A METHODOLOGY FOR UNDERSTANDING THE CONCEPTUAL RELATIONSHIP BETWEEN SUSTAINABILITY AND THE URBAN DESIGN DECISION-MAKING PROCESS

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The urban design process must be transformed and improved if sustainable urban environments are to be created. Although the UK government and other influential bodies have written many reports about the importance of urban design and sustainability in creating community, much more needs to be done to demonstrate how, when and where sustainability is embedded within the urban design process. We also need to understand who the decision-makers are within this process and what influences their decisions. A clear picture of how the urban design decision-making process works from start to finish, and how sustainability is embedded within this process, can help us to best achieve the goal of sustainable urban environments. This paper proposes a methodology to understand the relationship between sustainability and the urban design decision-making process through an EPSRC-funded project called VivaCity 2020. The project will help to disseminate knowledge about the complex relationship between urban design, decision-making and sustainability.

KEYWORDS: urban design, sustainability, decision-making, methodology.

1. INTRODUCTION

Increasingly, urban designers and planners in the UK are expected to address sustainability issues in building and urban design projects. To achieve the aims of creating sustainable urban environments, though, urban design must transform and improve the processes by which it normally operates. Too often, activities are undertaken with inadequate involvement of relevant stakeholders, discussion of sustainability issues are muted in favour of short-term gain and decision-makers are not held accountable for their choices.

To help combat these problems, the national government has written reports in recent years that advocate the benefits of involving the community, talking about sustainable communities and keeping processes open and transparent (Office of the Deputy Prime Minister, 2002, 2003, 2004a, 2004b, 2005a, 2005b). More needs to be done, however, to demonstrate how and where sustainability is embedded within urban design and how decisions being made and the influences on those decisions impact the creation of sustainable urban environments. Through the VivaCity 2020 project, knowledge will be disseminated that demonstrates a well-defined urban design process in which sustainability is embedded. VivaCity 2020 is an EPSRC-funded research project that aims to analyse urban planning, design and consultation processes to identify how and when key decisions related to urban sustainability are made. Case studies in three UK cities will form the basis for our understanding of the urban design decision-making process and its relation to sustainability.

The paper is divided into two sections. The first section reviews the literature on urban design and sustainability. Within this section, a higher level urban design process will be shown that has been synthesised from various design processes. The second section indicates a proposed methodology for investigating the urban design process and how and where sustainability is embedded within this process.
2. LITERATURE REVIEW

This section reviews our understanding of urban design, the urban design process and sustainability in two subsections: what do we know about urban design and the process? What do we know about sustainability and urban sustainable development?

2.1. What do we know about urban design and the process?

Defining urban design

As a concept, urban design is open to much interpretation because of its multidimensional nature. Different groups of people – researchers, professionals, educators, the lay public – think about urban design in their own terms, bringing their own experiences to the concept of urban design. No matter how varied the definitions are, there is some consensus about some of the basic components of urban design.

Urban design may be viewed as a multifaceted approach and response to urban change and development (Barnett, 1982, Rowley, 1994). Principles, guidelines, and considerations are constantly being formulated and evolve with respect to our social, functional, aesthetic and emotional needs. Emphasis is placed on our use, perception and experiences with places over time (Rowley, 1994). With this knowledge in hand, we can therefore attempt to define urban design as: the art and process of designing, creating, making and managing spaces and places for people (Commission for Architecture and the Built Environment, 2000; Rowley, 1994).

From this definition, two things become apparent. First, urban design is creative and distinctive to each situation in which it is implemented. That is, it cannot be employed as part of a blanket policy at a national level to be used in all places. Rather, urban design must be fostered at a more local level, through local authorities and the community, where people have more experience with the specific urban design issues that need to be addressed (Commission for Architecture and the Built Environment, 2000). Corresponding to recent government reports, involving local stakeholders in urban design projects is key to creating places in which people want to live, work and recreate (e.g., Office of the Deputy Prime Minister, 2002, 2003, 2004a, 2004b, 2005a, 2005b; see also Carley, Jenkins, & Smith, 2001). Urban design is thus a fundamental part of creating sustainable communities that are lively places with distinctive character, safe, accessible, pleasant to use, human in scale, and that are inspirational (Commission for Architecture and the Built Environment, 2000).

The second thing that is apparent from the definition of urban design is that it is a process. This process is complex, involving various stakeholders, tasks, issues, and feedback loops that form and influence urban design projects over time (see The Urban Design Process below for more information). Sustainability is also part of the urban design process, firmly and intimately embedded within design (see Office of the Deputy Prime Minister, 2004, 2005a, 2005b). It is therefore fundamental that we first understand the urban design process at a higher conceptual level because then we will know the basic “rules” to be able to discuss how and where the urban design process is influenced by sustainability. Moreover, we can begin to comprehend how the particulars of various situations shape and are shaped by urban design and sustainability (Jacobs, 1961). We must understand the local context – including the community – and how that context influences the relationships between stakeholders, including dealing with aspects of conflict, (dis)trust, and (mis)understanding (Rydin, Holman, Hands, & Sommer, 2003). With this knowledge, we can improve upon existing urban design processes, which will help ultimately to improve a variety of urban design projects.
The urban design process

To understand how urban design “works,” we must know more than the product; we need to comprehend the process (see Kagioglou et al., 1998; Rowley, 1994). The urban design process first developed as an alternative to the more traditional planning approach (Rowland, 1995). A traditional approach considers planning as more of a passive exercise, of which urban design has little part to play. For example, rational-comprehensive planning (Faludi, 1973), incremental planning (Lindblom, 1959; Etzioni, 1968), and decision-centred planning (Faludi, 1987) sees planners as rational decision-makers, making planning choices based principally on quantitative data collection and analyses. Some stakeholders, such as local residents and small business owners, may be apportioned less significance within traditional planning approaches because the information they may provide about a project to planners may be considered too subjective or qualitative. This information may not be entered easily into the rational decision-making process, and is therefore discarded in favour of more quantitative data (i.e., “hard” facts and numbers).

An alternative way of thinking about urban design highlights the qualitative, emphasising the characteristics of elements in a proposed development site and the relationships between the elements. The higher conceptual urban design process presented here is based on an amalgamation of different design processes from the fields of urban design (Biddulph, 1995; Canadian Institute of Planners, 2000; Rowland, 1995); planning (Bressi, 1995; Nelessen, 1994; Okubo, 2000; Roberts, 2003; Wates, 1996, 1998); architecture (Royal Institute of British Architects, 1999), the manufacturing, construction and engineering industries (Austin et al., 2001; Cooper, 2002; Woodhead, 2000); business (Smith & Jackson, 2000); and nongovernmental organizations (English Partnerships, 2000; Heritage Lottery Fund, 2000) (see also Macmillan, Steele, Kirby, Spence, & Austin, 2002, for a similar comparison of process maps in engineering and architecture). These different design processes were chosen because there is considerable overlap in the stages and phases experienced in the general field of design. What is interesting to note is that many of these design processes contain elements of rational decision-making, much like the traditional approaches to planning. For example, in the business process, which examines the initiation phases of a project, the evaluation phase consists of economic and financial analyses, a risk assessment, and cost and time planning (Smith & Jackson, 2000). These evaluations are principally based on quantitative information gathered from objective sources. What distinguishes some of the processes, particularly the more recent urban design and planning process, however, is the incorporation of more subjective information – including discussion of sustainability – into the different phases of the process. Integrating this type of information, such as interviewing community members to understand the local issues in a neighbourhood, may help to give a more complete picture of the context than if quantitative and rational decision-making were used alone.

The synthesised urban design process involves four stages: (i) Creating teams, appraising the situation and forming goals; (ii) Designing and developing; (iii) Evaluating, selecting and creating a plan; and, (iv) Implementing, monitoring and following up. In between each stage are transition stages that may help stakeholders to redefine the goals of previous stages and move forward to subsequent stages: (a) Continuing to understand the context; (b) Continuing to think about alternatives; (c) Re-creating a plan; and (d) Continuing the process. These transition stages may be seen as “soft gates” in which stakeholders review their actions and make decisions about how to proceed (Kagioglou et al., 1998). The transition stages also allow the process to be iterative, ensuring the project does not end when the development is built, but continues to be monitored and assessed throughout the lifecycle of the development.
2.2 The higher level urban design process

The higher level urban design process of stages and transition stages are outlined in bulleted form in this section (see Table.1).

Table 1. The higher level urban design process.

<table>
<thead>
<tr>
<th>Stage 1: Creating Teams, Appraising the Situation and Forming Goals</th>
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<tbody>
<tr>
<td>• Create teams, including a steering committee with an appointed leader, and a core multidisciplinary team. Involve as many stakeholders as possible.</td>
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<tr>
<td>• Appraise the project site and surrounding area via an identification of needs, issues, problems and opportunities.</td>
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<tr>
<td>• Identify stakeholder requirements through various methods (e.g., attending town hall meetings, surveys).</td>
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<tr>
<td>• Develop a mission statement, goals, objectives and/or vision for the project.</td>
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<tr>
<td>• Acquire funding and set up a budget and timetable for the project.</td>
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<td>• Communicate aims and the process at this stage to all stakeholders.</td>
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<tr>
<th>Transition Stage: Continuing to Understand the Context</th>
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<tr>
<td>• Might require revision of goals and communicating further with stakeholders.</td>
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<tr>
<th>Stage 2: Designing and Developing</th>
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<tr>
<td>• Start development of a project brief that includes plans for design.</td>
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<tr>
<td>• Provide feasibility, cost, social, legal and political assessment, and testing of ideas in project brief.</td>
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<tr>
<td>• Think about, use and involve stakeholders.</td>
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<tr>
<td>• Complete a list of options and alternatives; refine the content of options and alternatives through the use of workshops, community participation, maps, computer modelling, and so forth.</td>
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<tr>
<td>• Finish writing a report with recommendations about options and alternatives.</td>
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<tr>
<th>Transition Stage: Continuing to Think about Alternatives</th>
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<tr>
<td>• Might require revision of report from Stage 2 to think more about alternatives.</td>
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<tr>
<th>Stage 3: Evaluating, Selecting and Creating a Plan</th>
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<tr>
<td>• Options and alternatives are evaluated against mission statement, goals, objectives and/or vision.</td>
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<tr>
<td>• Selection of options and alternatives.</td>
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<tr>
<td>• Assessment of options and alternatives (e.g., financial analysis).</td>
</tr>
<tr>
<td>• Consult all stakeholders about selection and assessment of options and alternatives.</td>
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<tr>
<td>• Consult relevant stakeholders about decisions made up to this point and what needs to be done in the future.</td>
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<tr>
<th>Transition Stage: Re-Creating a Plan</th>
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<tbody>
<tr>
<td>• Might require selection of new options and alternatives based on new information from the context, stakeholders, assessment of project brief and so forth.</td>
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<tr>
<th>Stage 4: Implementing, Monitoring, and Following Up</th>
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<tr>
<td>• Implement the selected option and alternative.</td>
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<tr>
<td>• Identify any problems, review performance and monitor progress.</td>
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<tr>
<td>• Communicate with stakeholders about benefits via reports (e.g., through the use of the media)</td>
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<tr>
<td>• Settle accounts and finances.</td>
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<tr>
<td>• Establish a group to take over once the project has been completed.</td>
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The higher level urban design process provides a set of tasks for key stakeholders engaging in urban design projects. There are many issues that need resolving, however, including who the stakeholders are in this process, what influences their decisions throughout the process, and where and how sustainability is embedded within this process. Moreover, we believe that the synthesised urban design process as set out here is incomplete. For example, there is no information before the final stage about refining the selected option, setting a final budget and timetable, developing a detailed plan and including other processes (e.g., the project management and construction processes). Once we have conducted our case studies, we will be in a better position to describe the urban design process and provide more detail at each stage.

2.3. What do we know about sustainability and urban sustainable development?

Defining sustainability

Over 70 different definitions exist for sustainability in a variety of academic fields and disciplines (see Holmberg & Sandbrook, 1992; Pearce, Markandaya, & Barbier, 1989). What seems to characterise many of these definitions of sustainability is the recognition that the future is important to consider, that there are limits to our growth as a planet, and that there are ways for humans to protect and enhance the earth while satisfying various needs. Perhaps the most common and well-used definition comes from the Brundtland Commission, which defines sustainability as, “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (World Commission on Environment and Development, 1987). This strong, people-centred stance on sustainability stresses three main quality of life objectives: (i) social progress that addresses the needs of all people; (ii) the effective protection of the environment and prudent use of natural resources; and, (iii) the maintenance of stable levels of high economic growth and development (Department of Environment, Transport and the Regions, 2000). These three objectives are not qualitatively equal or mutually interacting. The social, economic and environmental dimensions occupy different positions in a hierarchy depending on the specific sustainability issue undertaken. The interactions between these dimensions are also dynamic, with changes in one dimension impacting the other dimensions (Kearns & Turok, 2004; Lehtonen, 2004).

Urban sustainable development

Following the Earth Summit in Rio de Janeiro in 1992, increasing attention is being paid to the sustainable development of urban areas. With over 47 percent of the world’s population currently living in urban areas and about 60 percent of the population becoming urban by 2030, it is becoming increasingly important to recognise the role of sustainability in urban areas (Population Reference Bureau, 2004).
Developing urban areas that are more sustainable by maximising interactions and feedbacks between the three dimensions of sustainability can help to combat the problems (e.g., sprawl, commuting, crime, alienation, loss of agro-economies) and enhance the advantages (e.g., proximity and accessibility to a range of amenities, diversity of social interaction and agglomeration economies) of cities (Carmangi, Capello, & Nijkamp, 1997; Girardet, 1999). Supporting urban sustainability means understanding the symbiotic and synergistic relationships among the elements of the city, meeting the needs of all citizens in urban areas, enhancing well-being without damaging the natural world, and guaranteeing that the development options of surrounding environments are not jeopardised, now or in the future (Carmangi, Capello, & Nijkamp, 2001; Girardet, 1999; Ravetz, 2000).

The drive to promote urban sustainability is growing. Governments in Europe and the UK adopted sustainable development agendas in the 1990s and continue to ensure that the sustainability of urban areas is promoted via policy. In the UK, urban policy has focused on the notion of creating sustainable communities (Department of the Environment, Transport and the Regions, 2000; Office of the Deputy Prime Minister, 2002, 2003, 2004a, 2004b, 2005a, 2005b). Through excellence in design, environmental and social responsibility and economic investment and legislative change, the government believes that urban centres can thrive (Department of the Environment, Transport and the Regions, 1999). The entire process of creating urban sustainable environments, though, must be transparent, giving stakeholders full information, participation, and ownership in sustainable development (Office of the Deputy Prime Minister, 2004a). Decision-makers and stakeholders must also consider the needs and broader interests of the community to secure a better quality of life for the community. Finally, short-term and long-term effects of urban sustainable development, including any costs to the environment, the community, and the economy must be identified and assessed. The next section outlines a proposed methodology that will be used to understand the urban design decision-making process and how sustainability is embedded into this process.

3. A METHODOLOGY FOR UNDERSTANDING THE RELATIONSHIP BETWEEN SUSTAINABILITY AND THE URBAN DESIGN PROCESS

As stated above, VivaCity 2020 will analyse urban planning, design and consultation processes to categorise how and when key decisions related to urban sustainability are made (see Khalfan, Bouchlaghem, Anumba, & Carrillo (2002) for a related project concerning the management of sustainability knowledge in the UK construction industry). We plan to undertake this research using a framework that involves eight separate Work Packages (see Figure 1). The first Work Package represents our understanding of the urban design decision-making process. The remaining Work Packages correspond to our understanding of sustainability issues (the exception will be the last Work Package, which will examine ICT support solutions that may be used to create tools and resources to aid in the generation of sustainable urban environments).

To help guide the research, each Work Package will begin case studies in London, Manchester and Sheffield. These cities were chosen because they represent 24-hour cities that contain a host of urban sustainability issues like the ones VivaCity 2020 is investigating. The research will be both quantitative and qualitative in nature, ranging from the collection of NO₂ emissions via pollution monitoring devices to open-ended, face-to-face interviews with key stakeholders in each city. Each Work Package will decide on the methods, tools and techniques that they believe will best capture the information needed for that research.
Through our case study work in each city, we will be examining when and where sustainability issues involving crime, environment quality, land use, and the provision of housing and public conveniences become introduced – and should be introduced – within the urban design process (see Figure 2). We will also be able to learn who makes design and sustainability decisions and what influences these stakeholders. For example, when different stakeholders (e.g., developer, architect, planner, city council and resident’s group) are thinking about the addition of a new mixed use development in an urban area, do they think about how the building design will impact crime and pollution in the area? Consequently, do they think about how crime and pollution will impact the design of the mixed use development? When will/should they think about crime and pollution within the process of designing the development? To what extent/in what detail will they discuss crime and pollution issues surrounding the new development? Who will make decisions about whether/when these issues should be addressed? What will influence their decisions (e.g., financial resources, public sector proclivity towards private sector involvement)?

![Diagram of sustainability and urban design decision-making process](image)

*Fig. 1. Proposed framework to understand the relationship between sustainability and the urban design decision-making process. Source: VivaCity 2020 main presentation (2003).*

From this information, a support specification will be formulated for the generation of tools and resources to enable the development of more urban sustainable environments. Consultation with various stakeholders about the support specification also will help to assimilate the needs of those most likely to use the tools and resources with the aim of seeking clarification for the above questions (see Innes & Booher, 2000). We may be able to introduce new sustainability issues into the process at this point (e.g., transportation). These tools and resources are an integral part of the urban design process, helping to interpret issues of sustainability (Owens & Cowell, 2001, 2002).
4. CONCLUSIONS

As the UK government stresses the importance of sustainability in urban design projects, key stakeholders need to become more responsible about understanding how the urban design process works and where sustainability is embedded in that process. The existing literature is vague about how the urban design process should be mapped in detail from beginning to end. The VivaCity 2020 project will attempt to define the process through case study research and provide as much detail about stakeholders, decision-making and sustainability. Doing so will give people involved in the urban design process more information about how to create 24-hour urban environments that are sustainable and well-designed, thus improving how urban design operates.

![Diagram](image)

**Fig. 2.** Where sustainability issues may be embedded into the urban design process. Source: VivaCity 2020 main presentation (2003).

5. ACKNOWLEDGEMENTS

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329


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