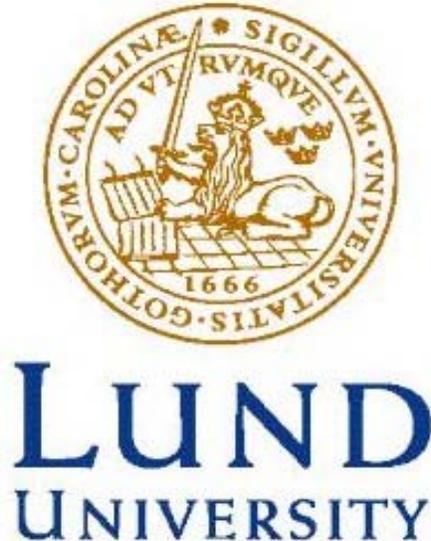


Realizing Malmö's Neighborhood Functionality and Social Capital Potential

The Impacts of High-Speed Transport Infrastructure on Rosengård and Fosie



Abstract: Increasingly, urban and suburban areas in many western cities are shaped by the tides of high-speed flows of people and goods. While an integral piece of our socio-economic fabric high-speed transport infrastructure (HSTI), limited in this paper to urban road networks, facilitates high-speed vehicle movement at the expense of neighborhood social interaction. A largely mono-functional land use, HSTI occupies large amounts of land dedicated to movement space and spreads out housing, recreational areas, commercial space, and other land uses. The wider space between residential, commercial, and recreational areas increases the distance and time residents must move, which can reduce overall formal and informal socializing among neighbors as well as limit neighborhood functionality. In addition, HSTI imposes "wall" and zone-of-influence effects over neighborhood interactive social exchange space (ISES). While ISES facilitates social exchange and interaction among neighborhood residents and businesses, HSTI increases safety concerns and limits the use and effectiveness of this multi-functional space. By imposing its various effects and reducing the liveliness and continuity of ISES, HSTI limits the development of neighborhood, and especially "bridging" social capital.

Interactive social exchange space, especially for lower-income groups, is an important building block of "bonding" and "bridging" social capital. This thesis presents a case study of Rosengård and Fosie, two large neighborhood areas in Malmö, Sweden that are interwoven with HSTI and have indicators of social capital decline. While there are many factors that contribute to Rosengård's and Fosie's socio-economic conditions, this paper will present theoretical and empirical evidence that HSTI disrupts and to some extent degrades their neighborhood functionality and stocks of social capital. Through use of traffic calming and creative transport initiatives, Malmö Stad and these neighborhoods may mitigate the negative impacts of HSTI by transforming HSTI from mono-functional movement corridors to a layered social and movement space.

Key words: Traffic, social capital, exchange, functionality, and neighborhood

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INTRODUCTION

“The realization that speed dominates stasis, and that stasis has become mere pause and rest, completely undermines the age-old concept of *permanence and identity* in favor of *transformation and event*. The city is being swept away by the metropolis. The action does not just replace one noun with another, but radically turns one state of affairs into *a state of perpetual motion*. As a collective action – a verb more than a noun – the metropolis destabilizes our sense of time and place. With the dissolution of the city into the forever-emerging metropolis, our existence slides into permanent mobility (Lerup, 2000, 77).”

Until recent years, Rosengård suffered from much higher crime rates than other neighborhoods in Malmö. Despite a number of national and municipal programs aimed to boost employment and stimulate better neighborhood conditions, Rosengård and certain Fosie neighborhoods have higher unemployment rates and social welfare dependence than most other sections of Malmö. Their relatively close proximity to central Malmö, along with multiple transport pathways provides these neighborhoods with good connectivity to other areas in Malmö. Despite the close physical location of Rosengård and Fosie to various recreational and commercial areas, along with walking streets and educational centers, Rosengård and some areas of Fosie are perceived to be unsafe and segregated neighborhoods, disconnected from Malmö and Sweden culturally, socially, and economically.

Several authors link Rosengård's relatively high unemployment rates, high residential turnover, social welfare dependence and "social distance" with the nature of the Swedish labor market and different forms of discrimination, not its physical location and structure. In her report, Ann-Katrin Bäcklund (2003) explains that the Swedish labor market has shifted from manufacturing jobs to service-oriented positions that require greater and greater information and communication skill sets. Automation, outsourcing, and horizontal, team-based organizational structures within the Swedish labor market are several trends that have placed higher demands on the communication and teamwork skills of employees. These trends have made it more difficult for foreign-born Swedes to enter and maintain employment in the Swedish labor market (Bäcklund, 2003). Hagetoft and Cars (2002) state that the high unemployment in Rosengård has to do with cultural differences and labor market discrimination and not with low physical access or physical isolation. A joint report of the Malmö Municipal Housing Company (MKB) and the Royal Institute of Technology links the high rate of unemployment among Rosengård's residents with their lack of integration into Swedish society (Andersson et. al., 1998).

This thesis offers a different slant on social distance, measured by neighborhood functionality and stocks of "bridging" social capital. Many forces influence the low employment and social distance of residents in Rosengård, as well as certain neighborhoods in Fosie. Labor market structure, language barriers, cultural practices, access to financial capital and markets, and community health are factors linked with economic and social participation levels in Rosengård and Fosie. While residents in Rosengård and Fosie may have difficulty finding employment due to their lack of human capital (e.g., language skills), discrimination, or other economic reasons, this thesis argues that there are also physical barriers in the area that disrupt social integration between Rosengård, Fosie and Malmö. Townroe (1995) claims that social exclusion is not only limited to low income residents but can also affect people of all income classes when there is "a *lack of access* at a level regarded by wider society to be both normal and appropriate to the key offerings of society – in education, health care, housing and recreational facilities." Urban community connection, interaction and social capital building requires neighborhood integration in four dimensions.

OBJECTIVES AND SCOPE

Putnam (2000, 317) comments on the link between social capital, neighborhood cohesion, and disadvantaged social groups:

"As we have seen, there is preliminary yet intriguing evidence that social trust, organizational participation, and neighborhood cohesion can help to break the link between economic disadvantage and teenage troublemaking. The problem, of course, is that social capital is often

lacking in disadvantaged areas, and it is difficult to build. Instead of a 'virtuous circle,' in which existing social capital facilitates the creation of more social capital, inner cities are too often marked by a vicious circle, in which low levels of trust and cohesion lead to higher levels of crime, which lead to even lower levels of trust and cohesion.”

This thesis targets the relationships between high-speed transport infrastructure (HSTI) and the functionality and social capital of two neighborhood areas in Malmö, Sweden. While high-speed transport corridors improve access for a segment of the population at a larger geographic scale, these conveyers also disable neighborhood functionality by stifling local social exchange. This thesis does not promote a deterministic view of neighborhoods or cities. Nor will it ignore or defend the idea that social capital differences among Malmö's neighborhoods partly result from Sweden's labor market structure. Through theoretical and empirical analysis of Rosengård and Fosie, this project reveals how HSTI disables critical neighborhood functions and in part explains social capital deficits in these neighborhoods.

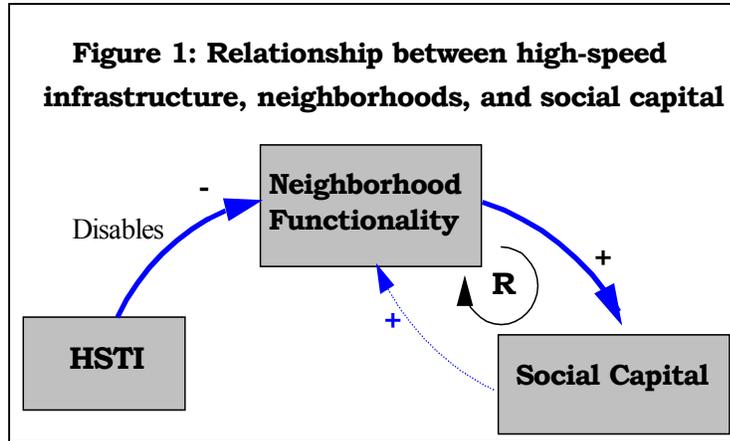


Figure 1 displays the relationship between the neighborhood functionality, social capital and high-speed transportation infrastructure. This thesis argues that rich neighborhood functionality bolsters social capital and burgeoning stocks of social capital also improve the functionality in neighborhoods over time. Through several direct and indirect influences, HSTI disables neighborhood

functionality, imposes direct and indirect physical constraints to diverse neighborhood social interaction and hinders the growth of local social capital.

The remainder of this section will delineate the scope and limitations of this research project. High-speed transport infrastructure will be defined. Neighborhood functionality and social capital are fundamental, yet broad and encompassing concepts that will be explained, limited, and operationalized for this project. While it is too extensive a task to examine the full impacts from HSTI on functionality and social capital development within neighborhoods, I will examine key linkages between HSTI, neighborhood function and form, and specific dimensions of social capital. The theoretical framework constructed in this thesis predicts that HSTI diminishes neighborhood functionality and reduces neighborhood social capital. Using empirical data and evidence from the case study, the thesis will test this theory in Rosengård and Fosie and propose ways to mitigate related negative trends.

High-speed Transport Infrastructure – Defined

Our current western society moves people and materials on a greater scale than ever before in history, ingraining our economies and lifestyles with movement. These dynamic material and human flows necessitate entrenched and large-scale physical conveyers that must be constructed, maintained, expanded, re-constructed and coordinated to manage the flows. In this context, HSTI takes on a more meaningful role. Along with other modes of transport and communication, HSTI defines our perception of our landscape, social, political, and economic systems. Khisty and Zeitler (2001, 597) regard mobility or speed maximization “to be one of the most desired goals of society and there is a constant thrust to build bigger and better facilities to expand the transport network for maximizing mobility.” Torsten Hägerstrand and Eric Clark (1996, 19) note that as transport infrastructure itself occupies more urban land area today, “transportation not only relates to land uses: it is itself a land use.” While transport infrastructure and mode are varied and intricate, including train, air, and sea transport of people and goods, for the purposes of this paper HSTI will be limited to the road network and the motor vehicles (e.g., cars, buses, lorries, etc.) that utilize this movement space. Further, this paper refines its discussion to include only intra-city HSTI that intertwines and dissects the urban and suburban landscapes.

Interface of Places and People: Neighborhood Functionality & Interactive Social Exchange Space

Neighborhoods include a physical environment and the interplay of people nested within that medium. Neighborhoods are dwelling places, places where residents may interact with family, neighbors, and friends within and outside their homes, and places where people can rest. Neighborhoods that are functionally diverse contain homes, work and play space, allow for rest, foster interaction and exchange among residents, allow people to grow food, and provide educational opportunities allow residents to meet more of their needs locally. Safe and diverse urban and suburban neighborhoods are composed of interactive social exchange space (ISES) and boast layered functionality for the residents. That is, residents may engage in flexible movement, social mixing, rest, education, and commerce within the same ISES. As attractive and multi-functional areas, neighborhoods can serve as a microcosm of the city for area residents. To function well, ISES must be safe, accessible, and non-discriminatory. In this manner, ISES encourages diverse community interaction among all groups in the community – workers, children, women, and elderly. The Swedish Urban Environmental Council (2003, 11) notes, "a fine-grained mix" of dwellings, work places, recreation, sport, service, culture, and education "encourages a lively city environment and combats segregation." Areas with extensive HSTI reduce the amount and effectiveness of intra- and inter -neighborhood ISES. These neighborhoods meet fewer needs for area residents within the neighborhood and ultimately obstruct local social capital development.

ISES is the medium within and between neighborhoods that fosters flexible social interaction and facilitates neighborhood cooperation and cohesion. As such, these spaces are essential building blocks of social capital. Person-friendly and healthy ISES allows neighbors to meet each other, find and engage in localized commerce, participate together in group activities, and build generalized trust – a cornerstone of social capital. Putnam (2000, 134) articulates that:

"When each of us can relax her guard a little, what economists term "transaction costs" – the costs of the everyday business of life, as well as the costs of commercial transactions – are reduced."

While allowing close friends and family members to forge tighter bonds, these areas also encourage informal interactions between loosely connected individuals. These loose ties lay part of the groundwork for generalized trust among neighbors and citizens labeled "thin" trust by Putnam. Generalized or "thin" trust differs from trust for friends or family, "thick" trust, in that thin trust is not based on these close personal relationships. Putnam provides several important points when he states that "thin" trust is even *more important* than "thick" trust because it allows us to expand our relationship base further. Neighborhoods and areas with productive ISES allow people the opportunity to spontaneously interact with neighbors and people outside of their immediate social circles. Over time, repeated and positive interactions grow "thin trust" among area residents. This "thin trust" is a crucial component of social capital, which provides other tangible benefits to individuals, the neighborhood, and the community at large.

Neighborhood ISES - Social Capital *LEGO* Blocks

Functionally diverse neighborhoods rich in ISES are social capital *LEGOs*. As building blocks of social capital, ISES provides the foundation for neighborhood social capital development through residents' exchange of ideas, values, and cultures. Scholars define the multi-faceted concept social capital differently. Fundamentally, social capital is based on relationships between people. This component distinguishes it from human capital, based on individual skills, and financial capital, based on monetary units (Mohan and Mohan, 2002). Francis Fukuyama (2002, 27) stresses that social capital "is shared norms or values that promote social cooperation, instantiated in actual social relationships." He contends that social capital "permits individuals to band together to defend their interests and organize to support collective needs." Fukuyama (2002, 23, 27) highlights that many regard social capital:

"as a key ingredient in both economic development and stable liberal democracy....Social capital directly affects the ability of people to organize for economic ends; it supports the creation of institutions and the rule of law; and is a vital underpinning of democracy, which is the source of legitimacy for the political frame-work in which development increasingly takes place."

Linström et. al. (2003, 1113) remark that most theorists define social capital as "the formal and informal social networks and associations that connect individuals and groups of individuals to each other" and include common features such as social participation in civic matters, social activities, and generalized trust of other people. They state that neighborhood social capital provides "affective support [for the health of the population] by being the source of self-esteem and mutual respect, by increasing access to local services and amenities...adaption of health behavior norms and social control over deviant health-related behaviors, and by facilitating the prevention of crime (Linström et. al., 2003, 1111)."

Putnam (2000, 135) links neighborhood social capital and economic development when he cites economic evidence showing that "trusting communities, other things being equal, have a measurable economic advantage...A society that relies on generalized reciprocity is more efficient than a distrustful society, for the same reason that money is more efficient than barter." Putnam distinguishes between "bridging" and "bonding" types of social capital. While "bonding" social capital is inward looking and forges tighter group bonds, "bridging" forms of social capital are outward looking, encompass more diverse relationships, and link people to external assets and information. Putnam notes the work from Mark Granovetter and other social mobility scientists that found that acquaintances, or "thin trust" relationships forged through "bridging" social capital are more important than friendship or family connections in leading people to employment opportunities. This correlation between acquaintance relationships and employment opportunities is even stronger for citizen groups lower on the socio-economic ladder. Neighborhoods with ISES help to build both "thin trust" and "bridging" forms of social capital.

Mohan and Mohan (2002) provide a useful critique of social capital as a concept, noting that social capital is defined differently by different groups and is difficult to operationalize. This thesis employs the tenets that productive social capital is formed through both informal and formal interaction and that it is a public good (i.e., that it is non-excludable). Importantly, this thesis argues that social capital is also place dependent. To operationalize social capital, I employ specific dimensions of social capital delineated by the Saguaro Seminar. Spearheaded by Robert D. Putnam and sponsored by the John F. Kennedy School of Government at Harvard University, the Saguaro Seminar employed a group of social capital practitioners to develop indicators of social capital. The Saguaro Seminar ultimately delineated 11 dimensions of social capital, which are listed and summarized briefly in Table 1.

Table 1: The Saguaro Seminar Dimensions of Social Capital

Social trust	The core of social capital, social trust includes trust for neighbors, co-workers, police and "most people."
Inter-racial trust	The extent to which different racial groups trust one another
Diversity of friendships	A measure of how diverse people's friendship networks are in terms of socio-economic class, sexual orientation, etc.
Conventional politics participation	The extent to which communities are registered to vote, actually vote, express interest in politics, and read newspapers regularly
Protest politics participation	Participation in marches, demonstrations, boycotts, rallies, and taking action for local reform
Civic leadership	Involvement in groups, clubs, and local discussions of local affairs and whether respondents were leaders of these groups
Associational involvement	Generally, how involved respondents are in a broad range of organizational activities, from religious involvement to labor unions to garden clubs
Informal socializing	Measures the degree to which residents had friends over to their home, hung out with friends in public places, socialize outside of work, engaged in more loosely organized social activities
Giving and volunteering	Giving money or time to charities
Faith-based engagement	A measure of religious attendance and membership, and participation in church activities and religious organizations
Equality of civic engagement across the community	A measure of how equal civic engagement measures are distributed in communities among different socio-economic groups

I limit my empirical analysis to four dimensions of social capital: conventional politics participation, social trust, associational involvement, and informal socializing. The Saguaro Seminar developed their 11 social capital dimensions for a phone survey in the United States; therefore, it is difficult to know whether or not all 11 measures are appropriate proxies of social capital in Sweden. To accommodate the Swedish context and to augment transferability, I select four of the broader dimensions of social capital for the case study of Rosengård and Fosie. Three of these measures, social trust, conventional politics participation, and associational involvement, have been used in published research as proxies of social capital in Sweden (Lindström et. al., 2003; Stolle, 1998). Voter participation is one of the more common proxies of social capital and as Lindström et. al. (2003, 1113) note, voting is "an instructive proxy measure of broader social change." While not specifically designating their proxy as informal socializing, Linström et.al. (2001) utilized psychosocial factors such as social participation, social anchorage, emotional support and instrumental support as their social capital proxy in Malmö. Social trust is a cornerstone of social capital and is correlated with associational involvement. While some activities blur the line between informal and formal, I will operationalize informal socializing as those social encounters and interactions that are loosely, if at all, organized and are more serendipitous in nature.

Informal socializing includes more happenstance activities that take place locally within ISES, either indoor or outdoor, and allow people to meet that otherwise may not encounter each other. ISES acts as fuel injection for resident socializing and facilitates bonding and dynamism within and between neighborhoods. While allowing people to build rootedness in their neighborhood, informal socializing can lead to more trusting relationships with neighbors and other community members, building generalized social trust, boosting conventional politics participation, and stimulating associational involvement. The richness of informal social networks in neighborhoods may account for a portion of the disparity in social capital between different neighborhoods in Malmö.

I will not argue or assume that all informal socializing is productive or *causes* generalized trust building. Certainly, some forms of informal socializing and associational involvement, like organized criminal activity or rigid ethnic enclaves, run counter to generalized trust building. While not ignoring these counter-productive forces, this thesis focuses on the constructive formal and informal activities that work in tandem to build "bridging" social capital. People that are engaged in positive informal activities as well as those individuals that participate in numerous formal associations build generalized trust. Stolle (1998), who researched the development of generalized trust in voluntary associations in Sweden and Germany, found that people who join associations already are more trusting than people who do not join. Stolle highlights that while there is an additional boost to generalized trust for association members during the initial group-socializing phase, membership over time "does not have an added linear effect on generalized trust." This thesis argues that informal socializing and formal associational mutually reinforce trust building and neighborhood social capital.

HSTI: Facilitating Movement but Imposing Social Costs

The benefits of HSTI for certain Malmö residents should not be ignored. Automobiles and HSTI provide many urban and suburban residents with convenient, door-to-door access to local, regional, and distant locations. The Swedish Institute for Transportation and Communication Analysis (SIKA, 2003) reports that on average, Swedes travel 45 km per person and day and that 69% of these kilometers are made by car. Most of these car kilometers are used by Swedes to travel to and from work during weekdays (i.e., for local travel) and for leisure purposes on the weekends. Automobiles and HSTI enables a portion of Malmö residents to travel flexibly to and from work and school, to various affairs, and to transport goods from these locations to their homes. Currently, many car owners rely on their car as the final link in the retail transport system, to convey retail goods from area stores and businesses to their homes (Goodwin, 1995). HSTI and cars enable automobile owners (and their families) instant mobility and access, around-the-clock, to social events and work-related functions. Many Swedes utilize their vehicles for medium and long distance travelling. SIKA (2003,71) reports that "it is only for really long journeys, over 600 km one way trip, that air travel is preferred to more or less the same extent as the car for domestic passenger transport performance. Shorter journeys are usually made by car."

General statistics are informative for general pictures, but they do reveal that only one in four Swedes own a car and less than one in four Malmö residents own a vehicle. While many Malmö residents do not receive the full benefits of automotive use, all of Malmö residents realize the significant impacts of the transport sector on the local and regional environment, human health, national economies, and our social patterns. Recent studies and data note the increasing negative external effects of the transport sector on local and regional air quality, its contribution to global climate change, stifling effects on economic activity and growth, and social disruption. In Sweden, Johansson (1997) reports that the transportation sector contributes significantly to local hydrocarbon, nitrogen dioxide, sulfur dioxide, and carbon dioxide emissions as well as to disruption of local natural and cultural environments through noise, water pollution, and physical encroachment. The Economist (1996, 6) finds that while there is “no clear relationship between the benefits of a car trip and the social costs incurred...” that the social external costs of driving ranges from lower estimates of 2.5% of GDP for developed countries up to 12% of GDP in the United States and 4.6% in Europe. Delucchi (1997) finds a range of \$231 to \$1,120.2 billion USD in total public sector and externality costs in the United States 1991. These costs, which are not born by car users, included highway construction and maintenance costs, loss of economic activity from congestion, medical costs of victims of car accidents, health illnesses resulting from air pollution, and noise and water pollution.

This thesis can not address the range of environmental, health, and social concerns generated from HSTI in Malmö. Instead, I will target the impairing effects of HSTI on neighborhood social capital development, which is linked to our greater economic and socio-political health. It is likely that automobile owners can and do engage in activities that extend their social networks over greater distances, building social capital in some respects. However, HSTI interferes especially with development of "bridging" forms of social capital in Rosengård and Fosie in several ways. HSTI spatially separates neighborhoods and traffic space acts as a barrier between these living areas. This wall effect cuts down on inter-neighborhood interaction. As Engwicht (1993) states, HSTI also imposes a "zone-of-influence" over ISES, impairing local neighborhood interaction. Finally, the movement space occupied by HSTI increases distance between other land uses and necessitates that residents move further to meet their household needs. This movement time cuts down on the time residents may engage in informal and formal community involvement. The costs from these three effects on social capital are especially significant and acute for groups that do not receive the benefits of car use, including children, young adults, elderly residents, women who do not work, and lower-income residents.

The emergence of neighborhood social capital is dependent on numerous variables and components. Jane Jacobs (1961, 50) likens the well-functioning urban neighborhood fabric to "an intricate ballet in which the individual dancers and ensembles all have distinctive parts which miraculously reinforce each other and compose an orderly whole." If neighborhood public areas are stressful and do not allow for mental and physical rest, residents will recede to their homes. Interactive social exchange space is, by its nature, diverse in function, form, and attraction, but is also fragile. HSTI disrupts ISES and over time may impose permanent control over neighborhood space. To combat these impacts, HSTI must be re-thought as not simply a movement space, but as a layered social and movement space. By fostering low-speed movement and improving functionality for all residents, urban and suburban neighborhoods may improve their overall functionality. Eventually neighborhood areas may boast the functions of the greater city, creating a Fractal City. These ideas, along with specific measures to stimulate neighborhood improvements in Rosengård and Fosie will be expanded in the Discussion section.

METHODS & MATERIALS

This study focuses on the local functionality constraints imposed by HSTI and its interference with neighborhood social capital building. To focus the goals and develop this thesis, I utilized deductive and inductive reasoning. These processes congealed to help me arrive at my specific research questions, develop appropriate methodologies, and collect the research materials necessary for the project. As this study focuses on contemporary events, asks ‘how’ and ‘what’ research questions, and does not control nor attempt to control behavioral events of people living in their neighborhoods, I employ two research methodologies to address and test my research questions: 1) a case study methodology, and 2) a

residential survey. These strategies correspond to Robert K. Yin's description of relevant situations for research strategies, which he outlines in *Case Study Research: Design and Methods*. Yin (2003, 9) explains that the case study is an advantageous research method when "a 'how' or 'why' question is being asked about a contemporary set of events, over which the investigator has little or no control." Similarly, Yin articulates that a survey strategy can be employed with questions of 'what' and 'how much' when the researcher can not or does not control behavioral events.

Employing Inductive and Deductive Reasoning Processes

Initially, the ideas for this research stemmed from site visits to Rosengård, a residential area in Malmö, in May 2003 as part of a project with the Lund University Master's in Environmental Science (LUMES) course Urban Systems. During these initial site visits, I experienced a confusion of place. In retrospect, I believe this confusion stemmed from the surprising diversity of people, languages, and shops in Rosengård, juxtaposed over a planned, sectioned, and non-distinctive infrastructure. This infrastructure is uniform in design, with many similar high-rise apartment buildings and other built structures (e.g., playgrounds and courtyards), and has a lack directional landmarks and signage. With these early observations and notes in Rosengård, I formed the hypothesis that the built environment can limit neighborhood functionality. This process involved inductive reasoning, beginning at the observation level and working toward the theoretical or general level (Trochim, 2003).

Concurrently in May 2003, I also attended lectures on urban form and development, including a specific case study of Rosengård. These lectures and early literature reviews provided me with established theoretical notions of urban form and its connection with social fragmentation. This deductive process, beginning with theories and then moving towards hypothesis, observation, and confirmation continued as I explored different types of literature and worked with my thesis advisor. Trochim, a Cornell University research methods professor, explains in his Research Methods Knowledge Base that much of social science involves a combination of inductive and deductive processes during the course of the research project.

Research Strategies

While I employed two research strategies to test my research questions and support my theoretical framework, the residential survey served as primary data for the case study. This case study involved scrutiny of two, primarily residential areas in Malmö: Rosengård and Fosie. I analyzed Rosengård and Fosie to observe how and to what extent the transport infrastructure in these neighborhoods impacts neighborhood functionality and the social capital of area residents. Rosengård, in particular, is a socially troubled area with higher unemployment, higher resident turnover, and more social welfare dependant residents than any other area in Malmö. This area has received attention by the media, citizens, politicians, social scientists and others due to its social conditions. With this thesis, I hope to test to what degree HSTI and neighborhood functionality plays a role in social capital levels of the case study area. Given that HSTI will influence the residents favorably and unfavorably, this thesis dissects the types of impacts it has on neighborhood functionality and area social capital.

In addition to the social characteristics of Rosengård, I choose this case study area for several reasons. Importantly, Malmö is close in proximity to Lund, which allowed me to make frequent site visits to Rosengård and Fosie. These neighborhoods are zoned primarily residential or residential/commercial (although both have some industrial zoning also) and they have a diverse ethnic character and mix of socio-economic groups (Malmö Stad, 2000). Fosie and Rosengård contain multiple housing types, including high-rise apartment complexes, owned and rented mid-rise apartments, as well as single-family homes. Rosengård was mainly developed during the million dwellings era in Sweden, when remarkably between 1965 and 1974 the Swedish government constructed over a million dwellings nationwide. The million dwellings areas are zoned in a traditional, planned fashion that separates land-use types for the most part (i.e., housing from commercial use, industry from housing, etc.). Rosengård is planned to completely separate HSTI from pedestrian traffic in order to create safer pedestrian pathways. Fosie developed during different periods and is more mixed in its development styles, architecture, and layout. Overall, the case study neighborhoods are primarily residential, but also host various commercial

activities, businesses, industrial uses, and recreational areas. The transportation infrastructure in and surrounding these neighborhoods is also quite intricate, including both primary and secondary roads (with various degrees of traffic flow), railroad infrastructure, bus routes, bicycle lanes, and pedestrian walkways.

Primary Data Sources – Site Observations and Interviews

For this case study, I used the following primary, qualitative sources of information: site visits, field notes and observations, interviews with relevant individuals in Malmö, and a residential survey. From May 2003 until October 2003, I made approximately 15 site visits to Rosengård and Fosie to observe the areas, collect information, and meet with interviewees. During these trips, I walked through the case study neighborhoods using different routes and explored different sections of these neighborhoods. I used these site visits to make general observations about the neighborhoods, and at times took notes and pictures of points of interest. I concentrated much of this time on observing the neighborhoods of Örtagården (Rosengård), Törnrosen, Persborg, and Augustenborg. While I maintained my notes of these trips, I did not create a formal field notebook to include as an appendix due to time constraints involved in recreating these notes. I have included area photos in Appendix 4 and note my observations when relevant.

I conducted one-hour long, semi-structured, in-depth interviews to focus my research questions, to gather transport information and traffic data in Malmö, and collect information relevant to the case study area. I arranged interviews with members of the traffic and planning divisions in Malmö Stad, representatives of the municipal housing company (MKB) working in Rosengård, a project manager in Augustenborg (Fosie), individuals working on a neighborhood network forum (Aktivstad) in Fosie, and a social capital researcher working at Lund Community Health Department. I asked the interviewees prepared and follow-up questions, taking notes that summarized their answers or in some cases recording the answers word for word. After each interview, I typed up the questions and answers to maintain an accurate account of the interviews for my records. Appendix 2 contains a written account of the interviews and the dates and time each interviews took place.

While I believe that my written summaries of these interviews accurately reflect the answers I received from each interviewee, these summaries are not full accounts of each answer and are not perfectly reflective of all the responses. I did take copious notes during the interviews and took pauses during the interviews to "catch up." I did not tape record these interviews due to the time constraints involved with reproducing the accounts word-for-word. To reduce any bias in the responses of the interviewees, I limited the amount of information I provided to interviewees regarding the specifics of my research project until after the interviews were concluded. Most of the interviewees recognized that my research was related to transport and the Rosengård area; however, I did not provide them with information concerning my specific research questions or theoretical framework.

Primary Data Sources – Residential Survey

As Rosengård and Fosie are large areas in Malmö, I limited my survey distribution to Örtagården and Törnrosen in Rosengård, as well as neighborhoods in Fosie. In addition, I received several surveys from the Annelund neighborhood, which is located just west of Törnrosen and may be considered part of Södra Innerstaden. Approximately 550 residents in these neighborhoods had an opportunity to reply to the residential survey. The residential survey form, located in Appendix 3, consists of two sections, one section soliciting personal information and the second part asking the respondent questions about their personal habits and their neighborhood. This three-page survey was designed to solicit three main sets of information from respondents: 1) personal and demographic information; 2) personal habits, activities, positive and negative feelings about their neighborhood and; 3) formal and informal community involvement and levels of trust. I use the first part of the survey to gather personal information, including sex, gender, home address, age, how long they have lived in Malmö and in Sweden. Respondents noted the time they spend each week in various forms of transportation (e.g., car, bus, bicycle, walking) and whether or not they own a vehicle. Respondents also explain whether or not they are involved in neighborhood or social organizations and if so, how often they participate in these activities.

The second part of the survey gathers information on the residents' social patterns, whether or not they have friends in their neighborhood, how many of them know their neighbors, and how involved they are with their neighbors. Respondents note where specifically they enjoy spending time with their neighbors and friends or where they meet them around the neighborhood. This section asks respondents whether or not they feel that there are enough neighborhood activities, local stores, socializing areas, work places, transport, cycle and walking pathways and green space. Further, respondents identify what types of problems they have in their neighborhoods and what is their biggest problem with the neighborhood. The survey identifies how much trust the respondent holds for their neighbors, generalized trust for Malmö residents, and for the police force in Malmö. In addition, the survey uses an open question to determine what respondents' would change, if anything, in their neighborhood. Lastly, I used an area street map on the survey and had residents identify specific areas they enjoy in the neighborhood, areas they think are unsafe, where they may have friends in their neighborhood, and whether any areas have too much traffic.

I created and based the survey questions on my own observations in the neighborhoods and also from the September 2002 draft of the Social Capital Community Benchmark Survey (SCCBS). The SCCBS, a product of the Saguaro Seminar: Civic Engagement in America project at the John F. Kennedy School of Government at Harvard University, gave me insight on formulating questions and gathering pertinent information on social capital. As mentioned in the Objectives and Scope section, I utilized the more general measures of social capital, generalized trust, conventional politics participation, associational involvement, and informal socializing to accommodate greater transferability and transparency of this survey and case study. While these sources helped me to direct and focus my survey questions, I developed the survey instrument uniquely and independently worded and arranged all of the questions.

To reduce order bias in the survey, I arranged the survey questions so that the respondents' answers would not be influenced by previous, leading questions. For example, the open question pertaining to what the respondent feels is the biggest problem in their neighborhood (question 4 in the second part of the survey) is not preceded by any question that lists neighborhood problems. The question that provides the respondent with a list of potential problems to choose from is placed later in the survey (question 7 in the second part). This survey is also written in its final form in Swedish, a language that to this point I have not mastered. Therefore, I employed help from my friend, Linn Keife, and my thesis advisor, both fluent Swedish language speakers, to translate the survey instrument from English to Swedish.

I distributed the neighborhood surveys and collected the survey data from respondents in two ways. In Örtagården, Törnrosen, and Annelund, the municipal housing office (MKB) distributed 65 hard copy surveys and cover letters by mail to the neighborhood trappvärdar (stair helpers) in these neighborhoods. The neighborhood trappvärdar serve as community liaisons between MKB and area residents. In order to minimize bias, I did not disclose the details of my research questions but only announced that I was researching neighborhoods in Malmö as part of my master's research at Lund University. Survey respondents returned completed survey forms to a designated contact in the MKB office in Örtagården.

Residents in Fosie completed the neighborhood survey electronically using the Aktivstad local community network. Martin Eriksson, who maintains the Aktivstad electronic forum for Fosie residents, posted the neighborhood survey on Aktivstad and assisted me with data collection. The Aktivstad network is intended to support the needs of Fosie residents, who can use the network as a virtual community, for different community organization functions, for personal e-mail correspondence, and for learning about community events and activities (Interview with Martin Eriksson, 2003). While the Aktivstad network supports between 700 and 800 active residents in Fosie, the survey was distributed to approximately 500 of these residents as a portion of them are not active user. Martin posted the survey electronically, emailed Aktivstad users that the survey was posted, and had members of the Aktivstad network fill out the survey online. Their survey responses were tallied electronically and saved in a locked, password-protected account until I retrieved the data.

As I employed the use of an electronic survey and hard-copy survey, I ensured that all the questions were worded similarly for ease of data compilation. In one case, I had to change the instructions slightly on the electronic survey for the final question, where I asked residents to mark specific

information on a map. The electronic format did not allow me to include the map in the online survey; therefore, I asked residents to write out very specific information (including street names) to answer this question. When I received a sufficient number of hard copy and electronic surveys, I collected the hard copies directly from the MKB office located in Örtagården and opened the locked Aktivstad account to retrieve the electronic surveys. By going onsite to collect the hard copy surveys, I tried to ensure the validity and integrity of the residents' data.

Importantly, this survey was distributed to a limited number of residents under a tight schedule and budget. Therefore, this survey could not be distributed to a wider number of residents. Due to the time constraints, I employed the help of my contacts in the area, both MKB and Martin Eriksson. While I believe that these contacts helped me to engage more people in the area, it also complicates my survey population samples and resulted in a relatively low number of responses. In Örtagården, Törnrosen, and Annelund the resident population sample consists exclusively of trappvärdar, or stair helpers, living in the neighborhood. These residents serve as the points of contact to MKB for a given number of residents located in their apartment buildings or floor levels. Twenty-five out of 65 trappvärdar completed the surveys, a 38% response rate. Trappvärdar may be more active or involved in their community and more likely to have established relationships with their neighbors by distributing correspondence and information from MKB to other residents. MKB has also been actively involved in encouraging social organizations and community events in Örtagården and Törnrosen over the past few years. Therefore, this sample population may be more involved in community associations or organizations, and may be more knowledgeable about community events.

With these sampling limitations in mind, I feel that the survey responses from the trappvärdar respondents are interesting precisely because their survey results do not provide an average picture of either Örtagården or Rosengård. In fact, I believe that their results provide an *optimistic account* of the area social capital. These individuals, while not average neighbors, are more likely to be knowledgeable about the problems and limitations in their neighborhoods. They are more likely to correspond with their neighbors about various issues, to be active socially, and to have regular correspondence with MKB about ongoing neighborhood projects. In general, the results of their surveys may provide keener insight into the social capital of the area and to overall neighborhood functionality.

The population that I sampled in Fosie is also not likely an average representation of Fosie residents. With the help of Martin Eriksson, I distributed the survey electronically to the Aktivstad users in Fosie. While all of the Aktivstad users live in Fosie, most of these users are Swedish-born citizens, are over 30 years of age, and are more likely to have a personal computer (indicating they may be in a higher socio-economic group). This population also signed up for the Aktivstad project, meaning they may have more interest in the democratic process than average residents. The Aktivstad project has tried to encourage a more diverse and larger membership in several ways, including providing free personal computers and Internet connection to area grocery stores, employment centers, and libraries. However, these efforts have still not resulted in widespread use of the system by area residents. (Interview with Martin Eriksson, 2003)

I believe selection bias exists in both survey groups. The response rate from the electronic survey was very low, with only 16 responses of a sample population of about 490 (approximately a 3% response rate). However, this sample population is also interesting. First, the sample is on average more "Swedish" as almost all respondents are older, native-born Swedes. Also, there are more pensionär (retired persons) in this sample than the average resident population in Fosie. This older group may spend more time in the neighborhood, be less likely to use an automobile, and may rely more on their local neighborhood to meet their needs. Also, on average this sample population has lived in their current neighborhood for more than 10 years and has regular access to the Aktivstad network. Therefore, this population may earn a better living than the average resident (i.e., own their own computer) and could be better informed and interested about events in their community and neighborhood.

Considering the low response rate from the neighborhood questionnaire, I will use the survey results cautiously. Given, the respondents are not an average, representative sample of Rosengård or Fosie residents. However, these respondents may be more informed about their neighborhoods than average residents given the group characteristics and selection bias in the survey distribution. In general, I believe the survey population will be more involved in the community, be more likely to participate in

associations, and therefore have a commensurately higher trust level than an average sample of Rosengård and Fosie residents.

Secondary Information Sources

The case study also taps secondary sources of information, including data and information provided by Malmö Stad, the interviewees, and journal articles gathered from the ELIN database at Lund University. Some of these secondary sources are official municipal government sources and statistics, including the traffic statistics for Malmö, maps of Malmö, history on the development of Malmö and Rosengård, and planning and development information for the city. This information was provided to me in written form courtesy of Göran Rosberg, Stina Nilsson, and Malmö Stad, maps and statistics were also available on the Internet at the official Malmö website (www.malmo.se). I also obtained written material on the development of the Ekostaden project in Augustenborg from Trevor Graham, the project manager. I obtained statistics and data on Rosengård during the LUMES Urban Systems course, and from Benny Carlsson, a professor in the Department of Economic History at Lund University. Lastly, I used several related newspaper articles from the local newspaper, *Sydsvenskan*.

THEORETICAL FRAMEWORK – SPREADING OUT, FENCING IN

The theoretical framework described in this section is based on interpretations of secondary sources, including books and literature, studies from multiple academic areas, and from Swedish government data. I drew information from many literature sources in the disciplines of urban systems, political science, transportation planning and development, economics, ecology, health sciences, sociology, and systems dynamics. In addition, this framework developed from my field observations in Rosengård, interviews, relevant Urban Systems lectures, and the use of systems analysis. I have already described the site visits to Rosengård and Fosie and my interviews in the Methods and Materials section of this paper. I employed the use of systems analysis and causal loop diagrams (CLDs) to select and develop of the specific variables analyzed in this study. These CLDs, which are included in this section, will help to explain the relationships between HSTI, ISES, and neighborhood social capital.

Space & Layers of Function

The car has permeated not only the transport sector but also largely influences neighborhood, social, and cultural life (Jensen, 1999). Jackson (2003) finds that "the car is very much a design issue, as homes, businesses, and the entire road network have evolved in form to accommodate the car's operational and parking needs. Cars both *enable and force* (emphasis mine) people to venture across the landscape in their daily activities." Importantly, HSTI within urban and suburban communities bring these communities crucial services, including fire, police, and emergency health services as well as various goods provision and delivery services. Especially for the vehicle-owning population of Malmö's neighborhoods, HSTI offers them a vital connection to their work, outside social networks, and various leisure activities. However, HSTI has marked impacts on communities and neighborhoods that are not fully understood. With the advent of HSTI and instant communication technologies, the social networks of certain neighborhood residents are no longer tied to the neighborhood. Automobile owners can utilize this flexible transport to maintain and disperse their social networks over far flung distances, to such extent that their social connectivity is not dependant on their neighborhood. While HSTI grants us regional and interstate connectivity, it simultaneously undermines our local social networks.

Paterson (1997) cites several studies in North America and Australia expressing the ways in which automobile traffic has eroded communities by splitting communities and separating community functions. He highlights that instead of having ties and responsibilities to the neighborhood and local community, "we become extended communities of people with similar interests, devoid of any spatial requirements or responsibilities; we know people on the other side of town but we may not know our next-door neighbour." Randall Crane (1996) notes:

"Cars do pollute and eat up our time, whatever their overall value in a mobile society. They likewise tend to monopolize the 'public space' of the street, which had always been a key element of the social fabric. Thus, even freshly built developments seem to lack charm, and perhaps in certain respects they lack functionality as well."

Crane identifies two critical concepts here: space allocation and the layered functionality of space. While ISES serves many functions within a given space, HSTI occupies space that primarily satisfies the users' need for movement. In other words, HSTI is mono-functional: moving person X (or multiple persons) or good Y (or many Ys), or both people and goods, from point A to point B, expeditiously. Of course, this statement is simplistic. Government agencies, firms, and individuals utilize HSTI to provide goods and services as well. For example, local governments use HSTI to transport garbage and refuse from the city, maintain city infrastructure such as water, sewer, and electricity systems, and police neighborhoods. Local emergency workers rush citizens to hospitals for life-saving procedures. Firms employ HSTI for movement of goods throughout cities. Citizens may use HSTI not only for mobility but also for enjoyment of the driving experience and travel. HSTI feeds, lubricates and is fed by the local, regional, and national economy.

While HSTI has its concrete benefits, it also imposes large economic and social costs on society, especially for those segments of the population that do not use the automobile. Notwithstanding the external costs of air and water pollution from vehicles on human health and ecosystem services, several authors have shown that noise and other disturbances from HSTI impose high economic costs to area residents. In Sweden, Wilhelmsson (2000) explains that almost 1.6 million people are affected by road noise in their homes. Of these individuals, 20% live in high noise-polluted areas where the noise levels are above 65 dBA. Using hedonic pricing, Wilhelmsson finds that noise from HSTI can reduce single-family housing values in high noise-polluted areas of Stockholm by up to 30%. Given that a portion of trips on local HSTI have multiple purposes or functions, data from Malmö Stad and SIKa suggest that *individuals in personal vehicles make the vast majority of trips on HSTI in Malmö and in Sweden*. Therefore, the magnitude of HSTI person trips in Malmö is not for government-related services, or for goods shipments; rather, it is for personal, high-speed movement. While less than 4 in 10 Malmö residents have a car (Malmö Stad, 2003(1)), all residents in high trafficked, noise-polluted areas pay the costs of personal vehicle travel.

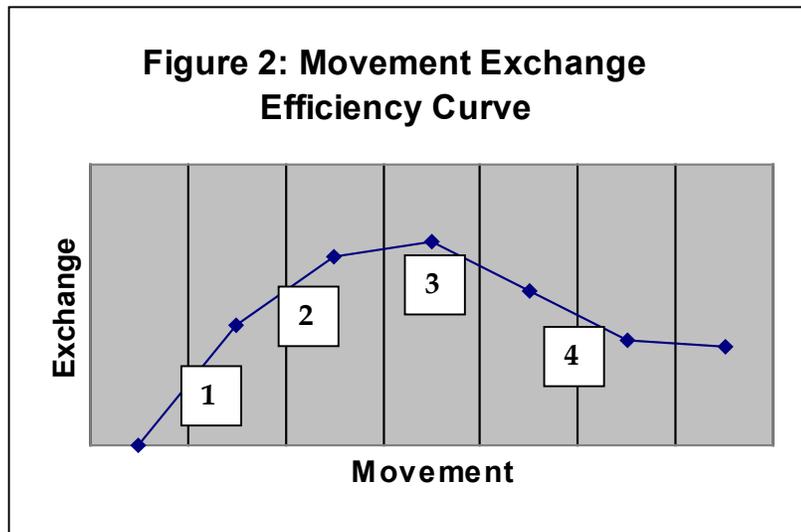
As opposed to mainly mono-function, high-speed movement spaces, neighborhoods are layered spaces. That is, neighborhoods with ISES offer rest, comfort, and interactive opportunities within the same space. By introducing or building HSTI into existing or developing neighborhoods, we have injected greater amounts of mono-functional movement space into neighborhood ISES. To compensate for this loss of functionality, urban and suburban neighborhoods spread out over larger areas. Strikingly, HSTI occupies very large amounts of space, especially when serving single-occupancy vehicles. Whitelegg (1993, 132) provides evidence from a Swiss study to demonstrate that space must "be consumed in large quantities to provide the infrastructure for high-speed travel, as can be witnessed in the new land requirements for new motorways, high-speed rail routes, and airports...Urban motorway and "relief" road construction is the ultimate expression of space sacrificed for speed." Table 2 demonstrates the amount of space required per person for various forms of pedestrian and high-speed transport (Table 2 adopted from Navarro et. al., 1985). Khisty and Zeitler (2001, 600) argue that the "space-time concept (the product of the land area occupied by a vehicle and the time of occupation) is a powerful one...Automobiles not only consume large quantities of nonrenewable energy and other natural resources, but also consume vast amounts of land."

Engwicht (1993) stresses that the increased presence of HSTI comes at a high cost to social networks and interaction in neighborhoods. He contends that space allocated to high-speed mobility results in spread out neighborhoods and that communities must expand in area to compensate for lost social exchange opportunities. Therefore, if HSTI were not present in the neighborhood or movement was slowed down sufficiently, more localized social exchange could occur within that same neighborhood space. Engwicht highlights four stages of high-speed movement and its impact on exchange efficiency, which he explains by way of a movement exchange efficiency curve (Figure 2 displays this curve, adopted from Engwicht, 1993, p.60). In Stage 1, a low level of high-speed movement increases exchange opportunities among neighborhood residents. With more high-speed movement, exchange continues to increase but at a decreasing rate (Stage 2).

Table 2: A Comparison of Space Requirements for Various Transport Modes

Transport Mode	Speed (Km/h)	Space required (M ² per Person)
Pedestrian	5	0.8
Cyclist	10	3.0
Fully Occupied Car	10	6.2
Fully Occupied Car	40	20.0
Car with 1 Person	10	18.7
Car with 1 Person	40	60.0
Bus- Full and 1/3 Full	10	3.1 Full 9.4 1/3 Full
Bus- Full	30	9.4 Full
Light Rail/Metro – Full and 1/3 Full	20	1.5 Full 4.6 1/3 Full

Stage 3 is the pinnacle equilibrium point, when high-speed movement reaches a level that maximizes local spontaneous exchange. During Stage 4, additional high-speed movement erodes exchange opportunities by converting neighborhood space to movement space and creating fixed barriers to exchange.

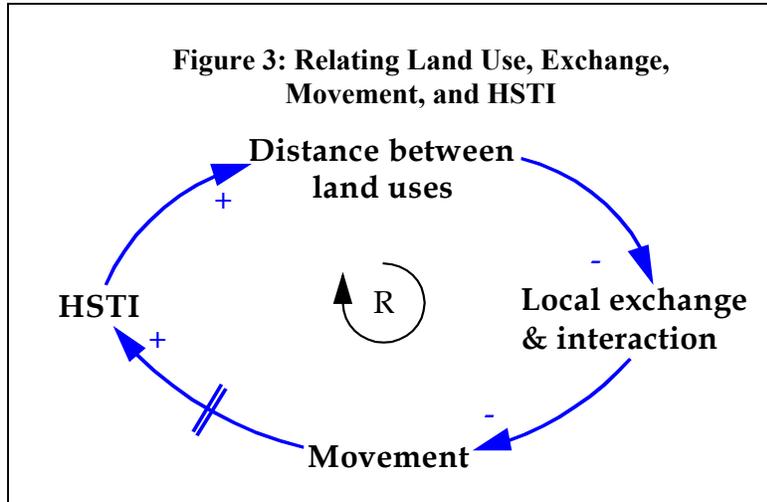


Hagerstrand and Clark (1996, 25) note:

“it is easy to show graphically that as property size increases in a built environment, so does the distance between various land uses, and thereby the amount of movement required for the same amount of exchange and interaction. To fulfil the increased need for movement between places, the domains dedicated to transportation are expanded, in length and breadth, creating even greater distances between land uses.”

Figure 3 demonstrates the reinforcing systemic relationships between land use distance, local exchange, amount of movement, and HSTI. As high-speed transport infrastructure develops in urban and suburban

areas, occupying greater space dedicated to movement, the distance between other types of land uses increases. This greater distance between land uses interferes with local exchange and interaction in several ways. First, HSTI creates physical barriers to community exchange. Simply, a high-speed transport corridor can not serve as a playground. It is a movement space, not a social space. Secondly, residents must move greater distances to meet their local needs (e.g., shopping, work, socializing) and this could reduce their exchange possibilities in two ways. By moving greater distances, more of the residents' time may be devoted to movement, reducing time available for exchange. Or, if residents turn to the high-



speed car to maintain an equal time dedicated to movement on an average day, then this movement is primarily movement alone, with fewer chances for social interaction. Over time, this process reinforces the need for maintaining and expanding the domain of HSTI. The momentum caused by individual decisions to engage in high-speed movement hardens the HSTI arteries around the community. As more citizens become tied to the vehicle to meet their household needs and daily exchanges, local governments attempt to meet the movement

demand by constructing more HSTI to accommodate the demand. This new development and construction reinforces the cycle, creating harder movement arteries.

HSTI = High-Speed Neighborhood Disruption

In his landmark study, Donald Appleyard (1976) linked social interaction with traffic intensity by comparing neighborhood streets in San Francisco, California. While these streets had demographically similar characteristics, they differed in their daily traffic volumes. Appleyard demonstrated that residents of the more heavily trafficked streets had considerably less social interaction, trust, and neighborhood ties than on the streets with less traffic. Appleyard's study demonstrated that average residents on high-trafficked streets or High Streets (16,000 or more vehicles per day) receded to the back of their houses and apartments, utilized the street only when necessary, and had comparably fewer local friends and acquaintances. Meanwhile, residents on the light-trafficked streets or Light Streets (2000 vehicles per day) were much more engaged in their street, had many friends and acquaintances, and were generally more aware of their own street. More specifically, his results showed that Light Street residents had approximately three times more friends and twice as many acquaintances as did Heavy Street residents.

To account for this social gap, Appleyard showed that residents of Light Streets considered their home territory to extend beyond the physical confines of their homes. By conducting interviews and mapping social interactive patterns on the three streets, Appleyard found that Light Street residents utilized the street space as a social space. On Heavy Streets, residents considered their home territory mainly indoors and some residents even limited this area to the rooms in their house away from the street. Residents on Light Streets had ISES within which to meet neighbors, people visiting the neighborhood, and friends on their street. Heavy Street residents were confined to their physical houses and had fewer chances to meet with and encounter their neighbors.

For readers that have walked beside a heavily trafficked street, Appleyard's findings are not shocking. HSTI creates noise, vibrations, dust, particulate matter and other types of noxious exhaust. In addition to these disruptions, pedestrians must be more aware of their personal safety the closer they are to HSTI. These distractions make spaces adjacent to HSTI much less attractive spaces within which to engage in spontaneous conversation or activities. Appleyard (1976, p.259-261) links three main traffic variables, volume, composition, and speed, to the overall disturbances of traffic and effects on street life. These disturbances include danger, noise, vibration, air pollution, dirt and litter, and appearance, and can

result in pedestrian death and injury, restrict children's play in the neighborhood, and interrupt indoor activities like eating and sleeping. Appleyard showed that street quality, including aspects such as safety for children, privacy, sense of home territory, responsibility, shared activities, and number of social contacts all declined with increased traffic volume. His research shows that these street qualities decline steadily with increasing traffic volume from low traffic levels up to 10,000 to 15,000 cars per day. At these higher levels of traffic volume, the percentages of people disturbed continued to increase but at a decreasing rate. Over time, these disturbances can diminish friendships and acquaintances and increase crime. Engwicht (1993, 48) stresses "that not only does [HSTI] take over the space [pedestrians] need for moving, [it] also [has] a *zone-of-influence* which expands as speed and quantity of traffic increases." He relays several of his many interview experiences in various communities of citizens that felt a reduction in the social sphere of their homes as traffic volumes grew on their streets.

Recently, authors from several disciplines have written of the various negative effects of HSTI on human health, crime, and social networks. Katyal (2002, 54-55) cites evidence that expressways, railroad tracks, and other forms of public construction disrupt social networks by creating a divide between social spaces and increasing crime on both sides of the movement space. When these barriers were removed in certain cities, Katyal notes that area authorities witnessed a remarkable drop in crime. Katyal states:

"When North London closed a series of roads in the hopes of eliminating drive-through 'john' traffic, arrests for all crimes dropped and 'within a relatively short period of time, a remarkable transformation occurred . . . the area was transformed from a noisy and hazardous 'red light' district into a relatively tranquil residential area.' In LA...Once the city placed traffic barriers on some of these streets, assaults fell from 190 to 163 in the first year, and from 163 to 138 the next year; homicides dropped markedly as well."

In her extensive literature review, Jackson (2003) finds "a growing body of evidence [that] strongly identifies the design of living space and associated activity patterns as a public-health issue." She cites several authors that "have called for designers and planners to address the pressing health problems of today—vehicle exhaust, physical inactivity, social and cultural isolation, and economic disparity."

Impacts to Social Capital

Putnam (2000, 115) writes:

"...Our evidence also suggests that across a very wide range of activities, the last several decades have witnessed a striking diminution of regular contacts with our friends and neighbors. We spend less time in conversation over meals, we exchange visits less often, we engage less often in leisure activities that encourage casual social interaction, we spend more time watching and less doing. In short, it is not merely "do good" civic activities that engage us less, but also informal connecting."

By spreading out neighborhood areas, imposing physical barriers and a zone-of-influence on exchange and community interaction, and stimulating the need for more movement, HSTI directly and indirectly reduces social capital. Putnam (2000, 205-6) draws a connection between mobility and neighborhood social capital:

"Residential stability is strongly associated with civic engagement...Just as frequent movers have weaker community ties, so too communities with higher rates of residential turnover are less well integrated. Mobile communities seem less friendly to their inhabitants than do more stable communities. Crime rates are higher, and school performance is lower, in high-mobility communities. In such communities, even longtime residents have fewer ties with their neighbors. So mobility undermines civic engagement and community-based social capital."

In this passage, Putnam hints at three important ways HSTI undermines neighborhood social capital. First, HSTI creates a physical, wall-like barrier as well as a zone-of-influence with its various disturbances. This combination limits the social space of the street for residents living in the area. As a barrier to and destroyer of ISES, HSTI diminishes neighborhood functionality by limiting pedestrian movement, forcing residents to rely on high-speed transport, and reducing informal socializing between

residents. Over time, the zone-of-influence and wall effects of HSTI can limit the generalized or "thin" trust building that residents created through informal and formal socializing. Secondly, Putnam cites evidence that areas that have a higher resident turnover are less stable and do not have the social capital stock of more stable neighborhoods. Appleyard discovered in his study that in many cases, heavier trafficked streets have greater residential turnover (Appleyard, 1976, p.5). Drawing on evidence from his extensive survey evidence, Appleyard found that high traffic volume was in fact *the main cause* for people to move away from the street. Even if high traffic is only a minor influence in creating higher residential turnover, it is not a stretch to assume that HSTI creates less stability and social capital in neighborhoods. It takes time for new residents to develop relationships with neighbors and make local acquaintances. In the presence of HSTI and more limited social interactive space, it may take longer on average for new residents to assimilate in the neighborhood. As a unit of social capital generation, the neighborhood becomes crippled when integration becomes more difficult.

Finally, HSTI creates more high-speed movement over time as area residents must move further to meet their everyday needs (See Figure 3). This movement could include travel to and from work or for daily affairs. In his extensive review of U.S. survey data, Putnam finds that Americans spend more and more time alone behind the wheel of a vehicle (currently an average of seventy-two minutes per day) and that 95% of Americans travel to work in a private vehicle. Like Americans, Swedes have experienced large increases in total personal daily travel and automobile travel over the past 40 years. Putnam's evidence shows that this time alone in the car is "demonstrably bad for community life." In short, each additional ten minutes of daily commuting time reduces community involvement from that individual by 10 percent. Besides education, he finds that commuting time is a more powerful influence on community involvement than *any other demographic factor*. His review of time diary studies also shows that higher average commuting times deal a double blow to neighborhood social capital. More commuting time reduces civic engagement and informal social interaction of the commuting individuals *as well as noncommuters* - imposing a "civic penalty" on retired residents, children, and other residents outside of the commuting workforce. Increasing average commuting times in urban and suburban areas are "in large part as a proxy for the growing separation between work and home and shops" (Putnam, 2000, 214).

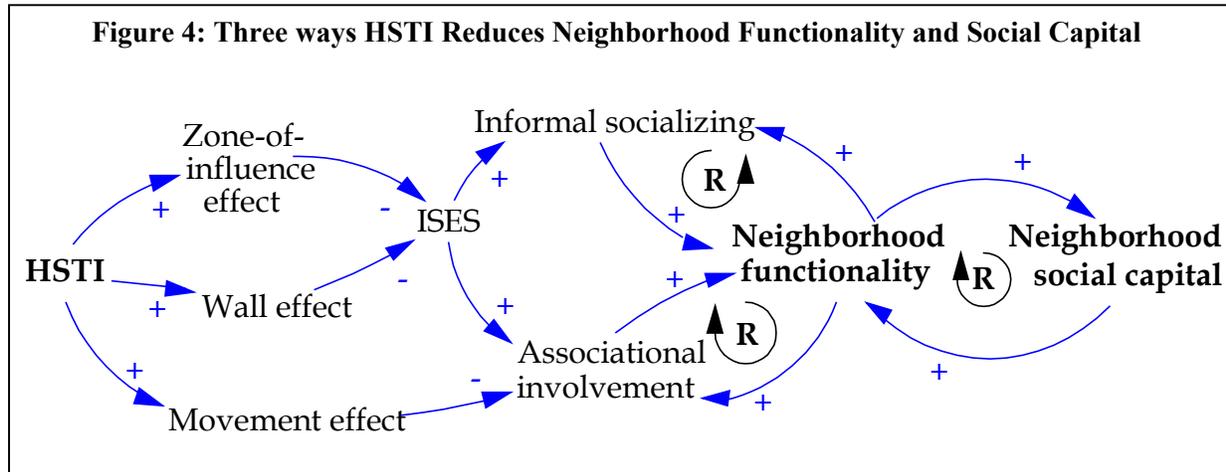
As neighborhood ISES is replaced with HSTI, land uses are spread over greater distances and not surprisingly, average commuting times increase. Engwicht (1993) describes how governments may try to replace some of the exchange opportunities edged out by HSTI by building residential areas, shopping centers, and workplaces on the city edges. These attempts to build out exchange opportunity result in the phenomenon called urban sprawl. In her account of urban transport, Power (2001, 731) contends:

The more people disperse, the greater the flow of traffic through and around cities. The congestion, noise, danger and dirt that this creates are major deterrents to city recovery. Cities that succeed in meeting the transport needs of a modern economy and simultaneously reducing traffic are the cities of the future. Sprawl makes this more difficult.

Engwicht notes that a while some of these exchange opportunities are replaced, a proportion are permanently lost as historic residential areas, green space, and neighborhood stores are replaced by movement space. City edge, or sprawl commercial development can out compete and undermine the viability of smaller, more centralized city shops and markets (Swedish Urban Environmental Council, 2003). If these central shops and markets die, area residents lose a functional component of their area and may be forced to move further for their shopping needs. Putnam highlights that "metropolitan sprawl appears to have been a significant contributor to civic disengagement over the last three or four decades for three distinct reasons: 1) Sprawl takes time; 2) Sprawl is associated with increasing social segregation and social homogeneity appears to reduce incentives for civic involvement, as well as opportunities for social networks that cut across class and racial lines; 3) Sprawl disrupts community boundedness.

Figure 4 summarizes the connections between HSTI and neighborhood social capital. Through its zone-of-influence and wall effects, HSTI cuts down the effectiveness and amount of inter- and intra-neighborhood ISES. That is, HSTI can spatially define neighborhood borders and reduce socializing opportunities within and between neighborhoods. As distances between land uses increase to accommodate HSTI, residents must move greater distances for work and daily affairs. With higher average commuting and movement times, residents have less time and energy to devote to civic engagement. As Putnam demonstrates, higher average commuting times effects both the civic

engagements of the commuters and non-commuters. When governments try to replace exchange opportunities by building out urban and suburban areas, central area commercial areas may suffer and over time close. This phenomenon, called urban sprawl, can lead to more movement of central area residents as they lose local commerce opportunities. Finally, as a function of all three of these effects, neighborhoods with more traffic have higher residential turnover, less stability, and are less effective generators of social capital.



The reinforcing loops in Figure 4 (i.e., those labeled with circled R) demonstrate that these processes are not linearly causal, but systemic. For example, to accommodate higher speeds, HSTI occupies more space and increases its spatial wall and zone-of-influence. The advance of HSTI into neighborhoods reduces ISES within and between residential areas and pushes land uses further apart. Neighborhood residents have less ISES within which to socialize and must move greater distances to account for the larger interstices between land uses. With less ISES and more movement time, residents have less time and space for informal or formal engagement with their friends and community. Over time, the community bonds loosen as acquaintances and neighborhood friends spend less time together, reduce their civic responsibilities, and simply must work harder to plan and enjoy their social engagements. HSTI increases residential turnover and along with these other effects creates a less cohesive and active community. An overall reduction in neighborhood functionality and stability diminishes the informal socializing and involvement opportunities available for established residents, especially vulnerable groups like the elderly, and for new members of area neighborhoods. This process then reduces over neighborhood social capital. Over time, this systemic process jointly erodes neighborhood functionality and social capital and impairs their regeneration abilities.

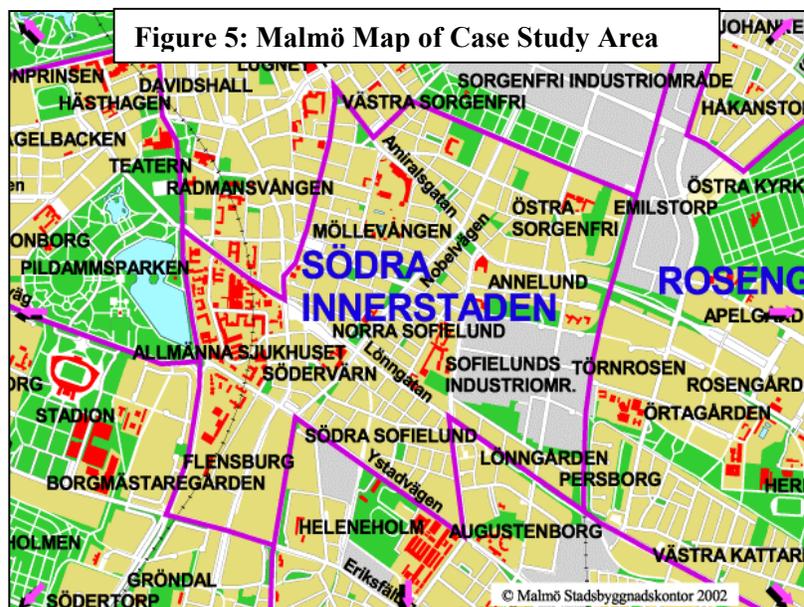
EMPIRICAL ANALYSIS & RESULTS

Rosengård and Fosie encompass large administrative districts in Malmö and themselves are separated into smaller neighborhood areas. Therefore, I limited my site observations and survey distribution in Rosengård to Örtagården, Törnrosen, and Persborg (observation only), which form the southwest section of Rosengård. In Fosie, I mainly observed Augustenborg and Västra Kattarp. Survey responses from Fosie came from Augustenborg, Lindängen, Almvik, V. Söderkulla, Hermodsdal, Nydala, and Gullviksborg. Finally, I include data from several survey responses from the Annelund neighborhood, which is west of Törnrosen and may technically be a section of Södra Innerstaden. Due to the limited number of survey respondents, it is difficult to extrapolate from the respondents to the general residential level. Despite the relatively low number of respondents, the survey results provide insightful, local evidence and commentary to compliment the interviews, published and written data cited in this section. Appendix 3 contains accounts of my personal interviews and Appendix 4 displays photographs taken in the case study neighborhoods.

Malmö, Rosengård and Fosie – Background, HSTI, and Survey Results

Malmö is Sweden's third largest city with a population of approximately 265,000 people. Situated across the Öresund from Copenhagen, Malmö is currently trying to re-invent itself from a manufacturing center to a European service, biotechnology, and educational center. With close cooperation with Copenhagen and emphasis on re-structuring its economy, Malmö is re-defining itself. One of the most ethnically diverse cities in Europe, Malmö hosts residents from over 150 countries. (Interview with Göran Rosberg, 2003) In fact, 34% of Malmö's population consists of foreign-born persons (24%) and foreign citizens (10%) that come mainly from the former Yugoslavia, Poland, Bosnia-Herzegovina, Iraq, and Denmark. Of the approximately 130,000 households in Malmö, 77% of these households contain 1 or 2 residents. Malmö has a higher unemployment rate than Sweden as a whole, with 6% of workforce age adults (age 16-64) being unemployed. About 72% of voters voted in the 2002 Malmö municipal election. (Malmö Stad, 2003)

Fosie and Rosengård are both large residential areas in Malmö, with Fosie containing approximately 40,000 total residents and Rosengård hosting about 21,000. Geographically, Fosie is located just south to Rosengård's Persborg neighborhood. Figure 5 shows a section map of Rosengård and Fosie in the bottom right corner of the map. The last photo in Appendix 4 contains a larger scale Malmö map showing the relative locations of Rosengård and Fosie in Malmö. Compared with Malmö's average demographic characteristics, Fosie has about the same percentage of foreign-born residents while Rosengård has more than twice the percentage of foreign-born residents (Giertz, 2001). Fosie has a slightly higher unemployed population of workforce age adults, 7%, while in Rosengård (Törnrosen, Herrgården, Kryddgården, Örtagården, and Persborg) less than 25% of men and women ages 20-64 are employed. Certain neighborhoods in Rosengård, especially Herrgården, have much lower percentages of employed residents and a huge percentage (above 80%) of residents dependent on social welfare (Urban Systems lectures, 2003). Overall, about 38% of Rosengård residents ages 18-64 were on social welfare in 2001 (Carlsson, 2003).



Rosengård, in particular, has received scrutiny from many sides over the past decade for its large immigrant population, high unemployment rate, high rate of resident turnover, and overall poor socio-economic picture. Most of Rosengård, and several of the case study neighborhoods like Örtagården and Törnrosen, were constructed during the million homes era between 1965 and 1974 to meet increasing demand for housing. While initially this area drew Swedes and immigrants seeking modern living to Malmö, many factors including macro-economic structural changes in Malmö, increasing distaste for industrial style housing, lack of services, and immigrant policies shaped Rosengård into a multi-ethnic, lower income, and higher turnover area. Over time, many Swedes moved away from the area and Malmö utilized the empty flats to accommodate newly arrived immigrants and refugees. While Malmö Stad and MKB have spent time and energy to improve conditions in the neighborhoods, Rosengård residents are separated from "average" Malmö neighborhoods both ethnically and socio-economically. Hagetoft and Cars (2000) provide a more in depth history of the Rosengård area.

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Statistically, Fosie more closely resembles "average" Malmö, as more of its general characteristics of this area are similar to Malmö's average picture. While I will not provide much history of Fosie in this thesis, I will give some background on Augustenborg, one of the older neighborhoods of

Fosie. Augustenborg was constructed in 1948 and was designed to attract rural Swedes to its modern-style facilities. Over the next few decades, Augustenborg drew young families and became a thriving community, complete with shops, activity centers, all types of organizations, and other services. As with the Rosengård neighborhood, new residents initially experienced a sense of belonging and modernity. However, Augustenborg also experienced a period of decline in the late 1960s and 1970s when many residents retreated from the area in search of more modern housing facilities. The area fell into disrepair for some time, but several programs in the 1980s and 1990s revitalized the neighborhood to some degree. For the past five years, Augustenborg has been revitalized by the Ekostaden (Eco-City) project, a joint European Union and Swedish project designed to promote ecological living in an urban neighborhood. Through various initiatives, the project has bolstered storm water management and infrastructure, introduced traffic calming measures, and made other positive changes to promote ecological living. (Graham, 2002)

Malmö's HSTI

Like most western countries, Sweden has witnessed a large increase in personal daily travel over the past 40 years – from an average of approximately 15 km per person and day in 1960 to over 40 km per person and day in 2002. This travel is not uniform across either socio-economic group or gender, as higher income, male Swedes tend to travel much longer distances every day (averaging between 80 to 100 km per day in the highest income classes). (Malmö Stad, 2002, Delrapport 2) In Sweden, the car is the most common form of transport – *for all types of trip purposes* – and accounts nationally for almost 60% of all journeys. While only three percent of all domestic passenger transport performance occurs on foot or by bicycle, 66% of all kilometers traveled in Sweden are by car. (SIKA, 2003, p.68) In Malmö, the third largest city in Sweden, the percentage of trips made by car may be slightly lower than the national average. According to Stina Nilsson of Malmö Stads's Gatukontoret (Traffic) Environmental Unit, approximately 30% of all trips in Malmö are conducted by bicycle, while between 30 and 40% of commuting trips in Malmö are with bicycles (Interview with Stina Nilsson, 2003). Despite these relatively higher number of bicycle trips locally, the majority of trips in Malmö are still made in personal vehicle. Data from Malmö Stad (2002, Delrapport 2) shows that approximately 45% of all trips to work and school in Malmö are made in the car and that the car accounts for more than half of all trips in the city.

Personal vehicle trips dominate the volume of HSTI trips in Malmö and will likely continue to dominate over the next several decades. Data from Malmö Stad's Traffic Division reveals that bus and truck trips together account for a maximum of five percent of road traffic, while personal vehicles account for the remaining 95% of motorized road transport (Nils Haraldson e-mail correspondence, 2003). Malmö Stad predicts that road traffic on local roads within and around Malmö will increase over the next 15 to 20 years due to the influx of new residents and the new Öresund link that connects Copenhagen with Malmö (Malmö Stad, 2002). Based on four different traffic scenarios, Malmö Stad's predicts that car traffic will increase between 10 and 50% in the next 15 years. Critically, a minority of Malmö's population generates the majority of the road traffic. While personal vehicular traffic in Malmö accounts for 95% of road traffic, only 363 people per 1,000 Malmö inhabitants has a car. In other words, less than 40% of Malmö residents enjoy flexible automotive transportation while generating a huge percentage of the total vehicle traffic.

Malmö Stad is aware that HSTI creates social and environmental problems for Malmö's residents. In their recent traffic system reports (Malmö Stad, 2002, Delrapport 1 and 2), Malmö Stad states the traffic is the largest environmental problem in Skåne (the region containing Malmö). Over two thousand residents are injured each year in Malmö from traffic-related incidents. While injuries resulting from cycling, walking, trucks and buses have remained almost constant over the past 12 years injuries resulting from personal vehicles have increased about 30%. Malmö Stad notes that average speed streets that cut through residential areas, including Nobelvägen, Bergsgatan, and Södra Förstadsgatan, serve primarily as through streets. These through streets often invite higher speeds through residential areas and result in more personal injuries. In addition to injuries, between 14,000 and 18,000 Malmö residents must cope with noise levels from municipal street traffic above nationally acceptable limits (65 dBA). Recently, Malmö Stad's Gatukontoret (traffic unit) has implemented legislation to reduce heavy truck traffic and

harmful emissions in the “environmental zone” of the city; however, this environmental zone does not include the areas of Fosie or Rosengård (Malmö Stad Gatukontoret, 2002). Malmö Stad (2003(2)) has also stated its intentions to reduce both carbon dioxide and nitrogen oxide emissions by 25% and 30%, respectively by 2005. Stina Nilsson of Gatukontoret noted that while Malmö has considered using “carrot” type approaches to reduce personal car traffic, the city has not developed or implemented a comprehensive plan to limit the use of personal vehicles.

Rosengård and Fosie – HSTI Picture

Rosengård and Fosie are both located mainly west of Malmö’s inner ring road (Inre Ringvägen), which in tandem with the outer ring road shapes Malmö’s southern and eastern borders. Major feeder roads slice westward from the inner ring road and through Rosengård and Fosie on their path to Malmö’s inner city (Innerstaden) and central area (Centrum). Table 3 provides a list of the major HSTI corridors within the case study sample areas and their average daily traffic intensities. In addition, Table 3 includes the corresponding road category consistent with Appleyard’s designation (1976, p.33). Light streets have between 0 and 2,000 vehicles per day; medium streets from 2,000 to 10,000 vehicles per day; heavy streets from 10,000 to 20,000 vehicles per day and, very heavy streets have greater than 20,000 vehicles per day.

Table 3: Rosengård and Fosie Street Intensities

Street Name	Traffic volume (daily average)	Street Category
Amiralsgatan	26,000-28,000	Very Heavy
Augustenborgsgatan	Over 2,000	Medium
Eriksfältsgatan	13,000	Heavy
Lantmannagatan	13,000	Heavy
Lönngatan	12,000-17,000	Heavy
Munkhättegatan	11,000	Heavy
N. Grängesbergsgatan	5,000	Medium
Nydalavägen	5,000	Medium
Poppelgatan	4,000	Medium
Trelleborgsvägen	21,000	Very Heavy
Västra Kattarpsvägen	8,000	Medium
Ystadsvägen	23,000-25,000	Very Heavy

Interestingly, Malmö Stad’s 2003 city map shows that several of these streets actually form neighborhood boundaries in the case study area. Figure 5 contains a section of Malmö Stad’s map, which displays Örtagården, Törnrosen, Persborg, Augustenborg, and Annelund (located in the right section of the map) and shows some of the major streets. Three of the streets listed in Table 3 and shown in the map, Amiralsgatan, Lönngatan, and Ystadsvägen run almost parallel to each other from Inre Ringvägen slightly north west and link the inner ring road with the central part of Malmö. These three roads are examples of streets that spatially define neighborhoods, forming a "wall" around several case study neighborhoods. Amiralsgatan is the northern-most feeder road of the three and defines the northern border of Örtagården, Törnrosen, and Annelund. Appendix 4 photo numbers 1 and 2 show Amiralsgatan leading both east and west from Rosengård centrum. These photos display the large quantity of space occupied by Amiralsgatan and the few pedestrian crossings over this street. Lönngatan is the middle feeder road and defines the southern border of Persborg and the northern border of Augustenborg. Appendix 4 photo 3 shows Lönngatan, with the Persborg neighborhood on the right and Augustenborg to the left. Photo 4 displays the entrance to Augustenborg and illustrates how Lönngatan defines the physical boundary of the Augustenborg neighborhood. Ystadsvägen, the southern most of these three feeder roads, forms the southern border of Augustenborg and northern border of Almhög. Västra Kattarpsvägen, one of the medium trafficked streets, runs almost north south and separates Örtagården on its western edge from Törnrosen. Photo 5 in Appendix 4 displays V. Kattarpsvägen and the entrance to the Törnrosen neighborhood. While not a heavy trafficked street, V. Kattarpsvägen has few pedestrian crossings or traffic calming measures. Lantmannagatan, which parallels V. Kattarpsvägen to the west, forms the

western edge of Annelund. Eriksfältsgatan and Munkhättegatan divide Almhög from Hydala and several other southern neighborhoods in Fosie.

The streets listed in Table 3 are some of the largest and most heavily trafficked streets within the case study area. However, many smaller streets also cut through the various neighborhoods and link these larger streets. Photo 9 in Appendix 4 shows Adlerfelts väg, which is not a main street in the area but creates a sizable gap between Örtagården and Rosengård Centrum. While I did not collect traffic data specifically for these smaller streets, based my own observations in these neighborhoods and my interview with Trevor Graham, the remaining streets probably fall into the light or medium traffic categories. While traffic volume is an important indicator of HSTI disruption, traffic composition is also critical (Appleyard, 1976, p.261). Especially large lorries or noisy vehicles can contribute a disproportionate amount of social nuisance in neighborhood areas. Trevor Graham, a project manager for the Ekostaden (Eco City) project in Augustenborg for the past five years, cited survey evidence from the early stages of the project that Augustenborg residents considered traffic to be a major problem in their area. Using his team's data and observations, Trevor and his co-workers observed about 360 lorries per day travelling through Augustenborg, which utilized Augustenborgsgatan to cut through the neighborhood on their way to central Malmö. While Augustenborgsgatan is a relatively small street and is not intended to be a feeder road to central Malmö, Trevor mentioned that lorry drivers utilized the street as a short cut. In addition, drivers of personal vehicles occasionally made dangerous maneuvers to attempt to get avoid one-way traffic streets in the neighborhood. (Interview with Trevor Graham, 2003) On several instances during my site visits, I observed drivers on Västra Kattarpsvägen, a relatively smaller through street that divides Örtagården and Törnrosen and runs near Augustenborg, travelling over the posted speed limit and ignoring designated pedestrian cross walks. In addition, I witnessed mopeds and small motorcycles utilizing the cycle pathways to cut through neighborhood areas, disrupting pedestrian traffic as they came through.

I use these examples to illustrate that traffic volume, traffic composition, and inappropriate use of transport infrastructure all play a role in the social disruption in the case study areas. Twenty percent of survey respondents said traffic or inappropriate use of mopeds around neighborhoods was the biggest problem in their neighborhood. Almost one-half of respondents listed that traffic is a problem in their neighborhood while 11 noted that noise is a problem. Of the respondents who noted traffic was a problem, two respondents in three came from the Fosie area. All four respondents from Augustenborg lived on Augustenborgsgatan and reported that traffic was the most serious problem in their neighborhood and that if they could change anything in their neighborhoods they would reduce through traffic on Augustenborgsgatan. Augustenborgsgatan is only a light to medium trafficked street, but still causes significant neighborhood disruption for the survey respondents. The responses from these Augustenborg residents coincide with the survey responses Trevor Graham and his colleagues collected from area residents early in the Ekostaden project (Interview with Trevor Graham, 2003). In Fosie, almost all the respondents living in the vicinity of Eriksfältsgatan (a heavy street) felt traffic was a problem on this street.

It is not surprising that survey respondents from the Fosie neighborhoods, especially the Augustenborg residents, more explicitly desired to change their traffic situation than did the respondents living in Örtagården and Törnrosen. While housing and pedestrian traffic in the Augustenborg and central Fosie area is generally located near or adjacent to HSTI, the planning and architecture in Rosengård mostly separates street traffic from housing areas and pedestrian traffic. While in theory this design is intended to create safer pedestrian pathways, it may actually exacerbate the wall effects of HSTI and create unforeseen safety problems. Survey responses from Örtagården and Törnrosen suggest that these residents enjoy socializing mostly in areas located away from local streets. When asked to designate areas on their neighborhood map where they enjoyed socializing, three times as many social areas were designated in areas physically separated from the street than social areas adjacent to area streets. Photos 6 and 7 in Appendix 4 shows V. Kattarpsvägen, the road separating Örtagården and Törnrosen. Photo 6 is a picture of the Falafel stand, located straight across from Örtagården on the corner of Bennets väg and V. Kattarpsvägen, which is one of the few street-focused social spots. While difficult to see, Photo 7 shows the bus stop on V. Kattarpsvägen on the left and a woman running from the right, across the street to catch an arriving bus. V. Kattarpsvägen has very few pedestrian crosswalks and does not coordinate pedestrian traffic with high-speed transit modes. The separation of street and pedestrian traffic in the area

leaves pedestrians with fewer safe and viable pedestrian routes along streets like Västra Kattarpvägen. In essence, the planning in this area does not coordinate the merger of pedestrian traffic and high-speed traffic.

Many of the social spaces indicated by respondents were located within courtyard areas that are cordoned off from local streets by high-rise buildings. Appendix 4 photo 8 displays a courtyard in Persborg, one of many similarly arranged courtyard areas in the case study neighborhoods. Several of the Örtagården and Törnrosen residents noted that they felt unsafe in street-centered areas, such as the area east of Rosengård centrum along Amiralsgatan (a Very Heavy Street) and along V. Kattarps vägen (a Medium Street). In addition, several residents designated on their maps that traffic was a problem on Cronmans väg, Bennets väg, and Hårds väg, three smaller streets that branch off of V. Kattarps vägen.

Social Capital in Malmö and Case Study Area

Several recent quantitative studies of social capital in Malmö indicate that social capital is not evenly distributed between Malmö's neighborhoods. Indeed, evidence from these studies indicates that neighborhood effects vary the levels of social capital in different neighborhoods and this difference has implications for community health. Martin Lindström, in the Department of Community Medicine at Lund University, has published several public health studies over the past few years regarding the effects of social capital in Malmö on population health. Using various large-scale data sets, including Malmö's public health survey, municipal election results, and diet and cancer study, Lindström has empirically analyzed whether social capital may be an influential determinant for residential health levels. Using different proxies for social capital, Lindström has shown that social capital is an important factor in determining population health in Malmö.

While not the focus of his studies, Lindström has demonstrated that *social capital levels are not uniform across Malmö's neighborhoods*. In one study to identify whether social capital may cause the health differences between higher and lower socio-economic groups, Lindström and his colleagues showed that psychosocial resources like social network and support (their proxy for social capital) account for statistically significant differences in certain health-related behavior between these groups. Lindström et. al. (2001), using a multilevel analysis of small administrative areas in Malmö, revealed that individual differences in social participation levels were the result of both individual factors, as well as contextual neighborhood differences. They concluded that social participation (the proxy for social capital in the study) accounted significantly for differences in these certain health-related behaviors. Therefore, individual social participation (social capital) levels depended not only on individual socio-economic characteristics but also on neighborhood context.

In a more recent study, Lindström et. al. (2003) showed that differences in neighborhood social capital levels in Malmö could partly explain individual differences in residents sense of security. After adjusting for many individual factors including age, sex, country of origin, and even individual social participation, Lindström et. al. found that differences in neighborhood social capital (as measured by electoral participation) significantly affected residents sense of security or insecurity related to crime. Noting other studies that show that a high level of social capital can prevent crime, Lindström et. al. note "that the results of [their] study imply that social capital may also be causally connected with indirect psychological consequences of crime such as fear of crime at the general population (non-victim) level."

Lindström et. al. do not diagnose what neighborhood characteristics play a role in social capital differences in Malmö's neighborhoods. Their 2003 study points out that the overall population characteristics of the administrative areas in Malmö are fairly homogeneous. However, they note that these administrative areas, or neighborhoods, contain different housing types. Without making a point of this difference, Lindström may have hit on a critical piece of the social capital difference puzzle: that the physical nature of the neighborhood itself influences levels of social capital. When making the point that general reciprocity and trust are the foundation of social capital, Putnam (2000, 136) highlights that a "dense network of social exchange" within the "social fabric in which our daily transactions are embedded" promote "an effective norm of generalized reciprocity." If social exchange indeed bolsters reciprocity and "thin trust" then perhaps ISES differences in neighborhoods may account for differences in neighborhood social capital levels. The question of which neighborhood factors account for uneven social capital distribution in Malmö remains open.

Conventional political participation is a useful contextual measure of social capital. Linström et. al. (2003) state that compared to demographically matched non-voters, voters tend to participate more often in community affairs, attend meetings and demonstrations, and to cooperate with their fellow citizens in the community. Using conventional politics participation as a proxy for social capital, it is evident that social capital levels are not uniform in the case study area. Overall, 72.5% of Malmö's voters participated in the most recent municipal elections held in 2002, while only 53.4% of voters participated in Rosengård and 64.8% of voters in Fosie. When looking more closely at selected neighborhoods in Rosengård and Fosie, the voting distribution fluctuates significantly. Therefore, overall both Rosengård and Fosie score lower in social capital than a statistically "average" Malmö neighborhood. Table 4 (data from Malmö Stad, 2003(3)) provides voter participation data from Malmö Stad for selected case study neighborhoods for the past two municipal elections held in Malmö. Although Malmö has shown just a slight reduction in overall voter turnout, every neighborhood *except* Augustenborg in the case study area shows a decline in voter participation from 1998 to 2002.

Neighborhood	1998 (Voter %)	2002 (Voter %)
Malmö	73.0	72.5
Fosie	67.5	64.8
Rosengård	55.0	53.4
Augustenborg	54.3	77.8
Almhög	65.5	58.2
Eriksfält	78.8	77.8
Gullviksborg	81.4	72.3
Hermosdal	56.1	53.4
Hindby	75.9	55.6
Nydala	64.3	61.5
V. Söderkulla	77.9	76.3
Tornrosen	51.8	47.8
Örtagården	51.5	48.0

Without additional trend data it is hard to discern whether or not conventional politics participation, and hence social capital are on a long-term decline in the case study area. While I tried to obtain data for elections held prior to 1998, this information was not available on Malmö Stad's webpage. With the curious exception Augustenborg, voter participation and by extension social capital levels have slipped in the case study area since 1998. According to Martin Lindström (Interview with M. Lindström, 2003), voting participation in Sweden as a whole and Malmö have declined for over 25 years. While voting participation among all groups has declined steadily, Lindström explained that conventional politics participation among the lower socio-economic groups has experienced a much sharper drop.

The survey respondents represent an above-average group when compared with their average neighbors. Thirty-five out of 39 registered voters or 89% of voters in the survey population voted in the 2002 election (only one person in the sample was not registered to vote). Based on the resident sample included in this survey, this result is not entirely surprising (See the Methods and Materials section for a more detailed discussion of the survey population). Given the higher than average conventional politics participation level among survey respondents, it is not a reach to assume that the sample population will show commensurately higher than average levels of associational involvement and trust.

Generalized Trust and Associational Involvement

In his extensive research, Putnam notes the strong correlation between citizens with higher levels of generalized trust, those that are involved in formal organizations, and their correspondingly higher overall contribution to the community. Putnam (2000, 137) states that in general:

"people who trust others are all-round good citizens, and those more engaged in community life are both more trusting and more trustworthy. Conversely, the civically disengaged believe themselves to be surrounded by miscreants and feel less constrained to be honest themselves."

Putnam generalizes that people with higher levels of trust for their fellow citizens volunteer more often, contribute more time or money to charities, participate more often in the political process and community organizations, comply more fully with tax regulations, and display many other positive civic traits. With the neighborhood survey, I tested residents' trust levels of their neighbors, people in Malmö, and of the police force. I then compared the respondents' level of generalized trust (i.e., trust of people in Malmö) and whether or not they were involved in any type of organizations or associations.

Overall, 55% of survey respondents had a generalized trust level of much trust or trust. Of the respondents that answered the question regarding their generalized trust level, 3 claimed they had much trust, 14 said they had trust, 12 claimed to have not much trust, and 2 had no trust at all. Of the fifteen respondents who were members of associations, 3 claimed they had much trust, 8 claimed they had trust, 3 said they had little trust for people, and 1 said she had no trust of people in Malmö. Out of the non-members, no one claimed to have much trust, six said they had trust, 9 said they had not much trust, and 1 said she had no trust. These survey results correspond with Putnam's general correlation between citizen participation and level of general trust. While 66% of the respondents who were members of organizations had much trust or trust, only 38% of non-members claimed to have trust of people in Malmö and none of the non-members had the higher trust level.

A glance at the two other barometers of trust used in the survey, trust of neighbors and trust of the police, reveals differences in the sample populations' trust levels. Almost 83% of respondents had a level of much trust or trust of their neighbors, while 73% had levels of much trust or trust for the police. Of all respondents, 45% said they had more trust for their neighbors than trust of Malmö residents, 48% had the same amount of trust for neighbors as generalized trust, and 6% had less trust for neighbors than generalized trust. All told, almost 52% of respondents had a *difference* in their level of generalized trust versus their level of trust for their neighbors.

Given this small sample size and the many variables that might account for the differences in trust levels among respondents, it is difficult to explain these trust differences. While being a member of an association seems to correspond to a higher generalized trust level in the sample population, associational members were almost as likely as non-members to have higher trust levels for their neighbors than general Malmö residents. Forty percent of associational members trusted their neighbors more than people in Malmö while 50% of non-members had more trust for their neighbors. The Discussion section will elaborate further on these points.

Considering all respondents, the average respondent attended some type of associational meeting about three times per month. Associational members, who accounted for 46% of survey respondents, had a wide dispersion of participation levels from never attending meetings to attending meetings almost every day. Putnam finds that besides education, commuting time is the strongest demographic indicator of community involvement, including associational involvement. For non-pleasure travel, which includes the time going to and from work or school, and for daily affairs, the sample population had an average movement time of almost 7 hours per week (all modes). Workers and students in the sample had an average movement time of 5.6 hours per week. For the average Malmö worker or student commuting to and from work/school and for daily shopping (non-leisure trips), I computed a rough travel time of about 4 hours. This data suggests that on average the sample population may spend more time in transit for non-leisure purposes than average Malmö workers/students. Almost 45% percent of the sample population owned cars, which is a slightly above average car ownership level compared with Malmö's average ownership of about 36%. While Putnam finds a strong link between higher commuting times and declining civic engagement, using trend analysis I discovered extremely weak correlation between overall commuting time, or car commuting time, and its effect on associational participation in the sample population. On average, respondents owning cars participated in associations slightly less often than those respondents without cars participated. Martin Lindström explained that most data with which he is familiar indicates that more engaged Swedes (i.e., those with higher work responsibilities and non-work obligations) also show higher levels of community engagement. Lindström noted that those unemployed residents, with the highest amount of free time, are the least civically involved group. (Interview with M. Lindström, 2003)

Informal Socializing

Informal socializing becomes a more influential building block of social capital within urban settings. Putnam (2000, 96) likens urban settings to

"not a single, tightly integrated community, but a mosaic of loosely coupled communities. As mobility, divorce, and smaller families have reduced the relative importance of kinship ties, especially among the more educated, friendship may actually have gained importance in the modern metropolis."

Malmö is a city largely constructed for smaller families. Malmö Stad (2003(1)) states that of all households in Malmö, 77% are one to two person dwellings. Fosie also maintains about 77% one or two person dwellings, while Rosengård has about 65% one or two person dwellings. Certain neighborhoods in Rosengård have a higher percentage of three and four person apartments, but even neighborhoods like Örtagården that accommodate many younger, larger families contain more than 50% one to two person flats. Considering this housing feature, informal socializing within Malmö takes on added importance in terms of social capital development. While associations, organizations, families, and work places build "bonding" social capital, forging bonds between people with similar interests or socio-economic groups, informal socializing facilitates "bridging" social capital. "Bridging" social capital cuts across diverse networks to a larger extent than "bonding" social capital and has monetary benefits, especially for lower socio-economic groups. Putnam (2000) cites evidence that "bridging" social capital allows lower income residents to expand their networks across socio-economic divides and discover better employment opportunities.

While informal socializing may take on a more meaningful role within urban settings, measuring informal socializing is problematic. Informal socializing within and between neighborhoods is influenced by individual factors, such as personal traits, type of work, and background of individuals, *and by contextual factors*. In this manner, the quantity and quality of informal socializing among area residents is dependent on neighborhood ISES because people need *places* to socialize. Social capital may form through formal associations, at work and school and other mechanisms, but an important social capital block may not develop at all. To gauge informal socializing levels in the area, I inquired in the neighborhood survey whether or not residents had friends in the neighborhood, where they met their friends, and how often they met with their neighbors. In addition, I asked residents how often each month they played sports, attended religious or neighborhood meetings, attended musical concerts, went to the bar or pub, or participated in another type of social activity. Finally, residents noted whether or not their neighborhood had enough places to meet friends, enough social activities, local shopping places, transport opportunities, walking and cycling paths, and green space.

Some of survey participation indicators blur the line between informal and formal socializing. For example, individuals could participate in sports with a formal club or they may participate in more informal ways with friends in their neighborhood. Putnam (2000) indicates that there is a continuum between formal and informal socializing and that these designations are not black and white. As I mentioned in the Objectives and Scope section, informal and formal activity most likely work together to build overall neighborhood social capital. However, *informal socializing largely contributes to "bridging" forms of social capital that ties together disparate groups*. Given that there is not a strict designation of formal and informal socializing, the information from the survey and residential turnover levels provide a basic indicator of informal socializing within the case study areas.

For a more generalized contextual indicator of neighborhood stability, I compiled statistics on residential turnover levels for the case study neighborhoods. Table 5 (data from Malmö Stad, 2003(3)) shows the residential turnover trends in the case study neighborhoods for the past six years and the relative change in turnover percentage for the period. While residential stability is linked with macro and micro push and pull forces at least a portion of neighborhood turnover rests on rest. In other words, more restful neighborhoods with better informal socializing opportunities are more attractive neighborhoods and give people less incentive to move. The Discussion section will expand on this concept. Table 5 shows that overall residential turnover rates in Malmö did not change much and if anything increased slightly during this time period. Conversely, most of the case study neighborhoods have less residential

turnover now than they did six years ago. Augustenborg, Gullviksborg, and Örtagården have experienced the most dramatic drop in residential turnover rates during the past six years.

Table 5: Residential Turnover Levels (%) in Case Study Area							
Neighborhood	1997	1998	1999	2000	2001	2002	% Change
Malmö	4	5	5	5	5	5	0
Fosie	10	10	9	9	8	9	-10
Rosengård	11	10	9	9	8	9	-18
Augustenborg	23	20	19	15	14	16	-30
Almhög	16	16	15	19	16	16	0
Eriksfält	6	6	7	7	8	7	+16
Gullviksborg	17	13	12	13	11	11	-35
Hermodsdal	22	23	21	20	16	18	-18
Hindby	12	13	10	8	10	10	-16
Nydala	15	13	13	12	12	13	-13
V. Söderkulla	8	9	8	7	7	9	+13
Tornrosen	16	14	11	13	11	13	-19
Örtagården	13	14	11	13	10	9	-30

Trevor Graham also explained that housing within Augustenborg has become more competitive over the past five years. However, he indicated that housing in Malmö has generally become more competitive and he was not clear whether neighborhood factors or broader trends in migration drove declining turnover rates in Augustenborg. Data from Malmö Stad (2003(1)) indicates that population growth in Malmö has increased faster than housing growth over the past three years. Therefore, Malmö's overall growth and not necessarily neighborhood factors may have increased competition for housing units and limited residents opportunities to move.

Of survey respondents, 50% claimed that on average they participate in at least one neighborhood meeting per month, while 36% participated in at least one sporting event. Thirty three percent of respondents went to the bar or had a party once each month and about 25% attended one musical concert each month. Thirteen percent attended church or a religious event once per month and about 25% participated in some other social activity each month. While on average respondents participated in 7 activities each month, there was a wide range of participation levels among respondents. Almost 85% of respondents had friends that lived in their neighborhoods. Of the respondents with neighborhood friends, most indicated that their friends lived in their immediate housing area (58%), on the same block (79%), or along other streets (60%). Forty-two percent of these respondents had friends that lived on the other side of their street. Of the respondents with friends in their neighborhood, most indicated they met their friends in local areas such as the yard, the garden, neighborhood activities, or in area bars, shops, and cafes.

About fifty percent of respondents felt that there were enough places to meet friends in their neighborhood. Only 33 percent felt that there were enough social activities in the neighborhood, while 57% did not feel that there were enough local shops. Only 33% of respondents felt that there were enough work places in their neighborhood. Most respondents were more positive regarding transport opportunities, cycling and walking paths, and green space. Ninety-one percent felt there were enough transport opportunities, 94% felt there were enough cycling and walking paths, and 86% felt their neighborhood had enough green space and parks.

DISCUSSION

Neighborhood functionality and social capital within Malmö and the case study areas are influenced by HSTI. Based on the theoretical and empirical data presented in this thesis, it is likely that HSTI reduces the effectiveness of ISES in Fosie and Rosengård. Inter- and intra-neighborhood ISES significantly influences neighborhood social capital development, especially "bridging" social capital. Therefore,

contextual neighborhood factors like ISES may partly explain social capital gaps between "average" Malmö neighborhoods and the case study area. While there are linkages between HSTI, neighborhood functionality, and social capital, this relationship is complicated by many other variables. Social capital, in its different forms, is generated and limited by macro and micro forces that include entertainment and media, economic and political changes, migration and employment patterns, education as well as urban development. In some ways, certain forms of social capital are generated when people use HSTI and various transport modes to visit friends and relatives and attend social events. The construction and management of HSTI provides jobs and services to various sectors, which has benefits to the community. It is difficult to sort through this dense matrix of influences and directly quantify the particular impacts of HSTI without more extensive survey evidence and empirical research. This field of study is open for continued analysis of these different forces.

The network of HSTI is extensive throughout Rosengård and Fosie, and divides many of the smaller neighborhoods within the case study area. The traffic volume and composition along these roads are diverse, ranging from very high to low trafficked streets. As Appleyard (1976) demonstrated in San Francisco, moderate increases in traffic intensity on HSTI can cut down significantly on neighborhood socializing, reduce feelings of residents home territory, and disrupt neighborhood networks by reducing socializing and increasing rates of residential turnover. Putnam (2000) points out that the most important and damaging impact to social capital in Indianapolis, Indiana (USA) in the past fifty years occurred when an Interstate highway was constructed in the early 1960s directly through a network of closely knit neighborhoods. While Rosengård and Fosie may contain more HSTI than average Malmö neighborhoods, it is debatable whether or not these areas incur heavier HSTI impacts than Malmö's central areas, which also contain dense HSTI. Given that Rosengård and Fosie are not located in Malmö's Environmental Zone and are a short distance from the Sofielunds Industriområde (industrial area) these neighborhoods may receive a disproportionate amount of heavy lorry traffic. Trevor Graham's comment that Augustenborg received a high amount of disturbance from through truck traffic seems to indicate that truck traffic importantly effects Fosie and Rosengård. However, I can not confirm whether or not traffic mix effects Rosengård and Fosie more significantly than other Malmö neighborhoods. One point is clear. In Rosengård and Fosie, car ownership rates are lower than Malmö's average and hover between 17% and 30% in neighborhoods like Törnrosen, Örtagården, Persborg, and Augustenborg. Therefore, HSTI caters to a minority of Malmö residents overall and even a smaller minority of residents in the case study neighborhoods. Significantly, a larger than average percentage of residents in Rosengård and Fosie bear the disproportionate costs of HSTI without the benefits of the car.

The Wall, Zone-of-Influence, and Movement Effects

The HSTI in the case study area occupies large swaths of space and create pedestrian wall and zone-of-influence effects. The photos in Appendix 4 show several large streets within the case study areas that separate neighborhoods simply by occupying large amounts of land and putting distance between other land uses. As mentioned in the Empirical Analysis and Results section, several streets define the neighborhood boundaries in Rosengård and Fosie. These streets range from light to very heavy and are especially disruptive of inter-neighborhood ISES. In this context, I use inter-neighborhood ISES to refer to both indoor and outdoor social areas spatially located in the interstices *between* neighborhoods. Based on their location, these areas are more easily viewed from the street and have the potential to bring together residents of different neighborhoods. However, as these spaces are located along heavily trafficked streets, they are not incubated from HSTI effects. These streets host many of the local area bus stops, which connect pedestrians with high-speed traffic. While most residents can access bike and cycling paths connecting the case study neighborhoods with greater Malmö, safety and mobility problems manifest when pedestrians *interface* with HSTI. These interface problems limit the efficiency of current inter-neighborhood ISES and the development of new establishments.

The HSTI wall effects are especially acute in the Rosengård area, where pedestrians and HSTI are generally separated within the neighborhoods. When pedestrians emerge from their neighborhood to catch a bus or to cross over the streets to other neighborhoods, their pathways are not well linked to pedestrian corridors along the streets or between the neighborhoods. For example, there are very few pedestrian crossings located along Amiralsgatan and V. Kattarpsvägen to allow residents to access the bus stops and

high-speed transit. Along V. Kattarpsvägen, for example, I noticed only one pedestrian crosswalk for a distance of at least one-half kilometer between Amiralsgatan and the end of Törnrosen (See Appendix 4, Photo 7). Lönngatan, which is flanked on either side by residential housing, is equally deficient in designated crosswalks in the area of Persborg and Augustenborg.

The moped problems in the area may be one symptom of the problems created by the separation of HSTI and pedestrian traffic. Many survey respondents complained of the inappropriate use of mopeds along cycle and walking routes, and I also witnessed this activity during my site visits. As there are few interfaces between pedestrian routes and HSTI within Rosengård, perhaps moped users simply utilize the more accessible pedestrian bike and cycle paths until they leave the neighborhood areas and can more easily access local streets. In addition to inappropriate infrastructure use, the movement coordination gap creates unsafe conditions for pedestrians crossing high-speed traffic areas and impairs the overall functionality of the neighborhood for pedestrians. Recently, the Sydsvenskan newspaper highlighted these unsafe conditions when they reported that two pedestrians were injured by a motorist while they attempted to cross Amiralsgatan to reach an area bus stop (Holm, 2003). Amiralsgatan facilitates high-speed automobile traffic and while it does have some overpasses for pedestrian traffic, these crossings are few and far between. In many cases, area residents have to walk relatively long distances in order to cross Amiralsgatan on designated crosswalks. To avoid these time delays, residents cross Amiralsgatan and other HSTI in non-designated areas and may increase their risk of personal injury. In this manner, the lack of pedestrian movement possibilities around area HSTI exacerbates safety problems. Data from Malmö Stad indicates that injuries resulting from personal vehicles continues to increase in Malmö.

In addition to the lack of inter-neighborhood pedestrian conduits, the chronic shortage of signage within the case study areas hinders flexible pedestrian movement within and between neighborhoods. Without living in the area, it is very difficult to find orientation to local shops, playgrounds, parks, streets, and area attractions. Based on my site observations, there are few local signs or maps located along either the pedestrian or street corridors to highlight appropriate pedestrian routes, local bus stops, area parks, or commercial areas. The lack of signage reinforces the safety concerns and HSTI barriers in the area in two ways. First, the lack of information about pedestrian routes near HSTI does not improve awareness of appropriate pedestrian crossings. Therefore, residents and non-residents alike are not made aware of existing pedestrian pathways, are more limited in their own daily movements, and may be more likely to engage in risky HSTI crossings. Secondly, the lack of information about area attributes and commerce limits attraction of the area to outsiders, who will be less likely to venture into Rosengård or Fosie. This point highlights a more subtle barrier to inter-neighborhood ISES. In this context, inter-neighborhood ISES are not those spaces located between neighborhoods but within neighborhoods. Attractive locations within neighborhoods can also foster inter-neighborhood interaction by attracting residents from many areas. However, if these areas are hidden away through poor pedestrian planning or lack of advertisement they will not effectively encourage inter-neighborhood mixing. This second point is especially important in Rosengård, where Malmö officials have spent much time, money, and effort to increase the attractiveness of the area for commercial vendors and area residents.

I realize that the linkage problems between pedestrian movement and HSTI highlighted so far are mainly *design* problems and not specifically problems with HSTI. Increasing injuries due to vehicle accidents, disorientation within the case study area, lack of pedestrian walkways and bicycle paths, and overall lack of knowledge regarding area attributes are symptoms of gaps between HSTI planning and pedestrian planning. Unenviably, urban planners must attempt the great challenge of planning for pedestrian-friendly movement in areas entrenched with HSTI. The fact that coordinating pedestrian and HSTI movements effectively require many professionals from a variety of planning and transportation disciplines *reflects the ingrained wall effects of HSTI*. Simply, HSTI is not friendly for pedestrians. According to personal observations, data from Malmö Stad, and comments from survey respondents, HSTI creates impacts such as noise, litter, vibrations, safety concerns and other disturbances within the case study area. Over one-half of the survey respondents judged traffic to be a direct problem in their neighborhoods. Photo 10, a wall constructed in one of many places along Lönngatan between residential housing and the street, is an example of physical measures residents employ to try to reduce local street noise and interference. A relatively high percentage of residents also complained of litter and scrap problems in the neighborhood. While other factors, such as trash sorting and collection procedures are likely to also lead to litter problems, HSTI partially contributes to dirt and litter in residential areas. Data

from Malmö Stad indicates that 7% of residents in Malmö are exposed to levels of noise above acceptable national noise limits (65 dBA). There is every indication to believe that at least 7% of residents in the case study area are affected by noise and that as people and goods traffic increases in Malmö over the next decades this influence will increase. In Rosengård, these direct influences are somewhat mitigated by the planning style. However, this style leads to the safety issues already explained.

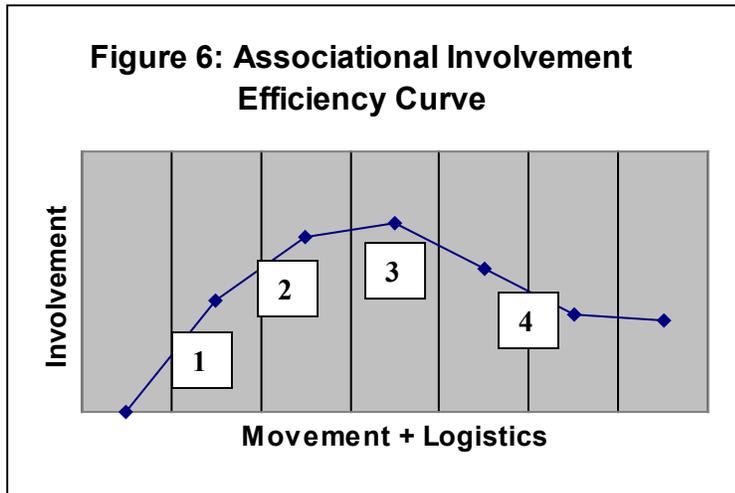
The movement impact of HSTI and its long-term relationship with social capital in the case study area is hard to discern. While Swedes are moving more now than ever before and utilize the car for most personal trips, travel distances and car use are much higher among higher income groups (SIKA, 2003). Less than 40% of Malmö residents own a vehicle, yet the increase in traffic should outpace population growth in the next few decades. The survey respondents, who likely represent an above average income class, own more cars than average Malmö residents (45%) and on average used their vehicles 3.3 hours per week for non-leisure travel. Most residents in Malmö have access to different forms of efficient public transport, including local and regional buses, bicycle and walking paths, and trains. Survey respondents reflected this modal diversity in their non-leisure travel patterns, which typically included either buses or cars and walking or cycling. While public transport and pedestrian movement are encouraged in Malmö, the trend towards personal vehicle use and its potential implications for social capital in the case study area are worrisome. Nadia Ilievska, a trappvärder, active community leader, and political member in Örtagården, explained that the lack of local bus service in Rosengård has already increased personal vehicle use in the area. While Rosengård residents use buses for trips to other parts of the city, Nadia said there were no local buses devoted to intra-Rosengård traffic. With 20,000 residents and relatively large distances between neighborhoods, she explained that many people make local area trips within Rosengård and must rely on cars for this travel. Nadia stated that those residents who do not have a car now hoped to save money for a vehicle in the future. (Interview with Nadia Ilievska, 2003) If the demand for local transport services are not met, area residents will attempt to purchase and utilize personal vehicles. Over time, this increased high-speed movement will exacerbate the wall and zone-of-influence impacts to the area, and potentially reduce social involvement.

While Putnam (2000) finds a very strong correlation between commuting time of U.S. residents and declining civic engagement, the residential survey data does not show the same trend. The limited number of survey responses and the likely above-average associational involvement of the sample population may partly explain this disparity. Unfortunately, I did not find additional Swedish survey data to validate Putnam's correlation. Compared with average Swedes, Americans move farther each day and use the car more frequently for personal travel. Martin Lindström explained that in Skåne, the more active members of the community also tend to be more active in their professional and personal life. Lindström said that according to certain psycho-social models, workers with both high job demands and high control of their work demands tend to be more active members of society outside of work. (Interview with Martin Lindström, 2003). Apparently, these workers carry their working patterns into their community life. While this correlation will require additional research and validation, perhaps the relationship between an active, movement oriented life and community involvement can be reconciled using a modification of Engwicht's movement exchange efficiency curve. Recall that Engwicht (1993) correlated exchange and movement by using a four-stage process. While higher levels of movement increase exchange in the first two stages, at a certain level additional movement creates barriers to exchange, resulting in maximum exchange efficiency in stage 3 and finally reducing overall exchange in the fourth and final stage.

In a similar way, perhaps movement and the logistics of movement are related to associational involvement. Figure 6 shows my modifications to the Engwicht efficiency curve. As individuals become more active community members they must also devote time and energy to movement and the logistics of their movement. For example, attending a public meeting involves a time commitment for moving to and from the meeting plus the time involved in planning the logistics of the trip. Personal movement and logistical planning increases as individuals increase their personal commitments, participating in meetings, social engagements, and other business. Over time, the time devoted to movement and logistics competes with time available for associational or community commitments, and eventually reaches an equilibrium efficiency point at Stage 3. With any added associational or personal commitments, the time involved for movement and logistical planning undermines the productivity of the individual and reduces the time and effectiveness of that individual in her community affairs. Putnam's correlation holds in Stage 4, when time and energy devoted to movement and logistics erodes associational involvement. Perhaps

average Swedes, who devote less time in the car and have shorter daily travel distances than Americans, have not yet reached Stage 4 of this efficiency curve.

This efficiency curve, while not backed by empirical data, may have important implications for political and associational involvement in Sweden and in the case study areas. In his study of Swedish survey data, Teorell (2003) concluded that the *number* of associations to which a person belongs is more



significant for determining political participation than the diversity of any single association. His study shows that individuals belonging to a larger number of associations have access to more information and are more politically involved. In this way, he demonstrates that the "bridging" form of social capital is more important for bolstering recruitment for associations and for political action.

Therefore, it is plausible that if the transaction and times costs created by movement plus logistics become too high, these costs will diminish

associational involvement and undermine political participation in Sweden. As Putnam notes, higher levels of personal movement not only limit an individuals civic engagement but also impose a civic penalty on her community.

Place Matters for Social Capital

Significant questions remain about the impacts of place functionality and scale on differences in social capital stocks. Based on conventional politics participation levels and residential turnover percentages, social capital is lower in many case study neighborhoods than "average" Malmö neighborhoods. Resident composition, socio-economic characteristics, and other forces may account for these social capital differences. Arguably, where social capital is deficient residents should be able to access social networks and enjoy formal and informal social opportunities outside of their neighborhoods. Transport to other areas of Malmö and areas outside of the city is available. The central areas in Malmö boast clean and friendly pedestrian walking streets and the harbor area has diverse recreational opportunities. Malmö has quality education available at many levels and many different associations and organizations for citizens. If these residents feel that their neighborhoods are deficient, they can access social resources in the larger Malmö area. If Malmö boasts these resources, don't all residents benefit equally?

Based on the empirical data, *place matters for social capital* and *neighborhood functionality and scale* are influential determinants of social capital stocks. While most survey respondents generally liked their neighborhood, a high percentage of respondents felt unsafe in certain areas of their neighborhoods. Only 55% of survey respondents had trust for the general population. As the survey group is on average higher income, older, and more active in the community, this trust level seems surprisingly low. While some may argue that the survey population is older and has more women than an average population, Lindström (2003) states that empirical evidence in Sweden shows that there is no trust differences between men and women and that older citizens are more, not less likely to hold generalized trust. Sixty percent of respondents felt crime was a neighborhood problem, while 25% of respondents listed that crime was the largest neighborhood problem. A relatively high percentage of residents complained of youth gangs, litter and scrap problems, and traffic. More than one-half of all respondents felt their neighborhoods did not have enough social areas, work places, or local shopping opportunities and almost 50% said they did not have enough places to meet friends.

Lindström et. al. illustrated that neighborhood social capital, not only personal characteristics, influence personal health characteristics among different socio-economic groups. He showed that these *contextual* differences, beyond personal attributes, significantly affect personal health as well as sense of neighborhood security. The impacts from HSTI on ISES in the case study areas may partly explain the

variance between neighborhood social capital levels, especially in those neighborhoods with lower income residents. For many lower income residents in the case study area, who lack requisite language and work skills, education, and financial capital, local ISES that attracts a diversity of residents gives them access to a broader social sphere. These residents may not have ready access to diverse work-based or associational networks that cut across the socio-economic bridge and therefore must rely more heavily on their local "bridging" spaces. While not all residents will take advantage of ISES, they should have that opportunity.

For predicting current neighborhood functionality and especially "bridging" social capital, *where and how* residents move in Fosie and Rosengård may be more timely questions than *how much* these residents move. Nadia Ilievska and Trevor Graham, both of whom have worked extensively in the Rosengård and Augustenborg areas, highlighted that neither Rosengård nor Augustenborg have nearly enough activities or places for teenagers and young adults to socialize. In Rosengård, for example, Nadia explained that the Centrum area shops and local stores close by 7pm, leaving young adults with few social options outside their homes. Residents living in a deficient social capital area with limited functionality do not necessarily have access to the area wide functionality and social capital pools. Nadia Ilievska and Trevor Graham explained that a majority of Rosengård and Augustenborg residents stay *within* their neighborhoods and do not often venture to other areas of Malmö. Nadia commented that besides the small percentage of workers having jobs outside of Rosengård and teenagers looking for social opportunities, many residents rarely venture outside of Rosengård. Trevor articulated the same principle for Augustenborg residents, and mentioned that local neighborhood resources are especially critical for groups lacking cars, like the elderly and younger children.

The lack of neighborhood functionality in Rosengård and Fosie for younger residents could explain the many complaints from survey respondents of youth insolence, crime, street gangs, and vandalism. Several survey respondents articulated their desire for better neighborhood supervision of younger residents and of rowdy conditions in the evenings. Linström (2003) cites many studies showing that high rates of social capital reduce crime through adult supervision. He notes that the reciprocal is also true that crime reduces social capital. Jackson (2003, 193-4) cites Jane Jacobs' "The Death and Life of Great American Cities," who "observed that where neighborhoods are configured to maximize informal contact among residents, street crime is reduced, children are better supervised, and people express greater happiness with their physical surroundings." Katyal (2002, 23) also cites Jacobs' work when he argues that architecture and urban settings should generate functional diversity not only in land use but also *over time*. Katyal writes:

"Jacobs argued that diversity of use would bring people outdoors and increase natural surveillance. To generate adequate diversity, each city district should serve more than one primary function, and each function should occur during a different time of day so that there is some reasonable consistency in population throughout the day. To plan for diversity, a city cannot simply add a few incentives for businesses to operate in a particular locale; rather, it must cultivate the type of residents who work in harmony with the character of a given city district. Such cultivation requires an understanding of the primary uses of city districts, and aggressive matching of those uses with incentives for secondary uses. Generic plans for inner-city development, such as Central Business Districts and Civic Centers, tend to ignore local conditions in lieu of a wide-eyed hope of generating a massive sea change in a given area. In addition to large-scale planning, municipal housing decisions, from zoning to permits for new construction, could be redesigned to enhance diversity instead of eliminating it."

Conversely, rigid planning disrupts social networks and increases potential for crime. Katyal cites a U.S. example where high crime rates in a St. Louis housing project were linked to the architectural design of the area. He writes that the high crime rate was a direct result of the architectural planning, which did not provide enough public space around the area to encourage informal social networks, social support, or informal social control.

There are numerous reasons for explaining why residents mainly stay in their neighborhoods, and why area respondents feel crime and youth residents are neighborhood problems. Whether simply for logistical ease or financial reasons, residents may prefer to stay at home. Most residents in the case study area do not have vehicles and rely on public transport, walking, or bicycling. Therefore, it may be more

logistically challenging for residents to explore other areas of Malmö. Some of these neighborhoods have higher percentages of younger residents and immigrant families, who may not be familiar with local rules and customs.

Alternatively, the lack of "bridging" social capital and accessibility to diverse social structures can also explain these phenomena. Under these circumstances, intra- and inter-ISES become more essential for Rosengård and Fosie residents as they must rely more heavily on local ISES to develop both "bonding" social capital with their friends and family and more importantly, "bridging" social capital. HSTI dismantles these neighborhood resources. Appleyard (1976), Katyal (2002), and Jackson (2003) provide evidence that traffic on HSTI is strongly correlated with crime or greater residential turnover. The OECD (1998) cites Swedish data that one-third of elderly Swedes feel unsafe in the vicinity of high-speed traffic. Based on my observations and relevant survey data, HSTI creates space between neighborhoods, spreads out land uses, and defines neighborhood boundaries. Planning for both HSTI and flexible and safe pedestrian movement is clearly difficult. Injuries, the lack of landmarks, incomplete signage, noise problems, and inconsistent pedestrian infrastructure and movement corridors are symptoms of the gap between HSTI and pedestrian planning and the weighty effects of HSTI on area residents. Survey evidence suggests that HSTI disrupts the effectiveness of intra- and inter-ISES in the case study areas. Many residents wished for less traffic and more social spaces to entertain friends and allow young residents and children places to recreate. Generally, residents tend to socialize within their neighborhoods, in areas away from the street, within courtyards, playgrounds and yards, within their homes or at local cafes and bars. While these areas may be helpful for generating "bonding" social capital among friends and close neighbors, they are typically intra-neighborhood social places that do not attract a mix of residents from other neighborhoods. These spaces are tucked away among high or mid-rise buildings and are out of view of local streets and without indicative signs.

Walk while We Talk – Social Transport, Augustenborg, and the Fractal City

This thesis has described how unmitigated HSTI increases individual movement through a variety of mechanisms. Especially high levels of movement in personal vehicles and the logistics and time involved in this form of movement can undermine residents' civic involvement and reduce area social capital. Khisty and Zeitler (2001) note "a high-speed society is one that has a decreasing meaningful experience." While high-speed movement is more often a purely mono-functional experience and concept, this reality can be changed. Transport spaces can be layered spaces. Where transport corridors are designed to consider all users, including more vulnerable users like children and the elderly, these movement spaces become social places. Corridors that foster low-speed movement can facilitate social interaction and become neighborhood ISES.

Jackson (2003) cites evidence that in planned developments, where walking paths are separated from the roads and from other human activities, that this design actually discourages walking. She notes that pedestrians may not feel a part of the urban environment in these areas and may feel unsafe away the street environment. Alternatively, Jackson states that where pedestrian pathways are coupled with distinctive landmarks, public buildings and are logically designed, pedestrians are more at ease, may more easily reach their destinations and are more willing to explore unfamiliar settings. Lynch (1981, 429) offers the following hope for city transport planning:

“It may be important to arrange the city so that more people can live close to their work if they choose to do so, and then arrange for the travel experience itself to be pleasant. Perhaps travel could even be a social or a productive event?...It is just possible that transport may not be the utter waste that we all consider it to be.”

Changes in street design and traffic-calming measures can help transition mono-movement space to layered social and movement spaces. The Netherlands has introduced speed reduction measures and "woonerfs", or residential yards in many of their urban and suburban areas. Katyal (2002) illustrates that "by repaving streets and displaying signs, a *woonerf* make streets fully available for pedestrians as well as cars, and provides the 'gestalt' message that the street belongs to the residents." Woonerfs slow down cars allow for flexible pedestrian movement and emphasize the street as a residential place rather than simply a movement space. The OECD (1998) reports that these techniques have made the streets much more

hospital for pedestrians and have reduced accidents with personal injuries in the Netherlands by 80%. The OECD cites a Swedish study conducted in Malmö that confirmed that speed humps used at intersections reduced vehicle speeds by 20 to 30% and showed that a majority of car drivers, pedestrians, cyclists, and residents favored the speed humps.

In its extensive cross-country comparison of the impacts of HSTI on vulnerable road users, the OECD (1998) compiled various recommendations for reducing traffic speeds and improving road conditions for all users. They state that urban public space should support not only travelling but also social and commercial activities and that increasing the use of walking or cycling as transport modes will facilitate both social and commercial activities. They state that a balanced transport system takes:

"into account in the design of the road infrastructure: a "guide of good practice" including design criteria similar to those applied to motorised traffic...Engineers and decision-makers should thus bear in mind that mobility of pedestrians, with an acceptable level of built-in safety, requires that a consistent network of footpaths, pavements, pedestrianised streets, specifically designed mixed traffic streets, etc. ...taking due account of the diversity of vulnerable road users (children, elderly, disabled persons, etc.)"

The OECD report provides several recommendations aimed at achieving the essential goals of low speed for vehicles, increased driver attention to pedestrians, and better organization of the pedestrian environment:

- Creating new links to avoid heavy traffic areas;
- Widening existing routes where needed in relation to pedestrian flows and ease of movement;
- Clearing the way of all obstacles;
- Improving crossing conditions at the contact points with arterials;
- Ensuring good quality surfacing;
- Providing direction signing;
- Ensuring good lighting along traffic corridors.

In addition to modifying and improving street infrastructure for all users, there are many options for reducing car traffic while facilitating social movement. In his study, Krämer-Badoni (1996) convinced families in Germany to avoid using their automobiles for a period of time and had them record their daily travels in a log. Testimony from participants in his study revealed that these participants experienced more spontaneous exchanges with neighbors, friends, and acquaintances during this car-free period than before giving up their cars. Using participants' daily logs and personal interviews, Krämer-Badoni found that these families experienced a greater amount of social exchange opportunities and encounters by using alternative modes of transport such as bicycling, walking, and public transportation.

From 1999 to 2002, Augustenborg employed the use of the Green Line, a battery-powered street train. The Green Line had tires and simply used existing streets, ran on a regular schedule and a designated route and connected Augustenborg residents with the main bus terminal in Malmö, several area shops and commercial areas. In addition to providing residents with flexible local transport, this line served as a social space. Trevor Graham (2002, Interview 2003) articulated that many residents found the Green Line provided them not only with easy access to daily affairs, but allowed them to regularly see neighbors they otherwise might not meet. The Green Line also allowed residents the ability to manage their affairs and visit area friends without the use of a car. In addition, local businesses and shops connected to the Green Line benefited from this transport service. Trevor explained that on special occasions the Green Line was used to transport Augustenborg's children and younger residents to local beaches and the Centrum area. For many of these residents, it was their *first time* visiting these areas. Unfortunately, Skåne Trafiken, the area transit authority, was supposed to administer the Green Line after 2002. However, they did not feel this type of transport was economically viable and the route was shut down.

These examples illustrate that HSTI can be converted to ISES. While this transition takes ingenuity, time, and energy it is definitely possible and may yield significant rewards to area social capital. Photo 11, in Appendix 4, displays Augustenborgsgatan near Lönngatan. This street is one example in Augustenborg where street calming measures, such as humps and narrower streets, and wider

cycling and pedestrian lanes have slowed traffic and improved pedestrian use of the street. Recall that out of over twenty smaller neighborhoods in the case study area, Augustenborg was the *only neighborhood to increase voter participation* from 1998 to 2002. In addition, Augustenborg reduced its residential turnover rate 30% since 1997, one of best improvements of all neighborhoods in the case study area. Granted, the Eco-Staden project has improved area aesthetics in other ways, such as building green roofs, refurbishing area schools and green space, and improving storm water management. As Trevor noted, area wide influences have made housing more competitive in all of Malmö. Assuming other area influences also matter, this tentative correlation between use of the Green Line coupled with street improvements and increasing social capital should not be ignored. This correlation should be analyzed more thoroughly with follow-up research.

The importance of functionality with neighborhoods is critical for developing ISES and building social capital. The neighborhood level must be able to fulfill residents' social, physical, and mental needs, meaning that the neighborhood should have similar characteristics to the city at large. The Fractal City would accomplish these goals by displaying similar functionality at the city and neighborhood levels. Engwicht (1993) explains that fractal systems, such as a picture within a picture, allow the viewer to see the whole picture regardless of the scale at which they view the system. The form of the area neighborhoods need not be similar but must by its nature fulfill the functions of the neighborhood. The conversion of neighborhood interstices from HSTI to layered social and movement spaces can stimulate functional improvements and fractal development by providing all residents with better accessibility and safety in their neighborhoods. Like Augustenborg's use of the Green Line, when these spaces provide residents with good connectivity to local shops, commercial areas, and area businesses they can help stimulate local interaction and economic growth. Over time, these areas become important inter-neighborhood ISES and can foster better "bridging" social capital opportunities in Malmö.

CONCLUSIONS

"Our enthusiasm for speed and change must be tempered. And the metropolis's spatial flows (Castells) must be manipulated, shaped, and rerouted. Global euphoria must be coupled with local energies. Although our IQs may be improving, we still eat, sleep, and die housed in the same vulnerable body saddled with the same, often poorly expressed, insatiable desire for love, friendship, and community (Lerup, 2000, 28)."

Neighborhoods influence social capital development in Malmö. High-speed transport infrastructure, through its wall, zone-of-influence, and movement effects, disrupts overall neighborhood functionality and reduces, or impedes local social capital development. Rosengård and certain neighborhoods in Fosie are generally lower in social capital than other areas in Malmö. To bolster job creation, job creation, and more job creation, which Göran Rosberg considers the three most important steps toward improving conditions in Rosengård, building "bridging" social capital matters (Interview with Göran Rosberg, 2003). Several authors cited in this thesis show empirically that "bridging" social capital, which is fostered through diverse associations and informal socializing, leads to better employment opportunities *especially for lower socio-economic groups*. As Rosengård and Fosie host a higher percentage of immigrants, low-income groups, and persons without personal vehicles, it is disproportionately critical that these residents gain access to "bridging" forms of social capital. Malmö's general population will also benefit from "bridging" social capital generation. Ivarsson (2003) conducted 160 in-depth interviews with Malmö residents to determine the best and worst aspects of the city. Based on his survey evidence, respondents rated integration as biggest failure in Malmö, followed by crime and unemployment. While "bridging" form of social capital are not easy to create, the conditions for its development improve when neighborhoods allow residents the *opportunity* to engage in conversation and activities with their neighbors and friends. Currently, high-speed transport infrastructure imposes barriers to the stability and development of interactive social exchange space in the case study area.

Neighborhood areas that boast intra- and inter-neighborhood social exchange spaces mix and attract people from many areas and provide residents with *place-based and local access* to more diverse social and work networks. Malmö, with its sights on growing into a European center with a rich educational and commercial partnership should be interested in boosting "bridging" social capital among

its residents. By using street-calming measures, improving pedestrian conduits, and employing creative approaches like providing incentives to car owners to use public transit, using neighborhood street trains, and employing the woonerf concept, Malmö can boost inter-neighborhood interactive social exchange space. These approaches will help Malmö become a more Fractal City, with the functional aspects of the city within every neighborhood, and accomplish its long-range goals.

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APPENDIX 2: INTERVIEW SUMMARIES

Interview with Stina Nilsson, Environmental Unit of the Gatukontoret Office, Malmö Stad, July 3, 2003, 11am

1) What is your position and for whom do you work?

Stina works specifically with the Environmental Unit of the Gatukontoret Office, which also includes a Planning Unit and Technical Unit.

2) What is your main role with Gatukontoret?

Stina elaborated on her position and role within the Environmental Unit of the Gatukontoret Office, in Malmö Stad and explained that currently her main project involves reducing Nox pollutants and local air emissions from heavy lorries. In addition, Stina is involved with adopting parking strategies to be more environmentally friendly. The approaches they use involve more "carrot" type approaches, such as promoting free parking for electric vehicles.

3) What are the problems you see in your unit with Malmö's transport situation?

There are local environmental problems such as air emissions (e.g., Nox) and particulate emissions. In addition, the carbon dioxide emissions are also a regional and global concern.

4) Are there any current efforts to reduce personal vehicle use?

Not so much with Stina's group. The City Tunnel project has brought more car use in Malmö, so the group is talking about trying to increase car sharing. However, trying to reduce personal car use is a sensitive issue in both Malmö and Stockholm, as evidenced by the political controversy surrounding road-pricing initiatives.

5) What is the breakdown locally of trips?

About 30% of all trips in Malmö occur by bicycle, while 40% of commuters in Malmö use a bike to get to work.

Interview with Göran Rosberg, Head of Information, Malmö City Planning Office, July 23rd, 1pm

1) How long have you worked in your position and what is your primary function in the office?

Göran has been the chief information officer (Informationchef) for Malmö's City Planning Office (Stadsbyggnads-kontoret) since 1987

2) How do you view the primary function of your office?

Göran is a geographer by trade and believes it is vital to have a mix of professions in the planning office (e.g., engineers, sociologists, planners, ecologists) to understand the bigger picture and regional perspective on Malmö. The office uses planning as a development strategy and makes decisions regarding city planning, zoning, and building.

3) How is Malmö planned in general terms? What type of planning dominates, zoning, mixed use, or what?

Malmö is composed of ten administrative zones, which use their own budgets to fund softer programs like health programs, schools, etc. These smaller zones do not conduct any built environment planning or building projects. Malmö developed in concentric zones from the western harbour area and is traditionally zoned around the million program areas. Current development plans are between the ring roads and western harbour area.

4) Briefly, can you describe Malmö's current development plans and strategies? Main focus?

Bridge (early 1990s) – regional integration

Economy

University (1994-1995)

Bo 01 (2001)

The dominant development theme is how best to prepare Malmö for both local integration and the regional integration of Malmö and Copenhagen through the Öresund link. The current development focus is on integration through the city tunnel project (slated to begin 2004), the western harbour area (Malmö university, Bo01, logistic (transport) park) and between the ring roads, with the idea that development should not extend beyond the outer ring road. These projects are intended to jointly bolster Malmö's regional position and reputation as an educational city, to bring an influx of new investment and attract new companies, and strengthen the position of Malmö and the Skania region. The Bo 01 development fostered an architectural integration of the city to create attraction and sustainable living.

5) What aspects of Malmö are planning officials most eager to improve? Change?

Officials recognized in early 1990s that there is social segregation in Malmö and that there is a need to bolster the economy and integration of Malmö with Skania and the Öresund region. The university development (a vision for the future), beginning in 1994-1995 is intended to accomplish several goals: 1) replace traditional industries with education center, 2) provide greater educational opportunities for residents as Malmö had historically poor statistics for college educated residents, 3) help to break down the current social barriers that exist in the city (university has focus areas in both social integration and ethnic relations).

6) What are the most significant challenges or problems faced by your office currently? Limitations or barriers to development?

The office wants to promote **cooperation between private and public ventures** (logistics park for transport) and stimulate new companies moving to the western harbour area. The city recognizes the need to maintain a **cooperative, not competitive** approach to working with Copenhagen for regional attraction of new business. Continue to struggle with how to integrate immigrants into the city. There is a need for citizens in Malmö to understand the **mental journey** of the city and the direction it will head towards an **educational-knowledge city**.

7) With which other organizations in Malmö do you regularly work? Do you often have community or neighborhood participation in your projects? Transportation office?

There is cooperation between Malmö and Copenhagen's planning departments and joint EU projects undertaken by both cities. While there is some cooperation with other Malmö offices, there is limited if any planning dialogue with ten administrative areas in Malmö or with citizen groups in the planning process.

Do you have any environmental or social focus in the planning process?

While up to the mid-1990s the environment was not a consideration in the planning office, now the environmental considerations play a role in the planning process.

Are there any future plans to change or modify the Rosengård area? If not, what would you do to it if you could do anything?

The focus and development resources will be targeted towards the aforementioned projects (western harbour, city tunnel, between inner and outer ring roads) and not at all in million area. The main concern Göran says need to be addressed is three things: 1) jobs, 2) jobs, 3) jobs! Education is a vital component to bolstering peoples credentials for good jobs.

Interview with Trevor Graham, Ekostaden Augustenborg, Augustenborgsgården, Tuesday July 29th, 2003, 11am

1. What are your job title, your primary responsibilities in the office, and length of time you've worked in Augustenborg?

Trevor has been project manager of Ekostaden since its inception in 1998 and is currently working with Edostaden as well as some other projects in Malmö (climate change education in schools, local investment program, etc). He is employed by the city district but works for the partnership with the district, MKB, and other organizations.

Augustenborg info- Built in the 1950s and for the most part MKB owned (about 1600 out of 1800 flats). The area has always been a relatively low income housing area, although in the early decades of the neighborhood there was a 'tough' cohesion between neighbors and good social networks (according to older residents). Augustenborg was built to be a town within a town and originally had 70 shops, which are now gone at this stage, a school, a cinema, which closed and then reopened, and social centers, which used to be in the cellars of buildings. The social clubs have changed, but are still in effect to some degree (e.g., sports clubs, international clubs, etc.) The neighborhood is relatively compact, mixed architecture, good transport infrastructure, lots of green space, older trees, etc. The apartment flats are a bit small but in good condition overall.

2. What are the main projects and changes that have been made? What are future intentions with the area?

The main Phase I eco-projects include: 1) green roofs and communal garden project that covers many of the industrial buildings, school, and some smaller structures; 2) waste recycling systems; 3) school development and school green space development; 4) additional green space development. Phase II projects include energy management with goals to increase renewable energy system (goal is 15-20% local renewable energy) and create a billing system that will give residents financial incentive to save money on heating (current billing system includes energy use in the cost of rent).

3. What were the primary drivers and inspiration behind initiating these Augustenborg projects? Environmental, social, or both? Mixed ethnicity area like Rosengård?

The social issues were the primary drivers for making the improvements, despite the technical approach and development projects.

4. Where did the funding come from for construction and project development? Which organizations collaborated on the efforts?

24 M Kr Lokal Investelings Programmet på Ekologisk Omställning. Miljödept (Central Gov)
6 M Kr Krettsloppsmiljard – Miljödept (Central Gov)
6 M Kr LIFE – EU funds
150 M Kr Total Funds (rest of funds were local from MKB, some others)

5. What are the barriers you faced and continue to face with encouraging ecological living? Economic, social, etc.

The main barrier has been organizational in nature. Although there are many parties working on the project (MKB, local administrative district, planning department, etc.) and they have worked together reasonably well (this is the one of the first collaborative development projects in Malmö), there has been conflict between parties. High-level management in these organizations has tended to support the project but have had limited time to devote to it, and one key player has left (MKB).

The other barrier is the socio-economic condition and cultural diversity in the area...was about a 50-50 split of Swedes to foreign born and now is 35-65 split.

6. How effective have the projects been in generating a better neighborhood for all residents? Has there been a certain segment of the population left out (e.g., elderly, ethnic group, etc.)

In general terms and not necessarily project related, certain ethnic groups have had a hard time breaking through the socio-economic barriers. Somalians and folks from the Middle East are more often on social welfare and the eastern Europeans are breaking through slowly. Unemployed people in the area are having some psychological problems.

7. How effective have the transport measures been, in particular (the green line and the car ridership programs)? Have these measures reduced automobile use or minimized the necessity for an automobile?

Although Augustenborgsgatan is a one way street, trucks and cars use it often as a two way street and a short cut to Malmö centrum. Residents indicated that traffic was a major problem in the area, there has been disagreement on appropriate measures to take to reduce lorry and through traffic (360 lorries per day in the neighborhood). There was an idea to create a pedestrianized street during Phase I of the project, to reduce road width and create a flush level surface for bikes, pedestrians, etc. However, due to cost and technical difficulties the idea was not implemented. The current approach centers on traffic calming measures, including reducing the speed limits from 50km per hour to 30km per hour, opening some 1 way street to 2 way traffic (to try to avoid crazy driving...backwards down one way street!) and reduce truck traffic by 50%.

The green line operated for three years, from around 2000 to 2002. The line ran every half hour and operated between Malmö's central bus station, ran east from Spårvägsgatan to Lönngatan, then made a right on one of the designated bicycle pathways through Augustenborg and across Ystadsvägen. The line served the residents of Augustenborg and also connected several area shops and businesses with the residential area and bus station. While there was some initial funding for this project allocated in the Ekostaden budget, Skånetrafikens was slated to eventually take over the green line operation. However, Skånetrafikens stated that they felt the green line was not economically viable, despite the fact that the electrical engine used in the green line cars is about 1/10 the expense of a conventional bus engine and the fuel (electricity) is also inexpensive. The residents seemed to enjoy the green line, used it as a social space, and once in a while the green line would go downtown to give the residents and kids a chance to see new areas of Malmö. Many of the children in the neighborhood had never been down to the central area or beach!

The car ridership program is still in operation. Initially, it had three electric vehicles while currently about 35 residents share two vehicles (one electric and one hybrid). As the capacity for each car shared is approximately 35 people, the residents are trying to attract new customers to the program as well as establish electronic booking procedures.

9. How much impact economically have the projects had?

Not significant, although the potential was and is there. About 40 persons have been employed as a result of the programs, some of them were long-term unemployed residents, which is a good thing. Trevor and others tried to use the investment programs as training opportunities (waste collectors and sorters, green building and space construction, etc.) for residents to develop skills in these areas. This would have employed more residents as well as built the local skill capacity of the area and Malmö in general. However, Arbetsförmedlingen was not interested in the initiatives (only IT) and eventually the new green space building opportunities went to outside contractors. Trevor and the city has virtually no sway at all in the affairs of Arbetsförmedlingen and therefore, they had to give up their ideas.

10. How much impact have the projects had to the built environment and what aspects or changes to the built environment have been most important in generating neighborhood cohesion?

On a positive note, the image of Augustenborg has changed for the better in the city. While the longer term prospects in Augustenborg look more promising, in the medium term there is a danger of gentrification in the area. Neighborhood cohesion is critical, as despite the valuable green space and social opportunities in Malmö centrum and western harbour, many residents in Augustenborg and the area do not venture outside their neighborhoods. Turnover of apartments has dropped in Augustenborg, from about 24% turnover in 1998 to about 10% currently. However, it is difficult to attribute this change to the Ekostaden projects as the general housing situation in Malmö has become more competitive.

11. Do you see the physical built environment as a barrier to the residents?

Yes, it may be. There is a feeling of limited mobility among residents as they find it difficult to travel to other areas of the city for jobs and recreation. Many of the low income residents can not afford to go there, even though the younger people may go to the centrum areas for social reasons.

12. Do you see the necessity or ability to extend the principles of Augustenborg to other areas of Malmö? What are the possibilities and limitations?

The idea of the green line was of interest in Universitet Sjukhuset and along the Malmö triangle toward centrum. However, these plans have not gone through yet and the developer of the green line cars, Street Train Sweden, will not build the trains until they receive an order. To construct and operate the green line you require planning permission, highways department, bus organization approval (bus mafia).

Interview with Martin Eriksson, September to October 2003 (several meetings)

1. What are your primary job functions?

I help oversee Aktivstad, which is an electronic community forum used to promote democracy and governance in Fosie. Aktivstad is a relatively unique project, and is one of the only democracy networks running in Europe at this stage (although some of our ideas also came from Finland). The network contains e-forums, email function, community event postings and other information for Fosie residents.

2. How successful has the forum been so far?

We have had mixed success. Currently we have around 700 total users, although some of these individuals may not use the network at all. While we have tried to attract a diverse and larger group of residents to the forum, mostly the e-community consists of Swedish-born residents, over 30 years of age. We have put designated computer terminals in area public places such as grocery stores, job centers, and libraries to try to give more people in the community Internet access. In addition, we will host a meeting in the near future with politicians, citizens, and others to try to boost use and also extend this project for the next year.

3. Have you thought about extending the forum to other areas in Malmö or Sweden?

Right now we are focused only in Fosie with no concrete plans to extend the forum to other areas....although we would like to do that in the future.

Interview with Martin Lindström, Lund Department of Community Medicine, Nov. 11, 2003, 13:30

1. You used conventional politics participation as your proxy of social capital in you neighborhood insecurity study. Is this a useful measure of social capital?

I think that CPP is a useful contextual measure of social capital. CPP is especially helpful as an evaluation of vertical trust, which is trust in institutions and institutional legitimacy, as opposed to horizontal trust that is more like generalized trust. You can use other contextual measures for social capital, such as migration.

2. What have been the voting trends in Sweden and Malmö?

Voting has declined in Sweden over the past 20 years, however the decline has not been uniform over all groups. While the higher income brackets have maintained higher voting rates and have had small declines, the lower income groups have had faster declines in voting participation.

3. Do you find a trend similar to Putnam's in Sweden that higher use of the car is negatively correlated with community participation?

Actually, in Sweden the data with which I am familiar shows that the more actively involved a person is with work and in other areas of his life, the more active the person is in the community. The unemployed in Skania, who have the most free time, contribute the least time to the community.

4. What are the explanations for this trend?

There is a psychosocial model called the Karacek-Theorell model that is used to model different demands on workers and their level of control at work. Basically, workers with high demands and high control in their worklife are more active people outside of work also. Specutively, those people carry over their energy and workstyle to their overall lifestyle. Those with low demands and low control are passive members of the workforce and lead a more passive lifestyle, while those with both low control and high demands have considerable job strain. Those people with job strain generally have a lower life expectancy.

5. You mentioned that neighborhood factors account for differences in social capital levels in Malmö. Do you have any idea what those neighborhood factors are?

Income disparity is becoming a bigger issue, with the gap between the rich and poor in Sweden growing. Velling, for example, is a community south of Malmö that is almost turning into a gated community. In addition, there are some differences, such as language, that create barriers between groups beyond class barriers. These language barriers can be perpetuated by the school system, where some schools are almost all immigrant students.

Interview with Nadia Ilievska, Trappvärder, Örtagården and Tolkjouren member, Nov. 11, 2003-11-16

1. What are your jobs and duties in the area? Nadia is involved in numerous areas. She functions as a trappvärder in Örtagården, as a professional juror, works in area schools and with the Rosengård speakers corner. She works with different community forums as well.

2. Are there barriers to participation in these groups? Language can be a barrier to participation in the town meetings and such, but generally there is a good deal of interest in these meetings.

3. What would you say are the biggest needs for the area? The biggest needs are with improved child care and competent teachers in the school system. The budget for Rosengård is also low and given the high number of unemployed residents this is an issue. There are no social places for the young residents, as Centrum closes at 7pm and there simply are not pizzarias, youth centers, and other places for the younger people to socialize. Vandalization is a problem in Rosengård and apartments and building fixtures do not get fixed soon enough. In addition, there are not enough places for health care.

4. Do you think the traffic situation is acceptable? No, there is not enough local bus service within Rosegård. Rosengård has 20,000 residents and not one local bus for the area. This creates resident dependence on cars.

5. Do residents in Rosengård use the resources in other parts of the city? Some young people and workers use the city and go to work in other areas of the city. However, most people stay in the neighborhood and do not venture out to other areas in Malmö.

APPENDIX 3: RESIDENTIAL QUESTIONNAIRE FORM (Malmö map not included)

Boende i Malmö: Frågeformulär om ditt bostadsområde

Personlig Information

(1) Vad heter ditt bostadsområde? _____

(2) Vilket år är Du född? _____

(3) Kön? Man Kvinna

(4) Hur bor du? (Ringa in ditt val)

A. Flerbostadshus/hyreshus

B. Radhus

C. Småhus/villa

(5) Äger Du någon bil? Ja Nej

(6) Hur länge har du bott i Sverige? _____ Hur länge har du bott där du nu bor? _____

(7) Vad gör Du? (Ringa in ditt val) Arbetar Studerar Arbetslös Annat _____

(8) I genomsnitt, hur mycket tid spenderar Du per vecka på transport som inte är för nöjes skull?

(t. ex. till och från arbete/skola, handla)

A. Bussen _____ timmar B. Bilen _____ timmar

C. Promenerar _____ timmar D. Cyklar _____ timmar

(10) Röstad Du i det senaste allmänna valet? Ja Nej Har ej Rösträtt

(11) Är Du medlem i någon organisation? (t. ex. sport, religiös, välgörenhet, etc.) Ja Nej

Om Ja, hur ofta deltar Du i organisationen per månad?

Och, hur hittade du denna organisationen? (Du kan välja mer än ett alternativ)

- A. Från vänner
C. Från media
- B. Från grannar
D. Annat _____

(12) I genomsnitt, hur många gånger per månad går du på eller deltar Du i någon av följande aktiviteter:

- A. Sportevenemang _____ B. Religösa evenemang _____
C. Bostadsområdes möten/evenemang _____ D. Musikevenemang _____
E. Fester/Bar _____ F. Anndra aktiviteter _____

Information om ditt Bostadsområde

(1) Har Du vänner som bor i ditt bostadsområde? Ja Nej

Om Ja, var träffade Du dem? _____

Om Ja, var bor de? (Du kan välja mer än ett alternativ)

- A. I samma hus
C. I samma kvarter
- B. På andra sidan gatan
D. Annan gata/kvarter

(2) I genomsnitt, hur många gånger per vecka träffar Du dina grannar? _____

(3) Vanligtvis, var träffar Du dina grannar? (Du kan välja mer än ett alternativ)

- A. På din gata
C. I lokal affärer
- B. I lokala parken
D. Annat _____

(4) Vilket är det största problemet i ditt bostadsområde?

(5) I genomsnitt, hur mycket förtroende har Du för: (Ringa in ditt val)

dina grannar:	Mycket pålitliga	Pålitliga	Ibland pålitliga	Inte pålitliga
personer i Malmö:	Mycket pålitliga	Pålitliga	Ibland pålitliga	Inte pålitliga
polisen:	Mycket pålitliga	Pålitliga	Ibland pålitliga	Inte pålitliga

(6) I ditt bostadsområde, känner Du att det finns tillräckligt med: (Ringa in ditt val)

Platser att träffa vänner?	Tillräckligt	Inte tillräckligt
Sociala aktiviteter?	Tillräckligt	Inte tillräckligt
Lokala affärer?	Tillräckligt	Inte tillräckligt
Arbetsplatser?	Tillräckligt	Inte tillräckligt
Transportmöjligheter?	Tillräckligt	Inte tillräckligt
Cykel och gångbanor?	Tillräckligt	Inte tillräckligt
Grönområden/parker?	Tillräckligt	Inte tillräckligt

(7) I ditt bostadsområde, vilka problem ser Du? (Du kan välja mer än ett alternativ)

- A. Kriminalitet
C. Trafik
E. Annat _____
- B. Buller
D. Miljöförstöring eller skräp
F. Ingen problemet

(8) Tycker Du om att bo i ditt bostadsområde? Ja Nej

Varför eller varför inte?

(9) Vad skulle villa Du ändra i ditt bostadsområde?

(10) Använd kartan för att fylla i följande information:

- A) Rita en cirkel runt ditt bostadsområde
- B) Markera med X platser där dina vänner i ditt bostadsområde bor
- C) Markera med # platser där Du vanligtvis umgås i ditt bostadsområde
- D) Markera med Δ platser där Du vanligtvis inte känner dig säker
- E) Om Du anser att det finns platser med för mycket trafik markera dessa med ***

APPENDIX 4: PHOTOS OF CASE STUDY AREA

Photo Description	Photos taken 11/11/2003
<p>1. Photo of Amiralsgatan running eastward towards Rosengård Centrum. Shows one of only a few pedestrian crossing areas over Amiralsgatan.</p>	
<p>2. Amiralsgatan looking westward toward inner Malmö. Photo displays the large amount of space occupied by Amiralsgatan as well as how Amiralsgatan defines the Örtagården neighborhood border.</p>	
<p>3. Lönngatan, running westward toward Södra Varn and the hospital. Lönngatan separates the Persborg neighborhood, on the right, with Hindby and Augustenborg on the left. Notice the housing orientation is away from the street, trying to protect housing areas from street noise.</p>	

4. Lönngatan defines the boundary of Augustenborg.



5. The street show here is Västra Kattarpsvägen, which defines the boundary of Örtagården and Törnrosen.



6. The corner of Bennets väg and Västra Kattarpsvägen, where very few crosswalks and pedestrian corridors are available. The falafel stand is one of the few street-based social spots.



7. A photo of V. Kattarpsvägen, showing the bus stop on the left side of the photo and the lack of pedestrian crossing areas.



8. Courtyard area in Persborg.



9. Adlerfelts väg, while not heavily trafficked, still creates a sizable barrier between Rosengård Centrum and Örtagården.



10. This photo was taken along Lönngatan, where numerous walls and physical barriers have been constructed between residential areas and the street.



11. A photo of Augustenborgsgatan, where the street width and pedestrian walking/cycling area are almost equivalent. The parked cars help to slow down traffic along with uneven pavement that serves as a traffic calming measure.



12. Malmö Map (Malmö Stad, www.malmo.se, November 2003)

