



Visualizing urban design conditions for sustainable social practices in urban centres

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Abstract With increasing attention in urban design theory paid to conditions that are conducive to sustainable forms of urban experience, there is emerging emphasis on the non-technological view of sustainable urban design. This perspective focuses on “design that factors in urban and social sustainability” (Christiaanse & Hoeger, 2006) and concerns itself with “not only the shape or contour of the game piece, but also a repertoire for how it plays” (Easterling, 2012). It emerges in the critique of “over-specification of form and function” (Sennett, 2006) and in the acknowledgement that “cities are turning into archipelagos; public infrastructures are splintering; and public spaces are being left to wither” (Christiaanse, 2009a). It shifts the discourse of sustainable urban design from forms to forces, spaces to strategies and constructs to conditions. However, despite increased exploration in this area, much of the theoretical design conditions put forward are text-based descriptions and lack graphic representation. This is due, in part, to contributions from disciplines traditionally not associated with graphic or design visualization, such as urban sociology and urban geography. Considering the suggestive potential of this discourse for designers, this paper seeks to ascertain if it can be represented visually. It looks at how concepts emerging in this area could be communicated to design practitioners, thus helping to bridge the gap between theory and practice. Through a level of abstraction, this research seeks to put image to text, to imagine what these conditions look like and where in the built environment they can be found.

This research examines two concepts from the non-technological view of sustainable urban design, that of “looseness” (Frank & Stevens, 2007) and that of “openness” (Sennett, 2009). An evaluation criterion drawn from these concepts is defined and applied to comparative case studies analysis. Retail-led regeneration schemes, often criticised as models of over-determined built form, were chosen from urban centres in Ireland and The Netherlands. The case studies in the Irish urban centre highlighted conditions of over-specification and over-simplification, revealing a lack of design conditions that factor in urban and social sustainability. The case studies in the Dutch urban centre highlighted a ‘better practice model’; therefore, revealing design conditions facilitating sustainable social practices. The results of the evaluation of each case study were graphically represented and the otherwise invisible socially sustainable urban design conditions made visible. This paper illustrates the beginnings of a wider exploration into how to make visual urban design conditions that are promoted as “design that factors in urban and social sustainability” (Christiaanse & Hoeger, 2006). It attempts to highlight how visualising concepts derived from urban theory and translating them into evaluation methods can bring rigour to the design process and design evaluation process. Visualizing and communicating urban design conditions for sustainable social practices in urban centres may go some way towards enabling a thriving public realm in such environments.

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Introduction

Of common concern in urban design theory focusing on the public realm, is the threat posed to existing and future social practices in urban areas by the continuous re-introduction of over-determined built forms and controlled environments. This concern has led to the identification of a pressing task – the clarification of specific urban ‘conditions’ that allow for the public realm to develop and extend. A discourse, therefore, exists which focuses on design for urban social sustainability. Contributions to this discourse come from a range of disciplines: architecture, urban design, urban geography, urban sociology and social and environmental psychology. The emphasis placed on design, and its role in the creation of ‘conditions’ for sustainable social practices, however, varies in this discourse across the different disciplines. Where design is emphasised, the communication of the urban conditions is predominantly text-based. If the textual descriptions are supplemented, it is with photographs of social practices in urban environments. This paper contends that this discourse holds a lot of potential for designers, in assisting the design of urban environments that can enable a thriving public realm. However, the value of this discourse could be lost due to the language of textual description used. This paper argues that graphic description of the findings from this discourse could add another dimension, and, more importantly, could communicate more easily with designers and those responsible for design review. This research, which explores how to visualize and communicate urban design conditions for sustainable social practices in urban centres, looks at how concepts emerging in this area can be communicated to designers. It looks at how this theory can be translated into a visual language.

Investigating Sustainable Urban Design

The research project presented in this paper emerged in response to the proliferation of in-town shopping centres built in urban centres during Ireland’s Celtic-Tiger building boom. Over-determined in form and function these ‘new town centres’ display a visible lack of sustainable urban design. Of particular concern is whether or not the design of these centres can allow for the development and extension of the public realm of the existing urban centre. Two questions were, therefore, generated: what evaluation criteria could be used to assess whether or not the design of retail-led regeneration schemes created sustainable conditions for social practices? Could these criteria be illustrated—graphically represented—to communicate more easily with designers and planners? This research began its search for criteria by exploring the discourse in urban theory that focuses on the public realm. It investigated the theoretical discourse that looks at sustainable urban design, specifically the non-technological view of sustainable urban design. This specific perspective is identified by Kees Christiaanse who advocates for sustainable urban design to be considered more broadly, for it to refer in addition to technological sustainability “*to the design discipline – design that factors in urban and social sustainability*” (Christiaanse & Hoeger, 2006). Christiaanse contends that the design of social sustainability and sustainable technologies must be differentiated in sustainable urban design and argues, “*social sustainability is a more complicated concept that cannot be solved with engineering, but must be encouraged by design*” (Christiaanse, 2010). In sustainable urban design research there are many who contribute to this non-technical area. This paper highlights three contributors: Richard Sennett, Karen A. Frank and Quentin Stevens.

Urban Social Sustainability

Sennett in his research examines the relationship between social life and physical design. He looks at the role design can play in social sustainability as demonstrated by his question: “*which designs might abet social relationships that endure, just because they can evolve and mutate?*” (Sennett, 2006). Sennett contends that the contriving of sustainable urban social spaces “*which allow for the gradual evolution and opening up of rituals of behaviour*” (Sennett, 2009) is a design issue. Following in the footsteps of Jane Jacobs (Jacobs, 1961), Sennett in his research highlights and attempts to make visible, through his writings and photographs, socially

sustainable urban design conditions. Frank and Stevens, in their research, similarly shine a light on physical urban spaces and how people use them (Frank & Stevens, 2007). They highlight the many different conditions observable in urban public space, and in particular sustainable socio-spatial conditions. Through studying how established public domains operate, and describing the physical and spatial characteristics which allow for that operation through text and photographs, they identify conditions which nurture *“particularity in the urban public realm, sustaining local practices and allowing the identity of place and culture to flourish”* (Frank & Stevens, 2007). This research, having explored the contributions of Sennett and Frank and Stevens, identified two useful theoretical concepts - the concept of *“looseness”* (Frank & Stevens, 2007) and the concept of *“openness”* (Sennett, 2009). This paper presents these two concepts, examining how they can be used to extrapolate urban design conditions for sustainable social practices in urban centres.

Two Theoretical Concepts - “Looseness” and “Openness”

The concept of ‘looseness’ in urban space is put forward by Frank and Stevens in their research on public space (Frank & Stevens, 2007). They define loose space as space which *“allows for the chance encounter, the spontaneous event, the enjoyment of diversity and the discovery of the unexpected”* (Frank & Stevens, 2007). Looseness in urban space allows for the development and extension of the public realm. In loose space *“the urban resident, with creativity and determination” can “appropriate public space to meet their own needs and desires”* (Frank & Stevens, 2007). Frank and Stevens explore certain social and physical conditions that can encourage looseness. In their research they identify *““ringy” spaces”* and *“appropriation”* as two defining features of ‘looseness’ in urban environments (Frank & Stevens, 2007). They point to the condition of *“different, densely interconnected and overlapping circulation loops”* (Frank & Stevens, 2007), found in ringy space, and the physical features of corners or fixed and semi-fixed elements, found in public space, that can enable appropriation to occur. Stevens highlights that ringy spaces *“provide more opportunities to change direction when moving through the city and allow spaces and people to be encountered in different sequences”* (Stevens, 2007). This formal condition helps *“sustain and enhance the general vitality and robust diversity of social practice”* (Stevens, 2007). Urban corners have been recognised by many urban theorists (Whyte, 1943; Sola-Morales, 2004) as places that encourage appropriation and social interaction: *“street corners express the nature of the city as a meeting place”* (Solà-Morales, 2004). Similarly, fixed and semi-fixed elements found in urban space are often appropriated and *“made use of in a variety of social acts”* (Stevens, 2007). The physical features of public space, identified by Frank and Stevens, keep it open to possibilities, encouraging social practices to develop and extend.

The concept of ‘openness’, as put forward by Sennett, emerges in response to the problems urban societies and environments face today (Sennett, 2009). Sennett writes about the closed and open system, stating that the closed system has paralysed urbanism through its basic principle of over-determined form. Drawing analogies between the natural and the built environment to establish the differences between a closed and an open system, Sennett advocates for *“rules which open up the environment to change rather than stabilize it”* (Sennett, 2009). The concept of ‘openness’ put forward by Sennett forces designers to consider how public spaces can be opened up, how the divide between inside and outside can be bridged and how visual form can invite engagement and identification (Sennett, 2006). Sennett believes that *“openness can be planned”* (Sennett, 2009) and that *“in the public realm, openness can be defined in terms of built fabric and its context”* (Sennett, 2009). Focusing on edge conditions within the city, Sennett distinguishes between borders and boundaries and explores the design of porosity. Sennett identifies passage territories and porous urban space as two defining features of ‘openness’. He points to the condition of *“the edge as border”* found in passage territories, and the condition of *“the porous wall”* found in porous urban space (Sennett, 2006). Sennett argues that these conditions *“create essential physical elements for an open system in cities”* (Sennett, 2006). These conditions

“create [...] space at the limits of control, limits which permit the appearance of things, acts, and persons unforeseen, yet focused and sited” (Sennett, 2006). These conditions allow for social practices to emerge.

Urban Design Conditions for Sustainable Social Practices

As previously stated, this research searched for criteria that could be used to assess whether or not the design of retail-led regeneration schemes created sustainable conditions for social practices. Having uncovered the two theoretical concepts of ‘openness’ and ‘looseness’ the next step was to use the findings from the literature to define urban design conditions for sustainable social practices. A summary of the findings are presented in the following table (Tab. 1):

THEORETICAL CONCEPT	DEFINING FEATURE	CONDITIONS
‘Looseness’	Ringy Spaces	Densely Interconnected and Overlapping Circulation Loops
	Appropriation	Corners; Fixed and Semi-Fixed Elements
‘Openness’	Passage Territories	The Edge as Border
	Porous Space	The Porous Wall

Tab. 1 Summary of findings from theoretical investigation

Having identified the physical and spatial conditions of: 1. Densely interconnected and overlapping circulation loops; 2. Corners and fixed and semi-fixed elements; 3. The edge as border; 4. The porous wall; an evaluation criteria was established. The next step was to apply these to case studies analysis.

Case Studies Selection

Retail-led regeneration schemes, often criticised as models of over-determined built form, were selected as case studies. They were chosen as testing grounds for the evaluation criterion. Four case studies from two countries were chosen in total. As already acknowledged, this research project emerged in response to the commercial typology of the shopping mall being used to regenerate urban areas of the Irish Urban Centre during the Celtic-Tiger building boom. Therefore, two case studies were chosen from Ireland. Two shopping centres built during the boom were chosen from Ireland’s largest town, the town of Drogheda. The country from which two more case studies were selected was The Netherlands. The Netherlands was chosen for a number of reasons. As a country it is widely recognised as a leader in urban sustainability. Unlike Ireland, it is a country with a strong reputation for urban design practice. Both Ireland and The Netherlands in 2008, just after the peak of the Irish property boom, had the highest shopping centre stock per 1000 population out of 25 European countries (Jones Lang LaSalle, 2009). Both countries are located in Northern Europe and share a similar climate. Two case studies were chosen from the Dutch cities of Nijmegen and Arnhem. Awarding winning projects, the Dutch shopping centres selected, represented a ‘better practice model’ than those chosen from Ireland. The case studies from The Netherlands represented a comparison field from which to analyse the case studies from Ireland against. The design of all the case studies were assessed to determine if the design provides conditions which allow for sustainable social practices. The case studies selected are listed in the following table (Tab. 2). The four case study sites and comparative scale are illustrated in the following drawings, (Fig. 1) and (Fig. 2).

CASE STUDY NO.	NAME OF SHOPPING CENTRE	URBAN CENTRE	COUNTRY	YEAR OPENED	NO. OF SHOPS
1	Mariënburg	Nijmegen	The Netherlands	2000	48
2	Musiskwartier	Arnhem	The Netherlands	2006	45
3	Scotch Hall	Drogheda	Ireland	2005	48
4	Laurence Town Centre	Drogheda	Ireland	2006	35

Tab. 2 Information on the case studies selected



Fig. 1 Site area of case studies numbers 1-4 before redevelopment



Fig. 2 Site area of case studies numbers 1-4 after redevelopment, highlighted in red

Case Studies Analysis using Evaluation Criteria

The case studies analysis consisted of two stages. Stage one involved the interrogation of primary and secondary sources in order to understand the history, context and design of each project. The plans of each scheme were re-drawn to facilitate comparative analysis and to set up a template for stage two. Stage two involved assessing each case study against the evaluation criteria established from the theoretical concepts of ‘looseness’ and ‘openness’. This was done by gathering original empirical material through non-participant observation fieldwork. Fieldwork was carried out in and around the ground plane and public spaces of each of the four shopping centres over a 12 month period. The findings were recorded in field notes, behavioural maps, visual surveys and photography. These findings were then visually represented through mapping and diagramming. Each of the four case studies were evaluated using the same graphic language to facilitate effective comparison.

Visualizing urban design conditions for sustainable social practices in urban centres

The findings from the case studies evaluation are made visual in the following images, (Fig. 4); (Fig. 5); (Fig. 6); (Fig. 7). They show how the urban design conditions for sustainable social practices derived from theory were visualised. They illustrate the extent and presence of each of the conditions across the four case studies. The following image (Fig. 3) illustrates the conditions looked for and their abstract interpretation.

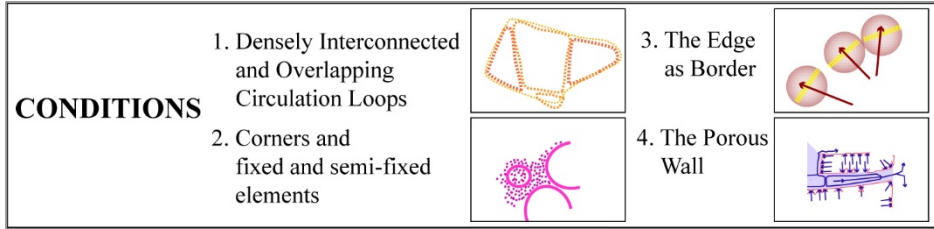


Fig. 3 Conditions looked for and their abstract interpretation and visualization

The images, (Fig. 4), (Fig. 5), (Fig. 6) and (Fig. 7), highlight the relationship between design and living, by illustrating how the design condition identified set up a specific use of the public spaces of each shopping centre. Through the use of symbolic expression, interpretations of life experience are represented. The representations acknowledge that what is projected at design stage and actually experienced when realised are closely related. For example, in (Fig. 1) it can be seen that the design of ringy spaces in case study number 1 set up intense pedestrian movement loops. The lack of ringy spaces designed in case study number 4 meant that less intense pedestrian movement loops were recorded. Similarly, the number of corners and fixed and semi-fixed elements used in the design of case studies numbers 1 and 2 meant that numerous appropriations around or on these physical features were recorded, compared to case studies numbers 3 and 4, where very few appropriations of the public spaces were recorded. In summary, the design of the case studies from the Dutch centres (case studies 1 and 2) show a much stronger prevalence of the four conditions looked for compared to the Irish models (case studies 3 and 4), and therefore a corresponding higher rating of social use and practice is found and illustrated.

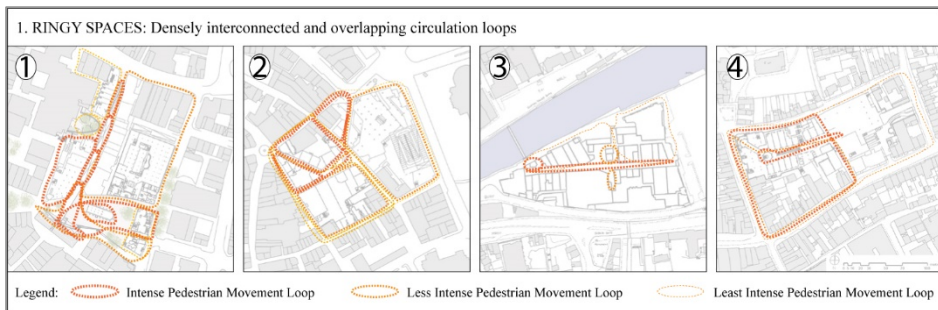


Fig. 4 Visualization of urban design condition no.1, across the four case studies



Fig. 5 Visualization of urban design condition no.2, across the four case studies

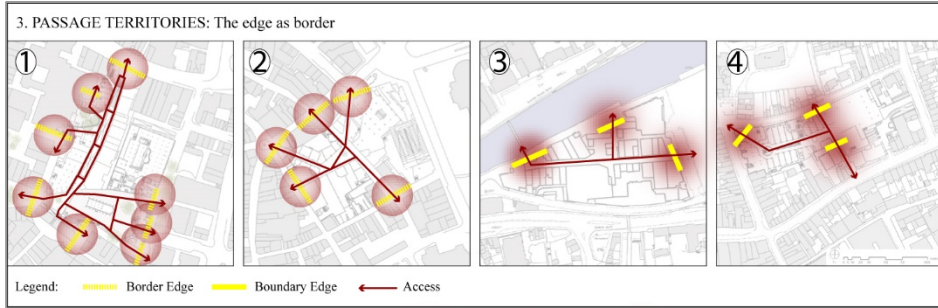


Fig. 6 Visualization of urban design condition no.3, across the four case studies

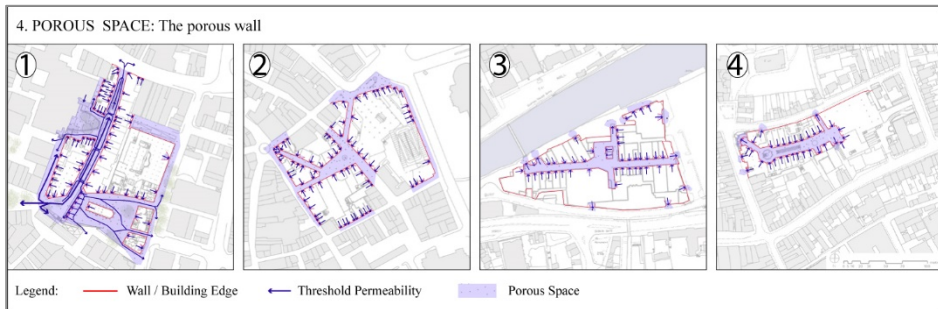


Fig. 7 Visualization of urban design condition no.4, across the four case studies

Conclusion

This paper draws attention to the discourse in urban theory that focuses on the non-technological perspective of sustainable urban design and explores how to make visual urban design conditions that are promoted for *urban social sustainability*. It highlights the value of this discourse for designers by attempting to translate the theoretical concepts found into a visual language that could communicate more easily with architects and urban designers. Increasingly in architectural and urban design theory the importance of clarifying conditions that allow for or can lead to urban and social sustainability is identified and reiterated. As Christiaanse notes it is not that urban designers or architects believe that they can actually design communities or sociability in urban areas, but designers “*definitely can design urban structures or physical conditions that stimulate the emergence*” (Christiaanse, 2009b) of social practices. Therefore, the more clarity there is surrounding what these conditions might be, consist of, and for designers what they look like, is crucial if social sustainability is to be considered in the design process. The images in this paper highlight the role of visualization as a tool for the communication of theoretical concepts and how they enable the evaluation of architecture and space. Visualizing the conditions derived from theory enables the concepts to be explored further and encourages experimentation of their graphical representation. It is often noted that “*knowledge on how to model [...] the cognitive level of urban space, that is, the level where the city is experienced by people in the street*” (Marcus, 2011) is underdeveloped. It is hoped that the findings presented in this paper add to knowledge on the micro scale of urban space, and provide ideas for how it could be represented. In representing design that factors in urban social sustainability it is hoped that the invisible conditions designed into urban space are made visible. Visualizing and communicating urban design conditions for sustainable social practices in urban centres may go some way towards improving design during the ideation and review stages, ultimately enabling a thriving public realm in such environments.

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