From Housing Segregation to Integration in Public Space
A Space Syntax Approach Applied on the City of Södertälje
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Abstract
In Sweden, urban design and town planning is rarely addressed in anti-segregation initiatives. Architectural issues have more or less been confined to matters regarding housing policy. Although segregation is an inherently spatial concept, its spatial dimension is analysed using quite simple spatial models and weak theories on the relation between spatial and social phenomena, methods that provide few analytical insights from an urban design perspective. The Swedish cityscape is to a large extent characterized by post war development, strongly influenced by neighbourhood planning ideas. What is conspicuous in many of these areas is the extreme segregation of public space and that many neighbourhoods are relatively spatially isolated from the city as a whole. Since prevailing approaches are giving weak guidance for urban design there will be an attempt in this paper to in part re-conceptualise the issue and possible generate new ideas on how to approach segregation within urban design.

This paper investigates how configurational theories and methods can contribute to more nuanced descriptions of spatial relations within different neighbourhoods and in the city as a whole. If social segregation is related to segregation in public space it is essential to capture the configurational properties in a highly tangible way. The result shows that the space syntax approach has the ability to shed light on essential configurational differences between neighbourhoods and that these spatial descriptions give valuable insight regarding how urban form influences the spatial advantages that different areas afford. This opens for new possibilities for how policies in urban design can address the segregation problem that could be articulated with more efficient anti-segregation interventions, both on a neighbourhood level and on a city level.

Keywords: Public space; urban form; housing segregation; co-presence

1. Increasing segregation in metropolitan areas
In Sweden, social segregation has been the subject of far-reaching political initiatives. Social and ethnic segregation, unequal living conditions, and unequal accessibility to services and to the labour market are commonplace and considered major social problems. It is stated that the negative outcome of segregation in some vulnerable areas limits the possibilities for both individuals and neighbourhoods, difficulties that in the long run even may have a negative influence on national development and economical growth (SOU 2007:104). There has been an ever-increasing polarization between the most and the least attractive housing areas since 1970 (Öresjö, 1997, p.43) and it is stated that the inequality regarding the living conditions in different geographical areas has increased during the
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1990s (SOU 2005:29). From an urban design perspective, a relevant question is how urban form influences these conditions, which calls for a better understanding of the social logic of the modern Swedish cityscape of today.

The Swedish government has since the mid 1990s launched different area-based programmes to counteract segregation and to improve the conditions for a long-term sustainable growth (SOU 2007:104). The aims of the Metropolitan Initiative, running for a five year period from 1999, was to promote sustainable economical growth, promote equal living conditions for the inhabitants, and to break social, ethnic, and discriminating segregation. Common features of the large housing estates addressed in the programmes are a large proportion of residents with foreign background, low employment rates, low education levels, and a large proportion that depend on social allowances. Areas were selected for the initiative according to the social profile of the residents within a certain geographical area. However, the Metropolitan Initiative has had only marginal success and it is concluded that the understanding of the segregation phenomenon will only be partial if vulnerable areas are studied isolated from the rest of society (SOU 2005:29). In spite of this critique the next initiative, The Urban Development Policy, has quite similar aim and direction (though the term “segregation” is more or less replaced by “exclusion”). One objective is to decrease exclusion in urban districts (SOU 2007:104). To conceptualise such formulation and to implement different actions without articulate the spatial dimension, appear to be quite difficult.

Although segregation is an inherently spatial concept, its spatial dimension is analysed using quite simple spatial models and weak theories on the relation between spatial and social phenomena (Marcus, 2007). Social distance and exclusion is commonly pointed out as negative consequences of segregation which quite obviously partly depends on configurational relations. The prevailing definitions and methods in the field provide few analytical insights from an urban design perspective which is suggested to be one reason for anti-segregation initiatives to rarely address urban design aspects. In the political discourse, architectural issues have more or less been confined to matters concerning housing policy (SOU 1998:25; Andersson, 2006). Also in official planning documents the segregation issue is often explicitly related to residential composition and proposes strategies about achieving a mix of people through a mix of dwelling types (including a mix of forms of letting and ownership) as for example in the Comprehensive Plan for Södertälje (2004). This limited focus may be a result of the difficulty to define the spatial dimension and to empirically capture how spatial configuration influences social segregation.

This paper explores how segregation in urban environments can be described more specifically by applying the latest theories and techniques in configurational analysis. The aim is to deepen our knowledge on the spatial dimension of social segregation and this is made by in part re-conceptualise urban segregation by focusing on segregation in public space rather than on differences regarding the composition of the residential population. Such strong focus on urban form also results in a delimitation that needs to be emphasized in order to avoid misunderstandings since segregation is a very
complex phenomenon that includes many fields and disciplines. The purpose of addressing segregation with an alternative spatial approach, i.e., a configurational approach, is to search for possibilities also within urban design to overcome negative consequences of segregation. It does not imply that other approaches are less important only that it is time to add a configurational approach as a complement: 'Even if space has an explanatory power over the formation and persistency of deprived areas, it is not replacing other explanations' (Vaughan, et al., 2005).

2. Housing segregation and its limitations

The meaning of segregation in an urban context in Sweden today is more or less tantamount to housing segregation, a concept that dominates the debate and is found in many national documents on the subject. Housing segregation is defined through quantitative methods according to how selections of the residential population are distributed geographically. Segregation is studied as a relative and relational phenomenon, and generally three categorisation principles are used: demographic, socioeconomic, and ethnic (SOU 2000:37; Integrationsverket, 2006; Andersson, 2007). The discourse elucidates how segregation is manifested in an area (e.g., municipality or region) and 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, 2006).

Within the housing segregation discourse, two main determining factors are identified: relational and fixed (RTK, 2006). The physical environment, which evidently is the main interest for urban designers, is perceived as fixed and difficult to change, and thus, it is not investigated to the same extent as relational factors. It is also notable that most descriptions of the physical environment (that is however rarely occurring) has been restricted to available statistical facts about the housing stock; e.g., year of construction, type of dwelling, number of storeys, and forms of tenure/ownership. The spatial layout and its configuration has neither been described nor addressed to any larger extent. As a result, architectural interventions within the anti-segregation initiatives have mainly been confined to housing policies if addressed at all. In spite of the fact that descriptions lack detailed information about spatial properties, a direct relation is frequently occurring between the problems of segregation and the large housing estates originating from the Million Programme in general (the Million Programme was a political initiative with the aim to build one million housing units within ten years, 1965-1974, in order to put an end to the concurrent severe housing shortage in Sweden). These areas, originally designed to embody principles of community and co-operation, are now in themselves perceived as a measure that created housing segregation (Andersson, 2007, p.62).

From an urban design perspective, the shortcomings with the descriptions that follow the prevailing housing segregation approach, has primarily to do with three aspects. Firstly, it is the difficulties to find an adequate definition of the geographical area as this will determine the level of precision and influence how data is aggregated (often referred to as 'The Modifiable Area Unit Problem', see O’Sullivan and Unwin 2002, pp.30-32). Secondly, it has to do with the lack of context as
each area is studied isolated from its surroundings, meaning that possible influence from neighbouring areas is not considered. Thirdly, that the units are categorized according to the composition of its residents, and therefore, the description explains very little of the conditions of the physical environment (Andersson, 2001; RTK, 2006; Legeby, 2008). This all together makes it highly uncertain to draw far-reaching conclusion regarding spatial qualities and properties from such descriptions.

A critical discussion of how cities are analysed as spatial systems is made by Marcus (2008) who argues that theories and methods to analyse cities as spatial systems are underdeveloped. This reasoning is highly relevant in the context of social segregation, especially when it comes to explore the role of urban form, since it calls for an analysis of urban systems at a finer scale, a scale that is possible to relate to everyday life rather than to an administrative perspective of space. This could be compared with Lefebvre’s (1991) differentiation of conceived and lived space. A way forward to deepen the understanding for the spatial parameter is to apply methods that describe spatial relations, i.e. distributions of space rather than distributions in space (Koch, 2004). Thus, the initial question is partly reformulated, also implying a shift in focus from a bird’s eye view to a street-level view. It means that integration and segregation is explored through analysis of the properties of public space. Furthermore, the consequences of a segregated urban fabric are possible to link to accessibility, or rather the lack of accessibility. It could be about accessibility to other people, movement flows, co-presence in public space as well as accessibility to important functions; conditions that have a direct influence on people’s everyday lives (Olsson, 1998, p.4; Schulz, 2004, p.205). From this point of departure segregation in public space appears as a far more urgent issue than earlier recognised.

3. The Space Syntax Approach
Space syntax aims to reflect both the objectivity of space and our intuitive engagement with it. Space is not seen as a neutral background to human activity, but as an intrinsic aspect of everything human beings do. Urban form in itself seems to have a promising potential to facilitate integration processes. Space is not just about properties of individual spaces, but about interrelations between the many spaces that make up the spatial layout (Hillier and Hanson, 1984; Hillier, 1996; Hillier and Vaughan, 2007). This indicates that when studying social segregation, spatial analysis needs to consider both the comprehensive level and the local level. Such an approach captures a neighbourhood’s spatial position in a wider context, and in addition, it makes a relevant comparison possible between different neighbourhoods within one spatial system regarding the spatial conditions. Design and planning decisions have often had some unexpected effects on problems such as social isolation and economic segregation. For example, it was widely believed that to break large residential developments into small inward looking units would promote stronger local communities, and that lower population densities would decrease crime and social malaise. However, these ideas seem to have been more part of the problem than the solution (Hillier, 1988).
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, p.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).

What seems to be conspicuous in many of the post-war suburbs in Sweden is the segregation in public space; the relation between buildings and public space is disrupted, the different scales of movements are separated, and the residents are efficiently geographically separated from others (Klasander, 2001; Hillier, 1996; Hanson, 2000). The lack of compression of scales is argued to be related to the linking between the local and the global context (Hiller, et al., 1993, p.35).

4. A configurational analysis of the city of Södertälje

The city of Södertälje, 30 kilometres south of Stockholm, has 84 000 inhabitants of which about 40% have foreign background (Stockholms Stads Utrednings- och Statistikkontor [USK], the municipal bureau working with statistics and analysis of Stockholm). The issue of social segregation and exclusion has been prioritised for a long time in Södertälje. The cityscape is to a large extent characterized of the post-war development, strongly influenced by the neighbourhood planning ideas (Franzén and Sandstedt, 1981) as there was a rapid urban expansion after the 1940s as a result of industrialisation. Four large housing estates are included in national anti-segregation initiatives, selected through the social profile of its residents [Figure 1], [Table 1].

![Figure 1: Södertälje.](image)

<table>
<thead>
<tr>
<th>Area</th>
<th>Population</th>
<th>Foreign background</th>
<th>Population 26-64 years</th>
<th>Employment rate</th>
<th>Unemployment rate</th>
<th>Soc. dep. (prop.)</th>
<th>Soc. dep. (ppl.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formholmen</td>
<td>3 414</td>
<td>59 %</td>
<td>2 493</td>
<td>61 %</td>
<td>5.7 %</td>
<td>9 %</td>
<td>8 %</td>
</tr>
<tr>
<td>Hovsjö</td>
<td>5 054</td>
<td>82 %</td>
<td>3 479</td>
<td>56 %</td>
<td>8.1 %</td>
<td>16 %</td>
<td>11 %</td>
</tr>
<tr>
<td>Romtorp</td>
<td>6 574</td>
<td>79 %</td>
<td>3 827</td>
<td>63 %</td>
<td>9.9 %</td>
<td>23 %</td>
<td>14 %</td>
</tr>
<tr>
<td>Grethe</td>
<td>4 021</td>
<td>86 %</td>
<td>6 475</td>
<td>56 %</td>
<td>8.3 %</td>
<td>10 %</td>
<td>5.3 %</td>
</tr>
<tr>
<td>Södertälje</td>
<td>83 642</td>
<td>40 %</td>
<td>48 239</td>
<td>72 %</td>
<td>3.8 %</td>
<td>109 %</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 1: Social data of residents in four neighbourhoods (Södertälje kommun, 2007a, Södertälje kommun, 2007b, and www.usk.stockholm.se).
Urban design matters have not been addressed in the initiatives in Södertälje; rather it has been a focus on education, employment, and local organisation. The absence of architectural initiatives has made the situation worse; it is argued that the passiveness of the planning authority has contributed to an increased isolation and exclusion of these vulnerable areas. By ignoring the physical aspect of segregation it is argued that the Metropolitan Initiative lost the factor that has maintained the permanence of segregation (Hajighasemi, 2005, p.101).

4.1 Empirical results - spatial segregation

Through the spatial analysis in this study it will be possible to identify urban segregation based on configurational properties. The spatial model (the axial map) comprises the whole city and the spatial system is acknowledged as a continuous system so that micro-scale variations are made visible. The analysis of global integration (radius n) clearly shows that Södertälje has a well defined core with high integration [Figure 2]. The surroundings has a concentric character but with a stronger integration towards the west and the south than to the east and the north. A few highly integrated lines stretch from the core and outwards. Generally, neighbourhoods in Södertälje tend to have stronger integration towards the city core compared with cross connections that are much weaker. There are also some spatially isolated areas found on a surprisingly close geographical (or metric) distance from the city centre.

As the radius of the analysis is decreased to 15 (i.e. radius-radius for the system) another pattern appear. A couple of new integration nodes stand out, for example in Geneta, Hovsjö, Rosenlund/Grusåsen, and Pershagen. At this level a stronger integration shows from the core to the west and the east than to the south or the north. Geneta surprisingly distinguish from many other areas, since it in spite of its metric distance from the city core appear as highly integrated at this level and well connected to the city core (at least in its northern part). Interestingly enough, in this part of Geneta, unlike most other suburbs, there is actually a street in the north where commercial businesses, restaurants, as well as churches and assembly facilities are found. The character of many of these activities clearly indicates that they are not just turning to the local area but rather also attract people from other parts of the city. However, some neighbourhoods are still spatially very segregated from their surrounding even at this level, for example Fornhöjden, Söder and Lina.

When studying local integration several integration congregations appear, indicating a kind of centrality for different neighbourhoods. Some areas have a very distinct core while there in other areas is difficult to identify a “main street” or a “central square”. As integration at different radii is compared it is possible to sense a rather predictable situation in the inner city (with a block grid structure) as the integration core at different radius tend to be fairly consistent, and also is enlarged as the radius is increased. In many of the suburbs however, the difference between radius 3 and 7 is surprisingly small; even though the radius is increased the physical catchment area seems to be in-
creased only to a limited degree. In some cases this can be explained to be caused by a more crumpled structure with shorter and several more axial lines, and in some cases it seem to be caused by a prominent enclave-design. Some neighbourhoods even have both these features.

One important finding is that on the global level both so called vulnerable areas as well as affluent areas have a strongly segregated position within the system. Such spatial hierarchy seems to have an isolating effect on the residents. However, it is suggested that such a spatial hierarchy means beneficial effects for some areas while others are more disadvantaged by such properties. Hence, the spatial isolation seems to have the potential to facilitate both the kind of segregation that is referred to as 'segregation of choice' and the kind of segregation that is referred to as 'segregation of coercion' (Varidy, 2005). A serious consequence of this hierarchical spatiality on the comprehensive level is that it in a way is enabling and to some extent reproduces the existing segregation patterns.

Figure 2. Integration at different radii where the most integrated lines are shown in red.
Another way of define spatial distance is through depth analysis. In other studies it is found that deprived areas (or so called ghettos) are characterised by a high depth measure in relation to the surroundings (Vaughan, et al., 2005). When comparing the four housing estates included in the national anti-segregation initiatives (originating from the Million Programme), some interesting differences are exposed [Figure 3]. From the city core the step depth to the four areas (to the planned local centre) range from 14 for Geneta, 16 for Ronna, 18 for Fornhöjden, and to 22 for Hovsjö. Generally, focus is on the distance between the city centre and a suburb but here another perspective is also analysed. Fornhöjden turns out as the most distantly located area in relation to the others; between 32 and 35 steps [figure 3]. It is possible to relate this to information regarding how the civic community is organised in the different areas even though it is difficult to say if it is related to the spatial connections or to other circumstances. It is established that the population in the three neighbourhoods Ronna, Geneta, and Hovsjö have well-developed relations; for example within Assyrian-Syrian communities, associations, and churches, as well as through kinship, a relationship that is especially strong between Geneta and Ronna (Södertälje municipality, 2007b). But in Fornhöjden the different Assyrian-Syrian communities are not described to be that influential even though about 30% of the population comes from (or has a connection to) nations in the Middle East. Here the civic society instead is described to be more strongly associated to the neighbourhood itself rather than bound to a certain ethnic or cultural context.

4.2 Planned centres in integrated locations?

A common critique of many of the modern suburbs in Sweden is that the local centres are not well functioning; neither as a social meeting place nor for commercial activities. They are often described as turned inside out or not located in a central position in the neighbourhood (Klasander, 2001; Olsson, et al., 2004). In this paper it will firstly be analysed if planned centres in Södertälje is located at the global and/or at the local integration core. Secondly, the overlapping of local and global integration in general will be studied for different neighbourhoods in order to relate this to the notion of synergy effects as different levels of integration overlaps, creating a compression of scales (Hillier, et al., 1993, p.35; Hillier, 1996). Similar reasoning is made by Jane Jacobs (1992) who beside a local activity also is emphasizing continuity and influences from the city level as one essential aspect of a functioning urbanity.
Starting with the centres; the result indicates that the intention to locate planned centres in highly accessible locations is not achieved in many of the thirteen studied areas in Södertälje. Quite contrary, about half of the neighbourhoods have centres located in neither the global nor the local integration core. Common features for these neighbourhoods are that they are peripherally located from the city core and planned and built after 1960. Of the other half, some of the planned centres are found in the local integration core, whereas only two areas have the planned centre located where both the local and the global integration cores overlap. In these two areas the location can be described as optimized from a configurational point of view, which means that it has the potential to derive advantage from urban form to support the intended use.

However, it needs to be emphasized that even if it is an optimized location within that specific neighbourhood the area itself might still be weakly integrated in the overall structure. In figure 4 there are maps showing the ten locally and the ten globally most integrated spaces in four of the studied neighbourhoods.

4.3 Important links within and between neighbourhoods
Integration reflects spatial accessibility, a kind of centrality, but in urban studies it could also be of relevance to analyse the potential for through-movement (choice) and identify the spaces (or segments) that are most likely to be frequently used as routes (Hillier and Iida 2005, 553). Still, it is important to bear in mind that also route choice analysis is about the spatial system in itself; its properties and its potential. To capture properties such as accessible density other complementary methods need to be used, for example the Place Syntax Tool (Ståhle, et al., 2005).

In Södertälje the potential for exchange within and between neighbourhoods is in focus which makes it interesting to identify the spatially most important links. The choice analysis (which is conducted on the segment map) at radius 5000 and 3000 metres shows that two of the large housing estates, Hovsjö and Fornhöjden, are spatially efficiently excluded from the highly frequented move-
ment network in Södertälje, while the other two, Geneta and Ronna, are at least intersected [Figure 5]. This is an important difference indicating that accessibility to Hovsjö and Fornhöjden is already on a global level strongly impaired.

![Choice analysis at different radii](image)

**Figure 5. Choice analysis at different radii.**

When reducing the radius to 1000 and 500 metres the choice analysis identifies some areas that are highly consistent through scales, which can be described as a predictable outcome. Other areas feature a more indistinct pattern, for example Hovsjö, where the different levels of movement flows are quite disparate. Both in Geneta and Ronna there is an identifiable main path that proves to be important on all different scales, while there in Hovsjö and Fornhöjden is no such self-explanatory or natural main path.
From a design perspective it is also of relevance to highlight the character of the most important linkages since these are the paths that people are reduced to use if they want to access the neighbourhood or just easily walk within 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 beside public transportation. In Hovsjö it is obvious that the main paths prove to be poorly designed; neither are details carefully designed nor are the paths constituted by buildings and entrances [Figure 6].

![Figure 6. The character of the main paths and streets in Hovsjö according to the choice analysis.](image)

The choice analysis, in comparison with the integration analysis, more distinctly highlights the important spaces (segments) for movement within and between areas. Hence, some spaces might come out as important for through movement in the choice analysis even though they are not well integrated. To interpret the results from a design perspective the theoretical difference between these measures need to be stressed and is pointed out by Hillier; integration (i.e. topological analysis) deals with closeness of a space to its neighbourhood and therefore we can intuit it. 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, p.3).

4.4. Accessibility to people

One way to illustrate the consequences of segregation in public space is to analyse the accessibility to other people. Normally, in studies based on statistical data, social phenomena are taken out of real space and placed into an abstract space that is weakly related to the world of real space and materiality (Hillier and Vaughan, 2007). The following analysis is conducted from the view that an area is always to some extent influenced by its surrounding which is essential to capture in order to achieve an understanding for complex urban structures. Hence, statistical data is integrated with the spatial model, distributed on the detailed level of address points and analysed with the Place Syntax Tool (Ståhle, et al., 2005).
Population density is analysed in the meaning of accessible residents from every address point. Not surprisingly, the highest values are found in the city centre [Figure 7]. However, it is clear that it is not only the number of residents in each area that alone determines the outcome. For example, the city core has 4421 residents and Hovsjö 5033, and the average number of accessible residents within three axial lines is 1500 in the city core compared to only 428 in Hovsjö. Within seven axial lines the city core has 6504 accessible people and Hovsjö only 3610. This is partly explained by the configuration within the area and partly by how it is integrated with the surrounding neighbourhoods. There is also a great variety that is important to emphasize between the four housing estates included in anti-segregation initiatives. In Fornhöjden 21% of the residential population is accessible within three axial lines, compared to only 9% in Hovsjö, and 5% in Ronna. Thus, configuration of space is playing a significant role in providing (or preventing) access to one’s neighbours.

The potential for urban life depends not only on the accessible local population (residents) but also on the accessible working population. As these two densities are added up, the city centre proves to have the highest number of accessible people [Figure 8]. Already the statistical data shows that the inner city has many workplaces but what the analysis reveals is how urban form reinforces the accessibility. A few other areas have an accessible even mix of residents and working population even though the total density is only a third compared with the city centre. In most neighbourhoods however, the density is considerably low and there is very little inflow from a working population, for example in the four large housing estates in focus as well as in Pershagen, one of the more affluent areas in Södertälje.
5. Discussion and conclusions

The different spatial analyses demonstrate that Södertälje is a spatially segregated city and that there are large differences between neighbourhoods regarding the spatial potential. The neighbourhoods in Södertälje have generally relatively strong spatial connections towards the city core but weak cross connections. Some areas, that geographically seem to be close to the city centre, prove to be segregated due to their spatial configuration. This means that the urban layout obstructs spatial integration, isolates the neighbourhood and efficiently impairs accessibility. The integration analysis reveals that both vulnerable as well as affluent areas are found in segregated positions on a global level. It is argued that these areas and their residents are more thrown upon the area's local resources, a situation that most likely is advantageous for people in affluent areas, while most probably unfavourable for residents in vulnerable areas with poor resources. Hence, spatially segregated areas afford properties which make them potentially more vulnerable, a vulnerability that is more or less built into the design. It can be compared with findings by Hanson who is arguing that disabling effects caused by urban design ideas tend to have the greatest impact on the weakest and least powerful people socially; those who depend on their local environment the most to support them in their everyday life, like children, elderly, sick and disabled, as well as unemployed (Hanson, 2000, p.117). This means that it is not possible to say that spatial segregation per se necessarily means that a local population is disadvantaged; thus, to be able to predict outcomes, one need also to consider the social profile of the residents. 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 not variations over time.

Another finding important to highlight is the large differences between the four housing estates included in the national anti-segregation initiatives. In the debate it is often suggested that there should exist a kind of “bag of fix” that can turn downward tendencies in so called vulnerable or deprived areas. This study proves that this is not the case, at least not in Södertälje. The four areas have different spatial properties and potential. First and foremost this is related to their position globally, but also, the areas have different spatial shortcomings and qualities on a local level that need to be acknowledged. Hovsjö for example is more spatially fragmented than the other estates, indicated both by the integration analysis and the choice analysis.

Figure 8. Index for accessible residential and working population in different areas in Södertälje. A 100 people potentially visible in the city centre corresponds to lower numbers in other neighbourhoods.
The accessibility analysis with the Place Syntax Tool has proven to have the ability to more specifically reveal what segregation in public space implies for the accessibility to certain features. For example, accessibility to other people as shown in this paper, but it could also be about accessibility to important amenities in the city (Legeby, 2009). It is shown that some areas have spatial properties that efficiently enable accessibility to the neighbours while other areas have configurational properties that separate people from each other, for example in Hovsjö, Ronna, and Pershagen. The preconditions for urban life - in respect of the potentially accessible people in public space - are considerably poorer in areas where accessibility at large is low but especially in areas with low accessibility to a working population (or workplaces). The understanding for the potentials for urban life is argued to be increased as both the accessible residential and the accessible working population is taken into account.

If discussing the impact of segregation in public space on a comprehensive level it is suggested that a spatially segregated and hierarchical urban environment is more vulnerable than an integrated and continuous system, and hence, one can argue that it is less sustainable. This has to do with the fact that spatially segregated neighbourhoods become more dependent on local resources and the local population, while integrated neighbourhoods can derive advantages from the surroundings and that more people get access to common resources in a city. The results show that spatial segregation is not a phenomenon restricted to poor areas, and hence, it is not only so called vulnerable or areas characterised of exclusion that need to be taken into account in anti-segregation initiatives. Social segregation is a concern of the whole city, particularly from an urban design perspective.

It is stressed, that this increased and nuanced knowledge about the spatial configuration is a necessity in order to find more effective urban design and planning policies within anti-segregation initiatives. The findings of this study open for a possibility to widen future anti-segregation interventions to also include urban design practice, which so far, has not been part of the strategies in Södertälje like in many other cities in Sweden. Earlier experience from studies on social segregation emphasize that coordinated initiatives, including engagement from all actors concerned, seem to have the greatest potential for successful results (Hajighasemi, 2005; Öresjö, 2006).

References


