Title

A Case Study of Pedestrian Space Networks in Two Traditional Urban Neighbourhoods, Copenhagen, Denmark

Author

Hrushowy, Neil James Christopher

Publication Date

2006

A Case Study of Pedestrian Space Networks in Two Traditional Urban Neighbourhoods, Copenhagen, Denmark

by

Neil James Christopher Hrushowy

A.B. (Princeton University) 1994
M.S. (University of California, Davis) 1998

A dissertation submitted in partial satisfaction of the requirements for the degree of

Doctor of Philosophy
in

City and Regional Planning

in the

GRADUATE DIVISION

of the

UNIVERSITY OF CALIFORNIA, BERKELEY

Committee in charge:

Professor Peter Bosselmann, Chair
Professor Michael Southworth
Professor Kenneth Craik
Professor Robert Ogilvie

Spring 2006

A Case Study of Pedestrian Space Networks in Two Traditional Urban Neighbourhoods, Copenhagen, Denmark

Abstract

A Case Study of Pedestrian Space Networks in Two Traditional Urban Neighbourhoods, Copenhagen, Denmark

by

Neil James Christopher Hrushowy

Doctor of Philosophy in City and Regional Planning

University of California, Berkeley

Professor Peter Bosselmann, Chair

Most pedestrian environment and behaviour research has applied concepts of connectivity and access uniformly at the neighbourhood scale. Actual pedestrian networks rely on a limited number of routes to provide intra- and inter-neighbourhood pedestrian connections, suggesting the need to focus research. Also, much of the literature has proposed improvements to the built environment that have little relation to the planning system's ability to implement them.

This research aims to assess the applicability of a network approach to pedestrian planning. It includes two case studies of comparable neighbourhoods in Copenhagen, Denmark. One neighbourhood has a robust pedestrian space network rich with choice, while the other has a fragmented network that limits pedestrian route choice.

A randomized survey of 600 households collected data on walking behaviour and perceptions of the pedestrian environment. Also, 17 in-person interviews were conducted with residents to understand how attitudes and pedestrian opportunties influenced walking behaviour.

This research also explored the role of Copenhagen's political culture of planning in building and maintaining robust pedestrian space networks. The theme of state-market

balance of power and its relevance to pedestrian policy implementation was explored through over 20 interviews with planners, politicians and private developers, as well as a detailed study of planning documents.

Survey results found that residents living in a robust pedestrian space network walked to a greater number of local destinations and a broader range of destination types. The relationship held for optional trips to social destinations. Residents living in a more robust pedestrian environment had a larger social network, suggesting neighbourhood design can influence social interaction.

The in-person interviews illustrated how residents chose routes through their neighbourhood, what constituted a barrier to pedestrian movement, and how social barriers affected the desirability of destinations that seemingly meet standard urban design criteria.

The political culture research demonstrated that economic constraints place stress on any planning system. A planning system that enjoys consistent political and financial support from elected officials, however, was found to have a superior ability to respond to collective challenges and develop innovative solutions. Further, the enhanced ability to implement policy appears associated with a more reflective approach to planning that encourages planners to enhance their skills and knowledge over time.

_____Professor Peter Bosselmann, Chair

Table of Contents

Acknowledgements

Many individuals have contributed, through intellectual insight, inspiration, and support, to the completion of this dissertation.

I am deeply grateful to Peter Bosselmann, who provided thoughtful and unparalleled support over the last six years. From the first day of CP241, Peter's passionate commitment to public space and public life research has inspired my work, while his quiet guidance has kept me on course. Through the many challenges experienced along the way, his support has never wavered; indeed, it has proved a pillar of strength thoughout.

I would also like to thank Ken Craik for the many days he selflessly spent discussing my research proposals, refining my thoughts and guiding my inquiry. Through his dedication to my research question, he led by example and I am deeply grateful. Michael Southworth expanded my view of the literature, probed the validity of my arguments and demonstrated time and again how the keen eye of a good editor is invaluable to any publication. Robert Ogilvie sat through many meetings as I worked through how best to explore the political culture of planning. His expansive knowledge of the literature provided the foundation for many of my ideas.

Any time one undertakes research in a foreign country, one inevitably throws the success of the project into the hands of those hosting you. I was very fortunate to have been the guest of a most talented and experienced group of urban space researchers. My special thanks to Jan Gehl, whose writings have inspired now several generations of urban designers. To Lars Gemzøe, whose friendship during my stay and continued collaboration has become the foundation for a pedestrian bridge over the Atlantic. And to Camilla Damm Van Deurs, Solvejg Reigstad and Susanne Andersen I send a warm thank you for your friendship and for

sharing in the daily trials and tribulations of my research effort.

I would like to thank my parents, Margot and Chris, who have always supported my many, many years at school. As I have moved down the bumpy path of academia, regardless of where it has led, their love and encouragement have helped to sustain me. My two sisters, Laurie and Jeanne, have supported me in life in many ways. Both are a testament to the strength of family, as stretched across the continent as we have become, and I cherish our friendship very much.

Finally, I am indebted to my wife, Alexandra. The thousands of contributions, large and small, that she has made to my ideas, my research and to this document are beyond measure. But more than her material contributions, she, above all others, has inspired me through her own life, as a researcher, as my campanion, and now as a loving mother to our son.

I would also like to thank Betty Deakin and the University of California Transportation Centre for the dissertation fellowship that enabled this research to occur.

"Life between buildings offers an opportunity to be with others in a relaxed and undemanding way. One can take occasional walks, perhaps make a detour along a main street on the way home or pause at an inviting bench near a front door to be among people for a short while."

Gehl 1987

"Public controls were viewed as restraints on progress, and though they have developed significantly over time, privatism remains a powerful force in contemporary society. Indeed, much of the debate on current urban policy can be seen as a battle between philosophies of privatism and public planning."

Cullingworth 1997

Chapter 1

Pedestrian Space Networks in Urban Neighbourhoods

1 Introduction

In recent years, efforts to build higher quality pedestrian spaces have gained momentum. Many North American cities have adopted policy statements that support walking as an important mode of transportation; a number of federal and state public health agencies are now advocating for pedestrian facility improvements, while also providing funding for research into the emerging field of "active living". Transportation planners have begun to pay attention to walking as a separate transportation mode, while grassroots movements for pedestrian- and transit-oriented design have begun to influence the design of new subdivisions. What was a small field dominated by urban designers only 10 years ago, has grown into a large field with representatives from a multitude of professions (Powell, 2005; Sallis et al., 2005). The momentum behind pedestrian design is palpable and there is a strong feeling that changes to how we plan are inevitable.

The diversity of professions interested in pedestrian space design spans from public health to transportation planning. The Centers for Disease Control and Prevention (CDC), for example, identifies community design and the lack of opportunities for walking as one factor that has contributed to the dramatically higher rates of obesity among Americans (CDC, 2003). The Transportation Research Board's *Committee on Pedestrians* wrote that substituting walking for short automobile trips would "dramatically benefit society" by improving physical fitness, reducing emissions, reducing costs associated with automobiles, and most importantly, increasing social interaction (Blomberg, Jordan, Killingsworth, & Konheim). In urban design, Carmona writes that the "contemporary ethos is to design pedestrian-dominant rather than car-dominant environments" (Carmona, 2003, p. 188 p 188), and

San Francisco's General Plan *Transportation Element* states that the City's policy is to "support pedestrian needs by incorporating them into regular short-range and long-range planning activities for all city and regional agencies and by including pedestrian facility funding in all appropriate funding requests" (Francisco, 2003). Clearly, promoting pedestrian activity is the focus of much policy talk; however little compelling evidence exists to support Carmona's claim that pedestrian concerns dominate contemporary design, even in San Francisco, a city known for its urban culture.

2 Problem Definition –Walking versus Urban Life

There are three issues associated with the recent research on walkable neighbourhoods that need to be addressed. First, much of the research energy over the past 10 years has focused on the relationship between neighbourhood design and the activity level of residents. The rationale is that a sedentary lifestyle is associated with inadequate access to walking and exercise facilities, and that single-use, low density and poorly connected suburban tract housing subdivisions force residents to drive for all trips. Since a sedentary lifestyle is associated with numerous negative health outcomes, including obesity and heart disease, then public health researchers have become very interested in promoting more walkable residential designs. While understanding the built environment's effect on physical activity is an important research goal, walking is not the only aspect of urban living that urban designers are interested in, nor is it the only outcome public health researchers have addressed (Syme, 2004).

The risk of making physical activity the exclusive outcome is that such a well-organized and well-funded research effort will overshadow other, equally important outcomes, such as designs suitable for children's play, the degree of neighbouring, or the connection to nature. These topics have long been the concern of urban design and still need to be included in the debate over the urban landscape (Appleyard, Gerson, & Lintell, 1981; Bosselmann, 1984; Cooper-Marcus & Sarkissian, 1986; Eubank-Ahrens, 1985; Gehl, 1987; Jacobs, 1993; Proshansky, Fabian, & Kaminoff, 1983; Rapoport, 1977; Southworth & Owens, 1993; Whyte, 1990). The focus on walking as the dominant outcome also turns some traditional

relationships in urban design on their head, such as the enjoyment derived from aesthetically beautiful and socially vibrant built landscapes; urban designers have argued there is value in such landscapes in of themselves, and do not need to be viewed as an input into a physical activity model. What if there is no benefit from certain elements of a proposed street redesign in terms of getting people to walk more? Are those elements the first to be cut because they only bring aesthetic enjoyment or an element of discovery to the walking experience?

The second issue is that the methods currently employed by active living researchers rely exclusively on quantitative assessments of the built environment. The data are collected in one of three ways: 1) objectively measured variables (e.g., density); 2) household surveys with self-rating scales; and 3) trained observers rating neighbourhood environments. The last two are considered alternatives to one another and are often paired with some objective measures of the built environment; they generally produce reliable and valid measures of a neighbourhood's walkability (Gauvin et al., 2005; Leslie et al., 2005; Saelens, Sallis, Black, & Chen, 2003). In this sense, the instruments are well suited to their task. However, there is reason to believe that reducing a street, for example, to its component parts – such as tree cover, sidewalk width, sense of enclosure, and traffic level – will generate an incomplete, or even inaccurate assessment of how well that street meets the diverse needs of users. Future pedestrian environment research should adopt a multi-method approach that allows for the unique characteristics of each neighbourhood to be incorporated into the study.

The third issue involves the appropriate unit of analysis. For an assessment of overall walkability, the neighbourhood could be the appropriate unit of analysis. To successfully design pedestrian space networks, however, a much more detailed approach is necessary. There are two reasons to measure units smaller than the neighbourhood. First, human mobility choices are based on perceptions of specific routes and not abstractions of entire neighbourhoods (Gehl, 1987), while the quality of the pedestrian experience is based on the physical and social characteristics that define the pedestrian's immediate environment (Bosselmann, 1998; Cullen, 1961). Second, improvements to pedestrian routes are most likely to occur on

a street-by-street, or a block-by-block basis, and not by entire neighbourhoods. Therefore, the research has to provide planners and designers with the level of detail they will need to work at this finer scale. Urban designers can contribute to pedestrian transportation planning by helping to refocus the debate towards a detailed understanding of how pedestrians use space not only from a functional perspective, but also a social, emotional and aesthetic one.

2.1 The Unique Needs of Pedestrians

The experience of walking connects the individual to his surroundings and makes him aware of the details to a much greater degree than if he were driving in a car (Appleyard, 1970; Gehl, 1987). Designing streets for the pedestrian, therefore, requires a completely different mind-set than designing for the car. The most important difference between automobile- and pedestrian-oriented design is the intensity, frequency and variety of stimulation throughout the route necessary for walking to be pleasurable, in addition to the obvious difference in the distance someone will be willing to travel while walking versus driving. To date, the most advanced survey instruments used to measure walkability rely on generalizations of the walking environment, both in terms of scale (neighbourhood) and in terms of detail ("interesting walking environment"). Practicing urban designers are already well aware that they need to create "interesting walking environments"; what they do need to know is what essential elements constitute an "interesting environment". On this score, urban design researchers have provided much more information than the sum total from transportation planning and active living fields, and until these fields adjust their research focus to the pedestrian scale, they will fail to meet the needs of practicing planners and designers.

Copenhagen's planning system is recognized as a world leader in pedestrian planning. Danish planning is also known for the degree of authority and level of resources planners have to implement planning policy. Lastly, the rational-hierarchical planning culture does not exist in any North American city to the degree it does in Copenhagen (there are a number of Scandinavian and Northern European cities with comparable planning systems). The

combination of a long-term commitment to pedestrian planning and a planning system empowered to implement planning policy made Copenhagen an ideal research site for this study.

3 The Challenge of Moving from Research to Policy Implementation

There has been considerable discussion concerning the most effective policies for pedestrian facilities, even though little action has occurred. A Transportation Research Board (TRB) report cites that long distances between origins and destinations, as well as the absence of safe and comfortable pedestrian facilities, have undermined efforts to increase pedestrian trips. Accordingly, cities need to reverse these trends by promoting higher density development around transit stations and a mixture of uses throughout the urban area since these strategies have been shown to increase both transit and pedestrian trips (Blomberg, Jordan, Killingsworth, & Konheim). Similarly, a Department of Transportation (DOT) report argued in favour of incorporating urban design variables into travel demand models, saying that urban design "is seen as one means to reduce personal automobile use, by locating activities so that non-motorized and transit trips can be substituted for automobile trips" (Eash, 2003). The factors listed for incorporation include the presence of sidewalks, mixture of land uses, building setbacks, transit stop conditions, and bicycle infrastructure. While certainly associated with good pedestrian environments, these factors provide little meaningful information about the quality of the pedestrian experience and very little concrete guidance that urban designers could use to inform their designs.

The Green Book, published by the American Association of State and Highway Transportation Officials (AASHTO), has become synonymous with street designs that have been especially hostile to nonmotorized transportation; unfortunately, the Green Book has been the standard for American street design for five decades. Indeed, the result of more than a half-century of streets designed according to AASHTO standards is that American street design is "among the least pedestrian- and bicycle-friendly in the world" (Frank 2003).

Fortunately, competing professional societies, such as the Institute of Transportation

Engineers (ITE), have begun to shift engineering's approach to designing streets. ITE has published several manuals for altnernative street standards that advocate for streets designs that are sensitive to the context of the surrounding built environment, as well as the needs of modes other than the automobile (Homburger & Institute of Transportation Engineers., 1989; ITE Technical Council Committee 5P-8., 1997; Lalani & ITE Pedestrian and Bicycle Task Force., 2001). Although the adoption of alternative standards has been limited to a small number of cities across the country, there is growing hope that there will be continued erosion of traditional transportation engineering ideas.

3.1 Political Culture as a Barrier to Policy Implementation

There appears to be no lack of rhetorical commitment to improving the pedestrian environment in America, but there is a marked absence of action. Most societies, be they in North America, Europe or Asia, have all become enamored with the perceived convenience of the automobile; perceived because no society has been able to build an automobile-dominated environment that delivers on the promise. And yet the continued pull of this mentality represents a direct challenge to policies that support walkable and social neighbourhoods. No society has been able to fully resist the push towards "motopia," but the United States has long been considered one of the best examples of an automobile-dominated culture and built landscape (Southworth, 2005). And while many European countries are experiencing suburbanization, it is rarely at the scale typical of a Houston, Phoenix, Atlanta, Orange County or Los Vegas. If we are serious about transforming those cities that are still reasonably pedestrian-supportive (Southworth, 2005), we need to better understand the barriers to policy implementation.

A key barrier between good intentions and more successful pedestrian environment is neither the lack of funding, nor the opposition by residents fearful of change (commonly referred to as NIMBYs, or "Not In My Backyard"), nor the fragmentation of the bureaucratic structure, nor the fierce home-rule mentality of contiguous municipalities. Rather, these challenges reflect a deeper set of cultural values that define the relationship between the state

and its citizens, what Mercer defines as the "political culture" of a society (Mercer, 1982). Applying the concept of political culture to planning, "respecting" private landownership dominates planning debate to a greater degree in America than in most other countries. As a consequence, the large range of issues that are popularly perceived to be within the domain of planning – coordinating land use and transportation policy, building affordable housing, or allocating resources for social services – has been reduced to land use zoning (Cullingworth & Caves, 2003). The overriding objective in land use zoning is to protect or raise property values, which makes fulfilling all the other mandates of planning extremely difficult due to the inherently conservative perspective associated with this narrow, market-oriented approach to land.

Referred to as "privatism" by Sam Bass Warner, these values are not uniquely American, but rather the degree to which they define society is a uniquely American characteristic.

> Psychologically, privatism meant that the individual should seek happiness in personal independence and in the search for wealth...politically, privatism meant that the community should keep the peace among individual moneymakers and, if possible, help to create an open and thriving setting where each citizen would have some substantial opportunity to prosper. (Warner, 1968)

In accordance with this philosophy, planning based on any goal other than the profit maximization of landowners represents a direct challenge to the dominant mindset with regards to land. There are times when alternative goals are achieved, but rarely systematically over a prolonged period of time. The pursuit of privatism through the practice of planning has undermined the state's ability to regulate where, when, for whom and how much development should occur. Instead, planning reflects a disjointed and incremental approach to policy that periodically takes advantage of the confluence of strong leadership, societal consensus and good luck to pursue broader public needs, but usually pursues a non-linear policy course that caters to the desires of influential partisan actors (Lindblom, 1959). When dominated by such a political culture, cities have a difficult time coordinating resources and investments necessary to produce robust pedestrian space networks. Advocates for a more robust pedestrian environment in America have begun to acknowledge the sizable challenges of retrofit-

ting an overwhelmingly automobile-dominated landscape (Southworth, 2005); however, they have not adequately addressed the incongruence between a vision for a more walkable society and the historic shortcomings of American planning.

Relating planning process to planning outcomes is not an entirely new idea; indeed, Bentley has argued that "(t)he poor quality of much of the contemporary urban environment, and the lack of concern for its overall quality, are functions of the processes by which the environment is produced, and the forces that act on those processes" (Bentley, 1999). Cullingworth has written two volumes on topic, grounding his theory in five decades of planning practice in America and comparing it to both the British and Canadian culture of planning (Cullingworth, 1993; Cullingworth & Caves, 2003). And while this has provided the foundation for this inquiry, the political culture of planning remains a little explored idea in mainstream planning literature, despite its centrality to successful planning outcomes.

3.2 Defining Two Competing Political Cultures of Planning

The planning environment is the "space" where the various stakeholders (planners, politicians, private landowners, and interest groups) meet to decide what should get built, for whom, and when. These interactions are heavily conditioned by the political culture of planning. The political culture of planning defines a planner's authority relative to other stakeholders, both directly in terms of the legal limits of that authority, but also indirectly in terms of what resources have been allocated to planning (extensive or limited), how the city has structured the planning bureaucracy (coherent or fragmented), and how much respect and trust politicians have for planners and their recommendations (extensive or limited). In this environment and according to these rules, stakeholders vie for influence over the planning and development agenda, while the product – the built environment – reflects the underlying values and hierarchies of power, in addition to the relevant zoning codes. In the United States, the market-oriented approach to land development can be categorized as an "incremental-individualistic" political culture of planning; "incremental" because of the opportunistic nature of planning (versus systematic), and "individualistic" because of the primary

focus on maintaining property values (versus improving the mobility of residents, addressing environmental concerns, or improving social equity).

The challenge is to bring into sharp focus how the political culture of planning affects urban planning and urban design. I argue that political cultures that are market-oriented will be less able than hierarchal planning environments to achieve geographically more extensive goals, such as the creation and maintenance of a continuous and connected pedestrian space network (PSN).

Adapting language from Wildavsky's *Culture Theory* so that it better reflects conditions in planning, I define two dominant political cultures of planning. First, Incremental-individualism is defined as an ideological commitment to an internally competitive and individualistic planning environment that limits the states ability to interfere in private land development. Such a system is synonymous with a disempowered public sector that has been intentionally fragmented across several public agencies and at best is able to influence short-term development issues (Thompson, Ellis, and Wildavsky 1990). Second, Rationale-hierarchical, is defined as a system that values rational discourse based on the best available information and a commitment to act in accordance with the public good. Such a system is synonymous with an empowered public sector and a planning system structure that ensures the efficient planning of land and services in the city.

The empowered public sector is premised on what is publicly perceived as a free democratic debate at the municipal level that arrives at a policy consensus, which is then implemented. Public power has been defined as public institutions using public money and control over public urban spaces and the design of private buildings to achieve goals defined by democratic institutions, be they at the municipal or federal level. Without political consensus, Copenhagen's city planners are able to achieve little more than San Francisco's planners; the difference lies in the societal expectation for consensus. This expectation prods politicians of different ideological mindsets to work together to address the most pressing issues confronting the city to a much greater degree than would be the case in San Francisco.

This fragmented public sector lacks the cohesion and the public mandate to coordinate the financial and human resources necessary to produce geographically more dispersed urban design goals. Even when there is a confluence of like-minded people within the public sector, the prevailing culture of private interests will likely confound most efforts. Therefore, there are both structural and attitudinal/cultural constraints placed on planners within a market-oriented planning environment that make it especially difficult to achieve those planning and design goals that are geographically more extensive.

In light of these challenges, pedestrian advocates must focus on solutions that do not require a long-term commitment or substantial resources from the city government, but rather use regulatory tools, such as higher parking rates, lower residential parking requirements, and higher density along important commercial corridors to make walking a more attractive choice. As cities continue to struggle to provide fast and efficient public transit service, implementing such policies should benefit alternative forms of transport in general. Lastly, if physical improvements were to be made, then identifying a limited number of neighbourhoods that would most likely support pedestrian improvements and also can raise funds to underwrite the project would be the most prudent course of action. This might not adequately reflect the polished vision of well-landscaped streets, parks and squares that has been articulated by some designers, nor conform to concepts of social equity, but it is commensurate with the political reality in most American cities.

3.3 The Political Culture of Planning and Pedestrian Space Networks

To conduct research on the walkability of neighbourhoods independent of how the political culture of planning shapes government policy is to assume naively that the current state of the pedestrian environment reflects primarily our state of knowledge. As implied earlier, this is simply not true. In a research field as applied as urban design, the investigator must always have one eye focused on implementation, and especially on what the anticipated barriers will be. That is, a keen awareness of the political culture of planning, then, must inform research design. Without a balance between desired outcomes and realistic outcomes,

investigators risk a situation where the "optimal" policy according to state-of-the-art research is beyond the realm of possibility because of restrictions generated by a given political culture of planning. I argue that research questions need to better reflect the political culture of planning in a given city or country. This research, by selecting a best-case research site, is able to explore how successful a planning system defined by a rational-hierarchical political culture of planning is in creating a robust pedestrian space network. If such a planning system cannot achieve this goal, then an incremental-individualistic political culture of planning will likely meet with even less success.

Drawing the concern for improved pedestrian space networks and the political culture of planning together, I suggest that an extensive pedestrian space network that connects people to as many different types of destinations (not just work, but social, recreational, and spaces that meet emotional needs), and does so with great attention to detail at a scale meaningful to pedestrians, is the backbone of successful pedestrian environments. By extension, a fragmented pedestrian space network will adversely affect the sense of connection to the built environment felt by users, reduce their potential for pedestrian mobility, and shrink the spatially-defined sense of social cohesion between residents. Robust pedestrian space networks by nature require urban designers and planners to adopt a logic of movement when they act to expand or strengthen the pedestrian environment. Such a logic entails a spatially-connected mindset and a belief in walking as a transportation mode, not just as a leisure activity. An example of a spatially connected mindset is the understanding that the total network of public and private spaces, not just individual public spaces, must be considered when making strategic decisions concerning physical capital expansion and improvement.

Incremental-individualistic planning environments have special difficulty in operationalizing such a logic, even when planners have been able mentally to make these connections. Conversely, rational-hierarchical planning environments, because they can more easily act in the public's interest (Cullingworth 1993), are better able to coordinate the necessary resources over a sufficient period of time. Copenhagen's 40-year financial commitment to

improving its public spaces demonstrates the staying power a hierarchical planning system can achieve.

4 Research Rationale

There are three normative premises underlying this research. First, the policy priorities that define the nature of the physical environment are influenced primarily by the political culture of planning, and only secondarily by our knowledge of how the built environment conditions human behaviour. Therefore, research that intends to understand how to build better pedestrian environments must also understand the constraints stemming from the local political culture of planning. Even with the expectation that cultures change, achieving today's goals must acknowledge the political context from which solutions would flow. Second, robust pedestrian space networks require the city to become involved in urban space development. Relying on market forces to create and maintain connected, attractive and safe pedestrian routes is inadequate. Third, successful pedestrian networks provide residents with attractive and safe routes not only to local stores and recreational facilities, but also to the larger neighbourhood and to adjoining neighbourhoods. Residents may not walk these greater distances on a daily basis, but the extent of home territory, as well as the degree of knowledge of the neighbourhood may be related to the occasional trips made for special shopping needs, leisure walking from home, and trips to friends who live beyond "normal" walking distances. If the route is unappealing over these longer distances, or there is a significant barrier to pedestrian movement, then a mode other than walking will be chosen. Though these trips are not considered "necessary" from a daily needs perspective, they do enrich our lives while reminding us that the urban experience is about much more than just meeting one's daily needs.

This range of pedestrian movement requires a scale of pedestrian planning greater than has been conceived of in the past. Researchers often assume 400 metres is the maximum distance that pedestrians will walk for most errands. There are other optional trips, however, that may get pedestrians to walk much further if the conditions are right, such

as social trips to meet friends, either at a park, café, restaurant, or at someone's home. The choice to walk to work also would entail much longer trips, again, if the conditions were sufficiently attractive. Given that the U.S. Surgeon General recommends the equivalent of 30 minutes of brisk walking most days of the week, which translates into approximately 3.2km per day, neighbourhood pedestrian plans need to envision environments far more extensive than those associated with the quick walk for a quart of milk.

5 Research Outline

This research will attempt to fill a number of gaps in the literature. First, it will address the gap between planning policy and planning action by linking specific qualities of the policy environment with outcomes in the built environment. Second, it will explore the validity of a network approach to pedestrian planning. The defining characteristic of this approach is the recognition that a limited number of high-quality routes play a disproportionate role in the success of the overall pedestrian environment. This is in contrast to the currently dominant research approach that uses a cognitively more abstract neighbourhood-wide walkability index as the primary measure of the pedestrian environment. Third, it will advance pedestrian research methods by integrating quantitative and qualitative methods to create a more complete understanding of how a robust pedestrian space network influences walking behaviour. Further, it will develop new research tools that better harness the power of GIS-based analysis by applying it to spatially dependent data collected through novel mapping questions included in the household survey.

There are three research goals for this research. The goals are,

I) To understand how a rational-hierarchical planning culture influences efforts to create a robust pedestrian space network.

II) To describe under what conditions rational-hierarchical planning environments are successful versus unsuccessful in creating robust pedestrian space networks.

III) To document how a robust pedestrian space network affects a resident's walking behaviour and her pattern of socialising within her neighbourhood.

These goals are reflected in five research questions that shape the work presented here.

1. How are the underlying values of the city's planning system expressed by Copenhagen's Municipal Plan? How do planners interpret those values and then translate them to the built environment?

2. What are Copenhagen's policies regarding the creation of robust pedestrian space networks?

3. Why was Copenhagen unable to create a robust pedestrian space network when it "improved" Nørrebro in the 1980s, but was able to do so in Vesterbro in the 1990s?

4. Under what conditions has Copenhagen successfully built robust pedestrian space networks?

5. How does a robust pedestrian space network influence:

    - The frequency of walking trips, and the distance per trip?
    - The purpose of pedestrian trips?
    - The variability of route choice?
    - The size of a resident's home range?
    - The degree to which the pedestrian space network supports a resident's social life?
    - The sense of "joy" or pleasure associated with using public open spaces?

6 Dissertation Outline

Chapter 2 reviews the relevant literature from several fields, but emphasises the advances in pedestrian research from the emerging field of "active living." The chapter will also critique the shortcomings in the new literature and offer suggestions for how urban design can play a more central role in defining the future research agenda and contribute to the research methods employed.

Chapter 3 describes the research methodology, including the research protocol, data collection process and data analysis tools. This chapter also presents the rational for selecting Copenhagen, Denmark as the study site.

Chapters 4 and 5 present the results from the political culture of planning research and the neighbourhood pedestrian space network research, respectively.

Chapter 6 summarises the main conclusions and discusses the implications for current research, as well as how future research strategies could be adjusted to ensure research outcomes better match the needs of practicing planners and designers. Importantly, the chapter also discusses the findings' applicability to the North American planning context.

Resources Cited

Appleyard, D. (1970). *Environmental Quality of City Streets.*Unpublished manuscript, Berkeley.

Appleyard, D., Gerson, M. S., & Lintell, M. (1981). *Livable streets.* Berkeley: University of California Press.

Bentley, I. (1999). *Urban transformations : power, people and urban design.* London ; New York: Routledge.

Blomberg, R., Jordan, G., Killingsworth, R., & Konheim, C. *Pedestrian Transportation: A Look Forward* (No. A3B04). Washington, D.C.: Transportation Research Board.

Bosselmann, P. (1984). *Sun, wind, and comfort : a study of open spaces and sidewalks in four downtown areas.* Berkeley, CA: Institute of Urban and Regional Development CED UC Berkeley.

Bosselmann, P. (1998). *Representation of places : reality and realism in city design.* Berkeley: University of California Press.

Carmona, M. (2003). *Public places, urban spaces : the dimensions of urban design.* Oxford ; Boston: Architectural Press.

Cooper-Marcus, C., & Sarkissian, W. (1986). *Housing as if people mattered.* Berkeley: University of California Press.

Cullen, G. (1961). *Townscape.* London: The Architectural Press.

Cullingworth, J. B. (1993). *The political culture of planning : American land use planning in comparative perspective.* New York: Routledge.

Cullingworth, J. B., & Caves, R. W. (2003). *Planning in the USA : policies, issues, and processes* (2nd ed.). London ; New York: Routledge.

Eash, R. (2003). *Incorporating Urban Design Variables in Metropolitan Planning Organizations' Travel Demand Models.* Chicago: Department of Transportation, The Travel Model Improvement Program.

Eubank-Ahrens, B. (1985). The impact of *woonerven* on children's behavior. *Children's Environments Quarterly, 1*, 39-45.

Francisco, C. o. S. (2003). *Transportation Element of the master plan.* Retrieved. from.

Gauvin, L., Richard, L., Craig, C. L., Spivock, M., Riva, M., Forster, M., et al. (2005). From walkability to active living potential: an "ecometric" validation study. *Am J Prev Med, 28*(2 Suppl 2), 126-133.

Gehl, J. (1987). *Life between buildings : using public space.* New York :: Van Nostrand Reinhold,.

Homburger, W. S., & Institute of Transportation Engineers. (1989). *Residential street design and traffic control.* Englewood Cliffs, N.J.: Prentice Hall.

ITE Technical Council Committee 5P-8. (1997). *Traditional neighborhood development : street design guidelines.* Washington, D.C.: Institute of Transportation Engineers.

Jacobs, A. B. (1993). *Great streets.* Cambridge, Mass.: MIT Press.

Lalani, N., & ITE Pedestrian and Bicycle Task Force. (2001). *Alternative treatments for at-grade pedestrian crossings : an ITE informational report.* Washington, DC: Institute of Transportation Engineers.

Leslie, E., Saelens, B., Frank, L., Owen, N., Bauman, A., Coffee, N., et al. (2005). Residents' perceptions of walkability attributes in objectively different neighbourhoods: a pilot study. *Health Place, 11*(3), 227-236.

Mercer. (1982).

Powell, K. E. (2005). Land Use, the Built Environment, and Physical Activity. *American Journal of Preventive Medicine, 28*, 216-217.

Proshansky, H. M., Fabian, A. K., & Kaminoff, R. (1983). Place identity: Physical world socialization of the self. *Journal of Environmental Psychology, 3*, 57-83.

Rapoport, A. (1977). *Human aspects of urban form : towards a man-environment approach to urban form and design* (1st ed.). Oxford ; New York: Pergamon Press.

Saelens, B. E., Sallis, J. F., Black, J. B., & Chen, D. (2003). Neighborhood-based differences in physical activity: an environment scale evaluation. *Am J Public Health, 93*(9), 1552-1558.

Sallis, J. F., Cervero, R., Ascher, W. W., Henderson, K., Kraft, M. K., & Kerr, J. (2005). An Ecological Approach to Creating Active Living Communities. *Annu Rev Public Health.*

Southworth, M. (2005). Designing the Walkable City. *Journal of Urban Planning and Development*(December), 246-257.

Southworth, M., & Owens, P. M. (1993). The evolving metropolis : studies of community, neighborhood, and street form at the urban edge. *Journal of the American Planning Association, 59*(3), 271-287.

Syme, S. L. (2004). Social determinants of health: the community as an empowered partner. *Prev Chronic Dis, 1*(1), A02.

Warner, S. B. (1968). *The private city; Philadelphia in three periods of its growth.* Philadelphia,: University of Pennsylvania Press.

Whyte, W. H. (1990). The Social life of small urban spaces [1 videocassette (60 min.)]. Los Angeles, CA: Direct Cinema Limited.

"The essential point is that the 'city dweller' is socialized not just by people, personalities, and social groups, but by spaces and place; by physical systems that are internalized as conceptions of time, movement, distance, familiarity, safety, beauty, and purpose that provide structure for that individidual"

Proshansky, Ittelson, and Rivlin, 1976.

"From a physical activity and health perspective, transportation studies have numerous shortcomings: the contribution of community design to overall physical activity is unknown, only a small number of environmental variables have been studied, and reliable and valid measures of environmental variables are not available."

Saelens, Sallis, et al. 2003.

Chapter 2

The Evolution of Pedestrian Research and its Future Prospects

The breadth of interest in the relationship between the built environment and walking has increased dramatically over the past 10 years to encompass many researchers from a variety of fields. Amid growing concerns for the deteriorating health of Americans (related to the lack of physical activity, higher rates of obesity and heart disease) and the economic and environmental unsustainability of America's current transportation system, researchers from architecture, civil engineering, economics, urban design, epidemiology, and transportation planning, among others, are now investigating this topic (Powell, 2005). Indeed, there is a growing sense that we cannot continue to prioritise the automobile in how we build new suburban development or maintain existing urban environments. Of paramount concern is how to encourage more people to use human-powered modes of transportation.

The litany of research documenting the rising rates of obesity, inactive lifestyles and the elevated morbidity risks as a consequence of this poor state of health are legion. The growth in obesity in America has been associated with an inadequate amount of activity and poor eating habits (Koplan & Dietz, 1999; Mokdad et al., 1999, 2000). One paper, using national CDC data, estimated that nearly one-third of Americans are obese, and almost two-thirds are either overweight or obese (Flegal, Carroll, Ogden, & Johnson, 2002). Another study estimated that the majority of Americans don't meet the minimum recommended standards for physical activity set by the Surgeon General and other health organisations (USDHHS, 1996), while over one-quarter of Americans engage in absolutely no leisure time physical activities (Lawrence D. Frank, Engelke, & Schmid, 2003). This inactive lifestyle has serious consequences for morbidity and mortality rates in America; statistical studies have generally shown that as activity levels increase, mortality rates decrease. One paper, which

reviewed nearly 20 years of epidemiological studies in order to estimate how many deaths can be linked to the underlying causes of a sedentary lifestyle and poor diet, found that approximately 300,000 Americans die prematurely each year due to these causes (McGinnis & Foege, 1993). This ranked second in the leading causes of death (14 percent of all deaths) behind tobacco (19 percent).

The environmental effects of America's automobile dominated transportation system are no less daunting. Mark Delucchi estimates that the total social costs of highway transportation in America in 1990-91 to range from $1.9 trillion to $3.2 trillion, depending on underlying assumptions (Delucchi, 1997, 2000). Of that total, the nonmonetary externalities of pollution from motor-vehicle use range from $35 billion to $517 billion. With respect to global climate change, the United States is the world's largest emitter of greenhouse gases, accounting for approximately 25 percent of emissions even though it represents less than 5 percent of the world's population (World Atlas, 2003), while over half of America's greenhouse gas emissions are estimated to come from transportation sources (source). The international community is placing increasing pressure on American lawmakers to take responsibility for their country's actions and act in a globally conscientious way. Given these challenges, it is imperative for the United States to become a leader in clean transportation policy. By creating pedestrian-oriented neighbourhoods, the United States could help reduce both the health risks and the environmental risks of its lopsided urban environment and transportation system at a population level.

1 Renewed Interest in the Urban Environment as an Activity Setting

The confluence of new fields has brought renewed energy to the topic of pedestrian design along with a level of resources and research sophistication that had been largely lacking. The result has been a wealth of empirical insight into what characteristics of the built environment influence the choice to walk. That much of the empirically-based research has only confirmed what urban designers and transportation planners in many European cities have "known" for decades does not diminish the scale of the achievement. Rather it should

be viewed as a beginning for future research that delves past superficial associations, such as between residential density and walking, and into questions of how density should be configured, what mix of unit-types should be provided, and what street and sidewalk configurations are most attractive to pedestrians. Importantly, urban designers also need to assert their views more forcefully so that other urban space considerations are not overlooked. That is, in our rush to make America more "walkable", we also need to make sure there are enough spaces to stop, watch, listen, engage, explore, learn and relax in. Making the connection between good walking environments and places that meet the diverse social, emotional and functional roles urbanites require of their cities continues to be a role that urban designers are uniquely qualified for.

2 Urbanism, Urbanity and the Meaning of Urban Life

The meaning of cities as a physical and social concept goes beyond its functional role in the everyday lives of its residents. Historically, cities have been an environment where a diverse range of people can come together and exchange goods, share ideas and explore new directions. Cities, because they concentrate people and wealth in one place, have frequently generated new forms of cultural expression, political ideas and social movements. This means that in addition to conceiving of the city's purpose as serving a purely functional role, such as to provide a healthy walking environment for its residents, there should be an idealistic vision for the city, a vision that reflects some of the core values of the society. For example, the manner in which the city is developed and maintained should reflect concepts of equity and social justice so that those with the least access to power are still represented, be they poor, racially discriminated against, too young to participate or not even born. The processes of physical change should build on the principle of collective action, underlining the imperative to work together and not solely for one's own benefit, while the built product should be vibrant, dynamic, restful, explorable or contemplative, in addition to being efficient, accessible and sustainable. That is, it should meet the diverse emotional and social, and not just functional, needs of its residents.

Urban form affects our attitudes and our behaviour. Active living researchers have focused on the physical activity aspect of the built environment-behaviour relationship, but there are normative outcomes that should be considered as well. Urban form can play a formative role in our democracy by either strengthening or weakening bonds between residents. Kathlene and Lyn, for example, found "significant differences in the lived experiences of suburban and urban dwellers, and these experiences profoundly affect the social lives of their inhabitants" (Kathlene & Lynn, 2000). Citing earlier social capital research by Putnam, the authors conclude that the lack of diverse social experiences associated with suburban living could compromise the ingredients for a democratically engaged citizenry.

This holistic vision of urban life is not easily reduced to a Likert scale measuring the degree of satisfaction, which perhaps explains why no studies to date have tried to incorporate the social or emotional dimensions of a resident's relationship with the built environment[1]. Measuring success over time according to a number of carefully selected indicators, however, is a reasonable and important addition to the larger urban development process. And yet, the success of a city's efforts to improve itself should also be measured through a narrative, a story that reveals how the city hinders or facilitates the efforts of its residents to meet their needs and fulfill their potential.

Given this context, how does the recent surge in research by epidemiologists and transportation planners (among many others) on the relationship between the built environment and walking build upon this conception of the city? Clearly, it has greatly contributed to the sophistication of the dialogue on urban spaces and should continue to play a central role in the ongoing dialogue on urban planning policy. And yet, it is not the entire dialogue and an important role for urban design will be to somehow influence the course of research ideas and methodologies so that 1) outcomes other than the amount and intensity of walking are considered, 2) a more refined set of built environment characteristics are included as independent variables, and 3) study designs that combine inductive qualitative and phenom-

1 Several studies have included social support for physical activity variables, but these are always on the right-hand side of the equation, and are never considered as dependent variables.

enological methods alongside the scientific deductive method. Possible strategies include expanding the definition of health beyond just physical well-being so that other variables, such as the determinants of mental health, can be included. In this way, the built environment's direct and indirect relationship to a broader concept urban living could be examined.

3 Understanding Urban Design's Approach to the Built Environment

Urban design's approach to urban space research differs from the other fields currently studying the walkability of neighbourhoods. There are primarily two differences; first, urban design conceives of the built environment in a more holistic manner; and second, its methods are mostly descriptive and largely do not rely on sophisticated quantitative data collection and analysis tools. Jan Gehl's recent study of London's footways serves to illustrate both points. In describing what is meant by "urban quality", the report says, "City life is more than walking" (p.29), and that city spaces need to be able to accommodate a range of activities. The report defines three broad categories of activities, including Necessary Activities (going to work or school, grocery shopping, etc.), Optional Activities (stopping to spend time in urban spaces), and Social Activities (watching, listening, and interacting with other people, both passively and actively). The report goes on to argue that only urban spaces that offer a high level of urban quality will encourage users to engage in the latter two categories of activities.

"Staying" in spaces has long been a research focus of urban designers. Appleyard conceived of streets as distinct places in which all manners of activities took place, with walking being only one (Appleyard, Gerson, & Lintell, 1981). For him, neighbourhood streets were places for communal activities, for children to play, learn and safely explore their world. J. Jacobs, the earliest and most influential urban critic, argued for the importance of street life to a healthy city and focused her energy on creating safe and attractive streets that supported a diversity of activities (Jacobs, 1961). Like Appelyard, Jacobs believed streets could be good spaces for children; indeed, good streets were essential to successfully assimilate children into society. They did differ, however, on whether streets should be designed to engender close

social contact between neighbours. Jacobs felt that privacy is one of the most important elements of city life, and the ability to remain unintangled in the lives of one's neighbours was essential to maintaining this privacy. Appleyard, by contrast, saw the degree of social relations between neighbours as a measure of successful street design. Neither author collected more than anecdotal evidence in support of their positions.

Lynch adopted a very broad frame of reference – urban form in general – in which walking can be placed as one of the user needs to be accommodated (Lynch, 1981). His performance dimensions - intentionally broad to ensure relevance to as broad a range of contexts as possible, can be applied to pedestrian space networks. Of all his contributions, his emphasis on legibility is likely the best remembered, as well as the most applicable to this discussion.

Lastly, Southworth and Ben-Joseph examined street standards and how they shape urban form at the neighbourhood level. They conclude that the postindustrial suburban landscape has become increasingly less walkable and more auto-oriented, although some recent, but limited, headway has been made in terms of New Urbanist street designs (Southworth & Ben-Joseph, 1995, 1997).

3.1 Urban space – The balance between movement and staying

If current research has focused too narrowly on walking in exclusion of the other aspects of urban life, then many urban designers have focused too narrowly on the quality of place to the exclusion of the pedestrian network connecting places. Perhaps the two exceptions are Cullen's Townscape study, which studied how urban design influences the quality of the urban experience through the lens of sequential views, and Lynch's Image of the City (Cullen, 1961; Lynch, 1960). Their approaches differed substantially, with Cullen adopting a clearly designer perspective of pedestrian environments, while Lynch was the first to employ cognitive theory to studies of the urban landscape. Cullen's study of how vistas open and close as one walks through an urban environment is perhaps a more appropriate analysis tool for Europe's deformed grid pattern of streets than for North America's gridiron, and yet

it still provides valuable insight into how a pedestrian experiences the built landscape. Most importantly, his study reveals how the both the pedestrian's pace and her ability to stop and engage with whatever she encounters distinguishes walking from all other modes, with the possible exception of cycling. By contrast, Lynch, in addition to introducing wayfinding and "imageability" into urban design's lexicon, forcefully argued that pedestrians have a unique cognitive relationship with the city, one that is influenced not only by the comprehensibility of the urban form, but also by the fact that pedestrians have a much closer sensory relationship with the surrounding environment than do car drivers.

Contemporary urban design has become divided over what scale should be emphasised, with one group falling back on the centrality of place in urban settings, while the other is pursuing a neighbourhood level agenda, and has introduced such concepts as pedestrian-oriented design (POD), urban villages and transit-oriented design (TOD) (Calthorpe, 1993; Duany, Speck, & Plater-Zyberk, 2000; Krier, Ibelings, Meuser, & Bodenschatz, 2003). This second group provides detailed recommendations for how urban environments should be designed, including many ideas for improving the walkability of urban environments, although they have little or no credible research to substantiate their claims. Unlike Lynch, Appleyard and Whyte, who were affiliated with universities, many of the current generation of urban design advocates are practitioners who must market their perspectives, perhaps weakening their resolve to conduct rigourous research. Regardless, their advocacy for a more fine-grained grid, greater proximity between origins and destinations, higher density housing, mixed land use and a mixture of housing types and tenures within the same neighbourhood became the starting points for much of the physical activity research. As noted earlier, the recent physical activity research has confirmed the relationship between many of these characteristics and walking, perhaps increasing the credibility of the New Urbanist's tenets, if not the physical manifestations of them.

Urban designers emphasising the centrality of place, a viewpoint that can be called destination domination, is likely a reflection of an architecture-influenced mindset that sees

objects in space, rather that space defined by objects (Carr, 1992; Dixon & Urban Land Institute, 2001; Ford, 2000; Koolhaas, Mau, Sigler, & Werlemann, 1995). This myopic perspective may have undermined the value of urban design to planners and policymakers since it ignores the value of the larger urban context, the importance of connections, and the fundamental role that movement plays in how people use urban space networks. This reverse logic is not isolated to North America, but also afflicts societies where architecture has historically enjoyed a position of prestige. For example, Jon Pape, the Director of Urban Space Design in Copenhagen, Denmark, noted that Copenhagen has historically addressed urban development from the perspective of buildings first, then urban space, and urban life last. As this approach has produced poor quality urban spaces in most of the urban redevelopment sites along the harbour, the city is now trying to reverse it priorities so that urban life comes first, then urban space, and lastly buildings. It is only within this larger framework that the design of place becomes meaningful.

3.2 Urban Design Research

Returning to those authors who have conducted research on the use of urban spaces, be they streets, square or parks, what can the urban design literature contribute to contemporary research? One important theme can be called "comfort and protection," since it deals with the negative influences of external factors on the walking experience. In this group are Appleyard, Bosselmann, Whyte, Eubanks-Ahrens, and Isaacs – a short list indeed. Appleyard focused on the effect of traffic on a number or activities, including neighbouring and social contact; Bosselmann studied the effect of sun and wind on pedestrian comfort (Bosselmann, 1984, 1994); Whyte studied both streets and urban plazas (Whyte, 1988); and Eubanks-Ahrens measured how street design influences children's play (Eubank-Ahrens, 1985). Between them, they found that traffic influenced the level of pedestrian activity and the amount of social contact between neighbours; that design modifies climate conditions and can either enhance or undermine the degree of user comfort; and that public plazas that provide ample, comfortable that is close to the stream of pedestrians, opportunities to purchase food, protect

visitors from wind and provide access to sunlight are better used.

The second category of research has focused on what conditions either encourage walking, or improve the experience of walking. Bosselmann's exploration of block and street dimensions and their affect on perceived time found that a stimulating built environment characterised by narrow facades and interesting transitions from one space to the next "accelerates" time, while a dull built environment characterised by long, unbroken facades "decelerates" time (Bosselmann, 1998). By contrast, Isaacs found that paths with smaller spatial dimensions were perceived as longer than paths with larger spatial dimensions, despite being the same length (Isaacs, 2000). In Gehl's classic book, *Life Between Buildings: using public space*, he emphasises an array of factors that create a positive walking experience, the most important of which is the opportunity to interact with other people in comfortable settings (Gehl, 1987). The design factors include adequate sidewalk width, the lack of pedestrian barriers, connectivity of paths, lots of formal and informal opportunities to sit and watch others, interesting paving and narrow and transparent retail façades along commercial streets. Perhaps no other practicing urban designer has so successfully merged research with implementation as Jan Gehl, with cities such as diverse as Melbourne, Australia; London, Great Britain; Cork, Ireland; Bern, Switzerland; and Copenhagen, Denmark having recently commissioned Gehl to produce public urban space and/or pedestrian plans for them.

3.3 The Social Science Perspective on the Environment-Behaviour Relationship

The final body of research worth exploring comes from the social sciences. This literature has been produced by a variety of fields over time, but sociology and environmental psychology have played the lead roles. Many of the results are cautionary and emphasise the complexity of the relationship between the built environment and behaviour, as well as the nuances in interpretation. Broady, for example, argued that the "effective – or total environment is the product of those physical patterns *plus* the behavior of people who use them, and that will vary according to their social background and their way of life" (Broady, 1968; emphasis added). In this way, Broady recognised the limitation of the built environment to

produce a given behaviour and emphasised the importance of culturally, socially, economically and ethnically defined roles in influencing behaviour in any environment.

Rapoport built upon this perspective when he argued that urban design either inhibits or supports social interaction, but does not determine behaviour (Rapoport, 1991). He qualified this statement in two ways, saying 1) design can be so inhibitive that certain activities become impossible, and 2) design can "suggest" certain activities. That is, if an activity in a given environment (e.g., walking to local stores or visiting local parks) is not encouraged by the prevailing cultural rules, then that behaviour will remain largely beyond the realm of possibility. In terms of the contemporary debate over physical activity, public health advocates and policymakers should explore whether an aggressive campaign to modify accepted patterns of behaviour will need to accompany any improvements made to the pedestrian environment. The example from the physical activity literature that most closely adheres to this perspective is the ecometric approach advocated by Gauvin et al., since the observers are trained to rate the neighbourhood's physical environment according to the "active living potential" (Gauvin et al., 2005).

The pluralistic population that typifies many North American cities adds new challenges for urban designers. Mark La Gory discusses the role of urban anonymity in pluralistic societies. He frames the debate around competing models of the human response to anonymous environments; one side of the debate asserts that the increasing urban complexity has led to greater individual self-awareness and autonomy by breaking down traditional social bonds, thereby leading to behaviour that is less predictable. Conversely, society's increasing emphasis on individualism has strained community solidarity and suggests a need to evolve the physical and social structures that help maintain social cohesion and normative integration (Pipkin, Blau, & La Gory, 1983; Sennett, 1977). To this end, spatial segregation minimizes role conflict and makes social life more predictable by emphasizing "us" and "them." The most meaningful categories distinguishing one group from another include stage in lifecycle, socioeconomic status, and ethnicity. If urban designers wish to help create walkable

neighbourhoods, they must consider in addition to the changes to the built environment, who they expect/hope will be walking and whether there is potential for, if not conflict, then a degree of discomfort.

Related to anonymity are the cognitively defined expectations residents have for their living environment. Altman identified four key categories of these expectations – privacy, personal space, territoriality, and crowding (Altman, 1975). He argued that privacy is the central issue, since it is the "central regulatory process by which a person (or group) makes himself more or less accessible and open to others and that the concepts of personal space and territorial behaviors are mechanisms that are set in motion to achieve levels of privacy." Further, he viewed the environment both as a determinant and as an extension of behaviour i.e., an individual moves to another, or adapts an immediately available, space in order to better support the desired behaviour. This suggests that in theory, residents choose the housing environment that better meet their privacy needs. Given that there is little agreement on the fluidity of many housing markets from the perspective of a given resident, there should be caution in how rigidly this perspective is applied. Regardless, Altman's research clearly emphasises the importance of privacy; therefore, when designers consider densifying a neighbourhood in order to better support pedestrian activity, they need to design housing and provide sufficient open space so that the privacy need is satisfied.

Theories of perception and cognition relate directly to the design of pedestrian environments since they can illuminate how a person uses information from the built environment to make decisions about where to walk, stop or hang out. Neisser adapted Ittelson's theory of perception by arguing that people process information in cycles (Ittelson, 1973; Neisser, 1976). These "perception cycles" filter information through schema, which are internal information structures that accept certain information and directs a search for more information, i.e., through action. This is significantly different from information-processing theories that assume people gather information in a linear sequence of internal processes corresponding to a series of transformations of information (Garling & Gollege, 1989). Neiss-

er's theory means perception is both a spatial and temporal process that occurs constantly as a person moves through the environment. It implies that any static theory of human interaction with the built environment is also too limited.

Applying this to the design of pedestrian space networks, I argue that any conceptual model of pedestrian needs must be based in movement. As noted, however, urban designers tend to focus on individual spaces and their immediate context, i.e., a place-oriented perspective (Tibbalds, 2001). The evolution of urban design towards the incorporation of user needs, and the small number of academics calling for an integrated spatial approach notwithstanding, most designers remain firmly embedded in place, not in flows. In describing the current role for urban design, Buchanan writes that it is "essentially about placing making, where places are not just a specific space, but all the activities and events that make it possible" (Buchanan, 1988). Even when a definition of urban design does include movement, as in the report on urban design by the British Government, it does not distinguish between pedestrians and other transport modes (Department of Environment & Britain), 2000). I suggest that in order to create successful pedestrian space networks, urban designers need to explicitly acknowledge the unique demands of pedestrian movement, with its increased sensitivity to immediate surroundings and the pedestrian's need to cover far greater distances than afforded by a five-minute radius or other arbitrary boundaries. This "logic of movement" may be a common frame of reference for transportation planners, but rarely do we hear urban designers talk in great detail about the necessary elements for a citywide pedestrian network.

Finally, Sommer offers a realistic assessment of how urban designers had best proceed in their efforts to better understand the physical and social environments in which they work. He argued that it is impossible to reduce urban phenomena to any group of factors and that designers "would benefit more from training in the techniques of systematic observation than in the empty rituals included under the category of experimental design" (Sommer, 1969). From this we can deduce that the kinds of rigid categorization of characteristics of the built

environment, *a la* Saelens et al., are less appropriate than approaches that explicitly allow for a variety of influences to combine and produce a given environment. Also implied in his statement is that inductive methods may be the most appropriate study design.

4 Advances from the Active Living Literature

The field of active living research represents an evolution in thought from the early pedestrian activity studies, and begins to acknowledge the breadth of the relationship between the built environment and lifestyle (Sallis et al., 2005). Even with this step forward, active living researchers tend to view the relationship in overly simplistic terms and have only begun to explore the emotional and psychological effects of living in a robust pedestrian oriented neighbourhood that supports the potential for a variety of physical and social activities.

The ability to collect high quality data on both the built environment and on physical activity will determine the degree of success of physical activity researchers to create accurate models of pedestrian behaviour. The progress made since the early transportation planning literature on walking is compelling, from a methodological, data quality and outcome perspective. Early studies often used data ill-suited for pedestrian studies, either because of inappropriate proxies for elements in the urban environment thought to influence walking, because of scales of measurement too gross for pedestrian research (Ewing, Schmid, Killingsworth, Zlot, & Raudenbush, 2003), because of unreliable or invalid measures of physical activity (Cervero & Duncan, 2003), or because of inappropriate study frameworks that apply a derived-demand model better suited for driving than walking (Handy, Boarnet, Ewing, & Killingsworth, 2002). Certainly, the complexity of the relationship between the built environment and physical activity (let alone any of the social and emotional needs urbanites place on the built environment) require sophisticated measurement instruments that are capable of distinguishing the variability in the built environment from one setting to another. And yet one cannot help but conclude that the limitations inherent in the transportation planner's traditional approach to research – limitations that range from poor quality pedestrian data to a derived-demand framework that ignores the fundamental cognitive differences between

walking and driving as modes of transportation – have prevented transportation researchers from making significant advances in knowledge. Indeed, it was only once epidemiologists and environmental psychologists became involved that the data quality and research instruments improved sufficiently to generate the breakthroughs we have witnessed in the past 2-3 years.

As both self-report ratings of the built environment and of physical activity have improved, and as researchers began to better comprehend the complexity of the research task, relationships that some argue have no correlation with walking, such as land use (Boarnet & Crane, 2001), or street connectivity (Crane & Crepeau, 1998), began to show significant and strong correlations with different types of walking. For example, the amount of walking has been found to be positively correlated with residential and nonresidential density (Lawrence D. Frank & Pivo, 1994) (Ross and Dunning 1995; Berman 1996; Kitamura, Mokhtarian and Laidet 1997); positively correlated with the perceived and objectively measured number of destinations (Hoehner, Brennan Ramirez, Elliott, Handy, & Brownson, 2005); correlated with urban form, using home age as a proxy for traditional and contemporary development ; correlated with walking to work (Craig, Brownson, Cragg, & Dunn, 2002); and correlated with land use patterns (L. Frank, 2000).

These conclusions provide valuable information for policy-makers concerned with improving the quality of the pedestrian environment, and yet this study framework will likely be unable to progress beyond measuring correlations between physical activity and very blunt measures of the built environment. Much of the problem lies in the difficulty of reducing the quality of any one dimension of the built environment to a single variable (Cervero & Duncan, 2003). The four characteristics that have received the most attention in the literature, land-use mix, residential density, aesthetic appeal and street connectivity, have often been measured using blunt instruments that do not account for differentials in quality. Table 2.1 lists a number of recent studies and summarizes how different investigators have tried to measure the built environment. Clearly, the breadth of approaches complicates the

comparison of results across studies, since how one study has measured "connectivity" may vary dramatically from another. On path connectivity, for example, no distinction is made between a sidewalk along major 6-lane arterial and a narrow two-lane local street (Berrigan & Troiano, 2002; Cervero & Duncan, 2003; Duncan & Mummery, 2005; L. D. Frank, Schmid, Sallis, Chapman, & Saelens, 2005; Giles-Corti et al., 2005). Other than levelness of the sidewalk surface, there have been no measures of the quality of the path, while density of intersection measures have assumed the ease of crossing to be equal across all intersections (Cervero & Duncan, 2003; L. D. Frank, Schmid, Sallis, Chapman, & Saelens, 2005). The research has also neglected to adopt a standard for whether net or gross residential density should be used, let alone any measure of how the public face of individual buildings relate to the street. Finally, the quality of the shops or recreation facilities in particular, and of shopping districts in general, has been ignored (Cervero & Duncan, 2003; L. D. Frank, Schmid, Sallis, Chapman, & Saelens, 2005; Giles-Corti & Donovan, 2002; Handy, Boarnet, Ewing, & Killingsworth, 2002).

4.1 Study Design and the Quality of Measurement Techniques

One aspect that studies differ along is how measures of the built environment are integrated into a model. The traditional approach used by transportation researchers adopts the derived-demand model from economics that assumes researchers can accurately quantify all major elements of the built environment that influence walking behaviour, and then perform a statistical analysis that describes whether and to what degree each element contributes to the decision to walk (or distance walked, walking intensity, etc.). This approach is based on a cost minimisation assumption; that is, individuals will choose the mode that minimises the cost of travel, where cost is defined as time, monetary cost, convenience, or other similar factors.

A second approach that is gaining support is the use of environment scores that combine multiple measures of the built environment into either a single measure of neighbourhood "walkability", or into a small number of collapsed variables that are used to represent

Table 2.1 - Summary of Measures of Built Environment

					Neighbourhood Measures			
Author	Year	Physical Environment Measures	Method of Data Collection	Study Sites	Density	Connectivity/Accessibility	Land Use Mix	Aesthetics	Other
Frank	2005	Neighbourhood walkability scale.	Objective measures.	Atlanta, GA	Net residential density.	Density of intersections.	Eveness of distribution of square foot for residential, commercial and office.	None.	None.
Giles-Corti	2005	Individual attributes.	Self-report ratings by trained observers.	Perth, Australia	None.	Distance to POS.	None.	POS attributes. Shade along paths; irrigation; walking paths present; sporting facilities present; adjacent to ocean or river; quiet surrounding roads; lighting present; birdlife present.	None.
Leslie	2005	Neighbourhood walkability scale, with 8 categories.	Self-report ratings by respondents.	Adelaide, Australia	Residential density: 4 characteristics.	Connectivity: 5 characteristics; Infrastructure for walking: 6 characteristics.	Land-use mix diversity: 21 characteristics; Land-use mix access: 7 characteristics.	Aesthetics: 6 characteristics.	Traffic safety: 6 characteristics; Safety from crime: 6 characteristics.
Hoehner	2005	Individual attributes	Self-report ratings by respondents and objective measurements.	Savannah, GA and St. Louis, MO	None.	Sidewalks present; bike lane present; public transit available.	Many destinations within walking distance; # of specific destinations; # of places to exercise; presence of POS; # of specific recreational facilities.	Neighbourhood pleasantness; presence of trees; free of litter; level of maintenance.	Feeling of safety from crime; feeling of safety from traffic; neighbour activity level.
Duncan & Mummery	2004	Individual attributes	Self-report ratings by respondents and objective measurements.	Rockhampton, Australia	None.	Euclidean distance versus network distance to nearest parkland, shopping centre, pathway network, busy street and newsagent; heavy traffic; perceived access; busy streets; safe to cycle; topography.	Shops, services and parks within walking distance.	Pleasant walks; cleanliness; maintenance.	Friendliness; dogs; hills; presence of other people, lighting, crime.
Frank	2004	Individual attributes	Objective measures.	Atlanta, GA	Net residential density.	Density of intersections.	Eveness of distribution of square foot for residential, commercial and office.	None.	None.
Saelens	2003	Neighbourhood environment score.	Self-report ratings by respondents.	San Diego, CA	Residential density: prevalence of 6 building densities.	10 questions under two headings: Streets in the neighbourhood; Ptaces for walking or cycling.	29 questions under two headings: Access to services; Proximity to specific stores/facilities.	6 questions under one heading: Neighbourhood surroundings.	Safety from crime (6 questions); Safety from traffic (8 questions); Neighbourhood satisfaction (17 questions).
Ewing	2003	County-level sprawl indices.	Objective measures.	U.S. Nationwide	Gross population density per mile2; % of population living < 1500 persons per mile2; % of population living > 12,500 persons per mile2; county gross population.	Average block size; % of blocks 1/100 of a mile2 or less.	None.	None.	None.
Berrigan & Troiano	2002	Home age as proxy for neighbourhood walkability.	Objective measures.	U.S. Nationwide	None.	None.	None.	None.	Age of home.
Cervero & Duncan	2002	Four factors measuring physical attributes.	Objective measures.	San Francisco Bay Area.	Employment density.	Ped-bike factor for origin & destination: avg block size; intersection density (3-way, 4-way & 5-way separate)	Land-use diversity factor for origin and destination: mixed-use entropy; employed residents-to-jobs balance; employed residents-to-retail/services balance; residentialness index.	Proportion of HH with <$25,000 annual incomes.	Slope; rainfall day of trip; daylight; trip distance.
Craig	2002	Neighbourhood environment score.	Self-report ratings by trained observers.	Six sites in three Canadian provinces.	# of destinations.	Pedestrian accessibility; presence of walking routes; pedestrian needs met; continuity of transportation system; route convenience; traffic threats; obstacles.	Variety of destinations.	Visual interest; visual aesthetics; potential stimulus overload; complexity of stimulus.	Social dynamics; safety from crime; potential for crime.
Giles-Corti	2002	Individual attributes	Self-report ratings by respondents.	Perth, Australia	None.	Presence of sidewalk and shops; type of roadway.	Proximity to recreational facilities; proximity to natural recreationa facilities.	Frequency of tree planting.	

connectivity, aesthetics, land use mix, safety or density. This approach recognises that pedestrians evaluate a range of characteristics while walking down a street and that the combination of characteristics for one space will likely be different than for another.

4.1.1 Walkability Defined

Before moving to a critique of the two dominant approaches to modeling pedestrian behaviour, it would be worthwhile to define "walkability." Sallis et al. suggest walkability refers to the "ability to walk to nearby destinations, such as shops" (Sallis et al., 2005), while Frank et al. defined walkability as the combination of high residential density, high intersection density (representing connectivity), and a high degree of land-use mix (L. D. Frank, Schmid, Sallis, Chapman, & Saelens, 2005). Neither of these definitions is appealing to urban design because of their one-dimensionality, since the experience of walking is about much more than proximity, route directness and destination choice.

An improvement to this transportation planner perspective comes from Gauvin et al. who first recognise that the built environment provides the potential for a range of intentional actions, and does not represent an outcome itself (Gauvin et al., 2005). Instead of walkable neighbourhoods (which assumes a degree of intentionality), it is better to think of the built environment as providing greater or lesser potential to support walking. Within this framework, the authors identify three dimensions that contribute to the low- to high-potential to support physical activity: 1) Activity friendliness; 2) Safety; and 3) Destination density. Each dimension is measured by a number of variables, such as the effort to walk, or the threat of traffic to pedestrians. Again, urban designers find little to relate to in this framework. Like the first set of definitions, this approach was created so that it could be easily quantified for research purposes, which severely limits its scope.

Southworth recently published a more appealing definition that includes several elements overlooked by those in the active living field (Southworth, 2005). He defines walkability as "the extent to which the built environment supports and encourages walking by providing for pedestrian comfort and safety, connecting people with varied destina-

tions within a reasonable amount of time and effort, and offering visual interest in journeys throughout the network." Perhaps more than his definition of walkability, though, are the criteria he proposes to measure walkable cities by. Several criteria overlap with those from the active living research field, such as connectivity, safety, and a fine grained and varied land use pattern. Even with these criteria, however, Southworth brings a welcome breath of reality with such observations as, "Connectivity is best addressed when an area is being designed... and is much more difficult to remedy once a place is built." Given that the majority of the "postindustrial suburban landscape" suffers from very poor connectivity, these communities likely have little hope of becoming more pedestrian friendly. Similarly, he observes that density, like connectivity, are best addressed at the time of construction, and that "[o]nce a low density course grained pattern is put into place, it is a legal and physical challenge to insert density and variety." As we strive to make our communities, walkable, healthful and sociable, understanding the constraints needs to be one of the first tasks.

Southworth argues that the least developed measure of walkability is the "path context," or the overall path environment that includes the buildings, land uses, façade design, tree plantings, views from the path and lighting. He observes, "[a] safe, continuous path network in a monotonous physical setting will not invite pedestrians." The challenge is to identify the essential elements that define the quality of the path context, and then to develop reliable and valid methods of studying it. Some of tried, but the complexity and variability of the built environment makes conducting controlled experiments extremely difficult (Bosselmann, 1999; Isaacs, 2000). Given that urban design is closer to art than science, and since path context is perhaps the closest physical manifestation of what urban designers do, researchers should consider employing qualitative methods in conjunction with the quantitative already discussed, otherwise they risk misrepresenting a core element of the pedestrian experience.

4.1.2 Applying the Derived-demand Model to Walking

The derived-demand approach has met with limited success for two reasons. First,

the underlying assumption, that each aspect of the built environment has a constant and independent effect on the choice to walk, is likely inappropriate for the walking-built environment relationship. Instead, elements of the built environment likely have a synergistic relationship, and that the combination of elements likely changes from one setting to the next. Second, experience to date suggests that researchers have done a poor job of integrating the full range of characteristics that influence walking behaviour, and an even poorer job of measuring them. One example serves to illustrate some of the problems with this research model. Hoehner et al used the concept of "walkability" to select the two study sites (Savannah, GA and St. Louis, MO), and then collected a combination of objectively measured variables and self-report ratings from survey respondents. The self-report survey method is perhaps best for gathering data on such variables as presence of sidewalks, availability of public transport, and availability of places for exercise, since there is less room for recall bias than for subjective characteristics, such as design quality or perceived density (which can vary greatly from actual density). For example, the variables meant to capture the aesthetic quality of a street segment are vague and provide little meaningful insight into the actual quality of the built environment. Respondents were asked, to rate on a four-point scale how "pleasant" a place their neighbourhood was for physical activity. The other three characteristics for which data was collected are similarly vague, and include presence of trees (no measure of canopy, spacing, etc.), amount of garbage and the degree of maintenance. Given the ambiguity of these measures, it is not surprisingly that the study produced such counter-intuitive results as a negative correlation between physical activity and neighbourhood aesthetics (both perceived and objectively measured).

One advantage of the study design is that the variables were identical across both measurement techniques, allowing for tests of validity. For example, the perceived amount of land use diversity was one survey question; the researchers also counted the number of nonresidential destinations within a 400m buffer of each respondent's residence.

4.1.3 Neighbourhood Scales and Ecological Models

An alternative research approach has been to develop neighbourhood-level scales of walkability (Craig, Brownson, Cragg, & Dunn, 2002; Gauvin et al., 2005; Leslie, Saelens et al., 2005; Saelens, Sallis, Black, & Chen, 2003). Indeed, studies such as the Leslie et al., called ecological studies because they use scales aggregated to the neighbourhood scale that reflect a combination of factors that influence walking, represents an important stride forward in how physical activity researchers conceive of pedestrian environments. By not including multiple, often related, neighbourhood variables in a statistical model, the problem of collinearity is avoided. More importantly from the perspective of pedestrian theory, however, is that the use of "neighbourhood" scores calculated as the aggregation of a number of factors hypothesised to contribute to walkability recognises that two neighbourhoods considered equally walkable often differ across a number of individual characteristics, even though as one unit they contain attractive walking routes (Gauvin et al., 2005; Giles-Corti & Donovan, 2002; Saelens, Sallis, Black, & Chen, 2003). For example, the presence of street trees is generally considered to improve the attractiveness of a street to pedestrians, but there are numerous well-used streets without trees, while there are many tree-lined streets that will never become attractive to pedestrians. By developing scales of walkability that allow for a number of elements to combine to create a walkable neighbourhood, researchers have progressed beyond the simplistic approach used by most transportation planners to date.

4.1.4 Critique of Ecological Scales of Walkability

Before such scales become widely adopted by either physical activity researchers or urban designers interested in improving the pedestrian environment, it would be important for urban designers to provide a critique of how the scales are constructed, especially in terms of what factors are considered and how the data are collected. Scale with large units of analysis, such as that applied by Ewing et al., provide reasonable measures of the walking environment at a county-level scale that reliably predict some aspects of walking behaviour, but offer a limited amount of design-specific information for urban designers because of the level of

abstraction (Ewing, Schmid, Killingsworth, Zlot, & Raudenbush, 2003). Indeed, some of have suggested that investigators need to match context-specific behaviours with measures of behaviour-specific environments (Giles-Corti, Timperio, Bull, & Pikora, 2005). That is, if the investigator is interested in walking for transport within neighbourhoods, then all measures of the built environment should be collected at the neighbourhood level, and not at some higher level, such as at the county level.

The first study to employ an environmental score focused on work trips across 27 neighbourhoods in three Canadian provinces (Craig, Brownson, Cragg, & Dunn, 2002). The environmental score consisted of 18 neighbourhood characteristics that were assessed at the neighbourhood scale; examples include the number of destinations, whether pedestrian needs are met, visual interest, and traffic threats. The rating approach differs from other studies in that a small number of trained observers rated all neighbourhoods instead of having respondents self-rate their immediate environment. There are three advantages to this approach: first, the degree of sophistication in what can be rated is greater since the observers can be trained to have a more nuanced understanding of the built environment; second, there can be greater specificity in what gets rated, both in terms of physical spaces and the kind of characteristics; and third, there is less opportunity for observer bias since all observers go through the identical training. Of the 18 characteristics, only visual interest and visual aesthetics did not contribute to the environmental score. Walking to work was related to the environment score, with a 1-point increase in the score resulting in a 25% increase in the percent of residents walking to work, with the effect stronger in urban neighbourhoods than suburban or rural neighbourhoods. The authors note, however, that due to the cross-sectional study design, causation could not be determined. For this reason, they proposed that prospective studies should be conducted.

Using a similar strategy, Gauvin et al. employed an "ecometric" multilevel modeling analysis to evaluate the built environment in 112 neighbourhoods across Montreal, Canada (Gauvin et al., 2005). Ecometrics is the "scientific assessment of environments through

systematic observation and analysis of resulting data through specialized statistical tools" that reduce inter-observer bias and increase reliability. Eight observers went through a 3-day training prior to conducting the observations to ensure consistency. 10 street segments from each neighbourhood were randomly selected. A research assistant then traced a route between each segment, creating the route that observers would walk in order to evaluate the built environment. The data generated from this process would then be adjusted for variability caused by inter-observer differences.

The street segment selection process, while adhering the principle of gathering random and independent observations, ignores the fact that a small number of streets in any neighbourhood (usually neighbourhood commercial streets) carry the preponderance of pedestrians, and therefore should receive relatively more weight than quiet residential streets. By oversampling streets that play a minor role in the overall pedestrian street network, the investigators risk creating non-representative environment score from the perspective of each street's relative contribution to pedestrian activity, the very outcome they were trying to avoid by choosing to randomly select streets.

There were 18 characteristics included in the neighbourhood environment score, categorised into three groupings; Activity Friendliness (AF), Safety (SAFE), and Density of Destinations (DD). The individual characteristics were similar, but not identical, to the Craig, Brownson and Dunn study (see Appendix 1 for complete list of characteristics). The phrasing of each item does not refer to any specific element, such as trees, sidewalk conditions or width of streets; rather, they are perceptions of larger concepts, such as the "pedestrian system", or of the general mood or environment, such as "socially dynamic/static." If one refers to the earlier article by Craig et al. 2002, one can find a definition of some of the characteristics. Social dynamism, for example, is defined as "the potential to see people sitting, standing, and moving about," which is followed by a list of examples, including seating at facilities, seating on porches, or outdoor cafés. The results demonstrate that by training observers, "it is possible to reliably detect between-neighbourhood differences," and that by

removing known sources of variance (i.e., between items and between observers), reliability can be increased. To date, however, no studies have employed ecometric analysis to study the relationship between physical activity and the built environment.

Lastly, the study by Saelens et al represented the first attempt to combine objective measures of total physical activity and neighbourhood scales to study the influence of the built environment on physical activity. Adults from neighbourhoods with differing walkability were selected to complete a survey on their neighbourhood environment. Physical activity was collected through a self-report assessment, as well with an accelerometer worn by the study participant. Test-retest correlations demonstrated a high degree of reliability of the Neighborhood Environment Walking Scale (NEWS) subscales (see Appendix 2 for the NEWS subscales). Also, residents of high-walkability neighbourhoods perceived their neighbourhoods as "having higher residential density, land use mix-diversity, land use mix-access, street connectivity, aesthetics and pedestrian/traffic safety" than did residents from the low-walkability neighbourhoods, strongly supporting the self-report measures' validity. Leslie et al. confirmed the reliability and validity of the NEWS subscales using a modified version in Adelaide, Australia (Leslie, Coffee et al., 2005).

The results demonstrate that after adjusting for age and education level, respondents from high-walkability neighbourhoods engage in significantly more physical activity than respondents from low-walkability neighbourhoods. Interestingly, the walkability scale was significant for moderate-intensity activity and total physical activity, but not for vigourous activity, an outcome that other investigators argue reflects the fact that different neighbourhood scales are necessary for recreational activity than for walking for transport (Giles-Corti, Timperio, Bull, & Pikora, 2005).

Unlike the more descriptive characteristics of the built environment used by Craig et al., the NEWS subscales use concrete characteristics of the built environment, such as the degree to which streets are lit at night, or the speed of traffic on their street. This approach represents an almost literal translation of the work by influential urban critics, such as J.

Jacobs' (eyes on the street), and Appleyard (pedestrian protection from heavy traffic). One is left to wonder which approach will prove to be a more useful measure of the built environment? Intuitively, Craig et al.'s approach is more appealing, since it goes further towards interpreting the built environment according to constructs that pedestrians are more likely to use, while Saelens et al.'s approach is closer to measuring individual attributes than to creating a composite score of the overall pedestrian environment. That is, Saelens et al. have assumed that the overall pedestrian environment is a summation of its component parts, while Craig et al. recognise the pedestrian needs can be met in a variety of ways, and that its is the synergistic – versus cumulative – effect of the various attributes of the built environment that matters most to pedestrian behaviour. In terms of pedestrian routes, Craig et al. allow for a variety of attributes – continuity of routes, multiple route choices, crossing routes or traffic obstacles – to produce the score for a given characteristic (e.g., effort to walk). While this may seem a subtle distinction, researchers have had substantial difficulty measuring the effect the built environment has pedestrian behaviour and many of the past shortcomings have stemmed from simplistic and blunt measures that have little to do with how pedestrians perceive and react to various stimuli.

A second distinction between the two approaches is the number of environment scores produced from the data collection and analysis. Saelens et al.'s approach produces a single walkability index, while Craig et al.'s produces three – density of destinations, safety, and activity friendliness. From the perspective of policy application, Craig et al.'s approach provides planners the opportunity to see more precisely which set of attributes is particularly lacking in a given neighbourhood, while a poor walkability score from Saelens et al may be the result of 10, 20, 30, or 40 low scoring characteristics and it would require additional analysis to pinpoint which ones. Finally, from the perspective of urban design, Craig et al.'s approach is likely easier to adjust by adding an additional category or adjusting an existing one so that the instrument better reflects urban design's holistic approach to studying the pedestrian experience.

4.2 Implications for Urban Design

Despite these current shortcomings, the shift towards ecological models brings physical activity researchers closer to urban design by implicitly acknowledging that urban spaces are about more than just walking. That is, by recognizing that people perceive and make travel decisions based upon the complete environment rather than on individual elements, physical activity researchers have abandoned a degree of their scientific rigidity in exchange for a more realistic understanding of how the built environment influences people's behaviour. As a consequence, questions regarding how to incorporate "sense of place" into public health research can be seriously addressed for the first time (Frumkin, 2003). Once sense of place is incorporated, it will then be a small step to change outcome variables to those discussed earlier, such as optional and social activities, and sense of community.

4.3 The Role of Urban Design in Future Research

It would be important for urban design researchers to step back one moment to consider how best to proceed. One the one hand, the prospect to collaborate with research-savvy fields, such as epidemiology and psychology, is seductive since it would provide an immense opportunity to explore research questions relating to pedestrian activity with a rigour and level of funding previously unavailable to any urban designer. On the other hand, urban designers need to remember that urban life – and its relationship to the built environment – is about more than just walking, and that walking is about more than transportation. Urban designers have long argued that public urban spaces serve a multitude of functions, including providing the opportunity to socialize, to see different types of people in person and not through a filtered medium, to experience different cultures, and to be seen and to express oneself to a wider audience. There are also design considerations for public urban spaces that go beyond the blunt measures used in much of the physical activity research, such as intersection density and mixed land-use, and include experiential elements, such as explorability and surprise. At the most basic level, public open spaces should provide the opportunity to just BE in the public realm, to be part of the public realm, if for no other reason than as a

reminder that cities are about collective spaces, collective responsibility and collective action.

The concern with the current line of research is that by focusing on walking as the lone outcome variable, all of the other roles public urban spaces play could be overlooked. In addition to providing a rich network of footpaths attractive for walking, cities also need places to stop and socialize in non-park spaces, they need places for performances, either planned or impromptu, they need places for activities that occur only occasionally, which would be overlooked in any short-term assessment of the built environment, and they need places for residents to engage in unplanned or unstructured activities. One role for urban designers, then, should be to remind the other fields of these needs and to help adapt the growing number of tested survey instruments so that they can be applied to these other outcomes.

A second and related concern is that those attributes not deemed related to walking would be excluded from research. Informal and formal places to sit, protection from sun and wind, and vistas at key points in the network are characteristics of the built environment not normally considered important for pedestrian behaviour, but essential for more place-bound activities in POS. That such activities take place relatively less frequently only reinforces the need to make special accommodations for them during research.

5 Impediments to Change: The Planning Environment versus Lack of Knowledge

The struggle between competing private and public interests is not a new topic in urban planning, but linking the context of that struggle – the political culture of planning – to the ability of planning authorities to achieve specific types of urban design goals is. Bentley's argument that planning environments are the main cause of poor quality built environments, while supportive of this thesis, does not reflect how the majority of the English language urban design literature has chosen to address the inadequacies of contemporary built environment. Carmona, for example, argues that the lack of knowledge, education and experience (i.e., human capital) on the part of designers, politicians and the public are major limiting factors in the effort to build better places (Carmona 2003). Similarly, the New Urbanists see existing planning policies as the major barrier to creating better places and the persistent

education of public planners and politicians as the solution, but do not ask why the old mindset has been so resilient to change (Duany, Speck, and Plater-Zyberk 2000; Kelbaugh 2002). This perspective, which views regulatory barriers as the major barrier to better built environments, implicitly suggests that given enough education and experience, every city could achieve the same high quality built environment found in cities such as Copenhagen, Denmark, Barcelona, Spain, or Lyons, France. This perspective is incongruent with the practice of planning in the majority of cities across America, where urban planning and design knowledge among professionals is at a comparable level to Denmark, but where the ability to apply this knowledge in any systematic way rarely exists.

Somewhat closer to Bentley's perspective is Muller's historical view of development in America, which he describes as being based on land as a source for speculative profit free from government intervention (Muller, 1994), as compared to a tradition of husbandry in Europe (Cullingworth, 1993). Cullingworth goes even further, arguing that the differences between the planning systems in America, Britain and Canada "are no accident: they stem from cultural differences and the consequent attitudes to land and property" (Cullingworth, 1993). This suggests that remedying defects in pedestrian planning in America would likely entail significantly greater challenges than the reeducation of planners, politicians and the public.

Remedying regulatory barriers is certainly more appealing than confronting the implications of Bentley's and Cullingworth's arguments, and perhaps this path of less resistance resonates more strongly in a culture perpetually looking for the silver bullet fix to its problems. Yet the lack of education and knowledge perspective is incongruent with the fact that many cities outside of America have successfully pursued a range of planning goals, whether it to build pedestrian-oriented neighbourhoods, to dramatically improve the efficiency of public transport or to reduce the energy consumption of the transportation system, and that urban planners and designers from around the world tend to be familiar these successes in great detail (Gehl and Gemzoe 1996).

I would agree that urban designers are more skilled in some cities than others, and that hands-on experience with implementing innovative design ideas adds significantly to the human capital within a planning environment (Flyvbjerg, 2001). Indeed, experience is the best type of education for practicing planners and designers; without experience, a city's ability to solve collective challenges will stagnate. Elkin argues that "social intelligence," or the skills needed to successfully address collective policy challenges, is less abundant in political systems suffering a systematic bias in policy orientation (Elkin, 1987). In particular, political systems characterized by popular control are "unduly hospitable to the preferences of businessmen concerned with land use...The result is systematic bias and shortcomings in social problem solving." Elkin argues that American cities are largely governed according to popular control. If true, then American planning departments are likely thin on social intelligence, a claim that has much anecdotal evidence.

One implication of Elkin's argument is that if we want "smarter" planning departments in American cities, then we will need to change the American system of urban planning and design so that planners and designers have a direct role in improving the quality of the built environment. Perpetuating the status quo will likely result in a continued degradation of the built environment at a time when other cities are pushing forward with meaningful solutions to the very real challenges presented by contemporary urban environments, challenges that will fester if left alone and certainly will not be solved through market regulation.

6 This Research Project

This dissertation addresses several gaps in the literature, both from a methodological perspective and from a knowledge perspective. All the recent studies have relied on either walkability scales or a list of characteristics of the built environment that were developed by groups of experts or adapted from urban planning literature. Some of this knowledge might be derived from open-ended user surveys and in-person interviews, but much of it is boilerplate that reflects the generally accepted principles of good urban design that have achieved

near "dogma" status within the field. Regardless of its origin, these principles are generic, rather than place specific. There simply has not been enough qualitative research in a variety of urban contexts for the field to arrive at such conclusions.

This research project includes methods that allow residents to self-define what the positive and negative characteristics of their neighbourhood street network are. Specifically, the household survey included 1) two open-ended questions that asked respondents to define the primary characteristic that distinguishes their favourite walking route; and 2) an extensive mapping section that asked respondents to identify the best and worst street segments in their neighbourhood, in addition to their favourite walking route through their neighbourhood. The mapping results were analysed to determine the degree of agreement across respondents. Those with a high degree of agreement were then revisited and analysed for their defining physical characteristics. To aid in this process, in-depth interviews with residents were conducted after the survey results had come in, which allowed the researcher to query directly about why a given street was liked or disliked by a large proportion of respondents. An example of a non-design related reason for why people enjoyed visiting two of the more popular retail streets in Vesterbro were the historical roles those streets have played in the neighbourhood. Such a finding would have been impossible within a purely deductive research model.

This research project also expands on the field's understanding of how pedestrian path networks influence pedestrian behaviour by incorporating GIS-based analysis of the survey results. To date, GIS has been used exclusively to identify, evaluate and categorize urban form prior to research, but never to analyze the results themselves. Given the fundamentally spatial basis of physical activity research, this represents a significant shortcoming in the literature. This research used GIS software to explore a number of relationships, including 1) the relationship between walking routes and social networks; 2) network fragmentation and distance walked; and 3) network fragmentation and two definitions of home-range. Future research should build on this approach by integrating objective evaluations of individual

street segments in order to test the relationship between the built environment and route choice.

References Cited

Altman, I. (1975). *The environment and social behavior : privacy, personal space, territory, crowding.* Monterey, Calif.: Brooks/Cole Pub. Co.

Appleyard, D., Gerson, M. S., & Lintell, M. (1981). *Livable streets.* Berkeley: University of California Press.

Berrigan, D., & Troiano, R. P. (2002). The association between urban form and physical activity in U.S. adults. *Am J Prev Med, 23*(2 Suppl), 74-79.

Boarnet, M., & Crane, R. (2001). *Travel by design : the influence of urban form on travel.* Oxford ; New York: Oxford University Press.

Bosselmann, P. (1984). *Sun, wind, and comfort : a study of open spaces and sidewalks in four downtown areas.* Berkeley, CA: Institute of Urban and Regional Development CED UC Berkeley.

Bosselmann, P. (1994). *Urban form and climate : case study, Toronto.* Berkeley: University of California at Berkeley Institute of Urban and Regional Development.

Bosselmann, P. (1998). *Representation of places : reality and realism in city design.* Berkeley: University of California Press.

Bosselmann, P. (1999). Livablie Streets Revisited. *Journal of the American Planning Association, 65*(2), 168-180.

Broady, M. (1968). *Planning for people: essays on the social context of planning.* London,: National Council of Social Service.

Buchanan, P. (1988). What city? A plea for place in the public realm. *Architectural Review,* 31-41.

Calthorpe, P. (1993). *The next American metropolis : ecology, community, and the American dream.* New York: Princeton Architectural Press.

Carr, S. (1992). *Public space.* Cambridge England ; New York, NY, USA: Cambridge University Press.

Cervero, R., & Duncan, M. (2003). Walking, bicycling, and urban landscapes: evidence from the San Francisco Bay Area. *Am J Public Health, 93*(9), 1478-1483.

Craig, C. L., Brownson, R. C., Cragg, S. E., & Dunn, A. L. (2002). Exploring the effect of the environment on physical activity: a study examining walking to work. *Am J Prev Med, 23*(2 Suppl), 36-43.

Crane, R., & Crepeau, R. (1998). Does Neighborhood Design Influence Travel? A behavioral analysis of travel diary and GIS data. *Transportation Research B, 3*(4), 225-238.

Cullen, G. (1961). *Townscape.* London: The Architectural Press.

Cullingworth, J. B. (1993). *The political culture of planning : American land use planning in comparative perspective.* New York: Routledge.

Delucchi, M. A. (1997). *The annualized social costs of motor-vehicle use in the U.S. based on 1990-1991 data : summary of theory, data, methods, and results.*

Delucchi, M. A. (2000). *Environmental externalities of motor-vehicle use in the US.*

Department of Environment, T. a. R., & Britain), C. f. A. a. t. B. E. G. (2000). *By Design: Urban design in the planning system: Towards better practice* (Government report). Lonon: DETR.

Dixon, J., & Urban Land Institute. (2001). *Urban spaces, no. 2 : the design of public places.* New York: Visual Reference Publications; Urban Land Institute.

Duany, A., Speck, J., & Plater-Zyberk, E. (2000). *Suburban nation : the rise of sprawl and the decline of the American Dream* (1st ed.). New York: North Point Press.

Duncan, M., & Mummery, K. (2005). Psychosocial and environmental factors associated with physical activity among city dwellers in regional Queensland. *Prev Med, 40*(4), 363-372.

Elkin, S. (1987). *City and Regime in the American Republic.* Chicago: The University of Chicago Press.

Eubank-Ahrens, B. (1985). The impact of *woonerven* on children's behavior. *Children's Environments Quarterly, 1*, 39-45.

Ewing, R., Schmid, T. L., Killingsworth, R., Zlot, A., & Raudenbush, S. (2003). Relationship between Urban Sprawl and Physical Activity, Obesity, and Morbidity. *American Journal of Health Promotion, 18*(1), 47-57.

Flegal, K. M., Carroll, M. D., Ogden, C. L., & Johnson, C. L. (2002). Prevalence and trends in obesity among US adults, 1999-2000. *Jama, 288*(14), 1723-1727.

Flyvbjerg, B. (2001). *Making social science matter*

why social inquiry fails and how it can succeed again. Oxford, UK ; New York: Cambridge University Press.

Ford, L. (2000). *The spaces between buildings.* Baltimore, MD: Johns Hopkins University Press.

Frank, L. (2000). Land Use and Transportation Interaction: implications on public health and quality of life. *Journal of Planning Education and Research, 20*(1), 6-22.

Frank, L. D., Engelke, P. O., & Schmid, T. L. (2003). *Health and community design : the impact of the built environment on physical activity.* Washington, DC: Island Press.

Frank, L. D., & Pivo, G. (1994). *Relationships between land use and travel behavior in the Puget Sound region.* Olympia, Wash.

Springfield, VA: Washington State Dept. of Transportation ;

Available through the National Technical Information Service.

Frank, L. D., Schmid, T. L., Sallis, J. F., Chapman, J., & Saelens, B. E. (2005). Linking objectively measured physical activity with objectively measured urban form: findings from SMARTRAQ. *Am J Prev Med, 28*(2 Suppl 2), 117-125.

Frumkin, H. (2003). Healthy places: exploring the evidence. *Am J Public Health, 93*(9), 1451-1456.

Garling, T., & Gollege, R. (1989). Environmental Perception and Cognition. In E. H. Zube & G. T. Moore (Eds.), *Advances in Environment, Behavior, and Design* (Vol. 2, pp. 203-238). New York: Plenum Press.

Gauvin, L., Richard, L., Craig, C. L., Spivock, M., Riva, M., Forster, M., et al. (2005). From walkability to active living potential: an "ecometric" validation study. *Am J Prev Med, 28*(2 Suppl 2), 126-133.

Gehl, J. (1987). *Life between buildings : using public space.* New York :: Van Nostrand Reinhold,.

Giles-Corti, B., Broomhall, M. H., Knuiman, M., Collins, C., Douglas, K., Ng, K., et al. (2005). Increasing walking: how important is distance to, attractiveness, and size of public open space? *Am J Prev Med, 28*(2 Suppl 2), 169-176.

Giles-Corti, B., & Donovan, R. J. (2002). The relative influence of individual, social and physical environment determinants of physical activity. *Soc Sci Med, 54*(12), 1793-1812.

Giles-Corti, B., Timperio, A., Bull, F., & Pikora, T. (2005). Understanding Physical Activity Environmental Correlates: Increased Specificity for Ecological Models. *Exerc Sport Sci Rev, 33*(4), 175-181.

Handy, S. L., Boarnet, M. G., Ewing, R., & Killingsworth, R. E. (2002). How the built environment affects physical activity: views from urban planning. *Am J Prev Med, 23*(2 Suppl), 64-73.

Hoehner, C. M., Brennan Ramirez, L. K., Elliott, M. B., Handy, S. L., & Brownson, R. C. (2005). Perceived and objective environmental measures and physical activity among urban adults. *Am J Prev Med, 28*(2 Suppl 2), 105-116.

Isaacs, R. (2000). The urban picturesque: An aesthetic experience of urban pedestrian places. *Journal of Urban Design, 5*(2), 145-189.

Ittelson, W. H. (1973). *Environment and cognition.* New York,: Seminar Press.

Jacobs, J. (1961). *The death and life of great American cities.* [New York]: Random House.

Kathlene, L., & Lynn, J. (2000). Evidence of the socio-political implications of urban design. In J. F. Benson & M. H. Roe (Eds.), *Urban Lifestyles: Spaces, places people*. Rotterdam: A.A. Balkema.

Koolhaas, R., Mau, B., Sigler, J., & Werlemann, H. (1995). *Small, medium, large, extra-large*. Rotterdam

New York: 010 Publishers ;Monacelli Press.

Koplan, J. P., & Dietz, W. H. (1999). Caloric imbalance and public health policy. *Jama, 282*(16), 1579-1581.

Krier, R., Ibelings, H., Meuser, P., & Bodenschatz, H. (2003). *Town spaces : contemporary interpretations in traditional urbanism*. Boston, MA: Birkhauser-Publishers for Architecture.

Leslie, E., Coffee, N., Frank, L., Owen, N., Bauman, A., & Hugo, G. (2005). Walkability of local communities: Using geographic information systems to objectively assess relevant environmental attributes. *Health Place*.

Leslie, E., Saelens, B., Frank, L., Owen, N., Bauman, A., Coffee, N., et al. (2005). Residents' perceptions of walkability attributes in objectively different neighbourhoods: a pilot study. *Health Place, 11*(3), 227-236.

Lynch, K. (1960). *The image of the city*. Cambridge Mass.: Technology Press.

Lynch, K. (1981). *Good City Form* (Eleventh Printing ed.). Cambridge: The MIT Press.

McGinnis, & Foege. (1993).

Mokdad, A. H., Serdula, M. K., Dietz, W. H., Bowman, B. A., Marks, J. S., & Koplan, J. P. (1999). The spread of the obesity epidemic in the United States, 1991-1998. *Jama, 282*(16), 1519-1522.

Mokdad, A. H., Serdula, M. K., Dietz, W. H., Bowman, B. A., Marks, J. S., & Koplan, J. P. (2000). The continuing epidemic of obesity in the United States. *Jama, 284*(13), 1650-1651.

Muller, E. (1994). The Americanization of the City. In *The Making of the American landscape* (pp. xvi, 433). New York: Routledge.

Neisser, U. (1976). *Cognition and reality*. San Francisco: Fremen.

Pipkin, J., Blau, J. R., & La Gory, M. (1983). *Remaking the city : social science perspectives on urban design*. Albany: State University of New York Press.

Powell, K. E. (2005). Land Use, the Built Environment, and Physical Activity. *American Journal of Preventive Medicine, 28*, 216-217.

Rapoport, A. (1991). Pedestrian Street Use: Culture and Perception. In A. V. Moudon (Ed.), *Public Streets for Public Use* (pp. 80-94). New York: Columbia University Press.

Saelens, B. E., Sallis, J. F., Black, J. B., & Chen, D. (2003). Neighborhood-based differences in physical activity: an environment scale evaluation. *Am J Public Health, 93*(9), 1552-1558.

Sallis, J. F., Cervero, R., Ascher, W. W., Henderson, K., Kraft, M. K., & Kerr, J. (2005). An Ecological Approach to Creating Active Living Communities. *Annu Rev Public Health.*

Sennett, R. (1977). *The fall of public man* (1st ed.). New York: Knopf.

Sommer, R. (1969). *Personal space; the behavioral basis of design.* Englewood Cliffs, N.J.,: Prentice-Hall.

Southworth, M. (2005). Designing the Walkable City. *Journal of Urban Planning and Development*(December), 246-257.

Southworth, M., & Ben-Joseph, E. (1995). Street standards and the shaping of suburbia. *Journal of the American Planning Association, 61*(1), 65-81.

Southworth, M., & Ben-Joseph, E. (1997). *Streets and the shaping of towns and cities.* New York: McGraw-Hill.

Tibbalds, F. (2001). *Making people-friendly towns : improving the public environment in towns and cities.* London ; New York: Spon Press.

Whyte, W. H. (1988). *City : an in-depth look at the people, the movement, and the buildings that make a city live* (1st ed.). New York: Doubleday.

"More fundamentally, qualitative research methods should be used to identify the characteristics of the built environment that should be measured and to explore appropriate ways of measuring them."

Handy, Boarnet, Ewing and Killingsworth, 2002.

"In general, case studies are the preferred strategy when "how" or "why" questions are being posed, when the investigator has little control over events, and when the focus is on a contemporary phenomenon within some real-life context."

Yin 2003

Chapter 3

Research Methods

1 Site Selection Criteria

There were two selection criteria used to identify a city appropriate for this dissertation's research aims. First, the city needed to engage in proactive planning and play a major role in urban space development. Second, it had to have neighbourhoods that offered a range of walkability characteristics so that an effective comparison could be made. Specifically, it had to have at least two neighbourhoods that provided comparable access to shops and services in terms of the average distance from a resident's home, but that differed in the degree of street and block fragmentation, the number of pedestrian barriers, and the degree of connectivity to adjacent neighbourhoods.

Due to the paucity of American cities known for proactive pedestrian planning, this research project identified Copenhagen, a city that has a long history of making improvements to public open spaces, including pedestrian facilities. Copenhagen was one of the first European cities to pedestrianise streets in its historic city centre. The city began in 1962 by pedestrianising 1.1 km of Strøget. Encouraged by the tremendous success of the initial project, the city has incrementally increased the scale and quality of the city centre pedestrian network year after year (see Images 3.1 and 3.2). Today, the pedestrian network includes approximately 33,000 m^2 of streets and 66,000 m^2 of squares (Gehl & Gemz˙e, 2000). Copenhagen also has a strong history of other urban planning interventions, including the development of new, and refurbishment of existing public open spaces throughout the city; the expansion the bicycle lane network and the urban renewal of outdated and dilapidated neighbourhoods. Many of these interventions have been extremely successful – some have not been – and on balance Copenhagen's planning system can be viewed one of the strongest

in Europe. Given this background, Copenhagen was deemed an excellent site to evaluate the role government can play in creating successful pedestrian space networks, as well as how such a network affects how residents use and perceive their neighbourhood.

1.1 Regulatory Planning versus Proactive Planning

The rationale for choosing a city with a proactive planning system is related to what tools the planning department has at its disposal to improve the quality of its public spaces in general, and the pedestrian environment in particular. Opportunities to improve the pedestrian environment occur under two very different mechanisms. The first mechanism requires individual landowners to put up a new building on their land. The planning department can then require improvements to the sidewalk directly in front of the property. In this way, certain fragments of the street can be improved, and if there are consistent city design guidelines for that street, there is the possibility over time of creating a coherent character to the street.

This system can be referred to a regulatory-based planning system, since it requires the planning authority only to create and enforce design guidelines. The benefit of this approach is that it doesn't cost the city very much money to gain improvements to public spaces. One drawback is the need for the large-scale transformation of an area in order to ensure a consistent design along the entire street length. This very rarely occurs. A second drawback is that a reconfiguration of the public right of way is impossible, since reallocating space between sidewalks and roadway requires consistency along the entire street length. A third drawback is a lack of discretion over where and when an improvement occurs, which can result in a mismatch between greatest need and opportunity. Finally, a planning structure that predominantly relies on this mechanism has a greater degree of inertia built into the design of the physical landscape and is therefore less likely to make the major adjustments that periodically become necessary.

A variation on this approach occurs in privately owned areas where there is a large-scale renewal of functionally obsolete land, such as abandoned port facilities or manufacturing districts. Many cities have large tracts of such land, and therefore, strategies for renew-

ing them have continuously grown in importance. As alternative land uses become viable economically on the abandoned land, the city can negotiate with large private landowners for improvements to public spaces in exchange for permits, zoning changes and other incentives at the individual city's disposal. Under these conditions, it is possible for a regulatory-based planning system to successfully create a consistent design of the pedestrian environment.

The second mechanism relies on the city to improve a street, square or park using its own funds. The city is responsible for designing and undertaking the improvement, and the use of public funds puts significantly more power into the hands of public agencies to achieve the goals embodied in the city's Municipal Plan. The benefits of this approach include an increased ability to achieve geographically more extensive design goals, significantly more discretion over the quality of the design, and the ability to achieve design goals that benefit the common good. The drawbacks include the limit of public funding and the relatively time-intensive process of integrating greater public participation during the design phase.

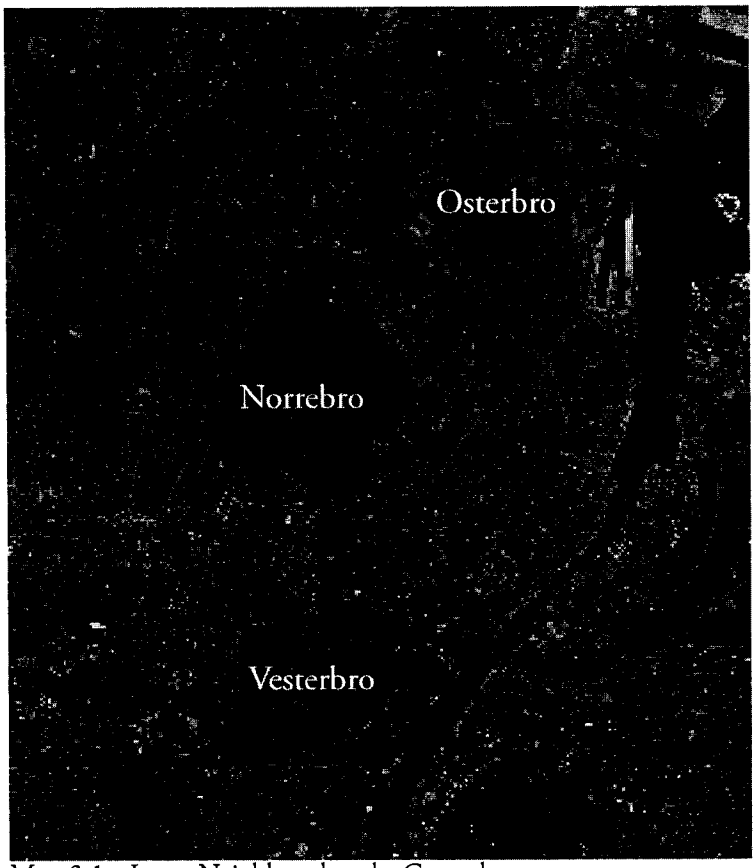
Copenhagen's planning system relies on both market forces to generate investment and on the exercise of public power to ensure private investment occurs in a way that provides the greatest benefit to the city. As the analysis of Copenhagen's planning system illustrates, the interplay between market forces and public power is much more complex than a single label can convey; however, the long-term commitment by the city council to invest in and improve the pedestrian environment, while simultaneously harnessing private investment to renew the substantial areas of land abandoned by a shrinking port industry, clearly identifies Copenhagen as a city with a balanced planning system that does not favour partisan interest groups at the expense of the general public.

1.2 The Neighbourhoods – Nørrebro and Vesterbro

Two neighbourhoods were of particular interest for this research study. Both had gone through an urban renewal process within the past 20 years, although each emerged with dramatically different results. The first neighbourhood, Nørrebro, saw large sections of its block structure fragmented by heavy-handed planning policy. The second, Vesterbro, expe-

rienced a much more subtle process and its existing pedestrian network was reinforced by a number of urban space and street improvements. This contrast in the degree of fragmentation of the pedestrian space network, combined with their similar sociodemographics, similar history, and similar reputation made Nørrebro and Vesterbro excellent candidates for the case study.

The three neighbourhoods that ring the historic city were formally faubourgs situated outside the city walls. Østerbro, Nørrebro and Vesterbro are translated as East Gate, North Gate and West Gate. When the city walls were torn down in the 1870s and the moat was turned into a string of parks, all three neighbourhoods became the focus of intense speculative building. Copenhagen was going through a rapid process of industrialisation at the time and the influx of new labour demanded a rapid expansion of the housing stock (see Map 3.1). Of the three, Østerbro is the most affluent and its street life the most sedate. It is also the furthest removed from the city centre, which adds to its air of exclusivity. Nørrebro and Vesterbro, however, were built for similar demographics and shared a common history as neighbourhoods for the working class. They remained working class neighbourhoods for most of their history, and consequently, little private investment was available to upgrade the housing stock. As a result, some buildings had no indoor toilets or warm running water well into the 1970s. These clearly undesirable living conditions



Map 3.1 - Inner Neighbourhoods, Copenhagen

meant the neighbourhoods were falling further behind the modern housing that was built in earnest, beginning in the 1950s, and contributed to the emptying of Copenhagen over the four decades following WWII.

1.2.1 Housing Modernisation – From Urban Renewal to Urban Revitalization

Beginning in the 1950s, new towns were built around the periphery of Copenhagen and there began a slow depopulation of the city centre for the newer, more modern housing. The city recognized the need to upgrade the housing stock in both Nørrebro and Vesterbro, and by the 1970s, attention had turned towards Nørrebro. Political momentum for renewal grew in the early 1980s, and the resulting process can be characterised as top-down and planner-driven, with little or no input from local residents. The physical plan called for the clearance of older buildings and the breaking-down of the traditional block structure. The new pattern was essentially a superblock model that contained inward looking housing with no mixed use. There was massive community resistance that culminated in violent riots, but only after many of the buildings in the area referred to as the 'Black Square' had been destroyed and replaced by public housing of largely poor architecture. The renewal efforts in Nørrebro continue to be criticised as a failed model by planners and residents alike.

The city disengaged from the Nørrebro in the aftermath of the riots. During the economic boom of the 90s, however, certain areas within Nørrebro were the focus of intense private investment that resulted in the upgrading of the housing stock. The improvements were centered on the housing stock adjacent to the Lakes that had been built during the second wave of Nørrebro's development at the beginning of the 20th century. These flats were already larger and of a higher original built quality than those from the first wave of development, and therefore were more desirable to begin with. With the exception of Sankt Hans Torv, the public spaces in Nørrebro have not been improved recently, despite their poor condition.

The dramatic failure of modern planning ideas in Nørrebro forced the city to reflect on its experience and develop a different approach to urban renewal. The City's strategy for renewing Vesterbro responded directly to the criticism of its approach in Nørrebro. The pro-

cess began in the early 90s with planners presenting a vision document for public discussion through a series of public meetings and mass mailings. After integrating residents' concerns and goals into the vision plan, the city then moved block-by-block and developed a physical plan in consultation with residents. Unlike the Nørrebro experience, only those buildings that could not be refurbished, or those buildings in courtyards that did not get sufficient sunlight, were torn down. In addition to the renewal of private buildings and spaces, the city included a number of public spaces in the renewal effort; this represented another departure from previous thinking and acknowledged the importance of integrating quality design in both the public and private realms. From the beginning of the public consultation phase, the Vesterbro renewal has taken over 12 years, and should be completed within the next two or three. The total cost is in excess of DKK 5 billion, for an area with a little over 5000 households. Vesterbro residents who remained in the neighbourhood were overwhelmingly happy with the process and final product, and the city has used its experience in Vesterbro to create a nationwide program of urban renewal.

2 Study Design – The Case Study Method

The case study approach was chosen over other research designs because it allows for the use of multiple methods to triangulate answers to the research questions (Yin, 2003). This process of triangulation was deemed necessary because of the complexity of the research questions. For example, at the time the research protocol for this study was written, there was little empirical research from either the transportation planning or physical activity fields to suggest which variables would be most appropriate to study. Further, a previous site visit indicated that there were issues relating to the historic reputation of each neighbourhood that may be influencing perception and use, as well as issues of social division between native Danes and more recent immigrants, especially in Nørrebro. It was difficult to conceive of using the scientific deductive model given this degree of ambiguity.

Case studies can suffer from a tendency to conduct analysis at a more abstract level and to ignore details regarding policy implementation (Yin, 2003). John Punter's multiple

case study of design guidelines in Pacific cities rarely moves beyond the city's stated policy to the policy's implementation, which leaves the reader with few meaningful ways of comparing one city's approach to another (Punter, 1999). Case studies that only focus on the policy level and not implementation may also have difficultly remaining focused on the original research question as the research progresses (Yin, 2003).

Including examples of policy implementation within my case study design has two advantages. First, it ensures this research will get down into the operational details of how urban design guidelines are manifested into built product, a significant shortcoming of Punter's study. By not including examples of policy implementation, Punter is forced to take the guidelines at their face value with no way of evaluating whether the city has successfully implemented them. As mentioned earlier, there are relatively minor differences in the tone and scope of design guidelines across the North American and European contexts, but very significant differences in implementation. Therefore, including examples of policy implementation should be considered central to any study of urban design guidelines, and critical for any study that examines specific topics, such as pedestrian space networks. The second advantage of including examples of policy implementation is that they prevent research "slippage" by constantly refocusing the author on the operational aspects of the research question.

3 Data Collection

Data collection was divided into three phases. First, interviews with planners and private developers, among others, were conducted over a three-month time span. Second, household surveys were mailed to a total of 600 residents in two neighbourhoods. Third, interviews with 17 residents were conducted. A more detailed discussion of each method follows below.

3.1 Political Culture Interviews

The research explored the underlying values and principles used within the planning structure. The primary source of data were 20 interviews with city planners, a politician, private developers, an urban designer who consults for the city, a representative from an urban

philanthropic institution, representatives from non-profit housing and development corporations, and a urban planning researcher. The positions of the planners ranged from intermediate planners responsible for individual projects to director level planners from a number of city agencies. The first interview was initiated using contacts from the Centre for Public Space Research, where this researcher was based. From this point forward, interviewees generally recommended other possible candidates, although a few interviews resulted from further recommendations from colleagues. All candidates were contacted via an email that introduced the research project, the researcher and his affiliation, and requested one hour of their time to discuss issues relating to planning policy.

The interviews took place in the interviewee's office and were conducted in English. The participants were informed that their comments would remain anonymous and that they would only be identified by their relative seniority. The conversations were recorded using handwritten notes. All participants spoke fluent English, although there were some minor difficulties, as discussed below.

The interview format and content was written prior to leaving for Copenhagen and the early interviews adhered to the content of the outline, but only partially to the format. Initially, the researcher was to read statements that discussed different aspects of the planning system; these statements were carefully worded to explore the underlining values that constitute the planning culture. The original wording was adopted from culture theory and tested the degree to which the planning system conformed to an individualist model versus a hierarchical model. Unfortunately, the precision of the wording and the use of academic language made it difficult for some respondents to fully comprehend the questions and then provide in-depth responses.

Over the span of the first 3-5 interviews, the format and content evolved. The format became less structured and instead of reading scripted statements, the researcher raised a list of topics and probed candidates to explore issues in greater depth. In terms of content, as data were collected it became clear that several of the topics deemed central to the research

question beforehand ended up being non-issues once in the country. For example, the Copenhagen planning system fit so closely within the hierarchical model that the interviews consisted of little more than yes or no responses to the prompts (see Figures 3.1 and 3.2 for the original interview guide and the revised list of key topics). At the same time, hints of a more nuanced relationship between the three planning departments in the city necessitated a recalibration of the interview guide. By the end of the interview process, the format was more conversational than structured, and generated greater insight into how the planning system used its authority to achieve its goals, as well as under what circumstances goals were not achieved. Importantly, it allowed for a better understanding of what the underlying values were, and how the political process of debate, compromise and eventual consensus transformed those values into a concrete planning agenda.

3.2 Neighbourhood Household Survey

The geographic boundaries used by the city to designate Inner Nørrebro and Inner Vesterbro were adopted for this study (the neighbourhoods will be referred to as Nørrebro and Vesterbro for the remainder of the dissertation). One advantage of this choice was a clear understanding among residents of their neighbourhood's boundaries, a rarity in urban space research. The size and population did differ across study sites, but there is no indication that this biased the research findings. Nørrebro is approximately 1.6km^2 and Vesterbro approximately 1.2km^2. 31,046 people reside in Nørrebro, and x reside in Vesterbro.

3.2.1 Sampling

500 randomly selected addresses for each neighbourhood based on the geographic boundaries of the research sites were purchased from the City's Office of Statistics. This office maintains a citywide database of residents who have indicated that they would be willing to participate in research approved by the city. 300 addresses were randomly selected from each neighbourhood to receive the survey. No names were attached to the addresses, and so the packet was simply addressed to "The Resident of...", which likely reduced the response rate due to its anonymity.

3.2.2 Mailing Procedure

The first mailing included 1)an introductory letter describing the research and its sponsor, the Centre for Public Space Research; 2) the survey instrument; and 3) a self-addressed, stamped envelope. At the end of the survey, there was a request for volunteers to participate in an in-person interview in order to further explore the themes raised in the survey. Respondents had to print their name, sign and date the document, and provide their telephone number. Ten days later, a second packet was sent out to all addresses from which no reply had been received, along with a letter indicating that this would be the last mailing. Due to the high rate of response for in-person interviews, the request for participation was removed from the second mailing. Of the 600 mailings, 216 were returned, one of which was removed because the respondent did not meet the minimum age for participation; this resulted in a 36 percent response rate. 115 were returned from Vesterbro and 100 from Nørrebro. 23 residents participated in the in-person interviews.

3.2.3 Survey Measures

The survey collected data on four pedestrian oriented topics, as well as a number of control variables, including age, gender, length of residence, income and presence of children in the household. The first topic was the type of destinations residents typically walked to from their home. Respondents were provided a list of 17 destinations to choose from, such as grocery stores, café/bar, and retail boutique. They were then asked to indicate the frequency on a per week basis that they visit a subset of destinations.

The second topic focused on chance meetings while out walking. They were asked to mark the frequency on a per week basis that they bump into someone they know and then indicate for how long a typical interaction lasts. The wording on this question turned out to be difficult for respondents to understand, and many respondents provided answers only to the frequency part of the question.

The third topic centered on a mapping exercise that asked respondents to mark 1) their favourite walking route through the neighbourhood, 2) their favourite street segments,

3) their least favourite street segments, 3) the location and type of destinations they typically walked to from their home, and 4) where friends in the neighbourhood live. Next, they were asked to answer a series of questions about the physical and social qualities of the favourite route they drew.

Lastly, respondents were asked about a number of their neighbourhood's physical and social characteristics, including questions regarding three major commercial streets. This section contained questions on safety, traffic conditions, quality of retail stores, and the diversity of people walking through the neighbourhood. After reviewing the responses and conducting the in-person interviews, the street selection process should have focused on gathering a more representative perspective of important pedestrian routes in each neighbourhood. One of the three streets selected in each neighbourhood (Jagtvej in Nørrebro and Sønder Boulevard in Vesterbro) represented a less than optimal selection because of its relatively minor role in the overall pedestrian network. A better choice in Nørrebro would have been Blågårdsgade, while in Vesterbro either Frederiksberg Allé or Gammel Kongevej would have produced a more complete picture. Questions regarding recommended improvements to the survey instrument will be explored in the Discussion and Conclusions chapter.

4 Analysis Strategy

The quantitative data were entered and analysed using STATA 9.0. The map data were entered and analysed using ArcGis 9.1. The open-ended questions were entered and summarised using Microsoft Excel. The resident interview transcripts and the planner interview notes were entered and analysed using the qualitative research software Atlas Ti.

4.1 Political Culture – Interviews and Primary Documents

The evaluation of Copenhagen's planning system required a review of the city's planning documents in addition to an analysis of the interview notes. Establishing the values, goals and principles with which the city uses to make planning decisions was necessary in order to have a clear foundation upon which the research could compare concrete actions of the planning system with its stated goals. The degree of congruence or incongruence be-

tween what the city says and what the city does formed a critical test of the effectiveness of the planning system. By coincidence, the city was undergoing a major revision to the process of urban space development, an event that provided an excellent opportunity to observe an open debate of many of the principles this research had intended to investigate.

The interview notes were analysed according to a number of themes, including the degree of public input into the planning process; sources of authority and legitimacy for planning; the role of private developers in setting the planning agenda in major redevelopment projects; the degree to which planners are able to confront private developers and steer plans towards better designs; the level of funding for public space improvements and the criteria used to prioritise improvements; and the degree of coordination across planning departments and any indication of a unified agenda. The stated goals for a given project were used to evaluate the degree to which the built product fulfilled the stated goals. In cases where the stated and realised goals differed dramatically, the interviews were used to identify reasons for the discrepancy.

4.2 Neighbourhood Household Survey

There were 213 respondents to the survey, with 100 in Nørrebro and 113 in Vesterbro. This translates into a 36% response rate. Many of the survey questions produced either nominal or collapsed ordinal data, although there are several important exceptions. First, the number of destinations a resident walks to from her home is a ratio-interval variable that is normally distributed. Similarly, the number social destinations (a subset of total walking destinations) is also ratio-interval. Consequently, the results from these two variables were analysed using multivariate regression. Second, the number of friends who live in the neighbourhood is a count variable with a distribution suitable for Poisson regression.

There were three other statistical tests used to analyze the data, depending on the nature of the outcome variable. For binary outcomes, logistic regression was used. For dependent variables that were ordinal scales with an unknown interval between values, a multivariate ordered logit model was used. Finally, for categorical dependent variables, the chi-square

test of independence was used.

References Cited

Gehl, J., & Gemz˙e, L. (2000). *New city spaces*. Copenhagen: Danish Architectural Press.

Punter, J. (1999). *Design guidelines in American cities : a review of design policies and guidance in five west coast cities*. Liverpool: Liverpool University Press.

Yin, R. (2003). *Case study research : design and methods* (3rd edition ed.). Thousand Oaks, CA: Sage Publications.

"Political culture comprises the orientations and beliefs that people have toward the structure and practice of their political institutions."

Mercer 1982

"The result of these various factors, I argue, is that there is a strong tendency for political leaders and businessmen, particularly those concerned with land-use matters, to find themselves in tacit or open alliance. The results of this, in turn, are the foreshortened public agenda alluded to above, the corresponding problems of systematic bias and ineffective problem solving, and a citizenry ill suited to the running of the sort of republic that we wish to be."

Elkin 1987

Chapter 4

Planning Culture and the Values Governing Urban Planning in Copenhagen, Denmark

1 Introduction

This chapter summarises a series of 20 interviews conducted over three months with planners from all three planning offices in Copenhagen, private consultants to the city, private developers of large-scale projects along the harbour, representatives from non-profit housing and urban development organisations, and philanthropic organisations. The position of interviewees ranged from project leader to the equivalent of the director of their department or organisation. The topics covered included: how specific projects were planned or designed; how the different planning offices coordinate their efforts; how the public was included in the programming phase of plan development; and what the major challenges facing the city are and how planners and politicians were working to confront those challenges.

The product is a broad understanding of contemporary planning in Copenhagen, what its strengths and weaknesses are, and what prospects it has in the near future. Crucially, these interviews provided insight into what underlying values shape the planning environment, who holds them and how competing interest groups come into conflict over these issues. From this, it will be possible to define the political culture of planning in Copenhagen; that is, the attitudes and beliefs that planners, politicians, developers and residents hold regarding the structure and practice of planning. What planners can do, and therefore, what goals are achievable, are defined by this foundation of knowledge. Lastly, this dissertation will construct a narrative of how Copenhagen's planning environment works, whom it serves, and why. Included in this narrative will be an understanding of how planners use the tools at their disposal to achieve the city's overall planning vision as outlined in the city's Municipal

Plan.

1.1 The Interview Process

The interviews were conducted in the interviewee's office, and were undertaken on the condition of anonymity. For this reason, the interview notes will be ascribed using an interviewee's position and by the department or organisation for which they work. A "senior planner" designation will include project managers of large-scale projects, while "director-level" will designate an individual who heads up a major office or department, either within the city's planning system or a private organisation. An "intermediate planner" will designate a planner who is part of a team working on a given project. There were no low-level planners interviewed. The interviews were not recorded, but rather were summarised using interview notes, which yielded few direct quotations. The rationale for not tape recording is explained below, but the primary reasons were time constraints and a need to generate a rapport quickly within a single interview.

The early interviews were used as test cases for the interview method, and from this experience important changes to the interview process and content were made. The first change was the decision to not tape-record the interviews; with the exception of three senior planners, I had one opportunity to meet with each interviewee. This limitation increased the need to learn as much as possible about the planning environment from each interaction. The need to quickly establish a rapport with the interviewee was paramount and the beginning of the interview was used to establish a sense of trust between us. Putting some interviewees completely at ease proved somewhat challenging for two reasons, one prosaic, the other more sensitive. The first reason was language. Although every participant spoke fluent English, the process of accurately translating their work into another language appeared to contribute to their nervousness. The second reason was that the planning system had been under stress over the past five years due to a political confrontation between the two mayors responsible for the majority of city planning – and this conflict had placed strain on the civil servants who work under them. That each mayor's planning office had adopted differing

strategies for the urban renewal of harbour lands only contributed to the sense of competition between them. This apprehension influenced the tone of the interviews whenever one of the projects in question was raised, and it was not until the fourth or fifth interview that I learned of this tension and was able to address it directly. As a result, I felt it would have added an unnecessary burden to the early stages of the interviews to tape record the conversations.

The original protocol called for a structured questionnaire interview format that would have asked each interviewee the identical set of questions and then compared the responses across planning offices and type of institution. The wording of the structured interviews proved both too technical and too subtle for this method of interviewing. Also, the questions were written while still in Berkeley with imperfect knowledge of the actual conditions in Copenhagen. The political tension is only one example of how an issue forced the research to be refocused so that the most pressing and relevant topics were addressed during the interviews, rather than the topics that I had inferred from afar would be the most pressing. As a result, the interviews evolved into a list of topics that slowly shifted over time as more information was gathered. Given this evolution, it would have been better had I had the opportunity to revisit the early interviewees, but with three exceptions, time did not allow for this. Still, I believe the information gathered from the interviews is richer and better captures the core challenges confronting Copenhagen's planning system today than if I had stuck with the original interview guide.

The analysis also relied on planning documents published by the municipality of Copenhagen, including several editions of the Municipal Plan, as well as area-specific planning documents.

1.2 Chapter Outline

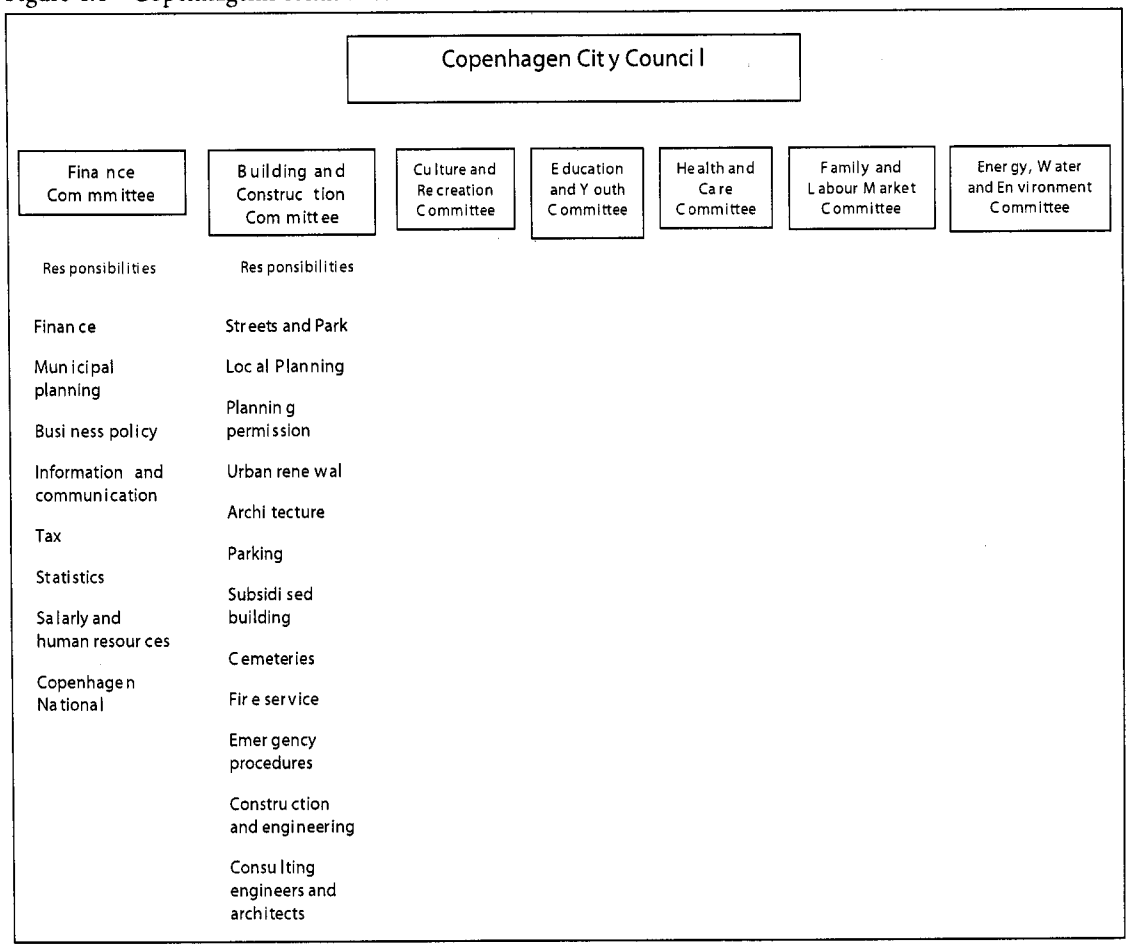
The chapter is divided into five sections. The first section will describe the structure of the planning system. The second will describe the role of planners in Copenhagen, and will discuss both planning's sources of authority, as well as how the practice of planning has

changed in response to shifting economic and cultural conditions. The third section will summarise the values that underlie the municipality's stated planning goals, as defined by planning documents and from the interviews. The fourth section will provide an in-depth examination of the Copenhagen Urban Space Action Plan, which is Copenhagen's most recent effort to redefine urban space development policy to better reflect contemporary challenges. The fifth section will conclude with a discussion of the implications for planning in general, but specifically for the expansion of pedestrian space networks in the city.

2 The Structure of the Planning System in Copenhagen

The municipality of Copenhagen's local government is organized according to a committee system, and consists of a Finance Committee and six standing committees (see Figure 4.1). Each committee has an administrative unit responsible for implementing policy and administering city programs. The two committees responsible for city planning are the

Figure 4.1 - Copenhagenn committee structure



Finance Committee and the Building and Construction Committee. The "supreme political authority" lies with the 55 member City Council, which establishes the guidelines for the committees and administrations. The Lord Mayor not only presides over Council meetings and is responsible for drawing up agendas and leading the negotiations, but also chairs the Finance Committee. The Finance Committee has the responsibility to oversee the work of the other committees, giving it tremendous influence over city policy and programs. This oversight responsibility has had important implications for planning in Copenhagen over the past 10 years, as will be discussed.

2.1 The Finance Committee and Finance Administration

The Finance Committee consists of 13 members, with the Lord Mayor as chair and the chairs of the other six committees also sitting on the committee. The remaining positions are filled by six elected councilors. In terms of the bureaucracy, there are four directors and a chief executive responsible for running the Finance Administration on a day-to-day basis, managing two staff functions and 14 offices, including three adminstrative units (see Figure 4.2). Office 8 is responsible for "the City of Copenhagen's overall physical planning, housing policy, municipal planning, regional planning and area-based urban regeneration" (City of Copenhagen, p. 11). The Finance Administration's most important function in terms of urban planning is the maintenance of the Municipal Plan.

There are three primary types of plans that govern the built environment in Copenhagen, the Municipal Plan, the Local Plan, and Urban Regeneration Plans. The Municipal Plan provides the overall guidance for how the city should be developed; the Local Plan provides the specific guidelines for how the goals and objectives outlined in the Municipal Plan should be implemented; and Urban Regeneration Plans dictate how specific areas in the city should be renewed, based on the goals and objectives from the Munici-

Figure 4.2 - Finance Administration

Finance Administration

Finance and Statistics
Offices 1, 2 and 3

Human Resources
Offices 4, 5 and 7

Housing and Urban Planning
Offices 8 and 9

International Relations
Office 10

Communication and IT
Office 11

pal Plan. The important distinction between a Local Plan and an Urban Regeneration Plan are their legal standing; the Local Plan is binding, but the landowner can choose not to build, while an urban regeneration plan is both binding and forces the landowner to take action. The following section will first describe the Municipal Plan, including its role in defining the content of Local Plans. It will conclude with a brief description of Copenhagen's urban generation plans.

2.1.1 The Municipal Plan

In accordance with the national government's Building Act, every municipality in Denmark is required to create a Municipal Plan (MP), typically every four years. The Municipal Plan provides four types of guidance to city planners. First, it establishes the overarching themes and objectives that guide all development in the city. In 1993, for example, the four themes were: Close-to-Station Areas; The City by the Sea; The Green City; and, The City's 3rd and 4th Dimensions. Second, every neighbourhood has a dedicated chapter that includes a description of the neighbourhood's character that is meant to help planners create context-sensitive LPs. Third, included in each neighbourhood chapter are the zoning guidelines for that neighbourhood. Finally, there are 9 chapters that outline the city's policy on issues such as open space, transportation, and housing. One of the important differences between Copenhagen's Municipal Plan and the General Plan for an American city is that the Municipal Plan includes the zoning necessary to achieve the plan's vision statements, thereby combining policy with implementation. This contrasts with the General Plan for an American city, which describes a vision that is rarely reflected in the zoning code (Cullingworth & Caves, 2003).[1]

The Municipal Plan controls the location, density and use of buildings. The Copenhagen Municipal Plan is a binding document that is not open to interpretation by investors or other private stakeholders (source: 3 Senior Planners in Planning and Architecture, and 1

1 There will be periodic references to the American planning system so that readers have a common point of reference. In particular, San Francisco will be used as an illustration of a city that is widely regarded as having one of the "better" planning systems in the country.

intermediate planner in Office 8). In this sense, there is far greater integrity to Copenhagen's planning system than that of a typical American city, where special interest groups, large private investors and urban political machines unduly influence planning policy and implementation (Hartman, 1974; Hirsch, 1983; Krumholz & Forester, 1990). As a result, Copenhagen's built environment generally reflects the intentions of the Municipal Plan (source: 2 Senior Planners in Planning and Architecture). The Municipal Plan's integrity, in addition to providing much greater certainty for all stakeholders, allows the city to make adjustments to future plans that remedy any shortcomings in the current plan brought to light through implementation; this feedback loop does not exist when the core principles of the General Plan are perceived to be up for negotiation. Finally, the long-term commitment expressed for a given policy direction, such as improving pedestrian spaces in the city centre or expanding the bicycle network, helps planners refine their knowledge of how urban environments work, since the connection between policy and product is much more explicit than in a context political context that changes policy direction with each new administration.

In addition to locally defined needs and solutions, the Municipal Plan must also address concerns raised by the national government. For example, in 1989 the national government decided Copenhagen should pursue a planning strategy that recognises the increasingly global scale of economic competition. As part of that strategy, the government wanted to transform Copenhagen into a "metropole," or a regionally dominant centre for commerce, trade and tourism that could compete on equal footing with other Scandinavian, Baltic and Northern European cities of similar size and cultural endowment. This "super" theme overlay the locally defined themes and had a significant effect on how Copenhagen shaped planning policy.

2.1.2 Urban Regeneration Plans

The current approach to urban regeneration reflects an evolution in the city's policy away from heavy-handed renewal to a more context sensitive intervention. The shift in strategy is in part a response to new economic constraints and the need to make do with

fewer resources. Perhaps more importantly, the current policy is a product of both the painful experiences of earlier efforts, as well as the much more successful responses to the earlier mistakes.

The latest strategy, called Quarter Lifts (Kvarter Løfts in Danish), is part of a new national funding program that is essentially urban regeneration "light," as compared to the heavy handed and intrusive urban renewal project in Nørrebro in the 80s and the comprehensive, but more context-sensitive Vesterbro regeneration project in the 90s. Indeed, it was the highly acclaimed Vesterbro regeneration project that provided the inspiration for the current policy, although it has been substantially modified to reflect the reduced financial resources the national government has allocated for urban renewal. There are currently 4-5 Quarter Lift sites across the city, including the neighbourhood surrounding Holmbladsgade and the area around Valby station.

2.2 The Building and Construction Committee

The Building and Construction Committee has significant influence over municipal planning, although the municipality's planning goals are still established by the Finance Administration through the Municipal Plan. Three directors and one chief executive manage the day-to-day running of the Administration. There are four departments that constitute the Building and Construction Administration (BTF – the Danish acronym for Bygge- og Teknikforvaltningen), but there are only two relevant to this research project: the Department of Planning and Architecture (referred to Planning and Architecture henceforth), which "draws up and implements Local Plans, Urban Renewal Plans and plans for housing grants" (City of Copenhagen, 2001, p. 27); and the Department of Public Streets and Parks (referred to as Streets and Parks henceforth), which is responsible for "the planning and maintenance of municipal parks, roads, playgrounds, squares, cycle paths, pavements, bridges and quays" (City of Copenhagen, 2001, p. 27). This structure represents a considerable concentration of power over the built environment within a relatively small number of people, especially when compared to the planning structure in many American cities that divides planning authority

between a large numbers of departments and separates policy decision making from implementation (Cullingworth & Caves, 2003). One consequence of Copenhagen's structure is that it allows for far more efficient and effective planning policy and implementation, which many countries view as a positive characteristic of a planning system (Cullingworth, 1993).

Even within this relatively more streamlined planning structure, inter-agency rivalry exists. At the time this research was conducted, Planning and Architecture and Streets and Parks were housed in different buildings in different parts of the city and this separation reflected a philosophical divide between the two departments. Planning and Architecture's perspective is more object-oriented and focused on individual buildings, while Streets and Park's perspective is more holistic and focused on the connections between individual parts. That Planning and Architecture had greater influence over policy due to its authority over Local Plans generated some frustration amongst planners in Streets and Parks and likely fed the rivalry. Planners from both departments agreed that this balance is currently shifting; however, there was some confusion over which way it is moving. Senior planners from both departments expressed the belief that their department's prominence within the planning system had been rising relative to that of the other (2 director-level civil servants).

One way to determine which department has been gaining influence is to evaluate how the city's planning policies have been shifting. For example, the municipality has been paying increased attention to how the urban design of public spaces can help the city achieve its larger urban quality goals. The steps it has taken include the establishment of a new position for a Director of Urban Spaces and a reformulation of its Municipal Plan that is based on the lifestyles of residents instead of a more functionalist perspective based on concrete physical outcomes. This shift has led to a more formative role for urban spaces in the municipality's planning priorities. It is difficult to conclude definitively what the full implications of this shift will be, since the changes have not been formally adopted, but early indications suggest Streets and Parks will have greater influence over how municipal priorities are set and implemented. In addition, in 2004 Streets and Parks initiated the Copenhagen Urban

Space Action Plan (CUSAP), a process that has brought planners from all three departments together in an effort to bring greater consistency and integrity to urban space policy. This process has progressed in unison with the reformulation of the Municipal Plan, and the Municipal Plan will likely reflect the discussions from CUSAP, and vice versa. Taken together, these developments suggest that Copenhagen has shifted its planning policy to a perspective that is more aligned with the values advocated by Streets and Parks.

2.2.1 The Local Plan

Local Plans are used to set specific guidelines for development, with projects ranging in size from a single lot to an entire neighbourhood. The Municipal Plan sets the zoning, but the value statements contained in the neighbourhood-specific chapters are too general to provide the level of detail necessary to guide development (senior planner, Planning and Architecture).

The Local Plan not only includes the specific zoning codes applicable to the given development, but it also represents the planner's interpretation of the value statements in the context of the proposed site. Transforming the Municipal Plan's value statements into specific guidelines allows planners a large degree of discretion to factor in local conditions, economic considerations, or any other unique circumstances. This authority illustrates another point of difference between the Danish and American planning systems, since American planners have few opportunities to engage in discretionary planning, regardless of the unique circumstances a given development may face, due to the Constitution's equal protection clause. The opportunity to exercise discretion, in addition to allowing for context sensitive plans, allows Danish planners to learn through experience in a way that is more likely to result in increasingly higher quality development over time than a system that attempts to uniformly apply the zoning code.

The guidelines for small developments are straightforward and are easily transformed into specific requirements. In general, the Municipal Plan's value statements mandate respect for the historic context while also requiring a contemporary design philosophy. The goal is

to create a building that is both harmonious with its context and representative of its time. If the site is along a retail street, the ground floor use must be public service oriented; otherwise, it must provide an interesting contribution to the streetscape. Over the past 30 years, the majority of development in Copenhagen has been at this scale, and the planners' skills and knowledge have been best suited to these smaller projects.

2.2.2 Creating a Local Plan for a Large Harbour Site

In the majority of cases, Local Plans are created for relatively small developments, often no larger than several lots. Indeed, the Local Plan is well suited to regulate this scale of development, since it can mandate the appropriate architectural scale and quality for a local context, dictate setbacks, and deal with parking issues. The scale of development in Copenhagen, however, began to change in the late 80s and early 90s once investors became interested in the large quantity of centrally located abandoned industrial land. Because of the size of these parcels, planners were forced to confront a host of new concerns, including the site's circulation pattern, open space planning, land use mix, and location of activity centres.[2] In the face these new challenges, there was little from the existing Local Plan process that could prepare planners for how to balance these public needs with the private economic interests of sophisticated developers.

Most frequently, a private investor will approach the city with a proposal for a site. The investor and Planning and Architecture then engage in a process of negotiation to refine the proposed plan. If the negotiation is successful, Planning and Architecture will then create a Local Plan to codify what was agreed upon. As indicated above, planners have struggled to define the best strategy for managing this scale of development, and their early efforts had significant flaws. In the majority of cases, the architectural design of the buildings that comprise the development was of sufficiently high quality; rather, it was the very poor quality of the open spaces between buildings that was of the greatest concern to planners. The

2 Parallel to the harbour development has been the construction of Ørestad, a new city extension built along the rail link to Sweden. Much of the first phase has been met with strong criticism, since the scale of development and style of architecture are better suited to suburban office parks than the highly urban environment envisioned for Ørestad.

issues ranged from a lack of public open space, to an uninteresting design where it did exist, to poorly defined boundaries between the public and private realms, to ambivalent or even hostile designs for the ground floors adjacent to public rights-of-way. The Local Plan, while well suited to the small-scale development, may rely on tools too blunt to effectively guide large-scale projects (2 Intermediate Planners, Office 8).

The poor quality of the early harbour development prompted planners to reconsider how best to manage this scale of development, a process that was not always amicable between the planning departments. The first change was a reshuffling of responsibilities between the two city administrations that exercise authority over planning, with the Finance Administration taking increased responsibility for large-scale development. One consequence of this shift in power has been a new model for managing large-scale development that does not solely rely on the Local Plan, but rather utilises part-ownership of the land by the government to dictate design parameters at a much finer scale than is possible using a Local Plan alone. At this stage, it remains unclear whether this model will be more successful in producing higher quality built environments, since the one site where this strategy has been applied, Sydhavnen, has yet to be built.

The second adjustment was CUSAP, which amounted to an effort to both better focus the efforts of all the planning departments on more consistently achieving a defined set of goals, primarily using planning tools that already exist. The CUSAP process will be discussed in depth later in the document.

2.2.3 Public Involvement

Low levels of public participation and a high degree of top-down planning marked the early years of urban renewal in Nørrebro. As indicated, this approach met with stiff resistance and produced poor quality urban environments. The city has made substantial efforts to improve the process of planning by listening more closely to residents. One of CUSAP's strategies will be to find better means of finding out what residents think about a given proposal. In a conversation with a planner involved with the plan, it was mentioned that public

meetings rarely produce representative comments, and therefore, should be considered only one aspect of public involvement. Instead, new approaches, such as establishing a number of community focus groups that represent different demographics (e.g., the elderly, or the disabled) that meet on a regular basis with planners, should be explored.

3 The Role of Planners

The preceding discussion described Copenhagen's planning structure and described planning's primary tools for implementing policy. It also provided some information on how planners fulfill their major responsibilities. The following discussion will explore the role of the planner is much greater depth. Topics will include how planners choose to exercise discretion while implementing planning policy, what a planner's source of authority is, as well as what the limitations of that authority appear to be. Most of the discussion will focus on planners in Planning and Architecture, since the underlying planning process is the same for both planning departments–the Building and Construction Administration and the Finance Administration. There will be some additional comments specifically oriented to the Finance Administration and Streets and Parks, however, as some circumstances are different. The section will conclude with a discussion of the evolving role planners from both Planning and Architecture and the Finance Administration have played in the redevelopment of large sites along the harbour, as well as in the city's urban regeneration program.

3.1 Reactive and Proactive Planning

City planners in Copenhagen have a tremendous amount of authority to engage in both reactive and proactive planning. Reactive planning refers to the regulation of private development, while proactive planning refers to the planner's active role in building and maintaining the built environment. The major tools for reactive planning are the Municipal Plan and the Local Plan. For cases where a Local Plan is not required, then the planner will have to exercise influence over the proposed development primarily through persuasion.

Proactive planning has two aspects in Copenhagen. First, Streets and Parks is responsible for maintaining and improving existing urban spaces, as well as building new ones.

Often the motivation for a given urban space project is guided by a larger city policy, such as the need to improve access to open space in a poorly served neighbourhood, or to augment the pedestrian network in the city centre. The selection of many projects, however, has been motivated more by political interests than anything resembling rational planning (director-level civil servant). Second, Copenhagen engages in the urban regeneration of dilapidated or neglected neighbourhoods through its Quarter Lift program that actively transforms both the physical and social fabric of neighbourhoods.

Understanding the role that city planners play in implementing planning policy, what authority they have, how they use that authority and under what circumstances, is equally important as understanding the specific policies that are being implemented. The following three sections will discuss each planning department, its responsibilities and how efforts may or may not be coordinated.

3.2 Planning and Architecture

Planning and Architecture is responsible for regulating the majority of development in the city, with projects ranging in scale from the individual lot to an entire neighbourhood (for urban regeneration projects), to large areas of vacant land along the harbour. More recently, the Finance Administration has become responsible for a number of large-scale developments along the harbour, as well as several urban regeneration projects. Despite this shift in oversight responsibility away from Planning and Architecture in favour of the Finance Administration, only Planning and Architecture has the authority to create a Local Plan, which is the planning system's tool for regulating development, i.e., the Finance Administration is forced to work alongside Planning and Architecture to implement its planning agenda. This results in the slightly incongruent pairing of two planning departments at a time when there is a degree of conflict between them.

It is generally the case that when an investor approaches the city with a proposal, it meets both the zoning guidelines of a given lot and the general architectural quality and character desired by Planning and Architecture. If the planner feels the proposal sufficiently

meets the objectives of the Municipal Plan, or, in the case where a Local Plan already exists for that area, the design meets the specific guidelines, then the project will move forward relatively quickly. In the 70s, this wasn't the case and many projects had to wait 2-4 years to get a permit. Today, 80% of permits are issued within two weeks (member of the Building and Construction Committee). Planners feel that the investor community is aware of the issues that most concern planners and generally bring proposals that meet these concerns, although they typically try to cut corners in terms of quality (Senior Planner, Office 8). At this stage, the planner and investor would negotiate how to resolve any points of difference and, in the majority of cases, they come to a mutually agreeable conclusion.

3.2.1 Applying the Municipal Plan Guidelines to Specific Cases

The Municipal Plan provides planners two types of guidance by which to evaluate a proposal, with one type binding and the other not. First, the Municipal Plan provides the zoning for each neighbourhood, which is non-negotiable. Included in the zoning are the use and density of the allowable development. Second, the Municipal Plan lays out guidelines, both at the neighbourhood-level in the form of general descriptions, and at the citywide level in the form of value statements. For example, special provisions for Nørrebro include, "The existing buildings within the area [of Stengade] may be used for cultural purposes and public-oriented service functions, etc. in accordance with provisions stipulated in a local plan" (City of Copenhagen 2001; p. 170). Similarly, the Traffic chapter states, "The objective is not to adjust the existing city to the increasing passenger car traffic, but rather to create, through regulations, sustainable traffic development that is adjusted to the existing city so that energy consumption and environmental impact are minimised" (City of Copenhagen 2001; p. 79). This part of the Municipal Plan cannot be binding, since it leaves most of the details to be decided later. Instead, it relies on the planner to i) interpret the value statements and translate that interpretation into built form, and ii) evaluate the proposal's merit against this interpretation. During these steps the planner is free to exercise personal judgment by taking into consideration the context of the site, and any history behind the proposal, includ-

ing any prior commitments made by the city to landowner.

There are a number of factors that define the extent of the planner's authority during the negotiation with developers. The most important factor is whether a Local Plan is required by law; if so, then the planner's authority increases substantially. If not, then the planner still has substantial authority, but the decision to exercise it becomes more complex. The investor knows that the planner has the means to block their proposal if given reasonable grounds; this is within the official limits of the planner's power. The choice to exercise this authority, however, is conditioned by several concerns. The first is the desire to maintain positive relationships with the investor community and solid public support for the significant authority of planning. The planner is confident that, if necessary, the Building and Construction Committee will back her position in a dispute with an investor (2 senior planners from Planning and Architecture). This kind of support, however, will be maintained only if planners continue to exercise discretion in which cases are brought before the Committee. Therefore, relatively minor disputes over architectural style or a difference in personal taste are not grounds for the planner to exercise her veto authority. In such cases, the art of negotiation serves the planner better than the exercise of her authority.

A second concern conditioning a planner's choice to exercise her authority is the personal relationship she may have with the investor and/or architect. The investor community is relatively small in Copenhagen with long-term relationships between planners and investors typical (senior planner, Planning and Architecture). Further, there are only two major architecture schools in Denmark, which results in planners and architects sharing common roots going back to their university years. This certainly affects the nature of the negotiations between the two groups and likely makes coming to consensus easier than if two strangers were forced to reconcile the same differences.

For a small number of projects, the planner may codify her interpretation of the Municipal Plan guidelines in a Local Plan. LPs must be created if the proposed site is located in the historic city centre, or if the proposed building exceeds a minimum size. The minimum

building size cut-off varies by municipality in Denmark, but in Copenhagen any proposed building over 2000m^2 requires a Local Plan. Similarly, large-site projects, such as any harbour redevelopment proposal, would require a Local Plan, although the rationale in this case would be the project's importance to Copenhagen's overall physical and economic development plan.

Planners have the discretion to request a Local Plan if i) the proposed development does not meet the minimum level of quality required by the city, and ii) the investor is unwilling to negotiate a compromise solution with the city. This is an extreme situation, with very few proposals going this route, in part because of the tremendous time investment on the part of the planner to usher the Local Plan through the process (senior planner, Planning and Architecture). It takes approximately one year from start to finish to create a Local Plan under these circumstances, with several planners having to invest their time. Yet the threat of a Local Plan provides planners with a very effective bargaining tool when confronted with especially difficult circumstances. If the planner chooses to create a Local Plan, then she can effectively dictate the terms of the development and the investor will have no choice but to comply if he wants to build (senior planner, Planning and Architecture).

3.2.2 Local Plan Implementation

The Local Plan is a powerful tool to guide development, and once adopted, is binding (senior planner, Planning and Architecture). That is, a developer cannot lobby the Planning Commission for an exception, as is routinely done in American cities. There is no board of arbitration or planning commission in Danish planning. Instead, politicians largely remain outside of individual planning decisions and respect the decisions made by planners. There have been some notable exceptions, but they tend to occur only when the development in question is very large and has a central role in the future well-being of Copenhagen's economy. When planners were asked whether a politician had ever intervened on behalf of a developer because that developer had contributed to the politician's campaign, none could remember a single case of this in their entire career (2 senior planners, Planning and Archi-

tecture; 2 intermediate planners, Office 8; 1 senior planner, non-profit housing corporation). In an interview with a politician who sits on the Building and Construction Committee, he stated that the city can never compromise on the cost of building permits and must always enforce the parking requirements, but that everything else is negotiable. This attitude was not confirmed through interviews with other politicians, but the tone suggests a degree of leeway for planners to extract concessions in exchange for things the developer might value. The very brief list of non-negotiables also illustrates how good design could be left off the agenda when pressing economic interests are at stake. Regardless, the lack of influence of private money in municipal politics has likely resulted in much greater integrity in the democratic process than found in cities where the need to raise campaign funds results in influence peddling becoming a *de facto* part of big city politics.

Politicians do influence planning, although the means may be subtle. In relation to a recent harbour development, for example, one planner indicated that since the project enjoyed tremendous political support because of its central location and importance to the city's economic well-being, then his ability to force the developer to adopt certain guidelines, such as providing space for groundfloor retail along a short stretch of one street, was compromised. This circumstance placed the planner in a difficult position, since his better judgment had been compromised by political realities. This example also highlights one of the few weaknesses in Copenhagen's planning system that is shared with nearly every municipality around the globe – how the fear of economic downturn weakens the political will to demand development that best meets the longer-term needs of prospective residents. The planning system's response to such cases will be discussed in depth later in the chapter.

3.2.3 Consistently Interpreting and Applying Municipal Plan Guidelines

The process of moving from the Municipal Plan's value statements to a Local Plan's concrete design guidelines allows the planner significant latitude to affect the appearance of buildings in the city. What rules do planners use to decide what matters and what does not? In discussions with senior planners who are responsible for project review, the process is

neither *ad hoc*, nor as open to personal interpretation as it sounds on the surface (two senior planners in Planning and Architecture). To ensure planners have the knowledge and expertise to review proposals according to a consistent set of criteria, Planning and Architecture holds meetings every two weeks in an attempt to maintain the same architectural standards across the city, as well as provide a forum for planners to share experiences, discuss emerging industry trends, and decide on the most appropriate strategic response to these trends. Depending on the circumstances, responses could range from new language to describe the department's priorities, to new policies, to changes in the process of review and approval. These meetings are meant to provide a common understanding across planners of what design elements the department feels most strongly about, what standards all planners should hold investors to, as well as a better understanding of the current market conditions and trends in the development industry locally and around the region.

Planning and Architecture produces no official document that summarises the detailed guidelines used to create Local Plans. Rather, the guidelines emerge from the internal Planning and Architecture discussions and are then communicated to the investor community by individual planners. This process certainly allows for a degree of personal interpretation as each planner has the opportunity to emphasise one issue over another, which does risk a greater degree of inconsistency within the planning system than if the guidelines were part of a formal and binding document. Perhaps in recognition of this, Planning and Architecture publishes nonbinding architectural guidelines that illustrate the quality expected by the city. Planning and Architecture also has begun holding an annual design competition for the best buildings completed each year, which also sends a signal to the investor community. Thus, the system governing architectural quality in the city is nontransparent in the guideline generation and open to the interpretation of individual planners, but does include some efforts to consistently communicate the guidelines to the investor community. That these guidelines were not developed in concert with the other departments responsible for development – Streets and Parks and Office 8 – and do not make any reference to the public realm onto

which these buildings face, suggests an opportunity for the planning community to improve, consolidate and formalise the city's urban space development guidelines, a process that was underway during my study. I will return to this discussion near the end of this chapter.

The danger of allowing planners to exercise discretion during the evaluation and plan approval process is an inconsistent application of standards and a lack of fairness for investors, a charge that did not emerge during any of my discussions. Indeed, both developers and planners agreed that the system is largely fair and that planners make efforts to understand and accommodate investor needs (two intermediate planners, Office 8; one senior planner, Planning and Architecture; one developer of a major harbour project). While the sincerity expressed by those interviewed should not be questioned, the validity can be. For example, in the interviews with two of the largest developers in Copenhagen, both men believed that not only had they been dealt with fairly by the city, but also that they had achieved all of their goals for their development. Similarly, the planners responsible for the projects in question believed that they had very positive relationships with the developer in question, and that the City had also achieved all of its goals. Having visited both developments, there is reason to suspect that the developers came away with a better deal than the city – and they probably did get everything they asked for. Conversely, as successful as these projects are in terms of the amount of new housing, the cleaning up a toxic site, and the extension of public access to the waterfront, there are fundamental flaws with the design; the buildings fail to frame public spaces, while ground floors provide little to no interest for pedestrians, in part because of long, blank façades, in part because the street designated as the main retail street has no shops. Therefore, the evidence suggests that if planners are free to exercise discretion does, then developers are not necessarily unfairly treated. Indeed, the opposite appears to be true.

3.3 Streets and Parks

The responsibility to maintain and improve existing urban spaces, as well as create new ones allows Streets and Parks to directly change the quality of the public realm at a

much greater scale than Planning and Architecture. Akin to the Public Works departments in American cities, but operating under a more expansive mandate that includes improving the quality of the urban experience, the work of Streets and Parks represents the most tangible examples of urban planning policy most residents experience. Since there is little dramatic change to the existing built environment allowed in established neighbourhoods, there only remains streets, squares and parks.

Outside of the city centre, the main task of Streets and Parks is to redistribute the public right-of-way by taking space away from the private automobile and giving it to transit, cyclists and pedestrians, either as bus lanes, new bike lanes, widened sidewalks or new urban spaces. As two senior planners from Streets and Parks stated, the outer areas of Copenhagen are dominated by streets that are too wide, that have too many cars and not enough opportunities to bike or walk. Identifying which streets should be improved in what order has been done according to sound urban policy in some cases, but in others according to the *ad hoc* principles of the political system (department director). This approach has made it difficult for Streets and Parks to pursue a coherent urban space strategy in most parts of the city, even though planners within the department have a clear vision of how Copenhagen should invest its infrastructure money. Perhaps related to the political system's somewhat cavalier attitude towards urban space improvement, Streets and Parks has suffered from insufficient funds to complete many of its projects, even when there has been political consensus on the need to improve urban spaces. The insufficient funding allocated to the urban space improvement program associated with the Vesterbro urban regeneration project provides a vivid example of this.

Streets and Parks pursues a set of goals distinct from those pursued by Planning and Architecture, perhaps because of its very different realm of responsibility, or perhaps because of the alternative values held by its senior planners. If Planning and Architecture focuses more narrowly on the architectural quality of individual buildings, sometimes at the expense of the building's effect on the public space in front it, then Streets and Parks takes a holistic

view of public space and its cumulative effect on the surrounding environment. Using the categories describe by Moudon, Planning and Architecture's design approach is best described as object-oriented and etic in its frame of reference, where etic refers to a perspective of an object that is generated entirely based on one individual's perceptions, ignoring the perspectives of any other group, such as the users of the space (Moudon, 1992). This is the architectural profession's traditional method of spatial evaluation, an approach that has been largely discredited by the environmental psychology and urban design literature (Lang, 1994; Michelson, 1976; Moudon, 1992). By contrast, Streets and Parks's design approach is best described as a combination of object- and subject oriented and derived-emic in its frame of reference, where derived-emic refers to an approach that actively solicits the opinions of other groups, but still has the designer interpret the meaning of those opinions (Moudon, 1992). This places Streets and Parks more in line with those in the urban design literature who advocate for greater emphasis on user needs (Crowhurst & Lennard, 1990; Gutman, 1976; Hester, 1975; Lang, 1994; Lynch, 1981).

This difference in planning philosophies has led to conflicting positions on projects, although with little visible conflict between planners (senior planner, Streets and Parks). One example of such a conflict concerned a proposed residential building on a lot that had become a *de facto* public space for residents in its immediate area. Streets and Parks wanted to maintain some form of public access to the site after construction and proposed creating a public path at mid-block in order to facilitate pedestrian movement (senior planner, Planning and Architecture). Planning and Architecture disagreed with Streets and Parks, deciding that public access was less important than the architectural design and the maintenance of the full development potential of the site. Since Planning and Architecture had formal authority over the site, its perspective prevailed. Planners from both departments have at least obliquely acknowledged such conflicts, and have embarked on a process intended to bring greater consensus to Planning and Architecture's approach to urban space development.

3.4 The Finance Administration

The role of planners in the Finance Administration has evolved significantly since the early 90s. the Finance Administration's core urban planning function has been to produce the Municipal Plan, and through that document, to establish the mandate for all development in the city. For a number of reasons, the most important of which was the political rivalry between the Lord Mayor and the Mayor of BTF, the Finance Administration expanded its role to include the direct oversight of major development projects along the harbour, as well as the city's urban regeneration program. These roles are very similar to the kind of roles planners from Planning and Architecture normally fulfill, except that the Finance Administration does not have the authority to create a Local Plan, which is needed to implement any planning policy. As indicated earlier, this creates the somewhat bizarre situation of a plan being developed and finalised by the Finance Administration (or by the consultants hired by the Finance Administration), but then codified by Planning and Architecture.

3.4.1 Harbour Development Plans

It was somewhat difficult to determine the criteria the city uses to decide whether the Finance Administration or Planning and Architecture should have jurisdiction over a given harbour development. In the words of one planner, if the project was of significant importance to the future well-being of the city, then the Finance Administration had jurisdiction (Intermediate Planner, Office 8). Yet according to this criterion, almost every harbour development should belong to the Finance Administration. Further, there was some confusion, or at least a lack of clarity, over what constituted "of significant importance." As best as could be determined from the interviews, the decision was essentially political, with the Lord Mayor taking responsibility for those projects that would likely have high visibility and could be translated into political capital (Intermediate Planner, Office 8; Senior Planner, Planning and Architecture; Senior Planner, Streets and Parks). In addition, planners in the Finance Administration believe their administration has unique powers and expertise that make it better suited to oversee certain types of projects; this could be entirely true, however it was

not clear whether this expertise was developed prior to, or after the Finance Administration gained jurisdiction over area-based regeneration.

3.5 Political Foundation for Planning Power

Given the substantial power given to planners, it would be reasonable to assume that all development in Copenhagen conforms to a high standard of design. The question of whether planners are able or willing to extract the necessary design concessions from developers, however, is not simply an issue of choice. Rather, a planner's capacity to successfully regulate development depends on the political system's ability to come to consensus on the core values that form the basis of planning decisions.

A director-level civil servant described planning's underlying values as heavily influenced by the European socialist tradition that still largely defines the modern welfare state. One by-product of this tradition is a government empowered to pursue public projects that are intended to benefit the general health and well-being of its citizens, even when individual freedoms are affected (director-level civil servant). This empowerment, however, is not unconditional and planners are allowed to act only once they have received approval through the democratic process. For example, the deep concern for energy efficiency and environmental sustainability, as expressed by the national objectives mandated in Copenhagen's Municipal Plan, has led to a number of policies that have curtailed both car ownership and use; policies include very high taxes on vehicle ownership, limited parking in the city, higher building densities, and a street network that gives priority to transit and bicycles. These restrictions have been complimented by incentives, including a significant expansion of public transport and bicycling infrastructure. The breadth of the solution-mix is virtually inconceivable in the American context for numerous reasons, not the least of which is the lack of public support for the curtailment of what is perceived as personal liberties, such as vehicle ownership.

The realisation that Danish planners are unable to consistently produce high quality development perhaps conflicts with how many view the planning process in Scandinavia

in general, and Denmark in particular. Contrary to popular perceptions, Danish planners do not work as independent agents who set their own goals; rather, they are the designated urban development experts who take the stated goals generated by the political system and transform them into physical products. During my discussions with planners, it became clear that planning's authority flows from a strong consensus in the political system, which then empowers planners to use their considerable power to act as the proxies for this consensus (senior planner in Planning and Architecture; senior planner in Streets and Parks). On issues where there is no political consensus, planners are unable to take a strong stand (senior planner in Streets and Parks; director-level civil servant; director-level non-civil servant).

The failure to extract sufficient concessions from developers could be interpreted in two ways: first, it could be interpreted as the politicians' failure to come to a consensus on what the fundamental goals of urban development should be, and not necessarily a result of the planner's lack of knowledge, foresight or courage to aggressively negotiate with the developer; second, political consensus on development goals could exist, but those goals may not include high quality design. Recent development in Copenhagen suggests that the second explanation likely predominates. I will first discuss the economic conditions that led to an early political consensus on harbour development that left high quality design as a secondary goal, and then turn to the two strategic adaptations planners have employed to bring good urban design back into the political dialogue.

3.6 Competing Definitions of Good Urban Planning

Very challenging economic conditions during the 1980s and shifting political priorities towards the end of the decade transformed Copenhagen's planning policy from passive into aggressive and proactive. Copenhagen found itself in a dire economic situation during the late 70s and early 80s, in part because of the loss of industrial jobs, in part because of protracted battles with organised labour, and in part because of a national policy that redistributed wealth from Copenhagen to rural Denmark (director-level non-civil servant). The combined strain nearly forced Copenhagen into bankruptcy. One consequence of the weak

economy was a drought in private development that lasted much of the decade. In response to these conditions, there began to grow a political consensus that Copenhagen must chart a dramatically different course, and that part of the new course should aggressively pursue the City's opportunity to play a major economic and cultural role regionally, and possibly internationally.

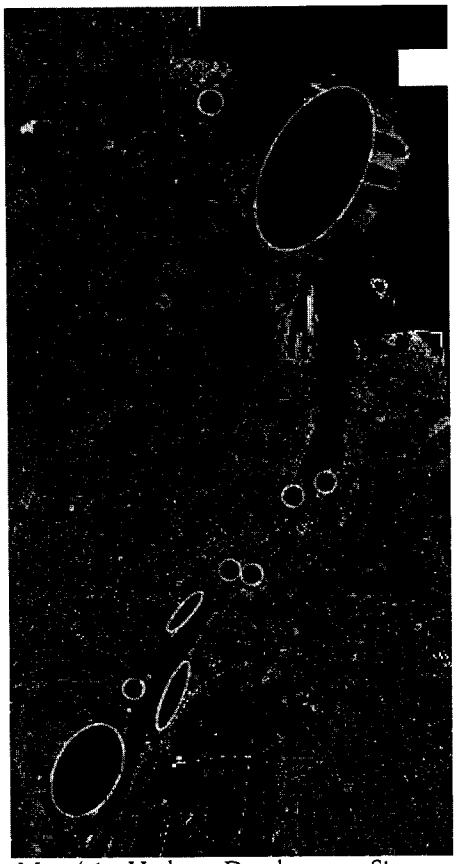
In 1989, the national government began to debate the appropriate long-term economic and cultural role for Denmark in both the European and international context. The dramatic economic decline of Copenhagen during the 80s generated concern that Denmark had already begun to lose stature among peer countries, and that continuing along the same policy path would turn Denmark into a fringe economy within Europe (City of Copenhagen, 2001p. 76). As a result, the national government initiated a series of national planning reviews from 1989 to 1993 that strongly recommended allocating national resources to improve Copenhagen's ability to attract new commercial activities, and therefore commercial construction. The 1989 National Planning Review stated, "[a]n important task for national planning in the coming years is to obtain a clear and comprehensive picture of how development is proceeding, what strengths present themselves in the growing international competition, and, especially, what the physical-spatial consequences of development are or should be" (City of Copenhagen, 2001, p.76). This focus on economic and population growth gave the green light to planners to aggressively pursue new commercial construction in the name of improving the city's international competitiveness. While planners benefited from such a clear mandate, they were not used to fulfilling this new role. As a consequence, there was a degree of learning through mistakes that was especially stark during the early years. The combination of new roles and a loosening of vertical restraints in the formerly hierarchical structure of the Building and Construction Administration presented planners both challenges and opportunities that would later come to redefine the practice of planning in Copenhagen, a transformation that was still not complete by Spring 2004.

The city government during the latter half of the 80s felt intense pressure to get

something going economically along the harbour (director-level non-civil servant). The city responded by providing exceptionally favourable financial and regulatory conditions to SKANSKA, a Swedish development firm, so that it could build the first large-scale private developments in many years. Fiskatorv, an American-style suburban shopping mall was built adjacent to the centrally located Vesterbro neighbourhood, while a high-end hotel and new office space was built along Kalvebod Brygge, a stretch of prime harbour land adjacent to the Inner City. Both projects are still strongly criticised by the public, by the architectural community, and by the city's planners for their poor design, inward-looking character and inappropriate size given the surrounding context (director-level civil servant; two senior planners in Planning and Architecture). One planner stated that the purpose of the Kalvebod Brygge development was overwhelmingly economic development, and not to improve the quality of the city, an opinion echoed by a number of sources, including a prominent politician. Some interviewees justified the social and aesthetic cost by citing the dire economic condition Copenhagen found itself in during the 1980s (city councilor on the Building and Construction Committee; director-level non-civil servant). At least one city document, a public marketing booklet, tried to paint the buildings as a positive contribution to the harbour, although it allowed that the development "may not please everybody's eyes" (City of Copenhagen, p. 93). While this euphemism may border on the absurd, it does not alter the fact that there was a strong political consensus for resolute pro-growth action, and that the perceived need to increase economic activity eclipsed any concern for quality urban design.

Soon after Kalvebod Brygge, new office space on Sydhavnen's abandoned industrial land, a harbour site to the south of the city, began to be developed and plans were laid for a number of other harbour developments (see Map 4.1 of harbour development sites). Within a few years, new development was either underway or moving towards construction along the entire waterfront; projects included Nordhavn, Frihavn, the new National Opera House on the Inner Harbour, the new National Library, Christiansbro, Holmen, Havnestad and Sydhavnen. Although the short timeframe suggests a coordinated effort, in reality the

harbour was developed in an opportunistic fashion with little vision for how the entire harbour should fit together (director-level non-civil servant; city councilor on the BTF Committee). The imperative for economic growth still dominated the political debate and no one from within the political system exercised the leadership necessary to move the city toward the adoption of alternative planning performance criteria that would result in a greater balance between urban design and economic development. The planning and architecture community did advocate for a master plan for the harbour, but the politicians ignored the recommendations of both public and private planners when they set the agenda for harbour development (director-level non-civil servant). As a result of the opportunistic approach to development, the harbour has a distinctly fragmented feel, even though some of the individual projects have merit unto themselves.



Map 4.1 - Harbour Development Sites

3.6.1 Early Adjustments by Planners

Perhaps in response to the one-sided nature of planning during this period, the 2001 Municipal Plan adopted language that stipulated aesthetic criteria be considered with equal weight as economic considerations [page number]. I was unable to obtain an English version of the 1997 Municipal Plan, and therefore cannot rule out the possibility that the language was adopted at that time. Regardless, this shift in focus suggests a conscious departure from economic development as the most important planning goal and the embrace of other criteria that could be considered more representative of the factors that contribute to quality of life in the city.

During the interviews with planners, developers, politicians and other involved

parties, it became clear that amongst many planners there was a reluctance to be too firm with harbour investors. The rationale for this more gentle approach was multifaceted, and included considerations for the harbour's special circumstances, including the highly toxic soil found in many of the industrial sites. The primary rationale, however, was an ongoing concern for economic development that had lingered well after the economic troubles of the 80s (two director-level civil servants; one director-level non-civil servant). Advocates of the less aggressive approach suggested that the city should be content with the amount and quality of housing produced so far, since new housing that catered to a more affluent demographic was also a central planning goal (director-level non-civil servant). These pragmatic, or perhaps cautious, stakeholders argue the city should continue to negotiate for the most important elements, primarily for more housing, implying that good urban environments should a secondary focus (director-level non-civil servant). That there is a marked lack of quality public urban spaces in the new harbour developments was not of great concern. It is difficult to determine whether this pragmatic approach represented the consensus view amongst planners and politicians, although it was dominant enough to effectively shape city policy regarding harbour redevelopment.

The hands-off approach and resulting poor quality outcomes helped fuel efforts by other groups in the city, primarily from Streets and Parks and the Finance Administration, to pursue a more aggressive and strategic course of action. The Finance Administration's effort to experiment with new development models has already been discussed. The second effort initiated by Streets and Parks, but which has grown to include all three planning departments, was CUSAP. One goal for the CUSAP process was to forge a new political mandate for a coordinated effort across all planning departments in order to pursue a higher standard of design using a consistent set of criteria for project identification and project design, which would be applied across the entire city. And while there was a growing sense that the economic downturn of the 80s was well behind the city and that the time had come to increase public pressure on private investors to produce development that met higher design stan-

dards, there was also a large degree of dissatisfaction among planners with the *ad hoc* and politically motivated process for identifying which urban space improvement projects received funding and which did not (director-level civil servant). It was on this issue that the Finance Administration's and Streets and Parks's strategic efforts differed; the Finance Administration had embarked on an entirely original approach that focuses exclusively on large-scale development, while Streets and Parks has attempted to reform how all urban spaces are designed, not just those in new harbour development.

4 Defining the Stated Values within the Planning System

"Stated" values are the underlying values and principles that are intended to shape the city's design guidelines and planning decisions. The design guidelines can include a plan's overall goals, its value statements, specific design requirements, as well as the goals verbally communicated by planners. Stated values describe the city's desired end product, versus what is actually built. "Translated" values are the values embodied in the built products that emerge from the planning process. The reason for separating values into stated and translated is based on the observation that cities often say one thing in their official documents and public statements, and then pursue a very different agenda. San Francisco's Transit First policy, for example, was meant to be the guiding principle behind how the city allocated public funding, designed streets and located new development. Over the three-decade life of this policy, San Francisco has failed to make the investments necessary to achieve a robust transit first transportation system, either in terms of service expansion or the design of streets that prioritises transit over the automobile. Therefore, any evaluation of San Francisco's transportation policy would need to place equal, if not greater, emphasis on what the city has actually done to meet the requirements set forth in the official policy, and not just the stated goals. Similarly, it would be reasonable to assume that Copenhagen would use the most positive language to describe both the proposed plans for new development, as well as the degree to which recently completed development lives up to the stated goals of the city. Crosschecking of stated goals and achieved results will be an important indicator of the planning system's

success in positively influencing the quality of life in Copenhagen.

4.1 Stated Values in the Municipal Plan

The Municipal Plan makes clear that Copenhagen must continue to grow in terms of its population, economy and centrality to the country, but that this growth must also be done in an economically, socially and environmentally sustainable manner. The effect on the built environment should be new, higher density and high quality housing built in areas already within the urban boundary, and new employment opportunities located close to transit service. By combining higher density housing and employment centres with public transit investments, the city is attempting to reinforce the central role of public transport within the overall transportation system, while keeping private automobile use to "the lowest possible level." Specifically, the Municipal Plan states that "[t]he localization of workplaces and dwellings is to support the use of environmentally friendly types of transport: public transport, cycling and walking." To achieve this, high traffic generating uses will be given priority in areas around transport stations, while there will be an ongoing process of "continuous conversion and modernisation in connection with urban renewal..." in areas that are already well-serviced by transit and/or are centrally located.

4.2 Responding to the National Agenda

In addition to locally defined needs, the Municipal Plan must also respond to the concerns of the national government; in the case of the 2001 Municipal Plan, the Municipal Plan must provide policies that help make the Copenhagen and Øresund Region more "attractive to research, labour and foreign investments." Given that the Municipal Plan must not only ensure that "holistic solutions are not implemented with undesirable local consequences," but also address the unique needs of individual districts, finding the balance between regional, long-term goals and immediate local needs presents an enormous challenge for Copenhagen's urban planners.

Three requirements set by the Ministry of Environment and Energy have substantial implications for Copenhagen's urban structure and future growth patterns. Through the

national political system, Danish society has placed a strong value on high environmental quality, which municipalities such as Copenhagen are required to achieve through local policy. Copenhagen has decided to translate this value into three goals: avoid urban sprawl and reduce overall transport work; emphasise the reuse and densification of existing urban infrastructure; and, optimize the use of existing transportation infrastructure, especially those investments in public transport. The Municipal Plan has used these goals to create urban planning policies that: reinforce the Finger Plan[3]; locate new employment and housing close to transport stations; prioritise the reuse of vacant urban land, especially those areas with amenity value along the harbour, for new residential development; and prioritise which areas within the Greater Copenhagen Region should be developed first, leaving other, non-essential areas as "prospective areas" for future development.

4.3 Municipal Plan Policies that Support Pedestrianism

Every development and renewal project discussed in this chapter reflects the Municipal Plan's priorities, although the large-scale goal of increasing use of non-automobile transport has been somewhat blurred in the implementation of some projects, especially with regards to the promotion of walking as a primary transport mode. Implementation strategies and success notwithstanding, the Municipal Plan directly and indirectly provides policies that strengthen the pedestrian environment in Copenhagen.

There are four chapters in the Municipal Plan that discuss topics that concern the quality of the walking environment, either directly, such as through street and urban space improvements, or indirectly, such as housing policies that affect the density and demographic profile of neighbourhoods. These chapters include Housing, Retail Trade, Recreation and Leisure, and Traffic. I will discuss each in turn, and relate how specific policies and value statements affect the quality of pedestrian infrastructure.

3 Originally conceived in the 1950s as a way to limit the effect of urban growth on the region surrounding Copenhagen while maintaining good access to nature for residents, the plan called for five fingers of urban development to extend out from the city centre along rail corridors.

4.3.1 Housing

The housing stock in Copenhagen has had a large effect on who chooses to live there. The city describes the available housing stock generally as consisting of "a relatively large number of small, old dwellings of a poorer standard and of relatively few owner-occupied dwellings" (City of Copenhagen, 2001). The demographic consequences are few families and a high proportion of low-income households, a profile that the city perceives as a threat to its long-term economic and social sustainability. The renewal of Vesterbro, the formerly blue-collar neighbourhood that is one focus of this research, is the result of efforts to make the city's housing stock more competitive with the rest of the region in terms of quality (Researcher, CASA; Project Manager, non-profit developer). Indeed, the city's decision to provide more middle- and upper middle-income housing along the harbour reflects the desire to broaden Copenhagen's demographic profile to include more affluent households with children.

The Municipal Plan's housing strategy lays out a social, economic and physical vision for Copenhagen's neighbourhoods that involves shifting the municipality's demographic base away from single-occupant and lower-income households to more affluent households and households with children. The municipality believes that Copenhagen's long-term attractiveness, both to residents and to future investment, will be maximised if it can achieve a population profile that more closely resembles the demographics of the rest of Denmark. For the two urban neighbourhoods in this study, this objective has several implications, including policies that promote larger, more expensive units attractive to middle-income families, projects to improve pubic urban spaces to ensure that older neighbourhoods remain attractive to new residents, and traffic calming to reduce the negative effect of automobile traffic on residents. The consequences of these goals became an important topic of discussion during the resident interviews, as both neighbourhoods have experienced a period of rapid social and physical transformation as a result.

4.3.2 Retail Trade

In addition to its regional shopping goals, the municipality has a series of retail trade goals oriented towards the local district centres that have a direct effect on the pedestrian experience. Of the five objectives, the most important is the city's commitment to "maintain the pedestrian shopping street character in the district centres" by requiring "the ground floor of the frontage buildings along the streets" to "be used for shops and other public-oriented functions"(City of Copenhagen, 2001). By requiring ground floor retail along important district commercial streets, the city has acknowledged the centrality of active ground floors in maintaining a strong pedestrian environment. A second objective, "to maintain a socially sustainable retail trade structure" that has "good accessibility for pedestrians, cyclists" and public transport riders provides a more general statement of support for pedestrian-oriented district centres, while leaving much discretion to planners to interpret how best to maintain this accessibility. Lastly, the objective of maintaining local-serving grocery stores in all parts of the city fulfills one of the most important links in sustaining an effective pedestrian-oriented neighbourhood, as grocery shopping remains one of the core household needs that too frequently forces households to use the automobile to satisfy.

The tools to achieve these goals are substantial, including the setting of maximum floor areas for grocery stores and shopping goods stores (3000m^2 and 1000m^2, respectively), and the ability to allow local-serving grocery stores almost anywhere in a residential area, with a maximum of 500m^2. Also, any proposed closing of a ground floor retail space located on an important shopping street must undergo a planning evaluation. Finally, stores that sell particularly bulky items, such as household appliances or cars, must be located in appropriate locations so as not to take up large sections of the street façade.

4.3.3 Recreation and Leisure

There are two projects outlined in the Recreation and Leisure chapter that directly affect the quality of the pedestrian experience, both of which use the greening of paths and spaces as the primary means to improve the amenity value of the route. The first project, the

creation of new park belts that run long distances across the city, is intended to increase the distance cyclists are willing to travel by improving the safety and degree of aesthetic enjoyment along the route; and to strengthen pedestrian and cyclist connections to green open spaces. Since parts of these paths will run through large regional parks, they will likely affect pedestrian route choices when leisure is the primary goal, and perhaps increase the frequency and/or distance of pedestrian trips. They will likely not affect pedestrian behaviour with regards to daily errands, since few services will be available along the route.

The second project, the renovation of streets and open spaces, directly improves the aesthetic and experiential quality of walking. The Municipal Plan states that the "[r]enewal and enlivenment of the public open spaces of the city form an important part of the initiatives in the neighbourhood regeneration projects aimed at improving the local environment, both aesthetically and recreationally." That is, the city has made a direct link between the quality of the built environment and successful urban regeneration efforts, a conclusion born out by 40 years of urban regeneration projects. The targeted projects include the station areas of the new Metro system, as well as those neighbourhoods that are in particular need of an "architectural-lift," including former blue-collar areas that have not been modernised, either in terms of the quality and quantity of the private living space, or access to public open space.

4.3.4 Traffic, Traffic Installations and Transport Facilities

The plan acknowledges that the continued growth of Copenhagen could result in more passenger car traffic, which will necessarily have a negative effect on the quality of life of residents. The central goal of the Traffic, Traffic Installations and Transport Facilities chapter is to ensure a sustainable and coordinated urban development and transport system that encourages the greatest proportion of trips to be taken on public transport, by bicycle or on foot. Further, the city intends to achieve a zero increase in the total number of automobile trips, with the additional growth-generated trips to be accommodated by alternative modes. To achieve these goals, the city intends to pursue a multi-faceted strategy that includes an ag-

gressive bus prioritisation plan, the construction of the new Metro subway system, efforts to improve "safety, comfort and passability (i.e., ability to pass safely) for cyclists," and improvements to the squares, open spaces and street areas of the city so that they "form beautiful and harmonious settings for human recreation and activities" (see Table 4.1 for mode split).

Table 4.1 - Commute Mode-Split in Copenhagen, Denmark 2004

	Mode-Split (%)
Bicycling	36
Public Transit	33
Automobile	27
Walking	4

Source: *Bicycle Account*, 2004 City of Copenhagen.

Bicycling and walking are closely associated at the urban neighbourhood scale in terms of the designs necessary for them to be attractive options for residents. The primary routes for both must be along the major commercial streets in order to maximise the convenience of running daily errands and to provide the level of visual interest necessary for the slower pace of each mode. Copenhageners also often combine walking and cycling within a single trip, choosing one or the other depending on in which stage of their journey they are. The journey home from work could include a cycled segment from the place-of-work to the city centre, where the cyclist would dismount and enjoy the abundant shopping and strolling opportunities on foot. Once the cyclist-pedestrian emerges from the other side of the city centre, he could remount and complete his journey to his neighbourhood, where he could dismount once more and run some daily errands, such as grocery shopping.

During the resident interviews, individuals of various ages and both genders described variations of this scenario, suggesting this is a behaviour pattern followed by a broad cross-section of the population. The seamless integration of these modes means that street improvements designed for one mode often have spillover effects for the other. Copenhagen experienced this spillover effect during the past 10 years; during that time, many routes benefited from substantial investments in their bicycling facilities; that most pedestrian improvements were limited to the city centre did not matter as much, since pedestrians also benefited along with the cyclists. By contrast, there are examples of where improvements to cycling

facilities have resulted in space being taken away from pedestrians, and the pedestrian environment suffered because of this. Further, the very large number of cyclists presents challenges in terms of where all those bikes will be parked, especially in intensely used areas that may not have very much extra space for bike storage. Often, cyclists will park their bike on the sidewalk in front of the store or café they are visiting, which can make walking along the sidewalk very crowded and unpleasant (see Image 4.1 fotex). Long-term solutions for this problem have not been identified, although the City's transportation planners have acknowledged the need for one.

Image 4.1 - Sidewalk along Vesterbrogade

A recent study of three parallel routes through Copenhagen's city centre, for example, found that each street fulfills a unique role in the transportation system. Specifically, the first street is used both as a rapid through route for bicyclists and as a walking street, but with very few opportunities for leisure strolling or staying activities; the second street is used as a leisure strolling street for locals and has many attractive opportunities for stopping and hanging out; lastly, the third is a strolling street used primarily by out-of-town visitors and locals who have errands on that street, but has relatively few opportunities for staying activities (Hrushowy and Gemzoe, forthcoming). The range of walking environments illustrates how a diverse pedestrian network is essential to meeting the equally diverse needs and moods of pedestrians.

The Municipal Plan does include some elements that, while not expressly for the benefit of pedestrians, do have a positive effect on the walking experience in the city. The plan stipulates, for example, that the visual quality of the street environment should be considered

"on equal footing with the technical and economic evaluations" when the city addresses the layout and arrangement of streets and squares (City of Copenhagen, 2001). This does not appear to be related to any goal other than to improve the joyful experience of being on attractively designed streets and urban spaces. Pedestrians clearly benefit from the prominence of visual quality among the city's priorities for street design. That such improvements affect pedestrian behaviour may be a foregone conclusion; however, it is difficult to discern where pedestrians fit into the city's planning objectives since the Municipal Plan makes no mention of pedestrian preferences in any text associated with the "visual street environment."

This lack of a stated relationship between street and open space design and walking was echoed in the results from the interviews with several planners and politicians, although there appeared to be a distinction between how the Finance Administration approached the issue versus Planning and Architecture. When asked whether pedestrian needs were explicitly integrated into how the city evaluated one of the recent harbour plans, the planners from both Planning and Architecture and the Finance Administration assured me they had been, but the objectives guiding Planning and Architecture's design were less clear than those for the Finance Administration.

Among planners in the Finance Administration, pedestrian needs were defined more in terms of an urban context, while in Planning and Architecture they were more recreational. In relation to Sydhavnen, a harbour redevelopment project under the Finance Administration's authority, the planner was most concerned with ensuring sufficient density to support an active public realm, as well as enough architectural diversity so that pedestrians would find all the streets inviting and varied in character. By contrast in Havnestad, the harbour redevelopment project under Planning and Architecture's authority, the pedestrian needs were al-

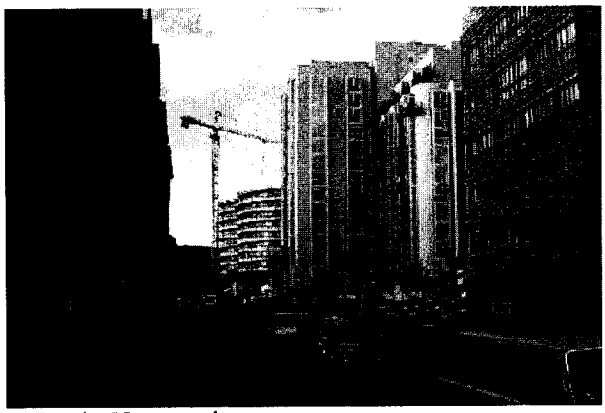


Image 4 - Havnestad

most exclusively met by large gestures, such as a broad greenbelt running diagonally through the site, as well as a very attractive harbour walk and park. While both elements constitute important pieces in the city's network of recreation paths and destinations, they will not play a central role in fulfilling a resident's day-to-day needs, needs that are typically met both locally and on foot. That two departments could have such dramatically different strategies for implementing the Municipal Plan's guidelines illustrates the danger in not having explicitly defined goals for pedestrians, especially for those areas that had no existing neighbourhood infrastructure.

The city's traffic plan, while emphasising the bicycle as a central transport mode for the majority of residents, does not prioritise pedestrian facility improvements, with the exception of the pedestrian streets in the city centre. Conversely, extensive resources have been dedicated to reducing the nuisance level of automobile traffic, especially along residential streets, by implementing district-wide traffic calming plans. Such improvements, while not specifically targeting pedestrian facilities, can still dramatically influence the quality of the pedestrian experience. Similarly, plans to improve the visual street environment will augment the network of well-designed and aesthetically pleasing streets and squares. High-quality street furniture, improved lighting, new surfaces, and improved building facades will help to highlight the "amenity values and urban architectural values of the city." These efforts will be increasingly focused on the neighbourhoods outside the Inner City where there has been a relative dearth of high-quality urban spaces.

The one objective that directly targets pedestrian facilities identifies the promenades along the harbour, canals and coast as important areas for pedestrian accessibility and aesthetic improvements. Specifically, the Municipal Plan lists accessibility, continuity, connections with surrounding neighbourhoods, safe traffic conditions, high aesthetic quality and the preservation of historic and maritime features as the key criteria for improving the pedestrian spaces (City of Copenhagen, 2001). These promenades, however, are primarily meant to serve recreational and leisure purposes, and not form part of the core pedestrian network. It

was this objective that Planning and Architecture was likely focusing on in the Havnestad plan. The choice to focus on promenades suggests that walking, versus bicycling, is seen as a recreational activity; not only are the locational choices for improvements to pedestrian facilities very different under this perspective, but the recreational focus leaves ambiguity surrounding what qualities urban planners identify as central to successful pedestrian environments in the neighbourhoods that surround the Inner City.

4.4 Walking as a Leisure Activity versus a Transportation Mode

The provisions in Copenhagen's Municipal Plan that discuss the pedestrian environment approach the topic from a limited perspective. Primarily, the Municipal Plan contains provisions that assume walking is a leisure activity and not a transportation mode central to how people access the city on a day-to-day basis. For example, the harbour path network receives much attention, while the inter- and intra-neighbourhood network receives almost none. By contrast, CUSAP directly addresses the pedestrian environment from a network perspective that acknowledges the centrality of walking's role in peoples everyday lives. During a follow-up interview with a director-level planner in Building and Construction who has intimate knowledge of CUSAP, this abrupt shift in policy was raised; the planner acknowledged that the City had for years taken the walking environment for granted, and that this oversight was pointed out by Jean Paul Charbonneau, the French urban designer hired to coordinate the CUSAP process. Indeed, Charbonneau emphasised the importance of refocusing the city's approach to urban space development to actively support a more central role for pedestrian movement within neighbourhoods and between them.

The one interview in which a senior planner from the transportation planning section of Streets and Parks expressly discussed pedestrian needs provides some insight into Copenhagen's strategy towards transportation investments over the past 10-15 years. Investments in public transport and the bicycle network were set at the top of the city's agenda, sidelining both the automobile and pedestrians; indeed, in order to improve the safety and passability of bike lanes, the planner acknowledged that the pedestrian likely lost sidewalk space–in

some areas, too much space (director-level civil servant). The city had recognised this imbalance and the planner believed that future plans would place more emphasis on pedestrian needs, although the limited right-of-way in some areas will present significant challenges. Despite increasing political pressure to accommodate the automobile, the planner believed the automobile would continue to reside at the bottom of the hierarchy of modes and receive more space only if there was something left over after meeting the city's other priorities.

4.5 Concluding Comments on the Municipal Plan

The Municipal Plan uses a number of policies to achieve its goals of economic, social and environmental sustainability, many of which affect the quality of the pedestrian experience in general, but do not specifically address a continuous and connected pedestrian space network. The commitment to higher-density housing, public transport, improved bicycle facilities and strong district retail streets will reinforce the attractiveness of walking in the city. The combination of strong regulatory enforcement, backed by significant and strategic public investment in streets and public open spaces, should provide a successful course of action to achieve the city's planning objectives. That public investment is not always strategic from the planning sense, but rather politically driven to increase public support for a given policy or politician, undermines Building and Construction's effectiveness (director-level civil servant). These challenges notwithstanding, Copenhagen should remain a fruitful site to conduct environmental design research since the city's urban planners continue to effectively implement many of the current urban design strategies that are merely being discussed in the United States.

The city's objectives as outlined in the Municipal Plan do not describe an explicit role for walking in the larger transportation system. Walking for recreation is clearly a priority for the city; strangely, this limited interpretation does not correspond with observations of how Copenhageners go about their daily lives. If we redefine urban public life, the enhancement of which is an explicit goal in the Municipal Plan, to include the daily walking trips residents make throughout their neighbourhood as they buy groceries, go clothes shopping, meet

friends at a café, or just look in shop windows, then pedestrian needs become much more central to how Copenhagen is planned. Even with this more generous definition, the trouble still remains that by not explicitly highlighting the pedestrian's needs, Streets and Parks, the department that is primarily responsible for capital projects, has difficulty in prioritising street improvements that are intended to strengthen the network of pedestrian routes. Instead, when a street is to be improved for other reasons, the new design's effect on the pedestrian experience will be considered, but this process is vastly different than selecting streets for improvement because they are a key link in the pedestrian space network.

4.6 Other Planning Documents–Harbour Promotion Literature

A promotional document published in 2001 titled *Water City*, offers some additional insights into where political consensus exists, what planning goals are being pursued, and how those goals have been manifested in new projects. The main thrust of this document is to express how Copenhagen has become an "ideal location for high-tech businesses or for regional corporate headquarters" (City of Copenhagen, Water City; p. 3). One of the main attractions is the availability of vacant harbour sites that "offer great potential for creating new, attractive residential areas." This land, the document suggests, should be used to "offer attractive housing opportunities to [Copenhagen's] citizens and to the businesses that nurture the continued growth of the city." This emphasis on "spacious, attractive, prime-location dwellings" corresponds with comments made by senior planners from both Planning and Architecture and Streets and Parks, who acknowledged that there is political consensus for the need to provide housing for more affluent residents (director-level civil servant; senior planner in Streets and Parks).

Attracting families remains a dominant theme in the document and special attention is paid to illustrating new family housing types that reference the currently preferred "garden dwelling." Given the proximity to the harbour, the City has coined this new housing "water dwellings," which are meant to offer "an inner-city location" that incorporates "the water in the urban development as well as the unique quality of the maritime element." To help

implement this goal, the City allocated DKK 400 million (approximately $70 million) for housing purposes between 2000 and 2004, with most of the funds used for infrastructure and site development to prepare the area for residential development.

5 A Discussion of Copenhagen's Efforts to Support Vibrant Urban Life

What has this analysis told us about Copenhagen's understanding of the environment-behaviour relationship? As the building block for good pedestrian design, it would be useful to understand where the city stands on it. The Municipal Plan policies and the planners' comments during the interviews support the contention that there remains a distinction between how the city designs walking paths along the water or through parks, and how it designs the urban pedestrian space network. With the former, the city has emphasised the continuity of the path and its role as a connective thread strung through a variety of neighbourhoods, while with the latter, it emphasises the street's role as a place, not a path. Designing the retail street as a destination versus as a path between destinations illustrates this perspective. How a resident arrives at the retail street seems to be a foregone conclusion that is actually ambiguous in the planner's mind; those close enough to walk will do so, while the rest will either bicycle or take public transport.

This lack of emphasis on urban pedestrian routes reflects larger priorities set at the federal level, as well as the perspective that walking is a recreational activity pursued either in the City Centre, in parks, or along the waterfront. The federal mandate to expand and improve the safety of the bicycle network seems to have eclipsed pedestrian improvements. A senior planner in Streets and Parks verified this hierarchy, saying that given the very limited right-of-way in many neighbourhoods, the trade-off between modes has meant that someone must lose, and that over the past 10-15 years, bicycles and buses have won while the pedestrians and automobiles have lost. The official also suggested that the shift had gone too far and that the pedestrian would have to receive higher priority in the future.

Improving access for the handicapped has grown in political prominence over the past several years in Copenhagen, and the city will likely adopt in the near future a compre-

hensive plan to address this issue (senior planner, Streets and Parks). Some of the challenges faced by the handicapped, however, also confront pedestrians without a handicap, just less severely. In this sense, objectives set for improving access illustrate where the city perceives gaps in the pedestrian space network. Bicycle parking along sidewalks is a severe problem for the handicapped and pedestrians alike, and movement becomes especially difficult along those streets with narrow sidewalks (senior planner, Streets and Parks). That many retail streets have shop signs sitting in the sidewalk competing for very limited space with parked bikes, prams and a large number of people, only increases a pedestrian's stress level and forces him to constantly weave his way around obstacles. The jostling and maneuvering necessary along Nørrebrogade, for example, was mentioned by many of the residents interviewed as something that detracted form the walking experience along the street, since they could never relax and enjoy the surroundings, or carry on a conversation with a friend. An official involved with developing the handicapped access plan explained how changing attitudes about the disabled amongst politicians and designers has proved far more difficult than coming up with sidewalk designs that improve access while maintaining Copenhagen's high design standards for materials and aesthetics (senior planner, Streets and Parks). Perhaps one of the challenges includes changing the prevailing perspective on pedestrian spaces from that of place to that of movement and networks.

The issue of density and its role in creating vibrant, but humane urban environments generates significant disagreements among Copenhagen's planners. As expressed through the interviews with planners, the divide largely runs between the Finance Administration and Planning and Architecture, but sometimes it cuts between the younger and older generations (intermediate planner, Office 8). In general, the Finance Administration advocates for higher density development along the harbour than does Planning and Architecture. The underlying reason appears to stem from competing visions for healthy urban living; many of the very dense and older neighbourhoods close to the city centre have, until fairly recently, been areas with substandard living conditions, and much of the early renewal efforts went towards

addressing this issue. It is perhaps in response to this history that Planning and Architecture is responding, as it is relatively more concerned about creating too much density and not enough green space[4]. Conversely, the Finance Administration is more concerned with creating vibrant and socially self-sustaining neighbourhoods, and sees a combination of density and coverage as important contributing factors. Both departments acknowledge that higher density contributes to a more active public realm, but the difference lies in how much emphasis is placed on urban life versus other goals, such as access to open space.

The Municipal Plan caps new development at 110%, or a 1.1 floor-area-ratio (FAR), while those districts with the greatest degree of public life are built at 200-300% with high lot coverage. By comparison to San Francisco, which has an approximate density of 25 people per acre, Vesterbro has approximately 230 people per acre, Nørrebro has approximately 450, and the Inner City has 140. That many planners in Copenhagen wish to recreate the vibrant urban life of Vesterbro and the Inner City in the new districts only underscores the almost schizophrenic relationship Danish planning has with density. As indicated, improving access to fresh air and green space were two of the main thrusts behind the New Town movement in Denmark after WWII, and urban densities began to fall relative to historic levels as people moved from the city to "garden houses" in the new suburbs. In Copenhagen, the population peaked in the 1950s at approximately 770 000, and then steadily declined for 40 years, falling as low as 468 000 in 1992. Beginning in 1993, the recent re-urbanisation movement reversed that trend and the population has increased every year until 2004, when it was almost 502 000. Similarly, the densities peaked at approximately 250 persons per acre in the 1950s, and have settled back down to approximately 140, still many times greater than San Francisco[5].

4 Interestingly, Planning and Architecture has been a more vocal advocate for tall, signature buildings that have a dramatic effect on Copenhagen's skyline. Indeed, PA has in general advocated for a shift in perspective from small city to regional metropole, which would entail certain sacrifices, such as views obstructed by new, modern architecture emblematic of the times.

5 On a personal note, having lived in both cities for an extended period of time, despite Copenhagen's much greater density, it is San Francisco that feels more congested, noisier, and certainly more difficult to move around. This underscores the fact that a well-planned, non-auto-oriented city can offer a superior quality of life to its residents than a half-breed akin to San Francisco.

To suggest that density and vibrant urban life are not priorities in Copenhagen given how many more people live in the same amount of space than in San Francisco may cut too fine a point for some, but that this density can exist and not automatically generate vibrant public urban spaces clearly suggests that density is one factor, while the quality of design is another, equally important one. That is, how this density is configured, how the spaces between buildings are framed, what uses meet pedestrians along the ground floor, and how extensive the pedestrian space network is all have important roles to play. That so much of the debate in the US focuses on density alone should disturb those who advocate for vibrant public spaces, since making such a facile argument could easily result in a complete rejection of the urban agenda if the density only succeeds creating are alienating and in-humane built environments. That said, Copenhagen's policies governing density are in the process of being re-balanced in accordance with contemporary goals, although there remains significant reluctance on the part of some planners to accept higher densities.

Three examples illustrate how ideas of density have evolved over the past decade. One of the earliest harbour renewal projects, Frihavnen alongside Langelinie, possesses little, if any, urban life. There are several reasons for the lack of outdoor activity, including an architecture that presents very unappealing, blank ground floor facades to pedestrians, a layout that does little to mitigate against the at times severe climate conditions associated with being exposed to the Baltic Sea, and according to some in the FD, the lack of density (intermediate planner, Office 8). Similarly in Havnestad, the city had asked DSI to create a real city feel akin to that of Nyhavn, one of the most popular outdoor spaces in the city. While DSI was willing to comply, the city was unwilling to raise the density above 110%; DSI felt that the density needed to be closer to the 200-300% typical of the very active parts of the city (director-level). As a result, the streets in Havnestad will likely be quiet, although the space along the harbour will be popular on warm days. Finally, in the Nordhavnen project, the Finance Administration had argued for relaxing the density cap so that the new district could be socially self-sustaining. It successfully won an increase to 130%, but there was tremendous

reluctance to go even that high. For Sydhavnen, the Finance Administrations hopes to push the density even higher, at least in part because of the economic reality of building affordable housing. Currently, the department is anticipating 150%, still well below the levels found in the older Bridge neighbourhoods.

6 Copenhagen Urban Space Action Plan (CUSAP)

The CUSAP process has become a central element in Copenhagen's planning policy over the past two years. A significant amount of time and resources, including a large degree of political capital, has been dedicated to the process. With regards to the other central element, harbour redevelopment, CUSAP's relationship is difficult to precisely describe, since much of the emphasis within the CUSAP process has been on areas beyond the harbour sites. Yet, the poor quality of the public urban spaces in recent harbour development and the lack of a coordinated vision to tie the harbour together did contribute to CUSAP's initiation. The fact that CUSAP began as an effort within Streets and Parks to bring greater rationality and consistency to how its work programme was set and to how Streets and Parks could best use its limited funds to improve public spaces, and the fact that Streets and Parks is not one of the central planning departments for harbour development might help explain CUSAP's arm's length relationship with the major harbour redevelopment projects. Further, harbour redevelopment had become a politically charged issue that has, to a degree, poisoned the relationship between planners in BTF and the Finance Administration. The source of the difficult relationship is the competing political careers of the two men who head up each of these city administrations, Lord Mayor Hans Kramer Mikkelson of the Finance Administration and Søren Pind, the Mayor of Building and Construction. This competition has filtered down through the respective bureaucracies and has complicated their interaction (director-level civil servant).[6] Therefore, the choice to embrace a holistic vision of Copenhagen's public

6 After my departure from Copenhagen, Mikkelson stepped down as Lord Mayor, triggering an election for his replacement and opening the way for Pind to ascend to the Lord Mayorship. The vote was held 15th November, 2005 and Ritt Bjerregaard from Mikkelson's party won a resounding victory over Pind, who will not a have a mayorship in the new government. How this will affect the relations between Building and Construction and the Finance Administration is unknown, but in a conversation with a director-level civil servant immediately prior to the election, it was suggested that

urban space and treat the harbour redevelopment in a tangential way may have been strategic.

6.1 How CUSAP Was Initiated

Mette Lis Andersen, the Administrative Director of Building and Construction initiated the CUSAP process (intermediate planner, Streets and Parks). As originally conceived, CUSAP pertained only to Streets and Parks and its activities regarding the creation and maintenance of public space in the city. One of the issues CUSAP was intended to address was the inconsistent role the political system played in identifying potential interventions and then lending support to the final designs. This was not an issue unique to Streets and Parks, and early on both Planning and Architecture and the Finance Administration joined the CUSAP process. The city hired Jean-Pierre Charbonneau, the city urban designer responsible for the transformation of Lyon, France's public spaces in the 1990s, to coordinate and facilitate the process. The discursive nature of the process led to the gradual enlargement of the initial mandate until CUSAP's scope came to include not only the city's official policy governing urban space creation, maintenance and improvement, but also how the three planning departments should communicate across departmental boundaries, within their own bureaucracies, as well as how both politicians and residents should be included throughout the planning and design process. This ambitious task prolonged the overall process since it required consensus on some intangible issues, such as what values should be guide Copenhagen's urban space planning agenda. At the time of writing, the final draft was before the municipal council for approval, and there is every expectation it will pass.

The process for creating CUSAP has one unique element: the document was developed alongside several pilot projects so that planners could test alternative strategies with in-the-field experience. Several of the projects were significant in scope and included a green bicycle boulevard that cut across the city, providing vastly improved conditions for cyclists to move longer distances through the city. Other projects focused on smaller urban space

---

this conflict had become institutionalized and would be difficult to fix.

improvements at the neighbourhood scale. The City, for example, created two new squares in outlying neighbourhoods using underused vehicle rights-of-way, demonstrating its strong commitment to allocating space according to what will best meet the needs of local residents, and not according to out-of-date and unbalanced traffic engineering standards. By pilot testing the revamped design process and design strategy, planners were prepared to move swiftly and apply CUSAP to the then emerging Parking Policy being debated by Council. The broad political support for CUSAP likely provided the inspiration to break a long-standing political debate on the most appropriate parking solution for the city.

6.2 CUSAP's Underlying Assumptions

There were four underlying assumptions that guided the development of CUSAP. The first assumption is that the opportunity for positive human encounter is a fundamental element to successful urban areas. From this core belief all the other assumptions, visions, goals and strategies hang. The second assumption is that Copenhagen's existing urban spaces do not form a coherent pedestrian network across the city, and that some parts of the city lack access to this network entirely. Further, the breakdown in this network is at least in part due to long stretches of "dull streets" that repel pedestrian activity. The third assumption is that the changing demographic, cultural and economic conditions require "spaces that reflect contemporary demands and which can create diversity and a modern identity" (CUSAP 06/05, p. 2). The final assumption is that to achieve whatever goals the municipality sets forth, planners will have to systematically pursue clear and consistent goals using a variety of tools.

The draft of CUSAP's vision states that urban spaces should be developed to create "a metropolis for people giving a better place in which to live." It goes on to define this as consisting of a "flexible, international metropolis" that will have a "strong identity with a dynamic city life and attractive work places," and "an attractive city to live in" with residential areas that provide "many possibilities for exciting and interesting experiences." CUSAP's vision clearly combines the economic and the quality of life aspects of planning, thereby directly

addressing the imbalance in planning policy from the late 80s and 90s. In terms of urban design, the choice to use the phrase "exciting and interesting experiences" to define the ultimate goals of public space in residential neighbourhoods represents an important advance in the way a city could choose to approach urban space planning. Gone is the strict and limited scope of a functionalist mindset, and instead we see a vision that orients itself to the diversity of residents' lifestyles. This is an inherently less prescriptive mindset that allows for a greater degree of creativity in how the built environment can best meet the needs of residents.

CUSAP's goals address three issues, Strategy, Quality and Process. The Strategy goal relates most closely to the pedestrian network element of this dissertation, while the Process goal relates most closely to the political culture element. I will discuss each in turn, but will begin with the Process goal and then turn to the Strategy goal. I will conclude with a summary of CUSAP's implementation and its future prospects.

6.3 The Process Goal

The Process goal intends to improve the decision-making process for urban space projects by creating a more effective foundation for political decisions, improved citizen dialogue and better use of, and cooperation with, private consultants and developers. This is the official language. Through discussions with planners, the motivations for the individual components became both clearer and more animated. In terms of establishing a more sound foundation for political decisions, for example, this is one of two elements in CUSAP that planners have included to address the inconsistent and at times *ad hoc* decision making process for identifying projects and allocating funds; the second component is contained within the Strategy goal and will be discussed later. By presenting a project's scope and initial design ideas to the BTF committee, planners hope to avoid situations in which politicians withhold support because they feel as though final products have been sprung on them with little or no opportunity for meaningful feedback. Indeed, by getting early approval and support for a project's general design, planners hope to increase the chances for full-funding and final approval, especially for those cases where other stakeholders, such as with important investors

or a group of residents disagree with a proposed plan.

The new process does not guarantee success, as politicians can still be influenced by outside interests and competing goals. The Nordhavn project, for example, will have a new Metro line built to it using the proceeds from the sale of Port- and City-owned land. There will be a powerful temptation among the politicians to sell the land to the highest bidder with the fewest constraints. In recognition of this temptation, Streets and Parks has been working very hard to ensure there will be a high quality urban space plan put into place, regardless of who the investors are. Nonetheless, it recognises that its position on the project will be "only as strong as the weakest politician in the chain" (director-level civil servant).

A counter-example is the urban space plan for Ørestad South, the latest addition to Copenhagen's city extension on Amager. The developer's initial proposal for the Local Plan was unacceptable on a number of points and planners worked to build a political coalition strong enough to block the plan. They were successful in their efforts and the proposal was sent back to the developer with a number of specific revisions included. Because of the strength of the political coalition, the developer was forced to acquiesce and returned with a new proposal that came about 80% of the way to the planners' position (senior planner in Streets and Parks). This version then became the basis for the official Local Plan for the massive development.

In contemplating the future prospects for other projects, a senior planner in Streets and Parks felt that it would be impossible to make a blanket statement, since case-by-case conditions will vary, depending on which political coalition dominates City Hall. By political coalitions, the planner was referring to the division of power between parties on the Left and Right, and whether one side dominates the council. During the period of time that data collection occurred, City Hall was divided between the Left and the Right, with neither side strong enough to fully control planning's agenda. The at times deep philosophical differences between the two groups on issues such as parking or control over how much influence investors should have over harbour land development, made consensus that much more difficult.

The recent election already discussed, however, has shifted power almost exclusively into the hands of the Left, primarily as a result of the strong showing by a previously minor party, The Radical Left. A party comprised of creative professionals, academics and other like-minded groups, the Radical Left could provide the kind of consistent political support planners have been hoping for, but have lacked over the past 10 years.

The strategic reorganisation of the planning process to change how politicians are involved in the design and programming phases of a project reflects both the degree of independence planners have to shape the environment in which they work, while also highlighting the limits of that independence. That is, without the explicit buy-in and support of the political system, planners cannot achieve the urban planning and design goals set for them. This independence is relatively new within Copenhagen's planning system and likely only emerged since the late 80s and early 90s, coinciding with city planning's dramatically increased responsibilities associated with the need to transform the city into a regional economic and cultural "metropole". Prior to this period, the planning system reflected a more rigid and hierarchical structure, both internally and in terms of its relationship with the public. While elements of this hierarchy remain, reflected in the city's amazing ability to set goals and then systematically pursue them, it is reasonable to assume that the evolution towards a more inclusive planning process will continue, although it is impossible to predict what the end-state will look like.

The Process goal also includes changes in how public comment will be solicited and how planners communicate with public citizens. Of central concern is the quality of the communication; planners recognise that public meetings often become an opportunity for the most vocal to dominate public discussion, while the design documents planners distribute to the public are highly technical and not very accessible to laymen. To this end, planners will work to engage the community in new ways that result in a more balanced and representative public opinion by actively soliciting input from groups that may not attend public meetings or be sufficiently organised to make their voices heard. Similarly, planning

documents will be designed to provide more accessible information to both politicians and residents, including design alternatives for others to decide between. This active solicitation of other perspectives also reflects the flattening of the planning system, although the commitment to act in the name of the public good remains unchanged.

6.4 The Strategy Goal

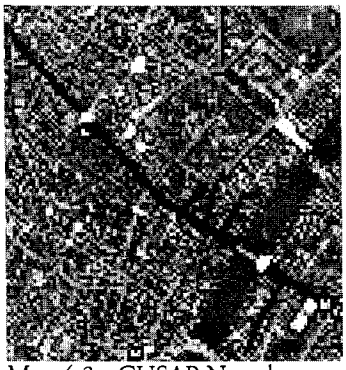
The city has developed four principles to guide urban space development. Before discussing the principles, however, it is noteworthy that the City considers itself the central developer of urban space, and that its actions should follow principles consistent with improving the quality of life of residents. This reflects one of the fundamental differences between Copenhagen's mindset towards the improvement and maintenance of public urban spaces and San Francisco's – in Copenhagen, the city is a central and active player in improving the quality of life of residents, and not a *de facto* by-stander to market forces. According to conversations with several San Francisco planners, the last large-scale urban space improvement project in a residential area initiated by the city was approximately 30 years ago in the Duboce Triangle. A three-decade lapse would be unthinkable in Copenhagen, while the possibility that planners will become a central and active player in urban space development is equally unthinkable in San Francisco. This divergence reveals the more troublesome cultural difference between the two cities; it is not that San Franciscans fail to appreciate a well-designed network of urban spaces, but rather they oppose the mechanism necessary for creating them. Addressing that opposition will be the key to establishing a sustained and coordinated effort to improve the public realm in San Francisco, while failing to address it will ensure a continuation of the *ad hoc*, opportunistic and fragmented process that currently dominates.

6.4.1 Four Principles Guiding Urban Space Development

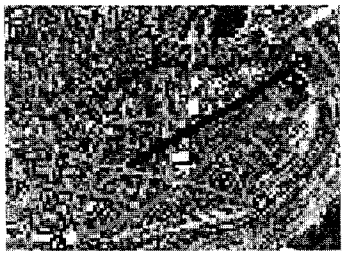
The four principles proposed to guide urban space development are intended to strengthen "the connections both within and between city neighbourhoods" (CUSAP 2005; p 9). This vision for how the network of public spaces is meant to function – as pedestrian and cyclist connectors both within and between neighbourhoods – was published after

this dissertation research was conducted, and well after it was conceived, but represents the policy embodiment of the research question. Specifically, CUSAP's approach to urban space development overlaps with this dissertation's thesis in two ways. First, a network approach to pedestrian spaces is required in order to produce a coherent system of paths that provide the opportunity for free pedestrian movement. Similarly, simply providing a sidewalk is an inadequate inducement to get a large proportion of the population to walk on a regular basis for a variety of purposes, and that the design of important pedestrian routes is essential to the overall success of the pedestrian network. Second, to achieve the goal of a coherent pedestrian network, the city must become directly involved as a central developer of urban space and systematically pursue an urban space improvement program, since simply relying on private developers presents insufficient opportunities to complete the pedestrian network. Beyond these two underlying assumptions, Copenhagen – or any city intent on achieving similar goals – must find solutions that meet the local needs and conditions, thereby personalizing what can be seen as the universal underpinnings to a successful pedestrian urban space policy.

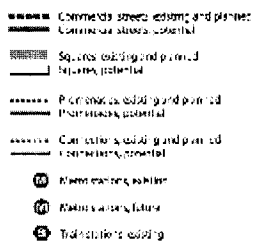
Copenhagen has defined four physical elements of the Strategy goal: 1) **Commercial Streets**, which are defined as the "heart of local areas;" 2) **Connections**, which are defined as the routes that connect residents to their local "shopping and cultural centres, recreational areas, institutions and sports facilities;" 3) **Squares**, which are defined as spaces that provide citizens with "new opportunities for pausing, resting, observing, playing and active recreation;" and 4) **Pedestrian Streets**, which are defined as "attractive and safe connections through the city." These elements can be applied at both the citywide scale and neighbourhood scale. Unlike the comprehensive hierarchy of streets used by North American traffic engineers, Copenhagen's street framework highlights those routes that perform important roles in the overall street network. That is, the majority of streets fall outside of these four elements, while only those streets necessary for the completion of the network are included (see Maps 4.2 and 4.3 for the City's proposed street improvement plan for Vesterbro and Nørrebro, respectively).



Map 4.3 - CUSAP Norrebro



Map 4.4 - CUSAP Vesterbro



The proposed design changes are similar across the four elements and primarily rely on a reallocation of the public right-of-way away from motor vehicles and towards pedestrians and cyclists, a removal of obtrusive barriers to pedestrians, improved pedestrian crossings, new paving solutions that better demarcate pedestrian from non-pedestrian spaces, more tree planting and improved lighting. But more than new design strategies, CUSAP is meant to improve the degree of coordination between city planning departments and across the different levels of plans, including the Municipal Plan, existing and new LPs, traffic plans, parking strategies, the harbour plan (the Blue Plan) and the green space plan. In addition to an increased awareness of other department's actions, the plan is intended to help the city better leverage its urban space investments by having one plan or project build on the strengths of another plan or project in a synergistic manner, rather than working at cross purposes.

6.5 The Quality Goal

The Quality goal is intended to ensure that all urban space projects provide the greatest value for the money by developing new construction solutions, both technical and functional, that allow Streets and Parks to increase the number of projects with the same amount of money. Fiscal prudence has become an increasingly important issue for the city as the national government has progressively reduced the amount of money transferred to Copenhagen for this purpose. As a result, the new financial constraint has shifted planning strategy towards smaller renewal programmes, more emphasis on private money for public improvements, and new efforts to leverage what public money there is to extract the greatest concessions from investors (director-level civil servant; CUSAP draft version). But this is only one way that Copenhagen has chosen to define "more value for the money"; the second definition

means improving the quality of existing streets and squares in residential areas across the city through numerous smaller, less expensive projects. More value in this sense is generated in comparison to the traditional and very large one-off projects in the historic city centre, which tend to be extremely expensive and take a long time to complete. The new strategy intends to more evenly distribute urban space improvements that to date have tended to cluster in the historic city or in those areas identified for urban regeneration.

6.6 CUSAP Implementation and Future Prospects

The new Parking Policy passed in Spring 2005 provides some insight into how successful the plan will be. Copenhagen had been without an official parking policy for over a decade and the issue had become politically charged. The key to building the political consensus for the plan was the revelation that the city could link parking policy to urban space improvement, as advocated for in CUSAP. This compromise generated a very broad political consensus and an agreement to fully fund the new policy, which calls for replacing 1000 surface spaces with 4000 underground spaces in a number of locations across the city. In those areas receiving the new underground spaces, the city has committed to creating new, and improving existing urban spaces, in part as a "thank you" to the approximately half of Copenhagen households that do not own a car (director-level civil servant). The space once taken up by parked cars will be returned to pedestrians and cyclists, with the new spaces designed according CUSAP's principles. And while the eventual financial commitment will be substantial, the City will only achieve its urban space goals if it applies the principles contained in CUSAP's Quality Goal, as discussed above. If the City successfully implements this ambitious plan on a politically charged issue while following the planning process and strategy outlined in CUSAP, then it will become a powerful precedent for future efforts.

The successful implementation of CUSAP will depend in part upon the degree of inter-departmental competition versus a willingness to coordinate efforts. There remains a philosophical gap between Planning and Architecture and Streets and Parks, although the divide is based more on relatively small differences of opinion, rather than a fundamental in-

compatibility of ideas (director-level civil servant). There are signs of progress, in part made possible by a new director of Planning and Architecture; plans have been made to move Planning and Architecture into the same offices as Streets and Parks so that planners from each department working on the same project can more easily meet and discuss ideas. Senior planners involved in the reorganisation feel confident that Planning and Architecture and Streets and Parks will come to share values and ideas, which will result in urban space becoming a larger priority for the city.

Both politicians and planners have gained confidence in how to manage large-scale private development and appear increasingly comfortable using the planning system's authority to extract higher quality urban spaces from private developers. As an example of this confidence, just prior to the completion of this manuscript, the city voted against an architecturally ambitious plan for Krøyers Plads, immediately across the harbour from Nyhavn; while very striking as an architectural art object, the proposal was not designed to be integrated into the surrounding neighbourhoods and would have exacerbated the fragmented nature of the harbour.

Ultimately, the degree of political commitment to CUSAP, and the political system's willingness to either force compromise or support controversial projects, will define the plan's success. Grand plans for Copenhagen have come and gone in the past, in part because of their grandness (director-level non-civil servant). CUSAP differs from these past experiences in that it doesn't mandate a final urban form solution, but rather provides clear principles to guide the prioritisation and design of urban space projects. Perhaps this less prescriptive and more conceptual framework will allow successive cohorts of politicians to find their own vision to become invested in, thereby maintaining CUSAP's centrality in Copenhagen's planning policy.

7 Alternative Scenarios and Implications for Pedestrian Space Networks

There are a number of possible scenarios for Copenhagen's planning system, although some are more likely than others. The following section will outline four scenarios – Status

Quo, CUSAP Ascendant, Sydhavnen Ascendant, and Market Forces Ascendant – and then discuss the implications for pedestrian space networks. In reality, these scenarios are not mutually exclusive; rather, the most likely outcome will be a combination of a number of them, with one or two dominating the others. The combinations will be discussed, yet it remains useful for simplicity to address each scenario individually first.

7.1 The Status Quo

Maintaining the *status quo* would result in a number of new harbour developments that provide the housing and office space the city needs, but fail to connect to the rest of the city. Given this scenario, we would also expect a continued improvement of pedestrian spaces and perhaps the provision of retail along the ground floor in new harbour developments. However, since CUSAP will be adopted, and since there likely will be more projects similar to Sydhavnen, then there is little chance the status quo will dominate Copenhagen's planning environment. Instead, we would expect to see the status quo slowly evolve as planners and politicians gain experience implementing CUSAP's and therefore, become more proficient in attaining higher quality urban spaces from private developers.

7.2 CUSAP Ascendant: Planners' Strategic Efforts to Align Planning Goals and Planning Action

The action plan, as it stands today, would provide Copenhagen with an unprecedented opportunity to systematically improve the pedestrian space network, both within and between neighbourhoods. Early indications strongly suggest a political commitment to the plan's implementation. Both the recent parking and urban space improvement policy and the Ørestad South open space plan demonstrate a willingness among the politicians to use CUSAP as the blueprint for policy. In addition to its effect on large-scale development projects, however, a key indicator of success will be Streets and Parks's future work program; that is, will Streets and Parks be empowered to consistently select urban space improvement projects that reflect CUSAP's underlying goals, including strengthening the links in the PSN? Without this consistency, it remains doubtful that Copenhagen will be able to transform the often automobile-dominated landscape of the outer neighbourhoods, even with the substan-

tial resources at its disposal, simply because of the scale of the change. The city's experience with implementing the city centre pedestrianisation policy demonstrates that only focused and systematic efforts over time will have a chance for success.

The research conducted for this dissertation will provide a baseline for future studies and will allow for comparisons of pedestrian activity and perceptions before and after improvements. CUSAP identifies one of the study sites in particular, Nørrebro, for a significant number of proposed improvements. Interestingly, Vesterbro, the research site selected because it already had a strong pedestrian space network, has many fewer proposed improvements under CUSAP, adding support for the selection's validity.

7.3 Sydhavnen Ascendant

The Sydhavnen model has the potential to dramatically improve the planning of harbour redevelopment sites. The funds used to purchase the land in Sydhavnen came from a fund that is supposed to be replenished by the sale of the improved land back to developers, thereby enabling the process to be repeated elsewhere. The obvious drawback is that the process of buying and selling of land can take many years and will limit the pace and scope of harbour redevelopment. Given that much of the harbour land has already been redeveloped, this limitation should not act as a significant constraint. The city, however, could apply this strategy to abandoned industrial land in other parts of the city. There remain large areas of derelict industrial land in a number of neighbourhoods, and the fund could have much broader applicability. In this case, the level of funding and rate of turnover would limit the extent this model would affect Copenhagen's renewal.

7.4 Market Forces Ascendant

The mere existence of CUSAP clearly states that the city's planners do not have faith in a market-dominated development system to produce the amount and quality of public urban spaces. Indeed, nearly every planner interviewed expressed reservations over the new harbour spaces produced under the system of largely laissez-faire planning that emerged after Copenhagen's dramatic economic recession during the 1980s. Some planners were highly

critical of the spaces, including those created for Planning and Architecture's signature plan for Havnestad. Because of this experience, Copenhagen's planners have concluded that primarily relying on market forces, applied either to harbour redevelopment or to a small number of sites in existing neighbourhoods, is inadequate to achieve the city's urban space goals.

7.5 Likely Outcome

The trend for the immediate future will be a more heavily regulated development process that allows developers less leeway to design urban open spaces as they see fit. CUSAP will become a dominant policy for urban open space development, especially in established, but heaving trafficked districts. The harbour development process will become more confrontational, as demand for harbour sites continues to increase while politicians and planners become increasingly unwilling to give developers a free hand. The Sydhavnen development model will positively affect the quality of harbour development, but the limited role inherent with an approach that heavy relies on public subsidies to maintain leverage with the private sector will mean some poor quality proposals will continue to be built.

8 The Political Culture of Planning and Pedestrian Space Networks

Overall, the outlook for pedestrians in Copenhagen is very positive. The degree of support for CUSAP will determine how successful the city will be in meeting pedestrian needs at a citywide scale, but the recent achievements bode well for the future. Although there were many problems with the urban open spaces in the early harbour redevelopment projects, the hope is that both planners and politicians have learned from the experience. In the past, the ability of Copenhagen's planners to adjust policy in response to previous mistakes has been one of the city's most striking characteristics. Whether this characteristic is related to the rational-hierarchical political culture is unclear. Certainly, the opportunity to learn through experience (including making mistakes) has meant that the institutional knowledge of Copenhagen's planners has grown far beyond that of a city that typically struggles to implement plans. San Francisco comes to mind. In this sense, the degree of institutional knowledge is directly related to the hierarchical side of the rational-hierarchical politi-

cal culture of planning, since the potential to learn through experience is so much greater.

Copenhagen provides as near a perfect environment for planning as found in almost any city. There is a strong institutional structure filled with well-trained planners; there is a political system that on-balance deeply respects the role of planning in society and is prepared to provide planners with substantial resources; there is a public that is predisposed to trusting the role of government; and there is a rich urban form already in place for planners to build on. Even with these advantages, it will be a long time and require a significant amount of resources for Copenhagen to create the network of connectors, commercial streets and open spaces called for in CUSAP. The city is likely up to the task, but it will be a stretch that will need some degree of luck.

Where does this leave a city defined by a incremental-individualistic political culture of planning? Even under optimal conditions, a planning environment defined by an incremental-individualistic culture will be unable to achieve the same degree of success as is likely in Copenhagen. Given that few American cities represent optimal conditions, what does this research imply? As suggested by Southworth, there are many cities in America, such as Phoenix, AZ that are beyond hope (Southworth 2005). Today, half of the U.S. population lives in developments built since 1950; for the vast majority of these areas, there is little chance they will ever become walkable if the current political culture of planning persists.

The focus in the U.S. should be on future development and cities. Well into the second decade of the New Urbanist movement, we see very few developments with the density or degree of mixed use, let alone the quality of pedestrian routes, necessary for walkable neighbourhoods. Every effort should be made to change this. Again, Southworth warns against unwarranted optimism, arguing that most new development, even if it strictly adhered to the highest possible standards of pedestrian design, would still be an island isolated in a sea of automobile dependent sprawl (Southworth 2005). While this will mean a continued reliance on the automobile for regional trips, it does leave open the opportunity for residents to walk to local stores and access local recreational facilities to meet at least some of

their utilitarian, social and leisure needs.

This leaves cities. Two lessons emerge from the study of Copenhagen's planning culture. First, many American cities enjoy a fine-grained grid that was laid out prior to the introduction of the automobile, making them potentially great walking environments. And yet decades of automobile-oriented planning have turned many city streets and neighbourhoods into unattractive, if not outright hostile, pedestrian environments (see Images 4.x and 4.x). The process of transforming these streets and neighbourhoods back into pedestrian-friendly spaces is very similar to what Copenhagen has laid out in CUSAP, only more challenging. The bottom line is that cities will have to become directly involved in a systematic effort to redevelop the public open space network by committing significant public resources to the redesign of streets. Reallocating the public right-of-way away from the automobile and giving it to transit, cyclists and pedestrians should be the top priority – without this step, all the aesthetic improvements will do relatively little for the many urban neighbourhoods that have inherited a fine-grained street and block pattern, but have been forced to exist within a traffic engineer's automobile-dominated worldview for the past 50 years. Cities that lean towards the rational-hierarchical planning culture will be the most successful in this effort, while those that are firmly incremental-individualist have little success to look forward to.

The second lesson is that while the city will continue to function without these investments, it will do so only by failing to meet many of its residents' basic needs. Some will find comfort in this certainty of continuity; they may even take it as an excuse to maintain the status quo – especially in places where pleasant climate and attractive natural landscape compensate for a dearth of public investment. This attitude misses the point of what cities like Copenhagen are trying to do: namely, to embrace the full diversity of experiences that urban life offers and to try to bring as much pleasure and satisfaction back into urban living. Copenhagen has focused on improving residents' quality of life by building pedestrian space networks that are both efficient and pleasurable, by expanding and improving the safety of the bike lane network, and by building high-quality housing that meets a diversity of

economic and lifecycle needs. The outcome will be a more economically, socially and environmentally sustainable city. Cities that ignore these quality of life improvements become places where those who cannot afford to move away dominate the demographics, and this is unhealthy for all involved.

References Cited

City of Copenhagen, D. *Water City.* Retrieved. from.

City of Copenhagen, D. (2001). *Copenhagen Municipal Plan.* Retrieved. from.

Crowhurst, S. H., & Lennard, H. L. (1990). *Urban Space Design and Social Life.* Paper presented at the International Making Cities Livable Conferences, Carmel, Ca.

Cullingworth, J. B. (1993). *The political culture of planning : American land use planning in comparative perspective.* New York: Routledge.

Cullingworth, J. B., & Caves, R. W. (2003). *Planning in the USA : policies, issues, and processes* (2nd ed.). London ; New York: Routledge.

Gutman, R. (1976). The Social Function of the Built Environment. In A. Rapoport (Ed.), *Mutual Interaction of People and Their Environment* (pp. 37-49). The Hague: Mouton Publishers.

Hartman, C. W. (1974). *Yerba Buena: land grab and community resistance in San Francisco.* San Francisco,: Glide Publications,.

Hester, R. T. (1975). *Neighborhood space.* Stroudsburg, Pa.: Dowden Hutchinson & Ross.

Hirsch, A. R. (1983). *Making the second ghetto : race and housing in Chicago, 1940-1960.* Cambridge [Cambridgeshire] ; New York :: Cambridge University Press,.

Krumholz, N., & Forester, J. (1990). *Making equity planning work : leadership in the public sector.* Philadelphia: Temple University Press.

Lang, J. T. (1994). *Urban design : the American experience.* New York: Van Nostrand Reinhold.

Lynch, K. (1981). *Good City Form* (Eleventh Printing ed.). Cambridge: The MIT Press.

Michelson, W. M. (1976). *Man and his urban environment : a sociological approach, with revisions.* Reading, Mass.: Addison-Wesley Pub. Co.

Moudon, A. V. (1992). A Catholic Approach to Organizing What Urban Designers Should Know. *Journal of Planning Literature, 6*(4), 332-349.

"Think of a city and what comes to mind? Its streets. If a city's streets look interesting, the city looks interesting; if they look dull, the city looks dull."
J. Jacobs 1961

"Social capital is defined as the social networks and interactions that inspire trust and reciprocity among citizens."
Leyland 2003

Chapter 5

The Quality of the Pedestrian Space Network and its Effect on Resident Use and Perceptions

1 Introduction

This chapter explores the relationship between the structure of neighbourhood pedestrian space networks and pedestrian behaviour. A randomised household survey and in-person interviews were used to collect data on trip frequency, trip purpose, typical walking destinations, and frequency of chance social encounters. The household survey also included questions on the resident's perceptions of important physical and social characteristics of the street environment, as well as general questions of neighbourhood satisfaction. A number of control variables were collected, including age, gender, income, and length of residence in the neighbourhood. Lastly, the in-depth interviews with residents allowed for the exploration of themes or patterns of responses that emerged from the household survey, and in the process provided the opportunity to construct a narrative that could flesh out the underlying skeleton of the survey results.

The chapter will begin with a brief history of each neighbourhood with an emphasis on changes that have occurred over the past 30 years. This will be followed by a comparison of each neighbourhood's physical environment, as well as the basic demographic profiles. One purpose of this comparison will be to demonstrate the comparability of the two neighbourhoods, and to determine whether there exist any variables that may confound the case study's findings. The number and concentration of immigrants, for example, is one factor that appears to affect the character of sub-areas within each neighbourhood, which may influence how residents perceive and use streets and open spaces.

Next, the chapter will present the results from the quantitative element of the house-

hold survey. This analysis will be supplemented by the results from the in-depth interviews with residents; the outcome will be not only "how" residents use the pedestrian space network, but also "why" they choose to use it the way they do. By relying on the experiences of residents to explain behaviour instead of having to infer motivations, this study will provide new insights into the complex relationship between built and social environments.

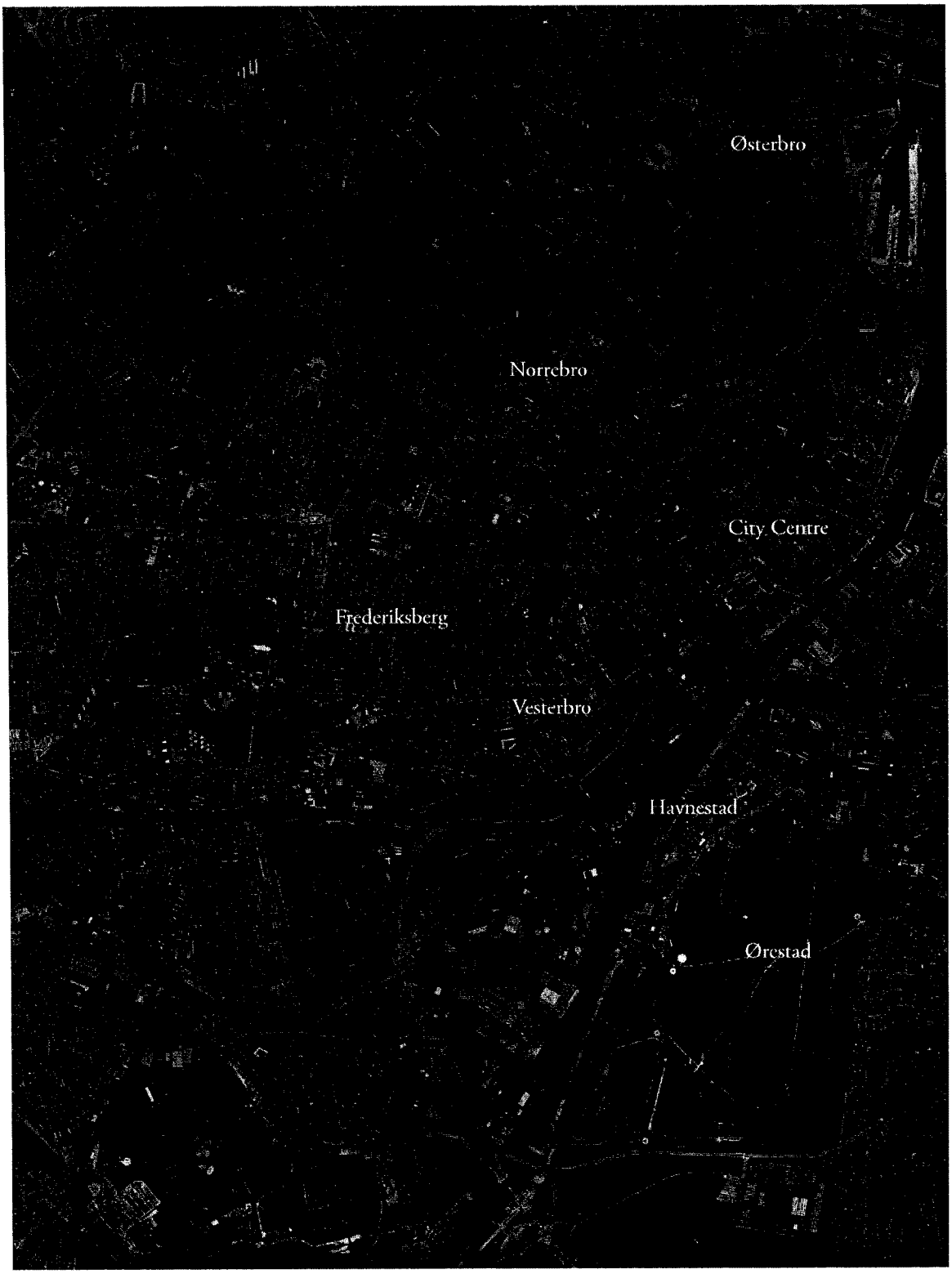
2 General Character of Each Neighbourhood

The study focused on two neighbourhoods, Vesterbro and Nørrebro, which have similar demographics. Both neighbourhoods were developed beginning around similar times for a similar demographic, although Nørrebro has a greater diversity of housing types, reflecting the more periodic nature of Nørrebro's development history (see Map 5.1). There were, for example, two spikes of development activity, one spanning 1920 to 1939 and second during the 1980s. The latter reflects the effect of Nørrebro's large-scale urban renewal project. The first spike introduced larger, better-built and therefore more expensive housing along the Lakes. Conversely, Vesterbro was built out to a greater extent initially, although it too experienced a small boom during the period from 1920 to 1939 (see Table 5.1).

TABLE 5.1 - Year of Construction by Neighbourhood Copenhagen, Denmark

	Nørrebro	Vesterbro	Copenhagen
Before 1920	60%	81%	35%
1920-1939	23%	10%	34%
1940-1959	1%	1%	15%
1960-1979	4%	4%	11%
1980-	12%	4%	6%
Total	100%	100%	100%

Nørrebro is also significantly more dense than Vesterbro, a fact that should result in more public life and bias the results in Nørrebro's favour (Nørrebro=181 inhabitants/hectare, Vesterbro=94 inhabitants/hectare, Copenhagen=86 inhabitants/hectare). One reason for this discrepancy is Vesterbro's history as a site with many small-scale industrial facilities. Much of this activity was located in the interior blocks behind the residences, but was been removed many years ago, leaving the space relatively free of structures. By contrast, Nørrebro's block



Map 5.1 - Norrebro, Vesterbro and Environs

interiors tended to contain housing, creating very crowded living conditions. Although much has been removed, there remain several intensely built-up blocks that drive up Nørrebro's density (see Map 5.2).

The neighbourhoods are also known as two of the rougher areas in the country, with the Nørrebro riots of the 1980s and 90s still high in the national consciousness. Deborah, for example, commented that "Nørrebro has always had a bad reputation, always. For as long as anybody can remember, all this century, or last century." Similarly, Charles described Vesterbro's reputation as "the wild place where the homeless, the prostitutes, the junkies – terrible places you could go at night." This rough reputation, however, largely no longer applies to either neighbourhood, although many residents still take some pride in the sense of authenticity that middle- and upper middle-class households seem to find when they can associate themselves with the working class.

The two neighbourhoods were selected because they have distinctly different block patterns and street networks, which in turn is hypothesized to affect how residents both use the PSN and perceive their relationship to the larger neighbourhood structure. The following section will describe the overall character of the street network in each neighbourhood, as well as provide an empirical comparison that includes block structure, the number, type and distribution of intersections, the location of important commercial streets and the distribution of public open spaces.

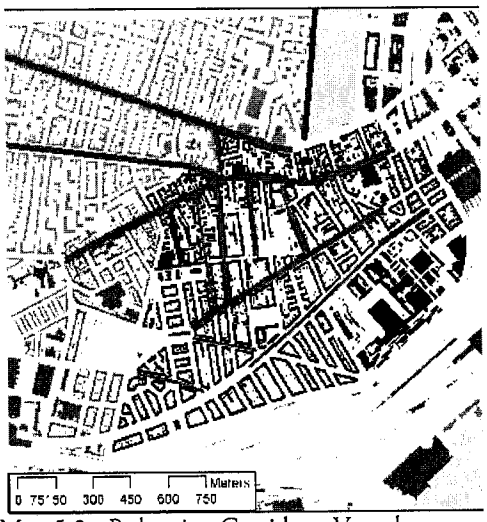
2.1 General Character – Vesterbro

Vesterbro's street network is characterised by a number of high-quality commercial and residential streets that run east-west through the neighbourhood, connecting all areas within Vesterbro to the City Centre. These predominantly commercial streets are connected north-south by several routes, either along quiet residential streets, through parks, or residential streets that have unique shops along the ground floor. Map 5.3 highlights the major and minor pedestrian corridors, along with the pedestrian destinations collected from the mapping section of the household survey. Map 5.4 highlights the streets that act as pedestrian

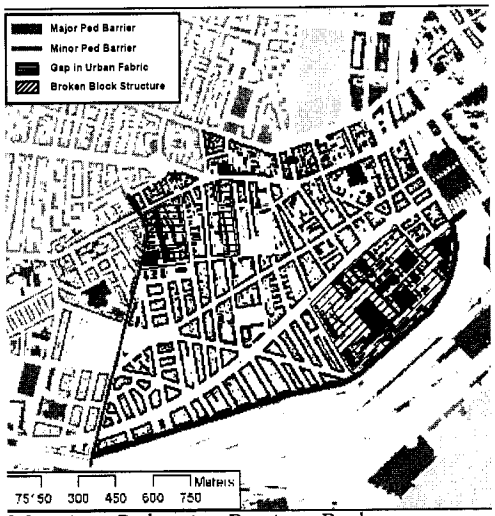
barriers, as well as those areas with a broken block structure, or that act as a gap in the urban fabric.

2.1.1 Istedgade

The heart of the current incarnation of Vesterbro is Istedgade, a commercial street that has been transformed over the past 10 years. A relatively narrow street (18.5 metres), it has one lane of traffic in each direction, a parking lane on each side, narrow sidewalks and no bike lanes (see Table 5.2). The diverse shops and restaurants provide a mix of green grocers, hip restaurants and cafés, clothing stores, antique stores, kiosks, bakeries, as well as other eclectic, one-of-a-kind establishments. The buildings strongly frame the street and there are no trees along its length. Despite the crowded, and at times cluttered sidewalks, there are a number of the city's most popular sidewalk cafés clustered at the end closest to Enghave Plads (see Images 5.1). There is also heavy and fast moving traffic (10,200 cars from 6am to 6pm), although there are substantially fewer cars along Istedgade than along the other major corridors in the neighbourhood (see Table 5.3). The residents interviewed frequently commented on the level of traffic along Istedgade, describing it as chaotic and dangerous for cyclists. Indeed, when one cycles along the street, one does feel more vulnerable than along most other Copenhagen streets. Rather than the level of traffic, though, it is likely the type of traffic, combined with the absence of bike lanes, which combine to make it a harrowing experience. The traffic is dominated by a large number of taxis bringing people to



Map 5.2 - Pedestrian Corridors, Vesterbro



Map 5.3 - Pedestrian Barriers, Broken Blocks and Gaps in Urban Fabric, Vesterbro

and from the central train station that is located at the eastern end of Istedgade.

Despite the traffic concerns, the majority of the Vesterbro residents interviewed said they enjoyed walking along Istedgade just to watch the vibrant and diverse urban life on display there, describing it as "hygglig" (roughly translated as "homey"), "colourful", and "alive," although many residents commented that with the street's rise in popularity, it was changing in negative ways, such as becoming more trafficked, dirty and hectic. Istedgade, however, still captures the spirit of Vesterbro better than any other street in the neighbourhood. Lois, for example, in describing how Istedgade makes her feel, says "I feel like smiling sometimes when I go down along Istedgade or some of the other streets. I see people, there is life outside the houses, and I feel happy."

TABLE 5.2 - Vesterbro Street Dimensions
Copenhagen, Denmark

	R.O.W. (metres)	Curb-to-Curb (metres)	Each Sidewalk (metres)	Parking Lane	Bike Lane
Vesterbrogade	16-23	10.5	2.5-4.5	X	Y
Istedgade	18.5	12	3.25	Y	X
Sønder Boulevard	40	33	3.5	Y	Y
Frederiksberg Allé	40	x	x	Y	X
Gammel Kongevej	18	x	x	X	Y
Enhavevej	15	10	2.5	X	X
Residential Streets	12.5	7.5	2.5	Y	X

Note: Data is missing for Frederiksberg.

The vibrant and popular length of Istedgade is somewhat counterbalanced by a short three-block stretch at the street's far eastern end, adjacent to the central train station. Here, the remnants of the drug and prostitution culture dominate the street, with pornography stores filling most storefronts. Red lights can be seen in a number of windows in this vicinity, and two locals interviewed described how brothels still coexist with artist studios and wine bars.

TABLE 5.3 - Traffic Counts, 2004
Copenhagen, Denmark

	6AM - 6PM	
	Autos	Bikes
Nørrebro		
Ågade*	45,600	3,700
Åboulevard	39,000	8,400
Fredensbro	37,300	14,800
Jagtvej	16,400	10,200
Tagensvej*	14,300	7,100
Nørrebrogade*	12,000	12,900
Vesterbro		
Enghavevej	15,400	3,500
Vesterbrogade	13,400	10,400
Gammel Kongevej	11,600	11,500
Istedgade	10,200	4,900
Frederiksberg Allé	7,800	2,500

*Data collected in 2002

The heroin dealers and users who once dominated this area of Vesterbro still hang out in front of St. Mary's church on Istedgade, although they are much less conspicuous than before the urban revitalization project of the late 1990s. The effect on resident use and perception is predictable, with residents eschewing this stretch whenever possible for aesthetic reasons, although few felt unsafe at any time of the day or night while walking along the street. The primary reason expressed by residents for their sense of security was the large number of people who use Istedgade 24 hours a day. For example, Lois said, "If I come from the railway station, I won't go that way – I'll always take Istedgade. There are always people." Such perceptions likely contribute to the greater sense of overall safety expressed by Vesterbroans and reinforce Jane Jacobs' much quoted observation that having "eyes on the street" results in greater security for users.

Image 5.1- Cafes along Istedgade

2.1.2 Vesterbrogade

Vesterbrogade has a very different feel than Istedgade and lacks its intimacy and sense of enclosure. As one male resident described it, Vesterbrogade "doesn't have the same life on the street as you have on Istedgade." While the differences from a design perspective are subtle, they appear to combine in a way that generates a far less appealing pedestrian experience. The street right-of-way ranges from 16m at the western end to 23m at the eastern, only slightly wider than Istedgade, with approximately the same amount of roadway dedicated to automobiles on both streets (10.5m on Vesterbrogade and 12m on Istedgade); however, there is a bike lane, but no parking lane along Vesterbrogade, which may contribute to a stronger feeling of exposure to traffic. As with Istedgade, Vesterbrogade does not have trees except at a limited number of locations where treed streets or squares adjoin it.

The continuity of shops is similar along both streets, although Vesterbrogade has a

greater number of wide storefronts, including several stretches of blank facades associated with banks or long glass display windows. Several residents mentioned the corner with Fotex, a department store, as a particularly unpleasant stretch of sidewalk because there are so many bikes parked there and very little space to walk past. Conversely, another stretch of Vesterbrogade – between Vaernedamsvej and Vesterbrotorv – has had several popular sidewalk cafés and restaurants open, yet it is still too limited to have a significant effect on the general character of the street (see Image 5.2). In general, residents described the walking experience along Vesterbrogade as "heavily trafficked", "not hygglig like Istedgade," and "boring," although some did find it "nice" with some good cafes.

Image 5.2- Cafes along Vesterbrogade

2.1.3 Gammel Kongevej

The third important retail street, Gammel Kongevej, runs along the top of the neighbourhood and can be characterised as a more affluent version of Istedgade. Forming the northern boundary of Vesterbro and connecting the neighbourhood to both Frederiksberg and the Lakes, it is a narrow commercial street (18 metres) with one lane of traffic in each direction, bike lanes and comfortable sidewalks, but no parking lane. The shops are more upscale and tend to market themselves towards an older clientele than the stores along Istedgade, but many residents interviewed said they enjoyed walking along the street just to see what stores have changed and look in the shop windows. Its distinctive character seems to appeal to many Vesterbroans as a welcome alternative to the bustling and grittier character of Istedgade and Vesterbrogade. A male resident, in relating how he first began to understand Vesterbro's character, described the complexity in the following way:

> Ya, I noticed the variety in the streets and the places...You could also go through the small streets up and down to Vesterbrogade and there is this living, still even

> when you go up there. I like that. And I like the contrast from going up from Vesterbrogade to Frederiksberg Allé to the garden. The complexity of going from one kind of street to another kind of street. So it's not just one place, it's more the fact that you can go from one setting to a completely different setting and have it all within 20 metres. I was aware of that initially. It wasn't a specific place, it was more how it worked, the combination.

This ability to choose a walking or cycling route according to one's mood was repeated by a number of residents, whether one wanted quiet time to think or the opportunity to see vibrant street life. Vesterbro differed significantly from Nørrebro in this way; no Nørrebroan described their route choice in the same rambling and animated fashion that many Vesterbroans did.

2.1.4 Frederiksberg Allé

Frederiksberg Allé plays a very different role for the neighbourhood. It offers no retail destinations and has a limited number of cafés and restaurants. Designed as a treed boulevard that terminates at a very popular regional park (Frederiksberg Have), Frederiksberg Allé is a 42m-wide green oasis amidst a very urban-feeling district, and provides a strong feeling of escape from the traffic and noise typical of the parallel commercial streets (see Image 5.3). Slanting northwest between Vesterbrogade and Gammel Kongevej, Frederiksberg Allé's wide sidewalks are never crowded and offer many opportunities to stop and rest on a bench along the side. The sharp contrast between it and Vesterbrogade, only one or two blocks away, provides an opportunity uncharacteristic in most urban areas, allowing residents to choose between alternative, but largely equivalent routes depending on one's mood.

Image 5.3- Frederiksberg Alle

2.1.5 Sønder Boulevard

The final major east-west corridor in Vesterbro is Sønder Boulevard and the newly

renovated square at its eastern end, Halmtorvet. Unlike the other major corridors, this street remains in transition as the city endeavors to improve what was a wide and barren mixed-use street to a formal boulevard with a substantial median that will contain parks, playgrounds and gardens. At 40 metres, it is the second widest street in the neighbourhood and is unattractive to the majority of the survey respondents. During the interviews, several residents referred to it in a derogatory way, calling it a "dog toilet," in reference to the large number of dog owners who use it to relieve their pets. The eastern end adjacent to the train station was formerly a major site for prostitution; the redesign of Halmtorvet and the changes to the traffic patterns of the surrounding streets successfully displaced the practice, shifting it several streets away to Skelbaekgade.

2.1.6 North-South Connectors

The large number of strong east-west corridors connecting most parts of Vesterbro to the city centre and surrounding neighbourhoods distinguishes it from Nørrebro. These corridors, however, are not the only reasons for the rich variety of choices pedestrians have. In addition, Vesterbro has a number of north-south connector streets that, while not as dominant as any of the major corridors, do provide a number of attractive options for residents to move from one corridor to another. Moving from east to west, the most important include the pedestrian route through Skydebanehaven, a former shooting range for the royal family that has been converted to a public park with a day care facility, and down Skydebanegade; West End, a narrow street with very attractive houses along the northern half; Absalonsgade, the street with the city museum; Valdemarsgade, a residential street lined with older trees, a rarity in Vesterbro; and Oehlenschlaegersgade, a predominantly residential street that does have a number of artist studios and boutique clothing stores in the half-basement (see Image 5.4). All these streets are 12.5m wide and are lined with buildings that range in height from two to five


Image 5.4 - Oehlenschlagersgade

stories, which creates a cozy sense of enclosure. This variety of experiences reflects the general theme of Vesterbro, that of choice and contrasting environments that are immediately adjacent to one another. The effect is an interlaced network of pedestrian opportunity with very few barriers.

As a general comment about the majority of residential neighbourhoods in Copenhagen, including Vesterbro and Nørrebro, there is a greater degree of pedestrian improvements and traffic calming than in any American city. It is common for primarily residential streets to be protected from through traffic by at-grade pedestrian crossings, neck-downs, one-way streets, bumpy surfaces (such as cobblestones) and street closings (see Image 5.5). The effect is of relative quiet and calm once a pedestrian steps off of the busy retail corridors.

Image 5.5 - Traffic Calming, Vesterbro

2.2 General Character – Nørrebro

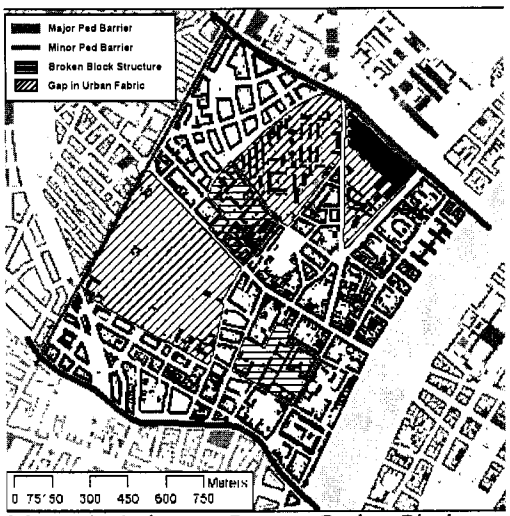
Nørrebro's urban fabric has the feeling of fragmentation and dislocation. There are distinct sub-districts within Nørrebro that are often divided by large roads or other significant physical barriers, such as parks, a home for the aged or a churchyard. Aggravating an already disjointed structure, the City conducted extensive urban renewal efforts during the 1980s that resulted in the destruction of the original block structure in several areas within Nørrebro, but most extensively in the area known as the Black Square. As one male resident commented,

> I think the problem with Nørrebro isn't that they tore things down and built new stuff; the new stuff they did build is ugly, but that's a question of taste, I'd say. I think the real problem is that they broke down the city structure. The block structure – they broke that down. So you get those semi-private public spaces that really nobody uses, first because they don't know they are there, then they don't know if it is public or isn't public.

These fissures in the built fabric have not been repaired over time, in part because the residents were so angry over the initial renewal efforts that the city was forced to adopt a

more benign approach to neighbourhood improvements that is more focused and limited in scope. Map 5.5 highlights the major barriers to pedestrian movement in Nørrebro.

Although the average taxable income is virtually the same in both neighbourhoods (Nørrebro= DKK 157,000, Vesterbro=DKK 160,900 in 2002[1]), income distribution across Nørrebro is less even than in Vesterbro and results in a greater concentration of low-income households and ethnic minorities in one area. This concentration has had the effect of reinforcing the physical divisions caused by a disjointed block, street and traffic pattern. In addition, because of its proximity to other neighbourhoods and centrality in the city, Nørrebro has more opportunities than Vesterbro to connect to adjacent neighbourhoods. Despite these advantages, however, the neighbourhood remains an island, isolated from its surroundings by large thoroughfares that offer little or no appeal to pedestrians. The one exception are the Lakes along its southeastern border, which offer one of the most desirable walking experiences in the city and do provide the opportunity for connection to surrounding areas, although the single route choice around the perimeter largely limits trips to recreational purposes. The cumulative effect on the pedestrian experience in Nørrebro is one of both internal and external fragmentation. Map 5.6 highlights the pedestrian routes through the neighbourhood, along with the pedestrian destinations collected from the mapping section of



Map 5.4 - Pedestrian Barriers, Broken Blocks and Gaps in Urban Fabric, Norrebro

Map 5.5 - Pedestrian Corridors, Norrebro

1 Source: Statistics Denmark, KÅS 2002.

the survey.

2.2.1 Nørrebrogade

Looking at specific streets as pedestrian routes, Nørrebro is characterised by a number of high-quality destinations that are separated from each other by heavily trafficked or otherwise unattractive pedestrian routes. The main corridor through the neighbourhood, Nørrebrogade, suffers from very high automobile and bus traffic, and is one of the few streets in the city where there are traffic jams of bicyclists commuting to work in the morning (12,000 cars from 6am to 6pm, 12,900 bikes from 6am to 6pm in 2002). The sidewalks are equally congested, with a scant 2.5m along the busiest section of the street to accommodate a high volume of pedestrian traffic, store signs and displays that often infringe well into the walking route, bicycle parking and the ubiquitous pram (see Image 5.6). The result is a hectic and harried walking experience that is endured out of necessity, but rarely sought for enjoyment.

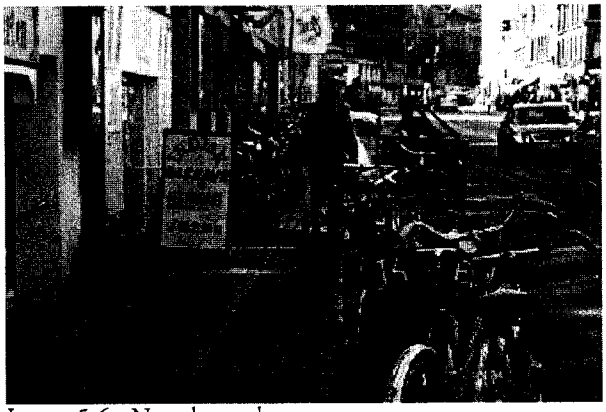


Image 5.6 - Norrebrogade

On this point there is some ambiguity from the survey results and interviews. Among those residents interviewed, several stated that Nørrebrogade was an unappealing street that they used regularly for groceries, banking, and as the most direct route out of the neighbourhood, but rarely as an enjoyable destination of choice. For example, Michelle commented, "...I do know a lot of places that are a bit trashy [in Nørrebro]. What I mean about trashy, is for example Nørrebrogade...It's just one big mess." Similarly, in response to a question about comfortable places to sit and hang out in the neighbourhood, Matt said "On Nørrebrogade most places look like shit because it's just a lot of big, yellow facades and stuff like that...it's not a hanging around place," and, "Nørrebrogade is too hectic to walk along for pleasure." Lastly, in a comment about the effect of an unpleasant street environment on pedestrian behaviour, Deborah found that

> People behave differently when walking along a street with lots of traffic, and the people walking, they are more in a hurry...If you go to Nørrebrogade, there isn't just traffic on the road, but also pedestrians. And they all have a goal, so they are hurrying to this place, and hurrying to that place. So, there is a different atmosphere...I feel more alert...People tend to do stupid things on Nørrebrogade, like not respecting the traffic lights, or small kids throwing a ball from one side of the street to the other. So, I would be more alert when I walk on Nørrebrogade.

Residents who share these feelings tend to avoid Nørrebrogade whenever possible, and walk along it only when they absolutely have to, such as when they are heading into the city centre or buying groceries.

The second group of residents shares the same perception of what Nørrebrogade's character is like, but interprets this character in a more positive light. One male resident sees Nørrebrogade as having "a Kasbah kind of atmosphere," with kebab shops and cheap food. He likes having a Nørrebrogade around, "as a kind of chaotic, very lively street," although he admits he enjoys the "small, sophisticated shops a bit more" that can be found on Elmegade and around Sankt Hans Torv. Another male resident comments that Nørrebrogade "is a fantastic street," but then goes on to say

> [Nørrebrogade] is very narrow and it has very little sidewalk. It's more or less only in the middle of the night, or perhaps before noon that you can go there and relax. The rest of the time, there are so many people and so much traffic that you need to concentrate on walking and not bumping into somebody and not getting annoyed at somebody walking at a slower pace. And taking care not to step out into this bicycle lane, or whatever. It's very,very narrow.

This is a hardly the kind of description one would expect of a "fantastic" street. The resident provided little insight into why he felt so positively about Nørrebrogade, making any interpretation quite difficult. Indeed, when asked how he would reach various points in the neighbourhood, he responded that he would choose quieter and less trafficked routes than Nørrebrogade. Only when absolutely necessary would he actually walk along Nørrebrogade instead of one of these other, more quiet routes. Similarly, the survey results clearly show that traffic is a major problem on Nørrebrogade, with 79% of Nørrebroans agreeing that there is too much traffic. These results suggest that a minority of residents appreciate the busy, chaotic and trafficked nature of Nørrebrogade, but that most find this chaos unappeal-

ing.

2.2.2 Blågårdsgade and Blagardsplads

On either side of Nørrebrogade are several short and relatively isolated pedestrian-friendly destinations that share few, if any, connections. On the southwest side of Nørrebrogade is Blågårdsgade and Blågårdsplads, a street and square that were pedestrianised during the original urban renewal programme in the late 70s early 80s. Although the pedestrianisation originally coincided with most of the stores going out of business, in recent years a number of stores, cafés and restaurants have opened that have brought new life to the street. Blågårdsgade begins at Nørrebrogade and runs southwest, terminating at Åboulevard, an extremely trafficked street. This represents a typical pattern in Nørrebro; a pleasant walking environment terminating at an unappealing thoroughfare, thereby failing to provide pedestrians with any appealing destination beyond the street's own attractions.

2.2.3 Elmegade and Sankt Hans Torv

Slightly further up Nørrebrogade past Blågårdsgade is Elmegade, a narrow retail street that over the past five years has become a popular destination for boutique shopping and eating. It runs northeast from Nørrebrogade to Sankt Hans Torv, the recently refurbished square that, because of the restaurants, cafés and nightclubs located along its periphery, has become one of the most popular and hip hangouts in the city. Together, Elmegade and Sankt Hans Torv provide the counterbalance to Blågårdsgade and Blågårdsplads to the west. As with Blågårdsgade, however, the Elmegade/Sankt Hans Torv area suffers from the lack of clearly defined connections to other pedestrian-friendly routes or destinations. Sankt Hans Gade does lead from the square to the Lakes, yet its separation from the square by Faelledvej undermines the strength of the connection. Walking in the opposite direction up Guldbergsgade does offer a somewhat appealing route to the northeast quadrant of the neighbourhood and does pass by the Empire, a new movie cinema popular among residents. From the in-depth interviews, however, residents tend to see Guldbergsgade in terms of the maxi-min solution; that is, they generally perceive it as the least bad route leading to the top of the

Nørrebro given the alternatives, which are very few. One respondent does enjoy cycling down the street because relatively few automobiles drive along it, although he did not list any other positive characteristics. Besides being quieter than Nørrebrogade, the most appealing characteristics seem to be its convenience as a connector from the top of the neighbourhood to Sankt Hans Torv.

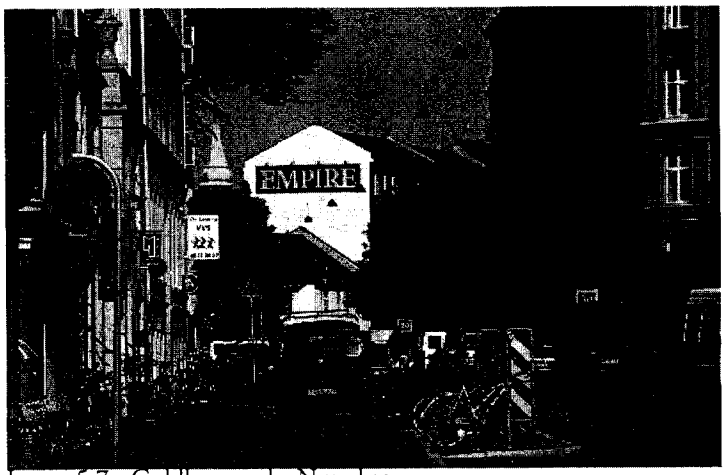


Image 5.7 - Guldbergsgade, Nørrebro

2.2.4 Traffic Barriers

There are no other major pedestrian corridors connecting Nørrebro to the surrounding urban environment. Rather, there are a number of high-traffic streets separating the neighbourhood from adjacent neighbourhoods; these barriers include Åboulevard along the southwest edge, Tagensvej along the northeast edge, and Jagtvej along the northwest edge (See Map 5.5). Traffic is not the only barrier, with much of the architecture along these streets hostile to the pedestrian; there are many long, blank facades, inward looking buildings, and few appealing side streets leading off to more interesting destinations. Lastly, Tagensvej and Åboulevard are 40m and 35-40 metres wide, respectively. The cumulative effect is one of a nearly impenetrable barrier to pedestrians.

2.2.5 Gaps in the Urban Fabric

The lack of high quality pedestrian routes linking the different parts of the neighbourhood together is not Nørrebro's only pedestrian handicap. There are several holes cut out of the urban fabric by idiosyncratic, large-scale uses. The least penetrable from a pedestrian perspective is the Panum Institute, an immense medical research and teaching institution that is part of the University of Copenhagen. Taking up almost 86,000m^2 of land, its inward-oriented design provides little visual interest to the passer-by, while offering no

pedestrian cut-through routes.

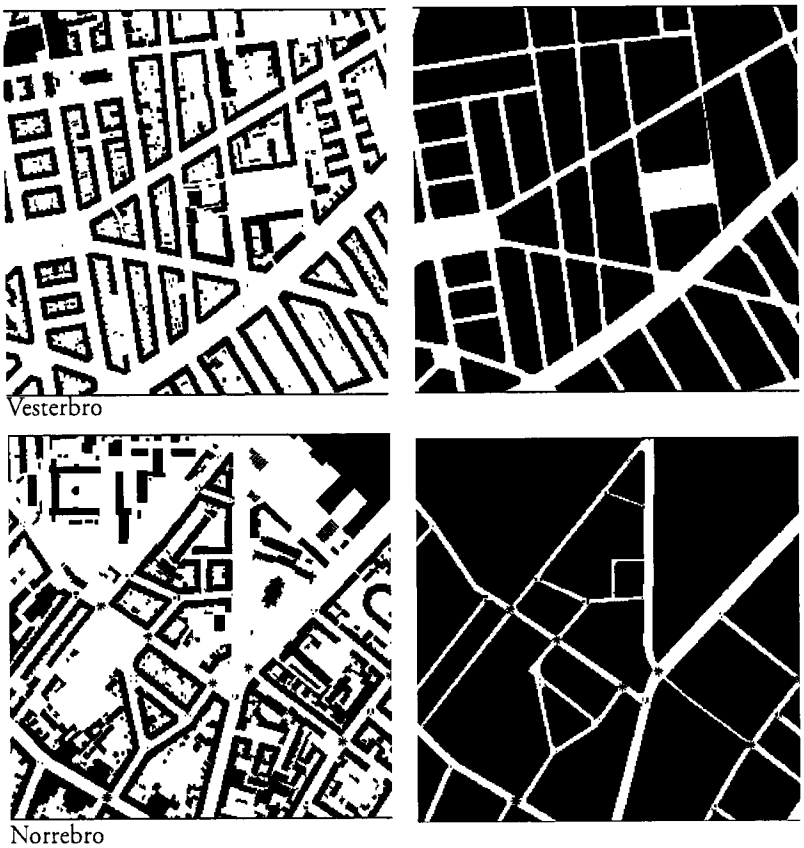
The second gap in the urban fabric is the Elderly City, a retirement community dating back to the early 1900s that is surrounded by a brick wall. The small number of entrances do not provide convenient walking routes through the area and close at sundown, which is very inconvenient during the winter. One resident interviewed did describe how she would bring her children there as an alternative to going to a park (the setting is pastoral with many large trees and sheep were once kept there), but neither the survey responses, nor the remainder of the in-depth interviews provided evidence that the grounds are used regularly by residents.

The third and most widely used gap in the urban fabric is Assistens Kirkegård, the famous cemetery that has the burial sites for Hans Christian Anderson and Søren Kierkegaard, among other cultural icons. As with the Elderly City, a high brick wall with gates surrounds the cemetery, and the gates are locked beginning in the evening. Despite this barrier, the cemetery serves as a park for local residents and it is not uncommon to see groups playing soccer or picnicking, and even the occasional topless sunbather amongst the tombstones. In addition to recreational uses, the cemetery has a number of attractive walking paths, although the indirectness of the routes means that they are generally used for strolling, rather that getting from one part of the neighbourhood to another.

2.3 Street and Block Structure

It is possible to provide empirical measurements of the urban fabric to complement the qualitative description above. Beginning with a figure ground, Vesterbro's urban fabric has a more consistent pattern of buildings, streets and open spaces (see Image 5.8). In terms of the percentage of the total area covered by buildings, Vesterbro has more of its land taken up by structures. Assistens Kirkegaard may be driving this result; once this area is removed from Nørrebro's calculation, then we find that Nørrebro is much more intensely built up. Second, when we compare the average block size in each neighbourhood, including the three major gaps in Nørrebro and the Meat City in Vesterbro, we find that Vesterbro has much

smaller blocks, averaging 44% smaller per block than Nørrebro (16,170m^2 versus 11,227m^2). The smaller block size translates into a greater number of blocks per square kilometre, with 71.3 blocks per km^2 in Vesterbro, and 52.6 in Nørrebro. Lastly, the street wall in Vesterbro has noticeably fewer breaks than in Nørrebro, and there are fewer sub-areas within Vesterbro where the urban fabric breaks down entirely, as it does in Nørrebro.



Vesterbro

Norrebro

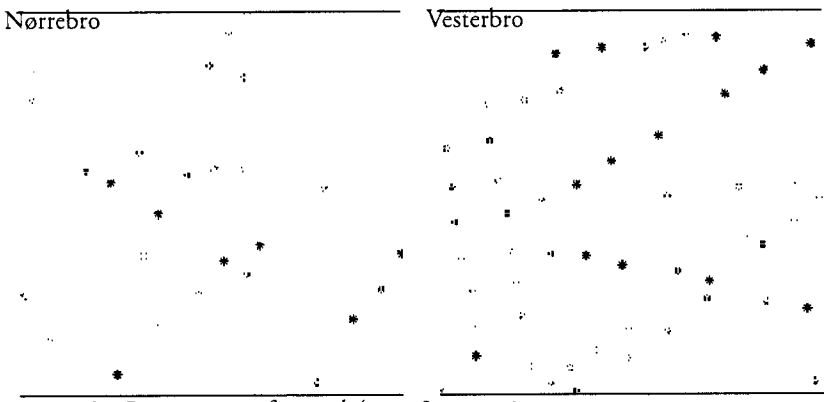
Image 5.8 - Urban Form Comparison

2.4 Intersections

The number, type and density of intersections provides one measure of the degree of pedestrian choice. All else equal, the greater the number of intersections over a given area means greater choice. Further, four-way versus three-way intersections implies the ability to continue along a chosen route uninterrupted by shifts in the block pattern. For the purpose of this analysis, pedestrian-only routes were included along with traditional mixed-flow streets. The results suggest Vesterbro provides greater pedestrian choice than Nørrebro, since it has nearly 30% more intersections per km^2 overall, as well as 20% more four or more way

TABLE 5.5 Average Block Size and # of Blocks
Copenhagen, Denmark

	Nørrebro	Vesterbro
Average Block Size, m^2	16,170	11,227
# of Blocks per Km^2	53	71
# of 3-way intersections per km^2	67	97
# of 4 or more-way intersections per km^2	27	32
Total intersections per km^2	94	121



Map 5.6 - Comparison of 3- and 4-way Intersections

intersections (see Table 5.4). As Map 5.6 illustrates, the distribution of intersections is also appreciably different between the two neighbourhoods, not only because of three large gaps in Nørrebro's urban fabric, but also because of the destructive effect of urban renewal.

2.5 Parks and Squares

The area of public open space in the form of parks and squares per capita provides a gross measure of a neighbourhood's access to outdoor recreational and leisure opportunities. Although imperfect because the decision of where to draw the neighbourhood boundary to perform the calculation arbitrarily excludes spaces that might be regional public open spaces beyond the formal neighbourhood boundary, but are nonetheless used by many of the neighbourhood's residents. This is the case for both Nørrebro and Vesterbro, with Faelledparken an important destination of many Nørrebroans, and Frederiksberg Have similarly important for Vesterbroans. Also, the measure ignores the role of such streets as Frederiksberg Allé that perform a similar function to parks in that it offers the opportunity for quiet repose within a treed landscape.

With these reservations in mind, a comparison of the two neighbourhoods shows that Vesterbro is the more urban of the two, with relatively fewer opportunities to access public open space. It would have been informative if the calculation could have been repeated with the four large public parks included (Faelledparken in Nørrebro, and Frederiksberg Have, Søndermarken, and Enhave Park in Vesterbro), but adequate maps were difficult to procure. Even without the additional calculation, many residents during the in-depth inter-

Map 5.7 - Open Space, 250m Buffer, Vesterbro

Map 5.8 - Open Space, 250m Buffer, Norrebro

views commented on how frequently they would visit one of the regional parks adjacent to their neighbourhood, which suggests residents do not rely exclusively on their local-serving open space network.

The presence of open space in the neighbourhood is only a necessary condition for use, but hardly sufficient; proximity also influences a resident's choice to use an open space. Using a 250m buffer around public open spaces, it appears that Nørrebro comes out ahead, with more of its area within a buffer zone (see Maps 5.7 and 5.8). Lastly, the issue of spatial quality reminds us of the danger of simply relying on a quantitative measure of access, as there may be several reasons why locals, regardless of how close a park is, rarely use it. As an example, the Vesterbro residents interviewed described how "normal" residents seldom used Vesterbro Torv because it was a hangout for alcoholics, preferring to sit in the cafes surrounding the square. Not that there were large conflicts between the two groups; as Anna, a resident who was born in Vesterbro and had raised her own family there said:

> ... it's not so mixed anymore, but there are still junkies, still alcoholics. If you go to Vesterbro Torv, you can watch the world there. There are a lot of alcoholics, and a lot of jet setters. They don't watch each other, they don't see each other. But they live together.

This coexistence was becoming increasingly tenuous, though, with the new and increasingly affluent residents less tolerant of difference than the old guard. The new Vesterbroans did

not feel comfortable sitting next to people who engaged in loud arguments and fights and had begun to try to have the police move the alcoholics away.

Choosing the semi-private space of the outdoor cafés has a monetary cost that precludes it from some. This presents an ethical dilemma for the city over what to do when some users of public space, because of their behaviour, language and general demeanor, effectively exclude large segments of the population from using the space. Interestingly, many Vesterbroans interviewed, while sorry that it had to be this way, felt that the alcoholics had been there longer than the affluent café-goers, and therefore had a right to be there. Besides, the residents reasoned, the alcoholics really didn't have any other place to go and forcing them to move would have been cruel.

A similar balance appears to have been struck in Nørrebro around Blågårdsgade and Blågårdsplads, with the affluent "New Nørrebroans" sitting in the cafés around the edge of Blågårdsplads, while the "Old Nørrebroans", and in this case, the residents of the surrounding public housing, use the square itself to drink while the children play games. Indeed, this contrast appears to be viewed as positive by many of the café-goers in that it illustrates how the "Old" and the "New" Nørrebro can still coexist. One female resident recommended we meet at Blågårdsplads because the new and the old do intermix there.

> It's the centre of Nørrebro, as I see it. And it's where the old Nørrebro and the new Nørrebro meet; you still have the old bars, like the Apothecary on the corner, and you have this square with the old statues and you got a view to the new buildings and the library, which is very nice, and I use that a lot.

While this opportunity for at least proximate interaction suggests a happy equilibrium between the two social groups, the neighbourhood remains essentially divided between immigrant and Dane, east side of Nørrebrogade and west.

2.6 The Role of Social Barriers in Defining the Use and Perception of Neighbourhood Space

This research was never intended to be an ethnographic analysis of various sub-populations in either neighbourhood. The methods are appropriate, however, for providing an overview of the issues confronting the residents, including issues of ethnic mix. Therefore,

it would be misleading not to provide as accurate an account of what was found in terms of social and class barriers, as these considerations do affect how residents perceive and use their local pedestrian space network.

Examining the distribution of destinations in each neighbourhood, it becomes clear that Vesterbro has a more even distribution of destinations than Nørrebro, with distinct concentrations along three of the east-west streets, with minor concentrations along several shorter street sections, such as Vaernedamsvej (see Maps 5.9 and 5.10). Destinations in Nørrebro concentrate along a small number of streets, and generally serve sub-areas within the neighbourhood, such as the concentration around the Elmegade/Sankt Hans Torv sub-area, or the Blågårdsplads sub-area. The exception is Nørrebrogade, yet the street's crowded and cluttered sidewalks do not lend themselves to easy linear movement, which makes Nørrebrogade's connective role within the neighbourhood more symbolic than real. Indeed, one can think of a street as both the connector between areas at one end and areas at the other, as well as the connector for one side of the street to the other; or more precisely, the residential area on one side with the residential area on the other. As it became clear from the analysis of the in-depth interviews, Nørrebrogade tends to act as the dividing line between two halves, rather than as their connector. In describing Nørrebro to an American friend, Carl, a resident of Nørrebro, gave this description of the neighbourhood:

Map 5.9 - Pedestrian Destinations, Nørrebro

Map 5.10 - Pedestrian Destinations, Vesterbro

> 'You have this project side, where you would have a lot of people who originate from Arabic countries, mainly, but immigrants somehow. There would be a large concentration of them. And then on the other side, you would have all these intellectuals, including me.' And in a very funny way, I think Nørrebrogade is this clash between these two different cultures. I think it's funny. I see it in a very positive way somehow.

While this resident felt that the two sides peacefully co-exist, other residents were not as convinced.

This divide first became apparent after the researcher had spent many days walking through Nørrebro noting the location of different types of shops and the relative concentrations of ethnic groups. These observations were reinforced by the results from the survey, which illustrated how favourite walking routes rarely crossed over Nørrebrogade. Finally, in the majority of in-depth interviews, the tension between the Danes and the immigrants became very clear, with one resident openly denouncing the presence of non-Danes in the neighbourhood[2].

By contrast, there was never this almost palpable sense of conflict or tension between Danes and immigrants in Vesterbro. The residents noted this, with one young woman saying that "you don't have the feeling of gangs as you sometimes have in Nørrebro...I don't know, but it's as if the atmosphere is very different between the two places." Another resident, Anna, suggested that the effect of immigrants on the two neighbourhoods differs because "the immigrants chose by themselves to live in Vesterbro, but in Nørrebro, they were placed there and I think this is a very big difference." This may be changing as the prices in Vesterbro continue to rise and new immigrants must rely more heavily on housing subsidies from the city to live in the neighbourhood. One lesson the city appears to have learned from the Nørrebro experience, though, is to not concentrate immigrants in one area, but rather to spread them more evenly throughout the neighbourhood.

The defining difference between the two neighbourhoods in terms of the social en-

2 Two months prior to submitting this dissertation, there was an article in the New York Times newspaper (NYT 01/09/2006, p.3) that discussed the rising ethnic tensions in Denmark, and mentioned Nørrebro as one of the more ethnically divided neighbourhoods in the country. Most recently, Nørrebro was the site of protests in response to the cartoons published in the Danish newspaper, Jyllands-Posten.

vironment might be the markedly different attitude towards ethnic minorities. During the in-depth interviews, Vesterbroans were more likely to discuss ethnic diversity as a defining and attractive feature of living in the neighbourhood, while in Nørrebro the reaction to immigrants was mixed and apprehensive. Charlotte, who had spent her entire life in Vesterbro, described the neighbourhood as "...multicultural. It's very exciting. There is the Pakistani shop next to the Asian restaurant, next to the French café." In strikingly similar language, Sian described the area around Istedgade as "much more colourful. And I like the different cultures living there...there are so many different shops on Istedgade, some Pakistani shops, Turkish shops, Indian shops, Thai shops. So you feel the different cultures in the same area." And in terms of living situations, Charlotte feels that "...you can still have a Danish family living next to an Arabic family without any problems." She suspects that one reason for the good relations are the rising housing prices that have helped to keep "problem-makers out." Conversely, she views Nørrebro, and especially the area around Blågårdsplads, as a place where the troublemakers have been moving.

Some Nørrebroans did view ethnic diversity as a positive element in the neighbourhood, bringing in new food and new life. But even those who tended to see ethnic diversity as positive also acknowledged the sense of tension and conflict that arose from the situation. One male resident who enjoyed the diversity commented, "[t]here are lots of conflicts and tensions...there are tensions and we do have problems with young people who are unemployed and have too little space and nothing to do in general. Maybe some of them are immigrants and have a particular hatred to other people, so we do have these conflicts in the area." Similarly, Deborrah commented:

> I think a lot of people are very positive towards foreign people...Of course, we are prejudiced and people who moved in here have prejudices against the native Danes. So, we get some culture clashes, now and then. It can be a problem in the schools, also. But then kids are often better at sorting things out than grown-ups are.

This partly optimistic, partly realistic assessment of the relationship between native Danes and immigrants contrasts sharply with the more relaxed and unequivocally positive view ex-

pressed by Vesterbroans. The existence of this tension has likely affected how residents define their home territory and where they choose to walk. We will return to this question when we examine the survey results.

2.7 The Process of Physical and Social Transformation

The transformation from working class to yuppie has not come without conflict, but the fact that each neighbourhood has dealt with the shift in very different ways has had significant consequences for the nature of public life, a point that will be discussed in depth later. Nonetheless, many of the social and economic pressures experienced by both Nørrebro and Vesterbro over the past 15 years have been similar, while the outcomes in terms of social cohesion and changes in the urban fabric have been very different.

2.7.1 Nørrebro's "Urban Renewal" Experience

The City of Copenhagen recognised in the 1970s that its housing stock was incompatible with modern conditions and began to undertake the renewal of the most out-of-date neighbourhoods. Nørrebro was the first large-scale renewal effort and the city's approach can be characterised as a very top-down and hierarchical plan. The city first targeted the Black Square, an area within Nørrebro so named because of the extremely high density of buildings that prevented sunlight from reaching many units and open spaces. Deborah, who lived in the Black Square during these years, described it as "the worst neighbourhood in town. And the worst housing with very narrow spaces in between the housing, so you would get hardly any sunlight in there. The place where the sun never shines." From an urban planning perspective, the area was a very high priority for improvement, although the initial strategies produced disastrous results.

The city opted for an invasive strategy that included leveling several city blocks and replacing the cleared buildings with modern structures. The population prior to renewal was approximately 16,000, while it was only 8,000 after the city was done. The result was fourfold: the city successfully reduced the density of buildings; it replaced the old structures with buildings that are universally recognised as ugly and detrimental to the pedestrian

network; it replaced the old block structure with an incoherent mega-block structure that inhibits navigation and increases the feeling of unease; and it so infuriated residents that the city was forced to stop the urban renewal effort after the initial phase. Observers both inside and outside the planning community recognise what happened in Nørrebro as an almost complete failure of planning policy, with two exceptions: first, legitimately unhealthy living conditions were replaced with more healthy and modern conditions; and second, the housing that replaced the old structures was so undesirable, there was no upward price pressure on the remaining houses, which had the benefit of preventing the large-scale displacement of poor people the city has witnessed in Vesterbro.

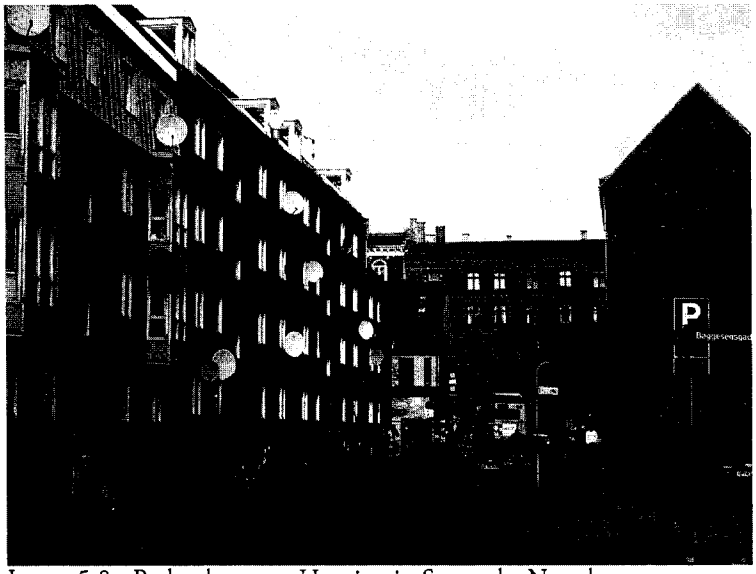


Image 5.8 - Redevelopment Housing in Stengade, Nørrebro

After the initial renewal failure, the city shifted its policy towards a gentler approach that provided funding for individual building owners to improve the units at their own pace. Improvements have included better plumbing, improved spaces in the inner courtyards, the enlargement of units through the combination of smaller units, and the improvement of selected public spaces. Many of the buildings along the Lakes and on the northeast side of Nørrebrogade, generally the most desirable area in the neighbourhood, have been improved in this manner. There has been a general lack of an open space policy, however, which has contributed to the sense of physical fragmentation. The result has been a slow and *ad hoc* process of improvement that has been governed more by the rising market demand for units in Nørrebro than any coherent plan. This *ad hoc* mechanism of physical change has built upon the social divisions generated by the urban renewal process 20 years ago, with the lines

of division reinforced through a combination of social and economic processes.

Some residents have viewed this type of renewal in a positive light. Given the proximity of Nørrebro to Vesterbro and their common history and character, residents from one area are very aware of what is happening in the other, making comparisons between the two neighbourhoods natural. Vesterbro's city-instigated transformation has dominated the planning-related news for the past decade, while Nørrebro's change has gone less noticed, in part because of the patchwork nature of the changes. Carl commented, however, that

> [b]ecause of the design shops, because these things come up here, without any state finance project to support it. I am very fond also of the work that has been done in Vesterbro, but it's seems more planned – very Scandinavian. Where this seems more like the spirit of the people who are living here. And I love that. I love going down Sankt Hans Gade and seeing a guy designing lamps that he makes himself. He's at least trying to make a living from it. I love that.

That these improvements are isolated to a single, rather small sub-district within Nørrebro does not diminish his sense of satisfaction. Indeed, the limited geographic scope of the improvements seems to suit his tastes, since the new shops cater to the narrow demographic into which he falls, while effectively keeping others out. As he comments later on, "...seeing it from a very selfish point of view, I like a newly renovated building, it looks nice, and I enjoy that, instead of a worn down one with cheaper apartments. And I don't miss anyone, as to if I were to have more of those people..." On this last point, there seems little difference between the demographic outcomes of publicly financed versus market-driven change, with both displacing low-income households; the major difference is that someone displaced in Vesterbro receives a generous relocation package, while a displaced residents of Nørrebro is forced to fend for themselves.

The effect of higher prices on who can afford to live in the neighbourhood and access the shops hasn't gone unnoticed. Jacob, who has lived in the northeast corner of Nørrebro for the past 12 years, commented that the gentrification around Sankt Hans Torv has produced a "provincial ambiance there that I don't like..." and

> I don't like it being that trendy, I think it's become – it hasn't got the same mix, and the prices have gone up, so there's only one type of trendy person who can afford to

> live there. Which means you get one type of café, it's the same type of people who meets the same type of people.

This tension between the need to refurbish an aging housing stock and the likely displacement of lower income households exists in Vesterbro, as well, with many affluent residents conflicted over the apparent lack of social justice and the obvious need to make improvements. For the cities that are fortunate to be highly desirable places to live, this debate is repeated across many neighbourhoods, whether it is the Mission District in San Francisco, or Vesterbro in Copenhagen. Copenhagen's experience suggests that a neighbourhood's happy equilibrium, where it has a well-maintained built environment and a diverse social milieu, is ephemeral, a stage that exists temporarily as the neighbourhood teeters between two poles; the ascent towards a gentrified state, or the descent towards a poorer, less well-maintained state.

2.7.2 Vesterbro's "Urban Revitalization" Experience

The urban renewal of Vesterbro in the 1990s and early 2000s was defined as the antithesis to the city's approach in Nørrebro. By abandoning the name "urban renewal" and adopting the term "urban revitalization," the city was sending the signal that new ideas and approaches had been adopted. Where Nørrebro was hierarchical, Vesterbro was inclusive; where Nørrebro was broadly destructive, Vesterbro used limited demolitions of only the most decrepit buildings, or buildings that produced overcrowding, preferring to rehabilitate existing structures; and where Nørrebro lacked an open space plan, Vesterbro had a plan that was implemented alongside the renewal of individual buildings. Some populations, primarily students, were upset with the revitalization of Vesterbro and the social change that would necessarily result from it (intermediate planner, private non-profit housing and development corporation). Despite these minor disruptions, residents and planners alike view Vesterbro as a success. According to a report commissioned to study how the urban revitalization project affected the demographic make-up of the neighbourhood and how the physical and social changes were perceived by those residents who remained, over 80% of expressed strong or

very strong satisfaction with outcome[3]. Indeed, Vesterbro's success has been the impetus for Denmark's national urban renewal policy–Quarter Lifts–that now governs urban renewal across the country.

The process in Vesterbro differed in several important ways. First, the city did not create any physical plan for the neighbourhood, but rather approached residents with a draft of the overall planning goals. The residents were given the opportunity to comment on those goals, and then to decide how the final goals should be implemented. The process of renewal was incremental in that it went block-by-block, building-by-building in a systematic fashion. One resident commented on how one could watch the progression of the renewal efforts by how the scaffolding slowly moved along the street, with the long line of improved buildings on one side, and the yet-to-be-improved on the other. This drawn-out approach allowed individual residents to participate in the decision-making for changes to their block and to their building.

The city also learned from its experience in Nørrebro that it could not arbitrarily separate the renewal of buildings from the renewal of public spaces (director-level civil servant). Consequently, there were a number of large-scale improvements to streets and public squares that accompanied the renewal of private buildings. In interviews with planners involved in the process, it was commented upon that the open space plan was more extensive than the work undertaken to date, but that the lack of funds had slowed implementation. In this sense, despite the realisation of the need to integrate public and private spheres during renewal, planners recognise that there still remains the opportunity for further progress.

As with Nørrebro, Vesterbro has undergone a dramatic social transformation over the past ten years as older, less-affluent residents have been replaced with more affluent, younger residents, including young families. In the process, the neighbourhood has gained the reputation as one of the most hip places to live, not only in Denmark, but also in Europe. The number of new restaurants, cafes, clothing boutiques and other unique shops has increased

3 Source: Den sociale status og udvikling pa Indre Vesterbro, CASA: 2002, pp 48-9.

dramatically, and the amount of street life has increased in a commensurate fashion. Gone are the dark bars frequented by "single men in their 50s with large dogs," replaced by chic cafes that cater to the media industry crowd that has moved in. There are areas within Nørrebro that have witnessed similar transformations, but they are more isolated and narrow in scope and tend to cluster around the more recent and limited public improvements, such as the area around Sankt Hans Torv. By contrast in Vesterbro, the transformation extends almost evenly across the entire neighbourhood. One possible conclusion is that the unequal levels of investment that typify market-driven change result in a more fragmented social and physical fabric than if the change is guided by government policies.

One paradoxical difference between the two neighbourhoods is the role of ethnic minorities, as discussed at length earlier. Vesterbro has the reputation as the more ethnic neighbourhood of the two, with a greater diversity of cultures, as well as in overall character. According to the most recent census data from 2002, however, 11% of the population in Nørrebro is an ethnic minority, while 7% of the population in Vesterbro is. As mentioned previously, the concentration of the ethnic population within a single area in Nørrebro has produced the dual effect of physically isolating the minority–and therefore limiting its effect on the character of the larger neighbourhood–while also increasing the tension between "New" Danes and "Old" by highlighting geographic separation. Vesterbro, by comparison, has its ethnic population spread across a larger area, which seems to have resulted in a greater degree of integration with the native Danish population, or at least an absence of tension.

3 Demographic Comparisons of Survey Respondents

The neighbourhoods can be compared across a number of variables, such as age, employment status, and income. Briefly, there were no statistically significant differences between neighbourhoods across a number of the background variables, including: age; childhood community; employment status; income; length of residence; and presence of children in the household. This lack of difference strengthens the argument that the neighbourhoods are comparable in terms of socio-economics. The general profile of respondents in the two

neighbourhoods is relatively young, female (with 58% and 55% in Nørrebro and Vesterbro, respectively), and employed. Both neighbourhoods have a large proportion of households with children (between 27 and 29%), and are stable, with at least 60% of respondents having lived in the neighbourhood for over five years. Below is a more detailed assessment of the socio-demographic profiles of respondents.

3.1 Age

There are minor differences between the two neighbourhoods in terms of age, with Vesterbro's age distribution skewed slightly towards the younger end of the spectrum, but the difference is not statistically significant (see Figure 5.1). The respondents in both neighbourhoods are very young, with 64 and 73 percent of respondents were between the age of 20 and 40 in Nørrebro and Vesterbro, respectively, which compares to 44 percent for all of Copenhagen in 2003 (City of Copenhagen, 2003). These data conform to the popular perception of Vesterbro as the young and hip neighbourhood in Copenhagen, with Nørrebro close behind. For the older age groups, 9 percent of respondents in Nørrebro, and 4 percent of respondents in Vesterbro were over 60, while and 16 percent were for all of Copenhagen.

3.2 Childhood Community

There are some differences in the type of community respondents grew up in, although neighbourhood is independent of childhood community. Vesterbro respondents were more likely to have grown up in either a rural or small town community, while Nørrebro residents are more likely to have grown up in either an urban or suburban setting (see Table 5.5). Given the density and urbanity of Vesterbro, it is somewhat surprising that it would attract such a large proportion of residents who grew up in non-urban environments.

TABLE 5.5 - Childhood Community
Copenhagen, Denmark

	Nørrebro	Vesterbro
Urban	33%	23%
Suburban	16%	13%
Small Town	26%	34%
Rural	9%	14%
Other	17%	16%

3.3 Employment and Income

The employment rate was virtually identical between the two neighbourhoods, with

63 and 61 percent employed in Nørrebro and Vesterbro, respectively. Noteworthy differences, although not statistically significant, include a higher proportion of retired respondents in Nørrebro than Vesterbro (10 and 5 percent, respectively), and a higher proportion of students in Vesterbro than Nørrebro (24 and 18 percent, respectively). Whether this difference has any appreciable effect on the public life in either neighbourhood would depend on whether one age category is a heavier user of the PSN than another, a result that will be explored later.

There is little difference in the distribution of income between respondents in the two neighbourhoods. The overall similarity, however, contradicts the popular perception that the young and affluent dominate Vesterbro; this view was expressed many times during the resident interviews and also can be read in the popular press (NYTimes Magazine article in 11/04). Given that Vesterbro is a popular destination among the city's young and hip, outside users could be a more important influence on popular perception than local residents. Comparing the neighbourhoods to the rest of Copenhagen, neither stands out in terms of income. Indeed, the average gross income in Vesterbro is well below that for the city as a whole, as well as for the majority of the inner-ring neighbourhoods (See Table 5.6 for comparison to other inner city neighbourhoods). Therefore, the perception that Vesterbro has become a playground for the affluent may be a result of both truth and imagination; the most recent residents are certainly much more affluent than those they have replaced, and these new faces may dominate popular perception. This perception may be reinforced by those visiting Vesterbro for its nightlife, who, while trying to dress as if they are able to maintain a certain lifestyle, are likely students or "wannabe" actors commit-

TABLE 5.6 – Average Gross Income in DKK, 2002 Copenhagen, Denmark

Area	Gross Income (000s)
Copenhagen, total	201.6
Central Copenhagen (Indre By)	251.8
Inner Østerbro (Indre Østerbro)	235.6
Christianshavn	226.8
Outer Østerbro (Ydre Østerbro)	214.8
Vesterbro	**191.5**
Inner Nørrebro (Indre Nørrebro)	**184.0**
Outer Nørrebro (Ydre Nørrebro)	176.7

ted to attaining social membership in a class that is as much illusory as it is real.

3.4 Length of Residence

The majority of respondents in both neighbourhoods (over 60 percent) have lived in their neighbourhood for over five years. The percentage of recently arrived residents is slightly higher in Vesterbro (14 percent versus 9 percent in Nørrebro), which reinforces the commonly held perception that both neighbourhoods, but Vesterbro especially, have been experiencing rapid social and demographic changes.

3.5 Households with Children

The neighbourhoods exhibit little difference in the proportion of households with children, with 27 and 29 percent of households in Vesterbro and Nørrebro, respectively. These neighbourhoods, however, have a much greater proportion of households with children than households in Copenhagen overall (16 percent). It is interesting to note how popular these inner neighbourhoods are for young families and is perhaps a reflection of the general trend in Copenhagen towards more families with children moving back into the city (an increase from 13 percent in 1993). One explanation for the large number of infants in these neighbourhoods, which is supported by the interviews with residents, is that young couples moved to either Vesterbro or Nørrebro when they were still without children because of the attractive, urbane lifestyle, decided to have children, and have remained for some period of time.

The choice to stay in a particular flat may not always be completely voluntary. Many young singles and couples have purchased a flat in what would be called a cooperative in the United States. This affordable housing option allowed them to purchase a home in what is otherwise a very expensive housing market; however, selling the flat would not allow them to capture the large increase in market value that has occurred over the past five years in Copenhagen, since price increases for this type of ownership are limited to increases in the cost of living and any improvements to the building. Consequently, several residents I interviewed in both neighbourhoods expressed a sense of being stuck in a financial conundrum. Ken, in

describing some of the challenges of living in Nørrebro, commented, "things have become extremely expensive. This has become so expensive, nobody can really move, unless they have lots of money. Everybody is locked in, unless you have lots of money." Charles' living situation in Vesterbro echoed this experience. "[I]f I had the chance, I would give up the sentimentality of being here and I would sell it. But my dilemma is that I can't sell it – it's not worth very much [because it is a co-operative]."

Interestingly, while some may have expressed frustration with their housing, none felt the situation was permanent, or that it represented a significant infringement on their quality of life. Carl, in Nørrebro, concludes "I'm pretty happy with my situation. I don't mind living here." Similarly, Charles concedes, "[b]ut still, I like being in the city; I'm like most people."

3.6 Sample vs. Population

The sample's demographic characteristics were compared to the population's demographics on a number of variables, including age, gender, and employment status. The sample is comparable to the population, with some minor variations in age and gender distributions. The sample, for example, contains relatively more residents in the 20-30 age category in both neighbourhoods than in the population, and fewer in the 31-40 age category (only slightly so in Nørrebro). Women were slightly over-sampled in both neighbourhoods.

4 Survey Results - Perceptions

The following section compares how residents viewed their neighbourhood from a number of perspectives, including factors that are directly related to the physical quality of the pedestrian space environment, but also those factors that have an indirect influence the walking experience, such as perceived safety.

4.1 Neighbourhood Satisfaction

The majority of respondents expressed satisfaction with their neighbourhood, independent of which neighbourhood they lived (89% and 93% of respondents expressed satisfaction with their neighbourhood, in Nørrebro and Vesterbro respectively). This is consistent

with the body of research in environmental psychology that has found a general propensity of residents to view their neighbourhood in a positive light, independent of legitimate sources of concern (Aragonés, Francescato, & Gèarling, 2002). This propensity towards optimism, referred to as the Pollyanna effect, makes any measurement of neighbourhood satisfaction difficult and is of use only when done across neighbourhoods in an effort to detect variability. This research used resident satisfaction in this manner and found that Vesterbroans were more satisfied with their neighbourhood than Nørrebroans. Given that the dependent variable is an ordinal scale, interpreting the odds ratios (ORs) from an ordinal logit model has to be done with this in mind. For neighbourhood satisfaction, being a Vesterbro resident is associated with an increase of 2.36 in her odds of being satisfied with her neighbourhood (z=2.86 Pr>|z|=0.00).

Examining several demographic variables hypothesised to influence neighbourhood satisfaction, including gender, age and presence of children in the household, age and children in the household were statistically significant. Every 10 years increase in age was associated with a 3 percent decrease in the odds of being satisfied (z=-2.70 Pr>|z|=0.01), while having at least one child in the household was associated with a 50 percent decrease in the odds of being satisfied with the neighbourhood (z=-2.04, Pr>|z|=0.04). In terms of attitudes and perceptions, a 1-unit increase in the satisfaction with the neighbourhood's walking environment is associated with an increase of 2.34 in the odds of being satisfied (z=5.56 Pr>|z|=0.00) (see Table 5.7).

TABLE 5.7 - Neighbourhood Satisfaction
Copenhagen, Denmark

	OR	z	|P|
Vesterbro*	2.42	2.87	0.00
Male	0.98	-0.07	0.94
At least 1 child in household	0.57	-1.60	0.11
Age*	0.89	-2.80	0.01
Perceived quality of neighbourhood walking environment*	2.35	5.49	0.00
Half median to median income	1.22	0.41	0.68
Median to 2x median income	1.26	0.52	0.60
2x Median to 4x median income	1.06	0.11	0.92
>4x Median income	5.39	1.35	0.18

**P≤0.05 *P≤0.10

NOTE: 0 to half median income was used as the baseline.

4.2 Perceptions of Streets and Public Spaces

The survey asked residents to evaluate the streets and public spaces in their neighbourhood in a number of ways. First, the survey asked the respondents three questions about the public open space system, including the quality of the walking environment, its connectivity to surrounding neighbourhoods, and the importance of public open spaces in the resident's social life. Second, the survey asked about the general qualities of the major commercial streets in the neighbourhood, including traffic conditions, sidewalk comfort, the diversity of people, and the degree of interest provided by the shop windows. These factors attempt to measure what Southworth refers to as the "Path Context" or "Path Quality," which can include the visual interest of the built environment, overall street design, or the transparency of fronting structures (Southworth, 2005). Lastly, the survey asked the respondent to evaluate the walking conditions of their favourite walking route in the neighbourhood.

The general picture that emerges from the survey responses is that Vesterbro has a more enjoyable walking environment, with particular streets considered exemplary for walking. The interviews also differed across neighbourhoods, with the discussions of favourite routes in Vesterbro more expansive than in Nørrebro. Typically, a Vesterbroan would have several routes that he enjoyed taking, depending on his mood. Conversely, most Nørrebroans would name the same route with two variations, depending on which side of Nørrebrogade they live on, and whether they are heading into the city centre or down to Vesterbro. Moreover, instead of routes, Nørrebroans discussed destinations, and then figured out how to get there. Faelledparken, for example, was a popular destination for residents on the northeast side of Nørrebrogade, yet there isn't any attractive route to get there. The following discussion provides the detail of the analysis.

4.2.1 Perceived Neighbourhood Walking Enjoyability and Neighbourhood Connectivity

There was no difference in the perceived enjoyability of the walking environment across neighbourhoods, controlling for age, income, at least one child in the household,

neighbourhood satisfaction, and whether the resident felt safe all the time (z=1.39, Pr=0.17). Neighbourhood satisfaction and sense of safety, however, were associated with perceived neighbourhood walking enjoyability. In terms of connectivity, being a Vesterbro resident is associated with an increase of 1.86 in the odds that the neighbourhood is perceived as connected to surrounding neighbourhoods, controlling for age, gender, income and car ownership (z=2.26, P>|z|=0.02).

4.2.2 Perceived Importance of Public Spaces for Socializing

Neighbourhood was associated with the perceived importance of public spaces – defined as the streets, squares and parks – as places to bump into and meet friends, using an alpha of 10% and controlling for age, gender, income and the degree of satisfaction with the neighbourhood's walking environment (z=-1.73 Pr=0.08). 40-45% of respondents in both neighbourhoods agreed that the public realm played an important role in terms of social interaction, while a nearly equal proportion disagreed, leaving a sizable group, approximately 20%, indifferent on the topic. The quality of the neighbourhood's walking environment was associated with the perceived importance of public space to social encounters, with a one-unit increase in the enjoyment scale associated with an increase of 1.65 in the odds of public space socialising scale (z=3.86, Pr>|z|=0.00). Both gender and age were associated with the importance of public space for socialising, assuming an alpha of 10 percent. For gender, women were more likely than men to see public spaces as important elements in their social life (z=-1.79, Pr>|z|0.07), while older residents were slightly less likely to find them less important (z=-1.79, Pr>|z|0.07).

The interviews confirmed the nonchalant attitude towards public spaces as meeting place, with most residents confident that they would meet someone they knew while walking about the neighbourhood, but that bumping into someone was never an explicit goal of the walk. Several residents commented that Danes are not as outwardly warm as people from Southern European countries, and don't have the same expectations for public conviviality as, say, Italians.

4.2.3 *Perceived Quality of the Pedestrian Experience along Major Commercial Streets*

The survey also contained questions to get a general sense of what factors contribute to walking enjoyment along three of the main pedestrian routes through the neighbourhood. The four factors measuring the path quality were analysed in two ways. First, the most important pedestrian corridors were compared side-by-side. Second, the ratings for the individual streets were collapsed into a single variable in order to create an average neighbourhood score. Since the major commercial streets carry the preponderance of the pedestrian traffic, this approach has advantages over weighting scores for every street in the neighbourhood equally. The danger is if pedestrians frequently use streets other than those listed in the survey. This study did not collect pedestrian traffic data for every street in each neighbourhood, and therefore cannot conduct that analysis.

Side-by-Side Comparison

In comparing Nørrebrogade to Istedgade, sidewalk comfort, the diversity of people along the street, and interesting shop windows are statistically different using an alpha of 5% (see Table 5.8). The largest odds ratio is for interesting shop windows, with an increase of 3.3 in the odds that a respondent would rate the shop windows as one of the most important

TABLE 5.8 - Comparison of Pedestrian Environment, Norrebrogade-Istedgade

Copenhagen, Denmark

	Odds Ratio			
	Traffic	Sidewalk Comfort	People Divesity	Interesting Shop Windows
Vesterbro	0.68	1.71 *	1.82*	3.44*
Age	1.01	0.99	0.97*	0.97*
Male	0.30*	1.32	0.69	1.03
Half median to median income	1.51	1.34	2.53*	1.37
Median to 2x median income	1.35	0.55	1.71	0.82
2x Median to 4x median income	0.66	0.54	1.56	0.45**
>4x Median income	0.73	0.91	0.46	1.26

**P≤0.05 *P≤0.10

NOTE: 0 to half median income was used as the baseline.

factors contributing to walking enjoyment, which is not surprising given Istedgade's reputation for eclectic boutiques. Table 5.9 illustrates which factors were most important in each neighbourhood.

Comparing Nørrebrogade to Vesterbrogade, the perceived importance of comfortable sidewalks and the perceived level of traffic differed across the streets, with Nørrebrogade more likely to be seen as having "too much" traffic and the sidewalks along Vesterbrogade more likely to be seen as being comfortable.

TABLE 5.9-Ranking of Factors that Contribute to Walking Enjoyment on Four Streets Copenhagen, Denmark

	Nørrebro	
	Nørrebrogade	**Jagtvej**
Most Agreement	People Diversity (57%)	People Diversity (30%)
	Interesting Retail Windows (48%)	Comfortable Sidewalks (19%)
Least Agreement	Comfortable Sidewalks (25%)	Interesting Windows (9%)

	Vesterbro	
	Vesterbrogade	**Istedgade**
Most Agreement	People Diversity (54%)	Interesting Retail Windows (73%)
	Interesting Retail Windows (53%)	People Diversity (72%)
Least Agreement	Comfortable Sidewalks (26%)	Comfortable Sidewalks (29%)

Neighbourhood Measures of Pedestrian Space Quality

There were statistically significant differences across the neighbourhoods for three of the four factors (Interesting Retail Windows, Comfortable Sidewalks, and Diversity of People) on walking enjoyability, controlling for age, gender and presence of children in the household (see Table 5.10). For all three neighbourhood measures of pedestrian space

TABLE 5.10 - Comparison of Pedestrian Environment, Norrebro-Vesterbro Copenhagen, Denmark

	Odds Ratio			
	Traffic	Sidewalk Comfort	People Divesity	Interesting Shop Windows
Vesterbro	1.17	2.34*	1.85*	3.68*
Age	1.03*	0.98	0.98**	0.99
Male	0.35*	0.98	0.70	0.98
Half median to median income	2.01**	2.10**	1.66	0.68
Median to 2x median income	1.75	1.00	1.73	0.54
2x Median to 4x median income	1.20	0.91	2.02	0.28*
>4x Median income	0.71	1.09	1.20	0.55

**P≤0.05 *P≤0.10

NOTE: 0 to half median income was used as the baseline.

quality, being a Vesterbro resident is associated with an increase in the odds of enjoying the neighbourhood walking environment. The largest difference between neighbourhoods was for Interesting Retail Windows (OR=3.68, z=4.05, Pr>|z|=0.00).

Other variables were also related to several of the factors. Namely, being male was associated with a 65 percent reduction in the odds of perceiving traffic as a problem (z=-3.62, Pr>|z|=0.00), while every 10-year increase in age resulted in a 2.5 percent increase in the odds of perceiving traffic as a problem. Lastly, age has a weak negative association with the likelihood of rating the diversity of people as an important factor for walking pleasure (OR=0.98, z=1.84, Pr>|z|=0.07).

4.2.4 Perceived Safety

The perception of safety influences how use residents use neighbourhood spaces. The perceived lack of safety, either at different times of the day or in different areas within the neighbourhood, will deter people – especially women and the elderly – from walking (citations). This research will need to establish whether one neighbourhood is perceived as significantly less safe than the other, since this has the potential to confound the survey results.

There is a significant difference in the perceived safety between the two neighbourhoods, with Vesterbroans almost three times more likely than Nørrebroans to feel safe all the

time, controlling for gender, length of residence, income and whether children reside in the household (z=3.21, Pr>|z|=0.00) (see Table 5.11). Predictably, being male is positively associated with feeling safe all the time (OR=2.9), while having at least one child in the household is negatively associated with feeling safe all the time (OR=0.40). Lastly, examining the association with income, we see that only those in the lowest income bracket experience a lack of safety, with all other income brackets more likely to feel safe all the time. This suggests that fear of violence could be spatially defined, with those areas with the highest concentration of poor people disproportionately affected.

TABLE 5.11 - Perceived Safety, by Neighbourhood Copenhagen, Denmark

"Feel Safe All the Time"

	OR	z	|P|
Vesterbro*	3.09	3.21	0.00
Age	0.98	-1.35	0.18
Male*	3.22	3.11	0.00
At least 1 child in household*	0.38	-2.45	0.01
Lived 2-5 years in neighbourhood	0.91	-0.17	0.87
Lived >5 years in neighbourhood	2.35	1.45	0.15
Half median to median income*	3.07	2.09	0.04
Median to 2x median income	1.83	1.29	0.20
2x Median to 4x median income**	2.69	1.66	0.10
>4x Median income	8.09	1.53	0.13

**P≤0.05 *P≤0.10

NOTE: 0 to half median income was used as the baseline.

The least safe time of the day is after sunset, with Nørrebroans nearly five times more likely to feel unsafe than Vesterbroans (z=-4.09, Pr>|z|=0.00)(see Table 5.12). Perceived safety after dark is also associated with gender, with women three times more likely to feel unsafe after dark than men (z=-2.87, Pr>|z|=0.00). Households with children are nearly 2.5 times more likely to feel unsafe after dark (z=2.20, Pr>|z|=0.03), while higher income

TABLE 5.12 - Perceived Safety, by Neighbourhood Copenhagen, Denmark

"Feel Unsafe After Dark"

	OR	z	|P|
Vesterbro*	0.21	-4.02	0.00
Age	1.02	-1.09	0.28
Male*	0.32	-2.87	0.00
At least 1 child in household*	2.66	2.31	0.02
Lived 2-5 years in neighbourhood	0.99	-0.01	0.99
Lived >5 years in neighbourhood**	0.31	-1.89	0.06
Half median to median income*	0.30	-2.11	0.04
Median to 2x median income	0.48	-1.51	0.13
2x Median to 4x median income*	0.28	-1.96	0.05
>4x Median income	0.11	-1.55	0.12

**P≤0.05 *P≤0.10

NOTE: 0 to half median income was used as the baseline.

households are 30 percent less likely to feel unsafe after dark ($z=-1.97$, $Pr>|z|=0.05$).

Exploring this issue of perceived safety through the in-person interviews, we find subtle differences between Nørrebro and Vesterbro. Residents from both neighbourhoods expressed a sense of safety from physical violence while walking, although Vesterbroans were emphatic in their sense of security, while Nørrebroans were more likely to attach caveats to their declarations of safety. Carl, for example, in describing Nørrebro to the west of Nørrebrogade, said,

> I would feel less safe – because it is so scarred over here, with nothing happening, people just live there and you just have walls. And you would have groups of young immigrants. So, late at night, if I am very drunk I wouldn't – no, I wouldn't be unsafe, truly not. I would think twice, but I wouldn't be unsafe, as such. Even though we had a tourist killed somewhere down here, which was really big in the media.

He is clearly conflicted and is reluctant to say unambiguously that he feels safe throughout the neighbourhood at all times of the day or night. The source of insecurity is a combination of physical design – blank walls and single-use districts – and social concerns, namely the fear of immigrant gangs. This sentiment was echoed by Michelle, who would avoid the main street through the public housing development, Stengade, because it is so deserted of people, as well as the fear generated by the stabbing death of the Italian tourist nearby. Even Deborah, who "couldn't imagine anything happening" to her late at night, acknowledges this attitude "is probably stupid." One can conclude that Nørrebroans, while not willing to be frightened away from their neighbourhood, nevertheless take precautions at certain times of the night in some areas.

Vesterbro's situation differs in one important way from Nørrebro's – more activity throughout the day and night leads to a greater sense of safety, especially among women. Sue, for example, had this to say about walking past St. Mary's church on Istedgade, the one remaining hotspot along the street for drug addicts and alcoholics.

> And I feel more safe (sic) because there are always people in the streets. I mean, when I come home late at night there are always people there, and even though they might not be someone you can talk to, there is someone around, so there is always an atmosphere of life and activity. I feel much more safe in an area like this than in

> area like Sydhavn, for example, where the streets are very quiet and you won't see any people. And so I feel quite safe [on Istedgade].

There is a sense among residents that, while unpleasant and uncomfortable to walk past, the drug scene at the eastern end of Istedgade and around the back of the central train station is still safe. The opposite effect is also true, with the area surrounding Skelbaegade often included as one of the few places in Vesterbro where people feel unsafe, primarily because of the absence of "normal" people, and not necessarily the presence of prostitution. Sarah described that area as having a "dead atmosphere" because there isn't anyone living there "trying to create a nice, cozy atmosphere." If at all possible, she "hardly ever takes this street."

4.3 Favourite Walking Routes and Destinations Outside of Neighbourhood

Finally, the survey asked residents to first describe their favourite walking route in the entire city and then to compare it to their favourite route through their neighbourhood. The responses to the open-ended questions were first located in the city and then collapsed into a number of response categories. Route and destination types, for example, were collapsed into three categories; urban, park, and harbour or water. Within each category, the route or destination description could be a place, such as Christiania, a street, such as Stroeget, or a more general description, such as parks. One person, who was a native Dane with extensive knowledge of Copenhagen, conducted this analysis in order to maximise consistency.

The most popular destinations were other urban areas within the city, with 48% and 53% of Nørrebroans and Vesterbroans, respectively, choosing urban routes and destinations (see Table 5.13). Within this category, the single largest route and destination by a large margin was the city centre (27% and 33% of Nørrebroans and Vesterbroans, respectively), with 13% of Nørrebroans and 14% of Vesterbroans naming Strøget as the specific destination. This somewhat surprising result suggests that a number of native Copenhageners, even those who live in very urbane neighbourhoods, enjoy walking along a street that is commonly perceived as a tourist destination. Indeed, during the resident interviews residents made comments, such as "I wouldn't take Strøget if I could avoid it", and "I wouldn't go along

TABLE 5.13 - Summary of Favourite City Walks and Destinations
Copenhagen, Denmark

	Routes & Destinations	Nørrebro	Percent	Rank	Vesterbro	Percent	Rank
Parks							
	Amager	1			0		
	Assistents Kirkegaard	9			0		
	Botanical Gardens	3			0		
	Faelledparken	4			0		
	Frederiksberg Have	2			20		
	Kastellet	6			5		
	Kongens Have	10			1		
	Parks	14			8		
	Søndermarken	0			7		
	Tivoli	1			2		
	Total	**50**	**30%**	**2**	**43**	**21%**	**3**
Urban							
	Christiana	4			7		
	Christianshavn	3			5		
	City Centre/ped. Streets	18			22		
	Frederiksberg	3			5		
	Frederiksstaden	0			3		
	København Hovedbanegaard	0			6		
	Kongens Nytorv	3			6		
	Stay within Neighbourhood	14			15		
	Nørrebro	0			3		
	Nyboder	0			1		
	Nyhavn	5			9		
	Østerbro	5			3		
	Raadhuspladsen	5			6		
	Straedet	1			5		
	Stroeget	13			14		
	Vesterbro	5			0		
	Total	**79**	**48%**	**1**	**110**	**53%**	**1**
Water							
	Harbour/Langeline	12			15		
	Holmen	1			2		
	Islands Brygge	0			4		
	Lakes	23			29		
	Total	**36**	**22%**	**3**	**50**	**24%**	**2**

Strøget, it's not an interesting place." Despite this, the city centre, with its pedestrian areas and high-end shops, apparently remains a popular and appreciated destination for many Copenhageners.

Parks and park-like settings were the second most frequently cited route and destination for Nørrebroans, while water-related routes and destinations were second for Vesterbroans (although there was virtually no difference between water-related and parks). Nørrebroans tended to list a greater number of parks than Vesterbroans, likely reflecting Nørrebro's proximity to a greater number of parks. Vesterbroans clearly preferred Frederiksberg Have to all other possibilities, while Nørrebroans were more evenly split between Kongens Have and Assistens Kirkegaard.

The most frequently cited water destination for both neighbourhoods was the Lakes, underscoring the immense appeal this area has for many Copenhageners (14% of all routes and destinations for both neighbourhoods). The other popular water-related route and destination was Langeline and the Harbour, with 7% of all routes and destinations for both neighbourhoods.

Turning to the reasons for why the route was chosen and how the route differed from the favourite route within the neighbourhood, we find that Atmosphere is the most important characteristic for Vesterbroans (23%), and the Sense of Urbanity for Nørrebroans (26%) (see Table 5.14). The categories flip for second place, although there is only one percent difference between Vesterbro's second and third place category (Sense of Urbanity: 21%, and Nature: 20%), so the robustness of the ranking is not the most important element of this comparison. Vesterbro's top three categories all constitute at least one-fifth of total comments, and then drop quickly to one-tenth and below. Nørrebro, by comparison, decreases more gradually with only one category greater than one-fifth of total comments, suggesting there is less agreement among Nørrebroans concerning what constitutes a good walking route. Specifically, Vesterbroans value almost equally three characteristics in their favourite walking routes outside the neighbourhood: Atmosphere, Sense of Urbanity and Nature.

TABLE 5.14 - How Favourite Walk in Copenhagen Differed from Favourite Walking Route

Description	Nørrebro	Percent	Rank	Vesterbro	Percent	Rank
Atmosphere						
Hygge & Intimate - charm	6			8		
Mood of People or Atmosphere	12			13		
Peaceful	5			18		
Relaxing & Holiday-like	2			1		
Unique Place & Feel	1			4		
Total	**26**	**19%**	**2**	**44**	**23%**	**1**
Historical						
Architecture	13			10		
Historic Environment	5			10		
Monuments	0			1		
Total	**18**	**13%**	**5**	**21**	**11%**	**4**
Nature						
Fresh Air	4			10		
Greenery (any ref. to nature)	18			**29**		
Total	**22**	**16%**	**3**	**39**	**20%**	**3**
Other						
Longer, Greater Length	2			3		
Openess & Views	3			8		
Total	**5**	**4%**	**7**	**11**	**6%**	**8**
Positive Street environment						
Beautiful (clean)	7			4		
Lack of Traffic	6			14	7%	
Wide Sidewalks & More Space	6			1		
Total	**19**	**14%**	**4**	**19**	**10%**	**5**
Sense of Urbanity						
Boutiques/Window Shopping	**19**			16		
Cafes & Restaurants	3			4		
More variety/something different	7			12		
People Diversity & Urban Life	7			9		
Total	**36**	**26%**	**1**	**41**	**21%**	**2**
Water						
Harbour Activities & Boats	2			1		
Water	10			18		
Total	**12**	**9%**	**6**	**19**	**10%**	**5**
No Difference	2			3		
Don't like walking	2	1%	8	0	0%	9
No Response	40			34		
Total	**140**			**194**		

Conversely, Nørrebroans clearly value only Sense of Urbanity above all other elements. The only sub-categories that received more than 10% of the comments was Greenery (or any reference to nature) for Vesterbro (15%), and Boutiques/Window Shopping for Nørrebro (14%).

5 Survey Results – Behaviour

The following section compares the walking patterns across the neighbourhoods, controlling for various demographic and socioeconomic variables. Important differences exist between neighbourhoods, with Vesterbroans walking to more destinations, and expressing a broader first-hand knowledge of their neighbourhood than Nørrebroans.

5.1 Mode to Work

As Table 5.15 illustrates, respondents in both neighbourhoods commute to work or school using similar mode splits. The most striking result is the very high proportion of respondents who typically bike to work – approximately three-quarters in both neighbourhoods – and the very low proportion of those who typically drive[4]. Given that there are only 263 private vehicles per 1000 inhabitants, compared to over 500 per 1000 inhabitants in San Francisco (Auto Ownership Rates in the San Francisco Bay Area: 1930-2010, MTC Report; interview with Director of Urban Space Design, Copenhagen, Denmark), such low driving rates should be expected. Indeed, the Bay Area has not had that low of vehicle ownership since before 1930. These results differ from citywide mode splits, most noticeably in the proportion of residents that walks and the proportion that bikes.

Table 5.15 - Commute Mode Copenhagen, Denmark

	Nørrebro (%)	Vesterbro (%)	Prob.
Bike	73	79	0.36
Transit	23	28	0.43
Drive	22	14	0.17
Walk	16	31	0.01

The one point of difference between the neighbourhoods is in the proportion of respondents who typically commute by walking. Vesterbroans were nearly 3.3 times more

4 The question asked respondents to check all modes that they typically use. Many checked both transit and bicycling, reflecting a decision that is at least partially weather dependent, although Copenhagen's most recent bicycle count found that 90% of cyclists continue to commute by bicycle through the winter.

likely to walk to work or school than Nørrebroans, controlling for age, gender, income and car ownership (z=2.86, Pr>|z|=0.00). Women are twice as likely as men to commute by walking (z=1.72, Pr>|z|=0.09), while residents with an above median income are 2.6 times more likely (z=2.09, Pr>|z|=0.04). The most influential factor is car ownership, with respondents who own a car almost one-fifth as likely to commute by walking than respondents who do not own a car (z=2.09, Pr>|z|=0.01) (see Table 5.16).

TABLE 5.16 - Choice to Walk
Copenhagen, Denmark

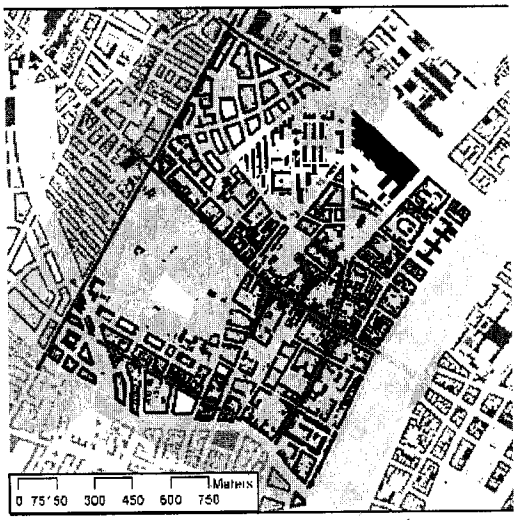
	OR	z	|P|
Vesterbro*	3.33	2.86	0.00
31-40 years old	1.71	1.11	0.27
41-50 years old	1.83	1.14	0.33
51-60 years old	1.72	0.80	0.42
61-70 years old*	28.40	2.70	0.01
Male**	0.49	-1.72	0.09
Above median income*	2.58	2.09	0.04
Owns car*	0.22	-2.79	0.01

**P≤0.05 *P≤0.10

There was no difference between Nørrebroans and Vesterbroans in terms of the proportion that commuted by bike. As with walking, however, other explanatory variables were significant. For age, as respondents became older, the likelihood of commuting by bike decreased. Lastly, respondents who owned a vehicle were less than one-fifth as likely to commute by bike (z=-4.02, Pr>|z|=0.00).

5.2 The Effect of Neighbourhood on the Number of Walking Destinations

An important measure of how residents use the pedestrian space network in their neighbourhood is to evaluate how many destinations a resident typically walks to from her home, as well as the types of walking destinations. In theory, the greater the number of destinations, the more connected a resident is to the surrounding area, all else being equal. "All else" is an important condition and includes issues such as the availability of places to walk to and the desire of the resident to walk. Fortunately, both Nørrebro and Vesterbro offer a rich variety of stores, cafes, restaurants and services in relatively close proximity to most residents, substantially alleviating concerns of any bias from unequal walking opportunities. Vesterbro likely has a more even distribution of shops, but the distances confronting most Nørrebroans should not act as a barrier to use (see Maps 5.12 and 5.13). The second issue, that of the desire to walk, is a function of personal characteristics and the desirability of the neighbour-



Map 5.12 - Commercial Streets, Nørrebro

Map 5.13 - Commercial Streets, Vesterbro

hood's walking environment. This study will assume that age, income and other socio-demographic factors will act as sufficient proxies for these underlying characteristics, and therefore control for their influence.

The kinds of destinations a resident typically walks to also speaks to the quality of the PSN. One can assume that walking to a social destination versus going grocery shopping suggests a higher quality of walking environment, since the elasticity of demand for optional trips is greater than for necessary trips (Gehl, 1987). That is, people have to eat, while walking out to meet a friend at a local café is optional, and the decision is made based on the enjoyability of the trip, including the quality of the destination, as well as the availability of a friend. An important independent variable in this analysis will be age, since a resident's life-stage is hypothesised to influence the number and type of destinations walked to. A student, for example, will spend relatively more time in cafés than a non-student. That said, there was anecdotal evidence from the in-person interviews that suggested that independent of age, Vesterbro offers such a rich walking and social environment that only the venues change by age, and not necessarily the number of trips taken. The following section will provide a detailed analysis of the survey results, accompanied by illustrations and explanations from the interviews.

There were 14 types of destinations specified in the survey, ranging from grocery

stores, to cafes, to child-related destinations. Each respondent was asked to check from the list which destinations they typically walk to from their home. This data was collapsed into two summary variables: first, the total number of destinations a respondent checked; second, the number of social destinations, which consisted of those destinations one typically goes to with friends, e.g., a café/bar or a restaurant.

The following analysis will look at whether neighbourhood influenced the proportion of respondents who walked to any one of the 14 individual destination types. Next, it will look at whether neighbourhood is independent of both the summary variables. Third, the analysis will examine whether other variables, such as age, gender, length of residence, income and presence of children affect the number of walking destinations checked by the respondent. Finally, the analysis will use a Poisson regression to control for the influence of the independent variables.

5.2.1 The Number of Walking Destinations Across Neighbourhoods

Table 5.17 summarizes the main statistics for the number of walking destinations in each neighbourhood. Using linear regression, we find that neighbourhood is associated with the number of walking destinations, with Vesterbroans typically walking to 1.4 more destinations than Nørrebroans (z=3.65 Pr>|z|=0.00). Examining each type of walking destination, we find that a greater proportion of Vesterbroans walked to 12 of the 14 destination types, while a greater proportion of Nørre-

TABLE 5.17 - Odds of Vesterbroans vs. Nørrebroans Walking to Neighbourhood Destinations Copenhagen, Denmark

	OR	z	P>|z|
Café/Bar **	3.0	3.64	0.00
Sport Facility **	3.0	2.77	0.01
Restaurant **	2.9	3.71	0.00
Retail **	2.8	3.56	0.00
Grocery Store	2.0	1.50	0.14
Hardware Store *	1.9	1.92	0.06
Pharmacy *	1.7	1.89	0.06
Medical *	1.6	1.69	0.09
Laundry	1.6	1.43	0.15
Public Space	1.5	1.41	0.16
Library	1.4	1.24	0.21
Child Related	1.1	0.16	0.87
Education Institution	1.0	-0.07	0.94
Cinema	0.7	-1.08	0.28

*P≤0.10 **P≤0.01

broans walking to only two destinations. Of the 14 destination types, the difference between neighbourhoods is statistically significant for four assuming an alpha of 1%, and three more assuming an alpha of 10%. Vesterbroans are nearly three times more likely than Nørrebroans to walk to four destinations (café/bar, restaurant, sports facilities and retail) from their home.

5.2.2 The Effect of Length of Residence on Walking Destinations

A visual examination of the data clearly illustrates the positive relationship between length of residence and the number of walking destinations, with the most recently arrived residents walking to on average 5.3 destinations, residents who have lived in the neighbourhood for 1-5 years walking to 5.9 destinations, and resident who have lived there for more than five years walking to 6.6 destinations. With dummy variables for the second and third response categories (2-5 years and more than 5 years, respectively), we find using linear regression that living in the neighbourhood for 1-5 years is not associated with the number of walking destinations, while living there for more than five years is. That is, a resident who has lived in the neighbourhood for more than five years walks to 1.31more destinations than a resident who has lived there for less than one year ($z=2.14$, $Pr>|z|=0.03$).

5.2.3 The Effect of the Number of Friends on Walking Destinations

The number of friends living in the neighbourhood is positively associated with the number of walking destinations. Specifically, for every additional friend in the neighbourhood, a resident walks to 0.07 more destinations ($t=2.21$, $Pr>|t|=0.03$).

5.2.4 The Effect of Age on Walking Destinations

Using five dummy variables for age (with respondents who are 20-30 as the baseline), we find that certain age groups do have different patterns of walking. Specifically, residents who are 31-40 years old walk to 1.37 more destinations as residents who are 20-30 ($z=3.00$ $Pr>|z|=0.00$), and residents who are 41-50 years old walk to 1.51 more destinations ($z=2.52$ $Pr>|z|=0.01$). Conversely, residents who are 61-70years old walk to 2 fewer destinations than the baseline ($z=-1.99$ $Pr>|z|=0.05$). There was no difference for residents who are 51-60 and more than 70 years old.

5.2.5 *The Effect of Income on Walking Destinations*

Four dummy variables were created for income, with the lowest income category (0-130 000 DKK) used as the baseline. All income variables are independent of the number of walking destinations.

5.2.6 *The Effect of Gender on Walking Destinations*

Gender is independent of the number of walking destinations (t=-1.61, Pr>|z|=0.11). Looking at the proportion of men and women who walk to individual types of destinations (e.g., retail, groceries, restaurants, etc.), the likelihood of walking to three destination types is statistically significant across genders, assuming an alpha of 10%. Men are 40% less likely than women to walk to a public open space and the pharmacy, while women are four times more likely to walk to an educational institution than men.

5.2.7 *The Effect of Children in the Home on Walking Destinations*

Having children in the home is associated with the number of walking destinations (t=3.11 Pr>|t|=0.00). Specifically, having at least one child in the home results in that household walking to 1.34 more destinations than a household without children. Looking at the individual destinations and using an alpha of 10%, households with children are 1.8 times more likely to walk to retail, 3.2 times more likely to walk to pharmacies, 1.9 times more likely to walk to public parks or squares, and, of course, 40 times more likely to walk to children-related destinations.

5.2.8 *Complete Linear Regression Model*

According to the preceding analysis, neighbourhood, the number of friends, age, length of residence and the presence of children in the household are associated with the number of walking destinations. Since these variables were examined individually, and not in conjunction with other variables, it is possible that once, say, income, is controlled for, the presence of children may no longer be significant. To provide the most accurate picture possible given the data limitations, a linear regression model that includes all the variables already examined was run to verify the validity of the earlier findings.

As Table 5.18 illustrates, the effect of neighbourhood remains significant. Vesterbroans walk to 1.3 more destinations than Nørrebroans. Two other variables are significant using an alpha of 5%; residents who are 31-40 years old walk to 1.15 more destinations than the baseline age category (20-30 year olds), and men walk to .92 fewer destinations than women. If we use an alpha of 10%, then residents who are 41-50 years old walk to 1.23 more destinations than baseline. The presence of children and length of residence are no longer associated with the number of walking destinations.

TABLE 5.18 - Number of Walking Destinations Copenhagen, Denmark

	Coefficient	t	P>|t|
Neighbourhood**	1.35	3.01	0.00
31-40 Years old**	1.08	2.25	0.03
41-50 Years old**	1.27	2.04	0.04
51-60 Years old	0.05	0.08	0.93
61-70 Years old	-0.86	-0.76	0.45
>70 Years old	-1.47	-0.97	0.33
Male**	-0.86	-2.16	0.03
1-5 Yrs LoR	0.76	1.20	0.23
>5 Yrs LoR *	1.12	1.86	0.07
Children in HH	0.58	1.35	0.18
Believe PS Important	0.24	1.63	0.11

**P≤0.05 *P≤0.10

5.2.9 Social Destinations

The choice to walk to a social destination is considered an optional trip in the urban design field, and it entails a different set of criteria than a required trip (Gehl, 1987). For optional trips, the quality of the walking experience is of greater importance since part of the purpose of a social destination is recreational. In other words, if one doesn't enjoy getting and being there, one doesn't make the trip. Therefore, we would expect the number of social walking destinations to be more sensitive to the quality of the pedestrian environment than total number of walking destinations.

In defining which of the 14 destinations should be considered "social" in nature, this research set two criteria. First, if it is reasonable to assume that the trip would be made either with another person or to meet someone, then the destination was categorized as social. Using this criterion, restaurants, cafes, and cinemas were categorized as social. Second, if it was reasonable to assume that being around other people is an important contributing factor to the overall enjoyment of visiting the destination, then the destination was also categorized

as social. Using this second criterion, retail boutiques and public spaces were categorized as social. Therefore, of the 14 possible destinations five were categorized as social.

Controlling for age, gender, income, length of residence and the length of residence, the average Vesterbroan walked to 30% more social destinations than the average Nørrebroan (z=3.16 Pr>|z|=0.00). In addition to neighbourhood, the top three income categories were significant using an alpha of 5%, with higher income groups walking to more social destinations than lower income groups (see Table 5.19). Age is also significant, with every ten-year increase in age resulting in a negligible 1 percent decrease in the number of social destinations walked to (z=-2.05, Pr>|z|=0.04).

TABLE 5.19 - Number of Social Destinations Copenhagen, Denmark

	IRR	z	P>|z|
Neighbourhood**	1.30	3.16	0.00
Age**	0.99	-2.05	0.04
Male	0.96	-0.49	0.62
Half median to median income*	1.11	0.73	0.47
Median to 2x median income**	1.44	2.87	0.00
2x Median to 4x median income**	1.45	2.61	0.01
>4x Median income**	1.85	2.63	0.01
1-5 Years in neighbourhood	0.94	-0.39	0.69
>5 Years in neighbourhood	1.06	0.40	0.69

**P≤0.05

NOTE: 0 to half median income was used as the baseline.

5.3 Frequency of Walking Trips

The frequency of walking trips is a second measure of the importance of walking to a resident's lifestyle. The survey collected data on how frequently residents walked from home to a number of destinations, including the grocery store, a restaurant, a café or bar, and public open space. The options for frequency were less that once per week, one to three times per week, and four or more times per week. The results indicate that both Nørrebroans and Vesterbroans are active walkers, but that some distinctions do exist. Specifically, living in Vesterbro is associated with an increase of 1.84 in the odds that a resident walked frequently to the grocery store (z=2.28 Pr>|z|=0.02). Similarly, living in Vesterbro is associated with an increase of 1.94 in the odds that a resident walked frequently to a café or bar (z=2.21 Pr=0.03). There was no difference in the frequency of walking trips to any other destination types, suggesting that once a resident decides to walk to a given destination, there is little

neighbourhood effect on the frequency of the walking trips.

A number of socioeconomic variables were examined to see whether they influenced the frequency of walking trips. Age and income had no consistent pattern with the frequency of walking trips, although there was some evidence that the odds of walking to a retail boutique increased with income. For gender, being male was associated with an increase of 2.38 in the odds of walking frequently to a restaurant ($z=2.13$, $Pr>|z|=0.03$), and an increase of 2.44 in the odds of walking frequently to a café or bar ($z=2.98$, $Pr>|z|=0.00$). Lastly, having a child in the household is associated with an increase of 2.34 in the odds of walking frequently to the grocery store ($z=2.74$, $Pr>|z|=0.01$), and an increase of 1.94 in the odds of walking frequently to a public space ($z=2.13$, $Pr>|z|=0.03$).

5.4 Chance Meetings and Social Networks

Neighbourhood has been hypothesised to be associated with both neighbouring and the number of social contacts. This study collected data on the number of chance meetings per week, allowing us to test whether the robustness of the pedestrian space network is associated with a resident's social network, controlling for the number of friends, age, gender and income.

TABLE 5.20 - Frequency of Chance Meetings
Copenhagen, Denmark

	Coefficient	t	P>|t|
Neighbourhood	0.37	0.26	0.80
Age	0.11	1.66	0.11
Gender	-2.07	-1.52	0.14
Income*	2.82	2.07	0.05
Number of friends living in the neighbourhood*	0.21	2.57	0.02
Frequency of trips to restaurants*	2.66	2.50	0.02

*P≤0.05

There was no difference in the number of chance meetings across neighbourhoods, suggesting that the quality of the pedestrian network is less important than other variables ($t=0.26$ $Pr>|t|=0.80$) (See Table 5.20). Similarly, gender is independent of the number of chance meetings ($t=-1.52$, $Pr>|t|=0.14$). Conversely, every additional friend living in the neighbourhood is associated with a 0.21 increase in the number of chance encounters each

week (t=2.57, Pr>|t|=0.02). A larger effect is associated with income, with residents who have an above median income experiencing in 2.82 additional chance encounters each week (t=2.07, P>|t|=0.05). Lastly, the frequency of trips to restaurants is associated with additional chance encounters, with respondents who walk to restaurants most frequently also having more chance encounters (t=2.66, Pr>|t|=0.02).

The result for income is at first glance counter-intuitive, since lower income is often assumed to be associated with larger social networks. As the analysis in the next section shows, however, this is not necessarily the case in these two neighbourhoods. One explanation is that affluent households tend to visit the same, limited set of "hip" destinations, primarily cafés, bars and restaurants. Interviews with Nørrebro residents suggest this may be the case, with several residents who live in the affluent quarter of the neighbourhood all mentioning the same small number of cafés when asked where they thought they would be most likely to bump into someone they know. More than trips to the grocery store, pharmacy or similar necessary destinations, it appears than social destinations play an important role in maintaining casual contact with members of one's social network. Returning to the results from the social destination analysis from above, we found a significant and increasing relationship between income and the number of social destinations a resident typically walks to. The fact that cafés, bars and restaurants in Copenhagen are expensive places to hang out appears to effectively preclude those in the lowest income groups from using them. If true, this implies that relying on semi-public spaces as the primary locales for social interaction in a neighbourhood puts those in the lowest income brackets at a social disadvantage.

5.5 Size of Social Network as a Proxy for Social Capital

The number of friends, in addition to being an independent variable for chance meetings, is also an outcome unto itself. One measure of social capital is the size of the social network (Lochner, Kawachi, & Kennedy, 1999). All things being equal, we would assume that older residents, and residents who had lived in the neighbourhood for longer, would have a larger social network. One would also expect that households with children would

have a larger social network, due to the multiple opportunities to meet one's neighbours having allows for. But once these factors are controlled for, along with basic socioeconomic variables, we would expect the neighbourhood with a more robust pedestrian space network to be associated with a larger social network because walking more often and for longer distances should increase the likelihood of meeting people and keeping up relationships.

Using Poisson regression and controlling for age, gender, income length of residence, and presence of children in the household, a Vesterbroan had 21 percent more friends than a Nørrebroan (z=3.21, Pr>|z|=0.00) (see Table 5.21). Also, residents who had lived in the neighbourhood for more than five years had nearly 60 percent more friends than someone who had lived there for less than one year (z=4.09, Pr>|z|=0.00), and households with at least one child had 22 percent more friends (z=3.08, P>|z|=0.00). Finally, higher income was associated with more friends for all brackets except for the highest, at which point the sign reverses itself. This outcome suggests that those at the bottom and at the top of the income distribution have fewer friends living in the neighbourhood than those in the middle of the income distribution.

TABLE 5.21 - Size of Social Network in Neighbourhood Copenhagen, Denmark

	IRR	z	P>|z|
Neighbourhood**	1.21	3.21	0.00
Age	1.00	0.33	0.74
Gender	1.06	0.95	0.34
Half median to median income**	1.56	4.14	0.00
Median to 2x median income*	1.22	1.91	0.06
2x Median to 4x median income**	1.26	1.99	0.05
>4x Median income**	0.94	-0.29	0.77
1-5 Years in neighbourhood	0.96	-0.33	0.74
>5 Years in neighbourhood**	1.59	4.09	0.00
At least one child in household**	1.22	3.08	0.00

**P≤0.05 *P≤0.10

NOTE: 0 to half median income was used as the baseline.

6 Summary of Results

There were a number of statistically significant differences in how residents perceived and used the pedestrian space network, both across neighbourhoods and according to several demographic categories. No single test provides conclusive evidence in support of the hypothesis that a robust pedestrian space network is associated with a greater and more diverse use of a neighbourhood's public spaces, and yet the large number of concurring

results provides strong support for this conclusion. Not only is Vesterbro's robust pedestrian space network associated with a number of behavioural outcomes, it appears to be associated with greater neighbourhood satisfaction and a perceived greater connectivity to surrounding neighbourhoods. This study also found neighbourhood satisfaction to be associated with the enjoyability of the pedestrian environment, suggesting that benefits of a robust pedestrian space network extend to include attitudinal outcomes and not just behavioural.

Specific behaviour differences included Vesterbroans walking to 1.31 more destinations from their home than Nørrebroans. Also, a greater proportion of Vesterbroans walked to 12 of the 14 individual destination categories, with the difference significant for seven of them. Looking at the sub-category of social destinations, Vesterbroans walked to 26 percent more than Nørrebroans. In terms of frequency of walking, the evidence is less conclusive, with Vesterbroans walking more frequently to only two of the five destination categories, with one considered a necessary trip (grocery store), and the other optional (café/bar). Finally, a typical respondent living in Vesterbro had a larger social network than one living in Nørrebro, controlling for length of residence, children in the household and income.

The in-person interviews support the conclusion that Vesterbroans perceive and use their pedestrian space network differently than Nørrebroans. Crucially, a Vesterbro resident perceives his neighbourhood spaces as a network that can be accessed to meet friends, run errands or to just explore the city; this was not the case for Nørrebroans. This is only partially due to the ethnic divisions in Nørrebro – long stretches of uninteresting streetscapes combined with heavily trafficked streets that box in Nørrebro on three sides contribute significantly to the localization of streets and public spaces. There was also evidence that alternative modes to walking were taken, primarily the bicycle but also public transit, because of the uninteresting or unappealing stretches of the neighbourhood. This has implications for how well a resident can know her neighbourhood and whether she systematically avoids certain areas because the fragmented nature of the pedestrian space network. This intense localization of sub-areas within Nørrebro allows a kind of ghettoization to occur, which can

then reinforce cultural divisions across resident groups, as has occurred in Nørrebro between Muslim and non-Muslim Danes.

The in-person interviews also brought to light the ability of alternative routes to substitute for one another in Vesterbro, depending on the resident's mood. Vesterbro's variety is exceptional; however, it does highlight the degree to which cities have ignored the psychological needs of residents, especially in very urban contexts where private space is likely more limited than in suburban settings. The ability to find a moment of solitude, free from noise, traffic and people, might be an essential element to long-term neighbourhood satisfaction. Perhaps the variety of routes allows a degree of control over one's environment, if only by choosing to be in one place versus another, that can be difficult to achieve in many cities. This points to possible future research questions that study how urban challenges, such as traffic, access to greenery, and route choices that meet the psychological needs of the pedestrian contribute to such outcomes as long-term neighbourhood satisfaction, amount of social capital, or sense of personal well-being. By extension, such research topics imply that policy interventions do not always have to focus on the built environment, but also can include campaigns that address how people view and use their neighbourhood spaces, as well as how they interact with, and organise among fellow residents.

References Cited

Aragonés, J. I., Francescato, G., & Gèarling, T. (2002). *Residential environments : choice, satisfaction, and behavior.* Westport, Conn.: Bergin & Garvey.

City of Copenhagen, D. (2003). *10 Year Statistical Review, 2003.* Retrieved. from.

Gehl, J. (1987). *Life between buildings : using public space.* New York :: Van Nostrand Reinhold,.

Lochner, K., Kawachi, I., & Kennedy, B. (1999). Social Capital: a guide to its measurement. *Health and Place, 5*, 259-270.

Southworth, M. (2005). Designing the Walkable City. *Journal of Urban Planning and Development*(December), 246-257.

Chapter 6

Conclusions and Discussion

1 Summary of Results

This research contributes to the field of pedestrian research in a number of ways. The combination of varied and complementary research methods has produced a more complete and nuanced understanding of how the built environment at the neighbourhood scale affects the use and perception of public open space than most other research projects that have relied on single research methods. Further, the research methods used, especially the GIS-based analysis of routes and the follow-up in-person interviews with residents, allowed for the exploration of findings from the quantitative survey and represent advances in how urban designers collect and analyze data. Lastly, the opportunity to study urban environments that in many ways represent best practices in urban design provided a unique chance to explore how many of the improvements to the built environment that researchers constrained to North American cases can only speculate on, actually affect perceptions and use. Examples include how an extensive bike lane network complements pedestrian movement, and how extensive neighbourhood-wide traffic-calming strategies affect the character and use of residential streets.

The interviews with planners, private developers and other supply-side stakeholders in urban development represent the first attempt in the planning literature to explore how the policy environment can constrain or facilitate the implementation of planning policy and urban design guidelines. Indeed, much of the urban planning literature has been written as though all potential policies are possible (Calthorpe, 1993; Duany, Speck, & Plater-Zyberk, 2000), when in fact a market-dominated and regulatory-based planning system such as the American system, places significant and potentially insurmountable obstacles to achiev-

ing geographically dispersed planning goals (Kunstler, 1994). This includes the systematic upgrade of pedestrian facilities in urban and suburban environments, which has significant implications for the field of active living research, implications the field has only begun to comprehend, let alone address (Sallis et al., 2005). This research provides guidelines for cities interested in pursuing a systematic upgrade to their pedestrian environment and gives much needed insight into the scale of involvement the planning system must be prepared to engage in.

The remainder of this chapter will summarise the key findings from each stream of research and then provide a fuller discussion of the implications. It will conclude with some ideas for how future research should verify and build upon these findings. This investigation marks only the beginning of new research methodologies and research foci, and as such, should be viewed as the launching point for future work.

2 The Relationship between Political Culture and the Building of Pedestrian Space Networks

Copenhagen's planning system has three complementary elements that allow it to effectively identify urban space challenges, define solutions and implement policy. First, an educated political body must arrive at a consensus on the vision for how to address the most pressing urban planning challenges, and that the political body must be willing to support the planning system to implement the policies necessary to achieve the agreed upon vision. Second, the structure of the planning system must encourage coordination across all departments with jurisdiction over planning related issues, and that a small number of departments across which to coordinate is better than a large number. Third, the financial resources must be made available for any solution that includes geographically dispersed improvements to public open spaces, be they streets, squares or parks. These elements, while enabling planners to successfully undertake ambitious pedestrian space improvement campaigns, are no guarantee of success, as Copenhagen's experience with public urban spaces along the harbour demonstrates. Still, Copenhagen has been most successful in identifying challenges and implementing solutions when all three elements have coexisted.

2.1 Consensus within the Political Body

Many of Copenhagen's harbour sites were developed at a time when a concern for economic growth outweighed all other considerations; this provided a weak foundation for planners to begin serious negotiations with well-connected and savvy private developers. Copenhagen's planners also lacked experience in redeveloping large sites, further contributing to the problematic outcomes. The successful planning of small-scale infill, however, demonstrates that Copenhagen's planner system is capable of high quality development that meets the goals of the Municipal Plan. The completion of the CUSAP process, along with the successful negotiation of the Ørestad Syd open space plan, and the promising plan for Sydhavnen, suggests that planners have gained the necessary experience to operate effectively at the larger scale, while politicians have come to value good urban space planning once again. Perhaps contributing to the shift in political focus has been election of a dominant centre-left coalition and the sidelining of the centre-right party, which also clears the way for a rapprochement between the Building and Construction Administration and Office 8 in the Lord Mayor's Finance Administration.

2.2 Coordination across Planning Agencies

One of the contributing factors for the poor outcomes associated with the harbour redevelopment was a lack of coordination between Planning and Architecture, Streets and Parks, and Office 8 in the Finance Administration. The CUSAP process offered the opportunity for planners from all three departments to discuss and come to agreement on what the underlying principles that guide planning policy should be, as well as the range of possible outcomes that would best meet these principles. Of equal importance to the final policy document produced by the process, however, were the interactions themselves, which provided a structured setting for planners from different backgrounds to express their personal philosophies for urban space development and to bring to light the assumptions that underlie these philosophies. It may well be that the social capital generated from the CUSAP process will have the larger effect on how Copenhagen's public urban spaces are created and

maintained than CUSAP's actual policies.

CUSAP's spatial network approach to urban design reflects the principles at the heart of the research hypothesis. The main thrust of the document is that planners need a coherent and systematic plan that targets the most important links in the pedestrian space network so that both inter- and intra-neighbourhood connections are strengthened. The opposite is also true, that planners should avoid strategies that produce a patchwork quilt effect of isolated improvements that are separated by stretches of monotonous, dangerous or otherwise unappealing streetscapes from improvements in adjacent areas. By extension, the city needs to remain an important developer of urban open space since private developers cannot be relied upon to generate the quality or quantity of urban open space needed by the city.

2.3 Financial Commitment Commensurate with Urban Space Policy

A long-term financial commitment to the quality of urban spaces is the final element to Copenhagen's successful model for urban space development. Without this element, the city centre could never have been pedestrianised, the numerous public squares across the city could not have been refurbished, the dramatic increase in the miles of bile lanes would never have happened, and the forthcoming parking and urban space investment would not have been a viable solution to the political impasse. Even with 40 years of financial investment in the city's urban spaces, Copenhagen is just beginning to turn its attention to the large areas beyond the city centre and core neighbourhoods, and will have no shortage of urban space improvement projects for many years. That is to say, even a city willing to provide sustained funding to improve the quality of its public urban spaces faces a tremendous challenge, suggesting that a city lacking such a commitment faces an even greater challenge.

Financial commitment is what defines the difference between a Copenhagen and a Melbourne, Australia; that is, while Melbourne has made *tremendous* strides since the early 80s in the quality of its downtown streetscape, in the quality of the architecture, and in the amount of street life, the street network still includes many disconnected fragments spread across the downtown. Indeed, where there are unbroken lengths of consistently designed

streetscapes, they are more than likely the product of city-sponsored upgrades. This comment is not meant to criticize Melbourne – just the opposite, as Melbourne represents the best-case scenario for a city unable or unwilling to become a central developer of urban public spaces. And it only achieved this level of success because of strong leadership from the planning director (Robert Adams) and sustained political support for the consistent application of design guidelines whenever a property was improved.

3 Building Planning Competencies

The ability to engage in a range of planning exercises at a variety of scales and across a long period of time has produced a talented pool of planners in Copenhagen who have a strong ability to learn from past experience and who are also humble enough to acknowledge mistakes and learn from the process. Indeed, it is difficult to imagine producing such a breadth and depth of planning expertise without the large number of opportunities Copenhagen's planners have had to learn through practice. At a time when many American cities increasingly rely on outside consultants to fill the large gaps in their own planning staffs, the lesson is bracing. Few opportunities to learn through planning experience leave many planning departments hollow shells without the depth to undertake serious plans in-house. For cities suffering from such atrophied planning staffs, major efforts will be needed before they will be capable of undertaking significant plans to improve the quality of the urban pedestrian space network – or any other complicated planning initiative.

4 Cultural Barriers to Implementing this Model in the United States

There are a number of culturally derived barriers blocking the implementation of a Copenhagen-style model in an American city. Cullingworth, in his seminal analysis of American planning culture, finds that the American reverence for private property rights, and more specifically, the desire to personally profit from property ownership, has undermined American society's appetite for individual sacrifices in exchange for the collective good (Cullingworth, 1993). Within this political culture, the level of public funding necessary for a sustained effort to improve the quality of public urban spaces is difficult to imagine in

the majority of American cities. There are some notable exceptions to this rule, however, proving that success is possible (e.g., Portland OR, Boston MA, or St. Paul MN). That these cities usually have a strong mayor system of governance and that the mayor often plays a pivotal role in pushing the urban space improvement campaign, does suggest there could be difficulties in maintaining such efforts over the long-term (Greenberg, 2005; Southworth, 2005).

Related to sustained political support for financial investments in public urban spaces is consistent political support for planners and the planning system, especially when large and politically connected developers are involved. That large investors hold influence over American municipal politics far in excess of the single vote allocated them is not news to those familiar with municipal governance (Hartman, 1974; Hirsch, 1983) (one more from Cullingworth). Planners have tremendous difficulty standing up to such investors without resolute support from politicians; if politicians are unwilling to take a strong stand because they have accepted large campaign contributions from the developer in question, then planners are left with little leverage[1]. This makes the consistent application of design guidelines extremely difficult, and usually results in a patchwork of successes and failures. As Copenhagen's experience during the late 80s and throughout the 90s demonstrates, even a system with a history of support for good planning can set its principles aside when pressing economic needs dominate the political discourse.

This discussion provides an outline of only the systematic constraints on American planners that are most likely to affect the success of building pedestrian space networks. There are also numerous local idiosyncrasies that can also make the planner's job more

---

1 Just days prior to submitting this dissertation, San Francisco provided one more excellent example of Elkin's "systematic bias". A piece of legislation that limited parking in the downtown as part of an effort to relieve congestion had the support of the Board of Supervisors, the Planning Commission and the Planning Department, and was on its way to being passed. At the last moment, downtown powerbrokers demanded a meeting with Mayor Newsom. They emerged with a commitment from the Mayor that he would do his best to kill the bill, despite the fact that Newsom had run on a clean government platform. *The San Francisco Bay Guardian*, February 22-28, 2006 pp. 5-6.

difficult. Taking San Francisco as an example, in conversations with several city planners, a frequent barrier to plan creation and implementation is the alarming lack of faith in the integrity of the planning system expressed by residents. Also, the city has decided to fragment authority over the public realm across half-a-dozen competing departments with no mandate for coordination. To date, there are no unifying streetscape design guidelines, and the pedestrian is left as an afterthought with regard to many specific elements, such as lighting. It is unclear how many cities suffer from such impediments, but there is no reason to believe this is an isolated case.

5 The Importance of Pedestrian Space Networks

Turning to the relationship between the degree of fragmentation of a neighbourhood's pedestrian space network and pedestrian behaviour, there were a number of significant insights relating to walking destinations, route choice, explorability and home range.

5.1 Number and Variety of Walking Destinations

This research found evidence that residents who live in a neighbourhood with a robust pedestrian space network (i.e., Vesterbro) walk from their home to a greater variety of destinations than residents living in a neighbourhood with a fragmented pedestrian space network (i.e., Nørrebro). In terms of walking trips to social destinations, Vesterbroans walked to 30% more social destinations than Nørrebroans. Since these trips are considered optional rather than necessary, they are assumed to be more sensitive to urban space quality. This means that path quality and path context are relatively more important to the decision to walk than for trips to the grocery store, laundry or doctor's office. Finally, the frequency of walking trips does not offer striking differences between the neighbourhoods, but Vesterbroans are more likely to walk frequently to a grocery store and café or bar than Nørrebroans.

5.2 Variety of Route Choice and Neighbourhood Explorability

A second observed behaviour difference was that residents living in a strong PSN used a greater variety of routes to reach destinations, which suggests that one can choose a

route that better matches one's mood. The opportunity to choose between walking along a tree-lined boulevard versus along a busy commercial street can appreciably improve one's happiness. This is a non-trivial outcome given the sacrifices–in terms of personal space, privacy and access to greenery–which most Copenhagener's make in order to live in the city. Indeed, improving a city's desirability to a greater range of people, including across income groups and lifecycles, has been an important planning goal during recent urban regeneration projects. Indeed, that Copenhagen has made this one of its core policies illustrates that cities can proactively plan for a demographic profile that best suits its long-term economic and social sustainability. This observation is especially relevant for those cities that are systematically loosing entire segments of their population, such as San Francisco.

Related to the variety of appealing routes is the neighbourhood's explorability. As with social trips, trips that are used to explore one's surroundings are likely more sensitive to the quality of the built environment than necessary trips; that more Vesterbroans than Nørrebroans rated their neighbourhood as one of the most appealing walking environments in the city suggests that Vesterbro has greater potential for pedestrian explorability. Indeed, both the mapping data and the in-person interviews support the argument that a strong pedestrian space network encourages residents to explore more areas within their neighbourhood.

Pedestrian barriers that deter pedestrian movement, such as long stretches of uninteresting streetscapes or large arterials with heavy traffic, appear to be the main factors influencing the degree of explorability. Also, the lack of an appealing destination deters the use of otherwise good quality pedestrian routes (the second half of Blågårdsgade in Nørrebro is an example of this phenomena). Even though "exploring" trips constitute a small proportion of total walking trips, they significantly add to the cognitive map of one's home territory. From a walkability perspective, "knowing" of a place is an important criterion for visiting a place. Therefore, more cities should consider urban planning policies that address such intangible goals as how to expand the cognitive map of residents, since this could lead

to longer walking trips and fewer dead zones within neighbourhoods.

5.3 Perceived Safety

The sense of safety while walking around the neighbourhood was one of the very few differences in perceptions the survey detected across neighbourhoods. This has two implications with respect to walking. First, a lack of perceived safety will deter walking, especially among women and at night. This might have a spillover effect to pedestrian behaviour during the day, but given that differences in perceived safety were significant only during the night, there is little compelling evidence for this. Second, greater walkability could encourage more people to be out, both during the day and night, thus improving the perceived safety. Evidence from the in-person interviews suggests the second scenario is certainly valid for at least some people, since several women commented that they felt safe even when walking through areas known to be centres of prostitution and drug dealing because there were always other people on the street. As with many built environment-behaviour relationships, this one likely flows both ways, with one phenomenon reinforcing the other in either a positive or negative spiral.

6 Narratives from the In-person Interviews

Results from the in-person interviews provide a rich context for interpreting the quantitative survey results. They also demonstrate that relying on quantitative survey data alone is inadequate to evaluate a neighbourhood's pedestrian space network because context matters in urban planning. Three examples serve as illustrations: 1) Vaernedamsvej's historic role as an important street for butchers, fishmongers and green grocers continues to affect its perceived attractiveness as a shopping street today, independent of the current shop selection; 2) the full extent of Nørrebro's ethnic tensions in influencing walking patterns, independent of the actual conditions confronting pedestrians, would not have come to light had this researcher not met with residents face-to-face; and, 3) the presence of heroin addicts in front of St. Mary's church or the prostitutes along Skelbaekgade would not have factored into the analysis had residents not discussed them during the interviews. Unearth-

ing these conditions often force planners to look beyond the physical impediments to pedestrian activity and to collaborate with other departments more capable of addressing difficult social conditions. By not conducting in-person interviews, the quantitative approach smacks of physical determinism in its emphasis on simplistic relationships between measures and outcomes. To exclude qualitative methods would represent a step backward in environment-behaviour research and should be resisted.

The importance of multiple route choices in Vesterbro versus the extremely limited set of choices facing Nørrebroans was another important finding from the in-person interviews. As discussed in the previous section, route choice provides the potential for a better match between mood and environment, an important characteristic in an intense urban area. Similarly, route choice provides the pedestrian the opportunity to explore more of her neighbourhood, which can be viewed as one element of accessibility. That is, accessibility does not just refer to a resident's ability to physically access an area, but also her desire to access it. By implication, sub-areas within a neighbourhood, or even entire neighbourhoods in a city, are effectively inaccessible if they are separated from surrounding neighbourhoods by stretches of unappealing or unsafe landscape.

7 Implications for Current Research

The success of the qualitative data collection highlights the need to include research methods that augment a purely quantitative research model. There are important neighbourhood characteristics that influence many aspects of walking behaviour, including trip frequency, purpose and route choice, that only come to light after residents are interviewed, and would go unnoticed by quantitative research methods alone. Albeit, adopting a multi-method approach would limit the number of neighbourhoods that could be included in a given study. The opportunity to study a large number of neighbourhoods that allow the use of sophisticated statistical tests is certainly appealing; it could bring conclusiveness to some aspects of the built form-active living debate. And yet our experience to date demonstrates a continued inability on the part of researchers to reduce core elements of the pedestrian

experience to a numeric value, regardless of how sophisticated the measurement techniques are. Rather than marching forward armed with the same set of tools, the fields currently dominating active living research need to make a concerted effort to include data collection techniques that, while perhaps considered beyond the bounds of formal scientific inquiry because of their normative orientation, are nonetheless very well suited to this research context. This should also be done with a sense of urgency, since policymakers have become keenly aware of the growing body of research and will make decisions informed by the results. These decisions must not be made based on results generated from one research model, but rather the whole body of research from a variety of fields.

7.1 The Danger Associated with Context Independent Research Methods

Some active living researchers have set a very high standard for evidence that documents the relationship between the built environment and walking (Sallis et al., 2005). The danger of waiting for more "conclusive" research before policy recommendations are issued is that such evidence is likely not achievable using quantitative methods alone (Handy, Boarnet, Ewing, & Killingsworth, 2002). Some of this misconception could stem from the relative lack of experience that some researchers have with the built environment, both from a design perspective and from a policy-making perspective: planning is not a science, nor does the built environment condition behaviour in any precise way. I argue that that a bright-line for the minimum density needed for a "walkable" neighbourhood likely does not exist in the way 100 degrees centigrade marks water's boiling point. Similarly, it is unlikely a bright-line for the degree of mixed land use exists, nor for the minimum street connectivity, let alone for the minimum degree of aesthetic appeal. And there is certainly no bright-line for the minimum tree canopy, sidewalk width, sense of enclosure, or perceived safety from traffic. This begs the question, When do we have enough information to make an informed recommendation? I argue we are already there, at least to make a start. By waiting, the research community implicitly undermines the sound planning principles of density, mixed land-use, fine-grained urban form, attractive paths and invigourating path contexts. Since

the research community will be unable to provide anything more than general guidelines on even the most straightforward of urban form elements, such as density, there is little compelling reason to wait.

Perhaps the difficulty stems from the fact that urban planning and urban design are not sciences. Flyvbjerg argues persuasively that fields such as urban planning are best not approached as a science since the universally valid truths upon which the natural sciences are predicated simply do not exist for any of the social sciences (Flyvbjerg, 2001). Instead, he argues that "phronesis" is a more appropriate model of research, since it allows the investigator to conduct context-specific research. This does not suggest the important advances in the quantitative measures of the built environment should be abandoned. Rather, the research outcomes from such studies need to be balanced with findings from other methods and sources, including interviews not only with residents, but also planners who have worked in the neighbourhood for many years, and as a consequence, have developed a context-dependent understanding of the behaviour-built environment relationship.

7.2 Measuring the Built Environment

Streets, squares and parks are not merely the sum of their individual parts, and urban design should argue against such reductionism, regardless of how worthy the objective. In terms of research, the current measurement instrument that comes closest to urban design's perspective is the "ecometric" model used by Craig et al. and Gauvin et al. in Montreal, Canada (Craig, Brownson, Cragg, & Dunn, 2002; Gauvin et al., 2005). To date, they appear to be the only active living researchers who recognise that the built environment embodies the *potential* to encourage different types of activities. That is, they recognise that people's perceptions are first sifted through schema before they inform action, and do not go unfiltered into decision-making. Instruments such as NEWS, by contrast, recognise no such intermediary step and implicitly draw a direct link between characteristics of the built environment and action; in this case, walking. Unfortunately, NEWS seems to have caught on as the accepted self-report rating instrument, with a growing number of investigators using it

as a tool to evaluate neighbourhoods in several different cities (Leslie et al., 2005). Urban designers needs would be better met if the ecometric model was adapted so that a more diverse set of outcomes could be studied.

Sallis et al., under the banner of the Robert Wood Johnson Foundation's Active Living Research national advisory committee, recently published a policy piece that proposed "developing a new transdisciplinary field that requires the close collaboration between people in different professions" as part of an effort to "build capacity of investigators" to conduct active living research (Sallis et al., 2005). Notably, "urban designers" were mentioned only twice in the piece. While this does not necessarily mean the authors overlooked urban design's contribution to the emerging field, the fact that not a single urban design author, including J. Jacobs, Whyte, A. Jacobs, Gehl or Bosselmann was cited, despite the fact that they were writing about pedestrian needs decades before "active living" was even conceptualized, is deeply disturbing. Judging by whom the piece does mention, it seems as though the authors believe only narrowly focused quantitative research is capable of contributing to pedestrian research. If this emphasis holds true, this would represent a significant shortcoming of the emerging research agenda.

7.3 Specificity of Measurements

Related to the methods debate is the question of at what specificity should researchers collect data, regardless of the methods employed? Experience from this dissertation's research suggests that it is not enough to study neighbourhoods as a unit. Rather, researchers need to be able to look at the individual parts that play a relatively more important role in the pedestrian space network, either as central connectors or substantial barriers. The reason is twofold: first, people do not make walking choices based on an abstract understanding of their neighbourhood, but rather based on individual street segments that they can link together in a manner that meets their needs at the time, and research should reflect this to the greatest possible degree; and second, American cities have yet to allocate sufficient funding to redesign the pedestrian space network across an entire neighbourhood, and they

are unlikely to do so in the foreseeable future. Therefore, urban designers will need information specific to individual routes so that they can target improvements with what limited resources they might have, keeping the neighbourhood-wide picture in mind, but generating the greatest positive effect.

Nearly all physical activity research to date collects aggregated data that reveals nothing about individual routes. The previous partnership between planners and environmental psychologists collapsed largely because of the inability of academics to provide results with enough specificity useable by planners. This was partly due to a reluctance of academics to be too "applied," a derogatory term for some academics, and partly due to research methods did not allow researchers to answer the questions of greatest relevance to planners. It would be a tremendous wasted opportunity if the current partnership ended for similar reasons. While walkability indices have helped researchers produce statistically significant results, unless active living investigators are able to bridge the gap between neighbourhood and street or place, then they will likely fail to make inroads with planning practice.

As a note on walkability, planners likely view the recent excitement over walkability indices with a skeptical eye since they already know that neighbourhoods with higher density, greater connectivity of streets and more land use mix are more walkable. In fact, this urban form combination has been policy in many cities in many countries for many decades. It seems as though this is news only to active living researchers, and disparaged by some transportation planners as recently as a few years ago (Boarnet & Crane, 2001). This suggests a gap between the practice of planning and planning research. One way for active living researchers to close this gap would be to work more closely with urban designers, since urban designers base a greater degree of their knowledge on real world experience than do many academic transportation planners.

Active living researchers should reconsider their reluctance to become vocal advocates for specific policies that support walkable urban environments within political debate. As with other challenges facing America, energy policy or health care for example, building

more walkable neighbourhoods is essentially a policy debate on lifestyles, and not a serious academic question. We have ample evidence from several successful North American cities, and many European and Asian cities to articulate a policy on walkable urban form without waiting for expensive, technically difficult and complicated prospective studies to tell us what we already know to be true: that density, connectivity and mixed land use supports walking. Research could then focus on whether specific street designs, configurations of residential density, or designs of public open space better satisfy the needs of different populations. The prolonged inability to advance policies that support walking is a damning failure of society since it reflects a fundamental inability of Americans to work together on common challenges. Perhaps the greater involvement of "expert" investigators will help convince more citizens and more politicians to support a shift in policy.

8 Limitations of Methods and Findings

There are two main limitations to the methods. First, this research was conceived as a multi-method approach to pedestrian urban space research. It included an empirical study of each neighbourhood's urban form; a quantitative survey instrument; a mapping component of the survey that asked respondents to spatially define their knowledge of high- and low-quality pedestrian environments, as well as their social network; and in-person interviews with residents. As such, no one method was intended to carry the entire burden of evidence in support of the hypothesis. The challenge has been to analyse of all the data collected. Unfortunately, a combination of software challenges and time constraints has meant that the mapping component of the survey must be left to later analysis. This leaves a key gap in the analysis of pedestrian space networks, since the spatial nature of the data was intended to reflect the geographically defined nature of the pedestrian experience. That is, it was hypothesized that a mapping analysis would better reflect the place-specific nature of the pedestrian environment. The absence of this analysis weakens the study's conclusions.

Second, the quantitative element of the survey would have benefited from a validated instrument for measuring the quality of the built environment. At the time the survey was

drafted at the end of 2003, such instruments were not widely available. One implication is that the results from this study cannot be compared easily to those of other research. Also, this study collected data on the perceived quality of the built environment on specific streets within the neighbourhood. The streets were selected based on their hypothesised importance as pedestrian corridors. The advantages of this approach over data collected at the neighbourhood scale have already been discussed; however, given the opportunity to reselect which corridors were included in the survey, it would have been beneficial to increase the number of corridors included to five or six, up from three. This would have allowed for most, if not all, of the important pedestrian routes to be studied. Further, this selection should have been informed from a number of resident interviews.

9 Opportunities for Future Research

Future research needs to be action oriented and context dependent. Such research should both document how the built-environment-behaviour relationship works and provide the opportunity for planners to learn through practice. Again, Flyvbjerg argues that a sense of intuition refined through experience is a necessary tool for practitioners in order for them to attain expert status in their field (Flyvbjerg, 2001). Why intuition? Because standardized solutions are ill equipped to address the complexities of real-life challenges. Instead, some combination of empirically based knowledge and context-specific intuition is necessary for planners to develop solutions for a broad range of urban environments.

Choosing research sites that are slated for improvements would be a beginning, although American cities rarely engage in the range and quality of pedestrian improvements, especially in neighbourhoods, that have met with success in Europe (Eubank-Ahrens, 1985). The risk of limiting research to the American context is that these small improvements will return non-significant results at the margin, possibly undermining the movement for more walkable neighbourhoods. One strategy to combat this would be to include outcomes other than physical activity, such as satisfaction with the neighbourhood environment, increased connection to nature, decreased effect of automobile traffic, and the amount of time resi-

dents spend outdoors in any improved public open space. A second strategy would be to conduct research in countries where government takes a more active role in improving public open spaces.

In terms of methods, early analysis of the mapping data is promising. As GIS-based tools become more sophisticated, they offer new opportunities for innovative research that better reflect the spatial nature of pedestrian networks. Indeed, the movement towards neighbourhood scale ecological measures of walkability is driven at least in part by the limitations of existing statistical software to cope with spatial data. To study networks and route choice without tools that allow researchers to explicitly differentiate between routes does not make sense; it is akin to a city's planning office trying to define a strategy to improve linkages in a pedestrian space network without the benefit of a map. Urban designers, who already benefit from a spatially defined view of the urban landscape, should be in vanguard of researchers adapting this exciting research tool.

References Cited

Boarnet, M., & Crane, R. (2001). *Travel by design : the influence of urban form on travel.* Oxford ; New York: Oxford University Press.

Calthorpe, P. (1993). *The next American metropolis : ecology, community, and the American dream.* New York: Princeton Architectural Press.

Craig, C. L., Brownson, R. C., Cragg, S. E., & Dunn, A. L. (2002). Exploring the effect of the environment on physical activity: a study examining walking to work. *Am J Prev Med, 23*(2 Suppl), 36-43.

Cullingworth, J. B. (1993). *The political culture of planning : American land use planning in comparative perspective.* New York: Routledge.

Duany, A., Speck, J., & Plater-Zyberk, E. (2000). *Suburban nation : the rise of sprawl and the decline of the American Dream* (1st ed.). New York: North Point Press.

Eubank-Ahrens, B. (1985). The impact of *woonerven* on children's behavior. *Children's Environments Quarterly, 1*, 39-45.

Flyvbjerg, B. (2001). *Making social science matter*

why social inquiry fails and how it can succeed again. Oxford, UK ; New York: Cambridge University Press.

Gauvin, L., Richard, L., Craig, C. L., Spivock, M., Riva, M., Forster, M., et al. (2005). From walkability to active living potential: an "ecometric" validation study. *Am J Prev Med, 28*(2 Suppl 2), 126-133.

Greenberg, K. (2005). Boston's Big Dig. In U. o. C. Berkeley (Ed.). Berkeley.

Handy, S. L., Boarnet, M. G., Ewing, R., & Killingsworth, R. E. (2002). How the built environment affects physical activity: views from urban planning. *Am J Prev Med, 23*(2 Suppl), 64-73.

Hartman, C. W. (1974). *Yerba Buena: land grab and community resistance in San Francisco.* San Francisco,: Glide Publications,.

Hirsch, A. R. (1983). *Making the second ghetto : race and housing in Chicago, 1940-1960.* Cambridge [Cambridgeshire] ; New York :: Cambridge University Press,.

Kunstler, J. H. (1994). *The geography of nowhere : the rise and decline of America's man-made landscape* (1st Touchstone ed.). New York: Simon & Schuster.

Leslie, E., Saelens, B., Frank, L., Owen, N., Bauman, A., Coffee, N., et al. (2005). Residents' perceptions of walkability attributes in objectively different neighbourhoods: a pilot study. *Health Place, 11*(3), 227-236.

Sallis, J. F., Cervero, R., Ascher, W. W., Henderson, K., Kraft, M. K., & Kerr, J. (2005).

An Ecological Approach to Creating Active Living Communities. *Annu Rev Public Health.*

Southworth, M. (2005). Designing the Walkable City. *Journal of Urban Planning and Development*(December), 246-257.

Appendix 1

List of characteristics from the neighbourhood environment assessment tool, Gauvin et al. 2005

Activity Friendliness (6)
Effort to walk around
Pedestrian system has limits to pedestrians
Bicycle system has limits to cyclists' needs
Effort to cycle around
Bicycle system addresses cyclists' needs
Pedestrian system addresses pedestrian needs

Destination Density (8)
Number of destinations
Variety of destinations
Inclusive of pedestrians
Exclusive of pedestrians
Environmental stimuli
Socially dynamic/static
Visual interest
Overwhelming

Safety (4)
Safety/feeling threatened with the potential for crime
Threat of traffic to pedestrians
Threat of traffic to cyclists
Safety/feeling comfortable with the potential for crime

Appendix 2

ID#_____ Version 12/2002 Date_____

Neighborhood Environment Walkability Scale (NEWS)

We would like to find out more information about the way that you perceive or think about your neighborhood. Please answer the following questions about your neighborhood and yourself. Please answer as honestly and completely as possible and provide only one answer for each item. There are no right or wrong answers and your information is kept confidential.

A. Types of residences in your neighborhood

Among the residences in your neighborhood...

1. How common are detached single-family residences in your immediate neighborhood?

1	2	3	4	5
None	A few	Some	Most	All

2. How common are townhouses or row houses of 1-3 stories in your immediate neighborhood?

1	2	3	4	5
None	A few	Some	Most	All

3. How common are apartments or condos 1-3 stories in your immediate neighborhood?

1	2	3	4	5
None	A few	Some	Most	All

4. How common are apartments or condos 4-6 stories in your immediate neighborhood?

1	2	3	4	5
None	A few	Some	Most	All

5. How common are apartments or condos 7-12 stories in your immediate neighborhood?

1	2	3	4	5
None	A few	Some	Most	All

6. How common are apartments or condos more than 13 stories in your immediate neighborhood?

1	2	3	4	5
None	A few	Some	Most	All

B. Stores, facilities, and other things in your neighborhood

About how long would it take to get from your home to the nearest businesses or facilities listed below if you walked to them? Please put only one check mark (√) for each business or facility.

	1-5 min	6-10 min	11-20 min	21-30 min	31+ min	don't know
example: gas station	1.____	2.____	3. √	4.____	5.____	8.____
1. convenience/small grocery store	1.____	2.____	3.____	4.____	5.____	8.____
2. supermarket	1.____	2.____	3.____	4.____	5.____	8.____
3. hardware store	1.____	2.____	3.____	4.____	5.____	8.____
4. fruit/vegetable market	1.____	2.____	3.____	4.____	5.____	8.____

	1-5 min	6-10 min	11-20 min	21-30 min	31+ min	don't know
5. laundry/dry cleaners	1.____	2.____	3.____	4.____	5.____	8.____
6. clothing store	1.____	2.____	3.____	4.____	5.____	8.____
7. post office	1.____	2.____	3.____	4.____	5.____	8.____
8. library	1.____	2.____	3.____	4.____	5.____	8.____
9. elementary school	1.____	2.____	3.____	4.____	5.____	8.____
10. other schools	1.____	2.____	3.____	4.____	5.____	8.____
11. book store	1.____	2.____	3.____	4.____	5.____	8.____
12. fast food restaurant	1.____	2.____	3.____	4.____	5.____	8.____
13. coffee place	1.____	2.____	3.____	4.____	5.____	8.____
14. bank/credit union	1.____	2.____	3.____	4.____	5.____	8.____
15. non-fast food restaurant	1.____	2.____	3.____	4.____	5.____	8.____
16. video store	1.____	2.____	3.____	4.____	5.____	8.____
17. pharmacy/drug store	1.____	2.____	3.____	4.____	5.____	8.____
18. salon/barber shop	1.____	2.____	3.____	4.____	5.____	8.____
19. your job or school	1.____	2.____	3.____	4.____	5.____	8.____
[check here _____ if do not have work away from home or do not attend school]						
20. bus or trolley stop	1.____	2.____	3.____	4.____	5.____	8.____
21. park	1.____	2.____	3.____	4.____	5.____	8.____
22. recreation center	1.____	2.____	3.____	4.____	5.____	8.____
23. gym or fitness facility	1.____	2.____	3.____	4.____	5.____	8.____

C. Access to services

Please circle the answer that best applies to you and your neighborhood. Both <u>local</u> and <u>within walking distance</u> mean within a 10-15 minute walk from your home.

1. I can do most of my shopping at local stores.

1	2	3	4
strongly disagree	somewhat disagree	somewhat agree	strongly agree

2. Stores are within easy walking distance of my home.

1	2	3	4
strongly disagree	somewhat disagree	somewhat agree	strongly agree

3. Parking is difficult in local shopping areas.

1	2	3	4
strongly disagree	somewhat disagree	somewhat agree	strongly agree

4. There are many places to go within easy walking distance of my home.

1	2	3	4
strongly disagree	somewhat disagree	somewhat agree	strongly agree

5. It is easy to walk to a transit stop (bus, train) from my home.

1	2	3	4
strongly disagree	somewhat disagree	somewhat agree	strongly agree

6. The streets in my neighborhood are hilly, making my neighborhood difficult to walk in.

1	2	3	4
strongly disagree	somewhat disagree	somewhat agree	strongly agree

7. There are many canyons/hillsides in my neighborhood that limit the number of routes for getting from place to place.

1	2	3	4
strongly disagree	somewhat disagree	somewhat agree	strongly agree

D. Streets in my neighborhood

Please circle the answer that best applies to you and your neighborhood.

1. The streets in my neighborhood do not have many, or any, cul-de-sacs (dead-end streets).

1	2	3	4
strongly disagree	somewhat disagree	somewhat agree	strongly agree

2. There are walkways in my neighborhood that connect cul-de-sacs to streets, trails, or other cul-de-sacs.

1	2	3	4
strongly disagree	somewhat disagree	somewhat agree	strongly agree

3. The distance between intersections in my neighborhood is usually short (100 yards or less; the length of a football field or less).

1	2	3	4
strongly disagree	somewhat disagree	somewhat agree	strongly agree

4. There are many four-way intersections in my neighborhood.

1	2	3	4
strongly disagree	somewhat disagree	somewhat agree	strongly agree

5. There are many alternative routes for getting from place to place in my neighborhood. (I don't have to go the same way every time.)

1	2	3	4
strongly disagree	somewhat disagree	somewhat agree	strongly agree

E. Places for walking and cycling

Please circle the answer that best applies to you and your neighborhood

1. There are sidewalks on most of the streets in my neighborhood.

1	2	3	4
strongly disagree	somewhat disagree	somewhat agree	strongly agree

2. The sidewalks in my neighborhood are well maintained (paved, even, and not a lot of cracks).

1	2	3	4
strongly disagree	somewhat disagree	somewhat agree	strongly agree

3. There are bicycle or pedestrian trails in or near my neighborhood that are easy to get to.

1	2	3	4
strongly disagree	somewhat disagree	somewhat agree	strongly agree

4. Sidewalks are separated from the road/traffic in my neighborhood by parked cars.

1	2	3	4
strongly disagree	somewhat disagree	somewhat agree	strongly agree

5. There is a grass/dirt strip that separates the streets from the sidewalks in my neighborhood.

1	2	3	4
strongly disagree	somewhat disagree	somewhat agree	strongly agree

F. Neighborhood surroundings

Please circle the answer that best applies to you and your neighborhood

1. There are trees along the streets in my neighborhood.

1	2	3	4
strongly disagree	somewhat disagree	somewhat agree	strongly agree

2. Trees give shade for the sidewalks in my neighborhood.

1	2	3	4
strongly disagree	somewhat disagree	somewhat agree	strongly agree

3. There are many interesting things to look at while walking in my neighborhood.

1	2	3	4
strongly disagree	somewhat disagree	somewhat agree	strongly agree

4. My neighborhood is generally free from litter.

1	2	3	4
strongly disagree	somewhat disagree	somewhat agree	strongly agree

5. There are many attractive natural sights in my neighborhood (such as landscaping, views).

1	2	3	4
strongly disagree	somewhat disagree	somewhat agree	strongly agree

6. There are attractive buildings/homes in my neighborhood.

1	2	3	4
strongly disagree	somewhat disagree	somewhat agree	strongly agree

G. Safety from traffic

Please circle the answer that best applies to you and your neighborhood.

1. There is so much traffic along the street I live on that it makes it difficult or unpleasant to walk in my neighborhood.

1	2	3	4
strongly disagree	somewhat disagree	somewhat agree	strongly agree

2. There is so much traffic along nearby streets that it makes it difficult or unpleasant to walk in my neighborhood.

1	2	3	4
strongly disagree	somewhat disagree	somewhat agree	strongly agree

3. The speed of traffic on the street I live on is usually slow (30 mph or less).

1	2	3	4
strongly disagree	somewhat disagree	somewhat agree	strongly agree

4. The speed of traffic on most nearby streets is usually slow (30 mph or less).

1	2	3	4
strongly disagree	somewhat disagree	somewhat agree	strongly agree

5. Most drivers exceed the posted speed limits while driving in my neighborhood.

1	2	3	4
strongly disagree	somewhat disagree	somewhat agree	strongly agree

6. There are crosswalks and pedestrian signals to help walkers cross busy streets in my neighborhood.

1	2	3	4
strongly disagree	somewhat disagree	somewhat agree	strongly agree

7. The crosswalks in my neighborhood help walkers feel safe crossing busy streets.

1	2	3	4
strongly disagree	somewhat disagree	somewhat agree	strongly agree

8. When walking in my neighborhood, there are a lot of exhaust fumes (such as from cars, buses).

1	2	3	4
strongly disagree	somewhat disagree	somewhat agree	strongly agree

H. Safety from crime

Please circle the answer that best applies to you and your neighborhood.

1. My neighborhood streets are well lit at night.

1	2	3	4
strongly disagree	somewhat disagree	somewhat agree	strongly agree

2. Walkers and bikers on the streets in my neighborhood can be easily seen by people in their homes.

1	2	3	4
strongly disagree	somewhat disagree	somewhat agree	strongly agree

3. I see and speak to other people when I am walking in my neighborhood.

1	2	3	4
strongly disagree	somewhat disagree	somewhat agree	strongly agree

4. There is a high crime rate in my neighborhood.

1	2	3	4
strongly disagree	somewhat disagree	somewhat agree	strongly agree

5. The crime rate in my neighborhood makes it unsafe to go on walks during the day.

1	2	3	4
strongly disagree	somewhat disagree	somewhat agree	strongly agree

6. The crime rate in my neighborhood makes it unsafe to go on walks at night.

1	2	3	4
strongly disagree	somewhat disagree	somewhat agree	strongly agree

I. Neighborhood satisfaction

Below are things about your neighborhood with which you may or may not be satisfied. Using the 1-5 scale below, indicate your satisfaction with each item by placing the appropriate number on the line preceding that item. Please be open and honest in your responding. The 5-point scale is as follows:

1 = strongly dissatisfied
2 = somewhat dissatisfied
3 = neither satisfied nor dissatisfied
4 = somewhat satisfied
5 = strongly satisfied

How satisfied are you with...

(example) __3__ the number of pedestrian cross-walks in your neighborhood ?

a. ____ the highway access from your home?
b. ____ the access to public transportation in your neighborhood?
c. ____ your commuting time to work/school?
d. ____ the access to shopping in your neighborhood?
e. ____ how many friends you have in your neighborhood?
f. ____ the number of people you know in your neighborhood?
g. ____ how easy and pleasant it is to walk in your neighborhood?
h. ____ how easy and pleasant it is to bicycle in your neighborhood?
i. ____ the quality of schools in your neighborhood?
j. ____ access to entertainment in your neighborhood (restaurants, movies, clubs, etc.)?
k. ____ the safety from threat of crime in your neighborhood?
l. ____ the amount and speed of traffic in your neighborhood?
m. ____ the noise from traffic in my neighborhood?
n. ____ the number and quality of food stores in your neighborhood?
o. ____ the number and quality of restaurants in your neighborhood?
p. ____ your neighborhood as a good place to raise children?
q. ____ your neighborhood as a good place to live?