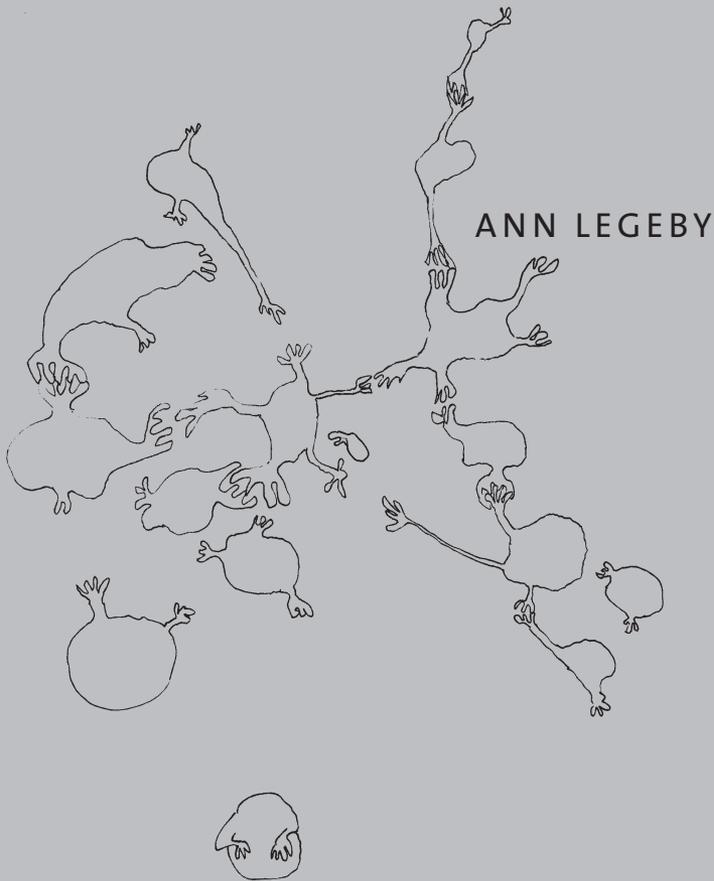


URBAN SEGREGATION AND URBAN FORM

From residential segregation to
segregation in public space



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the Built Environment**

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URBAN SEGREGATION AND URBAN FORM

From residential segregation to segregation in public space

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Abstract

Urban segregation is considered a major social problem in Sweden and several national anti-segregation initiatives have been launched to decrease social and ethnic segregation but so far only with marginal effects (SOU 2005:29). Urban design and town planning are rarely the focus in national anti-segregation initiatives; the architectural issue has mainly been confined to matters concerning housing policies. This thesis argues that the strong focus on residential segregation in prevailing research on urban segregation is unfortunate and skewed, confusing issues related to urban design.

This licentiate thesis explores *urban segregation* in relation to *urban form* because physical separation between people or between activities has an obvious direct relationship to how cities are shaped and structured by built form. Urban public space is often neglected in discussions on segregation and this thesis suggests that its role has been underrated. If it can be shown that segregation in public space influences such aspects of life as accessibility to other people and amenities, movement flows, co-presence in public space, and movement patterns, then it can be established that urban public space – as it is structured and shaped by built form – very directly influences people’s everyday lives.

The thesis explores how urban segregation can be conceptualized, analysed, and described in a way that increases knowledge and understanding regarding the role of urban form. Using a configurational morphological approach, this study shifts the focus by bringing attention to spatial relations within the city through public space, i.e., from *spatial location* to *spatial relations*. Hence, analysis focuses on distributions of space and *through* space rather than distributions *in* space. The result shows that configurational theories, methods, and tools contribute to more nuanced descriptions of spatial relations on both a local and a comprehensive level and analysis has the ability to shed light on essential differences in neighbourhoods and in the city as a whole. Using Södertälje as a case study, this thesis found a pronounced ruptured interface between the global and the local structure that clearly speaks of segregation in public space; this finding suggests that whether the neighbourhoods are residentially segregated or not, public space in most areas already

is segregated. Results show that the built environment has a significant influence: urban space can both reinforce and mitigate certain social outcomes. This thesis identifies various negative social consequences of the hierarchical and segregated spatial structure found in Södertälje. Although it is not possible to say that integration processes are hindered by urban form, it is possible to conclude that spatial properties may both create and reproduce segregation patterns.

Segregation in public space is found to be a far more urgent issue in the context of urban segregation than earlier recognised, and the result shows that urban form has a distinguishable influence on people's everyday lives. This understanding opens for the possibility to address urban segregation from an urban design perspective, contributing to a significant discussion of space and society as well as issues related to urban sustainability. The findings of this study widen the possibility for urban design practice to be an important tool within anti-segregation initiatives in the future, a tool that in Sweden is used only to a very limited extent.

Keywords: urban segregation, urban form, urban design, housing segregation, residential segregation, public space, co-presence, public life, spatial affordance

Acknowledgements

All these questions: How? Why? Some questions stay important only for a short time while others become lingering acquaintances. Some questions you can let go of as soon as a satisfying understanding is achieved while others are far more unyielding – they stick to your conscious like chewing gum stuck on the bottom of a shoe, demanding attention and answers at all odd times of the day. I believe those kinds of questions, the ones that just won't let go, function as important keys to knowledge. While working with this licentiate thesis, I have been able to devote myself to 'answer inquiring' when it comes to some of the unyielding questions I carry with me. To be a PhD student, has for me, meant a possibility for further education as well as a chance to explore and apply new ways of thinking, new perspectives, and new methods. Looking back, the process has many times been carried on in a roundabout way, a kind of wander up and down the roads of various thoughts, hypotheses, and theories. However, now, when its time to knot the threads together and let the material live in print, the seemingly aimless wandering has turned out to be important: if one doesn't look, one cannot know if there is something interesting there to find.

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1 Introduction

Increasing urban segregation

In the metropolitan areas of Sweden, social, economic, and ethnic segregation are considered major social problems that often result in unequal living conditions and unequal access to services and labour markets. During the last decade, residential segregation has increased in most Swedish municipalities (Integrationsverket 2007). Different neighbourhoods provide different living conditions for their residents. National reports have concluded that inequalities with respect to living conditions in different geographical areas have increased during the 1990s (Socialstyrelsen 2001). Several national initiatives aim to decrease social and ethnic segregation, but so far these initiatives have only been marginally effective (Socialstyrelsen 2001; SOU 2005:29). It is argued that a physical separation between groups in society manifests a social distance between different populations; as a result, some groups are excluded from important parts of everyday life, an isolation that makes it difficult, for example, to enter the labour market (SOU 1997:118). Social distance and exclusion are commonly pointed out as strongly negative consequences of urban segregation for society as a whole (SOU 1997:118; Hajjighasemi 2005).

Although segregation is an inherently spatial concept, the spatial dimension of social segregation is defined and analysed using quite simple spatial descriptions and weak theories on the relation between spatial and social phenomena. Furthermore, urban design and town planning have not often been in focus in national anti-segregation initiatives in Sweden. In the political debate, architectural issues have more or less been confined to matters concerning housing policy (SOU 1998:25; Andersson 2006). This thesis suggests that this has to do with how difficult it is to narrow down the physical, urban space dimension of social segregation and to capture empirically the impact and the influence of the built environment. The spatial dimension can never be fully understood or successfully managed without a powerful theory of space as a social entity: such a theory has been poorly described or absent from most discourse on the subject (Vaughan 2007; Hillier 2008; Legeby 2008).

In cities, physical separation between people or between activities has a very direct relation to spatial properties, a fact that makes the segregation issue a concern also for the architectural field, including urban design and town planning. However, the research field of urban segregation is dominated by studies on *residential or housing segregation*. This thesis argues that these prevailing descriptions and approaches used in studies on urban segregation provide a profound understanding of how residential segregation is manifested in urban areas and provides rich information regarding important factors that determine and reproduce residential segregation. However, while we learn how different social categories of people are distributed in our cities according to where they live, we do not gain knowledge regarding the specific influence of the built environment or whether the built environment is segregated in itself as a spatial system. How cities are built and structured influence accessibility to other people, to common resources, and to other important features in the city. The prevailing approaches and descriptions within residential segregation research give weak guidance regarding the role of urban form, information that is crucial for architects and urban designers. Descriptions do not primarily respond to questions that are highly relevant from the point of view of urban design, which leaves essential questions unanswered. Is the physical city segregated? Does the city have certain spatial properties that reproduce or neutralize residential segregation? This thesis argues that methods and tools that relate to approaches, analyses, and understandings of what implication urban form has for urban segregation are rather unexplored. To limit research on urban segregation to residential or housing segregation appears unfortunate. Although the residential aspect is crucial for the urban segregation matter, other relevant aspects also need further exploration. For example, this thesis looks at the possibility of integration in urban public space since the city is not only for living but also for other activities of which some make an impression in public space, such as working, travelling, walking, shopping, socializing, and recreational activities. Implicit in this approach is the idea to contribute to the social model within the current Swedish segregation debate: to widen the view of urban inhabitants as participants, not only as dwellers, in urban life.

Society and space

Generally, it is difficult to understand the relationship between society and urban space and how this is empirically defined. It is possible to see the city as either a large collection of buildings linked by space or a system of human activities linked by interaction (Franzén 1992, 37). However, to

study this relationship, the city needs to be recognized as both physical and social at the same time and urban theory and practice needs to connect the physical and the social city (Hillier and Hanson 1984; Hillier and Vaughan 2007; Franzén 1992; Olsson 1998).

This thesis questions whether many of the prevailing spatial definitions and descriptions of urban segregation are too one-sided and therefore do not give enough support for issues related to urban design and possibly misleading public debate. To gain a better understanding of the impact of urban form, it will be argued that a complementary spatial approach is needed. Such an approach considers the point of view of the people who actually live in and use the city (Marcus 2008). This could also include a focus on the potentials for urban life – interplay segregation – that in addition to housing segregation is argued to be a forgotten aspect within public debate on social segregation (Olsson 2005a).

The conception that people have the right to equal living conditions is stressed in the National Policy of Urban Development (2007/08:1). An important contribution to this discussion is research conducted by Julienne Hanson (2000). Hanson has shown that different urban design ideas are related to certain preconditions for sociability. Some urban layouts separate people from each other so that physical contact between close neighbours is made more difficult due to certain spatial relations such as relations between buildings and entrances, between buildings and streets, as well as between neighbourhoods. Because some areas are quite isolated and have low accessibility for people from other neighbourhoods, the potential for a mix of locals and non-locals or of residents and passers-by in public space is limited. Thus, the potential for urban life is significantly impaired (Hanson 2000; Hillier 1988). For architects and planners, it is of utmost importance to identify and explore any conditions that might influence such aspects, conditions that depend on the spatial properties of the built environment. These kinds of effects that the physical environment and urban form have could generally be described as a *probabilistic* impact rather than *deterministic*. Today, such insight that urban form has a probabilistic impact is rarely discussed in relation to issues concerning social segregation. This lack may be the result of an over-reliance on earlier deterministic models of the relation between space and the social.

To a large degree, public space has been neglected in Swedish discussions on segregation and this thesis is written from the view that its role has been underrated. It is through public space that people are connected and it is through public space that buildings and neighbourhoods are connected or related to one another. If it is possible to establish that segregation in public space influences, for example, accessibility to other

people, movement flows, co-presence in public space as well as accessibility to important functions, then it will be established that urban form has a very direct influence on people's everyday lives (Olsson 1998, 4; Schulz et al. 2004, 205). Implicit here is that segregation in public space appears as a far more urgent issue in this context than earlier recognised. At the same time, this allows social segregation to be investigated from an urban design perspective that acknowledges how town planning policies and urban design can address this problem.

The urban design perspective

It is important to stress that the issue of social segregation refers to many fields of knowledge, and to deepen our knowledge on the subject as a means to come up with actions that effectively can change the situation one needs to draw from all of these. However, the very word segregation has essential spatial implications and it is more or less impossible to conceptualise segregation without considering physical space, the built environment. When focusing on the field of architecture, including urban design and town planning, it is already on a theoretical level that the spatial dimension is essential to its understanding and successful study.

Segregation in the urban context is about separation, a separation of people as well as a separation of activities and functions; it is very difficult to understand such separateness without considering space as shaped and structured by built form. What is spatial in social segregation? Mats Franzén argues that “[...] if people and activities are of different kinds, space can be supposed to be implicated in not only the reproduction, but also and more importantly, in their constitution” (Franzén 2009, 1). In this sense, social categories and social activities are not only social phenomena but also are spatial phenomena. Hence much more systematic research is needed to understand how the physical city and the social city interact (Franzén 2009, 2). This way of understanding cities – not as a neutral background for social activities, but rather as an intrinsic aspect of social outcomes – is a crucial point of departure for this thesis. This thesis explores how different methods and tools can be used to distinguish more precisely the spatial, or rather, the configurational implications of segregation. That is, this thesis examines how the built environment influences urban segregation.

From an urban design perspective, urban form and spatial relations within a city should not be perceived as fixed; that is, cities are continually changing even though the changes often take place at a gradual pace. For example, new buildings are added into the urban fabric, new uses are found for old buildings, entrances are moved, streets are redesigned, and paths

are relocated. These are all changes that in one way or another influence the spatial relations within a city, and most likely, influence the use of the city. It is this urban environment that architects and urban designers are dealing with in their daily practise, reshaping or reconfiguring the urban landscape in order to achieve specific changes. And drawing from the presumption that the social and the spatial are closely related, describing and analysing cities as physical systems need to be made in a way that provide relevant information as well as a profound understanding of possible social outcomes produced by urban form. This understanding is critical since architects and urban designers rarely have such knowledge or such a foundation at their disposal, a deficiency that is of great concern when it comes to segregation issues addressed by urban designers and city planners.

If the physical environment in itself impedes sociability and supports segregation, it could be highly questionable to conceptualize the built environment only as a neutral background and in descriptions of social phenomena neglect the variable of urban form. To develop this knowledge is clearly a central task for architectural research. The question is how. If development of knowledge starts with descriptions, it is crucial to start from the very base and explore whether the way the problem is framed can actually address questions concerning urban form and social segregation. A simplified way of describing the city could be to see it composed of different layers that are superimposed upon one another: a structural layer formed by streets and public space, a built layer including, for example, buildings but also including greenery, as well as social and cultural layers including the population, and different kinds of cultural, historical, and social structures. In general, urban segregation research addresses the social layer using descriptions based on information, for example, about the residents, while traditional urban morphological research addresses the built layer using descriptions based on urban elements and typologies. This thesis, however, is specifically concerned with how *urban form* influences the *use* of the city. There is an attempt to foreground how urban form creates relations between the built layer and the social layer; hence the built environment is studied from a perspective that does not isolate it from the social layer; that is, the study is grounded in the awareness of the interdependence with the social layer. The physical environment puts people in various relation to each other, so by studying these relations it is possible to understand the physical prerequisites for relations between people when using the city, since, as Jan Gehl states, “[...] it is not buildings but people and activities that has a need for concentration” (Gehl 1980, 77)¹.

1. Citation translated from Danish to English by the author.

To capture the relations created by urban form, this thesis uses a configurational approach. There is a shift in focus from *spatial location* to *spatial relations*. Compared with research on residential segregation that describes geographical distributions *in* space, this thesis focuses on distribution *of* space and distribution *through* space. Distribution *in* space refers to location, for example, describing how different social categories of people (or any urban facility) are distributed or located in an urban system. Distribution *of* space refers to how urban space in itself is structured and shaped by built form, an approach that captures the impact of urban design. Distribution *through* space is how people use an urban system: how activity distributes itself in space as it is shaped by urban form. Hence, the distribution *through* space illustrates the consequences or the outcomes when both the distribution of space as well as how certain content (e.g., residents, working population, and various amenities) is distributed in space are taken into account (Marcus 2008; Koch 2004, 30-32; 2007, 82). This configurational morphological understanding of space and the knowledge that follows is what this thesis adds to the field of urban segregation.

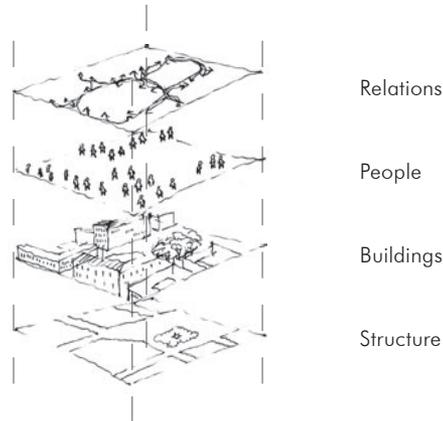


Figure 1:1. Focus on the relations within the city.

Questions in focus

This thesis mainly explores how urban segregation can be conceptualized, analysed, and described in a way that gives valuable and relevant knowledge from an urban design perspective. This calls for a better understanding of the role of urban form in relation to urban segregation matters. Such focus has an obvious relevance for architects and urban designers since in their daily practice they are engaged with modifications and changes of urban form.

During the process of designing the research, two basic criteria have come to stand out as essential. First, an approach is needed that includes a

comprehensive view of the city. Thus, neighbourhoods need to be studied in their spatial context and not as isolated neighbourhoods since spatial systems are continuous and local changes may have very remote effects (Brandberg 1999). Second, it is essential that theories, methods, and tools that are used have the ability to capture and distinguish spatial properties through analysis of urban space per se (which in this thesis refers to the physical environment structured and shaped by built form or distribution *of* space) and that this urban spatial system needs to be defined in a way that is relevant from a user's perspective.

This licentiate thesis departure comes from three main concerns:

- How is urban space conceptualised and described in Swedish urban segregation documents? The prevailing descriptions of housing segregation are explored to see how urban space is handled and conceptualized and what information such descriptions give regarding relations between urban form (the built environment) and social consequences.
- How can segregation be re-conceptualised to increase the relevance from an urban design perspective? In an attempt to widen the concept of urban segregation, there is a shift in focus from residential segregation to segregation in public space, which relates, for example, to issues of accessibility and to potentials for urban life.
- How can new approaches in configurational analysis and description develop and deepen our understanding of the spatial dimension of social segregation? Can urban systems and the built environment be analysed according to their implications for segregation? Is it possible to identify and describe the potentials and deficiencies that are consequences of urban form in different neighbourhoods in a comparable manner so that possible inequalities may be established?
- If it can be shown that urban form has a distinguishable influence on people's everyday lives, then the practice of urban design is a critical tool within anti-segregation initiatives, a tool that in Sweden is used only to a very limited extent. It could also contribute to a deepened discussion of space and society as well as issues related to urban sustainability.

Delimitations

Segregation in urban areas is a very complex phenomenon that concerns many different fields and disciplines. To avoid misunderstandings, it is important to emphasise the delimitation of this licentiate thesis since it

primarily focuses on one component, *urban form*. Apart from this spatial component, other components also create and reproduce segregation patterns that are not attended to in this thesis. The purpose of addressing urban segregation with a spatial approach – a configurational morphological approach – is to search for possibilities within the field of urban design to overcome negative consequences of segregation. This approach does not imply that other approaches are less important, but only that it is necessary to add an approach that is specifically relevant from an urban design perspective as a complement: “It is important to emphasize that while space has an explanatory power over the formation and persistency of deprived areas, it is not replacing other explanations” (Vaughan et al. 2005, 410).

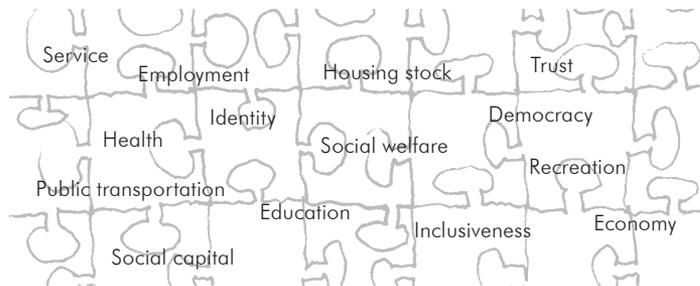


Figure 1:2. *Urban form is only one component of many that influences urban segregation.*

Structure of the thesis

Chapter 1 includes this introduction – brief overview of the problem and the field as well as the aims and the research questions in focus.

Chapter 2 deals with the problem of urban and social segregation and discusses different definitions as well as consequences. Some national anti-segregation initiatives in Sweden are described briefly. Different perspectives of segregation are outlined from a point of departure that could be related to urban design, town planning, and spatial planning. The notion of *interplay segregation* is described and has been important for the focus of this thesis. The chapter also includes a brief outline of the modern urban expansion as a background for understanding the Swedish cityscape.

Chapter 3 acknowledges the society-space relation. This chapter focuses on how social theories can be linked to the physical environment as well as how urban design principals have been adjusted to ideas about

society and sociability. Different aspects of urban life are outlined as well as how urban life may be related to the built environment and urban form. Also, there is a discussion about disurbanism and social malaise in an urban context. Finally, movement and co-presence as key features are highlighted.

Chapter 4 more specifically focuses on the spatial dimension; how the built environment and urban form are recognized within different traditions and what these kinds of descriptions and conceptualisations could imply for our spatial understanding. The thesis suggests a shift in focus from *spatial location* to *spatial relations*. The shift includes an analysis of the distribution *of* and *through* space rather than merely a distribution *in* space. The chapter bridges the theoretical basis to the empirical study as differences regarding methodological approaches and questions in focus are highlighted. There is a clarification of how spatial segregation in a city may be analysed empirically and the initial questions of the thesis are operationalized.

Chapter 5 introduces the empirical study with a brief background of the city of Södertälje. Also, the material, data, and tools used for the study are described together with different methodological considerations. In addition, a selection of official municipal documents for Södertälje that have relevance for urban design have been analysed and commented upon.

Chapter 6 presents the case study of Södertälje with the results. The empirical study covers three parts: *configurational analyses*, *accessibility analyses*, and *observations of co-presence* in public space.

Chapter 7 discusses the results and presents the conclusions. Also, the results are discussed in relation to a wider perspective about social segregation and urban sustainability.

2 Urban segregation

2.1 *The segregation issue*

The concept of segregation

Segregation means separation but how segregation more specifically is defined in the Swedish context of urban segregation varies. In most contemporary literature on the subject definitions and conceptualisations of segregation refer to Sven E Olsson Hort and Charles Westin and a brief review of these definitions is given below. This is followed by a few examples of how segregation is described in different investigations.

Olsson Hort (1995) argues that segregation is spatial, whether it exists in the labour market or reflects differences between certain social groups in neighbourhoods. According to Olsson Hort segregation as a concept also includes a certain level of social hierarchy between different sections of the population. Segregation defines borders between groups, placing the groups in a hierarchy of power, influencing collaboration and interaction. As a social construction, segregation is strongly related to social polarisation and resistance to change, which easily becomes a ground for political conflicts (Olsson Hort 1995, 2). Segregation is defined as an institutionalized form of social distance that manifests itself in physical separation. However, even if segregation implies separation between individuals and groups, it is not described as the antithesis of social integration (Olsson Hort 1995, 4).

Westin (1999, 59) emphasises that segregation stands for a separation from the whole. Segregation exists within many different areas such as the labour market, education system, athletics and recreation, health care, transportation systems as well as within the housing market. However, the concept is related to a spatial differentiation where housing is a key component for many of the other areas as well (Westin 1999, 59).

In the Swedish context, segregation implies a lack of social relations between different sections of the population, deficiencies that may result

in a distance between different groups manifested in their physical separation (SOU 1997:118, 23). However, primarily it is residential or housing segregation that is referred to in the national investigations about urban segregation, defined as the geographical separation between selections of the population, a definition based on socio-economic, ethnic, or demographic characteristics (SOU 1997:118, 23).

Segregation is both studied and understood as a relational phenomenon, and in a city or in a region certain degrees of segregation are shown between poor and rich, between ethnic groups, and between young and old. In the political sphere, however, Roger Andersson (2007, 67) argues that there is a tendency that the term segregated is applied to specific types of neighbourhoods (e.g., deprived areas), and that this view tends to conceal the relational character of segregation. According to Nordiska ministerrådet, segregated areas are characterized by high dependence on welfare subsidies and are found to have high levels of unemployment, low education levels, many households with single parents, and a high concentration of ethnic minorities as well as an unusual high frequency of drug and alcohol abuse and problems with criminality (Öresjö 1997a).

It is not surprising that the labelling in itself sometimes has a negative influence on a neighbourhood. Calling an area *deprived*, *excluded*, *vulnerable*, *exposed* or *segregated* may be stigmatizing, resulting in an unfavourable image of an area. In the long run, these labels unfortunately may even influence how the residents, others, and media perceive such a neighbourhood (Hajighasemi 2005, Hacking 2002). From an architectural point of view, a simplified labelling of areas might lead to unfortunate misconceptions. In Sweden, so-called deprived areas are often related to the modern suburbs from the 1960s and 1970s, such as the Million Homes Programme areas². Such classification might simplify the description of these areas, and as an unfortunate consequence they are often assumed to have similar spatial properties and characteristics. This narrow way of describing neighbourhoods might conceal important conditions and circumstances both regarding these particular areas as well as regarding other types of areas that on a comprehensive level most likely are important for the segregation issue.

A negative consequence of segregation that has been highlighted both in Sweden and internationally is exclusion. Housing segregation is arguably an impediment for the possibilities to achieve integration in society

2. The Swedish Million Homes Programme was a political project with the aim to build one million housing units within ten years (1965-1974) so as to end the severe housing shortage in Sweden.

and segregation is something that threatens democracy as well as economic growth and an important argument to counteract the ethnic and socioeconomic housing segregation is that segregation make it difficult for society as a whole to be integrated (Integrationsverket 2004). According to the Immigration Authority, a divided city – for example, a city characterized by housing segregation – results in unequal life chances that prevent people from integrating in society (Integrationsverket 2004, 15). Eva Öresjö emphasizes the issue of exclusion and its complex nature: “The problem in Sweden is not merely segregation in housing but the strong social and ethnic exclusion mechanisms that are growing. It is reflected in discrimination at work, segregation in secluded housing, political marginalization, etc. Today, being an immigrant no longer means a limited phase in the life of an individual. It has become a state which can extend over several generations, irrespective of actual citizenship or place of birth and upbringing. Many immigrants remain in permanent state of cultural subordination and social exclusion” (Öresjö 1997b, 44).

The Swedish situation

Sweden, as with many of the European metropolitan areas, faces difficult problems including social and ethnic segregation as well as conspicuous inequalities regarding the living conditions. It was as late as the 1990s that segregation became a social and political core issue (Olsson 2005a). Focus moved from a national debate about regional imbalances to the three metropolitan areas and the problems with social distances between neighbourhoods *within* the metropolitan areas. National investigations have reported that urban segregation can break the cohesive glue that is important for the development of a reasonable common ‘us’ among citizens (SOU 2000:37, 224).

According to Andersson, the increasing geographical concentration of many immigrants in Sweden has triggered the contention that ethnic integration failure is linked to housing segregation (Andersson 2007, 62). This concentration is partly a result of how the arriving immigrants who came in large numbers were directed to vacant apartments in certain suburbs (Olsson 2005a, 12). These vacant apartments were primarily found in the large public housing estates or in the Million Homes Programme suburbs in the three metropolitan areas of Sweden. Most countries have areas within the central part of the city labelled ‘deprived’, but in Sweden the areas defined as deprived, vulnerable, or segregated are most often found in more distant or peripheral locations in relation to the city core (Olsson 2005a, 12).

In Sweden, the development of housing areas after the Second World War was according to Andersson (2007) designed to embody principles of community and co-operation. Egalitarianism was a dominating principle in modern Swedish urban planning, but what once was seen as an example is now often linked with failure (Andersson 2007, 62). The flagship of modernist state-led housing planning, the Million Homes Programme built between 1965 and 1974 (constituting as much as 20-25% of the current housing stock), is now perceived as a measure that actually created residential segregation. At least in one respect, the Million Homes Programme was a major achievement as it did away with housing shortages and the inner city problems, but it has been contested ever since the first large housing estates appeared in the late 1960s and spurred the first wave of segregation research in Sweden (Andersson 2007, 62). Although neighbourhood and segregation research paid attention to the effects of segregation, it was not until the segregation according to social class was coloured by the ethnic component during the late 1980s that segregation became a prioritised political issue and that questions concerning its effects became more pressing. Early on, the importance of a more or less voluntary ethnic clustering was stressed, but later research moved away from these types of cultural explanations towards a framework that stressed the importance of social exclusion, white flight, white avoidance, blocking strategies, and racism (Anderson 2007; BråmÅ 2006; Molina 1997).

Is segregation a problem?

In Swedish national reports, the message is clear that segregation in our metropolitan areas is a serious concern and that economic, social, ethnic, and demographic segregation are interrelated. Further, the base for segregation is the economic and the social segregation rather than the ethnic, that segregation is about different classes in society, e.g., between those who have jobs and those who do not (SOU 1997:118, 75). Two classes have been identified: outsider-class and all others who constitute the core class of the welfare who also are established in the labour market. The national investigations note that people who live in the most vulnerable areas where unemployment rates are high are often excluded from society at large (SOU 1997:118).

The idea that all people should have a position in society and that all should have a right to equal living conditions is strongly rooted in Swedish society (SOU 1997:118). However, there has been an ever-rising polarization between the most and the least attractive housing areas in Sweden between 1970 and 1990, a development that even increased during the 1990s (Öresjö 1997b, 43). The intentions of the integrated society in the Swedish social and housing policies came according to Öresjö to

naught and the real situation turned out quite the opposite in the 1990s; housing areas were even more segregated than 20 years earlier. The segregation was not only socioeconomic, but also ethnic and related to health aspects. Öresjö suggests that this contradiction from the perspective of the Swedish welfare model has created a political and social trauma where nobody seems to know what position to take or how to resolve the problems (1997b, 43).

The situation is sometimes compared with how things were in the beginning of the 20th century: on the one hand, the social distance between classes was even stronger than today; on the other hand, today the physical distance is much greater between classes. A national investigation concludes that society needs common values to make it work (SOU 1997:118). These values are based on trust in others and trust in the public, whereas segregation is said to result in exclusion and gives rise to vicious cycles of problems that are mutually reinforcing. What makes segregation a societal problem is that it concerns the very foundations of society (SOU 1997:118, 78-79).

In addition, Mats Franzén (2001) discusses the unrighteous aspect of segregation and that segregation establishes or confirms a hierarchical difference between at least two groups. Hence segregation means there is, by definition, a superior or a subordinate position, morally and/or materially. Segregation creates insiders and outsiders, included and excluded, sublimated and stigmatized; that is, segregation is basically about power and relations between people and between sections of the population (Franzén 2001, 25). Segregation becomes a problem, irrespective of, for example, class or ethnicity, as it is perceived as unrighteous, as a lack of recognition and hence unworthy of a respectable society. Furthermore, as Öresjö has stated, segregation is especially compromising for Sweden since it presents itself as a successful welfare state. According to Franzén, segregation is an obstacle for processes that encourage the recognition of an outsider, encouraging otherness to be engaged by the established. This involves not only segregation in geographical space but also different forms of discrimination. His conclusion is that although spatial integration is not enough, it encourages people from different socio-economic classes to interact, confirming one each other's position as an equal member of society (Franzén 2001, 33).

Richard Sennett emphasizes that cities give people the opportunity to be aware of others and of society through the experiences and inventions in public space and that urban environment turns people outwards and enables people to see others and that this largely depends on the design of the urban environment (Sennett 1992, chapter 5-6). Franzén argues

that the Swedish urban landscape is problematic in this respect since it has a homogenous character that does not enable the kind of experiences or inventions that Sennett addresses: functions are largely separated from each other such as housing and business, and the strong housing segregation in Sweden means it is difficult for different categories of people to be seen or to see others (Franzén 2001, 34). Clearly, the potential to share public space appears to be impaired in Swedish urban areas: it is these assumptions that are empirically explored in this thesis. The possibility to have a mix of people in public space is, according to Sören Olsson, of utmost importance to counteract social segregation. He has coined the term *interplay segregation* to describe this phenomenon, which will be further attended to below (Olsson 2005b). To conclude, according to the reasoning above, it seems as if segregation negatively impacts society since in the end what we share in society is maybe not so much values as spaces.

2.2 *Anti-segregation policies*

Area-based programmes

In Sweden, social segregation has been the subject of far-reaching political initiatives. It is stated that in some vulnerable areas, segregation has restricted the influence of both individuals and neighbourhoods, difficulties that in the long run even have a negative impact on national development and economical growth (SOU 2007:104). Since the mid 1990s, the Swedish government has worked with different national area-based programmes and initiatives to counteract segregation and to improve the conditions for long-term sustainable growth (SOU 2007:104). It started with the *Blommansatsningen*³ followed by the National Examples and Local Development Agreement, also called The Metropolitan Initiative, which was launched in 1999 (Olsson 2005b, 23). All these initiatives focus on specific areas, to be precise, on the segregated or excluded suburbs. These initiatives attempt to solve the segregation problems in a few specific vulnerable suburbs in metropolitan areas (Olsson 2005b, 23). In spite of considerable efforts of policies and interventions to break segregation, only a marginal change of the situation has been noted (Törnquist 2005). It seems as if the patterns that came into being during a few years in the 1990s have been made permanent.

In the late 1980s, government-initiated investigations for metropolitan areas addressed segregation in Swedish suburbs. In the first report from 1990, the metropolitan areas were divided into smaller areas and the least attractive areas were identified according to the residents' level of dependence on social allowances. Through this criterion, about 50 'exposed areas' were identified and included in different programmes. In these areas, many residents were non-native Swedes, had low incomes, and exhibited more health problems (SOU 1998:25, 94). More reports note that there are in general several other parameters that are considered when analysing and defining segregation (or integration): ethnic background, level and type of education, employment and unemployment levels, income levels, participation in general elections, as well as health aspects. However, it is important to emphasize that the neighbourhoods are still analysed through the social profile of the residents who live in the areas at a certain time. Only a few analyses are based on other things (for example, on housing stock that show differences regarding type of housing or ownership (Integrationsverket 2006a, Integrationsverket 2007).

3. *Blommansatsningen* refers to the cabinet minister Leif Blomberg. The official name is *Special initiatives in immigrant dense housing areas* (translation by the author).

The contemporary urban policies include certain 'exposed areas' and within these areas there is primarily a focus on the labour market as well as on educational, cultural, and health-related interventions. Only to a very limited extent do the policies involve physical regeneration in these areas, an approach unlike what exists in many other countries (Andersson 2006, 787). Andersson identifies four phases of post-war Swedish housing and urban regeneration policies: the politics of inner city slum clearance (1940s to 1960s); the housing/urban renewal and cautious regeneration (1970s to 1980s); housing policy dismantled (1990s); and the selective and integrated urban area-based interventions (from late 1990s and ongoing). In the 1990s, the need for a specific *urban* policy became evident. Andersson tries to explain several aspects of these developments: the origins for the new policy; the use of similar strategy in other European countries; an acknowledgement of the importance of metropolitan areas for the economical growth; increased problems related to social polarisation/residential segregation; and the influx of several hundred thousand refugees who settled in suburban housing estates that face severe problems, i.e., social exclusion (Andersson 2006, 790).

The Metropolitan Initiative 1999

The Metropolitan Initiative was launched in 1999 and was a typical national area-based programme addressing vulnerable areas (Gustafsson and Rossing 2005). The initiative aimed at increasing long-term sustainable growth by providing new job opportunities and addressing social, ethnic, and discriminatory segregation to provide equal living conditions for the inhabitants of metropolitan areas. Initially, the initiative involved 24 poor and immigrant-dense neighbourhoods that were to share SEK 2 billion (220 million Euro) over a three-year period 1999-2002 (Andersson 2006, 791). According to the evaluations of the Metropolitan Initiative, a large number of residents in the addressed areas have indeed been favoured, but it is established that local actions alone will not have an impact on the overall causes or mechanisms of segregation. The understanding of the segregation phenomenon will only be partial if vulnerable areas are studied isolated from the rest of the society: "Segregation is not the responsibility of the vulnerable area. It is a matter for the whole of the municipality, region, society" (SOU 2005:29, 30). The aim to break segregation through area-based interventions was unrealistic (Integrationsverket 2006a). The local initiatives did not have the power to reach the all-embracing goals such as to break social, ethnic, and discriminatory segregation; these goals were over-ambitious and unrealistic (SOU 2005:29, Andersson 2006).

According to Andersson, compared to the other European and North American urban area-based programmes, the Swedish initiative differs in three ways. First, it lacks a real physical component. Second, no inner-city areas are targeted. Third, the initiative is launched with the ambitious (and rhetorical) aim to stop segregation processes. Although one of the eight goals is about increasing the attractiveness of the areas, very few measures have been integrated within the initiative that in some way involve urban design and changes of the urban form, and very little state resources are used for measures involving the physical environment. Instead, investments in the built environment are mostly the result of municipal co-funding (Andersson 2006, 792). Andersson states that the reason for not including physical interventions is “ [...] primarily that relatively few people believe that the physical structure of the estates and even less the quality of housing are important factors in the reproduction of ‘racialised’ social exclusion” (Andersson 2006, 792). However, Andersson does not fully agree with this general understanding that one is dealing with social and not physical problems. He stresses the importance of acknowledging that both richer and poorer neighbourhoods are part of the segregation patterns and processes, and he is critical of policy-makers who tend to address only the exposed areas, ignoring the more affluent areas. Also, he argues that the targeted neighbourhoods are sometimes poorly served in commercial terms and that they often are poorly integrated in the urban fabric. Andersson highlights several weaknesses relevant for urban design: public transportation often needs to be improved, physical barriers need to be removed or at least reduced, the facilities at the neighbourhood centres need to be upgraded, and there is a mismatch regarding size of apartments that need to be changed. In addition, new housing projects need to be scrutinised from a segregation perspective; for example, socially mixed neighbourhoods need to be encouraged (Andersson 2006, 797). Several of these aspects that are related to urban design will be further investigated in this thesis and it is argued that it can be studied empirically. For example, it will be analysed if the neighbourhoods are poorly or well integrated in the urban fabric and if the accessibility to certain facilities is lower in deprived areas than elsewhere.

All in all, it can be argued that the knowledge about the physical circumstances has not been studied thoroughly enough. There is very little information to be found regarding the spatial conditions and the role of urban form in relation to the segregation issue, especially on a comprehensive level, e.g., the municipality level where the vulnerable areas may be compared with other areas. Aspects regarding public space (shaped by built form), level of services, or how the spatial relations

within or between neighbourhoods are constituted are rarely the focus; rather it is the housing stock as such that is emphasised. However, there are exceptions. For example, one of the evaluation reports about the Metropolitan Initiative – *Arkitektur betyder: om trygghet och trivsel i fyra stadsdelar*⁴ (Schultz et al. 2004) – partly focuses on the built environment and many deficiencies are identified. This focus, in part, uses theoretical support from the writings of Anna-Johanna Klasander (Schultz et al. 2004; Klasander 2003). First, it is stated that the physical structure with a separation of functions as well as a separation of traffic is one of the basic problems in many of the addressed areas. Second, the spatial properties of these urban layouts cause many disadvantages for the people in these areas; e.g., the legibility within the neighbourhoods is poor and the public spaces are unpopulated, which implies that there is a low natural social control. A depopulated public space is often perceived as unsafe. Finally, the typology in many of these areas is problematic as it is characterised by a weak relation between the street and the building, and there are few entrances adjacent to pathways and streets (Schultz et al. 2004, 205-206, Klasander 2003). The evaluation report includes several concrete proposals. Increasing density, for example, can be done by adding new buildings along paths or places that are desolate and unattractive in order to increase safety and security. This is argued to constitute an important contribution to the one-sided housing stock of today as other forms of ownership and forms of tenure may be introduced. Also modes of transportation are seen as essential for the possibility to integrate these areas with the surrounding and with the city as a whole (Schulz et al. 2004, 208-209).

If these proposals are scrutinized in detail, the aim is to improve the areas by increasing the density of people in public space, increasing the density of buildings in an area, as well as improving the constitution of public space by adding more buildings (and entrances) along streets and pathways. However, this thesis questions if or to what extent such changes would result in a more populated urban space and/or a more secure environment for people when moving around in the areas. Although the proposals for once are quite concrete, they are at the same time rather general. It is most likely that even though a lot of buildings may be added, the intended effects can fail to be achieved if the buildings are placed in the wrong locations. This calls for more nuanced knowledge

4. The title in English is: *Architecture matters: About safety and well-being in four districts*, translated by the author.

and analytical tools that can help predict for example which building locations will improve the area most, or how much the potential for a more populated space will increase. This is exactly what will be explored in the empirical part of this thesis.

Unlike in other cities, the Metropolitan Initiative in Gothenburg did include some architectural interventions with the aim to compensate for different shortcomings in the physical environment as well as for the social situation (Schultz et al. 2004). In most of the other cities (e.g., Södertälje), however, there was not a focus on the physical environment. Ali Hajighasemi (2005) evaluated the Metropolitan Initiative in Södertälje and argues that the ignorance towards the physical component of segregation implied that the Metropolitan Initiative lost an important factor that has preserved the constancy of segregation. As investments in Södertälje only were beneficial for the people in the addressed neighbourhoods (i.e., those who lived in the area when the initiative was carried out) and did not include investments in the neighbourhoods (the built environment), the attractiveness factor was totally ignored. According to Hajighasemi (2005, 101), this is why the segregated neighbourhoods in Södertälje are found to be just as stigmatized after the Metropolitan Initiative as before.

The Urban Development Policy 2008

In the Urban Development Policy launched by the Swedish government, the objectives are partly reformulated, yet the focus is still on the same (vulnerable) areas. The idea that people have the right to equal living conditions is, however, stressed. The government has proposed the three objectives for urban development policy: first, fewer individuals living in exclusion in urban districts; second, fewer urban districts characterised by exclusion; and third, more urban districts as well as metropolitan and large cities as a whole that are characterised by economic growth and sustainable development to increase competitiveness (The Swedish Government 2008; SOU 2007:104). The 2008 Budget Bill states that the Urban Development Policy has a new direction and more precise targets since the government wants to strengthen links to other policy areas with a focus on employment, education, and security (The Swedish Government 2008). So far, this anti-segregation initiative includes 38 urban neighbourhoods in 21 different municipalities.

2.3 Perspectives on segregation

Most of the segregation research describes the state and the processes of segregation, often in quantitative terms. Although Andersson, Borgegård, and Fransson (2001, 83) stress the necessity of this work, they also suggest that research should combine different methodological concepts to increase the possibilities for a deepened discussion of what segregation means for everyday life for different groups. This type of approach should lead to a stronger focus on the consequences of segregation. In the following, some perspectives of segregation are briefly described as a background for understanding a proposed approach that is argued for in this thesis.

Segregation as residential segregation

The meaning of urban segregation in Sweden today could be said to be tantamount to housing segregation or residential segregation, concepts that dominate the debate and are also referred to in a number of national documents. Mostly the two concepts are used similarly in the literature about urban segregation in Sweden. Sometimes, however, the concept of housing segregation is used to emphasise its focus on the dwellings, such as housing type or forms of tenure: private rental, public rental, or condominium housing along with home ownership. In this thesis, however, both concepts are used and here no specific distinction is made between them, so both refer to a geographical separation of different categories of residents.

Residential segregation is defined through quantitative methods according to how people (or selections of the population) are distributed geographically, i.e., according to where people live. Segregation is studied as a relative and relational phenomenon, and, as pointed out above, generally three categorisation principles are used: demographic, socioeconomic, and ethnic (SOU 2000:37, Integrationsverket 2006b, Andersson 2007). The discourse elucidates the segregation pattern in an area (e.g., within a municipality or within a region), and it describes processes and mechanisms behind the segregation phenomenon. Recently, the use of longitudinal methods has significantly contributed to the field in this respect as it reveals how housing segregation develops over time (Andersson and BråmÅ 2004; BråmÅ 2006; Integrationsverket 2006a).

Since the beginning of the 20th century, the research field of segregation has been based on different theoretical notions that, for example, are outlined in Andersson et al. (2001) and there are different ways to define and measure residential segregation. Mapping segregation from

many different aspects reveals more than one pattern of segregation for a city. Cities have several patterns that are superimposed and overlap in different ways (Andersson, Borgegård, and Fransson 2001, 101). Naturally, methods will influence which variables are to be measured or what geographical delimitations are relevant. The geographical subdivision of areas is related to problems of how to divide areas, scale, and homogeneity within an area as well as how subdivisions of areas may change over time (this is further revealed in chapter 4). The different quantitative measurements that are common within Swedish research on the subject include the dissimilarity index and the segregation index (Andersson, Borgegård and Fransson 2001, 104-108). Segregation index derives from Duncan and Duncan's dissimilarity index and the measure is used to show dissimilarities. An even distribution gives a dissimilarity index of 0 but rises as dissimilarity increases to 100. The segregation index (also from 0 to 100) is a kind of dissimilarity index and measures the distribution of one category of the population in relation to the whole population in an area (Andersson, Borgegård and Fransson 2001, 104-108). Of course, there are also qualitative methods that aim to capture different subjective values among the population (Andersson, Borgegård, and Fransson 2001, 109).

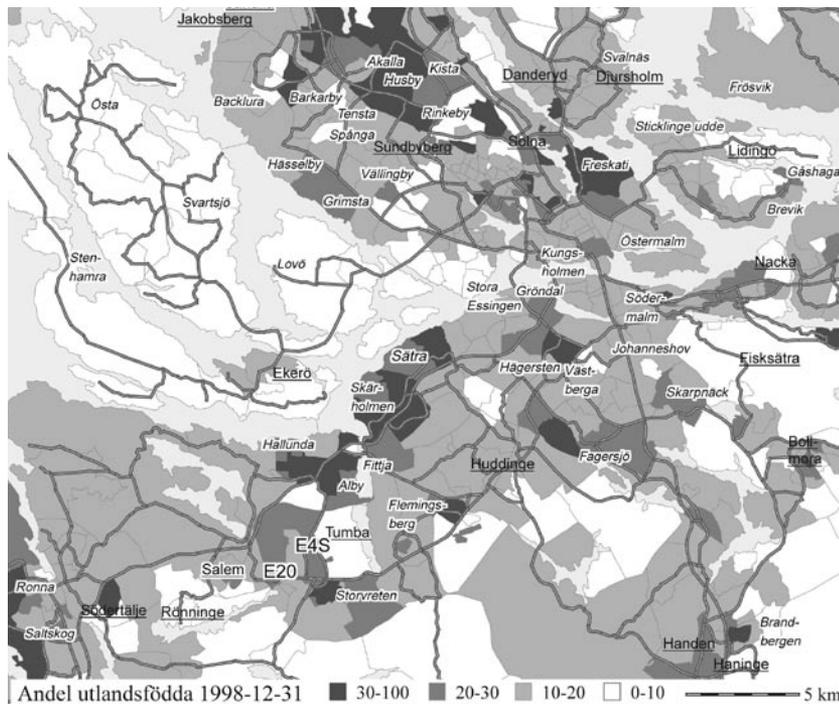


Figure 2:1. An example how residential segregation is described: percentage of people with foreign background (SamsData 98, in Socialstyrelsen 2001).

In this context, it might be relevant to mention another dimension of segregation that is also related to a time dimension. An example of such approach is found in studies carried out by the human geographer Torsten Hägerstrand (1991, 2009) who conducted studies focused on where and when different groups spend their time doing different things in the city. Although today it is possible to be quite independent of physical space (through different media, the use of telephones, internet, etc.), the social meaning of space is still strongly related to how human beings physically use space in everyday life. This strong focus on the use of space serves to some extent as inspiration also for this thesis. However, focus is more explicitly on how built form influences the use of space.

Housing segregation discourse often argues that there are two main factors determine segregation: relational and fixed (RTK 2006). The built environment – the main interest for urban designers – is in general perceived as fixed and difficult to change, and it is not investigated to the same extent as relational factors. Housing segregation research does capture information adjacent to the built environment, but the input is largely restricted to statistical information about housing stock. As a logical consequence of the focus and foundations of housing segregation, architectural interventions have mainly been confined to housing policies dealing with dwelling types, height of buildings, size of apartments, forms of tenure (private rental or public rental), condominium housing, and home ownership, whereas urban form: the spatial layout and its properties and conditions, has neither been described nor addressed in detail.

Interplay segregation

Another perspective of how segregation may be interpreted and conceptualized is the notion of *interplay segregation* (Olsson 2005a). This discourse represents a quite different approach compared with residential segregation since it focuses on urban life that takes place in the city and the interplay among people in public space. For the social segregation matter at large, interplay segregation is argued to be as important as residential segregation (Olsson 2005a). Interplay among people with different backgrounds and different social profiles could encourage tolerance and integrating processes that are important aspects in the discussion of segregation and exclusion. Among other things, this idea acknowledges the need people have to be seen and to see others.

Urban life could be characterized as *public* only if there is a certain density of people as well as a certain level of strangers or passers-by. If the density is lower and if there is less influence of people from outside a local area, then the urban life may be characterized as *local* (Olsson, Ohlander, Sondén 2004, Olsson 1991). The preconditions for urban life

depend on the built environment, land use, as well as on the density of people and the level of inflow of those who do not live in an area. Spatial location and issues of centrality and periphery are also discussed. Hence, the potential for interplay among people in public space is not only determined by where people live, but also where people work and conduct their everyday life activities.

This approach is highly relevant from an architectural point of view since the conditions for public urban life partly are determined by accessibility and movement, conditions that relate to urban form and the built environment. Consequently, it is suggested that different neighbourhoods could be described and analysed according to their potential for interplay in public space depending on its location, the spatial structure, or its configuration, as well as the accessibility to people. An attempt to capture this empirically will be carried out in the case study presented in this theses; the potential for urban life will be studied with reference to the number of accessible people as such as well as the possible mix of residential and working population.

Comments on the perspectives

Residential segregation and *interplay segregation* are interrelated and discern two sides of the matter. The first is whether or not one has neighbours from different groups in society and with different backgrounds. The second, which is perhaps even more important, is whether different groups in society are able to share public space and if there is a potential for public life to develop in public space in a specific neighbourhood. An essential question in this context is also whether it is possible to capture how this potential distinguishes between different neighbourhoods in a city.

This thesis argues that the prevailing definition of segregation (i.e., residential segregation) is unfortunate, concealing important conditions influenced by urban form (and urban design) and is limiting the debate in general. To gain a better understanding of the impact of urban form, it is argued that a complementary spatial description is needed that is logical from the point of view of how people use the city and move around in the city. Segregation in public space is thus essential as it both creates a distance between different neighbourhoods in the city as well as a distance between people in the city. It seems as if such a widened approach to the matter has the ability to consider the potentials for urban life that in addition to housing is important for social segregation (Olsson 2005a).

2.4 *The urban expansion*

Architecture and politics

To understand the characteristic features of the Swedish cityscape of today, a brief historical and political background is given. Urban design ideas have always been strongly influenced by social and political ideas. It has become clear, especially during the 20th century, that social ideas about inequalities in power are incorporated in our assumptions as well as into building regulations and different frameworks. This means that architecture and urban planning is closely related to politics (Hanson 2000).

Urban expansion clearly became a prioritised political issue in Sweden at the end of the 19th century. This is partly explained by a relatively late urbanisation in Sweden. In the mid 1800s, Sweden had approximately four million inhabitants with only four percent of them living in cities. As industries developed in urban areas, one million people from rural areas were attracted to the cities. In the beginning, these people settled within the existing urban area, enabled through a densification process (Åström 1993), but the situation became precarious and in spite of a rather extensive development the housing shortage in the metropolitan areas became acute, especially in Stockholm. The standard of living was extremely low and in the end of the 19th century Sweden was in fact one of the poorest nations in Europe and the gap between social classes, for example, workers and affluent people, was abysmal (Eriksson 1990). At this time, Gustav Sundbärg wrote an article about the extreme poverty in Stockholm in *Social Tidskrift* that significantly influenced the contemporary debate. This article helped make the housing shortage for the poor a pressing social issue. At this time, free enterprise handled virtually all construction in the city; the state was not supposed to interfere. However, this became strongly questioned and in the end requirements for society to be more active in dealing with the situation were prevalent (the article is referred to in Eriksson 1990, 229).

An early example of a political housing policy was the own-your-own-home movement. Eriksson (1990) points out three reasons for the success of this policy. First, it was a way for the Establishment to channel strong social tensions and bring the working class in a comfortable bourgeois-like lifestyle. Second, it was an opportunity to keep the workforce in rural areas, which was crucial for the agriculture sector. Third, it was a way to counteract the widespread emigration to America at this time. The state subsidies were primarily directed to the rural areas but were also used for urban areas just outside the planned city (Eriksson 1990, 348).

The need for increased control

The uncontrolled development in urban areas was not prevented by the building regulation established in 1874 since it only applied for formally planned urban land. In fact, most of the housing speculations, often built with extremely poor quality, took place at the urban edge where this regulation had no effect (Eriksson 1990, 350). The building speculations often resulted in densely populated settlements with extremely poor public facilities. Many of the industries developed outside the city area on unregulated land, which was followed by a construction of dwellings for the workers. At the same time, the wealthy people in society escaped the overcrowded inner city to the new garden suburbs that developed along the new tramlines and train lines (Johansson 1974, 209). According to Johansson, where early urbanisation took place was strongly influenced by the accessibility of land as well as land ownership. The crown-land near the city was particularly resilient for exploitation, so the early suburbs were established on private land far from the inner city. Hence, the urban growth at the turn of the last century was characterized by building construction at a rapid pace, an overcrowded inner city, and an extensive development farther from the city (Johansson 1974, 205).

Bjur (1984) argues that the uncontrolled development in metropolitan areas and the subsequent conflicts called for stronger interventions from the government implemented at the expense of the freedom of the individual landowners. The public planning gained legitimacy as social movements prevailed in the predominant liberal ideology. A new planning regulation acquired legal force in 1907 and this became highly influential with respect to urban development. The common good was presented as one of the main objectives of urban planning (Bjur 1984, 38).

A more scattered city

In general, there was a wide acceptance for an increased interference by the state in city planning that together with the new regulations had great impact on urban development. A key consequence of the building regulation of 1907 was that the municipality was forced to buy all land that was laid out as public space in a city plan. Hence, the municipality became responsible for the implementation of public facilities. In addition, the regulation involved an important spatial consequence as dense housing development was now allowed to be built in forms other than the traditional urban block structure (Klasander 2001). At the turn of the twentieth century, there was a severe housing shortage that together with the increased urbanisation opened for an expansion of the urban

area of considerable proportions that are of great relevance for the social segregation issue of today.

It is important to stress that the foundation for the scattered or archipelagic city that characterises the urban landscape of today was established at this time. Johansson describes it as the starting point for the development of a non-urban city⁵; in some way this is the beginning of urban sprawl in metropolitan areas in Sweden. Bjur also points out this as a transition period and calls the development an urban disbandment⁶ (Bjur 1984, 39). It was a starting point for an urban sprawl as such, a spatial separation – both regarding functions (i.e., industries, housing units, etc.) as well as the separation of different social classes in society (through, for example, the affluent garden suburbs or the own-your-own-home movement). The scattered and sprawled city and the necessary pre-conditions for its origin were a reality even before Modernism entered the architectural stage. The way was well prepared for design ideas that promoted geographically separated building enclaves as well as development with a mono-functional character.

Klasander (2001), who has conducted comprehensive research about the development of the modern suburb in Sweden, argues that the changes around the turn of the last century were crucial for establishing modernistic ideals in the coming decades. Klasander points out three key conditions. First, there was an unrestricted settlement pattern as the city no longer was growing concentrically. Second, public planning gained a new political legitimacy and it became possible to incorporate land using the legal system. Third, an aesthetic urban design was vigorously promoted that clearly distinguished it from the traditional urban block typology (Klasander 2001, 20-21).

Influential urban ideals

Many of the urban layouts that developed from the mid 19th century in rapidly growing Swedish cities were inspired by Hausmann. However, gradually there was a reaction towards the rigid grid net. On the international scene and in Sweden, Camillo Sitte became a significant source of inspiration. A freer form of urban layout patterns with a better adoption to the constraints in the terrain was introduced. This was an approach that came at the right time since most of the unexploited areas close to the central areas had been difficult to develop in accordance with the Hausmann approach (Åström 1993, 35-38).

5. Referred to as *Den stadslösa storstaden* in Swedish, in Johansson 1974.

6. Referred to as *stadsupplösning* in Swedish, in Bjur 1984.

The urbanisation led to overcrowded cities with serious social and health conditions. In many respects, this was an international problem. It was a severe critique of large cities and as a reaction urban design ideas showed a strong dissociation from the 'city' and became often a kind of antitheses of the city itself. Utopians, socialists, anarchists, and sectarians of different types tried new forms of living as an alternative to the urban life in growing cities (Schönbeck 1994, 277). It was in this era that Ebenezer Howard developed his city model The Garden City as an alternative to the capitalism at the time where local governance was central. According to Howard, urban planning was a mean to achieve social justice and change. His ideas were presented in *Garden Cities of Tomorrow* in 1902.⁷ Howard's Garden city was planned for 30 000 inhabitants at the most and the units were to be located in a circle outside every greater city. The idea was that the Garden City should be self-supporting in order to decentralize the metropolitan areas. Some units of Garden City developments were realised and the aesthetic character served as a model for the rest of Europe. However, in practice the Garden City never became self-supporting; instead they functioned more or less as commuting suburbs.

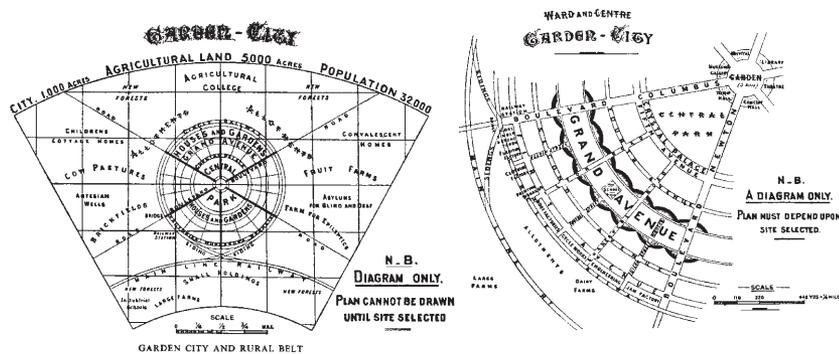


Figure 2:2. The principle of the Garden City of Ebenezer Howard, 1898, (from Choay 1969).

7. The ideas were also presented 1898 in the publication *Tomorrow: A peaceful Path to Real Reform*.

Consequently, this thesis suggests that the Garden City concept did not solve the problems of the urbanised areas in accordance with the original intentions; rather the areas allowed some sections of the population to escape the poor and overcrowded inner city areas. The basic idea, however, to design spatially separated 'city-parts' for one specific group in society or for one specific use or function (e.g., an area for housing or a location for work) was permanently established and would have great influence on new urban design ideas to come.

The modernistic influence

In spite of the development that was inspired of Camillo Sitte and in Sweden driven by P O Hallman, Albert Lilienberg among others, the critique towards the compact stone city increased. The inner city areas were still characterized by a dense block structure with few or no open spaces, parks, or recreation facilities. In Germany, for example, there was a reaction that resulted in a breaking up of the urban block into the lamella or slab house (Åström 1993, 39). The key words were sun, light, and air. The urban geographical distribution into freestanding building constructions was given strong and powerful aesthetics through modernism. The new attitude and approach to architecture and planning was clearly inspired by Le Corbusier and Walter Gropius and the association C.I.A.M., Congrès Internationaux d'Architecture Modern (Rådberg 1988, 72-78, 248). The modernism was not only a break in the trend regarding aesthetics; it was also a way to settle up with the bourgeois and reactionary powers. According to Le Corbusier, individualisation was seen as a threat to good citizenship (Rådberg 1988, 76).

In Sweden, the breakthrough of the modernism, in Sweden called functionalism, is strongly associated with the Stockholm Exhibition in 1930. Aspects such as rationality and cost effectiveness were prioritised and seen as the solution of the problems of the overcrowding cities and the severe housing shortage. According to one of the influential architects at that time in Sweden, Uno Åhrén, public planning was to answer for quality that was standing against the economical powers and a number of formulas were presented that calculated the turning point between the qualitative and quantitative interests (Klasander 2001, 24). The old city was viewed as out-of-date and even Åhrén spoke ironically of it: "The urban designer artist puts his head on one side and is modelling with street space and background as well as the whole artistic equipment as if urban

design where 90% of liberal arts, while rather it is 90% of technique”⁸ (Åhrén in Byggmästaren 1928, 173, quoted in Schönbeck 1994, 52).

The functionalistic ideas had great influence on the national housing and social investigation of 1933; for example, it was stated that the lamella house was a most suitable house type for families with children. The rational construction together with new possibilities for transportation led to an extensive exploration of housing areas outside the existing city (Rådberg 1988, 258-269). Rådberg argues that the lamella house was a completely new urban design doctrine and that it was most likely that it was due to ideological reasons rather than rational reasons that older ideas were turned down. The small town life form was according to radical architects obsolete and an inhibitory effect on people and the villas from the own-your-own-home era were seen as representing a petty bourgeois idyll that was not appropriate in modern society (Rådberg 1988, 311-312). In reality, the theoretical abstractions and simplifications of something as complex as the city came into realization more or less directly. The extension of the city at this time was mostly restricted to the development of housing units.

The Swedish Welfare State

According to Anders Törnquist (2001, 17), comparing other countries' housing policies with Swedish housing policy is difficult due to its egalitarian and democratic character. Törnquist argues that it was the linkages between the Swedish Social Democratic Party, the Swedish Welfare State, and the housing construction business that led to the Million Homes Programme. The Social democratic government was established in 1933 and launched the Swedish Welfare State (folkhemmet); the goal was not only to provide all people with a good dwelling, but also to be equal for all (Törnquist 2001). This is reflected in the national investigation of housing and social issues from 1945 where the dwelling is described as a social right for all people and the intention was to provide the Swedish population with good and hygienic dwellings at reasonable rents (SOU 1945, 63). The intention in the investigation from 1945 was that different social groups were not to be separated from each other. To build social housing for people who are less well off was at this time a common strategy in other European countries, but not in Sweden. However, the possibility that everyone could live anywhere did not mean that people actually

8. The quotation by Åhrén is translated by the author.

did so. The suburb became a symbol for Swedish belief in the future – a weapon against the old class society (Törnquist 2001).

The neighbourhood unit

The neighbourhood unit planning in Sweden developed from the critique of the functionalist way of building during the 1930s. The main idea was to focus on the social aspects forgotten during the functionalism movement. Franzén and Sandstedt (1981) describe it as a critique towards the rational moments of the functionalism and that the neighbourhood planning ideas had more of an emotional moment. They argue that for the same reasons the history would be repeated about 30 years later as the critique towards the suburbs rose towards the Million Homes Programme areas (Franzén and Sandstedt 1981, 139).

An important international influence for the Swedish neighbourhood unit planning was the sociologist Clarence A. Perry who presented his ideas 1924 and 1929 in *The Neighbourhood Unit: A Scheme of Arrangement for the Family-life Community*. The aim was to create physical conditions that could facilitate the emergence of a community. It was an attempt to promote the local community and civic life and there is a connection to the ideas of the Chicago School (Franzén and Sandstedt 1981, 149). According to what Franzén and Sandstedt render, the Neighbourhood unit is based on six basic design elements: the size (based on number of school children), the delimitation (based on motorways, landscape elements, etc.), open spaces, institutions (schools, churches, etc.), shopping malls, and some kind of traffic separation (e.g., local traffic separated from through traffic). The neighbourhood was about 800 by 800 metres and had about 5000 inhabitants. Franzén and Sandstedt (1981, 154) argue that Perry's Neighbourhood unit is neither based on theoretical nor empirical considerations; rather there are technical justifications for its construction and organization. Hence, the point of departure is *social* and *political* and it is the contemporary norms that decided the size of the unit, not a theory of an optimal population size for a good social life. Franzén and Sandstedt (1981, 156) strongly critique Perry's motivations. However, this thesis does not include a detailed discussion about the weak theoretical foundation of the neighbourhood unit, but the conclusions that Franzén and Sandstedt formulate about the Swedish situation and that are found to be relevant for the segregation issue are highlighted. First, they stress that neighbourhood unit planning in Sweden turned out to be consistent with functionalism; the typology was possible to incorporate into the comprehensive functionalistic planning structure that separates functions (land use). Second, the size of the unit was decided according

to the contemporary norms and was not a constant; thus it was influenced by current economic and political climate. Third, the design had a social foundation with the aim to create a sense of community among the residents. However, theoretically the relation between social conditions and physical design is vaguely formulated and is more of an assumption. As the *design* is governed socially but the *dimensioning* is practical according to certain norms, the emotional side of the neighbourhood unit is brought together with the rational side of the functionalism. Also, Franzén and Sandstedt add more specific conclusions such as that the neighbourhood planning was adapted for families with children and for a vehicle-dependent lifestyle. This can be described as a product of the planning experts. There are a few important differences between the Swedish neighbourhood units compared to Perry's. Politically, there was a social democratic profile of the neighbourhood unit, a difficult position to harmonise with a classical liberal standpoint. Also, in the Swedish version, all shops were gathered in a local centre and not as in Perry's version, located along streets in the outskirts of the neighbourhood, accessible also for adjacent areas (Franzén and Sandstedt 1981, 162-163).



Figure 2:3. The principle of Perry's neighbourhood unit (from Lang 2005).

The reason for focusing on the neighbourhood unit in this thesis is that these ideas have had such a great influence on the Swedish cityscape that exists today. It was not only a phenomenon of the 1940s and 1950s (see Franzén and Sandstedt 1981; Klasander 2001, 41), but also urban design ideas that in fact influenced Swedish building and planning for several decades even though the term neighbourhood planning was not that frequently used later on. However, the spatial separation and the sprawl tendencies that were the result of this way of building came out even stronger in the following design ideas that still were based on the same urban design features but with a different architectural character. The notions of neighbourhood planning became a norm for building and planning in Sweden and this change could be described as a completely new way of how to build cities during the post-war period that was governed through economic and political changes.⁹

An explanation for the significant impact that these neighbourhood ideas had was that they did fit very well in political and Swedish planning circles. According to Franzén and Sandstedt, an important goal in the political strive during the 1940s was to promote democracy. One of the political influential persons at this time, the sociologist Torgny Segerstedt, was of the opinion that democracy could be supported through well functioning primary groups.¹⁰ It was linked to the notions of the evil mass society where the individual became isolated within the mass. The evil mass society was seen as the very opposite of the group society, which was perceived as a positive force. In the same circle where Segerstedt was acting for a more democratic society, influential architects were included such as Jöran Curman, Helge Zimdahl, and Uno Åhrén. They interpreted and translated the sociological ideas about democracy into built form and advocated neighbourhood planning. This concept was argued to support the primary groups, the family, and close relations to neighbours, and it was believed that this would support the creation of democratic people. Inspiration for these political planning currents also came internationally, especially from England (Franzén and Sandstedt 1981, 59).

To conclude, what characterizes the Swedish neighbourhood unit planning is that the areas are primarily built for housing and specifically for households with children. Apart from housing, some basic complements are found, such as schools, nursery schools, community house,

9. Empirical support for such assumptions is shown in Franzén and Sandstedt, 1981.

10. According to Franzén and Sandstedt (1981, 58) the inspiration for Segerstedt was the theoretical idea of primary groups formulated by Cooley.

some shops, and places for play and recreation. The units are well defined geographically, efficiently cut off from neighbouring areas by roads, railways or green areas. Compared to Perry's scheme where a unit was placed within an urban fabric, the Swedish concept implied that one unit was taken out of the city fabric and isolated. Although driving is prioritised, there is rarely through traffic in the areas; the traffic system is highly hierarchical and car traffic is mostly separated from walking and cycling.

Urban layouts with ruptured interfaces

Klasander identifies the political driving force as one explanation for the strong development of the neighbourhood unit and argues that this was important for how the Million Homes Programme was designed. The support for the neighbourhood planning ideas was strongly rooted also in national movements that became crucial for the building of the Swedish welfare state. The financial and administrative foundation for the housing development during the coming thirty years was laid by the Swedish Parliament in 1946-1948, driven by a severe housing shortage at the time. Among other things, the municipalities were enabled to take responsibility for the provision of housing, new institutes for general and region plans as well as a municipal public housing sector were established. With this, the involvement of the state regarding housing issues increased considerably and became more permanent, which was an important precondition for the implementation of the Million Homes Programme. Klasander argues that the early neighbourhood units and the suburbs of the Million Homes Programme are possible to categorize as the same urban design type even though the aesthetic expression was to be changed radically over the years. As a design principle, the neighbourhood unit was to be unrestricted for four decades in Sweden and still today the social patterns are influenced by the ideals that were materialised in the design of these areas (Klasander 2001, 40). The strict lamella house plan from the 1930s was modified during the 1940s and houses were localised in more varied ways. The rigidity regarding orientation towards the sun was no longer a governing requirement and there was a focus on a well-defined public space along streets or squares, even though it was considerably different compared with the traditional urban block city. In these layouts, building entrances were normally located towards public streets and spaces in traditional cities. Shops and services were located in a planned neighbourhood centre (and not spread out more evenly as in an urban block structure). The idea about traffic separation, characterized by a hierarchical structure, was further developed and started to be implemented during

the 1940s. It was especially the pedestrian network that was separated from other kinds of traffic.

Klasander (2001) describes that during the 1950s, this development continued with some important modifications. It became common to accentuate the centre of the neighbourhood, for example, with a high building, and there was an explicit goal to remove through traffic from the centre. Sometimes even the centre was directed towards pedestrian pathways instead of a street (e.g., Hökarängen, 1949). As a result, no entrances were directed to the street or the adjacent parking lot. This development implied a transformation of the multi functional street (as a potential meeting place, etc.) into a mono functional street (i.e., transportation only). Klasander points out that it is during this period that streets and open spaces become less defined. As shops and businesses were localised to the planned neighbourhood centre, other buildings in the neighbourhood no longer needed to be placed adjacent to streets; instead, the buildings were related to green open spaces. The tower block house became more common, a house type that is easy to locate in difficult building terrain but does not contribute to a well-defined public space. Meanwhile, there were many heated discussions about multi-rise buildings during this decade. Also, a new criterion for dimensioning neighbourhoods with its centre was introduced, namely the requirements of business; as a result, the centre that during the 1940s was dedicated to democratic initiatives was now at the disposal of business.

The new scale in building that was introduced during the 1950s made way for a more rational and large-scale design in the 1960s. According to Klasander (2001, 49), the basic features still applied and the new suburbs were built peripherally – functionally, socially, and architecturally. The form of a segregated enclave with a planned centre and a consistent traffic separation were basic prerequisites. The guiding principle regarding traffic, the SCAFT¹¹ model (Statens planverk 1968), had an enormous impact. Vehicle traffic was efficiently separated from pedestrian movements and building entrances were removed from public streets to inner courts. The motives for these recommendations were largely based on traffic safety. Very deliberately, all possible conflicts between pedestrians and others were to be minimised and to achieve this it was believed that building entrances should not be located on the streets. Very often parking lots were placed between the buildings and the streets in order to

11. *SCAFT, Riktlinjer för stadsplanering med hänsyn till trafiksäkerhet*, later replaced by *Riktlinjer för bebyggelseplanering med hänsyn till bilplatsbehov* (Åström 1993, 178).

create a kind of safety zone (Klasander 2001). The SCAFT model gave legitimacy to an established practice, and in fact, these ideas still have a great impact on contemporary building and planning in Sweden.

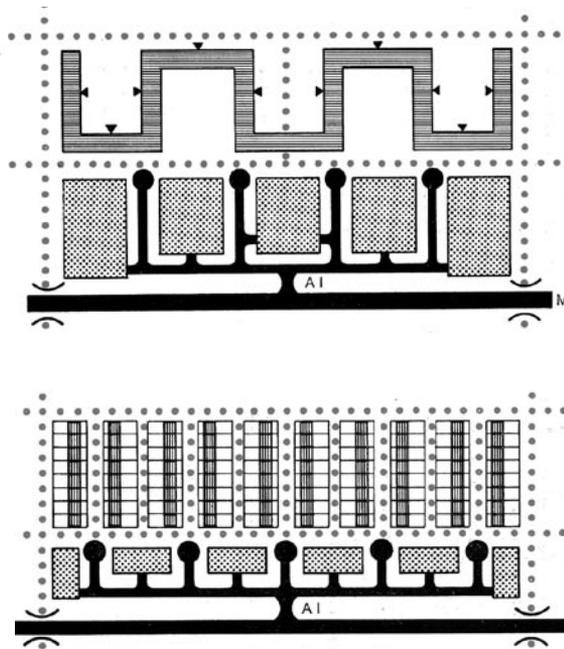


Figure 2:4 Principal layouts in SCAFT (1968).

The demand for a rapid development in combination with new requirements for state loans and subsidies resulted in large scale and monotonous housing estates. There was a simplification of form and at the same time the areas were planned in larger enclaves with higher buildings. The planned neighbourhood centre was no longer for public representation; rather, commercial activities were prioritised with large parking lots adjacent to it. Open spaces lack differentiation and the houses are no longer even relating to courts or the nature, only to indefinable and vague spaces between the buildings (Klasander 2001, 53). A similar change – “[...] a ruptured interface between dwelling and street” – is also acknowledged by Hanson in the study of different design principles (Hanson 2000, 113). The consequences of this for the residents will be further outlined below. The extensive development that was implemented during the 1960s and 1970s, including the Million Homes Programme between 1965 and 1974, implied that the prevailing ideas at this time received a significant impact that has left a considerable mark in the Swedish city landscape.

A deliberate separation

The social assumptions and design ideas developed during the post-war era resulted in an archipelagic city-landscape structure, a structure that could be described as both strongly spatially segregated and often also socially segregated. Several planning regulations and tools in Sweden were governed by the neighbourhood planning ideals and had great influence on the development of new suburbs for several decades. One typical example is the General Plan that was introduced and developed during the first half of the twentieth century. It is a typical example of how social assumptions and ideals from one era are incorporated in regulations and frameworks and hence have a very long lasting effect on the development to come, a phenomenon also acknowledged by Hanson (2000). The ideals of neighbourhood planning were promoted in many General Plans for Swedish cities with typical features such as the geographically isolated enclave with a planned centre for business and services, and a traffic system with a separation and differentiating of movements to, within, and around the neighbourhood. The General Plan for Stockholm (1952) had diagrammatic figures for suburbs showing a clear zoning of land use and a zoning of different types of dwellings. In addition, the plan promoted ideas of a deliberate segregation; in fact, segregation was part of the programme. People with similar socio-economic situation were to be located together since it was believed that they would more easily create bonds and create a sense of community. As Göran Sidenbladh, one of the leading architects of the post-war urban expansion of Stockholm, puts it: "Prerequisite for true community is that members of a group belong to the same class or social group. [...] Today one needs to consider that social bonds more easily come into existence in units that are homogenous from a social point of view. [...] With a moderate density of the population there will not be more people than that they are able to know or at least recognize each other. A mix of different social classes within such a unit should not be aimed at"¹² (Sidenbladh 1948, 115).

In the General Plan for Stockholm from 1952, this matter is not answered quite that unambiguously, but it is stated that people more easily develop ties to others from the same social class that people prefer to live with. Also it is suggested that when there are concentrations of people from the lowest income groups, gangs of a criminal or asocial nature occur. At the same time it is pointed out that practical democracy presupposes a mutual understanding between different social classes (Stockholms Stads Stadsplanekontor 1952, 125).

12. Citation translated by the author.

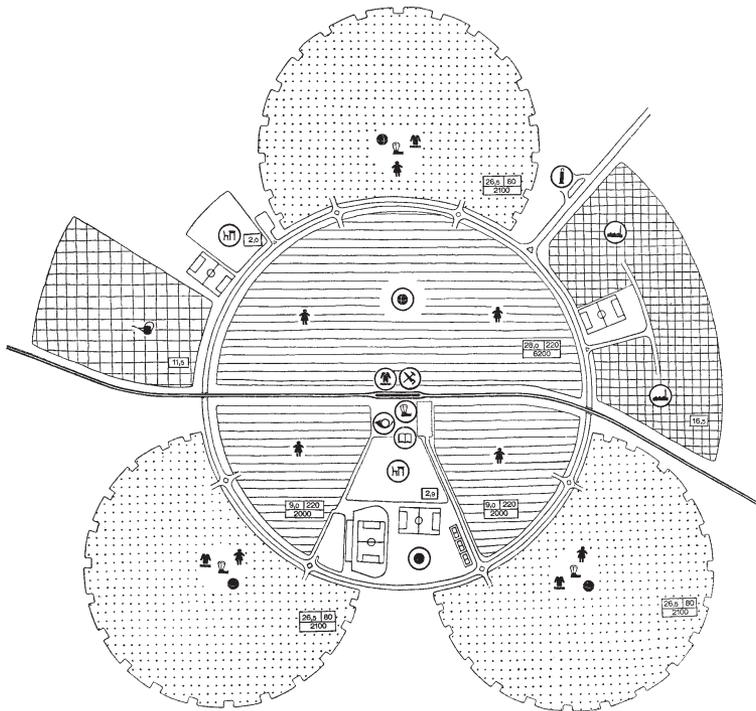


Figure 2.5. Template for neighbourhood with subway and 16 500 inhabitants.
(The General Plan for Stockholm 1952).

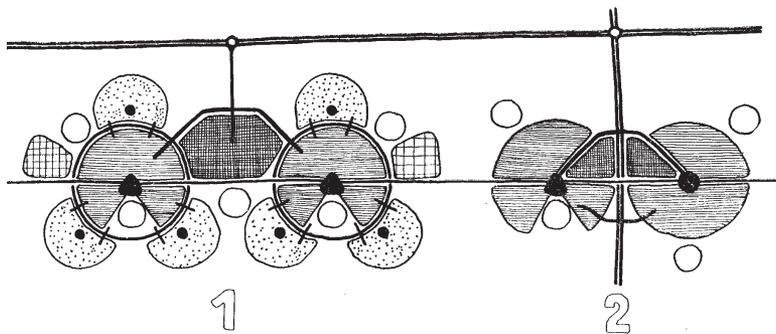


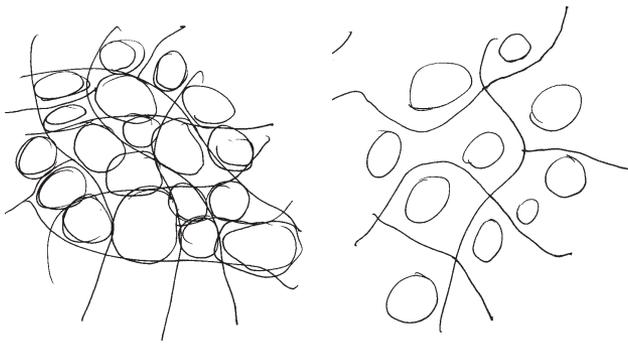
Figure 2.6. Templates for new development: 1 – two neighbourhoods with a common area for industries, about 33 000 inhabitants; 2 – two neighbourhoods with rental multi family houses, about 24 000 inhabitants. (The General Plan for Stockholm 1952).

However, the critical debate towards the suburbs, as was part of a critique towards the society at large and a rediscover of class society, peaked in the end of the 1960s as the Skärholmen centre was opened (Franzén and Sandstedt 1981, 17). Different investigations were conducted and actions were formulated in different regulations and policies that reflected the debate of the late 1960s. In the Bill of Housing Policy from 1974, one of the prime objectives regarding housing policies was the promotion of a comprehensive mix of different households within neighbourhoods. Contradictory to this intention, the development has turned out in a quite opposite direction and there has been an ever-rising polarization between the most and the least attractive neighbourhoods in Sweden between 1970 and 1990 (Öresjö 1997b, 43). The most attractive areas have acquired more and more of an exclusive character, and the least attractive areas have an increasing population of poor, untrained, and socially disadvantaged people, including large proportions of immigrants (Öresjö 1997b, 43). It is obvious that even if other social ideas of inequalities have come in power, urban layouts and design ideas and practice have not changed to any larger extent but is still much governed by the neighbourhood planning repercussions. Still people who live in different building enclaves are efficiently separated through the spatial design with little exposure towards each other. The dream of the integrated society is getting more and more distant from how reality turns out (Öresjö 1997b, 43).

Morphological changes and social assumptions

Both Franzén and Sandstedt as well as Klasander argue that the changes of urban design ideas took place gradually but that they rest on the ideas of the neighbourhood planning that have been modified as well as transformed in scale. It was obvious that the social intentions for the neighbourhoods from the 1940s and 1950s were not fulfilled, however, quite surprisingly new ideas on how to respond to this were not on the agenda, yet urban design focused even more on functional aspects. One reason for the resignation to create physical environments that could support social community could be the evident failures of the earlier suburbs and a lack of knowledge about how built environment influences social aspects. Another reason could be the strong belief in the possibilities of social fieldwork to create community, a method that gained great credence as a result of the heavy critique of the suburbs (Franzén and Sandstedt 1981, 37). The neighbourhood work (e.g., the social field work) became the sociologist's response to the critique of the deprived suburbs, sociologists who had empirically captured the negative effects on social life in many of the post war neighbourhoods with social problems. These initiatives

were encouraging people to organise within the neighbourhood and together with the authorities or the real estate owners try to improve the local environment such as playgrounds, common spaces, the environment at nursery schools, etc. Concurrently, the social ambition within planning was toned down and replaced by a focus on different functional aspects such as traffic, housing, and business. All these aspects were optimized separately and then these parts (or fragments) were put together in a kind of city like development. However, the prioritising on the parts was made at the cost of the whole and there was an apparent ignorance towards possible effects for social life.



*Figure 2:7. Do the city
constitute of parts or is
it parts that constitute
the city?*

As a result, initiatives regarding the built environment have been more or less absent apart from different kinds of ambitious maintenance projects. Focus among architects and planners has largely remained on physical and functional aspects while the essential question in this context – how the social and the physical city relates – has not been explored in detail. One could say that such knowledge has neither been on the agenda nor developed. The critique towards many of these suburbs that are designed according to the neighbourhood planning ideals has been, and still is, immense. It appears urgent to understand in more detail the social consequences of these morphological typologies and a starting point for such exploration is to acknowledge space as something more than a neutral background of our material existence. Before revealing more about how urban form might influence social use at large, urban life needs to be highlighted since this was one vital aspect missing in the suburbs created during the post-war era.

3 Society and space

3.1 The city: a place for social life

According to Franzén (1992) the built environment in sociological studies of everyday life in cities, is rarely foregrounded or dealt with in a concrete and systematic way. Unfortunately, this leaves much unsaid about the interrelationship between urban form and social life. What is found is often an indirect description of the city, and thus, it leaves matters relevant for urban design unattended. Franzén argues that it is obvious that space has significance for everyday life (for the life-world if referring to Habermas); more surprisingly is how rarely it has been documented. He even argues that in most historical and sociological studies of everyday life the influence from built environment is not described explicitly, it is generally missing or at the best it is taken for granted (Franzén 1992, 39). This chapter looks through a number of examples at how specifically the built environment is taken into account and what influence on social life is ascribed to it.

Simmel and Wirth

An early and most influential contribution was the now classical essay by George Simmel *The Metropolis and Mental Life* (*Die Grosstadt und das Geistesleben*) from 1903 of the life in Berlin at the turn of the last century. It is a rather negative image of the city that is proposed and the metropolis is described as a vast sum of people who adopt an attitude of reserve towards one another, a blasé attitude. The modern life in big cities was argued to have an affect not only on the individual but also on society and social life at large. A central theme is also the discipline of time, which is indispensable for the metropolis that is closely connected to modernity as such. Density is also emphasized together with mobility and economy. In an interpretation of Franzén it is argued that it is ambiguous whether Simmel formulates a reflection of the big city as one aspect of the modern

life or of the big city as such (Franzén 1992, 35). Although the observations are not formulated as aspects of urban space (of the built environment), Simmel is in general, according to Franzén (1992, 35), the one of the classical sociologists who is closest in doing so.

Simmel's work influenced Robert E. Park who together with other American sociologists became known as the Chicago School. Louis Wirth developed a theory of the city as a culturally form where urban life is defined as a specific life form (Wirth 1938). The urban-industrial society is described as the opposite of the rural-folk society. Typical characteristics of great cities are a certain size and density of the population and heterogeneity. It is notable that the built urban environment had made way for profound changes in virtually every phase of social life (Wirth 1938, 2). It was this life and these life forms that became the primary focus in Wirth's studies as in many other studies of the Chicago School. In this thesis, it is argued that especially one notion has had great impact for urban design ideals, namely the notion that an increase in the number of inhabitants in a community results in weaker social relations in neighbourhoods, in groups, as well as in families. Wirth believes there is no personal mutual acquaintanceship between the inhabitants who ordinarily live and work in a neighbourhood (Wirth 1938, 11). Life in the city is characterized by social disorganization and that the close living and working together of individuals who have no sentimental and emotional ties foster a spirit of competition and mutual exploitation (Wirth 1938, 15).

This description of the city as well as the description of the life in the city is clearly imbued with a negative image. People living in cities were believed to be negatively affected by the life conditions that emerged in the city. From a Swedish perspective, it could be surprising that these ideas got a hold since cities in Sweden at this time were neither particularly dense nor large compared to the cities that were studied in this context. What can then be said about the spatial dimension in these examples? Both Simmel's and Wirth's observations were made in large cities at a given historical time, Berlin at the turn of the century and Chicago in the interwar period. Franzén (1992, 36) describes this time as after the industrial and capitalistic breakthrough but before the breakthrough of the welfare state. Both cities were built with a traditional grid structure, a continuous block structure, each composed of several properties with a mix of uses and clearly, these spatial conditions had certain effects in that historical time (Franzén 1992, 36). For both Simmel and Wirth, these built environments with their similar spatial properties were the evident point of departure for their studies. The view of large cities as something threatening, something that was bad for humanity, was strengthen

during the first half of the 20th century. As a consequence of such notions, several urban design ideas were formulated that tried to respond to the critique towards the severely criticized urban environments, the traditional urban block structure. This resulted in new ideas for urban layouts that were designed according to completely different principles than before and were coloured with social intentions that were believed to counteract the bad influence cities were said to have on people (see also paragraph 2.4).

Jacobs and Habermas

The modernistic ideas and the new urban layouts brought a new social logic and one of the first to acknowledge the change and the consequences for daily urban life was Jane Jacobs in *The Death and Life of Great American Cities* 1961. Her book contains a comprehensive description and comparison between the traditional city with urban blocks (the grid structure) and the modern urban planning with housing estates or suburbs. Jacobs formulates a strong critique towards modern urban design principles that is said to imperil both liveliness and diversity. Jacobs argues that the urban layout in itself plays an important role in generating urban life, heterogeneity, and urban qualities. She is especially interested in the conditions for the daily life for women and children. In an area that lacks urban life, people need to enlarge their private lives if they are to have anything approaching equivalent contact with their neighbours or they must settle for lack of contact (Jacobs 1989, 62). This could also be described as an exposure of the private sphere. Jacobs argues that it is not only the social conditions that are poor in these areas, but also they are environmentally unsustainable; the costs for energy, infrastructure, and land will be too high in the sprawled suburbs (Jacobs 2005, 16).

Jürgen Habermas describes similar observations in *The Structural Transformation of the Public Sphere: An Inquiry into a Category of Bourgeois Society* (*Strukturwandel der Öffentlichkeit. Untersuchungen zu einer Kategorie der bürgerlichen Gesellschaft*), published only one year later, in 1962. Habermas argues that the concealed undermining of the intimate sphere of the family is architecturally expressed in how buildings and cities are designed (e.g., in the suburbs). Earlier there was a design that enabled both private sphere activities and public sphere activities to take place at the same time. Modern design and modern housing and living are according to Habermas (1984, 153) characterized by the loss of the private sphere and the loss of secured accessibility to the public. A design with blocks of buildings that characterise the traditional city, where houses adjacent to and facing the street and with gardens in the back – enabled people to have access

to both public space (the street) and private space (the interior and the garden). Such arrangement however, was seen as out-of-date when traffic was given a higher priority in town planning. Modern architecture is said to neither create a sheltered private sphere nor a public space where (private) people are brought together into a public common (Habermas 1984, 154). Habermas quotes Bahrtdt who describes the indistinctness between the private and the public in large modern cities: “The social problems of the modern metropolis consist for the moment not so much of a too urbanised city life, rather that characteristic features of city life is lost. The interdependence between public and private sphere is impaired. [...] the more the city as a whole is changing [...] the more the metropolitan citizen draw herself back to her enlarged private sphere” (Habermas 1984, 154).¹³

The observations made by Jacobs and Habermas illuminate impaired conditions for everyday life and for a functioning urban life in modern urban design. A public space that is unpopulated and where accessibility is limited for locals as well as for non-locals is described as a great disadvantage. Clearly, this has implications for the possibility for people to share public space and to share practices, and thus, this has implications for interplay in public space. But what is it more precisely in the urban layouts that inhibit people to share public space? The observations and descriptions of cities as places for sociability, if anything, raises question about more specific knowledge regarding the relationship between built form and social outcomes and also how different social beliefs has influenced urban design.

13. The citation of Bahrtdt is originally published in ”Von der romantischen Grosstads-kritik zum urbanan Städtebau” in *Schweizer Monatshefte*, 1958, 644. The citation above is translated from Swedish to English by the author.

3.2 Social theories and cities

How the built environment – the physical and spatial forms – could be related to social outcomes is a focal issue of this thesis. The interest lies at the level of urban design and it is this level that primarily will be explored. While studying the literature in this matter, it is striking how great an impact certain social beliefs have had in different design paradigms during the twentieth century and what is even more notable is that much of the outcome very weakly corresponds to the initial social aims. Architecture and urban design on one side and social theory on the other seem to derive from very different traditions and approaches. They are difficult to interlink with one another in any other way than on an abstract or a conceptual level. As soon as one tries to translate social goals into urban design and to urban form, uncertainty takes over: How does one know that this urban pattern really facilitates certain human purposes? Partly this might have to do with the defects inherent in the theories such as the lack of analytical theories for architecture and the ignorance towards the spatial agency within social theory.

Social theories and spatial theories

The connection between spatial and social theories is in no respect obvious. Social issues appear as strongly interdisciplinary in the field of planning and urban design. Nevertheless, the linking of social outcomes to urban design or urban form in itself seems to be difficult to capture. In line with Hillier, there is a need for a better and deeper understanding of the phenomenon of architecture and how it affects people's lives. A necessity for such studies is that they are based on the study of the built environment *per se*. Also, theories that support our understanding of the world are more helpful than those theories that seek some sets of rules that, if followed, will guarantee architectural success; in this sense, analytical theories are more supportive than normative (Hillier 1996, 3).

In several publications, Bill Hillier has emphasized the need to link social theories to design level theories; the problematic linking between social goals and urban design is partly caused by the absence of any meeting of minds or sharing of interests by social theorists and built environment professionals. Hillier believes that little is known about how patterns of living and working can be affected, for good or ill, by the physical and spatial forms we impose on them. He argues that built environment professionals largely make use of theory-like propositions that link the social outcomes to the physical and spatial form of the built environment: "In the absence of scientifically tested propositions, a shifting consensus of beliefs fills the need, and it can take

decades of social costs to show the inadequacy of these beliefs” (Hillier 2008, 216). What we find in practise are a number of conventional, theory-like propositions that link spatial forms to social outcomes. Such ideas have powerfully influenced design and planning and might even be viewed as paradigms. Hiller argues that many of the ideas are quasi-theoretical and not based on evidence and the experience suggests that they are probably wrong. In the space syntax approach, focus is first and foremost on space. Such studies look for evidence of social processes in the spatial forms of the built environment and such greater descriptive precision both permits linkages to mainline formulations in social theory and leads to testable design-level propositions (Hillier 2008).

Hiller and Vaughan (2007) also emphasize that spatial form needs to be understood as a contributing factor in forming the patterns of integration and segregation in cities. However, the reflective disciplines that support and nourish the physical and the social city (the morphological disciplines, on the one hand, and the social sciences, on the other) take an asymmetric view, foregrounding one city and backgrounding the other. The result of this is that the ‘other’ city is seen through the foregrounded one. According to Hiller and Vaughan, this has resulted in many partial theories *about* the city, but no theory *of* the city as both of the things that it seems to be, namely both the physical and the social city: “The social city is either side of the physical city: it brings it into existence, and then acts within the constraints it imposes” (Hillier and Vaughan 2007, 206). It is important to understand how the layouts in the city embody social ideas and that the spatial configuration has consequences for how collections of buildings come to life as living cities (or fail to thrive). It is found that the urban street network is in and of itself a key determinant of movement flows and hence co-presence in space (called the theory of natural movement, Hiller et al. 1993). It is argued that this is intuitively clear, mathematically necessary, and empirically demonstrable and the key to understanding cities as socially meaningful patterns of relative integration and segregation (Hiller and Vaughan 2007, 213). The details of the space syntax theory will be elucidated further in chapter 4.

The literature within urban sociology describes many shortcomings of urban environments created during the twentieth century. According to Hillier, those with a social science background are far more likely to deny agency to the built environment in the genesis of social problems than to seek to explain it (Hillier 2008). Still, very little knowledge is achieved of how urban environments actually work leaving those who deal with urban design with a set of questions regarding how space and its configuration actually influence social life.

Architecture and social life

Design and planning decisions have often had some unexpected effects on problems such as social isolation and economic segregation. Habermas indicates that the expansion of the private sphere was facilitated by the new architectural design, a design that also implied limitations of the public sphere and abridged it. This finding has similarities with Jacob's observation that people in areas that lack urban life need to choose between isolation or to enlarge their private lives if they do not want to be isolated (Jacobs 1992, 62).

The relationship between architecture and behaviour is the primary focus in Hanson and Hillier's 1987 paper. They identify two views that dominate the perceptions about the relation society and space. The first claims that our socio-spatial environment is deficient since the heterogeneous urban environment does not properly reflect the *territorial nature* of man and his various kinds of social groupings (e.g., Lynch and Newman). The second view sees heterogeneity as quite a contradictory indication that space is unimportant, that *social groupings exist independently of space*, not requiring spatial reorganising to make them better (e.g., Pahl and Weber) (Hanson and Hillier 1987, 251-252). Against these two trends there has been an attempt to build a spatial theory of heterogeneity and non-correspondence, a theory that as once accepts the fact of heterogeneity and shows how space plays a positive role in generating and controlling this heterogeneity. They conclude that to the extent that a social system works on correspondences spatial encounters will tend to be specific to a certain transpatial category, while encounters that are specifically to do with membership of that transpatial label will tend to increase the density of encounters within the group locally, but not the range of encounters globally across space; hence, it is a system that tends to be *deterministic*, both socially and spatially. On the other hand, to the extent that a system works on non-correspondences, the categorical purity of the local system will tend to be weakened or locally heterogeneous, but at the same time transpatial identities will be used to cross space and work to the global coherence of the society. Such a system will tend to locally emphasise openness, continuity of space, lack of local enclosure of space, and permeability of those boundaries that do exist. This is believed to work more *probabilistically*, which gives non-correspondence systems a robustness that highly structured systems do not possess: they can tolerate much more local disorder and yet be reproducible. However, any large scale discontinuities that tend to isolate small groups in enclaves will represent a perturbation in the system, a barrier to its efforts to project encounters globally across space (Hanson and Hillier 1987, 269-270).

If one focuses on the effects of urban transformations, there are some examples that may be highlighted in this context. Hillier has acknowledged that it was widely believed (but departs from) that breaking large residential developments into small inward looking courtyards would promote stronger local communities, that lower population densities would lessen crime and social malaise, as well as that public open spaces with good enclosures would be successful and frequently used. It is possible to notice that such assumption also is contradictory to what Jacobs is writing about with respect to urban qualities. It is necessary, Jacobs believes, to achieve a certain density to create propitious conditions to urbanity and urban qualities. According to Hillier, layouts characterized as enclosures or clusters are not the answers to the urban problem, but the problem itself. He argues that its indiscriminate use has been responsible for the creation of the fragmentary, unintelligible, and largely under-used spaces that form a significant proportion of our urban environment today (Hillier, 1988, 64): “It is not density that undermines the sense of well-being and safety in urban spaces, but sparseness, not large spatial scale, but its insensitive reduction, not lack of order but its superficial imposition, not the ‘unplanned chaos’ of the deformed grid, but its planned fragmentation” (Hillier 1996, 179).

A detailed analysis of the social outcomes in different urban layouts made by Julienne Hanson supports this reasoning further. Hanson has studied morphological changes in London and found that different design ideas are related to specific preconditions for sociability (Hanson 2000). The analysis indicates that modernistic urban layouts (i.e., housing estates) have isolated people from each other, both on the neighbour level and on the neighbourhood level. It is a paradox that the conditions for urban life and interaction with neighbours turn out to be prominently poorer in those areas where the social ambitions have governed the design ideas (Hanson 2000).

One highly relevant study for the Swedish context regarding the relation between buildings and public space is made by Klasander (2005) who argues that the diffuse relationship between the private and the public realm started during the 1950s and was reinforced during the 1960s. Then around 1970 housing estates were designed so that the buildings neither related to the landscape nor to the street, but only to other buildings. Klasander also emphasises the qualitative difference in that patterns of buildings and patterns of movement networks are treated as independent objects of design. This results in a lack of coherence that is argued to make the areas less legible. All in all, it is argued that the problematic social segregation in many of these areas is reinforced by the design (Klasander 2005, 39).

Another architectural contribution about cities and social life is presented in an observation-based book by Jan Gehl, *Livet mellem busene, udeaktiviteter og udemiljøer* (1980). This includes a thorough investigation of how differently people use space in various built environments. Three main basic activities that take place in public space are defined: necessary activities, optional activities, and social activities. Gehl argues that the physical environment has a great influence on these activities and how this is manifested is also the theme of the book. The activities in public space are suggested to have different intensity, from low, which refers to neutral contacts such as seeing and hearing, to high intensity, which refers to friendship, etc. Most important is that all different levels of contacts are seen as important for the urban life at large, some forms of contact even presupposes others (Gehl 1980, 13).

Like Sennett, Gehl also emphasises the value and importance of getting information about society (or learn unwritten rules) in public space; if media inform people of the greater world and the sensational news, then being among others in public space gives crucial information of everyday life, which is just as important, for example, if other people work, how one behaves, how one dresses (Gehl 1980, 19). It is emphasised that the built environment has a strong influence on social life and it is stated that it is not buildings but people and activities that need to come together, meaning that it is the space between the houses that is more important to focus on rather than building density (Gehl 1980, 77). For the concern of this thesis, it is the writings on the city or the district level that are most relevant and not the very detailed level that also is thoroughly attended to (e.g., the design of the street). In addition, Gehl points out how important walking is for city life, and that it is of utmost importance that the physical environment invites people to spend time in public space and thus is co-present in public space. This is very much in line with the basic fundamentals of space syntax theory.

Laura Vaughan has conducted several studies in the realm of urban segregation (Vaughan 2005, 2007). Studies have shown that there is a spatial mechanism involved in the creation of poverty areas and it is argued that spatial segmentation of areas has detrimental effects on the most vulnerable populations, especially those who depend on local movement and local networks for support and exchange (Vaughan 2007, 248). When studying the relationship between physical segregation and social marginalisation in urban environment, it is found that some urban areas are especially prone to settlement by impoverished immigrants. It is suggested that the physical separation of poverty areas from the economic life of the city implies a lack of potential for the economically marginalized to integrate into society (Vaughan 2005).

Isolation built into the layout

According to Hanson, the modernist urban genotype with its ruptured interface and its way of relating dwellings to one another tore apart and remade the everyday fabric of ordinary people's lives, making commonplace habits and practices rare or non-existent. Hanson suggests transformations were not just a change in the physical, spatial ordering of residential areas; they also influenced the way people used space, encountered one another, and behaved towards one another (Hanson 2000, 114). A study of the morphological changes in London has illustrated that design ideas are related to specific preconditions for sociability (Hanson 2000). Space syntax is used to capture the shift in design paradigms over time. Hanson describes the development as isolation was built into the urban layout. It is found that the conditions for urban life and interaction with neighbours are prominently poorer in areas where the originating design ideas were governed by high social ambitions. Hanson summarizes the effects as follows: "The disabling effects of the urban transformation had the greatest impact on the weakest and least powerful people socially; those who depended on their local environment the most to support them in their everyday life, like children, elders, the sick and disabled, the unemployed" (Hanson 2000, 116-117). Hence, the results support Jacobs' apprehension that modernistic estate layouts have isolated people from each other both on a neighbour level as well as on a neighbourhood level. The spatial explanations look to the properties of the urban layouts and the accessibility and permeability of the areas. In addition, it is shown that the constitution of public space, how buildings and entrances are located in relation to open space, has a strong influence on human interaction.

Hanson defines some consequences for how behaviour was affected by the urban design in the modern estates. Important differences have to do with the relation between building interiors and the street. This relation is described as going from a doorstep culture to a situation where strangers, or non-locals, are frozen out and is related to how people move within the neighbourhood. For example, it was easier to bump into people in the older layout, further influencing the number and scope of people's acquaintances. Hanson also argues that social arrangements went from being more casual or informal to pre-arranged or formal. Children and the elderly are more isolated. Children, for example, are less supervised in the estates than in the streets before the changes of the layouts (Hanson 2000, 115). In addition to providing empirical evidence for many of the ideas that Jacobs presented, Hanson illustrates more specifically how urban form influences the outcomes in a way that is very informative for urban designers.

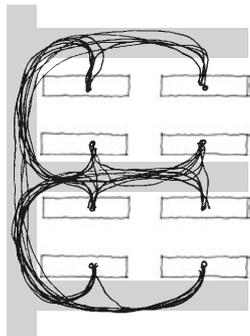
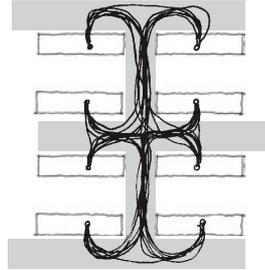
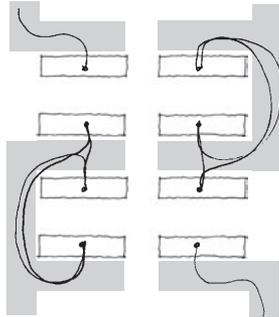


Figure 3:1. The spatial relation between entrances influences who will share streets and who becomes a neighbour.

3.3 Urban life

Why endorse urban life?

There are many examples of how diversity in urban life is seen as enriching, especially when talking about cities, but there is also the reality where these differences are seen as a threat and a breeding ground for conflicts. This is also reflected in descriptions of cities and influences how cities are viewed. Over time, our ideas and apprehensions of what the city is have shifted dramatically; the city has been described both as a place for crime, conflict, and withdrawal as well as a place of connection, celebrated as a site of difference (Valentine 2008).

In the book *Det offentliga stadslivets förändringar*¹⁴ (1998), Sören Olsson has acknowledged the importance of urban life drawing from Sharon Zukin (1995) among others. It is not obvious that urban life in public space is seen as only positive. In Sweden, the discussion about safety in public space is primarily associated to evenings and nights where people are exposed to certain kinds of violence. According to Olsson, perceived and real insecurity in public space is a threat to publicness, but privatisation or a strong control of space is also a threat since publicness is based on freedom and accessibility for all people (Olsson 1998, 105). In spite of this, it is argued that the advantages of a public urban life outweigh the disadvantages. Olsson provides several reasons that explain the importance of urban life. The first is related to the need people have to be seen and to see others – two central features of modern society – and in a city public space encourages these activities. The second reason is related to tolerance: in public space different groups in society share the same space. Co-presence in public space may be related to different kinds of ongoing negotiating processes and this increases the potential for interaction. Urban life can be said to be associated with few rules, but one basic idea that most people follow is tolerance towards other people. Similarities and differences between people are made explicit and if someone is exposed for differences there is also a chance that gradually one becomes used to it and that it is no longer provocative. If a city at large is characterised by segregated residential environments, publicly accessible urban space becomes even more important and its significance is often underrated (Olsson 1998, 107). The third reason outlined is that urban life improves cohesion in society at large, a phenomenon that refers to a kind of civic

14. A title in English would be something like: *Changes of the public urban life*, translated by the author.

spirit where people are willing to do things for the common society. It is easy to lose the feeling for the whole society if one is only living in limited circles and segregated spaces. The fourth reason outlined is related to politics and democracy. Even if public spaces in Sweden are infrequently used for a political debate and political expression such as organised protest marches, these places are important since they have a potential for enabling such activities when needed (Olsson 1998, 108-109).

Similarly, Richard Sennett argues that the city and urban life offer people a possibility to handle complexity and to learn the unwritten rules of public life (Sennett 1992, 1993). It is argued that impressions from the city and experiences of the city support people to open up. The modern city has the ability to turn people outward, not inward, providing people with the experience of otherness. In this context, diversity is essential and in the presence of difference people have at least the possibility to step outside themselves (Sennett 1992, 123). According to Sennett, to be exposed is often more associated to the likelihood of being hurt than of being stimulated. This has resulted in a public realm designed to avoid social contact, for example, motorways that cut off poor neighbourhoods from the rest of the city and dormitory housing developments (Sennett 1992, xii).

Jacobs argues that urban layout plays an important role in generating urban life, heterogeneity, and urban qualities. She was one of the first to acknowledge the specific spatial articulation of the block city (the grid structure) and its sharp contrast compared to modern layouts. Jacobs strongly criticises modern urban design principles because it may imperil both liveliness and diversity (Jacobs 1989, 62). A functioning public urban life makes it possible for people to choose a certain level of contact (Franzén 2003a, 38), but if there is no public life at all, one has not even the possibility to decide whether one would like to participate. In qualitative studies of segregated suburbs, Elisabeth Lilja (2002) has pointed out that especially people who feel excluded from society at large appreciate the opportunities to have an urban life to interact in.

These examples illustrate clearly that it is not only dwelling that is of importance for integration and tolerance processes in society, but also what happens in public urban space, for example sharing public space and sharing everyday practices. A populated urban space is a crucial prerequisite for co-presence, co-awareness and urban life. However, it is important to emphasise that there are different levels of urban life or public social life which will be attended to and further revealed in the next paragraph.

However, in an empirical study of Swedish suburbs (Olsson, Ohlander, and Cruse SONDÉN 2004) it is clear that the cosmopolitan urban life is very rare. These suburbs are not spatially connected to other areas and thus they have a very limited catchment area, so the possibility to attract large numbers of non-locals is limited. The urban layout and the location as such influence who will be co-present in public space, and this influence what kind of social life will appear. In the context of social segregation and especially for aspects of interplay segregation, it is important to explore what kind of urban life is likely to emerge in different neighbourhoods (Olsson 2005a). From this it may be concluded that empirical studies should explore the spatial preconditions essential both for identifying the accessibility to people, identifying which streets or squares are centrally located in an area, whether local and global structures overlap.

Along with the critique towards the poor environment in different suburbs there has been a strong focus on the social life on a neighbours' level in the Swedish context. This was pointed out as one of the more pressing shortcomings in the debate that carried on during the 1970s. Great importance was attached to patterns of contact since a functioning social network was seen as a very important support for people with social difficulties.¹⁵ Consequently, many of the different initiatives carried out in problematic areas have had a very local character and the comprehensive relations were ignored (Franzén and Sandstedt 1981, 35). Thus, to discuss accessibility to other people at a neighbourhood level or even at a cosmopolitan level has for a long time been seen as irrelevant. A long time would elapse before an intensified discussion about urban qualities took place that actually influenced urban design practice. Not until the beginning of the 1990s was there a broad discussion of the renaissance of the city and a rediscovery of qualities related to urbanity beyond the neighbourhood.

Urban life as a by-product

Urban life could be said to be an unintended by-product of a number of frequently and rather anonymous encounters in connection to everyday life activities. Here the properties of the Swedish urban landscape come into focus. To a large extent, the Swedish cityscape is a result of a late urbanisation materialized in suburbs or housing estates. The modern

15. National housing policy of 1975 (SOU 1975:51, 59) is referred to in Franzén and Sandstedt (1981, 34).

Swedish city is more of an infrastructure construction than it is a space for a diverse and lively urban life (Franzén 2003a, 33). The realization of the modernistic urban design ideas implied that everyday life was rationalised and hence the everyday life was made easier. However, one undesired and unpredicted consequence of this rationalised everyday life was that all occasional, accidental, and unintended actions were lost in addition to public urban life that earlier was taken more or less for granted (Franzén 2003a, 40).

Jacobs, in a very concrete view about the built environment, presents a set of very well defined features required to achieve urban qualities, such as urban life. For example, the street is described as the heart of the city and should be alive with activities and pedestrian movements, emphasizing that a mix of residents and visitors is essential. The conditions for diversity, a key concept, include a land use mix as well as a mix of different building types to achieve a variation of the rent levels within the same area. Jacobs promotes a certain level of density and variation both regarding people and different activities. Also, small or short building blocks are preferred, creating opportunities for frequent meetings between people. In addition, Jacobs argues that building entrances consequently should be placed adjacent to public streets. Another crucial feature is continuity in the urban fabric, since places depend on and are influenced by their surroundings.

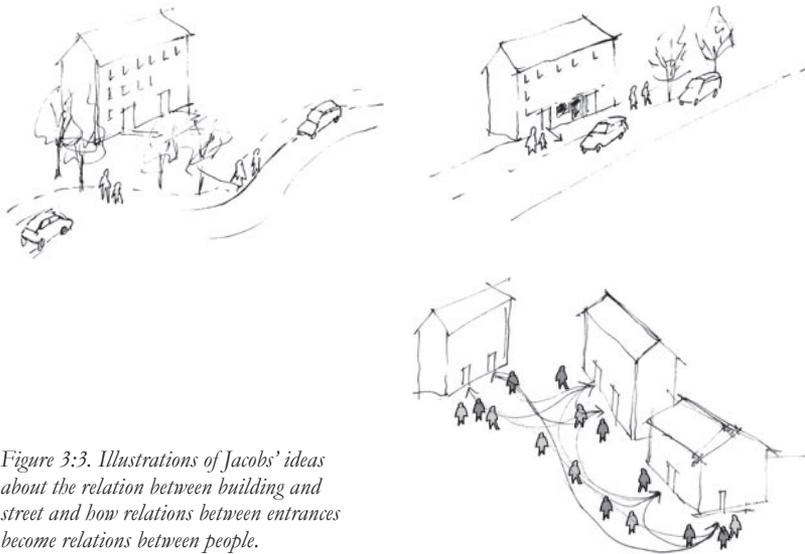


Figure 3:3. Illustrations of Jacobs' ideas about the relation between building and street and how relations between entrances become relations between people.



It is interesting to compare the urban life that Jacobs describes as essential for the city with the ideas presented by Olsson. It seems as if Jacobs' idea of a well-functioning urban life includes and presupposes a mix of residents and visitors, so the local urban life overlaps with a more global urban life. Hence, different types of urban life – at different levels – take place at the same time in the same public space; the levels are superimposed. This could be compared with what Lefebvre recognizes in his writings about rhythm analysis. For example, in *Seen from the Window* (Lefebvre 1996) he describes different rhythms of the city that are composed by all everyday life activities and when superimposed they animate the street and the neighbourhood. There are many different rhythms: the linear or routine, which is the perpetual chance of encounters and the cyclical, which is social organization manifesting itself (Lefebvre 1996, 220-223). This thesis argues that there is an obvious risk that highly rationalised urban layouts where different activities are efficiently separated spatially (i.e., according to a zoning principle) fail to encourage a very diverse rhythm; it is, however, likely that the urban rhythm is both monotony and quite.

In some sense the different types of relations discussed here are evidently simplifications and abstractions; however, when analysing and interpreting cities, it is possible to investigate the influence urban environment has for different types of urban life. This type of investigation is possible because urban life is governed by aspects such as density of people co-present in public space as well as local and global spatial integration. This thesis argues that since different kinds of social relations are entangled, they do not need to be in a state of opposition; good accessibility to the local neighbours does not need to stunt the accessibility to non-residents or passers-by and vice-a-versa. According to this line of reasoning, the idea of excluding strangers from a housing estate to achieve a stronger local community appears to be groundless.

When comparing the neighbourhood planning ideals presented in the previous chapter, it is obvious that these urban design principles are diametrically different compared with the urban environments discussed by Jacobs and Lefebvre. Areas that were designed with high social ambitions – a kind of architecture of good intentions – often seem to have had the opposite outcome. The urban layouts have a design that appear to efficiently separate different types of everyday life activities as well as different levels of urban life that potentially can take place in urban environments. Hence, what Lefebvre refers to as routine, perpetual, and cyclical rhythms of the city are separated in physical urban space to a large extent.

Disurbanism and social malaise

Many suburbs are criticized for being places characterized by disurbanism. As discussed above, the relations between buildings and urban public space are disrupted, different scales of movement are disrupted, and often residents efficiently have been geographically separated from visitors or strangers (Klasander 2001; Hanson 2000; Hillier 1996). But can architecture cause social malaise? This is question that is discussed in *Space is the machine* by Hillier (chapter 5, 1996). Even though there is a widespread belief that architecture can cause social malaise either by directly bringing about anti-social behaviour or by inducing stress and depression in individuals or by creating vulnerability to crime, little is known about these effects (Hillier 1996, 183). According to Hillier, there is a problem of method in establishing any kind of link between architecture and social outcomes and it is easy to get caught in a discussion of architectural determinism that often comes to reach a dead end. Instead, Hillier is arguing that the question is put up in the wrong way and is suggesting that both the architectural and social variables should be treated at a much finer level of resolution. The environment needs to be studied so that also microstructures of the urban spatial environment are taken into account – the immediate spatial milieu in which many people live out much of their everyday lives, and not at a gross level such as the estate, the block, number of stories per block, etc.

In the Swedish debate, often there are contradictory arguments whether physical environment could cause social malaise. Some are playing down the importance of the built environment while others attach great importance to it (see Törnquist 2001, 53-59). Without exemplifying different views of the importance of the built environment, it could be of relevance to highlight one aspect that rarely is put to the fore and that is how different groups manage in different areas and how dependant they are of the properties in the local environment. This reasoning could also be related to the ideas of Habermas who argued that the new architecture in one respect led to inflicting a new lifestyle on people (see chapter V, Habermas 1984).

Hanson is adding a useful piece of information for this kind of reasoning as she describes how different sub-groups or classes are *not equally dependent* on the physical environment and on the urban life that is likely to come into existence. Her example of groups in the 1970s includes four sub-groups, each with different orientation toward economic and social life (Hanson 2000, 115). She concludes that the traditional working classes appropriated the street as a key 'lifespace' and hence could not make their old lifestyle work, which was characterized by a street-orientated local solidarity based on strong spatial networks in the transformed

morphologies since contact is frozen out and they became more isolated. They also had difficulties adopting any new lifestyle. The new working classes distanced themselves from the easy informality of the street by adopting a more up-market way of life (a more home-centred lifestyle). The traditional middle class (bankers, lawyers, etc.) had a more suburban lifestyle (not dependent on the local urban life to the same extent) that in many ways was the antithesis of a street-based culture, a lifestyle based on local conformity by formal house-to-house visiting and joining clubs. Finally, there is the new middle class, media people are using the potential of both local space and 'transpace', space acts as a mixing mechanism to widen social contacts, and the traditional and the transformed morphology do not imply the same conditions.

These sub-groups did not form identical experiences of the old and new morphologies because these did not fit into their preferred modes of interaction and socialisation in precisely the same way. Hanson (2000, 116) extends this idea: "[. . .] there is no mystery why some people like living in flats but others prefer streets". According to Hanson (2000, 116), the worrying thing is that "[. . .] the new morphologies were aimed at precisely those people who were least equipped, socially to cope with the lifestyle changes that were demanded by a shift from an "all-neighbours" to a "no neighbours" spatial model". For those living on a housing estate, there was not even a choice to disengage in the urban street life since the decision to minimise social contact was already built into the urban layout itself.

What do these sub-groups identified in the 1970s mean for the information age? As with Hanson's reasoning, it is impossible to unreflexively return to the street-based culture of the recent past. The argument is not that the street-oriented outward-facing and stranger-friendly housing layouts can in any sense compensate for economic and social inequalities, but that they are more empowering than many other layouts (Hanson 2000, 116). The shift from the streets to estates implied that the control over the interface between private and public life was transferred from the local residents to space itself through the design. However, today it is possible to speak of giving local residents choice and control over their own lives, maintaining people's independence and dignity or providing less discriminatory, more architecturally enabling environment.

Human interaction is not all

To balance these statements of urban life, it could be fruitful to in part scrutinize this apprehension. It is easy to let oneself be convinced that a well-functioning urban life will lead to all sorts of positive outcomes and

that there is a strong link between urban public space and urban civic virtue and citizenship. It is argued that the free and unfettered mingling of humans in open and well-managed public space encourages forbearance towards others, pleasure in the urban experience, respect for shared commons, as well as an interest in civic and political life. However, Ash Amin questions the validity of this view by arguing that there is overconfidence in the potential of a vibrant and inclusive public space that will improve urban democracy (Amin 2008). However, Amin is not denying public space has a role in shaping public behaviour or indeed even a sense of the commons. In the context of this thesis, it is relevant to outline some of the aspects highlighted by Amin, aspects that can be related to the idea of exploring spatial affordance in different neighbourhoods. Even if the workings of urban public space are suggested to be politically modest, it is still full of collective promise, a promise that is located “[. . .] in the entanglement between people and the material and visual culture of public space, rather than solely in the quality of social interaction between strangers” (Amin 2008, 8). This implies that the collective forms of being human through shared practises need not be restricted to those with a purely human/inter-human character, but should according to Amin also include inputs such as space, technological intermediaries, objects, and nature. What is emphasized within this post-humanist perspective of urban public space is that interaction is not a sufficient condition for public culture. With four keywords, essential aspects are identified for civic formation: multiplicity, symbolic solidarity, conviviality, and technological maintenance (Amin 2008).

For this thesis, however, this widened view of aspects involved indicates that it is relevant not only to explore urban spaces that have a potential to nurture a cosmopolitan urban life, but also in the empirical study to include the potentials for a local public life. Furthermore, this view leads to exploring accessibility to non-human amenities in general such as common facilities, commercial service, neighbourhood centres (in their role of being symbolic centres), and meeting places. The results of such a study could then be analysed with focus on differences between neighbourhoods with the intention to capture the spatial affordance of different neighbourhoods.

Two key features: co-presence and movement

The basis for the reasoning about public urban space and urban life, also one of the key points of departure for this thesis, is that spatial configuration influences patterns of movement in space, and movement is by far the dominant form of space use. According to Hillier, it is through move-

ment that patterns of co-presence are defined, and, in turn, co-awareness among the individuals living in and passing through an area depends on patterns of co-presence. Human behaviour does not simply happen in space: encountering, congregating, avoiding, interacting, dwelling, and conferring are not attributes of individuals, but patterns or configurations, formed by groups or collections of people. They depend on engineered pattern of co-presence and indeed co-absence (Hillier 1996, 29). The relation between space and people will be found at the level of the configuration of space rather than the individual space: “The relation between space and social existence does not lie at the level of the individual space, or individual activity. It lies in the relations between configurations of people and configurations of space” (Hillier 1996, 31).

Co-present individuals may not know each other or may not form a community, but they are part of a kind of raw material for a community, which may in due course become activated and can be activated if it becomes necessary. Co-presence is the primitive form of our awareness of others (Hillier 1996, 187). Patterns of co-presence and co-awareness are the distinctive product of spatial design. Hence, according to Hillier, the determinable effects of spatial form on people are both limited and precise and spatial form creates probable encounters and co-presence. But what happens if urban space, the built environment, is designed in a way that inhibits people to share public space? This may imply that natural patterns of social co-presence in space are not achieved. At its best, in such circumstances space is empty; at worst, space is abused and a source of fear (Hillier 1996, 188): “[. . .] the pattern of co-presence does result largely from design and its analysis therefore offers the most promising path from architecture to its social effects” (Hillier 1996, 189).

Hanson explains that empirical studies of the built environment on social effects showed that the fundamental relation between physical urban space and society was not encounter, but co-presence. Co-presence (or its absence) is a generic feature of societies. It is a precondition for face-to-face human social interaction without any way determining what takes place. Part of the social function of urban environments is to structure co-presence among people of different ages and genders, between inhabitants and strangers or outsiders, among people of different occupations or social classes, and within economic, civic, and religious life (Hanson 2000, 120). Mixed co-presence and mixed space use seem according to Hanson to be as important for ‘urban vitality’ as the principle of mixed use (i.e., not zoned use).

Using this reasoning, it is possible to link back to the notion of interplay segregation by Olsson (2005a) who similarly concludes that the

importance of urban life is crucial when discussing urban segregation. In addition, the highly influential ideas about the foundations for urban life by Gehl developed during the 1970s and 1980s are in line with this reasoning (Gehl 1980). When the problem is formulated and defined like this, it is obvious that focus on public space and conditions created by how the physical environment is shaped and structured by built form can open new possibilities for anti-segregation initiatives. It gives a well-founded motive for this licentiate thesis to investigate properties in public space and such a widened focus supports the idea that it is essential not to limit research on urban segregation to residential segregation.

4 The role of urban form

4.1 Knowledge relates to understanding

Approaches on urban segregation

How can the spatial dimension in social segregation – the influence of the physical environment – be captured in a way that contributes to urban design? This thesis argues that the attempt to increase the understanding of the role of urban form calls for an alternative spatial approach than normally is applied in the context of social and urban segregation research. If we are to learn more about how changes and modifications of *urban form* may influence aspects related to segregation, it is necessary to use descriptions that relate the physical city with the social city. In the following chapter, the spatial dimension in different research traditions will be further refined both theoretically and for practical purposes to develop new ideas about the methodology of the empirical study. A motive for this overview is to elucidate which questions different approaches address and which questions will be left unanswered. It is necessary to go back to basics and question whether the prevailing descriptions in segregation research adequately describe the purpose of urban design and whether these descriptions of segregation provide enough guidance regarding how urban design can play a role in this matter. In the end, these questions explore how the way the world is described influences the production of knowledge.

Urban space in the geographical tradition

When residential segregation is described, it is normally made through a geographical mapping of the composition of the residents in different neighbourhoods according to their social profile. Normally, the variables in focus are demographic aspects, ethnic background, or socio-economic aspects such as levels of employment/unemployment and recipients of social allowances (Regeringen 2003). Other variables include income

levels, education levels, health aspects, criminality, as well as participation in elections (Hajighasemi et al. 2006, 14, 26; Integrationsverket 2006). The level of segregation is then defined by the differences regarding the compositions of categories of residents regarding these aspects when comparing certain geographical units.

With such a geographical spatial approach, the limitation from a design perspective primarily has to do with the difficulties finding an adequate definition of the geographical area (e.g., the block, the neighbourhood, the district, or the municipality) and there are difficulties related to how data is aggregated. Furthermore, it is difficult to capture possible influence from the context, the neighbouring areas (O'Sullivan and Unwin 2003; Andersson 2001; RTK 2006; Marcus 2007a, 2008; Legeby 2008). A categorization of areas based on the composition of its residents is problematic when it comes to an urban design interpretation, since such an approach does not describe the *physical area in itself* but its *residents*. As a result, the description explains very little of possible social outcomes that the built environment has and thus it is very difficult, if not impossible, to draw far-reaching conclusions of the spatial properties in relation to urban segregation.

How an area is defined (according to size and delimitation) is crucial since it determines the level of precision and it determines which residents belong to which area. It is important that the size of areas studied is clearly related to what issues are in focus. Also, different land uses might influence the result to a disproportional degree, such as the amount of open spaces and working places within the residential area. These concerns are closely related to another major difficulty with these analyses: how is data aggregated? Although data often is compiled at a quite detailed level, it is reported at various levels of aggregation for practical and integrity reasons. For example, Swedish census data is compiled on an individual and a household level and includes information of the geographical location of where people live (i.e., geographical coordinates). However, the geographical location is normally not more specified than the property, and the coordinates are selected centres within each property. Even if each household or even each individual has coordinates connected to all kinds of other information, these coordinates are not more exactly defined than the selected centre of the property. Hence, all households within the same property will have the same coordinates. In areas with large properties (for example, in many post-war suburbs), there is a risk for unrealistic uniformity. A few Swedish municipalities have access to and are using more nuanced information and are able to provide data on a address point level.

Studies of urban segregation normally use data aggregated on other geographical levels, for example, NYKO-areas¹⁶, SAMS-areas¹⁷, municipalities (290 in Sweden), or regions. Aggregations of data are hence made according to such geographical units, which is a reason for analysing patterns rather than the individual geographical units. The issue here is that the aggregation units used might be arbitrary with respect to the phenomena under investigation. The definition of the spatial unit within a particular study is likely to determine the observed patterns and relationships. The aggregation units used will affect statistics. This difficulty is referred to as *the Modifiable Areal Unit Problem (MAUP)* (O'Sullivan and Unwin 2003, 30-32). The lack of context has to do with the fact that every unit more or less is studied isolated from its surroundings; hence, possible influence from neighbouring areas is not taken into account. From an urban design perspective, this is a troublesome shortcoming as it is essential to capture possible relations from neighbouring areas since in reality all parts of the city are spatially related to the city as a whole in some way.

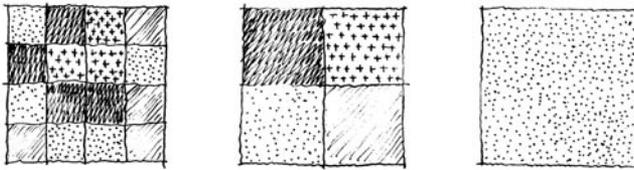


Figure 4:1. The size of the area is crucial for the outcome: an area may be diverse at one level but not on another depending on the resolution.

However, most Swedish quantitative studies on housing segregation presented in, for example, national reports (e.g., SOU reports) are based on so called SAMS-areas. This implies a risk that local nuances and variations are hidden. These areas are comparatively large and are not necessarily homogeneous from a morphological or configurational perspective. There has been a critique towards the descriptive and analytical means in geography when the finer scale of urban fabric is studied, the level where urban life can be said to take place. The most obvious risk is that descriptions based on residential data that are aggregated into

16. NYKO stands for *nyckelkodsområde* and there are about 90 000 NYKO-areas in Sweden.

17. SAMS stands for *Small Area Market Statistics* and there are about 9 200 SAMS-areas in Sweden.

administrative areas become abstract and that important sides of the issue are concealed. As a consequence, the quantitative and geographical descriptions of housing segregation are often argued to represent a kind of top-down perspective (Lilja 2002; Andersson, Borgegård and Fransson 2001). The geographical descriptions are in a sense ‘half blind’ for spatial relations in the urban layout. From a design level it is a shortcoming that the descriptions do not recognise how buildings are related to one another or how they relate to the street. Neither is it recognised how streets are related within an area or how different neighbourhoods are related to others as well as to the city as a whole through public space. According to Lars Marcus, this makes geographical descriptions logical from an administrative or bureaucratic point of view, while they are not logical from the point of view of people actually living in and using the city (Marcus 2008, 6).

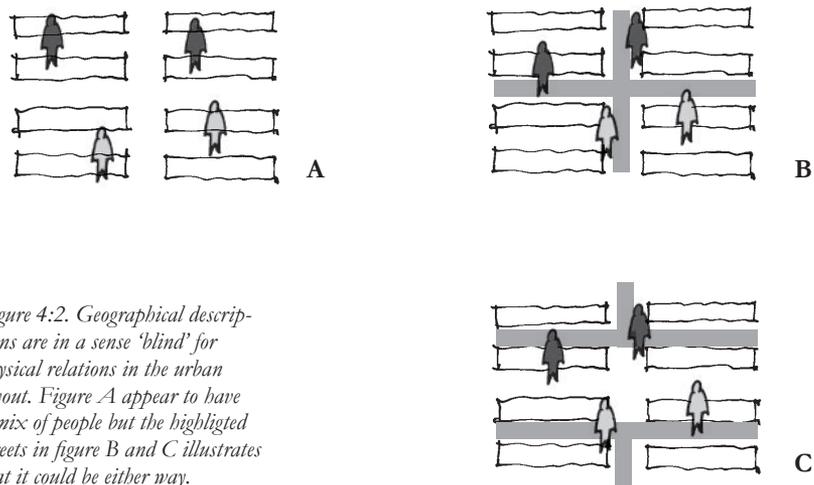


Figure 4:2. Geographical descriptions are in a sense ‘blind’ for physical relations in the urban layout. Figure A appear to have a mix of people but the highlighted streets in figure B and C illustrates that it could be either way.

Some Swedish studies address segregation using qualitative methods. Compared to studies based on quantitative methods that reflect a kind of outside perspective, these studies prove to reflect a kind of inside perspective. Elisabeth Lilja, for example, applies an approach that primarily responds to issues regarding meaning and identity but also captures information that relates to the spatial dimension, to the built environment. Through in-depth interviews, it is described how people use, perceive, and value their physical environment, and it is found that the built environment can help people interact with one another and significantly mitigating segregation forces (Lilja 2002, 43). From these findings, it is

argued that there are integrating mechanisms in the physical environment that are not visible, and also, many post-war areas have a design that does not support urban life (Lilja 2002, 2). However, it is highly important to emphasize that in spite of such poor spatial preconditions people do develop strong relations between each other in these neighbourhoods. However, from an urban design perspective, it is essential to study these integrating mechanisms and capture the configurational properties that have the ability to facilitate urban life. Therefore, the challenge for architectural research is to make these invisible mechanisms visible.

Urban space in the morphological tradition

Another tradition when analysing urban space could be described as an urban morphological tradition, a kind of refined geographical approach. This thesis briefly outlines the morphological tradition, focusing on what the descriptions are based on and what they tell about how people are using (or rather can use) space. Urban space is represented differently in the morphological tradition than in the geographical, influencing the knowledge that is produced. Urban morphology could be said to include many different directions, and three main schools stand out in the field: Italian, British, and French. According to Anne Vernez Moudon (1997), three principles appear in the field. First, the central elements that define urban forms are buildings, open spaces, plots or lots, and streets. Second, there are different scales such as the building/lot, the street/block, the city, and the region. Third, studies of urban form also need to take the time aspect into account (1997, 7). Very often the elements are sorted into typologies. So what are the limitations with this tradition or approach when studying issues related to segregation? Marcus (2008, 7) stresses that the classification of both the *type* and the *element* can be problematic. As with the geographical approach that ends up with units that present an unrealistic uniformity, it is the same situation with the type: there is a risk that it is either too general or too specific. The element is problematic as there is difficult capturing the context since the elements are often put together in larger units, explaining also typical urban settings. The elements often have weak ties to their context and in these descriptions the influence from its neighbouring elements is ignored. Also in this description there is a kind of top-down perspective since they have a conceived point of departure rather than perceived (Marcus 2008, 8).

Urban space in the space syntax tradition

From the urban morphological tradition space syntax emerged in the 1970s. Space syntax began from the observation that space is the com-

mon ground of physical and social cities. The physical city is a complex pattern of space, while all social activity and interaction happens in space (Hillier and Vaughan 2007, 207). A detailed presentation of the theory is found in *The Social Logic of Space* by Bill Hillier and Julienne Hanson (1984). The new concept – spatial configuration – that was added to the existing concepts has a potential to reshape research questions. Spatial *configuration* means *relations between spaces*: the simultaneously existing relations among the parts that make up the whole. The spatial relations potential to embody or carry social ideas is first theorised and then transformed into measures by linking them to geometric representations of the system of spaces that are studied (Hillier and Hanson 1984). The notion of integration and segregation is a way to formalise these terms and this suggests that there could be an approach to urban research that is both quantitative *and* at the same time informed by the search for social and cultural influences and meanings (Hillier and Vaughan 2007, 207). An important aim with the space syntax approach was to find a new way to describe and analyse different kinds of urban layouts that have proved to be rather different (for example, some modern housing estates compared to traditional urban areas) and detect possible influence on social outcomes and on social life. Space syntax is a set of tools that are linked to a set of theories that can be used to explain, describe, analyse, and understand spatial systems from a point of departure of how people perceive and are able to use space. Through comprehensive analyses of space in combination with observations of human activity, it has become evident that space and social activity are related. Hence, the space syntax approach shows that a spatial layout can reflect and embody social patterns and space can also shape a potential social pattern by influencing movement and create patterns of natural co-presence in space (Hillier and Vaughan 2007, 212).

Space syntax reflects both the objectivity of space and our intuitive engagement with it. Space is not only seen as the background to human activity, but as an intrinsic aspect of everything human beings do. From a spatial point of view, human experience and use can be translated into quite simple geometrical forms. The elements used are the *axial line* (since movement is essentially linear), the *convex space* (required for interaction), and the *isovist* (the variably visual field that we see from any point in space). How buildings and cities are organised in terms of these three geometric ideas is useful when analysing human experience and use of space.

Space is not only about properties of individual spaces but also about inter-relations between the many spaces that make up the spatial layout of a building or of a city. Formally this is called the configuration of space and layouts that shape shallow graphs are defined as integrated

(high accessibility between spaces), while layouts that shape deep graphs are segregated. If the whole system is analysed, we get the *global integration* that measures the mean depth from each space to every other space (or axial line) in the layout. *Local integration* is when the mean depth up to a few steps from each space is measured.



Figure 4.3. The axial line, the convex space, and the isovist (Hillier 1996).

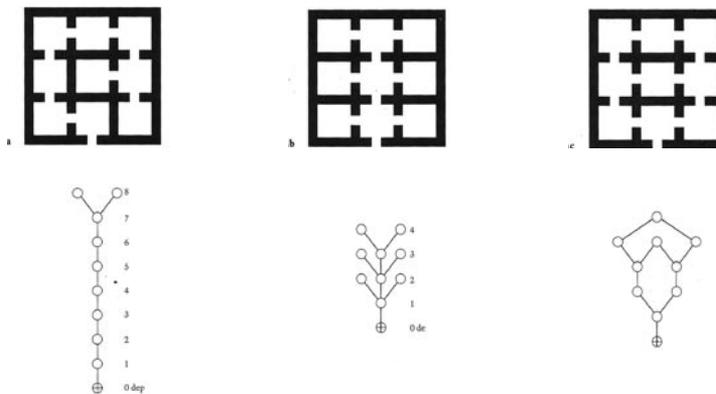


Figure 4.4. Deep and shallow structures (Hillier 1996).

What distinguishes space syntax from other approaches is that it is space with reference to its potential (social) use that is in focus while other urban morphological approaches often focus on types, characteristics, and to some extent structure. From the point of view of this thesis, the experiential level of cities is essential since what is relevant to capture is how people actually experience and use the city and not primarily the administrative or conceptual level. What is interesting from the perspective of urban segregation is that space is used in a *conservative mode* to structure and reproduce existing social relations and statuses (usually using space to segregate). Also space can be used in a *generative mode* to create potential for new relations by using space to create co-presence through integration (Hillier and Vaughan 2007, 212).

When trying to counteract segregation and facilitate better conditions for integration, urban form in itself seems to have a promising potential in this respect. However, the first step towards an understanding of such possibilities is the need to analyse and describe the spatial relations and to relate the properties to possible social outcomes in order to understand the consequences of the design. Also, the line of reasoning of hierarchical or shallow spatial systems might be possible to relate to the reasoning of hierarchical or shallow social systems. This could add to the discussion on urban design as one aspect of social sustainability.

4.2 Explanations

The challenge within research is to formulate relevant questions since this determines what methods and approaches are to be used, which in turn influences how a phenomenon will be understood. This section provides a brief overview of some questions in focus together with some explanations and causes found within segregation approaches. This strategy illustrates that these approaches differ from what is sought when applying a configurational approach. In general, it could be said that if theory seeks to describe, explain, and predict, then research methodologies may be viewed as prescribed ways to test those descriptions, explanations, or predictions. The methodology also offers means by which theoretical claims can be affirmed, modified, or rejected (Groat and Wang 2002, 73-75).

To explain *why* something happens is more difficult than to simply establish things that happen. However, the explanation is essential to define since this brings a deeper understanding of a certain situation or phenomena. Not least, it can open for a change of a phenomenon. Within theory of science different types of explanations are defined: *causal explanation* – an explanation of a phenomena from its causes (often the causality lies in past time); and *teleological explanation* – explanations from its intended effect (Føllesdal, Wallø, and Elster 2001, §36, §38; Thurén 1995, 103-107). It could be useful to look at some examples within the field of segregation research and reflect on what is said to define segregation as such (*explanandum*) and what is said to cause segregation in the first place (*explanans*) (Føllesdal, Wallø, and Elster 2001, 185).

Explanations within residential segregation

In Sweden, quantitative residential segregation generally refers to three categories: demographic, socio-economic, and ethnic (Andersson 2007, RTK 2006). These categories are largely inter-conditional. According to this discourse, segregation is principally never absolute; hence the research focuses on differences regarding concentrations as well as distribution patterns. So what causes or explanations are important in housing segregation? As pointed out in previous chapters, there are two determining factors identified for housing segregation: fixed and relational. The fixed factors, which refer to the built environment, have not been studied to the same extent as the relational factors and are argued to be difficult to change. Relational factors refer to aspects influenced by organisational conditions and individual actions and have – quite naturally – been the main focus within residential segregation research. Institutional actors

such as the state, the municipality, financiers, estate agents, and housing firms influence in different ways the residents' choice of housing, movement decisions, as well as people's possibilities to realise their housing demands and requirements. Different factors are concurrent and hence reinforce each other, so it is crucial that factors are viewed in their full context. Taken together, the result of how systems work within different institutions involved has resulted in housing segregation (RTK 2006, Bråmås 2006). Hence, the relational factors could be said to explain housing segregation, i.e., they provide *explanans* for the phenomena and as such they can be viewed as causal explanations. However, it is also possible to view all these actions as intentional control of people's possibilities in the housing market such as certain criteria for applicants that systematically disfavour some groups in society or people or groups are simply treated in different ways. From this view, these could be referred to as teleological explanations.

Another explanation for housing segregation is life style. This is related to how people on an individual level choose to act, actions that fall within the framework of teleological explanations. How the majority of the population chooses to move has a very direct influence on ethnic housing segregation, a relationship that previously has been overlooked. This phenomenon is sometimes referred to as *white flight* or *avoidance* (Bråmås 2006).

It is quite clear that housing segregation studies rarely focus on fixed factors, which is determined by the built environment such as place bound properties, level of services, etc. One exception, however, is the issue of dwelling type and forms of tenure (e.g., private or public rental) and ownership, which is dealt with as a causal explanation for segregation. Some neighbourhoods have a very homogenous housing stock that is related to an assumption that people according to their social profile choose (or are forced/directed to) a specific dwelling type such as housing unit with some form of tenure (private or public rental) on the one hand, and condominium housing or home ownership on the other hand. These causal explanations most likely have resulted in housing policies that attempt to counteract segregation. A socio-economic mix within a neighbourhood probably results in a decrease of segregation according to the definition above. However, one needs to question whether a mix of dwelling types always leads to a mix of categories of residents? This seems to still be an open issue; at least, it is argued that mixed housing is not to be considered as a kind of quick fix for the segregation problems (Nyström 2007). This thesis will show that an evenly mixed housing composition throughout the city is far from the only way that architecture and urban design can

contribute. Quite the contrary, it is assumed that more detailed spatial analyses opens up new kinds of actions and interventions.

Explanations within interplay segregation

Interplay segregation (presented in paragraph 2.3) encourages people to interact in different everyday life situations with others who may have a different social, economic, or ethnic background (Olsson 2005a). This is partly manifested through urban life and co-presence in urban public space. Olsson refers to urban thinkers such as Jacobs, Habermas, and Sennett who emphasise the importance of public life with respect to how society as a whole functions. Interplay segregation indicates that the spatial configuration within neighbourhoods as well as the position on a comprehensive level (central or peripheral) plays a role for the social outcomes that serve as an eye opener for other possible approaches. This thesis further explores how urban form in itself can increase or decrease access to common resources, including other people.

From a segregation perspective, interplay between people is important as it is related to ‘the new economy’ or the ‘symbolic economy’ (Zukin 1995) as well as ‘the network society’ (Castells 1999). Olsson argues that the ‘new economy’ is interrelated with education, culture, and meeting places in a way that develops and supports urban life and that creativity and business seem to thrive in such climate (Olsson 2005a). Thus, interplay is about peoples’ accessibility to urban life, access that has a very direct relation to the built environment in itself, its contents, as well as the composition of the population, both working and residential (non-locals and locals). The empirical material that supports this notion includes reflections of urban space: its structure, its design, and its location (centrality-peripheral aspects). However, these conditions are primarily described with the aim to understand rather than to explain. The results show that the Swedish suburbs have poor spatial preconditions for a well-functioning urban life (Olsson, Ohlander, and Cruse Sondén 2004).

Jacobs lists the conditions for the built environment that encourages good urban life, aspects that mainly include spatial criteria (Jacobs 1992), emphasising the importance of the street, land use mix, and clear definitions of what is private and what is public. This could be described as a normative approach since it predicts whether certain spatial properties are present that will lead to certain outcomes (a common approach in the architectural field) and whether such predictions are true, suggesting that these properties may also explain the effects. According to Sennett, the privatisation of public space has a restrictive influence on public urban life, and modernistic design ideas are criticised for not supporting urban

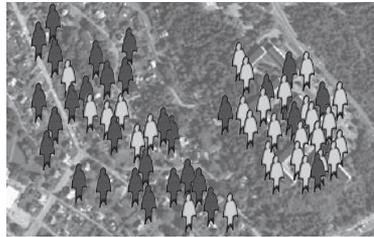
life (Sennett 1993). The accessibility to publicness as an explanation could be linked to the accessibility to the kind of urban public space that nurtures the growth of public urban life. Jacobs, Habermas, and Sennett believe that neighbourhood planning has failed to encourage stronger social communities by urban form, by the structuring and ordering of the built environment. The attempts to recreate stronger communities by requiring people to enter into social relations and at the same time strongly limiting the number of accessible people has the opposite effect. That is, such planning has actually discouraged public urban life and inhibited people to share public space. According to this perspective, it is the decreased accessibility to urban life and the decreased accessibility to other people that is perceived as a cause of people's isolation, i.e., a causal explanation. However, it is quite obvious that there is a strong relation also to teleological explanations. Privatisation of public space is often governed by intentions to exclude certain people or certain groups of people such as gated communities that are designed to achieve a kind of private character with an explicit aim to exclude others. It is not unusual that this idea is based on the notion that the identity among those on the 'inside' is being reinforced by an exclusion of (certain) people on the 'outside'. This is an example that captures both intentions among those who design areas (the architect and the urban designer) as well as intentions among the individuals who choose to move to such an area. In the end, the large-scale result on a macro level is a kind of summary of all these individual intentions on a micro level.

Comments on descriptions and explanations

Paragraph 4.1 and 4.2 bridge the theoretical basis with the empirical study by elucidating what kind of questions are in focus as well as what kind of explanations and descriptions are found within different research traditions. This has relevance since the descriptions and explanations of a situation or a phenomenon often have strong influence on what kind of interventions or actions are considered to be efficient, which is especially evident when it comes to anti-segregation initiatives. It is an obvious risk that significant factors are overlooked only because they are not recognised or studied, and thus not described. We cannot gain knowledge of relations or phenomena that are not looked for. From the examples, it may be concluded that an empirical study, conducted from an urban design perspective, needs to more specifically concentrate on any possible causal explanation found in urban space as it is shaped and structured by urban form, without neglecting any possible teleological explanations related to how areas are designed. This is related to the idea that urban

design principles always are governed by aims that respond to certain problems or intentions, intentions that could be both of ideological character or integrated in legislation and more or less conscious for the actors themselves.

Focus on residents:
social category



Interventions with focus
on residents?

Focus on buildings:
typology



Interventions with focus
on buildings?

Focus on space:
use of public space



Interventions with focus
on urban form?

Figure 4:5. Knowledge as well as interventions are influenced by descriptions and how we understand phenomena.

4.3 *What is spatial in social segregation?*

The city is like gin and tonic

The approaches and traditions that have been outlined above are without a doubt spatial; still significant differences are found of how urban space is defined and what influence urban form is ascribed to have on urban segregation. The ideas of Henri Lefebvre regarding the urban issue and everyday life could be helpful when trying to understand some of these differences (Lefebvre 1991; Franzén 2003b). As with the idea of ‘the city as two things’ presented by Hiller and Vaughan (2007), Lefebvre has perhaps a more communicative or at least a more pleasurable metaphor to help understand space and society, namely not as ‘cat-and-mouse’ but rather as ‘gin and tonic’. This means that there is not a relationship between society and space where one quantity is given by the other. Rather, society *and* space are intimately related and are mutually dependent. According to Franzén (2003b, 51), the view of space as both a result of and a precondition for social and economical processes were established during the 1970s (Franzén is referring to Elisabeth Lebas 1982). According to Martina Löw, space can be conceived only in relational terms, as a structure-forming, habitualized, and materialised arrangement of objects. She argues that segregation as spatial structure both develops from social action and is socially productive (Löw 2009, I03:1). Löw theorizes that cities develop and display an intrinsic logic that pre-structures development opportunities, which is influenced both by social and spatial structures. This means that every city possesses certain essential characteristics that pervade all areas of life so there is a close mutual relation between the spatial and the social (Löw 2009, I03:2).

A way forward is to observe the world as concrete and dynamic instead of thinking abstract and static. To concretise means to acknowledge the context and its consequences, the localisation of the phenomenon in time and space, and its temporal and spatial relations (Franzén 2003b, 51). Here Lefebvre could be useful. As with Hiller and Hanson, Lefebvre understands space both as a social product and a physical materiality: (social) space is a social product.

Lefebvre’s conceptual triad

The conceptual triad that Lefebvre presents includes *spatial practice*, *representations of space*, and *representational spaces* (Lefebvre 1991). All three concepts address the idea of space, possess social qualities, and mutually influence one another. *Spatial practice* is based on experience, the *perceived space*: it is the spatial practice of society – it propounds and presupposes it. *Represen-*

tations of space, also called *conceived space*, are based on expectations and are conceptualized spaces, the space of scientists, planners, urbanists, and social engineers. These conceptions are used to design and control space; they have a strategic use, directed to the future. These are generally abstract spaces. Finally, it is the *representational spaces* that are space as directly lived through its associated images and symbols, and hence the space of inhabitants and users. Space is constituted by the interplay between these three quantities or elements: the perceived, conceived, and lived space. In cities, the spaces are often a built and planned environment where the practices are worked out in advance. However, in reality planning can never fully foresee the practices that really are to take place – there are inevitably unforeseen consequences according to Lefebvre (1991).

Marcus (2008) analyses urban environments using Lefebvre's ideas to explain the shortcomings and differences between the traditions or approaches: "Drawing from his triad perceived, conceived and lived space, it seems obvious that one in the morphological approach has a strong bias towards description and analysis of conceived space, while lack in the same when it comes to perceived space" (Marcus 2008, 9). Marcus argues that the morphological approach is a weak descriptive tool that does not fully capture the way people actually live in and use space and that the morphological descriptions (and the knowledge derived from them) hinder the development of new and more sustainable approaches to designing cities. Marcus summarizes the major obstacles of representations found within the geographical tradition and the morphological tradition in the following ways. First, both approaches present descriptions that give rise to misleading uniformity – the geographical unit and the urban type, respectively. Second, the descriptions have weak ties to their context. Third, the descriptions represent a kind of top-down perspective, a kind of system descriptions rather than life-world descriptions (according to Habermas) in the geographical approach and descriptions of conceived space rather than perceived space in the morphological approach (Marcus 2008, 9).

Lefebvre believes there are large differences between the conceived space (the space that is conceived by planners and architects) and the lived space (the space as it is lived and used). This tension often causes disillusionment. Urban design interventions are made more difficult when the outcomes do not fulfil the intentions. Especially for actions related to social segregation, this becomes highly relevant. In the Swedish context, many of the recent anti-segregation initiatives are highly criticised for being ineffective (SOU 2005:29). Also the strategy not to involve urban design interventions has been highly criticised. One important reason for

this difficulty is a lack of knowledge needed for practical planning. As discussed already, the built environment and urban form is treated quite uncritical in segregation research and quite simple spatial assumptions and models are applied in analysis of segregation in cities. New knowledge regarding the relation of urban form to aspects of social segregation should start with descriptions and an understanding of space that also captures what Lefebvre calls the *lived space*. Such approach includes the experiential level of cities, not only the administrative (or conceptual) level. In addition, the relations to the surroundings – the relations between neighbourhoods (or units) and relations to the city at large – need to be considered rather than just studying the neighbourhood itself. Also, very local variations need to be brought into relief. If we describe and understand space as *lived* in a more complete way, the unforeseen consequences might decrease.

4.4 *From spatial location to spatial relations*

A necessary turn of focus

Urban design and town planning are rarely seen as impressive tools within national anti-segregation initiatives. Architectural strategies are in general limited to housing policies or different kinds of up-grading projects that only aim to improve existing buildings and open spaces superficially. Not often do strategies include modifications of the spatial configuration or actions that in a more fundamental way change the spatial relations in urban environments. However, intuitively, it is easy to imagine that the surroundings have a great impact on both urban use and urban experience, but geographical and morphological approaches have failed to describe how space – i.e., urban form – affects social relations and situations. For example, how the built environment through its configuration can influence and create patterns of movement, patterns of co-presence in public space, as well as influence the accessibility to resources in the city. This thesis shifts the focus by bringing attention to the spatial relations within the city through public space. The initial question needs to be reformulated. Instead of describing geographical units from a bird's eye view (according to certain parameters) it is more relevant to transfer the point of departure for the analysis to the street level. This implies that accessibility through public space is explored from certain locations. This seems to be especially suitable for issues related to social segregation since segregation is perceived as an inherently relational and relative phenomenon.

A 'street-level' spatial approach determines the boundaries of an area based on the real street network. That is, the radii or distance can be adjusted according to the question in focus. Describing the mutual *accessibility* between residents instead of their geographical *location* means that the influence of the spatial dimension is taken into account: public space as it is shaped and structured by built form. This means that the number of accessible people (as such or with a certain profile) depends both on *the number of residents* as such in combination with the *distribution of space* itself. Thus the situation or the outcome is either influenced by a change of the number of people with a certain profile or through changes of the street network. Up until now, focus within initiatives has been on changing the composition of people rather than changing configuration of public space (Hajigesami 2005).

Analysing the residents may establish that all the residents within a certain administrative neighbourhood have little potential for interaction due to the spatial structure; for example, landscape barriers or cul-de-sac

structures may prevent people from moving in certain directions. Groups of people might not use the same paths or streets, the same bus stops, or the same facilities depending on the design of the street network. This calls for a re-focusing. For example, uncovering where people live may be less important than uncovering where people live in relation to others. Similarly, determining how many people live in a specific area may be less important than determining how many people are accessible from a particular building (street or area) within a particular walking distance. The descriptions that are produced from such question are argued to be more realistic or plausible, and hence, closer to what is perceived as *lived space*. This reformulation of the question provides a way of seeing the problem from a new perspective.

By recognising and analysing the urban system based on how spaces in reality are related on the street level, on the ground so to say, the descriptions appear as more concrete and perhaps more like a perceived situation compared with the geographical descriptions, which appear to be more abstract.

Distribution of space – distribution through space

To operationalize the questions in focus means applying methods that describes spatial relations and acknowledge the shift from location to relations, i.e., distributions *of* space and *through* space rather than distributions *in* space (Marcus 2008; Koch 2004). Distribution *in* space refers to what is normally found in analyses of residential segregation as patterns of how different categories of the residential population according to certain aspects or criteria are distributed in an urban system. It could also be descriptions of where other facilities such as public playgrounds and workplaces are located in a city. The focus is on *location*. Distribution *of* space refers to how space is structured and shaped by built form based on analyses of space in itself. This captures how urban environments are designed. Distribution *through* space is how the built environment and public space is made use of by people: how activity distributes itself in urban space as it is used in everyday practice. In analysis of distributions *through* space the distributions *of* space is combined with certain content found in the urban environment and it illustrates what is made accessible through physical space, for example accessibility to residents, working population, or different amenities in the city. It reflects a rather realistic street level perspective since it captures people's accessibility to different things through the street network (Marcus 2008; Koch 2004, 30-32; 2007, 82).

In this thesis, the configurative analysis is the primary link between space and social relations. However, it needs to be emphasized that a

configurational approach still has its limitations since it only shows the potential within the urban system. On the one hand, the approach has the ability to reveal which areas are most accessible or most far away and it has the ability to reveal spatial barriers within the embedded context. In turn, such features may be related to different social use in general. On the other hand, what specific social use of spaces will in reality occur is not that easy to capture since this is also constituted by the specific situation: who inhabits space, their social background (or habitus), historical aspects, as well as many other non-configurative factors. To achieve the full picture, several different analyses should probably be combined. In spite of this delimitation, the configurational approach captures information about the social potential within a spatial system, or in other words, a plausible outcome for people in general. Such methods and descriptions are essential to increase the understanding of the spatial impact; the impact of urban design.

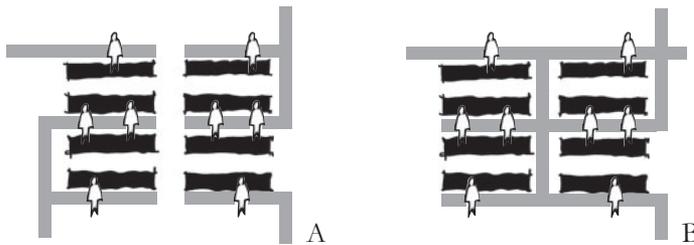


Figure 4.6. The possibility for people to share the same public space is influenced by the urban layout and how it is configured, by urban form. In example A, the maximum accessible people are three, while all eight are accessible in example B.

Spatial affordance

In this thesis, the study is widened to not only take into account residential data but also investigate other aspects. For example, this thesis explores how urban layouts differ regarding the accessibility to other people as well as to the accessibility to amenities, and identifies the important spatial features that influence this accessibility. If it is possible to respond to these questions in a relevant way, it is also possible to discuss the inequalities regarding living conditions in different neighbourhoods that depend on urban form. This line of reasoning leads to the concept of *affordance*, a term coined by James Gibson: affordance describes what the environment affords animals or humans in terms of shelter, water, tools, etc. (Gibson 1979). According to Gibson, affordances of the environment are what it offers the animal, what it provides or furnishes, either for good

or ill. Interestingly (and relevant in this context), affordance describes the needs of the receiver (Gibson 1979). Affordance in an urban context could be said to describe what spatial advantages an area – a neighbourhood or a city as a whole – afford its residents or its users depending on differences in orientation and preferred forms of solidarity within different groups. This concept could be useful both as a description of what the built environment and urban form mean for the user and as a way to identify specific spatial conditions as either good or bad depending on the point of view of the resident. For example, a spatially-segregated area could be beneficial for some people while others are strongly disadvantaged by the same kind of features. To some extent, spatial affordance in different neighbourhoods regarding some aspects can be measured, techniques that will be further explored in the empirical study.

The shift of focus in relation to research questions

Before moving on and clarifying more in detail how segregation in the built environment can be analysed empirically, the initial questions for the thesis will be recapitulated. The first question that deals with how space is conceptualised and described in relation to urban segregation has already been revealed above and weaknesses from an urban design perspective have already been identified. These findings suggest another question: the second question in focus is about how segregation can be re-conceptualised and approached from a new angle in order to further increase the relevance for the architectural field. The key aspect to respond to in this question is the turn of focus from spatial *location* to spatial *relations*. That is, to more explicitly examine accessibility through space – i.e., the distribution *of* and *through* space instead of distribution *in* space. The third question relates to the exploration of a configurational approach to segregation matters with the aim to deepen our understanding of the role of urban form within urban segregation. The purpose of testing configurational methods and tools is to see if an approach based on a different conceptualisation of space will contribute to new knowledge about how urban design influences segregation. The third question has an additional aim that strongly influences how the research questions are operationalized, namely to develop knowledge that can support a more effective urban design and planning practice concerning the urgent issues of social segregation. If it can be shown that urban space actively influences social aspects, then this could contribute to a more dynamic understanding and contribute to the discussion on the theory of space-society relations. In turn, this approach encourages a general discussion of social sustainability within spatial urban systems.

4.5 How to analyse spatial segregation

Segregated public space

The key element when analysing spatial relations and accessibility in a city is evidently public space. An urban landscape characterized by a prominent segregation in public space, reveals disrupted spatial relations within and between neighbourhoods. Such disrupted spatial relations separate different scales of movement (i.e., short distance movement from long distant movement) and separate neighbours from each other as well as from people in general. To investigate whether public space, as it is shaped and structured by built form, is segregated, a profound analysis of public space in itself is needed that reveals segregated areas within a city and how this segregation influences the accessibility to people. Furthermore, this type of investigation illustrates the *consequences* of a segregated urban space: e.g., how public space as a mediator defines relations between people as well as relations between people and different resources in the city, further establishing and reproducing patterns of segregation or exclusion.

Understanding the methodology and procedure will help answer questions about segregation in public space as well as help identify the implications of such segregation. That is, the line of reasoning presented so far includes a shift in focus from residential segregation to a focus on segregation in public space. The built environment is analysed in a way that takes into account how public space is interconnected spatially through streets, paths, and parks. To explore segregation in the urban spatial system from this perspective means that the bird's eye view is replaced by a street level view to explore spatial accessibility *through public space*. These approaches were chosen because they contribute valuable and relevant information regarding a particular aspect; however, this thesis does not explore all aspects related to the physical environment; rather it focuses specifically on such social aspects that are related to urban form. These have been highlighted in the theoretical overview.

Other approaches have contributed with suggestions regarding spatial aspects that are found to be of significant importance; these aspects are subjected to further empirical studies. Three aspects have been identified as highly relevant and will be outlined as follows. First, the issue of centrality and periphery is salient both within the housing and the interplay segregation discussions. Thus, an analysis of spatial integration is motivated and preferably carried out with a configurational approach. Two relevant questions are explored, Which neighbourhoods from a configurational perspective are segregated from the city as a whole? and Are

these neighbourhoods characterized by segregation on a comprehensive level only or are they also segregated locally? Second, accessibility to urban life, to common resources, to private and commercial service, or to resources in general provided in the city stand out as crucial in the segregation context. Such accessibility depends on or is influenced by both people (the population, both residential and working population) and the material amenities (e.g., service, infrastructure, culture, public transportation, and recreation). In addition, the distribution of space itself obviously plays a vital role for the outcome. However, it is of great importance that the analyses also have the ability to distinguish the influence that urban form has from other aspects. Third, to understand how neighbourhoods differ regarding their spatial conditions – or as described earlier, how they differ regarding their spatial affordance – the analyses should facilitate a comparison between areas and elucidate the spatial relations between neighbourhoods as well as to the city as a whole, an approach that analyses the city on a comprehensive level.

Configuration

Architectural artefacts and their properties should be in focus. The configurational properties will be identified in a comparative way, preferably also in quantitative terms. These spatial properties then need to be linked to plausible social outcomes and the foundation for such reasoning is developed in the theoretical discussion that opens this thesis.

The space syntax approach is found to be a relevant theory and methodology for this purpose; it is a configurative morphological approach that more specifically focuses on the structural level of form compared with traditional morphological approaches in general. Configuration deals with relations between artefacts rather than with the specific form of artefacts themselves – with the topology of form rather than the geometry of form. This means that space syntax can analyse segregation dynamically: how people are connected, mediated, and integrated through public space rather than statistically averaged across large areas (Marcus 2007a, 255). Configurational analysis uncovered by various space syntax techniques shed light on the elusive pattern aspect of objects in architecture and urban design and give quantitative expressions to the idea that it is how things are put together that actually matters (Hiller 1996, 1).

Space syntax provides quantitative results that can be used for correlation and comparative analyses. Through correlation research methods, it is possible to recognize instances in the “real world” where explanatory values can be obtained by showing that certain variables have strong relationships with other variables. However, it is important to emphasize

that it does not necessarily demonstrate that one variable causes another (Groat and Wang 2002).

Operationalization of the questions in focus

There are three main questions in focus that concern this thesis (see the introduction in chapter 1). The first and the second questions are attended to in the theoretical part of this thesis. The third question – how a configurational approach can deepen our understanding of the role of urban form in relation to urban segregation – is discussed theoretically and empirically. To bridge from the theoretical and the empirical, the initial question about the configurational approach needs to be more precisely formulated into operationalized questions to make them empirically testable. To this end, the configurational approach has been divided into three parts. The first part deals with the analysis of spatial segregation and integration in the urban system (of space itself). The second deals with analysing the consequences of a segregated public space, information that is possible to capture through various accessibility analyses. The third part deals with observed co-presence in public space: how public space in different neighbourhoods is populated – densely or sparsely – if studied on site. The operationalized questions that correspond to these three main fields are presented together with some methodological proposals for the empirical investigation. This set of operationalized questions is formulated in a rather general way; they are not necessarily adopted just for Södertälje; they might also be applied to other cities.

- From a housing segregation point of view, the city of Södertälje is highly segregated and the situation is in many aspects pressing. If public space as shaped and structured by built form also is segregated, does this mean that relations between neighbourhoods and people are impaired? To investigate this, it is of utmost importance to conduct analysis on a comprehensive level and include the whole city in order to capture the relational aspect. If only a few areas are depicted and separated from its urban context, significant spatial relations may be lost. The spatial relations are captured by *integration analysis* on the global level to reveal how neighbourhoods are related to their surrounding as well as to the city as a whole. Local integration analysis reveals how areas are integrated on a local level, for example, if areas have a local integration core or if they have a more scattered pattern. In addition, a *depth analysis* is used to illustrate spatial or topological distance.

- To what extent does the spatial structure facilitate or inhibit through-movement in different neighbourhoods? In addition to integration analysis, it is possible to conduct a *route choice analysis* that identifies the most important links for through-movement and transfers between different locations. To reflect both short and long movements, these analyses (integration analysis and route choice analysis) need to be made at different radii.
- Many post-war suburbs have pathways that are not constituted by buildings and thus lack a kind of natural surveillance that may restrict pedestrian movement. Is this type of pathways common in the neighbourhoods in Södertälje? The constitution of space is governed by how the buildings (i.e., entrances and windows) relate to public space (streets, paths, parks, etc.) and this may influence on how secure, attractive, or interesting the paths are perceived. Thus the accessibility to buildings will be analysed throughout Södertälje to enable a comparison between areas regarding this aspect.
- Do neighbourhoods possess such spatial conditions that could lead to disurbanism? Are, for example, different scales of movement disrupted? Such disruption implies that different urban activities in public space are not superimposed, rather separated, and this means for example, non-residents are separated from residents. This may be explored by an investigation of the synergy phenomenon: how the integration on a local level correlates with integration on the comprehensive (global) level. This relates to, for example, what Jacobs refers to as an overlapping of the local and the global city life as well as to the idea of Lefebvre regarding urban rhythms.
- Often, neighbourhoods do not have a viable local centre that offers services or places to meet other residents or non-locals. Is there a mismatch between the location of the planned neighbourhood centre and the spatial centrality? Does the location of the neighbourhood centre work together with the patterns of natural movement? It is often claimed that the local neighbourhood centres in Swedish suburbs are not perceived as centrally located within the area, i.e., from a spatial point of view. The hypothesis here is that the centres are not located where the configurational conditions are optimized, resulting in low accessibility either from a local or from a comprehensive point of view. This hypothesis is intended to be confirmed or rejected using *integration core analysis* at different radii to establish to what extent the cores overlap with the planned centres.

- Segregation in public space influences the relations between people and a relevant question is where do people live in relation to others. How dense are areas with respect to the number of potentially accessible people? In order to respond to this question, an accessibility analysis is needed that takes into account where people live at an address point level and how they are related to others through public space.
- Are some areas prone to have better access for non-residents than others? This is studied by further accessibility analyses, both the accessibility to other residents at different radii and the accessibility to the working population, as well as combinations of these two. This gives information regarding the potential inflow of people from the surroundings. The neighbourhoods can be compared and it is possible to illustrate how urban form plays a role for this outcome. This accessible density is strongly related to the potential for an urban life to develop, since it influences how many people may share public space and share some everyday practices.
- How does the accessibility to a diverse population differs between neighbourhoods? By adding specific social data about the residents to the accessibility analysis, it is possible to investigate what people are accessible from different locations throughout the city with a certain profile such as employment status, education level, income level, or ethnic background.
- The issue of equal living conditions needs to be concretized regarding the spatial aspect. That is, this question needs answering: how does the accessibility to specific amenities differs between neighbourhoods? Information of different functions (e.g., bus stops or playgrounds) are thus linked to the spatial model and studied on both the address point level as well as the NYKO-area level. This partly captures what is described earlier as the *spatial affordance* of different neighbourhoods.
- The potential for urban life is influenced by both a density aspect and by what kind of mix the population has regarding residents and non-residents (i.e., the constitution). How is public space populated (or not populated) in Södertälje when observed on site? Is it possible to establish a difference between areas through observations and how does this relate to the spatial properties, to urban form? Observations need to be conducted in several areas and preferable

simultaneously. The observed movement flow can then be used both for comparative analyses as well as in correlation analyses in order to see if it correlates to certain spatial properties.

5 Case study Södertälje

5.1 Structure of the empirical study

Introduction

In the empirical study a configurational approach will be applied to the city of Södertälje. The methods used are based on a spatial conceptualisation that reflect and foreground the user's perspective and hence departs from a street level perspective. Both the global and the local urban context are taken into account so the neighbourhoods are studied in relation to their surroundings and to the city as a whole. An important aim with the empirical study is to identify the consequences of segregation in public space, for example, the consequences for accessibility to other people and to service, as well as how it influences the conditions for co-presence in public space. In the theoretical section of this thesis, the strong focus on public space, as shaped and structured by built form, is argued to be a necessity in order to increase the awareness of how social segregation is influenced by urban design. The strong focus on public space is also of vital importance when searching for an alternative foundation for defining urban segregation that is not primarily based on the residents and their social profile. The empirical study also aims at capturing spatially-related inequalities between neighbourhoods by exploring spatial affordance of different areas. An essential question is suggested using this approach: What extent does a configurational approach contribute to knowledge that can support a more effective urban design practice and encourage the focus on issues related to urban segregation through urban design policies and interventions?

The comparative aspects of the empirical study are important and thus neighbourhoods are analysed in similar ways and always in their urban context. This enables a comparison between different areas regarding aspects related to and influenced by their spatial configuration, an investigation that this thesis addresses.

Structure

Chapter 5 includes this introduction to the empirical study with a brief background regarding the choice of the area, the urban development in Södertälje, as well as a description of the material and data used for the study. The principles for how the spatial model is made are outlined together with a short presentation of the computer tools that are used.

The case study of Södertälje is organised into three different parts: the *integration analysis*, the *accessibility analysis*, and the *observation analysis*. All results, however, are presented in chapter 6 where each study opens with a recall of the theoretical standpoints and any specifications regarding theory or methods are nuanced when needed. Reflections of each analysis summarises the results and a more extensive discussion as well as conclusions are presented in chapter 7.

The three analyses include the following:

- Integration analysis

The configurational analysis investigates the spatial conditions in the city of Södertälje including segregation in public space, spatial centrality, identification of important linkages within and between neighbourhoods, the occurrence of ruptured spatial relations, and centrality of planned centres as well as constitution of buildings. The space syntax analyses that will be used are integration, synergy, mean and step depth, constitution, and route choice.

- Accessibility analysis

An analysis of accessibility explores the consequences of spatial pre-conditions including segregation in public space. Accessibility to the residential population and to the working population through public space will be analysed for the whole city and accessibility to certain significant amenities in the city is also analysed (i.e., public playgrounds, bus stops, and grocery stores). In addition, a more nuanced accessibility analysis will be conducted where certain socio-economic information of the residents – such as aspects regarding level of education, level of income, as well as ethnic background – are integrated. This approach captures a kind of *accessible diversity* throughout the city of Södertälje.

- Observation analysis

An analysis of co-presence and movement flows in public space is made using on-site observations. A number of neighbourhoods are studied simultaneously for two days, from early morning until the evening. About

fifteen people have been involved in the observations in about ten neighbourhoods. Three of the areas have twenty observation spots (gates) and the others about ten. The reason for conducting on-site observations is both to capture differences between neighbourhoods regarding the character of public life and to compare how such momentary observations correspond to analyses based on the spatial model.

5.2 Background and data

The choice of the area

The case study is conducted in the city of Södertälje, located approximately 30 kilometres south of Stockholm. The municipality has about 80 000 inhabitants. Södertälje was chosen for the study for the three reasons. First, the issue of social segregation and exclusion has been a prioritised question in the municipality for a long time and Södertälje has been included in several of the national initiatives such as the Metropolitan Initiative. Second, the size of Södertälje has been suitable for conducting studies of a whole city system and not only focusing on the ‘deprived’ areas, areas that previous studies often seem to prioritise. That is, a precondition to capturing relations between neighbourhoods as well as between parts and the whole is to address cities from a comprehensive point of departure. Third, the cityscape of Södertälje is largely characterized by the post-war development influenced by the ideals posited by neighbourhood planning. These neighbourhoods seem to represent many Swedish cities and seem to have quite different preconditions for sociability compared with cities of a more traditional urban character. Hence it is argued that to understand these structures and their consequences for social outcomes requires further study.

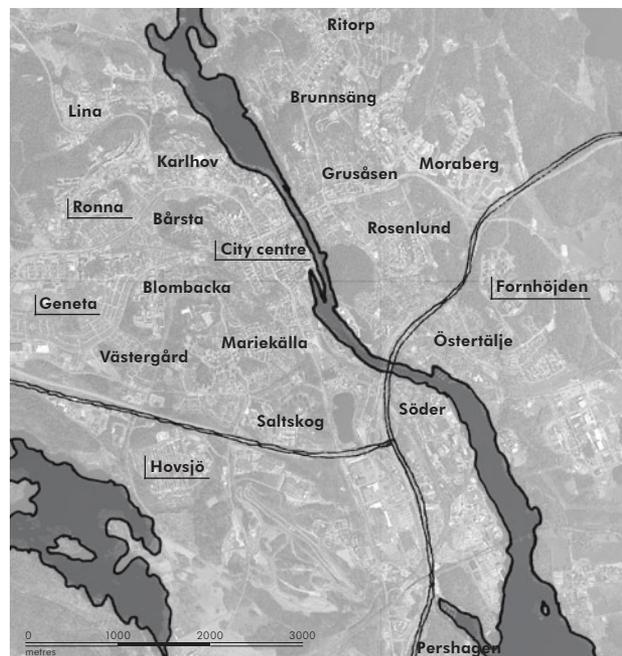


Figure 5:1 Map of Södertälje 30 kilometres south of Stockholm.

The spatial model

A model of the spatial system of Södertälje is constructed for the configurational analysis what in the space syntax approach is called an axial map. In this case, the axial map represents public space accessible for pedestrians (and bicyclists). The spatial model consists of about 5 000 axial lines and comprises the fewest and longest lines possible that cover all publicly accessible urban space (Hillier and Hanson 1984, Hillier 1996). These axial maps are constructed using digital maps, thematic maps (e.g., bicycle maps), and aerial photos. In addition, on-site studies have been made when necessary. The axial map has been drawn in several different versions during the empirical investigations. Several critical decisions regarding how to draw the axial map have been taken. One difficulty has been to create an axial map with a suitable and relevant resolution. The available maps and aerial photos together with observations in the field have resulted in a very detailed foundation for the axial map. The first versions turned out perhaps too detailed for the scope and purpose of this study, which comprises more or less the whole municipality and focuses on capturing relations between the parts and the whole. For example, the radius-radius measure (i.e., the highest depth of the most integrated axial line in the system) turned out to be very high (19). A revision of the axial map was needed and that implied several simplifications that less strictly followed the physical paths but more consistently followed visual lines of sight (e.g., in open terrain and open spaces). This resulted in fewer axial lines in the whole system and a reduced radius-radius measure to 15. Also, simplifications were made in later versions in those areas that were studied specifically for certain in depth studies through field surveying in order to achieve a more consistent manner throughout the whole case study area.

There has been a discussion if all motorways should be included as possible pathways or not in the model. Initially, they were not included since the model was intended to reflect pedestrian (and bicyclist) accessibility. However, since the longer distances are discussed in terms of spatial integration and segregation, the final version has been slightly revised. In the final axial map, the included motorways are the ones that are possible to use for pedestrians and bicyclists or that are important links in the internal Södertälje infrastructural system. Motorways that function as regional linkages only (for example, motorways with only one entrance/exit within the Södertälje traffic system) are still not included since they are not likely to be of importance in the Södertälje internal transportation system.

Statistical data

It is of greatest importance to link the analysis of the spatial system back to what it means for people in their everyday lived experience. This requires combinations of analysis that take into account both the properties of the spatial systems as well as where people or certain facilities are distributed in space, i.e., where they are located. Public space in itself then appears as the mediator for all these potential relations and it is through public space that these relations in reality are made concrete. Such a combined analysis could be described as an analysis of the outcomes or consequences of two parameters: the spatial factor through its spatial configuration and the content factor – where people, services, or other facilities are located. Such combined analysis requires, apart from the spatial model, information and statistical data about the population and/or about facilities that are found relevant in the study.

The statistical census data is provided by the municipality of Södertälje and include information about the residents regarding their age, gender, ethnic background (BEFPAK 2006), information about education level (AMPAK 2006), levels of employment (including self-employed) and unemployment (AMPAK 2006), income level (INKOPAK 2006), as well as ownership of vehicles (BILPAK 2006). The statistical data is aggregated at the level of NYKO-areas, which is more or less equivalent to the property level, at least in neighbourhoods built after the 1950s.

In the empirical analyses, the data for the people in every NYKO-area is distributed between the address points within that area. Hence, in the analysis, all address points within one NYKO-area get the same properties reflecting the population in that specific area. To bring the data down to every address point is of significant importance when doing analyses based on the spatial model with axial lines since the address points within one NYKO-area can be situated quite differently. Of course, a better resolution of the data would be to use data that are aggregated on the level of address points directly (or properties), but such data was not available for this research study.

Additional data regarding service of different kinds, such as public playgrounds and grocery stores, are also provided by the municipality. This data has been digitalised in order to be integrated into the spatial model before analyses. Storstockholms Lokaltrafik, the public transportation operator within the Stockholm Region, has provided digitalised information regarding location of bus stops and commuter train stations.

Maps

The geographical maps are provided by Södertälje municipality and include GIS-maps with the street network, buildings, properties, aerial

photos, and information about NYKO-areas. The NYKO-area is an administrative division of the municipality and represents a rather fine resolution of information. There are approximately 90 000 NYKO-areas in Sweden and the case study in Södertälje comprises about 1 200 NYKO-areas. In some housing estates with large properties, one NYKO-area corresponds more or less to one property. This level of geographical division is more detailed according to what is generally used in segregation studies (national investigations, etc.) where the SAMS unit is commonly used. In total, Sweden is divided into 9 230 SAMS-units.

For the accessibility analyses in the case study, address points have been made for every building in Södertälje larger than 50 square metres. It is to this address point that the statistical data have been linked.

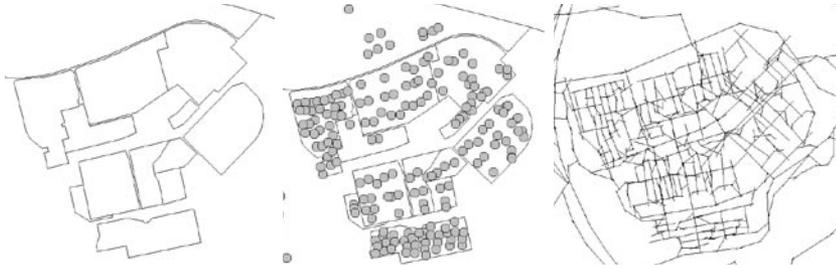


Figure 5.2. NYKO-areas and address points in the neighbourhood of Horsjö as well as the axial map of Horsjö.

Computer tools

The *integration analysis* is made with the space syntax programme Confeego¹⁸, which is used together with the GIS-programme MapInfo. The basis for this analysis is the axial map. The *accessibility analyses* are made with the Place Syntax Tool (PST)¹⁹, which is also used together with the GIS-programme MapInfo and based on the axial map together with statistical data connected to every address point. Accessibility analysis using PST is argued to just like space syntax both strengthen the experiential

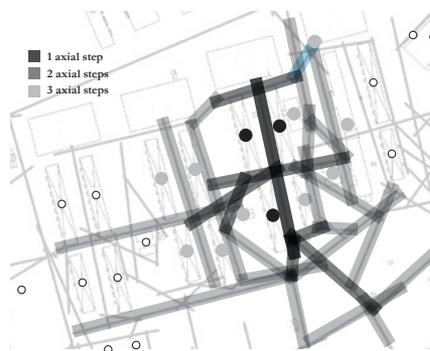
18. The academic version of Confeego is used in the Södertälje study. See <http://www.spacesyntax.org/software/newtools.asp>

19. http://www.arch.kth.se/sad/index_subpages/ps_factsheet.htm

aspect of urban form, which is weak in accessibility research and in urban morphology in general, but also contribute to space syntax analysis by integrating place bound data in urban areas. This is achieved by using axial descriptions as a measurement of distance to particular contents in urban space e.g., residential population or retail within regular geographic accessibility analysis (Stähle, Marcus and Karlström 2005, 136; Marcus 2007b, 4). Hence, it is not only possible to analyse the accessibility to other spaces, but the accessibility to specific contents in space as well (i.e., accessibility to different attractions or amenities), whereas integration analysis deals with general spatial accessibility (i.e., accessibility to urban space in itself) (Marcus 2007b, 5).

The Place Syntax Tool has the ability to capture a very fine scale of accessibility to the population (or any other statistical data) at different ranges from certain locations. In these analyses, the definition of a geographical area does not need to be fixed, rather it can be adjusted (in terms of metric distance, bird distance, or axial step distance, or combinations of these) to the specific purpose of the analyses (Stähle, Marcus and Karlström 2005). While traditional geographic descriptions usually deals with representation of data such as densities within geographical units, place syntax deals with representations of the accessibility within a certain radius (Marcus 2007b, 5-6). This circumvents the otherwise deeply rooted MAUP-problem in geographic analysis.

Figure 5:3. PST measures statistical data along axial lines to the extent that it is suitable for what is analysed. Accessibility can also be measured according to metric distance through public space or just within a certain radius without taking into account how streets on the ground are composed.



The *route choice analysis* is made with the programme DepthMap²⁰ and the analysis is based on a segment map where the axial lines have been divided into segments and thus can possess different properties on different segments of the axial line. Statistical analyses and calculations are made within Microsoft Excel, SPSS, and Statistica.

20. Depthmap was created by Alasdair Turner at University College London. See <http://www.vr.ucl.ac.uk/depthmap/>

5.3 *About Södertälje*

Urban development in Södertälje

A brief outline of the urban development in Södertälje is given to provide an idea of how the cityscape has emerged and what driving forces are related to this with respect to industrial development and population growth. Södertälje history starts around the medieval era and the first documentation is from the year 829 when Södertälje was granted a town charter. The strategic location gave the city great importance for transportation on both land and water. The building of Södertälje canal started in 1803 and finished in 1819, and creating a most important connection between Mälaren Lake and the Baltic Sea, reopening the water connection for the first time in a thousand years. The railway to Stockholm was built in 1860, and the railway to Gothenburg was built in 1862, which was quite early since the railway system in Sweden dates from the mid 1850s.²¹

The industrial prosperity in Södertälje took place between 1945 and 1970 and had great consequences for the demand of labour. Consequently, the demand for housing increased rapidly during the 1940s and the 1950s as in many other Swedish cities. The areas that were developed during the first period of expansion were deliberately located close to the inner city, for example, Rosenlund, Mariekälla, and Grusåsen. The number of inhabitants in Södertälje increased rapidly during the post-war era; in 1950, Södertälje had about 25 000 inhabitants and in 1960 about 33 000 people and in 1970 there were as many as 61 000 people living in the municipality. Not only did urban expansion increase demand for housing but also it increased demand for industry and office buildings. As in many other Swedish cities, new areas were in this period built according to the ideas of the neighbourhood planning ideals described in paragraph 2.4, and later, many areas were part of the Million Homes Programme. This resulted in new large housing estates that were located at farther distances from the city centre and were spatially separated from other already existing areas. Many of these areas were also built in locations that had more complicated terrain, such as in Bergvik, Ronna, Geneta, Saltskog, and Fornhöjden (Gelotte 2004).

21. http://www.sodertalje.se/Kommun-demokrati/Om_Sodertalje/Historia/

In Södertälje, the housing stock in 2002 included 26 600 units in multi family houses (68%) and 12 400 detached houses (32%). Compared with many other municipalities in the region, the percentage of multi family houses is very high. Södertälje also has a high number of flats that are for private and public rental (55%) compared with condominium flats (15%) and home ownership (30%).²² In 2007 the total population in the municipality was 83 600 of which approximately 67 000 live in the central part, which is included in this case study. In the municipality, 40% of the population has a foreign background, of which about 29% are born abroad and about 12% have parents that are born abroad. In 2008, the employment rate was 78% (2006) and the unemployment rate came up to 3,5%.²³

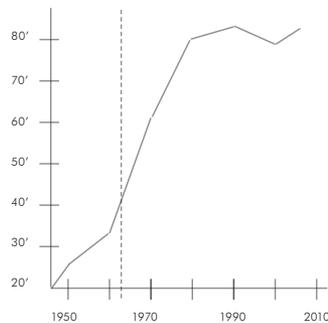


Figure 5:5. Population in Södertälje. During the 1960s other municipalities were incorporated with Södertälje (Gelotte 2004, 12).

The number of jobs in Södertälje is about 36 000. Business and industry in the municipality is strongly influenced by a few large companies, such as AstraZenica and Scania. Together these companies provide as much as a third of the jobs in Södertälje. It is a regional labour market with extensive commuting from and into the municipality. Every day, 14 000 people commute into Södertälje from other municipalities, and 10 000 people commute in the other direction. Hence the infrastructure system has great importance for the labour market. Over 90% of the jobs in Södertälje are located in central parts of the city.²⁴

22. This is low compared with Sweden in general where 46% of all housing units are home ownership.

23. http://www.sodertalje.se/Kommun-demokrati/Om_Sodertalje/Statistik/

24. http://www.sodertalje.se/Kommun-demokrati/Om_Sodertalje/Statistik/

Official municipal documents

A selection of official municipal documents have been studied focusing on what kind of strategies that are proposed regarding segregation that are related to spatial planning and urban design. The intention is to analyse to what extent Södertälje municipality sees urban design interventions as possible means for achieving goals related to segregation and exclusion. Three documents that are relevant for this study: The Comprehensive Plan from 2004²⁵, the Integration Policy of 2001, and the Building Policy of 2005. More general documents such as national reports and evaluations of different anti-segregation initiatives have been referred to in chapter 2.

The Integration Policy from 2001 presents aims for Södertälje municipality regarding integration such as how to counteract segregation, how to provide equal living conditions, and how to create an open and integrated society. The strategies that are defined in order to achieve this do not include urban planning or urban design but address other fields of a more institutional character. For example, the strategies include different kinds of individual support for employment. Social, demographic, and ethnic mix in organisations and institutions is supported.

The Comprehensive Plan for Södertälje is from 2004. Although the comprehensive plan addresses counteracting segregation, the possibilities to do this through comprehensive planning is said to be limited. It is noticed in the plan that segregation problems are related to areas with dwelling types of a certain kind. According to the comprehensive plan, a mix of tenancy and ownership forms in both new and existing areas should be prioritised when new housing developments are planned. There is also a reference to the Integration Policy and to other initiatives such as The Metropolitan Initiative. This is a very typical and illustrative example of how segregation is addressed: all actions proposed are all closely related to housing policy (i.e., ownership, tenancy, and different types of dwellings). Thus, other aspects that might influence segregation such as equal (spatial) living conditions, infrastructure and public transportation, accessibility to different features or other physical or spatial amenities are not addressed at all.

25. The Comprehensive Plan is a strategic planning document that deals with how land and water resources best could be used and about development within the municipality. The Comprehensive plan is also an agreement between the State and the Municipality in how national interests are taken into account.

The Building Policy in force was approved in 2005. One of the main aims of the Building Policy is to attract certain sections of the population that now leave the municipality. A dilemma that needs to be acknowledged, according to the Building Policy, is that there are more people with high levels of education and high-income levels who leave the municipality compared to how many who move in. The ambition to attract certain sections of the population includes families with children (single family houses), people over 55 years who want attractive housing, single persons (students, etc.), and wealthy households who are believed to demand exclusive housing in attractive locations (waterfront areas or similar). A quantitative goal is to build 8000 new housing units by 2015. The strategy identifies attractive geographical locations and earmarks them for such development. This ambition seems to be very difficult to combine with the ambitions of the Comprehensive Plan – changing the one-sidedness character in the large housing estates dominated by rented flats. However, public open spaces are mentioned more generally and it is said that the local physical environment is important. A general upgrading of open public spaces is promoted and should be conducted, but there are no details or specific goals of what this upgrading should result in or which public spaces are considered to be unattractive.

The Million Homes Programme areas are mentioned in the Building Policy and it is suggested that these housing estates need to be complemented with other kinds of dwellings than the ones found there today to increase the status of the areas. The policy however, does not recommend building detached houses in the Million Homes Programme areas since it is not profitable. Areas that actually are suitable for new development according to the Building Policy include Grusåsen, Rosenlund, Östertälje, and Pershagen.

Reflection: municipal documents

To summarise these documents, none of them can be said to present strategies with bearing on urban design. The identified strategies and goals are more or less restricted to housing policy interventions. No goals deal with how areas should work locally or how new development could be used in a way that creates new relations in the urban fabric. Quite remarkably, the documents to some extent present contradictory goals. In the Comprehensive Plan of 2004, there is a clear objective to achieve a mix of housing types in all areas although this is not followed up in the Building Policy of 2005. Areas that are not profitable to build in (i.e., Million Home Programme areas), according to the Building Policy, should

not be developed unless financing is arranged in some alternative way (what this alternative way means is however not defined).

The questions raised and analysed in this Södertälje study could be seen as an objection to this narrow way of dealing with the issue of segregation within the realm of spatial planning and urban design and it would be fruitful if the results of the case study has the ability to contribute to a widened discussion including possible interventions within planning and urban design practice in the future.

6 Empirical results

6.1 Integration analysis

Spatial segregation in Södertälje

To investigate and explore the spatial segregation in the city of Södertälje, an integration analysis is used. Integration is a measure of how accessible each public space (or axial line) is from all other spaces (or axial lines) and can be said to reveal how much potential it has as a destination. Within space syntax research, highly integrated paths have been found to correlate to certain kinds of land use, businesses, or activities that depend on high accessibility as well as with high movement flows. Although integration is a quantitative measurement, qualitative aspects are taken into account. The integration analysis is made to gain knowledge about the spatial system in general and about segregation in public space in Södertälje specifically, both on a local and on a global level. The aim is to define how the urbanised parts of Södertälje, which is characterized by many housing estates from the post-war era, are spatially segregated and to what extent neighbourhoods are located peripherally or centrally in the urban fabric. Spatial integration reflects spatial accessibility, a kind of spatial centrality measurement, and hence spatial segregation could be argued to reflect peripheral properties.

The analysis is based on the axial map of all publicly accessible spaces, reflecting where people can walk. To capture relations between the parts and the whole, global integration is analysed, at radius n and at radius 15 (which is radius-radius for the Södertälje system: the mean depth from the main integrator that is found in the city core). The reason to use radius-radius value as a complement to global integration (radius n) is to maximise the globality of the analysed system without inducing edge effects. To capture interrelations between different estates or neighbourhoods as well as local integration, a lower radius is chosen, namely radii three and seven. Radius three has proved to correlate well with pedestrian use (such

as movement or land use) in urban areas characterized by a more traditional block structure. However, in studies of modern suburbs, results indicate that a higher radius (for example, radius seven) is more accurate (Ståhle 2005) and this will be further explored.

In this initial phase, the analysis and its foundation have very little in common with how segregation is defined within residential segregation research or how segregation is defined politically in Sweden, where the definitions are rather exclusively determined by the statistical information of the residents within certain geographical area. It rather is an analysis of the segregation of the spatial system in itself, i.e., it captures the distribution *of* space.

Integration on a comprehensive level

The analysis of global integration clearly shows that Södertälje has a strong core with a concentric surrounding (see figures below). Warm, reddish colours indicate high integration while cool colours, such as blue and green, indicate a segregated (or peripheral) location in the system. In Södertälje, the urban development has a quite distinct edge, and outside the built up areas countryside dominates the landscape, resulting in a natural edge effect. In many cities, a common phenomenon is that ‘wheels’ and ‘spokes’ of integration appear outside the core, but this is not the case in Södertälje. This structure, also known as a ‘deformed wheel’, is found in larger systems, such as London, as well as in smaller towns. The deformed wheel is characterised by a semi-grid of lines near the centre (like a hub), strong integrators that link the core to the edges (like spokes), and some edge lines are also integrated to form a partial rim. Each local area has its heart linked to the super grid lines that surround it by strong integrators and these form an edge-to-centre structure in all directions (Hillier 1996, 170, 182, 352). This means that there is a relation of part and whole that is partly made up of a relation between local and global integration (Hillier 1996, 171). The ‘deformed grid’ is usually the main public space structure, while less integrated residential areas form the interstices of the wheel. The lack of such features is an indication that the relations between the parts and the whole – or at least the relations between the different suburbs – are weak in the Södertälje system.

What also appears on the comprehensive level is that some neighbourhoods, preferable some of the large housing estates, seem to stand out with prominently smaller spatial scales and are more complex than the surrounding street-based areas. This is the case in Hovsjö, the northern part of Ronna, as well as Fornhöjden. In addition, these areas seem to be less varied regarding the integration of the axial lines; the areas are more

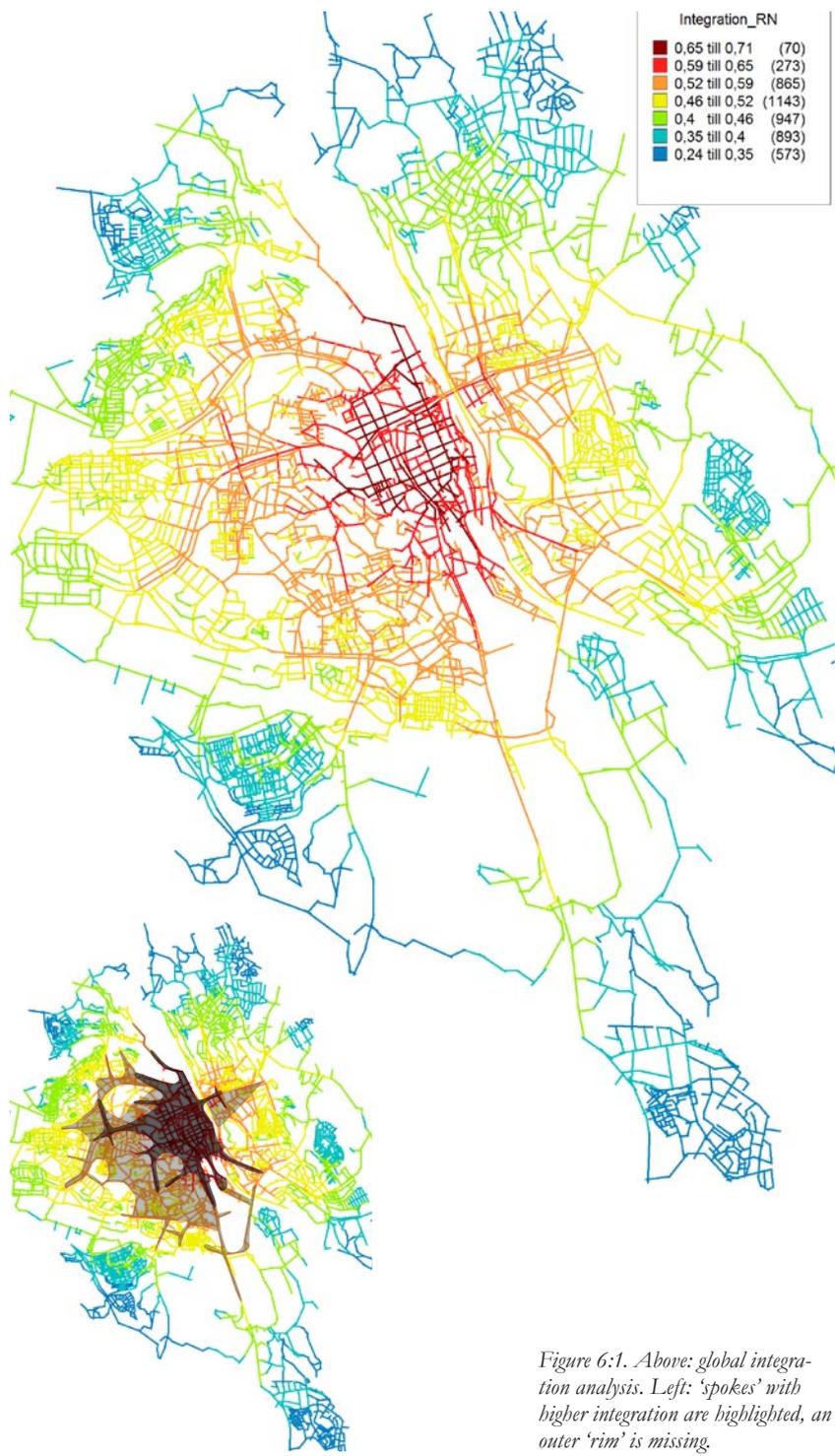


Figure 6:1. Above: global integration analysis. Left: 'spokes' with higher integration are highlighted, an outer 'rim' is missing.

or less segregated as a lump. According to Hillier, good urban space has segregated lines, but they are close to integrated lines, creating a mix within an area (Hillier 1996, 174).

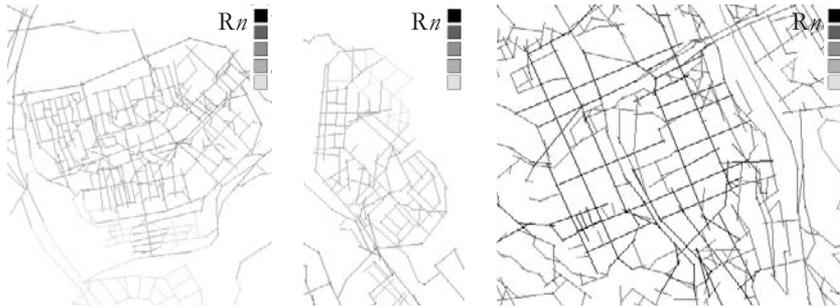


Figure 6:2: Hovsjö and Fornhöjden with smaller spatial scales and more complex urban layouts compared with the city centre (to the right).

In Södertälje it is possible to distinguish some spokes as strong integrators from the core and out towards the more peripheral parts, but these are not linked through cross connections to any larger extent. Therefore, an outer rim is missing, indicating that there are weak connections between neighbourhoods in the outer areas, so the spatial connections are through the city core and many neighbourhoods only have one entrance/exit. To some extent, this is suggested to be a result of the topography and other elements that create barriers in the Södertälje urban systems, barriers that reflect differences in levels or the Södertälje canal as well as motorways (e.g. E20 and E4). However, it is clear that these barriers do not completely explain the lack of cross connections. Instead, it seems as if this situation is a result of the designing principles, creating separate and well-defined neighbourhoods with still undeveloped buffer zones in between. These features appear to be the result of the neighbourhood planning ideals, a kind of planned fragmentation.

The spatial conditions and properties vary dramatically between different neighbourhoods. Although the system is not yet analysed with neighbourhood populations, this spatial analysis exposes significant spatial differences between neighbourhoods. One important finding is that on a global level both vulnerable areas (such as Hovsjö and Fornhöjden) and more affluent areas (such as Pershagen) have a strongly segregated position within the system. Such spatial hierarchy seems to have an isolating effect on the residents. Hence, it is argued that a system with such isolated areas has the potential to facilitate both the kind of segregation that



Figure 6.3. Spatial accessibility: neighbourhoods in Södertälje from high integration to low.

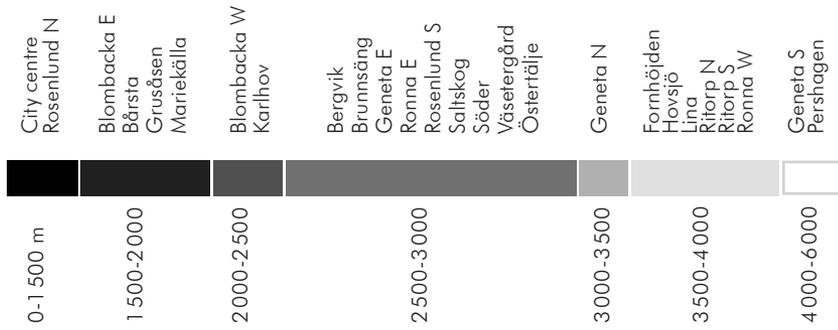


Figure 6.4. Metric distance in relation to the city centre.

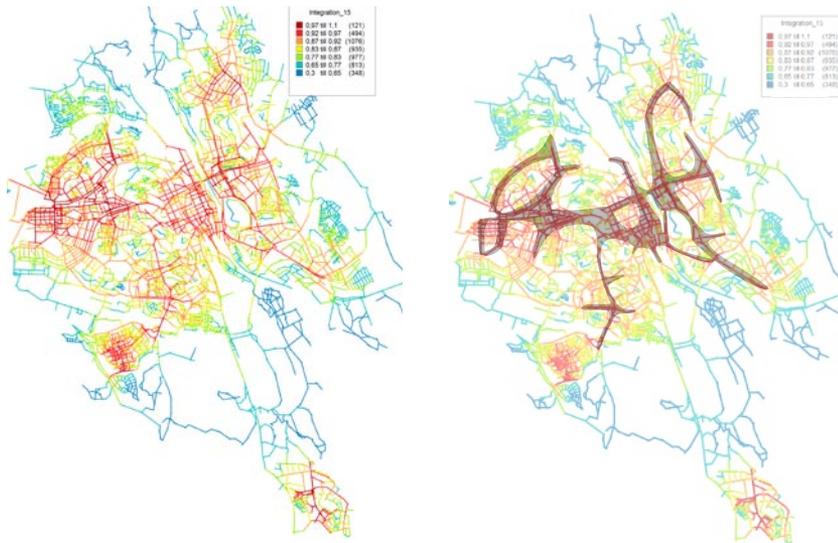


Figure 6.5. Left: integration analysis, radius-radius (radius 15). Right: the most integrated lines are highlighted.

is referred to as 'segregation of choice' and the kind of segregation that is referred to as 'segregation of coercion' (Varidy 2005). This implies that these areas and the people who gather there are efficiently isolated from the rest of the city. The spatial hierarchy then seems to provide beneficial effects for some people while others seem to be more disadvantaged by the spatial properties.

The radius-radius analysis, which in this case means that each open space is analysed according to its surrounding within a radius of 15 axial steps, reveals large differences between neighbourhoods in Södertälje. On the one hand, when the surroundings only up to a certain limit are taken into account rather than the whole system, some areas still have a very peripheral position, such as Fornhöjden, Söder, and Lina. On the other hand, some neighbourhoods that on the global level are very segregated turn out to increase its anchorage to the surroundings at this level. A considerable change is salient for neighbourhoods such as Geneta, Hovsjö, and Pershagen. The concentric character, which is legible in the global integration analysis, does not appear in the analysis at radius 15. Here another pattern appears where areas such as Geneta and Brunnsäng seem to have come closer to the city centre in relation to the geographical (metric) distance.

Integration at a local level

The result of the local integration analysis in Södertälje reveals several integration congregations (about eight) that reveal a natural spatial centrality in different neighbourhoods. Some neighbourhoods have a very distinct core while others have a more similar character throughout the area. In such areas, it is difficult to identify any kind of 'main street' or a 'central square', at least not from a configurational point of view. In other words, urban form is not creating advantageous spatial preconditions for such features to develop.

In the outer neighbourhoods, the differences between radius 3 and radius 7 analyses are surprisingly small. These differences indicate that even though the radius is increased, the physical catchment area seems to be only limitedly increased. Some of these areas also have many short axial lines, so a distance of even seven axial steps is actually a very short metric distance. Integration analyses at different radii produce more predictable outcomes in the inner city, a seemingly consistent core that increases as the radius increases. In many of the suburbs, however, the spatial integration pattern changes as the scale changes. This thesis will investigate important differences between various typologies using detailed studies of integration cores as well as by overlapping such integration core patterns at different radii.

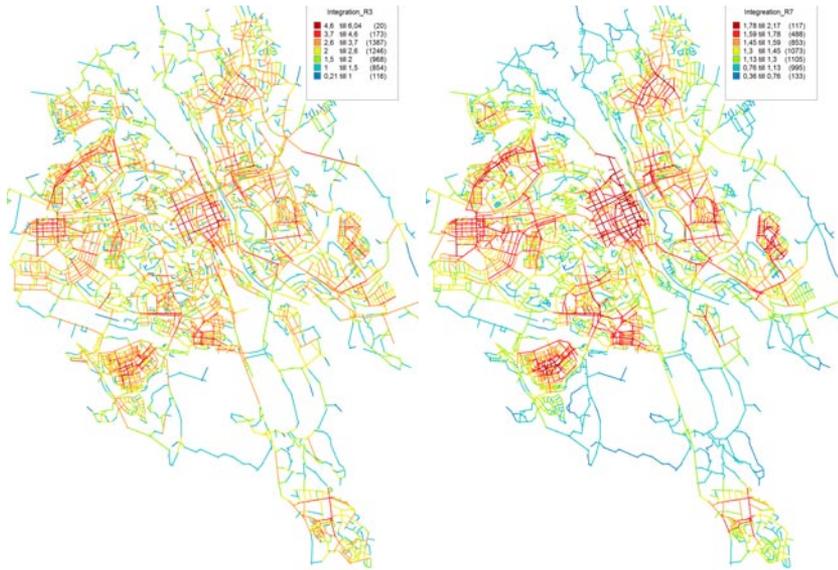


Figure 6.6. Left: local integration, radius 3. Right: local integration, radius 7.



Figure 6.7. Horsjö and city centre; left: radius 3, and right: radius 7.

Overlapping integration patterns

With disurbanism in this context is meant the disruption of relations at different scales (Hanson 2000). Such neighbourhoods are characterised by weak relations between buildings and public space, and a ruptured relation between scales of movement inhibits interaction between residents and non-residents (e.g., passers-by or strangers). These ruptured relations are found in layouts where segregated spaces are far from integrated spaces and where there is no mix of integrated and segregated spaces at the local level. Such a poor relation between global and local integration, from the local point of view, results in areas with no clear relation to the global structure (Hillier 1996, 175). Two analyses are presented below that reveal how the integration patterns overlap in Södertälje. The first deals with how *integration cores* overlap, and the second deals with how *integration patterns overlap* on the global and the local level.

Integration cores

As a first step of the analysis, the most integrated spaces at different radii are identified for a number of areas in Södertälje, i.e., the most accessible spaces. The most integrated public spaces are those with the highest potential to attract movement and other activities. Urban spaces where the local and the global integration cores overlap thus have configurational conditions which make them to favourable places for a neighbourhood centre or a neighbourhood main street.

In the figures below, the ten most integrated spaces (or axial lines) at a local and a global scale are highlighted (integration cores) and different typologies are represented in the neighbourhoods. In this analysis, only spatial conditions are taken into account, so aspects such as land use and building density are left out. If the pattern of the most locally integrated lines are not connected, discontinuous and segregated pattern appear. Neighbourhoods with such a fragmented structure include Ronna, Hovsjö, Ritorp, and Lina. In contrast, areas in which the most integrated spaces are connected on a local level include the city centre, Söder, Grusåsen, Östertälje, Geneta, Fornhöjden, Saltskog, and Pershagen.

However, even though these areas present a distinguishable core on the local level it is also significant to see whether the core on the *local* level overlaps with the core on the *global* level. As the most integrated lines on the global level is highlighted it is possible to see that in many areas these highly integrated spaces are located between areas, or at the edge, rather than within areas. This occurs for example clearly in areas as Geneta, Ronna, Fornhöjden, Hovsjö, and Saltskog. This finding is a significant finding: Because locally integrated spaces are found elsewhere compared

with where the globally integrated spaces are found, it is most likely that movement on different scales is separated spatially. Such characteristics clearly speak of segregation in public space. In these areas, fragmented structures do not accentuate certain spaces as main streets or the like, so central gathering points must be defined by other features and strategies. Although local neighbourhood centres may have businesses that depend on good accessibility, the lack of such accessibility puts these businesses at a disadvantage. Movement patterns – created and reproduced by urban form – fail in its effect to concentrate people and thus, urban form fail in supporting the neighbourhood centre.

The overlapping of integration cores shows that areas such as the city centre, Söder, Grusåsen, Östertälje, and Karlhov have spaces that are highly integrated on different levels. These spaces are anchored in the surrounding environment both locally and globally. In addition, the integration core in the city centre form a ring, including the streets Storgatan (the main street, partly pedestrian), Nedre Villagatan, Tjappgatan, and Torekällsgatan/Badhusgatan. Surprisingly, there are no highly integrated spaces that create connections across this inner circle. As a result, the area looks like a doughnut: the central core is less integrated than the surrounding urban spaces (streets) that form the circle. The table below shows whether integration cores overlap in different areas, housing types and approximate years of development as well as the median depth for each area (radius *n*).

Area	R3-R15	R3-Rn	med.depth	year	housing type
City centre	•	•	16	1600-1920	blocks, grid structure
Mariekälla	•	-	19	1920-1950	villas, multi family houses, grid structure
Karlhov	•	•	20	1950-1960	villas
Lina	•	-	27	1980-1990	multi family houses, villas, terraced houses
Ronna	-	-	22	1960-1975	multi family houses, terraced houses, villas
Geneta	•	-	21	1960-1970	multi family houses, terraced houses, villas
Saltskog	-	-	20	1965-1980	multi family houses, terraced houses
Hovsjö	-	-	26	1970-1975	multi family houses, terraced houses
Pershagen	•	-	31	1930-1950	villas, (multi family houses)
Söder	•	•	26	1940-1950	multi family houses, (villas)
Ritorp	-	-	29	1960-1970, -	villas, terraced houses
Brunnsäng	•	-	24	1960-1970, -	multi family houses, terraced houses, villas
Grusåsen	•	•	20	1940-1950	multi family houses, villas
Rosenlund	(•)	-	20	1940-1950, -	villas, terraced houses, multi family houses
Östertälje	•	•	21	1910-1940	villas
Fornhöjden	-	-	27	1965-1970	multi family houses

• overlapping
- not overlapping

Table 6:1. *Overlapping of integration cores, approximate year of development together with housing types in each area.*

Centrality of planned neighbourhood centres

A critique of many modern Swedish suburbs is that they lack well functioning neighbourhood centres: they do not function either as a social meeting place or as a site for commercial activities. They are often described as turned inside-out or found in a non-central position in the area, making them difficult to access (Klasander 2003; Olsson, Ohlander, and Cruse Sondén 2004). The analysis of the integration cores at different scales will now be compared with the location of the planned neighbourhood centres to find out whether the spatial centrality overlaps with the location of the planned neighbourhood centre.

The result shows (figure 6:8 and 6:9) that very few housing areas planned during the post-war era in Södertälje have their planned neighbourhood centres in locations that work together with either the local (radius 3) or the global integration core (radius 15 and radius n). Hence, the intention according to neighbourhood planning ideas to locate neighbourhood centres locally in an estate appears not to be achieved in many of the studied areas in Södertälje. Often the integration core is only adjacent to, but not found within, the planned neighbourhood centre. Thus, it is not surprising that the centres are perceived as non-central or that they are described to have their back to the front so to say. Thus, as far as Södertälje is concerned, the critique then seems to be accurate.

In some neighbourhoods, the planned centres are located where the integration core is found, but the integration on the comprehensive level as such is very low, hence the accessibility is still limited. However, one can argue that the location at least has been optimized according to what is possible given the spatial situation. In the figure of integration cores above (figure 6:8), the position (central or peripheral) in the overall structure is illustrated with a filled circle (in a scale from one to seven). In the figure below (figure 6:9) a map illustrates in which neighbourhoods the most integrated lines at different levels overlap with the planned local centres, on a local and on a global level. Clearly, the areas closer to the city centre in general have their local neighbourhood centres in a more favourable position compared with other areas.

To conclude, the intention to locate the neighbourhood centres centrally has not been realised in many of the studied areas in Södertälje. About half of the areas have neighbourhood centres located neither in the global nor in the local integration core. What these areas have in common are that they are peripherally located from the city centre and were typically planned and built after 1960. Of the other half, some of the planned neighbourhood centres are found at the local integration core. Only two areas have the planned centre located where both the local and the global



Figure 6.9. Planned neighbourhood centres in relation to integration cores.

integration cores fall together: it is only in these areas that the location can be described as optimized from a configurational point of view. Such localisation has the potential to derive advantage from the urban form to support the intended use and function: the position derive advantage from patterns of natural movement and patterns of co-presence. In the other cases, urban form and land use are not complementary; rather, urban form can be described to be counterproductive for how the space is intended to be used.

Integration interface – synergy

Many post-war suburbs have internal, local structures that relate weakly to the larger scale system in which they are imbedded (Klasander 2003). The integration interface, or synergy, reveals to what degree integration at different radii correlate, such as between local and global integration. Normally, in such analysis, radius 3 is compared with radius n (Hillier 1996, chapter 4). Unlike the core analysis above, this analysis takes into account all spaces (all axial lines) in an area, focusing on more than just the most integrated ones. If integration at different radii overlaps there is a good integration interface, a synergy effect and a compression of scales is created (Hillier et al. 1993, Hillier 1996). This compression indicates that different scales of movement overlap and some spaces may encourage interaction between local and global activities and between locals and non-locals: urban form creates a potential for people to share public space and to share some everyday practices. As residents and working population are added in the analysis, the potential for a mix of locals and non-locals is revealed. Thus, synergy can be discussed in relation to the notion of interplay since the interaction between different levels of urban life, from local to cosmopolitan, are depending on the number of people who share public space (density) as well as if there are locals, non-locals, or a mix of these groups. Using a similar approach as interplay, Jacobs argues that urban life is depending not only on local activity but also emphasise urban continuity throughout the city. Such continuity, she argues, provides the spatial conditions required for a mix of residents and passers-by as well as a mix of land use. This thesis analyses whether different levels of urban life have a potential to come together. However, on this stage, the analyses are strictly limited to the potential of public urban space: population densities will be added in part two of the case study.

The analysis shows that local and global integration (radius 3 and radius n) correlate well in areas such as the city centre, Grusåsen, Blombacka, Bårsta, and Karlhov and that a significant disruption exists between the local and the global integration in Hovjsö, Lina, Geneta, Pershagen, Söder, Saltskog, Fornhöjden, Ronna, and Bergvik.

If the global integration of radius n is replaced with radius 15 (which is argued to be relevant in this case since radius-radius is a kind of maximum for the Södertälje area), Blombacka (east), Grusåsen, Brunnsäng, and the city centre are found in top while Saltskog, Förnhöjden, Hovsjö, and Ronna show the lowest correlation figures.

Figure 6:10. Correlation of integration, radius 3 and radius n .

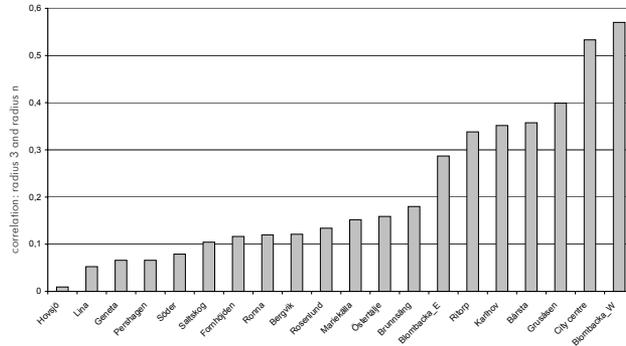
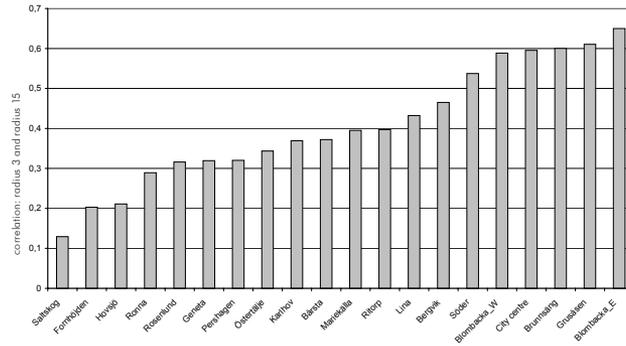


Figure 6:11. Correlation of integration, radius 3 and radius 15.



In a diagram (figure 6:12) that shows how radius 3 relates to both radii 15 and n at the same time, it is clear that there are quite large differences between neighbourhoods within Södertälje. The figure highlights the ten neighbourhoods that are included in the observation study. According to the ideas regarding synergy effects, areas found in the lower left part of the diagram have poorer integration interface than areas in the upper right part of the diagram (Hillier 1996, 174). The areas have been organised into four clusters. The first group, where space to a higher degree generates multiplier effects, includes the city centre and Grusåsen. The second group includes Mariekälla and Östertälje. The third group has five areas: Pershagen, Geneta, Ronna, Förnhöjden, and Saltskog. Hovsjö is clearly distinguished from the other areas and has the least favourable properties according to the synergy effect. Common features for many of the areas with poor conditions (with the exception of Pershagen) are that

they are built between the mid 1960s and the 1970s as housing estates. The urban layouts are formed as well demarcated enclaves with weak connections to other neighbourhoods. The areas are also to a large extent planned according to the principles of traffic separation and hence car traffic is directed to streets that more or less encircle the neighbourhoods with no direct contact to buildings, while the internal system is restricted to pedestrian (and bicycle) movements. It is also evident that many of the spaces (axial lines) that are significant for the areas are not constituted by buildings, and hence not by entrances. The axial lines also appear to be shorter with very few that go through a whole neighbourhood.

Neighbourhoods that provide the spatial conditions for good interfaces between scales of movement include the city centre together with Grusåsen, which originates from the beginning of the 1950s. Characteristic features of these areas are that they have a relatively non-hierarchical street structure such as a grid, they are well integrated in the immediate surroundings as well as in the continuous urban fabric, and they have a few very long axial lines that intersect the whole areas. In addition, there is a pronounced relation between the buildings and the streets – a distinct boundary between public space and private space. The traffic system is mixed to a high degree, even though some paths and streets are restricted for pedestrians only. All in all, the areas are rather permeable, allowing others apart from the residents to both see and come through these areas since the main streets here are part of the street system on a more comprehensive level, and buildings are not hidden for people just passing through the area.

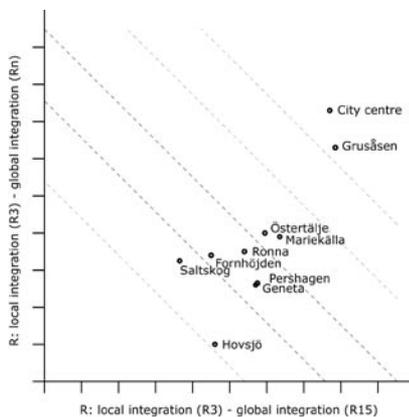


Figure 6:12. Neighbourhoods according to the correlation coefficients (R) for radius 3-15 and radius 3-n.

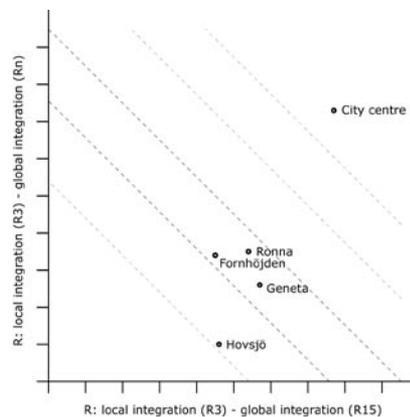


Figure 6:13. The four large housing estates highlighted together with the city centre (R for radius 3-15 and radius 3-n).

Since the design of urban layouts is influenced by different ideas and ideologies that shift over time, a diagram has been composed where the level of synergy is presented in relation to the year different areas were planned and built. In many cases, however, it is difficult to establish an exact year, so but these years are approximate. The diagram reveals quite clearly a trend that the integration interface, or the synergy effect (i.e., the correlation between radius 3 and radius n), is decreasing the later the areas were developed. The city centre is found at the top in the left upper corner, and Hovsjö is found in the opposite position, in the lower, right corner.

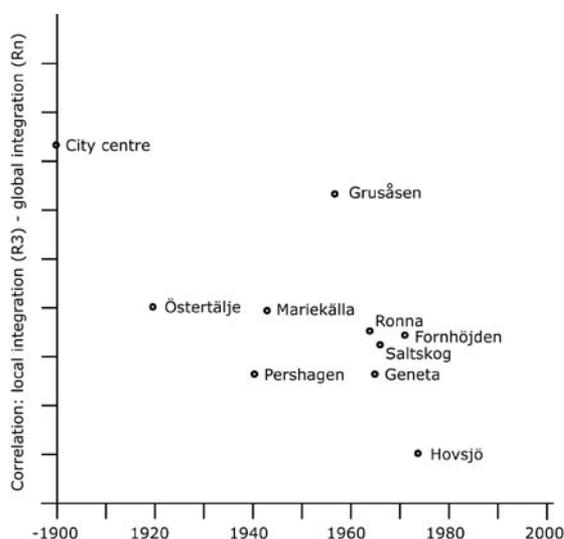


Figure 6:14. Overlapping integration patterns in different areas in relation to approximate years of development.

Spatial distance

Another way of define spatial distance of suburbs is through depth analysis. Some studies have found that deprived areas (or ghettos) are characterised by a high depth measure compared to other areas (Vaughan et al. 2005). The analysis of integration patterns shows how well integration at different scales overlaps within an area. Another way to understand the relation between the part and the whole requires describing and comparing the *depth* of all the areas. The measure depth describes another kind of spatial character: how deep different spaces are located in relation to one particular point or to the system as a whole (Hillier 2006, 31). If a system has few steps to all other spaces, it can be described as shallow;

if a system has many steps, the structure can be described to have a deep character (a strong spatial hierarchy). Neighbourhoods with high depth values are not as easily accessible as those with low depth values. For example, the minimum value of mean depth for all spaces in the Södertälje spatial system is 15 and the maximum value is 37 (at radius n). The city centre has a minimum value of 15 and a maximum of 19 with a median depth (as well as a mean) of 16. Areas that are well connected to the city centre have a comparatively low median (or mean) depth, e.g., Bårsta and Mariekälla. Higher values are found in Hovsjö, Söder, Fornhöjden, Lina, and Pershagen.

The four areas included in the Metropolitan Initiative are highlighted to provide a nuanced description of them as ‘segregated’ and to emphasise their differences, variations that are most important if they are considered to be redesigned. The median depth values for Geneta and Ronna are similar (21 and 22) but they are higher for Hovsjö and Fornhöjden (26 and 27). Interestingly, in this context the affluent areas, such as Pershagen, have one of the highest values with a median depth of 31, which means that this area is also quite segregated from the city as a whole. Note also the position of the neighbourhood Söder: it has a high depth measure but is located only about 2.5 kilometres from the city centre.

16	18	19	20	21	22	26	27	31
city centre	Bårsta	Mariekälla	Saltskog Rosenlund Karlhov Grusåsen	Geneta Östertälje	Ronna	Hovsjö Söder	Fornhöjden Lina	Pershagen

Figure 6:15. Median depth (radius n) for neighbourhoods in Södertälje, from 16 to 31.

A similar analysis is the step depth analysis, which illustrates a kind of distance between different areas such as the distance between the four suburbs (their planned local centre) and the city centre (Stortorget) as well as the distance between the suburbs themselves. The distance from the city centre to the areas range between 14 and 22: Ronna at 14; Geneta at 16; Fornhöjden at 18; and Hovsjö at 22. On the whole, the location within the urban fabric reflects very different spatial conditions and potentials. This becomes clearer as the location of the suburbs is described from a reversed perspective, namely the relation to the other areas from every suburb respectively. Then Hovsjö and Fornhöjden turn out as much more distantly located (or spatially separated) from the other areas; Fornhöjden, for example, is between 32 and 35 steps from the other suburbs,

while Hovsjö is between 20 and 35 steps from the other suburbs. The neighbourhoods Geneta and Ronna hence have a closer spatial relation both between the areas as well as to the city centre.

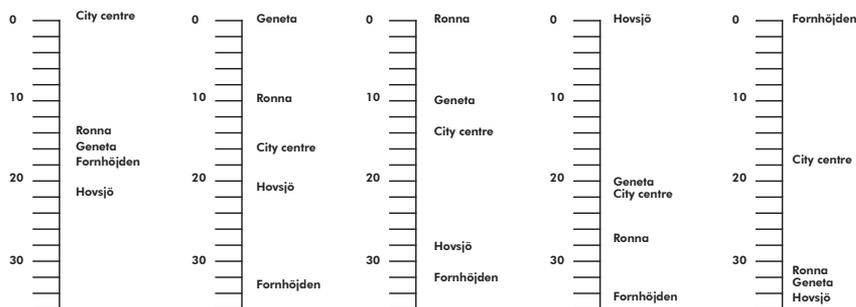


Figure 6.16. Step depth analysis for the city centre and the four Million Homes Programme areas.

Through-movement: important links

Integration is a measure of accessibility (to-movement), but in urban studies it could also be of relevance to analyse the potential for *through-movement*, using *route choice analysis*, and identify the spaces (or segments) that are most likely to be frequently used as routes (Hillier and Iida 2005, 553). Route choice analysis is about the spatial system in itself – its properties and its potential. To capture properties such as accessible density (e.g., people and buildings), other complementary methods such as the Place Syntax Tool need to be used (Ståhle, Marcus and Karlström 2005).

The possibility for people to move through and between neighbourhoods in Södertälje is one of the issues in focus, which makes it interesting to identify the paths that people are most likely to use in this respect by choice analysis. Choice analysis is based on the segment map where axial lines are divided into segments at every intersection. To interpret the results from a design perspective, the theoretical difference between the measures integration and choice needs to be stressed (as Hillier does). Integration (i.e., topological analysis) deals with closeness of a space to its neighbourhood and therefore it is possible to intuit integration. Choice (i.e., geometrical analysis) cannot be intuited because it deals with how the segment we are on feature on routes between locations which might be quite remote (Hillier 2007, 3).

The results at radius 5000 metres and 3000 metres show that two of the large housing estates, Hovsjö and Fornhöjden, are spatially efficiently

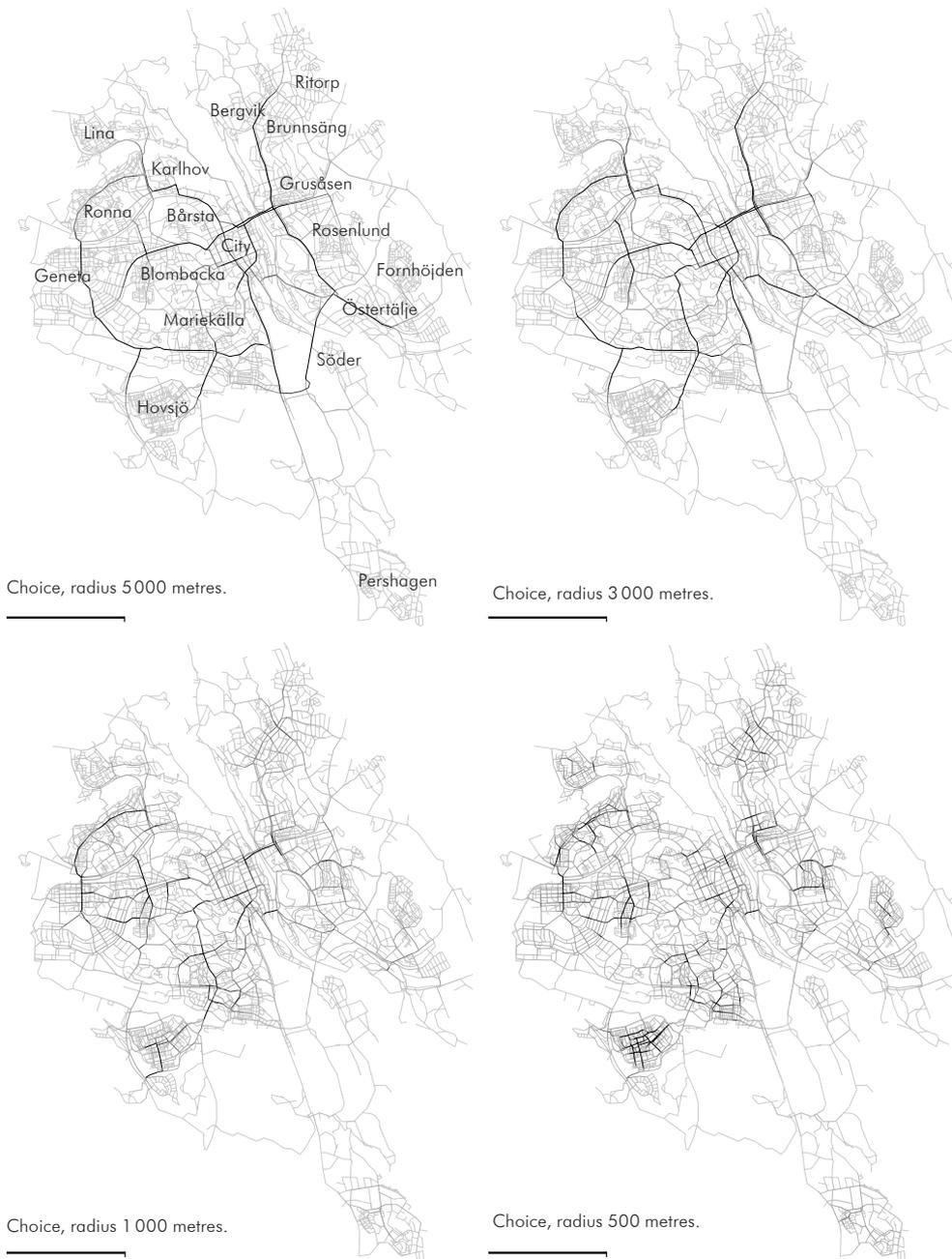


Figure 6:17. Route choice analysis at different radii.

excluded from the highly frequented movement network in Södertälje, while the other two, Geneta and Ronna, are at least intersected. This important difference indicates that the accessibility to Hovsjö and Fornhöjden is already strongly limited on a global level.

When reducing the radius to 1 000 and 500 metres, the choice analysis identifies some areas that are highly consistent through scales; i.e., the outcome in these areas is more predictable. Other areas feature a more indistinct pattern, such as Hovsjö, where the different levels of movement flow are quite disparate. Both in Geneta and Ronna there is an identifiable main path that proves to be important on all different scales, while in Hovsjö and Fornhöjden there is no such self-explanatory or natural main path.

From a design perspective, it is important to highlight the character of the most important linkages since these are the paths people are most likely to use if they want to access the neighbourhood or just easily walk through the neighbourhood. A well-designed pedestrian network is especially important in areas where households have low access to private cars since it makes the residents even more dependent on walking and public transportation. In Hovsjö, the main paths are separated from other traffic and poorly constituted: the paths lack direct relation to buildings and entrances. From a pedestrian's perspective, the perception that a street is safe is influenced by whether or not there is a mix of traffic and whether it is constituted.

In most areas, the through-movement network includes streets that have a mix of car, bicycle, and pedestrian traffic; however, in three out of four large housing estates, the most important links are designed according to the ideas of traffic separation where pedestrians can use dedicated paths without car (or bicycle) traffic.

Compared to integration analysis, the choice analysis more distinctly highlights spaces (segments) important for through-movement, i.e., for movement between areas or between (two) specific nodes. Some spaces might come out as important for through-movement in the choice analysis even though they are not well integrated. For example, on the comprehensive level (comparing choice at radius 5 000 with integration at radius 15 or n), it is possible to detect a kind of ring road (the rim that was missing in the integration analysis). On the western side, there is a half circle that is largely tangent to the major roads in the Södertälje traffic system – along Ängsgatan, Strängnäsavägen and then passing through Ronna and Geneta and then continues along Genetaleden and connects to Nyköpingsvägen. From Nyköpingsvägen, the circle splits; one direction goes back to the city centre and the other connects to the eastern side of



Figure 6:18. The character of the main paths and streets in Hovsjö: 5 000 metres, 1 000 metres, and 500 metres.



Figure 6:19. The character of the main street in Rosenlund where car traffic is located in the vicinity of pedestrians and bicyclists.

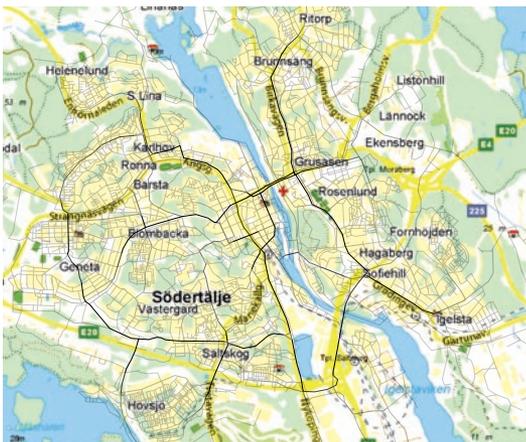


Figure 6:20. The choice analysis (radius 5 000 metres) superimposed on a city map where the major roads (for vehicles) are highlighted.

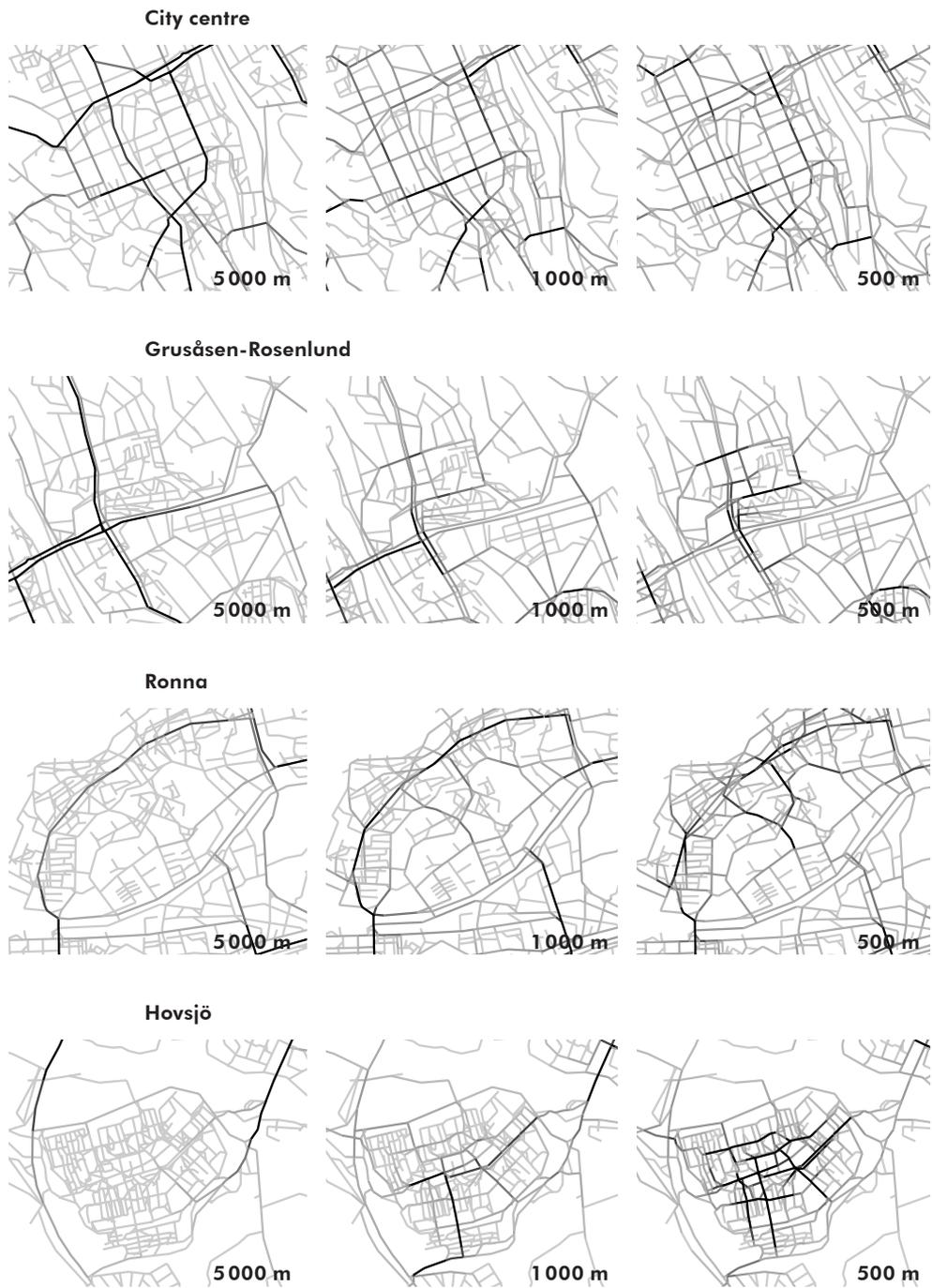


Figure 6:21. Details of the choice analysis at different radii in four neighbourhoods.

Södertälje via the bridge Saltsjöbron. On the eastern side, choice analysis also identifies some of the major roads and forms a half circle, namely Erik Dahlbergs väg, Grödingevägen, Birkavägen, and Stockholmsvägen, which leads to the city centre via the bridge Mälärbron.

When comparing the local level of integration at radius 3 with choice at radius 500 metres in different neighbourhoods, it is possible to see that these measures largely correspond in many neighbourhoods. But on a global level, integration (radius n and 15) and choice (radius 5000 and 3000 metres) does not correspond in the same way, especially in the outer areas. The pattern of conglomerations in different neighbourhoods that appear in the integration analysis does not appear at all in the choice analysis; rather, a pattern with a few paths stand out like a web covering some parts of the city area. In most places, these main paths are streets that have mixed traffic. One exception is a path in Geneta, which is part of the comprehensive choice routes that partly is accessible only for pedestrians. However, it needs to be emphasised that many areas are not efficiently linked to the rest of the city. As a result, it is not likely that people from other parts of the city will pass through or enter these areas unless they have a specific destination within these areas. This result accentuates the hierarchical character of Södertälje, illustrating the lack of spatial integration and spatial permeability.

Accessibility to buildings

In connection to the choice and integration analysis, it is also valuable to investigate the constitution of buildings. How to measure space constitution, outlined in *The Social Logic of Space* (Hillier and Hanson 1984), is defined as the number of building entrances opening onto an axial line or convex space. Spaces can be permeably constituted (through entrances), but also visually constituted (spaces that can be viewed from windows). The implications of spaces being constituted or unconstituted are associated with personal safety and perceptions of safety (Conroy Dalton 2007, 275). The reason spaces are at least perceived as safer is that entrances and windows towards an open space imply that there is potential for presence of a person, a concept that Jacobs (1989) also addresses as natural surveillance through co-presence and Hanson (2000) describes as a doorstep culture.

In the analyses above, the important links are identified according to spatial integration and according to important links within and between neighbourhoods for through-movement. To get an idea of how the buildings are related to these important links and routes, a constitution analysis is carried out measuring the accessibility to other buildings from every address point. The accessibility to buildings indicates, apart from

constitution aspects (but not entrances specifically), a kind of density of buildings that can be related to liveability as well as natural surveillance. Since it is the comprehensive level that is studied in this context, the precision of this analysis is limited to one address point for every building. This implies that in some respects areas with single-family houses or terraced houses have higher accessibility than areas with predominantly family block houses. However, even if comparing areas with similar types of dwellings, there are large differences that make it possible to identify the spatial properties in public space rather than to the dwelling type itself.

The analysis is conducted at two different levels. The first aims to capture the local situation and hence radius is placed on to two axial turns and a maximum metric distance of 800 metres (i.e., all buildings along three axial lines and within 800 metres). The second analysis aims to capture a comprehensive level within six axial turns and a maximum metric distance of five kilometres. On the local level, the result shows that a few neighbourhoods are distinct and present very low accessibility to buildings, e.g., Hovsjö, Ronna, Fornhöjden, and Lina. When comparing with Geneta, the difference is notable: areas that have similar dwellings as Geneta prove to have far higher accessibility and are likely to be perceived as denser. The city centre is an area with high accessibility to buildings along with, for example, areas such as Grusåsen, parts of Rosenlund, Pershagen, and the terraced house area in Geneta.

The result of the comprehensive level turns out slightly different: neighbourhoods with low accessibility to buildings are Fornhöjden and to some extent also Hovsjö. In other neighbourhoods, however, the accessibility has evidently increased in accordance with the increased radius. Most distinctly this comes out for several of the neighbourhoods on the east side of Södertälje canal, e.g., Ritorp, Brunnsäng, Grusåsen, Rosenlund, and Östertälje (Fornhöjden is not affected, indicating a very strong spatial segregation). On the western side of the city, it is the city core together with Geneta, Blombacka, and the eastern part of Ronna that show high accessibility to buildings and only Hovsjö has a different pattern.

As a complementary study, a detailed analysis is carried out in Hovsjö. All entrances are here identified to illustrate how the axial lines are constituted. It is quite clear that the well integrated paths and streets in Hovsjö that are identified as the most important for through-movement (according to choice analysis) and to-movement (according to integration analysis) turn out to be the least constituted: these paths have very few entrances adjacent to them and building gables that face the paths are without windows. This mismatch is of great concern since the most important paths for pedestrian use have spatial properties that make them likely to be perceived as unsafe.

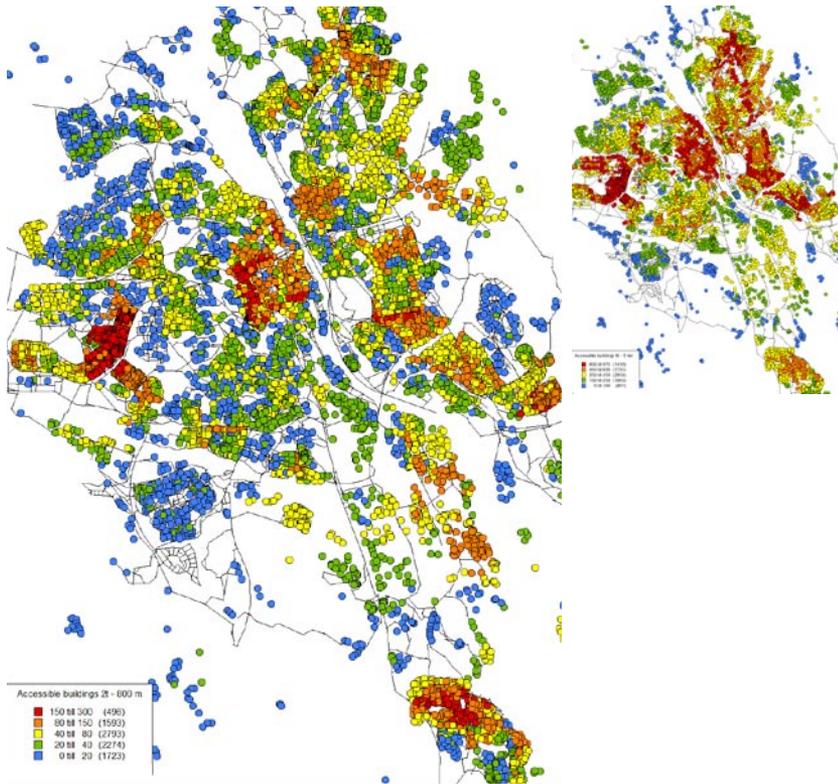


Figure 6:22. Left: local accessibility to buildings (along three axial lines but maximum 800 metres distance). Right: global accessibility to buildings (seven lines, 5 kilometres).



Figure 6:23. Constitution in Honsjö: blue lines are weakly constituted by buildings, and both according to integration analysis and choice analysis these are important for the area.

Reflection: spatial integration and segregation

The integration analysis of Södertälje shows a well integrated core in the central part of the city and that suburbs in general have a distinct spatial connection to this core. However, cross-connections are evidently weaker. Some areas, in spite of a close geographical position to the city centre, prove to be segregated due to configurational properties: the areas have weak connections that link to the surroundings. This means that the design of the urban layout in some cases inhibit spatial integration, isolates the neighbourhood, and efficiently impairs accessibility. The integration analysis reveals a spatial hierarchy and what needs to be highlighted is that on a comprehensive level both vulnerable areas and more affluent areas are found in strongly segregated positions in the urban system: a spatial hierarchy that have an isolating effect for the area and its residents.

By analysing overlapping of integration cores and patterns of integration at a local and a global level illustrates whether the spatial relations are ruptured. Neighbourhoods where patterns overlap at different scales, that have a good integration interface, are described as more predictable and the areas tend to have an anchorage in the city as a whole. A spatially ruptured structure and a ruptured interface between different scales clearly speak of segregation in public space. A ruptured interface between different scales of movement inhibits the development of such things as central gathering points and main streets. As the neighbourhoods within Södertälje are compared regarding the synergy effect and when areas were planned and built it is possible to see a trend that the correlation between global integration and local integration is decreasing the later areas are developed: the city centre is found to have well overlapping spatial relations, a good integration interface, while Hovsjö has the least overlapping relations. In areas with ruptured structures urban form fails in concentrate movement patterns as well as it fails to concentrate patterns of co-presence in public space. There is an obvious risk that public space is characterised by co-absence and thus being abused. However, this does not mean that public space is determined to be abused, only that the configurational properties of urban form give weak support for a social use.

Analysis of *route choice* identifies spaces (or segments) that are important for through-movement. In Södertälje a kind of ring road appears on the comprehensive level that forms cross-connections that were missing in the integration analysis. However, still some of the neighbourhoods are left unconnected to this network. Again, the result accentuates the hierarchical character of Södertälje, illustrating the lack of spatial integration and spatial permeability in areas such as Hovsjö and Fornhöjden.

On the one hand, the integration core analysis identifies those areas characterised by segregation in public space, so the layouts of these areas are already creating certain segregation effects or constraints for the residents. On the other hand, neighbourhoods that have significant correlations between the local and the global integration pattern are (according to the ideas of synergy) more clearly embedded in the overall structure and are less spatially segregated from the whole. Hence the spatial affordance in these areas is likely to be more advantageous for the residents and users compared with other areas. From these findings a corollary question appears: What *consequences* are possible to prove or identify through complementary studies? This question requires looking at accessibility to residents and non-residents (for example, working population) or movement flows in the areas, conditions that will be attended to in further empirical studies.

6.2 Accessibility analysis

Urban form and accessibility

The spatial analysis described in the previous paragraph has shed light on how spatial segregation in an urban system can be captured, analysed, and even measured in a way that enables comparisons between neighbourhoods. The next step is an attempt to capture some of the *consequences* of such spatial segregation for everyday life with descriptions that strive to reflect the situation from a quite detailed street level, or user's perspective, the 'lived space' if one borrows the Lefebvrian formulation. Hence, to recall from the theoretical discussion, focus for the accessibility study is not on the *distribution in space* but using the kind of analysis in the previous chapter of the *distribution of space* and reach an analysis of the accessibility to different resources as a *distribution through space*. The result from the integration analysis shows that many of the neighbourhoods in Södertälje, both vulnerable and affluent areas, are characterized by a strong segregation in public space. Such segregation also has a strong influence on accessibility to different amenities. Hence, the initial question for this part of the empirical study is as follows: How does urban form influence accessibility to people and to different amenities in the city? The number of people that are accessible through public space is possible to relate to the reasoning of potentials for urban life and interplay as well as to issues concerning the natural surveillance in public space: accessibility analysis captures the potential for people to share public space and share everyday practices. The accessibility to important functions through public space – e.g., locations of employment, public transportation, or other common resources – can be related to aspects of equality regarding the spatial conditions in different neighbourhoods. In this thesis, this concept is referred to as *spatial affordance*. Just as resources are redistributed in society through taxes and subsidies resources are also redistributed through planning and are accessible through public space.

In other studies, the links between social exclusion and mobility is of interest, as some groups in society become increasingly excluded from mainstream society through accessibility barriers to everyday, vital services, such as locations of employment, healthcare, and shops. This has come about as a result of the emergence of sparser urban (suburban and exurban) spatial patterns in combination with the significant rise in car ownership and the related trend towards more centralised services, changes that quite obviously disadvantage people without cars (Conroy Dalton 2007, 264). This tendency is perhaps more explicit in the USA or in the UK but still relevant for the Swedish setting.

The accessibility analysis is based on the spatial configuration in combination with information regarding the population as well as information about certain amenities. The analysis is composed of three parts:

- accessibility to people, residents and working population (which is the same as locations of employment) as well as the combination of these two;
- accessibility to certain amenities or common resources, e.g., public playgrounds, bus stops, as well as grocery stores; and
- accessibility to people with a certain social profile as more detailed information about the residents is added (e.g., income and education levels, employment rates, ethnic background), an analysis that indicates the potentials for a kind of *accessible diversity*.

The results of these analyses are possible to relate to the discussion of contextual analysis. The contextual analysis is based on the idea that people to some extent are influenced by the social context. That is, the people that share public space on a daily basis will influence each other to a certain extent. For example, in this sense some neighbourhoods are more supportive than others regarding, for example, the possibilities to enter the labour market (Strömblad 2001). Similar ideas also occur within the discussion of neighbourhood effects (Andersson 2004). The accessibility analysis appears to be most suitable for this purpose since it deals with accessibility on the micro level and only takes the people into account that are actually accessible according to how streets influence the way people relate to each other. That is, people that are not likely to use or do not have the potential to use the same public space (e.g., a street) are not included. However, this thesis does not include a problemization of the notion of neighbourhood effects. At this stage, this thesis will only explore how the conditions for this can be analysed using a spatial configurational approach and the results will only be evaluated in relation to the questions in focus for this thesis.

The data that are used are statistics provided by Södertälje municipality. From the beginning, the statistics are arranged according to the NYKO-areas²⁶ and then it has been evenly distributed between all address points within one specific NYKO-area.²⁷ In the analysis, the point of departure is then every address point and from that to all other address

26. There are approximately 90000 NYKO-areas in Sweden. The studied area in Södertälje consists of approximately 1000 NYKO-areas, and the area includes about 10 by 5 kilometres.

27. In the comprehensive analysis, there is one address point for every building larger than 50 square metres in the spatial model of Södertälje.

points or to a certain place (such as a playground or a bus stop) *through* public space. The spatial model used is again the axial map.

Accessible residents

One essential precondition for urban life is the density of people. To obtain a realistic outcome, the analysis captures the plausible level of intensity. The number of residents in neighbourhoods could be used to define population density in an area. However, this thesis argues that a more realistic way of describing population density is to measure the number of *accessible people through public space* in order to capture those who actually have the potential to share the same street. Therefore, the number of residents accessible through public space from every address point at different radii is analysed. The distance for the analysis is two and six axial steps, respectively. That is, the number of people along three and seven axial lines from every address point is used to reflect the local catchment area as well as a catchment area that reflects a neighbourhood's range within walking distance. The results are presented on both the address point level on very detailed maps and presented in tables according to the NYKO-level.

Ten neighbourhoods are highlighted in the accessibility analysis. The areas have a population ranging from approximately 2 200 to 6 700 residents. The number of accessible residents varies from approximately 260 to 1 500 within a radius of three axial lines and from 1 400 to 6 500 residents within a radius of seven axial lines (see table below). The highest values are found in the city centre and there is a considerable difference compared with many other neighbourhoods. It is hence indicated that urban form and the *distribution of space* most noticeably influence the accessibility to other people. For example, if the city centre with its 4421 residents is compared with Hovsjö with 5 033 residents, the mean number of accessible residents in the city centre is 1 500 compared with 428 in Hovsjö, and at a larger radius the corresponding numbers are 6 504 and 3 610.

Another illustrative comparison is to look at the four areas included in national anti-segregation initiatives that are often ascribed great similarities. However, these four areas show large differences: within the lower axial radius it is possible to reach 21% of the population in Fornhöjden compared to 10% in Geneta, 9% in Hovsjö, and only 5% in Ronna. Hence, urban design and configuration of space plays a significant role in providing access to one's neighbours. The accessibility is thus not necessarily determined by type of dwelling, how high the buildings are in an area, or how many people live in each household, but rather the configuration of the street system.

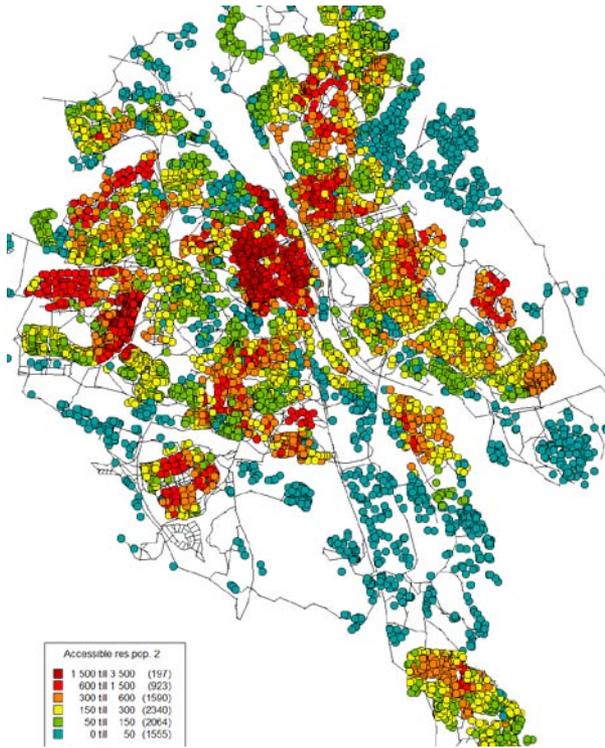


Figure 6:24. Accessibility to residents on a local level (along three axial lines).

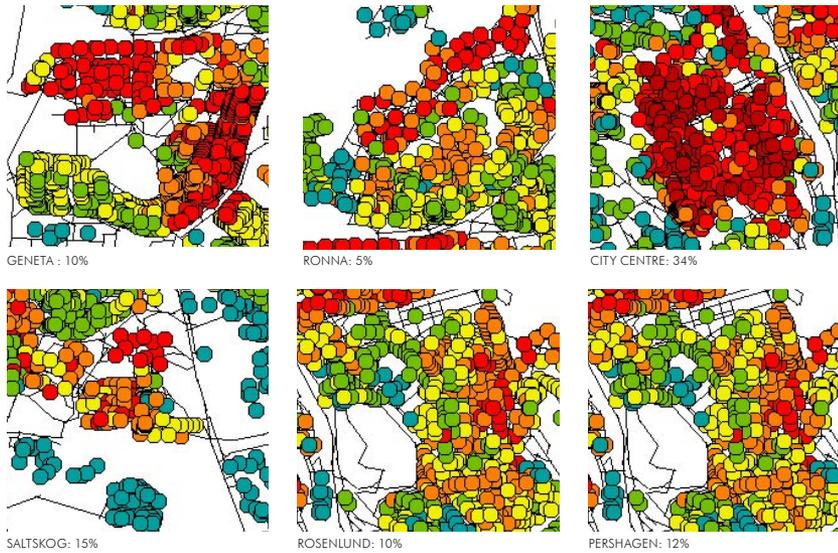


Figure 6:25. Accessible residential population in relation to the total population within an area.

In configurational analysis, it is common to define the range of the study in axial turns or in a combination of axial turns and metric distance. In this case, the analysis is also conducted using a metric distance (i.e., still along walkable paths and streets/along axial lines), namely a radius of 200 metres, 400 metres, and 1000 metres. For 200 metres, the analysis shows that fewer people are accessible in the city centre compared with the analysis based on axial turns. This is however not true for Hovsjö and Ronna, where the results from the metric analysis and the axial step analysis are similar. For 400 metres, the analysis shows an interesting pattern. For the city centre, the number of accessible people within 400 metres is in principle comparable to the three-axial-lines result, but in all four large housing estates the metric result is considerably higher than the three-axial-lines result. Therefore, the axial lines are probably shorter in the large housing estates than in the city centre, a situation that probably breaks up the streets and paths, producing a possible negative effect on legibility, orientation, as well as the possibilities to view the area as a whole. This has to do with how people move in cities; metric distance captures the physical effort to move from one point to another, and the distance measured in axial steps captures the mental effort (Hillier 1996, Marcus 2008). People seem not to necessarily choose the shortest routes (measured in metric distance) but routes that involve few axial steps and are easier to navigate; i.e., the mental effort is smaller which makes up for a larger physical effort. However, differences between the four housing estates are revealed. In Hovsjö and Fornhöjden, the accessible residents are largely increased as the metric range is used while the increase is more modest for Geneta and Ronna.

For 1000 metres, the analysis includes the surroundings and the outcome is thus influenced by how well the area is embedded or connected to this surrounding. Areas where the number of *accessible people* does not exceed the number of *people who are registered in the area* are in all probability spatially quit isolated, whereas areas that prove to have access to even more people than are registered to live in the area probably are well integrated in the urban fabric and are located close to other residential areas. The results show that neighbourhoods that are significantly increasing the number of accessible people in the range of 1000 metres are the city centre, Grusåsen, Mariekälla, and Saltskog. Neighbourhoods where the number of accessible people within 1000 metres is about the same as the number of people who are living in the area are Fornhöjden, Hovsjö, and Rosenlund. Finally, areas that have access to fewer people than are actually living in the area within the radius of 1000 metres are Geneta, Pershagen, and Ronna.

On a city district level, the analysis of the number of accessible residents shows that when the axial step distance (a kind of mental distance) is compared with the metric distance (a kind of physical distance) – e.g., within the range of seven axial lines compared to the range within 1000 metres – it appears that only two areas have more accessible residential people in the axial step analysis, namely the city centre and Rosenlund. This means that the urban form in all other areas has a limiting or inhibiting effect on the accessibility to other people. To some extent, this can partly be explained by the fact that there are shorter axial lines in general in these areas – that is, shorter lines of sight. In a neighbourhood of this kind, several axial turns or steps are necessary even to cover short metric distances. In other words, one can argue that there is a longer mental distance than a physical distance in such areas. A result of this is that the potential to see other people in public space and the potential to be co-present in public space is considerably lower in these neighbourhoods, phenomena that have implications for urban life and the perceived safety and security of the streets and pathways.

Finally, it needs to be emphasised that the results on the address point level reveal significant variations on a micro level that are of vital importance from an urban design perspective. Such detailed descriptions provide different kinds of design decisions than the aggregated results since it reveals a more nuanced understanding of how space is used. For example, it is possible to see how one block is different from a neighbouring block and it allows the comparison of different types of buildings and dwellings.

Area	Residents	Accessible residential population					
		2 turns	6 turns	200 m	400 m	1000 m	6turns vs.1 km
City centre	4421	1500 (34%)	6504 (147%)	345 (8%)	1398 (32%)	6232 (141%)	+4%
Fornhöjden	2925	619 (21%)	3088 (106%)	446 (15%)	1448 (50%)	3353 (115%)	-15%
Geneta	4584	474 (10%)	3800 (83%)	185 (4%)	647 (14%)	3889 (85%)	-2%
Grusåsen	2919	398 (14%)	3374 (116%)	206 (7%)	788 (27%)	4038 (138%)	-20%
Hovsjö	5033	428 (9%)	3610 (72%)	531 (11%)	2016 (40%)	5072 (101%)	-40%
Mariekälla	2914	276 (9%)	3862 (133%)	185 (6%)	851 (29%)	6050 (208%)	-57%
Pershagen	2225	261 (12%)	1439 (65%)	108 (5%)	385 (17%)	1538 (69%)	-7%
Ronna	6696	349 (5%)	3812 (57%)	295 (4%)	1027 (15%)	5461 (82%)	-43%
Rosenlund	2908	291 (10%)	3270 (112%)	169 (6%)	654 (22%)	3262 (112%)	+0.2%
Saltskog	3024	447 (15%)	3319 (110%)	335 (11%)	1123 (37%)	4420 (146%)	-33%

Table 6.2. Accessibility to other residents within the radius of two and six axial steps (along three and seven axial lines and within 200, 400, and 1000 metres). Also, the increase or decrease when comparing axial step catchment area with metric catchment area.

Accessible working population

Density of people in public space, however, influences more than just the residents. Others that are present in public space might be there for many other reasons, e.g., passing by, working, visiting, shopping, and amusement or just drawn to a specific attraction. Many components may influence co-presence in public space and in turn influence public life, so in this study the *non-locals* are of interest. Studying density in a more realistic way than only taking the residents into account requires analysing the accessibility to people who work in an area. The data used for this purpose includes both people who are employed in different companies as well as self-employed people. Again, the difference of distribution *in* space compared with distribution *of* space is of vital importance. The diagram below identifies the locations of employment (as distributed *in* space). There are a few very important employers in Södertälje: AstraZenica, Scania, and the hospital. In addition, the city centre is home to many work places.

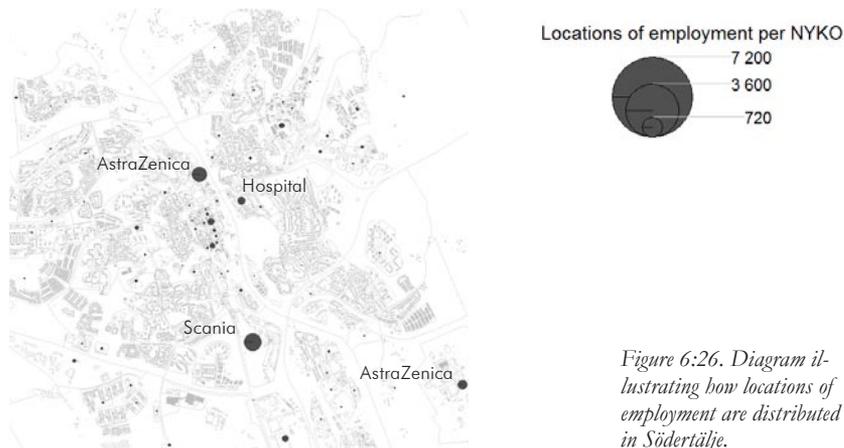


Figure 6:26. Diagram illustrating how locations of employment are distributed in Södertälje.

Apart from exploring the potentials for urban life, this accessibility analysis is also relevant in order to demonstrate how the accessibility to locations of employment as such differ throughout the city from every address point, NYKO-area, or neighbourhood since this often is seen as crucial for the possibilities to access the labour market. Research has also found that a physical separation of poverty areas from the economic life of the city implies a lack of potential for the economically marginalized to integrate into society (Vaughan 2005). The result of the accessibility analysis shows that the city centre clearly has the highest accessibility to locations of employment, and with that the highest accessibility to a

working population. Although many workplaces are located in the city centre, the urban form, characterised by high spatial integration, reinforces this effect as the accessibility is established. The overall pattern for Södertälje reveals that the accessibility in general is higher in a zone that stretches in a north-south direction with a tinge to the east side of the city. All four large housing estates are not in the vicinity of this zone. From this it is possible to conclude two things: the potentials for an inflow of people who do not live in these areas is low and the people who live in these areas need to be quite mobile in order to participate in the labour market. This restriction of movement makes them highly dependent on either private or public transportation and on the street or pedestrian network that link these areas to places with more locations for employment. The quality of the pedestrian network in different areas has been attended to in the integration analysis and the constitution analysis, and below, there will be further studies on the subject as the accessibility to bus stops are analysed.

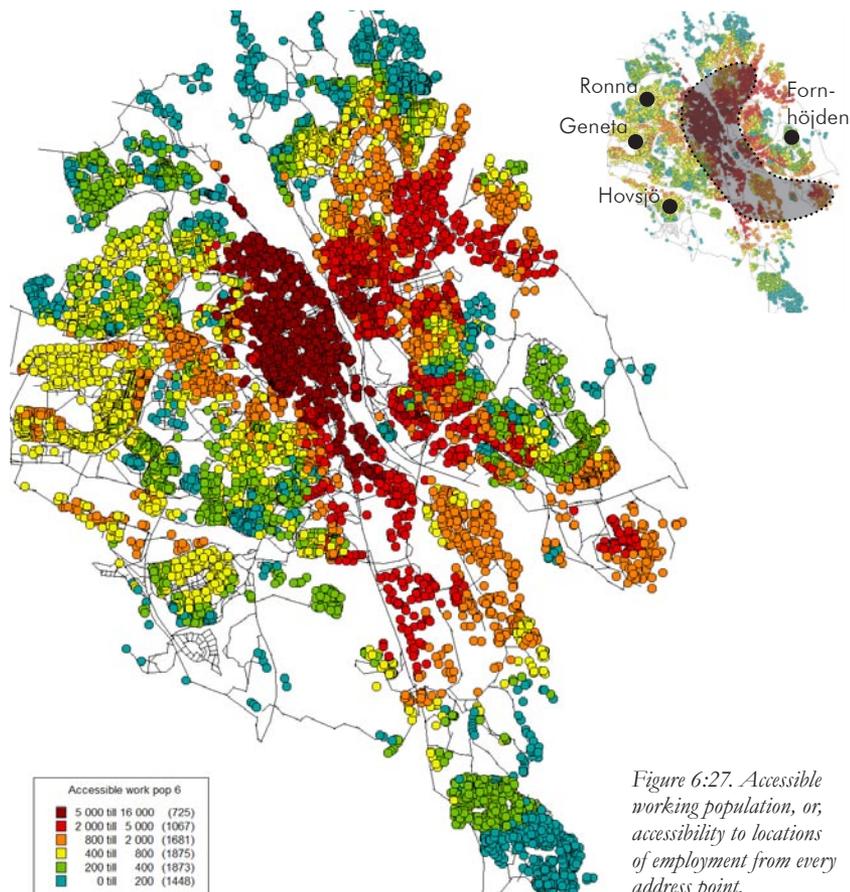


Figure 6:27. Accessible working population, or, accessibility to locations of employment from every address point.

Apart from the city centre, only Rosenlund and Grusåsen are distinct from other very sparsely populated neighbourhoods. Worth noting is that the AstraZenica area in the north of Södertälje is quite efficiently cut off to the north-west due to the weak spatial linking and neighbourhoods in this direction have surprisingly low accessibility to locations for employment in spite of the short geographical distance.

Area	Working population	Accessible working population		
		2 turns	6 turns	1 000 m
City centre	9865	3353	11990	9134
Fornhöjden	195	50	216	240
Geneta	587	59	648	593
Grusåsen	818	157	2739	3027
Hovsjö	514	51	450	720
Mariekälla	493	79	2572	2887
Pershagen	185	21	200	174
Ronna	639	37	413	567
Rosenlund	1846	206	2871	1917
Saltskog	175	34	881	1052

Table 6.3. Accessibility to working population (locations of employment) along three and seven axial lines and within 1 000 metres.

When analysing the potential for urban life, both the density of the local population (here analysed as residents) and the density of people spending time in the area during daytime and/or are coming from other parts of the city (here analysed as working population) are considered. For this reason, these two parameters are added. In this analysis, the differences between neighbourhoods come out even clearer; without a doubt, the highest potential for a public urban life is found in the city centre. Neighbourhoods that have good preconditions for a mix of residential and working population (or a mix of locals and non-locals) are Grusåsen, Mariekälla, and Rosenlund although the total number of accessible people in these areas are only a third compared with the city centre (see figures below). The other neighbourhoods are characterized by low density (few accessible people) and very little inflow from a working population. These areas appear to be efficiently disconnected or excluded from other areas due to their manifest segregation in public space. Among the areas that are excluded from the rest of the city, the four neighbourhoods included in the urban development agreement are found, together with one of the more affluent areas in Södertälje, Pershagen.

To illustrate the results in a comparative manner, the numbers of accessible people have been recalculated; if one imagines that it is possible to see 100 people at the same time at a street in the city centre, this corresponds to lower figures in the other areas according to the figure below.

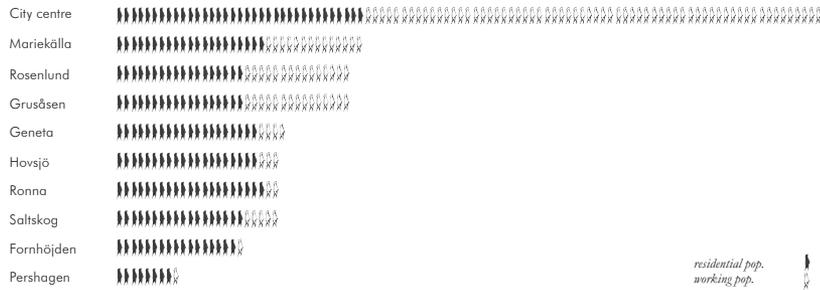


Figure 6:28. A 100 people visible on a street in the city centre corresponds to lower numbers in other neighbourhoods as shown in the illustration.

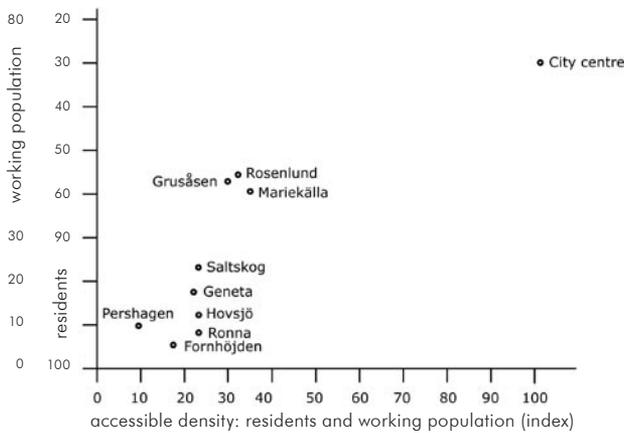


Figure 6:29. Accessible density as well as relation between residents and non-residents for neighbourhoods in Södertälje; the potential for a local public life or a cosmopolitan public life.

Accessibility to certain amenities

The spatial advantages that different parts of the city afford are to some extent not only related to accessible people but also related to the accessibility to certain amenities or common resources, and the location of these amenities are in turn highly governed by urban design and planning decisions. To get a general picture of the conditions that are of relevance for social segregation, one would probably need to analyse a great many components such as accessibility to public and private service, recreation, culture, health care, and locations of employment. However, in this

analysis, three features have been selected apart from locations of employment that has been attended above and these amenities are bus stops, grocery stores, and public playgrounds (as an example of a resource provided through the planning authorities).

If the minimum distance to a bus stop is analysed, the overall impression is that areas are quite similarly provided with bus stops. Still, the variations within a neighbourhood may vary considerably and this kind of nuanced information is quite valuable from an urban design perspective. For example, when different NYKO-areas in Hovsjö are compared, the minimum distance to the closest bus stop varies between 92 and 430 metres (or according to topological distance, between two and five steps). The corresponding figures for Ronna range between 111 and 723 metres (and between two and four steps). As the minimum distance from every address point is illustrated, which is an even more detailed analysis, large variations appear. In some areas, even address points that are located with a very short metric distance may be impaired by quite different properties, differences that reveal barriers in the spatial network. As a result, to gain detailed understanding of the conditions in an area that has relevance on the street level, it is necessary to take into account the walkable street network; otherwise, there is an obvious risk that important nuances are concealed. In this context, the frequency of train and bus services is not taken into consideration, yet bus stops (identified as physical features) are a concern for urban designers while matters related to frequencies and the like seldom are.

With respect to matters of social exclusion, it is relevant to relate the minimum distance to bus stops and to how many households that have access to private vehicles. For people living in areas where the accessibility to public transportation is low, the significance of private alternatives for mobility increase. The table below shows both minimum distance to bus stops and the percentage of households with a car; two of the areas are divided into sub areas since car ownership varies significantly within these areas. In some areas with low access to bus stops, not more than half of the households have access to vehicles, e.g., Geneta south, Saltskog, and Ronna north. In the two areas with lowest access to bus stops, Östertälje and Pershagen, the car ownership is instead among the highest, 66% and 71%. It can be argued that the residents in these areas have managed to compensate for deficient public transportation. In Östertälje, there is a station for the commuting train, which needs to be regarded as quite advantageous. To conclude, the lowest accessibility to vehicles is found in Fornhöjden, Geneta North, and Hovsjö, which in combination with a very high unemployment rate means that the accessibility to public transportation is of utmost importance as a way to counteract exclusion.

Area	Bus stop		Households with access to a vehicle
	metres	steps	
Geneta South	291	2	75%
Pershagen	361	2	71%
Östertälje	363	3	66%
Geneta East	276	2	54%
Ronna South	264	2	53%
Rosenlund	210	2	51%
Mariekälla	242	2	48%
Ronna North	300	3	47%
Saltskog	293	2	43%
City centre	207	1	31%
Fornhöjden	247	3	30%
Geneta North	251	2	28%
Hovsjö	229	3	28%

Table 6:4. Minimum distance to stops for public transportation and the percentage of the households with access to a vehicle.

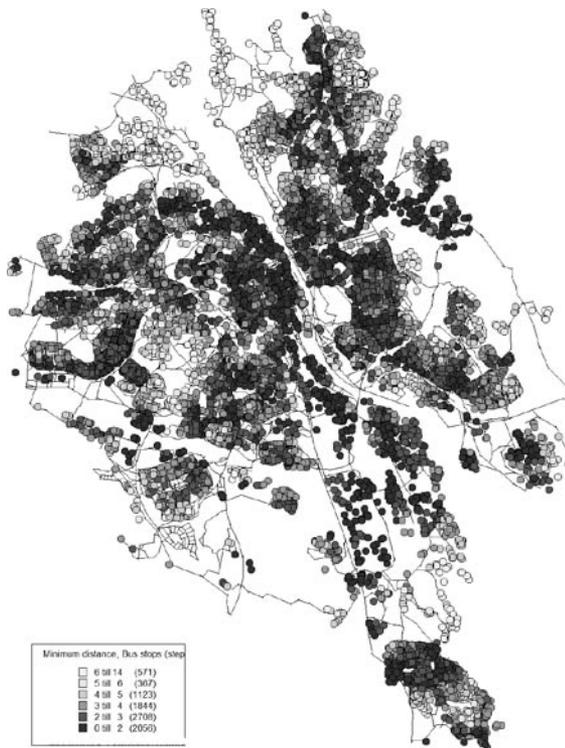


Figure 6:30. Minimum distance to stops for public transportation from every address point.

The accessibility to public playgrounds owned and maintained by the municipality is analysed as it is a kind of amenity of which its accessibility is highly governed by decisions within the Planning Authority. The location of public playgrounds is an example of how common resources may be distributed within the city as a result of urban planning considerations. The result of minimum distance to public playgrounds shows significant differences: Fornhöjden and Saltskog appear as the least favourable areas

in this respect whereas the city centre, Östertälje, Hovsjö, and Geneta have the most favourable conditions. If the four large housing estates included in national anti-segregation initiatives are compared, significant differences in accessibility appear; Ronna and Fornhöjden have very poor accessibility while the situation is better in Geneta and Hovsjö. It is a fact, however, that many real estate owners provide their tenants with such facilities, but it is nevertheless interesting to discuss how the common resources are distributed. This is due to the fact that all playgrounds or other facilities provided by a house owner are not 'free'; these amenities are actually paid for by the tenants through their rents and all public playgrounds are paid by taxes. Hence, this is a matter of equitable distribution of common resources.

These spatial inequalities identified are of great concern, but unfortunately the awareness of such inequalities is probably quite low among those concerned, which might be related to how such phenomena is de-



Figure 6:31. Minimum distance to public playgrounds from every address point.

scribed. The accessibility analysis presented on the address point level is advantageous in this respect since it is made on a comprehensive level, which means that it is possible to evaluate one area in relation to other areas and in relation to the overall situation. Also, it is the actual accessibility that is measured through public space.

The third analysis in this set of studies is the minimum distance to a grocery store. This has relevance since buying food is a quite obvious an everyday activity and the grocery stores in themselves often function as important attractors. The analysis shows that the metric distance on average differs significantly between neighbourhoods, but most areas after all have fewer than 500 metres to a grocery store. Shortest distances are found in the city centre, 152 metres, and in Hovsjö, 259 metres, and the longest distances are found in areas as Pershagen and Östertälje, areas that are dominated by single family houses and relatively large plots, but also Ronna and Geneta are areas with longer distances in average.



Figure 6:32. Minimum distance to grocery stores from every address point.

All together, the accessibility to certain amenities shows that the affordance for different neighbourhoods vary to a large extent, and at the same time the spatial inequalities are illustrated in a very concrete way. Here only three features have been in focus (beside the population) and to achieve a more general picture several more features may be included (such as health care, schools, cash dispensers, recreation facilities), but this study shows how this may be investigated in a way that takes urban form into account. According to these three parameters studied, the city centre, Hovsjö, and Grusåsen prove to afford spatial advantages, while Saltskog, Ronna, and Pershagen turn out to be disfavoured in this respect.

Finally, the result reflects in a way the neighbourhood planning ideal: accessibility to amenities that the neighbourhood planning strategy identified as important prove to be relatively good in some of the post-war areas. But the accessibility to other people essential for an urban life to develop – and has great influence on interplay segregation – is everything but satisfying in many of these areas.

Area	Bus stop		Public playground		Grocery store	
	metres	steps	metres	steps	metres	steps
City centre	207	1	282	2	152	1
Fornhöjden	247	3	1226	8	318	3
Geneta	276	2	447	3	561	4
Grusåsen	256	2	619	5	419	4
Hovsjö	229	3	330	3	259	3
Mariekälla	242	2	441	4	446	4
Karlhov	222	2	713	6	314	4
Lina	319	3	477	5	452	4
Östertälje	363	3	442	3	500	3
Pershagen	361	2	658	5	767	4
Ronna	281	3	628	5	520	4
Rosenlund	210	2	579	4	311	3
Saltskog	293	2	939	8	328	3

Table 6:5. Minimum distance to different kind of service: stops for public transportation, public playgrounds, and grocery stores.

Accessibility to a diverse population

The analysis of accessible people is made more nuanced as social properties are added, an approach that could reflect a kind of accessible diversity. Information about employment, unemployment, income, education, and ethnicity is integrated into the analysis.

The first aspect in focus is employment. Musterd and Andersson note that neighbourhood effect is related to employment levels (Andersson 2007, 80). The status of the residents has an impact on those without employment; a relation is found between the percentage of unemployed in 1991 and those who remained unemployed in 1995 and 1999. Important to notice, however, is that the empirical study for that analysis is based on how many people are unemployed in geographical areas the size of 500

by 500 metres. Unlike the accessibility analysis, this analysis does not take into account how these people are related to each other through public space. In other words, it is not clear whether it is likely that they will share the same public space.

The result of accessibility to employed people and unemployed people in Södertälje shows that the inner city provides accessibility to both people who are searching for work and to people who have work: 52% of the accessible residents have work and 2% search for work. However, the accessible working population is four times higher compared with the residents who have work within the area (along seven axial lines). In areas such as Fornhöjden and Hovsjö, quite another picture appears: the inflow from neighbouring areas is very low, so the possibility to find people with work in public space more directly depends on the local resident's situation and here only 39% (Fornhöjden) and 29% (Hovsjö) of the accessible residents have work and 3% (Fornhöjden) and 5% (Hovsjö) are searching for work. Also the proportions can be illustrated between people with work and who are searching for work to those who are potentially accessible in different neighbourhoods.

Area	Accessible residential population	
	with work	search for work
City centre	52%	2%
Fornhöjden	39%	3%
Geneta	36%	4%
Grusåsen	51%	3%
Hovsjö	29%	5%
Mariekälla	52%	2%
Pershagen	52%	0.5%
Ronna	30%	5%
Rosenlund	54%	2%
Saltskog	47%	2%
Avarage of Södertälje	46%	3%

Table 6:6. Share of accessible residential population with work and in search for work. Radius: six axial steps. (The average of Södertälje includes 816 NYKO-areas in the municipality).

As with Strömblad's concern for contextual effects, the differences are evident, suggesting that people who live in Hovsjö and Fornhöjden, for example, are greatly disadvantaged by the low number of accessible residents with work that are potentially co-present in public space.

The next theme for analysing accessible diversity is ethnic background. The categories chosen are Swedish and foreign background. Again large variations appear. In the city centre, most residents have a Swedish background; however, as accessibility is analysed, this dominance is reduced in favour of a higher percentage of people with foreign background. Hence, it is possible to see how urban form to some extent influences the potential for diversity in this respect, enabling residents from other areas to be accessible.

Figure 6:33. Accessibility to people with foreign background from every address point within a radius of three axial lines.

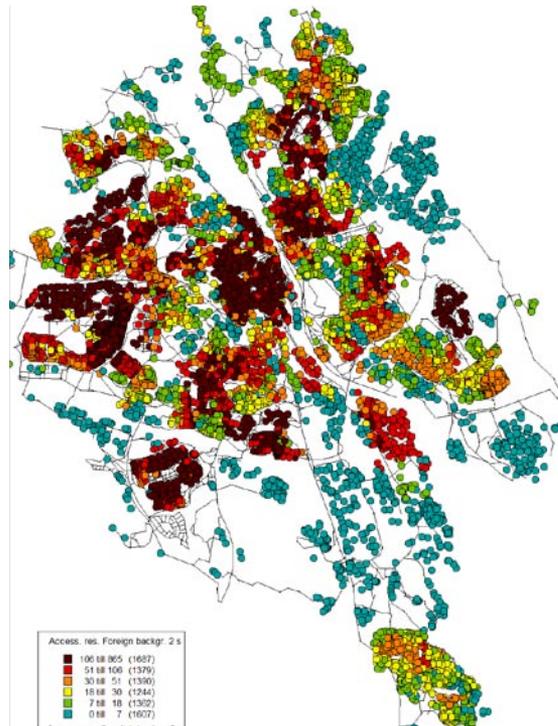
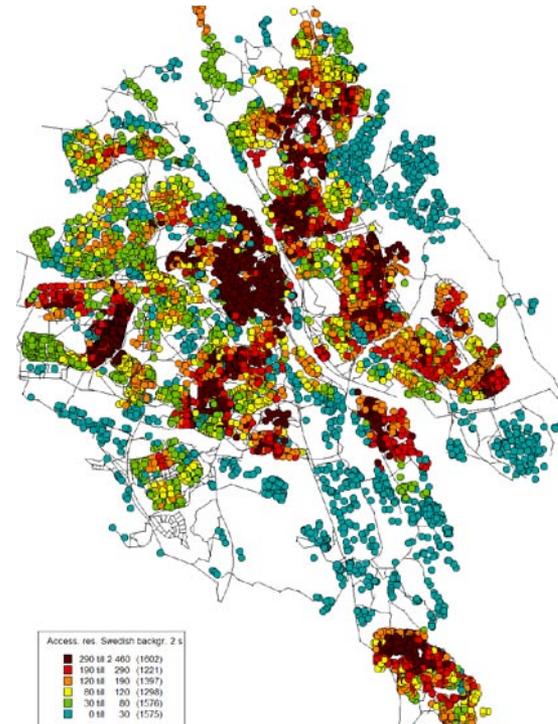


Figure 6:34. Accessibility to people with Swedish background from every address point within a radius of three axial lines.



To make the results easier to interpret, the percentage for ten neighbourhoods is placed in relation to the situation in Södertälje on average. The mean value of *accessible* residential people with foreign background for Södertälje is 27% within a radius of three axial lines (for the selected ten areas that are studied in this respect and shown in the figure it is 24%). This accessible percentage should not be confused with what normally is stated, which in Södertälje is 40%. The mean value of *accessible* residential people with Swedish background is for Södertälje 61%. As each neighbourhood is compared to the average, it is shown whether an area reflects the overall situation or if there is a divergence. The table below shows the different areas in relation to Södertälje as a whole.

The table and the figure show that areas such as Grusåsen, Mariekälla, and the city centre reflect the average situation (cluster 1), whereas Fornhöjden, Ronna, and Hovsjö are characterized by a population with foreign backgrounds (cluster 3). In-between these outcomes a cluster of the following areas are found: Saltskog, Geneta, Östertälje, and Pershagen (cluster 2).

Area	Accessible residential population ethnic background	
	Foreign	Swedish
City centre	19%	74%
Fornhöjden	49%	37%
Geneta	42%	36%
Grusåsen	22%	69%
Hovsjö	62%	18%
Mariekälla	23%	69%
Pershagen	9%	86%
Ronna	52%	23%
Rosenlund	18%	75%
Saltskog	30%	56%
Average of Södertälje	27%	61%

Table 6:7. Share of accessible population with Swedish and with foreign background (six axial steps). The average of Södertälje includes 816 NYKO-areas in the municipality.

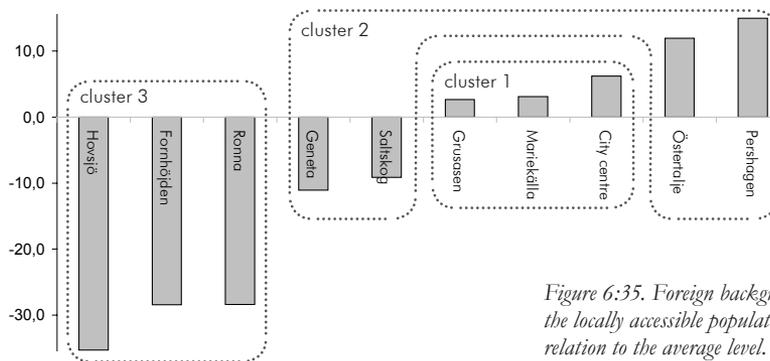


Figure 6:35. Foreign background: the locally accessible population in relation to the average level.

The accessibility to people with different income levels is analysed and the income levels are organised into five groups, where level 1 is the lowest income and level 5 the highest level. Level 5 is found in Pershagen, Östertälje, Mariekälla, and in the central part of Södertälje. In the figure below, the income distribution is shown within the accessible population. Not very surprisingly, Hovsjö and Ronna are dominated by low-income groups and Pershagen is dominated by more affluent groups.

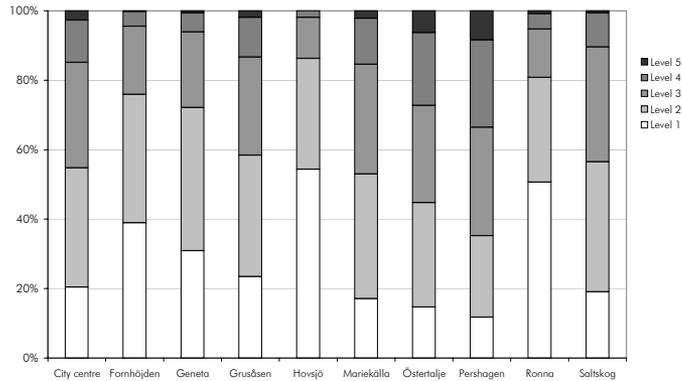


Figure 6:36. The distribution among different income groups (share of accessible residential population).

As the relation between the group of high-income people (level 4 and 5) and the group of low income people (level 1) is studied, it is possible to see that some areas afford accessibility to both these groups, while in others the mix is not as thorough. A cluster analysis placed Mariekälla and the city centre in the position of having access to a mixed population when it comes to income levels, followed by Saltskog, Grusåsen, and Östertälje. The two clusters with least mix consists first of Pershagen and Geneta and second of Fornhöjden, Ronna, and Hovsjö, which are areas that have the least mix in this respect. Interestingly, four large housing estates are found among the least mixed areas together with the affluent area Pershagen, however, in Pershagen there are no low-income people.



Figure 6:37. Mariekälla and the city centre has the most mixed accessibility while Fornhöjden, Ronna, and Hovsjö the least.

The next feature to be studied is the level of education among the accessible residents. Here the different levels are divided into three groups: the first level includes the nine-year compulsory school; the second level includes upper secondary school; and the third level includes post-gymnasium studies as well as higher studies (e.g., university). The result from the local level shows that a few areas have a predominance of accessible people with the third level compared with the first level, namely Östertälje, Pershagen, Mariekälla, Grusåsen, and the city centre. The other areas have the opposite situation with predominance of people with the first level of education. However, a cluster analysis is made according to the balance between people with level 1 and 3. From this Fornhöjden and Saltskog grouping, two areas stand out as areas that provide residents with access to a significantly mixed population with respect to education, while Östertälje and Pershagen provide the least mixed population (see figure below). It needs to be emphasised that all four large housing estates actually provide access to people with different education levels, in Fornhöjden in particular.

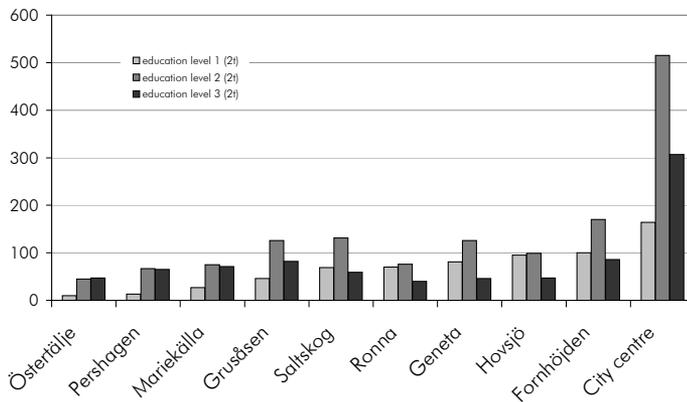


Figure 6:38. Accessibility to residents according to education level.

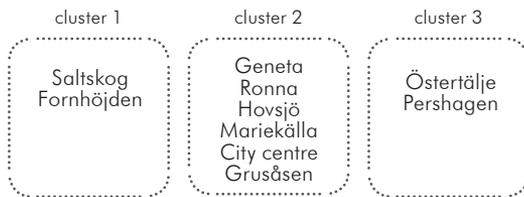


Figure 6:39 Clustering of neighbourhoods according to balance between level 1 and 3.

Reflections: accessibility

Areas that are spatially more isolated and segregated (as explored in the integration analysis) are to a higher extent depend on the social profile of the residents within the very local context, whereas areas that are embedded in an urban context are less dependent on the local composition and are to a larger extent influenced by the neighbouring areas. In some areas, this effect is in a way double (such as in Hovsjö and Pershagen where the residents have quite homogenous properties). In addition, these areas are quite isolated or segregated from a configurational perspective. This means that it is not only people in the vulnerable areas that are excluded from others, but also people in affluent areas are excluded from the city as a whole. This finding is important to highlight since the possibilities to mix with other people depends on which groups are accessible. This places the focus on both segregated vulnerable areas and segregated affluent areas in the city. Accordingly, cities that have many spatially (configurationally) segregated neighbourhoods depend more on a local mix of people and a more even distribution of amenities compared to cities that are spatially integrated to avoid large groups (or neighbourhoods) from being subjected to exclusion.

Accessibility analysis makes it possible to illustrate how urban form influences accessibility to people as well as accessibility to different amenities. It is clear that space in itself has the possibility to both reinforce and mitigate certain outcomes even though other aspects in the end also influence the outcomes. Some areas such as the city centre, Grusåsen, and Mariekälla have spatial properties that more efficiently enable accessibility to other residents. Similarly, the residents in these areas are made accessible to others. In areas such as Ronna, Hovsjö, and Pershagen, the spatial properties separate people from each other and exclude the residents from the neighbouring areas. Hence, space can either work in a conservative way, structuring and reproducing social relations, e.g., reproducing social segregation patterns. But space can also work in a generative way and create potential for new relations: create potential for co-presence by spatial integration. The accessibility analysis is in a very direct way illustrating the consequences of an integrated or a segregated urban space: the outcome is depending both on *distribution of space* and the *'content'* that is located *in* space, and the combination of these two parameters is captured by analysing *distribution through space*.

A primary interest for the accessibility study has been to explore the preconditions and potentials for urban life since interplay, co-presence, co-awareness, and/or interaction in public space is pointed out as highly important for social segregation (Olsson 2005a; Jacobs 1992). The condi-

tions (the accessible density as well as the mix of residents and working population) are found to be most favourable in the city centre, Marickålla, Rosenlund, and Grusåsen and they are prominently poorer in the four large housing estates as well as in Pershagen. Such poor conditions are of great concern since an impaired urban life has the greatest impact on the weakest and least powerful people according to Hanson (2000). On the contrary, people with more resources are likely to overcome spatial shortcomings and thus are likely not to be affected to the same extent: their inclusiveness in society is provided for by other networks and means. In addition, their mobility is probably secured through private vehicles. From this point of view, the spatial isolation may even be an advantage for some selections of the population, at least in a short-term perspective. It may be advantageous on an individual level but not for society at large.

From the results of the analyses of minimum distance to certain amenities such as bus stops and public playgrounds, it is clear that the results aggregated to NYKO-areas conceal important nuances and that the finer scale (i.e., the address points) is far better for the purpose of urban design. The significant inequalities regarding accessibility to common resources that are found in Södertälje are of great concern. It is obvious that people in some areas do not have the same spatial advantages as others. This could be described as a kind of spatial discrimination for those residents who live in disfavoured neighbourhoods. From a welfare perspective, this is without doubt an ethical dilemma.

From an urban design perspective, one important finding is that the four neighbourhoods included in the urban development agreement do not have the same type of spatial properties and it has been possible to illustrate in more detail how these differences come about. This fact implies that there is no silver bullet with respect to how to turn the downward tendencies in these areas, an often-cited suggestion. Quite the contrary, these areas have different strengths and shortcomings that make them unique and as such they need to be addressed quite differently if spatial modifications or urban design interventions are to be considered.

6.3 Co-presence in public space

The set-up of the study

This part of the empirical study investigates the density of people that are present in public space and how this varies in different neighbourhoods. Co-presence in public space is related to the discussion of interplay segregation and public life, since the existence of an urban life is highly important for mitigating isolation and exclusion (Jacobs (1989), Franzén (2004), or Lilja (2002) outlined in chapter 2). The density of people – or rather the lack of density – on streets and pathways in a neighbourhood may be related to the issues of disurbanism, social malaise, and deficient natural surveillance of public space. The empirical studies presented above have indicated that there are large differences between the neighbourhoods in Södertälje, studies based on the configurational conditions and statistical data of residential and working population. In this section, however, the method is more direct and aims to capture the level of co-presence or co-absence as the neighbourhoods are studied through observations on site.

The observations have been conducted in ten neighbourhoods simultaneously during two weekdays in the month of May. The weather was normal for the season, some clouds but no rain. Movement flows were registered for five minutes at a specific place five times a day, the first at 8 a.m., the last about 5.30 p.m. In some of the neighbourhoods, there were also two evening observations at the same places, between 6.30 and 9.10 p.m. In May, when the observations were carried out, it was not dark during the evening observations, rather dusk, since sun sets about 9.40 p.m. at this time of the year. The city centre, Hovsjö, Geneta, and Ronna had at least twenty gates observed; in the other neighbourhoods ten gates were observed. In all, sixteen people were engaged as observers.

The gates are not chosen randomly but according to a certain strategy. The gates cover different parts of the neighbourhood: high as well as low integrated axial lines, places close to what could be described as local attractors, for example, a planned centre or an important point for public transportation, and paths essential for entering a neighbourhood from other parts of the city such as bridges, the entrance streets, or strategic pedestrian underpasses between neighbourhoods. The data includes information only about the number of people passing each observation gate. Thus, there is no information about who lives or works in a certain neighbourhood or whether the person spends time in the area for any other reason.

Observed pedestrian flow

The observation data gives an idea of how dense the public space is populated in the neighbourhoods of Södertälje. The mean values as well as the max values reveal large differences within Södertälje. The table below shows data of the observed pedestrian flow arranged by area. The inner city clearly stands out as the most populated and Pershagen the least. In-between two clusters appear the first cluster (Grusåsen, Östertälje, Hovsjö, Ronna, Saltskog) and the second cluster (Mariekälla, Fornhöjden, and Geneta). Looking at the maximum number, as high as 315, who passed during one five-minute period it is obvious that the city centre distinguish from all other areas. Other neighbourhoods have maximum number of observed people between 13 and 43. The mean value has been transformed into an index where the city centre is given the value of 100 to make a comparison easier. The public spaces in general – with the exception of the inner city – are quite sparsely populated. Thus, in some areas it seems to be more appropriate to discuss co-absence rather than co-presence.

Area	Valid N	Mean	Median	Minimum	Maximum	Std.Dev.	Index
City centre	280	22	10	0	315	39.2	100
Grusåsen	80	5	4	0	21	4.7	23
Östertälje	280	4	3	0	23	4.3	18
Hovsjö	280	4	3	0	23	4.3	18
Ronna	280	4	2	0	43	6.9	18
Saltskog	110	4	2	0	32	5.4	17
Mariekälla	140	3	2	0	17	3.1	13
Fornhöjden	140	3	2	0	13	2.9	12
Geneta	280	3	1	0	23	3.5	12
Pershagen	204	1	0	0	16	1.9	4

Table 6:8. Pedestrian flow for every observation occasion aggregated for every neighbourhood.



Figure 6:40. The neighbourhoods have been clustered according to pedestrian flow by the occasion.

Pedestrian flow by axial line or gate

For this study, it is preferred to present pedestrian flow according to place rather than to observation occasion. Therefore, the observations have been summed up for every street or place (or axial line) and it is possible to identify spaces that have low as well as high flow values. Altogether, the observation includes 138 axial lines (a few with more than one gate). The result shows that Saltskog, Hovsjö, Geneta as well as Ronna Grusåsen, Perhagen, and Östertälje have gates where less than 1.5 people passed during one day. The lowest number for Fornhöjden is 4.5, and for Mariekälla it is 6.0. Then it is a leap to the city centre where the lowest value at a gate during one day is 28 people. The highest values are again found in the city centre, but in Östertälje there is one gate with high flows (by the station for the commuter train) and in Ronna there is one gate (close to the neighbourhood centre) with high flows.

The observed flows have been recalculated into movement flows per hour to account for differences between observation occasions. The mean value presented in the table is a mean for the two observation days. In addition, to make a comparison easier, all values within each area are aggregated and an index is specified where the city centre is given the value of 100. The aggregated values show that the city centre is distinguished from the others, and then Östertälje and Grusåsen form the next cluster, followed by Ronna, Hovsjö, and Saltskog, and the next group consists of Mariekälla, Geneta, and Fornhöjden. Finally, Pershagen has the lowest values.

Area	Gate N	Flow per hour and gate (mean)	
		people	index
City centre	20	263	100
Östertälje	10	72	27
Grusåsen	10	61	23
Ronna	20	48	18
Hovsjö	20	48	18
Saltskog	11	46	17
Mariekälla	10	35	13
Geneta	20	31	12
Fornhöjden	10	27	10
Pershagen	16	12	5

Table 6:9. Pedestrian flow by gate and hour.

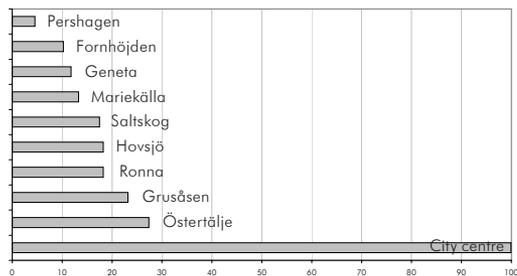


Figure 6:41. Index values, pedestrian flow.

Correlation: flows and configuration

Previous research within the space syntax field has found a strong correlation between high integration and movement flows, especially in cities with a traditional grid structure but weaker in more modern layouts, for example, in enclaved housing estates (Hillier 1996). A correlation analysis of the observation data in each neighbourhood is made between movement flows and integration values (radius 3, radius 7 and radius *n*) as well as choice values (choice radius 3 000 metres, radius 1 000 metres, and radius 400 metres). The correlation coefficient (Pearson correlation R) is shown in the table below and the highest correlation for each area is in bold text.

Area	Integration			Route choice		
	radius 3	radius 7	radius <i>n</i>	radius 400	radius 1000	radius 3000
City centre	0.46	0.29	0.31	0.06	0.15	0.18
Hovsjö	0.37	0.17	-0.03	0.37	0.30	-0.11
Fornhöjden	0.22	0.22	0.28	0.27	0.17	-0.14
Grusåsen	0.20	-0.40	0.14	0.19	0.31	0.38
Östertälje	0.16	0.20	-0.14	0.51	0.48	-0.08
Mariekälla	0.16	0.40	0.36	0.14	0.53	0.56
Pershagen	0.13	0.05	-0.02	0.06	0.08	0.07
Ronna	0.13	0.00	-0.10	0.17	0.06	0.04
Saltskog	0.06	0.24	0.18	0.13	0.19	0.26
Geneta	0.05	0.03	-0.04	0.12	0.07	0.10

Table 6:10. Correlation coefficient (R) for observed pedestrian flow and configurational values.

As shown in the table, the correlation at large is low. Some areas have better correlation with integration values and others have better correlation with choice values. However, most of the neighbourhoods have their best correlation between observed flows and one of the two local configurational properties, either the local integration (radius 3) or local choice (400 metres). Saltskog and Fornhöjden are the two exceptions. The city centre meets the expected pattern with the strongest correlation (R=0.46) found with local integration (radius 3). Areas that have better correlation to choice values than integration values are Östertälje, Mariekälla, Ronna, Saltskog, and Geneta. If the whole data material is analysed for all ten neighbourhoods, the highest correlation is found between movement flow and local integration (radius 3).

In a figure showing the correlation between movement flows and the summed up values of local and global integration, it is possible to identify three clusters. The best correlation is then found in Grusåsen, the city centre, and Mariekälla. The second best correlation is a cluster with Östertälje, Hovsjö, Saltskog, and Fornhöjden. The least correlation is found in the areas Geneta, Pershagen, and Ronna.

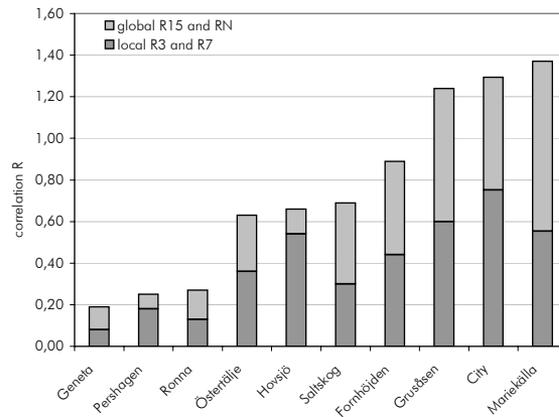


Figure 6:38 Correlation between pedestrian flow and local and global integration.



Figure 6:39 The highest correlation is found in Grusåsen, the city centre and in Mariekälla.

The result with low correlation between movement flow and integration values is not very surprising. As already shown in the integration core analysis and the synergy analysis most neighbourhoods within Södertälje have a ruptured interface between scales of movement, and hence, urban form is weak in supporting a concentration as well as an overlapping of different movement flows within the area. This means that short distance movement is physically separated from long distance movement resulting in an unpopulated public space. People using these areas need to challenge the conditions given by the configurational properties in their everyday practices. As long as urban form is not modified or changed, the weak support for social life to develop will remain.

Correlation: movement flows and accessible population

The potential for having people co-present in public space has earlier been analysed through analysis of the accessible population (see paragraph 6.2). As the observations are made in several areas with different character and configurational properties, it is of interest to see if there is a correlation between observed movement flow and the calculated number of accessible population. As the observation data is compared to the calculated data, the highest correlation is found between observed movement flow and two of the calculated values, namely accessible working population ($R=0.98$) as well as accessible residents and working population when summed up ($R=0.97$). The results indicate three things. First, it is important to take into account the working population when studying the potential intensity in public space and not only consider the residents. Second, the correlation also proves to be stronger with the locally accessible people, i.e., within a radius of 3 axial lines compared to, for example, 6 axial lines or 1000 metres. Third, generally it is also possible to see that there is a higher correlation for values based on a radius in axial step distance compared to a radius in metric distance.

In this context, it also needs to be emphasised that population calculated as accessible population is found much more adequate to use than only the registered residential population. The correlation (R) between observed pedestrian flow and the registered residential population in each neighbourhood is not more than 0.25 (not a significant value).

Correlation coefficient (R): observed data (flow) and calculated data (accessible people)

residential population (radius)			working population (radius)			working and residential pop. (radius)		
3 lines	7 lines	1 km	3 lines	7 lines	1 km	400 m	1000 m	3000 m
0.916	0.780	0.490	0.980	0.951	0.909	0.974	0.945	0.839

Table 6:11. The correlation coefficient (R) for observed data and calculated data.

An outline of the observations in the neighbourhoods

Storgatan, in the *city centre* next to the central square Stortorget, has the highest number of observed people both during daytime and in the evening. Recalculated to people per hour, Storgatan has 1672 pedestrians passing per hour. Other high values are found close to Marentorget, a square between the main pedestrian street and the waterfront, as well as at the gate close to the commuting trains and bus station (689 people per hour). Early afternoon turned out to have high numbers of passing people. Streets with the low pedestrian flows in the city centre are Turinge-

gatan-Oxbacksleden (51 people per hour) and Dalgatan (48 people per hour), both located west of the main traffic route through the city centre, a street that is likely to function as a barrier. The gates with high values are on lines that have high integration values, especially local integration (radius 3), a finding also made evident in the correlation analysis.

In *Ronna*, the highest pedestrian flow is found at the entrance to the planned neighbourhood centre with as many as 337 people per hour as a mean value for the two days. Worth noting is that the mean value for passing people was higher during the evening observations compared to observations during daytime. The planned centre is located close to the highly integrated main street, but the square is more or less hidden from this street. Hence, the local centre is not fully gaining advantage of the spatial potential that is found in the vicinity. However, in general the results indicate that public space in *Ronna* is relatively sparsely populated, especially compared with the city centre. Seven gates out of twenty gates have less than 20 people passing per hour. This may be compared to the city centre where the lowest flow is 48 people per hour.

The most integrated paths in *Ronna* are found in the outskirts of the area, for example, the pedestrian underpass in the south that leads to *Geneta* (highest radius 3 value) with a flow of 87 people per hour as well as the footbridge linking to *Karlhov* with a flow of 29 people per hour. The underpass is also an important link according to the route choice analysis, and in reality there are not many other alternatives for movement between *Ronna* and *Geneta*. Thus, it is of great concern that this path is not constituted by buildings or entrances, and there is no street for vehicles with visibility to this path. In spite of this relatively insecure environment, there is very little difference regarding the pedestrian flow during daytime compared with the evening; this may be due to the fact that people do not have much of a choice for north-south movements but are obliged to use this link.

In *Geneta*, as in *Ronna*, the highest pedestrian flows are found at the planned neighbourhood centre with 159 people per hour. In addition, this centre has a square that is separated from the local integration core. *Geneta* has lower mean values than *Ronna* and almost half of the gates have less than 20 people per hour. Some of the most populated spaces in *Geneta* are comparable to the least populated streets in the city centre. According to the observed gates, there is a weak correlation between observed flow and configurational values.

The highest observed flow in *Hovsjö* is found at the street with bus stops in the middle of the area with 134 people per hour (thus less than the planned centres in both *Geneta* and *Ronna*). The gates closer to the

planned centre have even fewer people, about half as many. Surprisingly, many people were at one of the pedestrian paths northwest from the centre, thus most likely functioning as an entrance to the whole northern part of Hovsjö. This also turns out to be used frequently both during daytime and during evenings. The rest of the gates have considerable fewer people and in Hovsjö, there are five gates out of twenty that have less than 20 people per hour. One of the few connections through the central park between the northern and the southern part of Hovsjö has relatively few people, only 57 people per hour, which indicates that the exchange between these areas is quite low. The intensity of the pedestrian flow is not more than what is found at the paths between the residential houses where privacy is a priority.

The path that connects the whole neighbourhood to the rest of the city (towards the city centre) has very few people, not more than 30 people per hour. Since this is the only path connecting to the rest of the city, it indicates that very few people walk to and from Hovsjö. As in Ronna and Geneta, this path is not constituted by buildings or entrances and is even not in contact with the street for vehicles and is most likely to be perceived as insecure when it gets dark. Again, this fact means most likely that the importance of public transportation increases. When comparing the spatial measurements with pedestrian flows at the twenty gates, it is found that Hovsjö has a higher correlation between the pedestrian flow and local integration (radius 3) and choice at a local level (radius 400 metres) than other measurements even though the correlation value is low ($R=0.37$).

In *Fornhöjden*, compared to the three other large housing estates, significantly fewer people were observed. Three out of ten gates had flows less than 20 people per hour. The most intense gate is found at the southern entrance to the neighbourhood with not more than 50 people per hour. The paths adjacent to the planned centre had even fewer people observed – 20 and 21 people per hour. The most populated public space in Fornhöjden is the central pedestrian path in the middle of the area with 59 people per hour. The gates close to bus stops are strongly influenced by this and thus occasionally have higher values.

In *Saltskog*, the most populated public spaces are found next to the neighbourhood centre with 103 and 138 people per hour. The path linking the houses to the west is also one of the more populated with 88 people per hour. The neighbourhood is connected to the surroundings in several directions and the connection towards the city centre has 29 people per hour and the connection to the southwest has 32 people per hour. However, the general conclusion to be drawn is that this is a neighbourhood with a sparsely populated public space.



City centre



Geneta



Fornhöjden



Mariekälla



Figure 6:44. Observed flows in the different neighbourhoods.



Ronna



Hovsjö



Österåker



Grusåsen



Pershagen had the least people seen in public space. Only one of 15 gates has a flow over 20 people per hour and the highest flow is not more than 28 people per hour.

Östertälje is in many ways similar to *Pershagen* although *Östertälje* has a station for the commuting train with a flow of as much as 540 people per hour. Otherwise, the movement flows seen in public space are more modest, ranging from only 4 to 46 people per hour. There is a pedestrian path that connects *Östertälje* to *Fornhöjden*, but only 12 people per hour was observed here.

In *Mariekälla*, the high movement flows are observed where shops are located (90 and 53 people per hour) as well as at the street that connects the neighbourhood towards the city centre by *Campus Telge* (66 people per hour). Hence, this could be described as a most predictable outcome. Four of the ten gates had fewer than 20 people per hour.

In *Grusåsen* the southern entrance to the neighbourhood had the highest observed flows with 132 people per hour. Near the local centre there were relatively many people observed. The connection to the northeast had as many as 75 people per hour and the path along the waterfront had 117 people per hour.

Reflections: observations

The observations of pedestrian flows show a substantial difference between the city centre and all other neighbourhoods. The intensity of the observed pedestrian flows in the city centre is dramatically much higher than in any of the other areas where very few people are observed at all. So few people – i.e., a public space characterised by co-absence – can not support or encourage urban life, not even a local urban life. In fact, this lack of people places these areas at risk for disurbanism and anti-social uses.

Attractors, such as neighbourhood centres with their different facilities available, seem to attract people to a certain extent in *Ronna*, *Geneta*, *Saltskog*, and *Mariekälla*, even though these locations do not correspond to where the natural movement routes are found. In the neighbourhoods *Hovsjö*, *Fornhöjden*, *Pershagen*, *Östertälje*, and *Grusåsen*, the reverse is the case: no more people are observed at the neighbourhood centre than elsewhere. Many of the large housing estates are similar in the sense that there are few linkages to enter these areas. In *Ronna*, *Geneta*, and *Fornhöjden*, these connections have relatively high pedestrian flows, but in *Hovsjö* these paths are rarely used.

One important finding in the correlation analysis between configurational data and observation flows was that the strongest correlation was found between observed movement flow and local integration (radius 3) when

taking into account all studied neighbourhoods. However, the differences between the areas are quite distinctive even though many of the areas prove to have a correlation to one of the local configurational properties, either integration or choice. The other correlation analysis between observed movement flows and calculated accessible population turns out to be highly interesting. A very strong correlation exists between observed flow and the accessible population within the local area (including the accessible working population). In addition, accessibility measured according to axial steps is preferred over distance measured in metres. To only consider the residential population when trying to understand co-presence in public space seems to be quite irrelevant, but the correlation between integration and choice, and pedestrian flows was not that strong in the neighbourhoods in Södertälje.

Finally, perhaps it is unnecessary to study all ten areas simultaneously; the outcome would not be so different if there were some variations according to which day the areas are studied, as long as weekdays are separated from weekends. If so, this implies that fewer people are needed, and this would make the process of setting up the study much simpler. Since a main interest of this study was to explore possible mixes of people in the different areas, a complementing study would be highly relevant, a study that would ask people at different local centres, recreation locations, etc. where people live and work in order to capture to what extent people use different parts of the city.

7 Discussion and conclusions

Urban segregation is a prioritised issue in metropolitan areas in Sweden and is the subject of comprehensive national and local initiatives. However, urban design has rarely been the focus in anti-segregation initiatives; the architectural issue has to a large extent been confined to matters concerning housing policies. This licentiate thesis has shown that housing policy is far from the only tool that can be used within the field of architecture to counteract urban segregation. How the built environment is structured and shaped through urban design has proved to influence significantly urban segregation matters.

The main interest of this thesis has been to explore *urban segregation* in relation to *urban form*. This focus has required a new way of addressing segregation that includes a reformulation of the questions that constitute the very point of departure for such an attempt. As a consequence of this alternative point of departure, a configurational approach has been applied that involves an introduction of a set of theories, methods, and tools that are novel within the field of urban segregation. Compared with descriptions that come from other approaches, the descriptions and results that follow from such an approach are argued to have a higher degree of relevance for urban design issues and for the understanding of the role of urban space as shaped and structured by built form. In this concluding chapter, the three initial questions are recalled and the findings are briefly outlined and discussed in relation to these questions.

The first question is about how space is conceptualised and described within the field of social segregation in general and within housing segregation in particular. This stems from the belief that descriptions for how we understand the world are essential since it influences how we act in the world. Hence it is of great importance to elucidate what information different descriptions can give about the relation between urban form and social outcomes.

The second question deals with how segregation can be re-conceptualised to respond more explicitly to issues related to urban design. This has included a shift in focus from residential segregation to a focus on segre-

gation in public space and the motives for this shift are outlined. Hence, this thesis is not primarily studying how ethnic, socio-economic, or demographic categorisations are distributed *in* space; rather it explores theories, methods, and tools that have the ability to define and capture segregation in urban space itself (physical space), i.e., the distribution *of* space, as well as some of the consequences of such segregation, the distribution *through* space.

The third question aims to investigate if new approaches in spatial analysis and description, such as a configurational approach, can deepen our understanding of the role of urban form within urban segregation. The case study is carried out in Södertälje, Sweden. The physical environment is analysed with the intention to investigate spatial segregation as such, including segregation in public space, and to describe properties of urban space in a way that is possible to relate to social consequences and outcomes. A better insight of the role of urban form for social segregation and exclusion is suggested to lead to increased knowledge regarding how to address social segregation from an urban design perspective and that such knowledge is expected to support a more effective urban design and planning practice. This concluding discussion will deepen the discussion on space and society and arrive at sustainability aspects within urban design.

Weak guidance for urban design issues

Urban segregation ranges over many fields where issues related to architecture and urban design most often appear in the housing segregation discussion. However, in this thesis it has been argued that the residential segregation discourse is quite limited when it comes to issues that specifically relate to *urban form* and *urban design*. How residential segregation addresses urban space is open to certain objections: the residential segregation research describes how different categories of people are distributed in the city, while an urban design perspective looks for how urban form influences the relation among people.

More specifically, there are three conclusive parameters that have been discussed in detail. First, cities and different areas are classified or labelled according to the residents' social profile at a certain time and not according to their spatial properties. Second, the way geographical units are defined as well as how the units are analysed in relation to other units and to the city as a whole are important factors to consider. Third, the strong focus on residential aspects implies that other aspects such as possible processes in public space are neglected, a finding that partly highlights the notion of interplay segregation. A consequence of the methods and the modes of procedure found within residential segregation research is

that descriptions, explanations, and to some extent even the interventions are continuously centred on the residents. On the one hand, the research regarding the physical environment is not a primary focus and is not at all developed to the same extent; rather it is perceived as fixed. On the other hand, it is the physical environment, referred to as fixed, that is the main interest for an architect or an urban designer and which is consistently dealt with in practice. Taken together, the understanding of the physical environment within segregation is thus limited and the role of urban form is in this context more or less unexplored.

This thesis argues that it is highly questionable to draw far-reaching conclusions regarding such a spatial concept as segregation from an analysis that only partially considers urban form and its structuring of urban space. Another aspect of the matter is that the composition of the residents in a neighbourhood changes over time and that this does not necessarily need to be related to modifications or changes of the physical environment. Spatial structures tend to develop at a much slower pace than the composition of the population, which is an argument to investigate urban space in itself – the built environment as it is structured and shaped by built form – and to try to understand how space can support the users (or different groups in society) on a more general level.

Focus on public space as a way forward

The second research question revolves around how urban segregation can be addressed in order to come up with more relevant knowledge regarding matters related to urban design. The most important precondition for such an alternative approach is the shift in focus, from location in space to relations in space, i.e., from distributions *in* space to distributions *of* and *through* space. This means that it is not where people live in the city as such that is the key question for these studies, but rather how urban form relates people to other people and to certain amenities, and this involves public space since public space is seen as the mediator of such relations. Such an approach can capture consequences of urban form since what is described is more or less the accessibility *through* public space as it is shaped and structured by built form. Accessibility in this context is then easily related to the inherent spatial dimension within concepts such as segregation and exclusion and at the same time it is in a very concrete way related to urban design practice. One important object is to describe the city from a perspective that acknowledges how neighbourhoods, buildings, and people are spatially related through the street network, i.e., a street-level perspective. This as an attempt to reflect the *lived space* as defined by Lefebvre.

A stronger focus on public space involves an opening to elucidate more about the potential for people to share public space, and hence the potential to share practices. To simplify, unlike the field of housing segregation that thoroughly investigates to what extent there is a mix of residents within an area, this approach has the ability to respond to whether or not there is a potential for a mix of people in public space and to establish the density of the population as accessible people. This has significance for the notion of interplay segregation and empirically the preconditions and thus the potentials for urban life is further investigated – both the potential influenced by spatial properties and the potential influenced by accessible population, including the residential and the working population.

A new approach on urban segregation

The third research question identified in this thesis is whether a configurational approach can deepen our understanding of how physical space relates to social segregation. This more in-depth study defines public spaces as segregated or not and whether Södertälje as a city is characterised by a segregated public space. In addition, such an approach reveals some configurational explanations for why a city becomes spatially segregated. To empirically investigate this, several questions have been formulated for the overall research question, and then three sub-investigations are conducted. First, an analysis of the spatial properties including segregation in public space through global and local integration analysis, integration core analysis, synergy analysis, as well as an analysis of important linkages within and between neighbourhoods was conducted. These studies show among other things the occurrence of ruptured spatial relations that potentially could lead to disurbanism. Also the spatial centrality of neighbourhood centres is studied. Second, an analysis of accessibility including accessibility to people, the potential for urban life in public space due to aspects as accessible density of residents and working population, accessible diversity regarding certain social aspects, as well as the accessibility to certain amenities are conducted. The accessibility analysis elucidates different *consequences* of segregation in public space. Finally, there is an analysis of co-presence in public space based on observations of movement flows on site in Södertälje where conceivable correlations between movement flows and spatial properties are explored. Below follows a brief outline of the findings together with reflections of what this means more specifically for urban environments.

Segregation in public space

The first thing to establish was whether Södertälje is segregated from an urban design perspective apart from being segregated according to

a housing segregation perspective. The integration analysis shows that suburban areas in general have a distinct spatial connection with the city centre while other cross-connections are evidently weaker throughout the system. This differs from many other cities where often the integration pattern forms a kind of wheel whereby areas are connected directly, rather than via the city centre. What is a concern for Södertälje is that this fact puts the city centre in a most delicate position since the spatial relation between many areas goes via the city centre only as other alternative connections either are weak or even in some cases are missing.

Already the integration analysis identifies that there are both vulnerable areas and affluent areas that are found in segregated positions on the comprehensive (global) level. So what does this imply for the city as a whole? Well, there seems to be two sides of the matter; the most obvious consequence is that these areas (and its residents) have limited spatial access to the city as a whole, but it is just as much a converse situation: the city as a whole has limited spatial access to these areas (and its residents). This fact will be further discussed below.

As the neighbourhoods are studied in more detail, there is an attempt to explore to what extent public space is coherent. By highlighting the most integrated lines, the different neighbourhoods prove to have different properties where some have a very distinct core where most of the highly integrated lines are well connected, but some areas appear to be quite fragmented with no obvious 'main street' or spatial 'centre'. Different radii were chosen, two global and two local measures, and the most interesting finding with such sequence of analyses is that some areas are very consistent according to which lines come out as highly integrated, for example, the city centre where almost the same lines stand out irrespective of which radius is chosen. The opposite situation is, however, also found: the most integrated lines at one level do not correspond to any other level. These areas with an overlapping of integration cores are more predictable from a spatial point of view, and this centrality has an anchorage both in the local context and in the global context. From the results, it is not easily interpreted what spatial characteristics are common for areas that show a coherent pattern. The hypothesis that large housing estates in general have a more fragmented structure was not possible to confirm by this analysis; at least did it not fully apply to Södertälje. The four large housing estates were in fact different according to this respect; Geneta and Fornhöjden show a coherent pattern while Hovsjö and Ronna have a more fragmented pattern. Neither was it possible to find a very direct relation between the outcomes and the position of the area in the global context. These results gave rise to questions about how well the global

and the local scale overlap more generally in the neighbourhoods if all axial lines are taken into consideration. Therefore, a synergy analysis was conducted to investigate to what extent the local internal structure relates to the larger scale system of the city in which they are imbedded. A high correlation means that there is a good integration interface, a synergy effect, that is described as a compression of scales (Hillier et al. 1993, Hillier 1996). Here the results show that the highest correlation is found in the city centre, which is not very surprising. Among the areas that lack a compression of scales, the large housing estates are found together with Saltskog and Pershagen. The result, scattered in a diagram, revealed an informative pattern that identified the properties of different areas in relation to others. The city centre and Grusåsen clearly have the strongest overlapping of scales, and then Östertälje and Marickälla are positioned followed by Ronna, Pershagen, Fornhöjden, and Geneta. The two areas where the global and the local scale weakly overlap are in Saltskog and Hovsjö.

The way the areas scatter in this diagram in combination with the statement that many post-war suburbs lack a compression of scales places focus on a possible relation between synergy qualities and when areas were planned and built. Another diagram was compiled where synergy correlation was compared with an approximate date when the neighbourhoods were planned and built. From this, a most interesting pattern appears: the city centre has the highest correlation and is one of the earliest developed areas in Södertälje whereas neighbourhoods of later date tend to have less correlation according to synergy. The lowest correlation most clearly depicts the four large housing estates together with some other areas. As a matter of fact, since the correlation in many areas is very low, it would be more relevant to discuss non-correlation, or degrees of non-correlation, at least as far as Södertälje is concerned. This finding leads to other questions: Is this a general feature for Swedish cities or is Södertälje an exception to the rule? According to Franzén and Sandstedt (1981), similar situations are to be found in many other Swedish cities, at least in cities that developed rapidly between 1945 and 1970 since this was an era strongly influenced by the neighbourhood planning ideals (see paragraph 2.4).

However, Södertälje may be in a rather unique position since the urban expansion was extremely rapid with more than a doubling of the population in only twenty years between 1960 and 1980. Today a very large proportion of the total urban development originates from this modern era and now is characterised by a strong non-correlation between the local and the global scale, a situation that needs further investigation. The results show why the highly rationalised city is not much of a social city.

These findings suggest further studies are needed in other Swedish cities that have a different expansion pattern with perhaps a larger proportion of urban development also from other periods.

Another issue closely related to both the integration core analysis and the synergy analysis is to what extent the neighbourhood centres have a location that is spatially central within different areas. Only two out of thirteen studied areas had the neighbourhood centre where both the local (radius 3) and the global integration (radius n) cores are found; in these areas the centres are located in accordance with the spatial centrality. In most other areas, the location of the neighbourhood centres is unfortunate since the physical structure does not support the intended use to any large degree. This confirms the apprehension that many of the modern suburbs have non-central centres, spatially speaking; that is, spatial conditions for them to be successful are not optimized. Typically, these neighbourhoods are substantially more segregated than the rest of the urban surface and all these areas were planned and built between 1960 and 1980.

As far as choice analysis, the most valuable outcome in this context is probably the identification of the most important links for through-movement as it identifies some areas that are weakly connected to this network, which is another indication of their segregated position. In Södertälje, a rather well-formed outer ring appears on the west side while the ring or circle on the east side is much smaller and also deformed. This indicates that there is a discontinuation in the overall network that contributes to further fragmentation of the urban fabric. A development of the choice analysis in future research studies would more specifically investigate the quality at these paths in search for aspects that either counteract or support pedestrian movements in general, such as constitution, visibility, other security measures, and density of people.

Accessibility through public space

A consequence of segregation in public space is that accessibility is decreased. A way to capture what this means for people's everyday lives is through several accessibility analyses. In this context, the configurational approach, applying the Place Syntax Tool, has profoundly contributed with valuable knowledge regarding the potential for, on the one hand, accessible density of people, and, on the other hand, the kind of diversity of people that are accessible through public space. When comparing different neighbourhoods, there are large differences regarding accessible residents. It is established that some areas have spatial properties that more efficiently enable accessibility to the neighbours while in other areas

people are separated from each other through the spatial configuration. This difference could mean 5% of the residents in one area are accessible from each address point while as much as 34% are available in another area. As accessibility is analysed at different scales, it is clear that urban form has a significant influence on the outcome. Urban space can both reinforce and mitigate certain outcomes depending on the configuration. Some areas that appear as densely populated when considering how many people who are registered in the area turn out to provide quite low accessibility to neighbours and to others in the area due to poor integration. The results confirm that the level of accessibility to other people is determined for both urban form and the population. This tool makes it possible to distinguish or rather derive the influence from either factor: the effect of space and the effect of the population, respectively.

A primary interest for this thesis has been to explore the conditions and potentials for urban life since interplay (co-presence, co-awareness, and/or interaction) in public space is pointed out as highly significant for social segregation (Olsson 2005a, Jacobs 1992). A conclusion of the empirical study is that the understanding of the potential for urban life is increased as both the accessible residential population and the working population is taken into account. The conditions for urban life – with respect of accessible people that potentially could be co-present in public space – are considerably poorer in areas where accessibility at large is low but where also the accessibility to the working population is low. The potential for public life in different neighbourhoods in Södertälje varies significantly. In many of the suburbs, the potential for a local public life is very poor, a compromising and disadvantageous situation for the residents. This is especially true for those suburbs where the residents have fewer resources in general.

The accessibility analysis also is used to investigate and identify inequalities between neighbourhoods. With this as a base, the notion of affordance is discussed. It is found that the accessibility to certain common features varies considerably throughout Södertälje. With the Place Syntax Tool it has been possible to establish that people in some neighbourhoods do not have the same spatial advantages as others; in particular, this turns out to be the case in many of the neighbourhoods that are characterized by a strongly segregated public space. People are both relatively isolated from neighbours within the area as well as isolated from people and amenities in the surroundings. Still, a delimitation of this study needs to be emphasised: only three parameters are included in the analysis apart from people. Quite naturally, a more genuine image of how the affordance of different areas can be established calls for a more thorough investigation that includes a larger range of parameters.

However, the method applied has proved to be useful, especially when the results are interpreted on the address point level. Finally, if it is believed that social segregation is related to what living conditions are provided locally, this could promote better conditions in areas where the population has fewer resources. For example, it could be motivated to have better accessibility to public transportation in areas with few workplaces, low access to services, poor pedestrian networks, and low vehicle ownership.

Co-presence in public space

The aim of the observation study is twofold: to investigate how populated public space is in different areas when studied on site and to search for correlations between the observed movement flows and certain configurational properties. Regarding the first task, it is easy to establish that all areas, with the exception of the inner city, are quite sparsely populated, and hence, co-absence is again a more appropriate description of the situation in Södertälje. Such conditions imply a risk for disurbanism or for space being abused. Regarding the second task, it is established that the correlation between movement flows and integration values as well as choice values are quite low, although the city centre is an exception. This agrees somewhat to earlier results within the space syntax field where a strong correlation often is found between movement flows and local integration (radius 3) in traditional grid structured cities (Hillier 1996). When it comes to Södertälje (where most neighbourhoods originate from the last fifty years or so), the search needs to be continued. Among the correlation analyses conducted, there is one that needs to be highlighted: the correlation between movement flows and accessible people. In particular, very high correlations were found to the accessible working population as well as to the accessible working and residential population when taken together. This is highly interesting and from the basis of this result it is possible to argue that for the development of post-war cities the accessible population, including the working population, is a good indicator of the intensity in public space.

If the initial question for investigating co-presence in public space is recalled, it is possible to conclude that there are few areas that provide the spatial conditions for interplay in public space as described by Olsson (2005a). Neither do the neighbourhoods have spatial features that superimpose movement flows and urban activities on the local and the global levels, which according to Jacobs is a precondition for a functioning urban life. To the contrary, the physical environment turns out to be more of a hindrance than a support for people to share public space, both within an area but also for people from different areas.

Closing discussion

The different analyses confirm that the urban system of Södertälje is characterised by a palpable segregation in public space. The typical archipelagic structure that is very typical for the Swedish cityscape is perhaps easily recognised on any map, but its fundamental segregating effects can be more profoundly shown by various configurational analyses. The ruptured interface between the global and the local structure clearly speaks of segregation of public space, which means that whether the neighbourhoods are residentially segregated or not, public space in most areas already are. Furthermore, this implies that urban form lacks the ability to concentrate movement patterns and patterns of co-presence; i.e., urban form in these layouts gives weak support for a social use. People in these areas need to challenge the spatial conditions given by the configurational properties in their everyday practices. As long as urban form is not modified or changed, the weak support for social life to develop will remain.

It is also possible to identify areas that have poor spatial conditions for different kinds of urban qualities to develop, qualities discussed by Jacobs, Sennett, and Zukin, outlined in previous chapters. To some extent, it has been proven that the advantageous spatial conditions have continuously decreased in areas that originate from a more recent date, especially in areas built during the 1960s and onwards. This means that the design does not invite people to share public space. One may say that natural patterns of social co-presence are inhibited by urban form; it is a planned fragmentation. The consequences of this might be that public space is empty, but it is an obvious risk that it may be abused and become a source of fear (Hillier 1996, 188). For a city like Södertälje, this is a most pressing fact since the major part of the city development is relatively modern. Spatial integration, however, is by no means enough, but it is a necessary condition to make mutual confirmations possible as Franzén (2001, 33) stresses. However, there are still large differences also between these more modern areas and the configurational approach helps identify these differences. It needs to be emphasised that there are great spatial differences between the Million Homes Programme areas that normally are ascribed to have similar features and characteristics. From an urban design perspective, such assumptions are incorrect. Their spatial characteristics may with a new configurational approach be much more nuanced and explicitly pronounced, which is a necessity to make this knowledge relevant for the practice of urban design.

The accessibility analysis has revealed that neighbourhoods in Södertälje in general provide low accessibility to other people, the city centre being the exception. As in the integration interface – or synergy – analysis, where

it is suggested that it is more relevant to discuss degrees of non-correlation, it seems in this context to be more relevant to discuss co-absence rather than co-presence. The problem in many of the suburbs is that public life depends on a certain density of people that are co-present in public space, but shops, cafés restaurants, libraries, health care facilities, businesses, and even public transportation also depends on a certain amount of accessible people. These facts make the insufficient accessibility particularly pressing.

Another important finding that needs to be highlighted is that the four large housing estates included in anti-segregation initiatives have in many aspects important differences when it comes to the spatial properties. That is, they do not necessarily share the same spatial advantages or disadvantages. As a result, one can argue that there is no such thing as a 'bag of fix' that can be applied for these kinds of vulnerable areas as often is indicated. How to improve the physical environment and how to improve the potential for social life both need to be defined according to the specific circumstances in each neighbourhood. If spatial modifications are to be considered, the different spatial strengths and shortcomings of the areas need to be identified through analyses that reveal nuances on a very detailed level. In this context, it is also important to point out that it is when the results of the analyses are presented at a very detailed level such as the address points that important nuances appear. It is this detailed level that turns out to be much more informative from an urban design perspective compared when results are presented at the NYKO-area level (which is in many cases equivalent to the level of properties). It is obvious that the aggregated results conceal important nuances that appear at the finer scale. This finding is relevant also for the first question presented in this thesis about conceptualisations of urban space and what different descriptions in fact reveal or explain.

The more nuanced knowledge regarding the role of urban form for social consequences is possible to discuss in a wider context and it is argued that this contributes to a deepened discussion of space and society, on the one hand, and of social sustainability within urban design, on the other hand. Segregation in public space has been demonstrated through the new configurational approach and neighbourhoods characterized by spatial isolation and low accessibility are found to be more exposed to the local context, and as such, more dependent on local resources of different kinds. Hence, segregated neighbourhoods are developed using the area's own resources, an advantageous situation for people in the affluent neighbourhoods, while most probably unfavourable for people in the vulnerable areas where the resources are poorer. Segregated neighbourhoods do not provide beneficial spatial advantages for its inhabitants and its users

as spatially more integrated neighbourhoods. On a larger scale, cities with this kind of fragmented structure can be argued to have a kind of latent vulnerability built into the design. Hanson, for example, argues that disabling effects caused by urban design ideas tend to have the greatest impact on the weakest and least powerful people – those who depend on their local environment the most to support them in their everyday life, such as children, the elderly, the sick and disabled, the unemployed (Hanson 2000, 117). It is not possible to say that people in a neighbourhood that is spatially segregated necessarily is disadvantaged. To predict the outcomes, one needs also to consider the social profile of the population. This is crucial to highlight since urban designers in practice have great influence on the configuration of space but generally very little control over the population, especially when it comes to variations over time.

Segregation in public space has proved to have a negative effect on accessibility. It has been shown that neighbourhoods can have a segregated public space within the area, so a decreased accessibility to neighbours and to other local features and neighbourhoods can also be segregated from the surroundings, making them more dependent on local resources. This leads to a discussion about what segregation in public space may imply on a comprehensive level in a municipality. It is suggested that a spatially segregated and hierarchical urban structure is less robust than an integrated and continuous urban system and hence one can argue that it is less sustainable from a social perspective. An important finding is that spatial segregation is not a phenomenon restricted to poor areas; affluent areas are also spatially excluded from the whole. Therefore, a hierarchical and segregated urban structure facilitates isolation, an isolation that can either be a product of choice (sometimes referred to as an enclave) or a product of coercion (sometimes referred to as a vulnerable area). From a social segregation perspective, both these outcomes could be argued to be equally unfavourable, since it risks reinforcing polarisation and increasing social distances in society at large. As Franzén (2001, 25) explains it: the hierarchical differences between at least two groups imply a superior or a subordinate position morally and/or materially. Hence, one can question from a sustainability point of view if it is justifiable to design or develop cities that are composed of spatially segregated neighbourhoods that has a planned fragmentation built into the design. To fulfil an ambition to design socially sustainable neighbourhoods, they might need to be more flexible and robust and as such be able to provide the spatial advantages that are especially important for people with poor resources. An integrated public space has also great importance for the notion of interplay segregation that has been highlighted in this thesis. In

cities that are characterised by a manifest housing segregation it is likely that the possibility to share public space becomes even more important than in cities where housing segregation is not as evident.

Social segregation is a concern of the whole city, so this is an argument for taking into account not only vulnerable areas in anti-segregation initiatives but to involve segregated areas as such whether they are poor or affluent. This is highly relevant from an urban design perspective for two reasons. First, it is possible to identify segregated areas using a configurational approach. Second, spatial segregation is possible to decrease through modifications of urban form. This implies that it is possible to include urban design practice into anti-segregation initiatives that can prove to be effective and predictably affect the outcome.

For Södertälje, it has been confirmed that the city has a spatial structure that is both strongly hierarchical and characterized by segregation in public urban space. That this has various negative social consequences has been outlined thoroughly in this thesis. Although it is not possible to say that integration processes are hindered by urban form, it is possible to conclude that the spatial properties, the configuration of urban space, in Södertälje are segmenting and even reproducing segregation patterns. Any large scale discontinuities that tend to isolate small groups in enclaves will represent a perturbation in the system that is a barrier to its efforts to project encounters globally across space (Hanson and Hillier 1987, 269-270), because, in the end, as the city is like gin and tonic, the spatially impaired relations will to some extent influence also social relations since they are interdependent.

To conclude, the configurational approach contributes to an increased and more nuanced knowledge about the spatial conditions and its social consequences. The conclusion that urban form does play an important role for what spatial advantages and disadvantages are created suggests that a purposeful and active urban design practice is needed. Such insight makes it possible to address issues related to urban segregation as well as address aspects regarding social sustainability, urban design, and policies that can be highly supportive complement to other interventions within anti-segregation initiatives. Earlier experience from studies on social segregation emphasize that coordinated initiatives, including engagement from all actors and institutions concerned, seem to have the greatest potential for successful results (Hajighasemi 2005, Öresjö 2006). The findings of this study widen the possibility for future anti-segregation initiatives to also include urban design practice, an approach that so far has not been part of the strategies within anti-segregation initiatives in Södertälje or in many other cities in Sweden.

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