



**KTH Architecture and
the Built Environment**

Identifying Strategic Initiatives to Promote Urban Sustainability

CARINA WEINGAERTNER

Doctoral Thesis
Stockholm, Sweden 2010

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Abstract

This thesis explores the overarching topic of the capacity of strategic urban development decisions and initiatives (including planning initiatives) to positively and powerfully influence the ability of a city to promote sustainable patterns of development. The work is presented in six scientific papers, the first four of which focus on the development of an inter-disciplinary conceptual framework and research methodology. The concept of *Situations of Opportunity* and its related *Field of Options* is proposed as a means to identify and analyse periods in the growth of cities when urbanisation can be more easily managed so as to promote sustainable development goals. Historical studies in the cities of Stockholm, Dar es Salaam and Curitiba are used to develop the methodology. Another paper looks ahead and refines the methodology in combination with future studies, presenting a research strategy that employs *Situations of Opportunity* as a means to identify and explore periods in the future urban growth with significant potential for change. Building on the method developed, the remaining two papers consider the social dimension of sustainable development and how it can be promoted in the urban context, during ongoing *Situations of Opportunity*. The concept of social sustainability is reviewed and discussed from two different disciplinary perspectives (urban development; companies and products), exploring commonalities and differences in approaches, and identifying core themes that cross disciplinary boundaries. A case study of Eastside, a brownfield redevelopment site in Birmingham (UK), reveals how the retention of established small food outlets can provide opportunities for promoting social sustainability goals in an urban regeneration area. Overall, this thesis provides a better understanding of how transformative change can happen in cities. The *Situations of Opportunity* concept developed here can be a helpful way to study strategic initiatives that promote sustainability in cities.

Key words: sustainable urban development, transformative change, research methodology development, situations of opportunity, field of options.

To three very special people, whom I love dearly:
Ursula, Martin and Emanuel

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Carina Weingaertner
Brasilia, November 2010

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List of Papers

Paper I

*MAMMUT - Managing the Metabolism of Urbanization:
Testing theory through a pilot study of the Stockholm Underground*

Authors: Carina Weingaertner and Örjan Svane

Published: Sustainable Development 2006, Vol 14 (5), pp. 312-326. Wiley InterScience.

Paper II

*Daladala buses deregulated – Analysing Urbanisation’s Situations of Opportunity Via
Tanzanian Example*

Authors: Carina Weingaertner, Örjan Svane and Berndt Brikell

Published: International Journal of Sustainable Development and Planning 2008, Vol 3 (1), pp. 16-28. WIT Press.

Paper III

*Developing methods for analysis of public transport systems to promote environmentally
sustainable urban development – Learning from Historical Situations of Opportunity in
Curitiba and Stockholm*

Author: Carina Weingaertner

Presented: European Network for Housing Research Conference (ENHR), Reykjavik 2005. Published in Licentiate Dissertation (2005) and submitted to an international academic journal.

Paper IV

*Situations of Opportunity in City Transformation – Enriching evaluative case study
methodology with scenarios and backcasting, exploring the sustainable development of
three Stockholm city districts*

Authors: Örjan Svane, Stina Gustafsson, Josefin Wangel, Daniel Jonsson, Mattias Höjer, Per Lundqvist, Jenny Palm and Carina Weingaertner

Presented: European Network for Housing Research Conference (ENHR), Prague 2009. The paper is being revised for publication in a planning research journal.

Paper V

Exploring Social Sustainability:

Learning from perspectives on urban development and companies and products

Authors: Carina Weingaertner and Åsa Moberg

Paper Submitted to an international academic journal.

Paper VI

Urban Regeneration and Socio-economic Sustainability:

A role for established small food outlets

Authors: Carina Weingaertner and Austin Barber

Published: *European Planning Studies* 2010, Vol 18 (10), pp. 1653-1674. Routledge.

1. Introduction

“Sustainability has that ring of universal desirability about it: no one is prepared to fundamentally challenge its precepts, no matter how vague these are, simply because there is an almost holistic human wish for a viable future for this unique planet and its inhabitants”

O’Riordan & Voisey 1998, p. 3

The vision of a sustainable city – a place that provides and sustains a good quality of life for its citizens without depleting nature – is something most people can agree on. However, the reality of achieving such an outcome still poses considerable challenges, and the pattern of development in most (if not all) cities remains unsustainable in the long term. This thesis attempts to explore some concrete opportunities to promote sustainable development that emerge in the process of urbanisation.

Although general principles of sustainable development of cities are common in the academic and policy discourses, in practice, opportunities and initiatives for promoting sustainable urban development in one place are often dependent on its unique characteristics and context, and thus are not necessarily replicable in other localities. Therefore, besides analysing in detail some opportunities for promoting sustainability in cities, new methodology to explore such opportunities was developed in this thesis with the aim of enabling stakeholders in urban development to identify and seize such initiatives within their own context.

1.1 Background to the work

Research and literature on the theme of sustainable urban development are abundant (see for example Janssens *et al.* 2009, Wheeler and Beatley 2004). There are endless definitions (a brief review is presented later on) and a number of writings that approach and review how sustainable development is implemented in cities. Disciplines including planning, architecture, environmental engineering, policy research and urban geography are among those that have carried out research in this field. In the literature, there is considerable overlap of research between these disciplines and it is not always easy or possible to completely separate one from another. However, although research topics on sustainable urban development such as transport, water, land use, ecology, etc. may be similar, each discipline tends to analyse the issues from its own perspective. Recently, however, cross-disciplinary approaches have become more common.

Some studies analyse how the city's ecological footprint can be reduced (Wackernagel & Rees 1996), focusing on efforts to minimise pollution, reduce depletion of energy and other natural resources, and address adverse effects on the living environment (Bromley *et al.* 2005, Habitat 2001, Blowers & Pain 1999). Other researchers have focused on how changes in urban form and the built environment can promote sustainable cities (Cooper *et al.* 2009, Jabareen 2006, Williams *et al.* 2000, Jenks *et al.* 1996, Rabinovitch & Leitman 1996), while still others concentrate on the implications of governance and community involvement (Lafferty 2004, Agyeman & Evans 2004). However, research has also found that there is limited understanding in public agencies of what sustainability actually means, and there is relatively weak implementation of key principles in practice (Evans *et al.* 2003, p. 49).

Thus, there appears to be a strong inertia that needs to be overcome in order to translate the long-term sustainable urban development goals and ambitions into practice (see for example Raco 2007, Rydin 2003, Hajer 1995). The obstacles and inertia have also been studied from various perspectives. Some researchers have concentrated on socio-cultural conditions within organisations, such as professional attitudes (Håkansson 2001 & 2005, Isaksson 2003, Nilsson 2003, Asplund & Hilding-Rydevik 2001, Asplund *et al.* 1997), while others have focused on the more specific issues of governance and power in planning practices (Sehested 2009, Baker & Eckerberg 2008, Owens & Cowell 2002). Still others look at implementation problems more generally, such as lack of clear or workable goals and targets, vague prioritisation, etc. (Åkerskog 2009, Lafferty & Meadowcroft 2000).

How can this inertia to change be overcome and sustainable urban development be promoted more effectively? This thesis is a contribution to the studies of sustainable urban development as a process of change. It looks for ways to identify and analyse opportunities that planning (with a broad meaning) has to promote sustainable urban development, and thus to contribute to bridging the gap between the present and the vision for a sustainable city.

Various disciplines have studied how change arises in cities. On the one hand political scientists often study change from the perspective of institutions, policy and implementation processes, focusing on actors and their interplay, and frequently with less emphasis on contextual or place-related factors (Lowndes 2002, Peters 1999, Rothstein 1996, Kingdon 1995). On the other hand, planning literature and practice often presume more rationalistic processes, guided by documents such as visions, strategies and plans, as means to shape the future and promote change. These also focus mostly on the built environment as an object, with a weaker and at times less explicit understanding of the actors and relationships involved (Sehested 2009, Shipley 2000). The research strategy proposed and tested in this thesis lies between these two approaches to change: it considers the importance of actors and their networks, but at

the same time focuses on place, thus incorporating elements of political science and planning theory.

There is often a gap and tensions can arise between what Healey (2009, 2007) calls urban strategies and planning projects. In planning research and practice, spatial strategies are often used to justify long-term (50+ years) visions of city transformation, and they can include orientating goals and a framework of principles (Healey 2007). Strategies often have little legal or formal power, but exert influence through the strength of their visions and their power of persuasion (ibid). Planning projects, on the other hand, are often short-term proposals reliant on trend extrapolation and prognosis, which tend to promote incremental change and have more formal and political power (ibid). This thesis bridges the gap between these two areas. It contributes to planning practice as it explores how transformative change can happen in cities by identifying units of analysis that lie between the spatial strategy and the planning project in relation to time-frames (10-15 years), complexity and realism. It also considers how persuasion rather than formal means of influence can be used, and examines what needs to happen for strategies to be realised. However, it should not be viewed as a blueprint for construction.

The ways in which the multiple structures and actors in cities interact characterise cities as complex systems (Frey & Yaneske 2007), and long-term planning for sustainable urban development is thus also a very complex activity. This complexity can be illustrated by the uncertainties about what the future may bring, by the conflicts of interests between different stakeholders, by the challenges of identifying and involving the actors that can promote change, by defining the role of planning and the issues that should be addressed through it, etc.

My contribution to this line of research has been to examine how planning can strongly contribute to urban sustainable development, through exploring the concept of *Situations of Opportunity* and other approaches. Thus this thesis identifies and analyses opportunities where actors have greater freedom of action to promote extensive (i.e. transformative rather than incremental) change in cities.

Such opportunities are referred to here as 'strategic initiatives'. While some authors have discussed concepts that relate to strategic initiatives, such as strategic thinking, strategies or plans (Healey 2007, Hajer 1995), I use the term in a looser way, considering its literal meaning, i.e. referring to decisive or critical actions. Nonetheless, the claim that strategies consist of 'ideas about how future opportunities may be grasped and threats avoided' (Healey 2007, p. 183) also fits well with the ways in which the term strategic initiatives is used here.

1.2 Aim and scope

The focal point of this thesis is the transformation path between the present and the vision for a sustainable city. In it I have examined Opportunities to promote sustainable urban development whilst asking 'what should change?', 'who should take action?', 'when can change best happen?' and 'how much impact will that change have?'. The different parts of the research are presented in Papers I-VI. Although each paper has its own objectives and aims, the overall aim of the thesis was to:

Develop and explore the concept of 'Situations of Opportunity' as a planning strategy, and analyse the capacity of such strategic initiatives to positively and powerfully influence the ability of a city to promote sustainable urban development goals.

This cover essay serves two main purposes: to summarise the findings of the research carried out during my doctoral studies (Figure 1); and to explore the connections between the individual papers. It is therefore both a summary of the research carried out and an attempt to take the findings one step further.

1.3 The research journey

The process that led to this thesis started in 2003 when I joined MAMMUT, a interdisciplinary research team developing a new methodology and conceptual framework for studying strategic opportunities to promote environmental sustainability in cities, at the Royal Institute of Technology (KTH) in Stockholm, Sweden. The research carried out in that project yielded four papers and led to my Licentiate Degree¹ (Weingaertner 2005). Following that I took a break from academic studies and worked in a local planning authority, dealing with issues of sustainable development and its implications for policy-making in practice. In 2007 I returned to academia, joining an interdisciplinary research group at the University of Birmingham (UK) studying the process of regeneration of inner cities and how they contribute to promoting sustainable urban development goals. It was around that time that I resumed my doctoral studies at KTH.

The six papers presented in this thesis reflect various stages of my doctoral education journey. The first three papers were published as part of my Licentiate thesis (Figure 1), which also contains a cover essay with a detailed discussion on research methods and development of the conceptual system and methodological framework used throughout my research.

¹ The Licentiate is a degree typical of Nordic higher education institutions, and although it is often likened to the MPhil degree in the British system, it is not the same. The Licentiate equals completion of at least half the doctorate education (about 2 years), and requires the student to finish most coursework and a dissertation formally equivalent to half a doctoral dissertation.

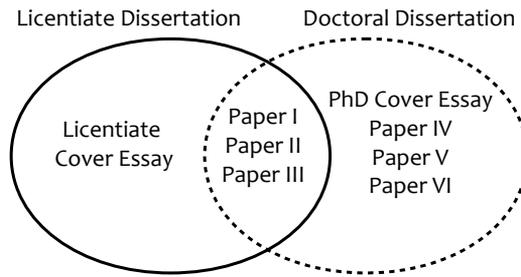


Figure 1: PhD Publications

A more detailed summary of the six papers, their aims and main findings are given later in this thesis. Most of the papers, with the exception of Paper III, were co-authored with one or more colleagues. However, I was first author of most, except for Paper IV, where my contribution comprised historical studies and early methodological development. Paper VI started as a single author work, but evolved to include the contribution of a colleague who was looking at similar questions from a different disciplinary perspective. All six papers have been presented in peer-reviewed international conferences, and three of them have subsequently been published in international peer-reviewed academic journals. The remaining three have been submitted for publication.

MAMMUT research programme

Papers I-IV are the result of work carried out under the research programme 'MAMMUT – Managing the Metabolism of Urbanization'². In this programme an interdisciplinary group of researchers from social, political and natural sciences worked together to study ways in which planning with a wide definition could contribute to the future development of cities towards sustainability in a two-generation perspective. During the initial stages of that research programme, a draft theory in the form of a conceptual framework was formulated.

The project adopted a normative approach, with the assumption that cities need to change in order to promote environmental improvements or achieve sustainability in a wider sense. Thus a series of questions was proposed to illustrate the links and complexities of the interrelation between urbanisation and sustainable development,

² The MAMMUT project ended in 2006, but a new research programme was granted funds (2007-2012) and continued with a similar line of research under the title of '*SitCIt: Situations of Opportunity in the Growth and Change of Three Stockholm City Districts – Everyday Life, Built Environment and Transport Explored as Energy Usage Systems and Transformative Network Governance*' (Svane 2006).

namely: *What? By whom? How much? When?* (Jonsson 2006, Svane 2005, Weingaertner 2005).

- *What can change?* The object of change (buildings, urban infrasystems, institutions, or people's way of life)
- *By whom can change be initiated?* The agents of change (actor networks, planners, policy-makers and policy-implementers)
- *How much should change?* The extent of change – assessed in quantitative and/or qualitative terms (As much as it takes to reach certain sustainability goals, or as far as possible in a sustainable direction)
- *When?* The timing. When can or should conclusive change best take place? (Being prepared to identify and utilise a formative moment when it arises)

My involvement in the project was two-fold: between 2003-2005 my research contributed to further developing and testing the conceptual system and research methodology developed in the project through case studies in a historical context, identifying and analysing strategic opportunities to influence the urbanisation process in the cities of Stockholm, Dar es Salaam and Curitiba. My Licentiate thesis and Papers I-III were written during this period. Since 2007 my involvement with this particular line of research at KTH has been more indirect, as I have been working mostly with the Eastside Sustainability Research project in Birmingham (outlined below). Even so, I have continued to be engaged in discussions about how to take the research of historical studies one step further, and develop the MAMMUT methodology to study the complex issue of city transformation into the future. Paper IV is a result of this later work.

Eastside Sustainability Research

The inter-disciplinary research project at the University of Birmingham (UK), entitled: 'Eastside Sustainability Research'³ (see www.esr.bham.ac.uk) aims to explore how urban sustainable development is addressed in the context of regeneration of inner-city areas, with an in-depth case study of Eastside in Birmingham.

Two papers included in this dissertation were written within this research programme. Paper V explores the concept of social sustainability and its main aspects from the perspectives of urban development as well as companies and products, with a discussion on similarities, differences and challenges related to context-dependent interpretations of the concept. Paper VI analyses the potential opportunity that retention of established small food outlets provides for promoting social sustainability goals in urban regeneration areas.

³ This particular research project ended in 2008, but the UK Engineering and Physical Sciences Research Council (EPSRC) granted further funding, and the research continues under the sustainable urban environments programme as 'Urban Futures: Sustainable Regeneration - From Evidence-Based Urban Futures to Implementation' (www.urban-futures.org)

1.4 Research methodology

Case study methodology was used to varying degrees in Papers I-VI (except in Paper V, which relies on literature review and analysis). Case study is a form of qualitative research, and an assumption behind this methodology is that one can learn from *'the study of the particularity and complexity of a single case, coming to understand its activity within important circumstances'* (Stake 1995). Case studies allow quantitative and qualitative data to be used in parallel, to explore many aspects (or variables) and their complex interrelations, within a real-life context.

One common criticism of this methodology is that the uniqueness of the case makes generalisation more difficult. However Flyvbjerg (2006, p. 228) argues that the criticism about generalisations is misdirected, and that *'one can often generalize on the basis of a single case, and the case study may be central to scientific development via generalization as supplement or alternative to other methods. But formal generalization is overvalued as a source of scientific development, whereas "the force of example" is underestimated'*. It has also been argued that instrumental case studies can include generalisation to theory or methodology, for example in the form of a conceptual system (Svane 2005, Yin 2003).

In Papers I-III, empirical findings from exploratory or instrumental case studies⁴ were intentionally and repeatedly used in different urban contexts (Curitiba, Stockholm and Dar es Salaam) with the explicit aim of testing and further developing the draft theory and conceptual system of *Situation of Opportunity* as a research strategy. Thus, these studies did not include an in-depth, detailed analysis of each case, but were deliberately designed as pilot studies (2-3 months), with the purpose of testing and developing the methodology and draft theory initially proposed in MAMMUT, rather than producing novel empirical results.

In academic works, the reliability and validity of research is often discussed as a means of quality assurance. Validity refers to the credibility of the research, while reliability relates to the possibility to repeat the same study and obtain similar results (Yin 2003). The complexity, uniqueness and timing of case studies mean that in contrast to experiments, the repeatability of such studies is often limited. The historical studies presented in Papers I-III rely mostly on written sources of information and interviews with key informants. The repeatability and validity of the research could have been improved had it been possible to interview actors involved in the decision-making process, but the time that elapsed between the events and the case study prevented this from being done. The case study in Paper VI addressed some of these concerns, as

⁴ For Bell (1993, p. 8) exploratory case studies are in search of new insights on the phenomenon being studied, whilst Stake (1995) suggests that instrumental cases aim at understanding a problem through the use of a case study.

it studied an ongoing issue. However, repeating interviews to obtain the exact same answers may not be possible, even if the same interview guides are used, as the views and opinions of interviewees are time- and context-dependent.

Triangulation of data is often used to increase the credibility and reliability of research and the findings presented (Yin 2003, Stake 1995). Thus, throughout my work I have used a range of different sources and types of data as well as data collection methods to reduce biases and distortions and increase the validity of the research. Besides a review of the literature, other methods for data collection included interviews, direct and indirect observations, field visits, pictures, maps and land use surveys. The data were subsequently analysed mainly using qualitative methods. Academic literature and policy documents were examined, whilst comparing and contrasting arguments, to help draw conclusions. Land use surveys were analysed with the help of software (MapInfo), while aerial photographs and maps were studied to learn about the scale of urban transformation in some of the case study areas. Recordings of the interviews were used alongside notes and policy documents, and helped create a more holistic and complex understanding of the areas being studied.

Before we proceed, a few words about the structure of the dissertation: the next section briefly reviews some key concepts, and the following section outlines each paper in turn, highlighting their aims, major contributions and findings. I then discuss how the papers relate to each other and finally conclude with some reflections on future prospects for research.

2. Considerations on key concepts

This section provides a short overview of 'sustainable urban development' and explores the meaning of 'Situations of Opportunity' and 'Fields of Options' – two core concepts in the methodological framework used here. For a more detailed and in-depth discussion of the latter concepts, see Weingaertner (2005) and Papers I, II and IV.

2.1 Sustainable Urban Development

Although the general sustainable development debate has been going on for quite some time, it was not until the 1990s that it was commonly applied to cities (Hardoy *et al.* 2001, p. 339). While concerns with principles of harmonious relationships between humans, their settlements and the natural environment have long been central to the planning of cities (Blowers 1993, Hall *et al.* 1993), the opportunity that cities provide in explicitly promoting sustainable development goals has only been recognised more recently.

Besides the early ecological/environmental concerns, in recent years the importance of economic and social dimensions in the conceptualisation of sustainable urban development has gained momentum. In the current debate, issues such as social cohesion, perpetuation of cultures, economic stability and growth, access to employment, services and education, health and wellbeing are all considered equally relevant for the achievement of sustainable urban development goals (ODPM 2005).

A plethora of definitions for sustainable development have been applied to cities, a sample of which is presented in Table 1. Although most authors have similar concerns about the need for a shift from the current direction of urban development, they vary in their approach to what sustainable urban development means, as Table 1 shows. Some writers take a more overarching perspective that considers the flow of natural, social and economic resources, whereas others promote more specific definitions. Elkin *et al.* (1991) suggest the relevance of urban form and transport, others highlight the importance of access to services (ODPM 2005, European Commission 1996). The issue of scale is considered by Haughton and Hunter (1994), and several definitions suggest that sustainable urban development is related to meeting people's needs (basic or secondary) and promoting well-being. The importance of participation in decision-making is highlighted by for example Mega and Pedersen (1998) and Jenks (2000). In addition, inter and intra-generational aspects are considered by some (ODPM 2005, Jenks 2000, Girardet 1999). On the other hand, in the policy arena, sustainable urban development has often become another language for curtailing

urban sprawl, building on brownfield sites, promoting higher densities and mixed uses (for an overview see Jabareen 2006).

Table 1: Sustainable Urban Development – a sample of definitions

Sustainable Development and urban form

[Sustainable urban development] “must be of a form and scale appropriate to walking, cycling and efficient public transport, and with a compactness that encourages social interaction” (Elkin et al. 1991, p. 12)

The role of people and businesses

[Sustainable urban development is] “one in which its people and businesses continuously endeavour to improve the natural, built and cultural environments at neighbourhood and regional levels, whilst working in ways which always support the goal of global sustainable development.” (Haughton & Hunter 1994, p. 27)

International Council for Local Environmental Initiatives

“Sustainable [urban] development is development that delivers basic environmental, social and economic services to all residents of a community without threatening the viability of the natural, built and social systems upon which the delivery of these services depends.” (European Commission 1996, p. 8)

European Foundation for the Improvement of Living and Working Conditions

“A sustainable city is one which succeeds in balancing economic, environmental and socio-cultural progress through processes of active citizen participation” (Mega & Pedersen 1998, p. 2)

Meeting people’s needs

“A ‘sustainable city’ is organised so as to enable all its citizens to meet their own needs and to enhance their well-being without damaging the natural world or endangering the living conditions of other people, now or in the future.” (Girardet 1999, p. 13)

Achieving Sustainable Urban Form

“Sustainable development, both inter and intra-generational, was defined as development that does not require resources beyond its environmental capacity, is equitable, promotes social justice, and is created through inclusive decision-making procedures” (Jenks 2000, p. 3)

Sustainable Communities

“...places where people want to live and work, now and in the future. They meet the diverse needs of existing and future residents, are sensitive to their environment, and contribute to a high quality of life. They are safe and inclusive, well planned, built and run, and offer equality of opportunity and good services for all” (ODPM 2005, p. 56)

As with the sustainable development concept more generally, it appears to be very difficult to precisely define or find agreement on the meaning of sustainable urban development. Uzzell et al. (2002 p. 27) suggest a process perspective and maintain that

“sustainability is neither a vision nor an unalterable state but a creative and local process of searching for balance that spreads into all areas of urban management and decision making. As every city is different, every city must find its own way toward sustainability”. Meadowcroft (1999) supports this argument, reflecting that sustainability has fluid and context-dependent meanings, and can thus be used to justify and support a range of policy programmes, from planning compact cities, to creating mixed communities and more environmentally friendly urban design.

Unless otherwise stated, I have used a broad interpretation of the concept of sustainable urban development in this thesis. Thus considering it to be a never-ending process of change (rather than a static endpoint) that promotes measures that balance environmental, social and economic priorities, but also one that recognises that each locality will have to devise its own strategies and priorities for promoting sustainable development within its context.

2.2 Situations of Opportunity

When looking at the growth and development of cities from a historical perspective, some moments in time are considered more important than others. The concept of *Situations of Opportunity* (abbreviated to *Situations*) relates to such moments (Papers I-IV). There are a number of other policy and decision-orientated concepts such as Policy Windows, Formative Moments, Windows of Opportunity and Strategy Making which consider similar issues (Healey 2009, Kingdon 1995, Rothstein 1992, Townsend 1991, Paper II).

Policy Windows refer to occasional and short periods of time when actors have an opportunity to implement new policy (Kingdon 1995), and also promote the idea of a 'queue' of agenda items waiting their turn to be dealt with. Kingdon (1995, p. 168) argues that such windows usually open in response to changes in leadership, changes in power relationships in an assembly, or significant shifts in public opinion. Formative Moments, on the other hand, are described by Rothstein (1996, 1992) as moments of institutional and political instability induced by a specific problem or crisis (such as changes in economic or social circumstances), which existing political institutions are unable to handle. In addition, Rothstein (1992, p. 17) claims that during these formative moments in social and political history, strategically and tactically skilled and well-positioned actors have the possibility to reshape the political institutions and their relationship towards a positive (or negative) development spiral. Windows of Opportunity have been described as recurring (cyclical) situations when it is possible to promote a specific policy agenda (Townsend 1991), and it has been argued that it is possible to promote a particular policy trend during such windows because the full extent of the consequences of that policy is not realised among those affected in a negative manner and thus likely to oppose it (Lukes 1974, Bachrach & Baratz 1970).

In the field of urban planning, the idea of Strategy Making has some similarities with the *Situations* concept. Healey (2009) suggests that Strategy Making relates to efforts to change direction, open up new possibilities and potentials, and move away from previous positions. It is aimed at responding to changing contextual parameters and making a contribution to them, requires collective governance work and emerges slowly over time, often being unpredictable. A similarity between Strategy Making, Windows of Opportunity and *Situations of Opportunity* is that when compared with Policy Windows or Formative Moments, they are less constricted in time and also represent a way of making things happen. They actively search for opportunities to promote change, rather than waiting idle for a formative moment or a policy window to open up.

The *Situations* concept is related to all of the above concepts, but a fundamental difference is that it relates specifically to the normative objective of sustainable urban development, and it is a wider concept in scope and time (Papers I-III). In *Situations of Opportunity* the pre-history, the formative moment (when decisions-of-no-return are taken) and the analysis of outcomes from cross-disciplinary perspectives are all relevant. In addition, it refers to an *Opportunity* in relation to impacts on the future development of the city, with embedded normative goals of environmental improvements (Paper I). However, it is not necessarily an opportunity in relation to political or societal power relations (Jonsson 2006).

The *Situation* concept was first formulated using Grounded Theory during an investigation of the environmental management of the Hammarby Sjöstad ecohousing project in Stockholm (Svane 2008). It was subsequently developed as a methodology for analysing historical and ongoing cases of city transformation. This methodological development was aided by studies of extensive, planned transformation (Svane 2008, Jonsson 2006), such as the planning and growth of the public transport systems in Stockholm and Dar es Salaam (Papers I & II). Based on these studies, a historical *Situation of Opportunity* is defined as:

A period in the city's development when a limited number of actors planned and implemented a consistent set of measures that profoundly and lastingly influenced the future growth of the city – changing its built environment and transport infrastructure, its institutional set-up and its citizens' way of life.

The research strategy proposes that *Situations* be studied from two perspectives on urbanisation, namely metabolism and management. Management of the urbanisation process is studied as a complex interplay between three disciplinary aspects, urban structure, institutional framework and citizens' way of life. The metabolism (or exchange of resources and wastes between the city and its hinterlands) is represented by environmental impacts (Weingaertner 2005 pp. 28-35, Papers I & III).

2.3 Field of Options

The alternatives or choices available to actors in a *Situation of Opportunity* show the situation's *Field of Options* – in other words, they reveal the actors' freedom of action (Papers I & IV). There are a number of contrasting research strands that discuss actors' freedom of action whilst undergoing change (Weingaertner 2005). Some research traditions such as parts of political science and environmental management often argue in rationalistic terms (Elwell 1996, Kingdon 1995) and stress that well-informed individual actors usually have great freedom of action (this is illustrated for example among economists with the concept of '*Homus economicus*'). Other researchers lean towards a more deterministic explanation, indicating that incremental change is often the norm, and that freedom of action is restricted by past choices, thus acknowledging the importance of history in shaping the availability of alternatives for change (see Lindblom 1959 on 'muddling through', Greener 2002 on 'Actor Network Theory' or, more generally, the path dependency literature, e.g. Arrow 2000). Still other approaches suggest that change is always very complex and deeply embedded in socio-cultural processes and relations (Healey 1997, 2007, Ostrom 2005), whereas the discursive structure approach suggests that the way problems are understood or framed constitutes the presumptions for policy action (Bacchi 1999, Hajer 1995, Fischer 1995).

The *Situations of Opportunity* approach takes a middle way, by considering that the challenge of sustainable urban development calls for drastic measures that cannot be achieved through incremental change. At the same time, it accepts that there are limits to rationalism, and that the pre-history of a *Situation* will restrict the freedom of action of its stakeholders. Thus, in the process of growth and transformation of cities, *Situations* are periods when inertia to change is low, and actors' pooled freedom of action – the *Situation's Field of Options* – is wide (Brikell 2005, Weingaertner 2005, Paper II). Therefore, during the *Situation* actors have a greater than average possibility of guiding and influencing the urbanisation process so as to contribute to the achievement of sustainable development goals in a long-term planning perspective.

Whilst studying historical *Situations*, there is a factual outcome with a resulting urban structure and a certain way of life. The pilot studies of historical *Situations* (Papers I-III) showed that in order to better understand the concept of *Field of Options*, it is helpful to study the factual outcome alongside a contrasting counterfactual scenario – illustrating the *Field of Options* that was, at least in principle, available to the actors. Even though it may be controversial to use counterfactual scenarios to illustrate what 'might have been', the concept is still useful in relation to historical studies as it shows how different choices in a given moment – the *Situation* – may result in contrasting outcomes with regard to impacts on the environment.

The *Field of Options* of future *Situations* can be illustrated using scenarios of plausible alternative developments (Paper IV). Jonsson (2006) argues that different scenario approaches should be used. Normative scenarios can set the context, the vision (i.e. images of the future that are 'able to sustain'), while explorative scenarios are better suited to explore the available – and plausible – *Field of Options* to *Situations of Opportunity* that can concretise the normative vision.

3. Reflections on papers

3.1 Outline of papers

This section briefly summarises the main aims and findings of Papers I-VI. The conclusions drawn in each paper are discussed in the following section. The papers are appended.

Paper I: *MAMMUT - Managing the Metabolism of Urbanization: Testing theory through a pilot study of the Stockholm Underground*

Paper I outlines and tests the possibilities and limitations of the concept of *Situations of Opportunity* and its related research strategy. It uses the historical pilot study of the development of Stockholm's underground system to analyse the relationship between the urbanisation process and sustainable development and answer the following questions:

- Can the conceptual framework of MAMMUT help identify a strategic *Situation of Opportunity* in the 20th century history of Stockholm?
- To what extent can the *Situation* be analysed with the aid of the conceptual framework?
- How usable is the methodology and its associated conceptual framework? How can it be developed for use in studies of the future?

In the urbanisation process, actors face different alternatives while seeking to influence the city's development. Analysis of these options shows the extent to which – guided by principles of sustainable development – the process can be managed. Assessment of a small number of environmental impacts (energy use, CO₂ emissions) originating from the exchange of resources and wastes between the city and its hinterlands (its metabolism) alongside qualitative analysis of other impacts (such as quality of life) reveals the extent to which sustainable urban development goals are attained.

The Stockholm Underground was developed in response to major traffic problems in the early 1930s. From an array of possible options, the decision to incrementally develop the underground system was taken in 1941, and construction of the system took almost 30 years (Sidenbladh 1981, Larsson 1977, Asker 1975). Its construction, coupled with the Million Housing Programme (Lundahl & Vidén 1992), became a structuring force that directed the physical post-war growth of the city through the development of suburbs connected to the city centre by the Underground lines. Paper I describes the institutional setting needed for development and operation and the

role of local planning authorities in the process, and also briefly explores how the Underground affected the way of life of households.

In order to contrast with the factual outcome and illustrate the width of the *Field of Options*, in Paper I a counterfactual scenario is proposed and compared with the actual outcome. In this scenario, which uses urban development ideas that were common at that time, Stockholm's development is based on a car-dependent urban structure with highways, roads and a bus system. Consequently it differs from the real outcome in its urban and institutional structure, as well as its urban way of life. A brief qualitative assessment of main environmental impacts of both alternatives illustrates the extent to which environmental sustainability is achieved. The conceptual framework is discussed and further developed throughout Paper I, aided by the empirical material summarised above.

The main contribution of Paper I is the analysis of the research strategy in general, as well as the discussion of its key concepts, rather than the pilot case study in itself. As regards the question of whether the conceptual framework of MAMMUT can help identify a strategic *Situation of Opportunity* in the 20th century history of Stockholm, the answer seems straightforward: studying the development of the Stockholm underground shows that it is indeed possible to identify at least one series of events that fit the definition of *Situation of Opportunity*. Paper I also illustrates how decisions taken at that formative moment powerfully influenced the future urban development of the city, including the physical structure, the institutional set-up, citizens' everyday life and the environmental impacts. Thus, the actors utilised a *Situation of Opportunity* to produce a synergy between urbanisation and sustainable development, although this was not their explicit intention.

The findings in Paper I suggest that the second and third questions above should be re-phrased to: Does the concept of *Situations of Opportunity* define a relevant unit of analysis? Does the conceptual framework support analysis of the *Situation* once it is identified? and How can the methodology and the framework be developed to better fulfil that purpose? There are three main areas that need further consideration and development: i) How to take the concept from a pilot study to a full research project; ii) the complex relationships between the three disciplinary aspects of the *Situation* studied (urban structure, institutional frameworks and people's way of life); and iii) the issue of applying the concept to studies of the future.

Paper I showed that management of the metabolic outcome (i.e. environmental impacts) of urbanisation is complex and should consider the relationships between the management aspects, i.e. physical structure restricting a certain way of life, or powerful institutions guiding the development of the urban structure.

In summary, Paper I shows how the conceptual framework proposed by the MAMMUT project can be used to study the urbanisation process and its possible synergies with

sustainable development through a historical example of a *Situation of Opportunity* in Stockholm. It concludes that the knowledge derived from the study should be applied to studies of the future in order to help identify and analyse *Situations of Opportunity* and outline their *Field of Options*, eventually contributing to the sustainable development of urban areas.

Paper II: *Daladala Buses Deregulated - Analysing Urbanization's Situations of Opportunity Via Tanzanian Example*

As research progressed, the need for more in-depth discussion about the main concepts proposed by this evolving research strategy arose. Paper II further examines key concepts with the aid of theories from political science such as 'formative moments' (Rothstein 1996) and 'action arena' (Ostrom 1999, 1990). Paper II begins by introducing the concepts of *Situations of Opportunity* and *Field of Options*. How can such *Situations* be identified and analysed? In historical studies, when did these moments open up and what did they consist of? Was the process intentional, accidental or the effect of an evolutionary process? Furthermore, what was the *Field of Options* available to the stakeholders?

The analysis of these questions was assisted by the availability of empirical material on a historical *Situation of Opportunity*, namely the development of the 'Daladala' bus system in Dar es Salaam, Tanzania (Nguluma 2003, Sohail 2003, Lupala 2002, Lugalla 1994). The analysis considered four disciplinary aspects: institutional, social, environmental and urban structure. To illustrate the situation's *Field of Options*, a counterfactual scenario based on commuting by train was examined.

During the 1970s, the government in Dar es Salaam began issuing licences to private bus owners, allowing them to operate in parallel to the existing public bus system. This was done as the existing system was failing to provide an adequate level of service to the population. During this *Situation of Opportunity*, rather than investing in improvements for the existing public transport system, the government lost control of the market to private operators that owned mini-buses with the capacity to carry 15 to 30 people (usually one bus per operator). The informal sector now constitutes about 90% of the fleet used for public transport in Dar es Salaam. Paper II explores the ways in which the 'Daladala' system influenced the development of Dar es Salaam and looks upon the decision to open the public transport market as a 'chance lost' from the perspective of actors planning the city's development, but a 'chance taken' by small entrepreneurs – the mini-bus owners. The suggested counterfactual scenario consists of a well-organised and centrally structured public transport system, and a different set of institutions at the local and national government levels. In this scenario the city would develop a different physical structure, with a more dense urban structure, shorter commuting distances and time for citizens, etc. However, Paper II

acknowledges that the existing informal system provides a very flexible and comprehensive, if somewhat unstructured, service. In terms of environmental impacts measured per vehicle km/person, it is unknown whether a different public transport alternative to the 'Daladala buses' would have produced better results.

Paper II shows that Rothstein's (1996) hypothesis on the properties of Formative Moments can be helpful in the identification of historical *Situations of Opportunity*, and the categories suggested by Ostrom (1999, 1990) for characterising an Action Arena can be useful in analysing a *Situation* once it has been identified. Another important observation that emerged from the discussion of Rothstein's work is that an analysis of the prehistory of a formative moment is not included in his discussion. However the pilot study in Paper II shows that the actors in a *Situation* might be restricted by decisions taken in previous years or by routines in the decision-making process. Thus, even though an outside observer or a researcher analysing the *Situation* afterwards could identify a wide *Field of Options*, the stakeholders would have disagreed, if asked at the formative moment. They might not even have been aware of being in a *Situation of Opportunity*. In other words, Paper II indicates that the analytical framework needs to consider the influence of path dependency.

Paper III: Developing methods for analysis of public transport systems to promote environmentally sustainable urban development – Learning from historical *Situations of Opportunity* in Curitiba and Stockholm

The main focus in Paper III was to continue to explore the *Situation's* conceptual framework, and more specifically analyse the environmental impacts of urbanisation within that research framework. The pilot study of Curitiba's (Brazil) public transport system during the 1970s is analysed as a historical *Situation of Opportunity*. It has been argued that public transport systems can create opportunities for cities to influence their growth as well as reduce energy use, and possibly minimise negative effects on the environment such as greenhouse gas emissions (Habitat 1996, 2001, Newman 1996). As in the Stockholm case (Paper I), Curitiba's pre-history restricted the *Field of Options* available to actors, and although an alternative development for Curitiba could have been similar to that in Stockholm, the choice of a bus-based transport system in 1971 (the formative moment) greatly influenced the city's future development, affecting its urban structure, institutional set-up and people's way of life.

In relying solely on buses, Curitiba's transport system is different from the underground plus trams and buses of Stockholm (Paper I). In Curitiba the changes in the urban form were probably the most evident aspect: densification along corridors, bus terminals, and significant changes in the road network. However, the other three aspects (institutional, social and environmental) also contributed to changes in the city's development. Actors such as the mayor Jaime Lerner and his team of planners

were empowered to take decisions that influenced the urban form, citizens' way of life was influenced by easy access to efficient public transport whilst living in compact urban areas, which in turn influenced the environmental impacts (IPPUC 1990, 2000, URBS nd, Rabinovich 1992).

Besides furthering understanding of the conceptual framework, Paper III also aimed to explore methods for the assessment of environmental impacts created by transport systems as a means to estimate the impacts of the metabolism of urbanisation. For each of the two cities compared, energy use for operating the public transport systems during one year was roughly estimated and used as an indicator of environmental impacts. This analysis provided valuable information about the types of measures that were most relevant. The study also confirmed the finding in Papers I and II that pre-history influences the decision of stakeholders during the formative moment.

Paper IV: *Situations of Opportunity in city transformation – Enriching evaluative case study methodology with scenarios and backcasting, exploring the sustainable development of three Stockholm city districts*

If global warming is to be kept at 2°C, society faces challenges of a new magnitude (IPCC 2007). In Sweden, as in any high-income country, this could be a powerful driving force in city transformation. However, tackling the challenge of sustainable urban development poses problems for planners and researchers. Decisions must be made on the planning processes to be used and the urban structures that enable transformation and how planners and other actors can combine forces to liberate themselves from path dependency, extending their freedom of action.

Paper IV builds upon previous research on historical cases of city transformation and the conceptual system of *Situations of Opportunity* (Papers I-III) by applying the concept of *Situations* to planning for urban areas. It thus starts to explore the applications of this approach for studies of the future. In order to do so, however, further methodological development is needed. Paper IV examines whether evaluative case study methodology merged with techniques from Futures Studies could provide a cross-disciplinary research approach that defines the challenge in scope and time, while retaining its complexity.

Paper IV starts by briefly outlining explorative case study methodology (Stake 1995, Bell 1993) and future scenarios, and explains how these can be used to study complex phenomena. Complexity is understood as a means to integrate the issues of 'What to change' and 'Change by whom' in order to explore 'How change can come about' and evaluate 'How much it could contribute to sustainable urban development' (these questions are similar to those discussed in Paper I and section 1.3 of this thesis). Note that in Paper IV the earlier question of 'When can change best take place' is replaced

by 'How can change happen?', which is broader in scope.

Paper IV shows that Futures Studies can indicate the probable or supply visions of the desirable, and can be predictive, normative or explorative (Börjeson *et al.* 2006). Paper IV focuses mainly on normative scenarios, and on the long-term necessity of mitigating global warming, using backcasting and other scenario techniques to develop plausible *Situations* that could markedly contribute to sustainable urban development. To illustrate this, scenarios were developed that explore the path of transformation of three Stockholm city districts, from today's climate changing society towards a 2060s vision of a low carbon, low energy society. These scenarios were then further explored and evaluated using case study methodology.

Paper IV proposes that future *Situations* be developed in four steps, in which the first two steps are transdisciplinary exercises (Lawrence and Desprès 2004). In the first step, 'Situation Seeds' (i.e. periods in the future when plausible but improbable change can happen) are identified. In the second step, these Seeds are developed into 'Content Scenario', i.e. a consistent description of the *Situation* as a plausible future development. In the third step, the *Situation* developed in the Content Scenario is evaluated in disciplinary work packages, using Energy Usage Modelling (Lagergren 2005) to quantify and evaluate outcomes in terms of reduced energy use and emissions, and Transformative Governance Network to study the process of change, its agents and their forms of co-operation over time. In the fourth and final step, the 'Final Scenario', a narrative of the *Situation* as a process of change seen from the future looking back, is presented.

For example, in the city district of Bromma in Paper IV, the starting point for developing future *Situations* was the following 'Seed': What if the residents of Bromma were prepared to partly replace their use of private cars by a car-share system combined with improved public transport? A scenario of the *Situation* was then developed by asking What-Who questions: What types of car does the system provide? What changes in the public transport system could reduce car use? Who would manage the car-share system in Bromma? What role could the public transport company play? This iterative questioning resulted in a cross-disciplinary Content Scenario describing the *Situation*.

The third and fourth steps applied to Stockholm city districts are not presented in Paper IV. However the feasibility of these steps has been tested in recent projects (Lewakowski *et al.* 2010, Sølgaard *et al.* 2010). These studies indicate that it is feasible to continue along these lines of research to explore the potential for extensive and rapid reductions in energy use and associated emissions and produce a cross-disciplinary body of knowledge about the process of transformation in cities.

Paper V: *Exploring social sustainability - Learning from perspectives on urban development and companies and products*

At this point the focus of my research shifted from *Situations of Opportunity* that promote environmentally sustainable urban development to embracing other dimensions of sustainability in cities.

Paper V starts by recognising that despite the extensive body of literature, there is still a fragmented approach to social sustainability. Therefore a better understanding of the meanings and interpretations of that concept is still needed, in particular when considering it from a cross-disciplinary perspective (McKenzie 2004). Paper V contributes to the ongoing debate by reviewing and discussing the social dimension of sustainability from the perspectives of two fields: urban development; and companies and products. These fields were deliberately chosen as they are often led by two contrasting groups of stakeholders. Urban development is strongly led by the public sector, whereas companies and products are generally led by private interests. Analysis and comparison of the conceptualisation of social sustainability within these contrasting fields was also intended to help identify core themes, which cross disciplinary boundaries.

A literature review of existing conceptualisations of social sustainability, including a list of aspects that are used to characterise the concept, revealed that in both fields societal issues only recently became a focus in the sustainability debate. Paper V then analysed the commonalities and differences in how the concept is understood.

Each field has some unique aspects that make up its understanding of social sustainability: the relevance of production and labour practices is high in the companies and products (Benoît & Mazijn 2009, GRI 2007), whereas connectivity and movement as well as a sense of community are more specific to the urban development field (Colantonio & Dixon 2009, RESCUE 2005). Thus Paper V concluded that alongside the list of aspects, a set of key themes (social capital, human capital and well-being) may be beneficial for promoting an overall understanding of the concept and putting more specific aspects into perspective. While comparing and contrasting the fields it also became clear that life-cycle approaches to social sustainability are currently commonly discussed for products, but urban development initiatives could benefit from such approaches to avoid sub-optimisations and possible negative social impacts.

Another finding relates to stakeholders of social sustainability. In urban development, agents for change are often found in the public sector, but a specific actor is rarely assigned explicit responsibility for promoting social issues. In contrast, at least to some extent, individual companies are more explicitly considered responsible (or the agent for change) for promoting social sustainability, as indicated by the growing importance of corporate social responsibility policies within companies. In addition there are also

stakeholders who can be grouped as 'affected by change' (some stakeholders being both).

In practical projects (e.g. a neighbourhood redevelopment, new product or company), each of these groups of stakeholders may find some aspects of social sustainability more relevant than others. Their interpretations of the meaning of individual aspects will often reflect their own agendas, and thus agreement on key aspects within a specific context might be difficult. Paper V points out that it is important to involve as many stakeholders as possible in a process of iterative questioning, to determine the most important aspects to be considered for social sustainability within a particular project. The use of key themes alongside more specific aspects of social sustainability could be further developed to aid the identification of local priorities and conditions.

Paper VI: *Urban regeneration and sustainability: A role for established small food outlets*

In recent years the challenges of urban regeneration and sustainable urban development have increasingly been brought together in the discourses concerning the re-shaping of central and inner-city districts in large British and European cities. The re-use of brownfield sites near city centres has been particularly targeted, not least because of recent government policies that support and encourage such redevelopment (DCLG 2006, Adams 2004, EP 2003). In response, many former industrial sites in the vicinity of city centres are being transformed to incorporate a range of uses.

Paper VI explores the opportunities and obstacles created by the regeneration of inner-city districts, to promote the social dimension of sustainable urban development. In the UK, current sustainable development goals in regeneration policies and projects are mostly dominated by the environmental dimension (biodiversity, natural resources) and qualities of the built environment (density, mix of uses, access to open space), with some focus on the more easily quantifiable aspects of social and economic dimensions (such as job creation, affordable housing provision, etc.) (Williams & Dair 2007). However, there appears to be limited understanding about the benefits of integrating socio-economic aspects of sustainable regeneration.

Urban areas targeted for redevelopment are often considered to be unsafe, underused and with little or declining economic activity. In reality, however, these sites often have an established community of residents, businesses and services that choose to operate in low-profile, run-down and unattractive brownfield areas because of their history, location, low property values, etc. These businesses represent part of the existing local social and cultural values, they are bearers of the area's history and could contribute to its vibrancy during the transition period and beyond, attracting people and reducing safety and emptiness concerns while also strengthening the local

economy (RESCUE 2005, Wheeler 2004, Sachs 2002).

Paper VI extends this debate by critically exploring an ongoing regeneration project branded as 'exemplar of sustainable urban development' in Birmingham's Eastside district (UK). The study showed how retention, rather than replacement, of established small businesses (food outlets in particular) in urban regeneration sites could be a valuable *Situation of Opportunity* for promoting socio-economic sustainable urban redevelopment goals.

Unlike previous papers (I-IV), Paper VI does not focus on the development of the *Situation of Opportunity* methodology, but rather starts with the assumption that the retention of some types of established businesses in regeneration areas provides stakeholders of regeneration with a unique opportunity to promote the socio-economic dimensions of sustainable development. Thus it indirectly examines an ongoing *Situation of Opportunity* that may be encountered by actors involved in regeneration of urban areas. Paper VI also reflects on current planning policy practices and local governance issues and how actors such as planners could seize (or ignore) this particular opportunity.

3.2 The red thread

Papers I-IV had the overarching aim of developing and testing the concept of *Situations of Opportunity* as a methodology for exploring the city transformation initiatives that promote sustainable urban development.

Paper I looked at some rather straightforward questions, and the conclusion from the case study was that the *Situations* methodology and conceptual system could be used to identify one such strategically relevant initiative in the recent history of Stockholm – the development of the underground system. For a *Situation* to be a relevant unit of analysis, however, the proposed conceptual system needs to further address the questions posed in this thesis (see section 1.3). Paper I confirmed that in a full-scale research project, management and metabolic aspects of urbanisation need to be analysed from a cross-disciplinary perspective considering issues of mutual dependency and interchange.

Paper II compared the concept of *Situations* to similar concepts used in political sciences and concluded that *Situations of Opportunity* is a similar, but not identical, concept to 'Formative Moments' and 'Action Arenas' (as discussed in sections 2.1 and 2.2). However, Rothstein's (1996) hypothesis on the properties of formative moments and Ostrom's (1999, 1990) categories characterising action arena proved useful, in particular when analysing the institutional aspects of a *Situation*. It was shown that the stakeholders of a *Situation* may be restricted in their choices (thus the *Field of Options* is smaller) by the pre-history or routines in the decision-making process. Future

research should therefore develop tools that help stakeholders of future *Situations of Opportunity* recognise that they are approaching such instants and identify as wide a *Field of Options* as possible. Paper II showed that in the development of a *Situation* a ‘chance lost’ from the perspective of some actors (in this case city planners) can be a ‘chance taken’ by other actors (mini-bus entrepreneurs).

Paper III compared the development of public transport systems in Curitiba and Stockholm and confirmed the point made in Paper II that while it is possible to influence and guide the process of urbanisation in certain moments, the pre-history that influences the decision of actors in the formative moment plays a significant role. The discussion and comparisons of the *Situations* in the two cities also suggested that the proposed research framework is applicable in different contexts. Paper III reinforced the finding from Paper I that management and metabolic aspects are interrelated, not in a cause-effect manner, but rather in a complex web of synergies.

Applying the draft theory and conceptual framework in historical cases of three very different cities helped test the usability and adaptability of the proposed research strategy. Paper IV reported on methodological development of the *Situations* concept for analysis of future growth in cities. An important difference between this and Papers I-III is that rather than identifying existing/past *Situations*, possible *Situations* that lie 10-20 years ahead need to be created. Whilst acknowledging that methodological difficulties still lie ahead – as this is a complex step in the development of the *Situations* research strategy – Paper IV concluded that it seems feasible to develop a strategy that merges Future Studies with Case Study methodologies, to explore some urban planning initiatives that have the potential for extensive and rapid reductions in energy use and emissions.

One of the necessary limitations of Papers I-IV is that they mainly focused on *Situations* that provided opportunities to reduce impacts quantified in terms of energy use, thus concentrating primarily on the environmental dimension of sustainable urban development. In contrast, Papers V and VI analysed a current opportunity for promoting the social dimension of sustainable urban development.

The review and analysis of the concept of social sustainability from two contrasting disciplinary perspectives in Paper V led to the conclusion that despite differences in definitions, there is an underlying common understanding that the social dimension is related to improving and maintaining good quality of life for people. Paper V also revealed that some aspects of social sustainability can be emphasised and others played down, depending on the context and stakeholders involved. The overall conclusion was that urban development could learn from the approach of companies and products, and vice versa.

Some of the knowledge from Paper V was applied in Paper VI in exploring how

planners and other stakeholders are missing an *opportunity* to promote socio-economic sustainability in brownfield redevelopment sites. The conclusion was that retaining established food outlets throughout and beyond redevelopment activities can help promote social sustainability goals. Paper VI identified a need for improvements in local governance of regeneration areas, and claimed that actors involved in this process should accord greater attention to the role of established businesses in fostering urban districts that strive towards integrating socio-economic aspects of sustainable development.

To sum up, whereas the first four papers are concerned mostly with the development of the *Situation* methodology and conceptual system, the last two papers explore how such initiatives can be used by key actors such as planners, to promote social sustainable development goals in cases of ongoing urban transformation. Thus the research carried out in Papers I-VI provided new knowledge on the transformation path between the (unsustainable) present and the vision for a sustainable city. *Situations of Opportunity* are proposed as a possible planning strategy to identify and analyse strategic initiatives that have the ability to positively and powerfully promote sustainable development in the process of urbanisation.

4. Concluding remarks

This thesis provides a better understanding of how transformative change can happen in cities, whilst exploring a new theory in the form of a conceptual system. The concept of *Situations of Opportunity* was found to be a helpful way to study strategic initiatives that promote sustainability in cities. Besides the methodological and conceptual development, another main finding illustrated by the case studies of Curitiba, Stockholm, Dar es Salaam and Birmingham (Papers I-IV, VI) is that despite contextual differences particular to each city, it was possible to apply the proposed conceptual system to identify and analyse strategic planning opportunities that have the ability to powerfully influence the cities' transformation path towards promoting sustainable urban development goals.

However, realisation of visions of a sustainable city depends on cities being able to identify the issues and approaches best suited to their particular needs and circumstances. As the city develops, circumstances may change, as will the strategies for promoting sustainability goals. Even within cities priorities may vary and thus it is important that each city identifies context-specific strategic initiatives to promote sustainable development at the local scale. Planners are in a privileged position to identify a wide range of options for future development of cities, as they are constantly involved in a process that uses strategic thinking and future visioning as tools for strategy-making (Healey 2007, pp. 282-286).

Within this context, the conceptual framework of *Situations* proposed here could become a tool to aid strategic thinking and broaden the perspectives of planners and other actors involved in the process of change in relation to sustainable urban development, helping them to identify and utilise opportunities where freedom of action is large and the *Field of Options* available is wide. The ongoing SitCit research has started to explore this line of research.

Another important aspect that could be considered further is the possibility to develop a methodology that could help identify *Situations of Opportunity* well in advance. Having reasoned about the relevance of such *Situations*, it is crucial that future research explores ways of providing actors in urban development with tools that could enable them to identify (or perhaps even create) *Situations of Opportunity* ahead of time, to enable more co-ordinated action and better results. The use of future scenario methodology to explore ways in which *Situations* can be identified well in advance is a possibility that is currently being explored by some researchers in the SitCit project, as well as other ongoing research. However, this is a challenging area of research, as using the *Situations* methodology to prescribe or predict paths for future transformation is controversial.

One further issue that could be explored in the future development of the *Situations* methodology is how social sustainability aspects can be made more prominent within the proposed research strategy. One suggestion is that in analysis of the metabolism of cities, alongside estimating environmental impacts (in terms of energy use and emissions), the methodology could be further developed to measure the impacts that changes towards a more sustainable city will have on people (e.g. examining issues such as health, social capital, education, etc.).

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