

City Form: The Sustainable Urban Form Consortium

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On November 1st 2005, the Faculty of Architecture and Planning, Thammasat University, was honoured to welcome Professor Mike Jenks from Oxford Brookes University, UK to lecture about the multidisciplinary research project he has been involved with under the title “City Form: The Sustainable Urban Form Consortium.” The lecture aims to present the progress and methods of the ongoing project in the UK jointly taken by Oxford Brookes University, Sheffield University, Heriott-Watts University, University of Straclyde and University of Leicester as well as fourteen private sectors, local authorities and organizations.

Professor Mike Jenks is presently the head of Department of Architecture, Oxford Brookes University and the founder and director of Oxford Centre for Sustainable Development. He has been one of the leading pioneers in sustainable urban design, and has lectured and authored numerous books and articles relating to the concept of Compact Cities and Sustainable Urban Forms.

Urban Design Theories?

In the context of United Kingdom and some European Union countries, the concepts of Sustainable Urban Form and Compact City have long been embodied in the planning policy, and launched into practice under different idioms; Urban Village, Urban Renaissance and Regeneration and Urban Intensification. Furthermore, they have also been embedded in urban design theories such as Smart Growth, New Urbanism and Coding. Yet, as evidences have suggested, such incorporation of theories into policy and practice does not necessarily ensure sustainability. Thus, the challenging question arises; are the policies, theories and practices based on the sound foundation?

These urban design theories do share a common ground. They all emphasize on the importance of generating diversity, higher density, mixture of uses, transport choices, walkable neighbourhood, street grids and compact building design. Such similarities are inspired by a few well-planned, well-functioning cities such as Amsterdam and Barcelona (figure 1).

It is important to recognize that sustainability can also take place in different forms. It is a common mistake for urban planners to emulate what has been achieved in some cities in a form of rigid formulation. However, not every city can achieve what Amsterdam or Barcelona has done. Such naivety leads to the criticism for some contemporary urban design theories, such as New Urbanism and Coding for being imposing and inflexible.

Urban sustainability is more complex than a merely prescriptive design guidelines. There are many apparent precedents of the failure of urban design theories which effecting millions of lives and the accuracy of these guidelines are becoming doubtfully vague (figure 2). There are the limits in “physical and social capacity” in different societies and cultures to accept and pursue a sustainable theories. Such behavioral limitations are founded on the different “lifestyle” and aspiration of the people (figure 3). For example, how can we answer the situation in Athens or Sheffield where there are very low use of excellent transport system or the questionable unwillingness to cycle amongst ethnic minorities and workers in Holland.



Figure 1 Compact City models; Amsterdam (left) and Barcelona (right)



Figure 2 Ypenburg – a vast new development stretching between Delft and Den Haag, an example of failure in translating sustainable guidelines into a truly sustainable development

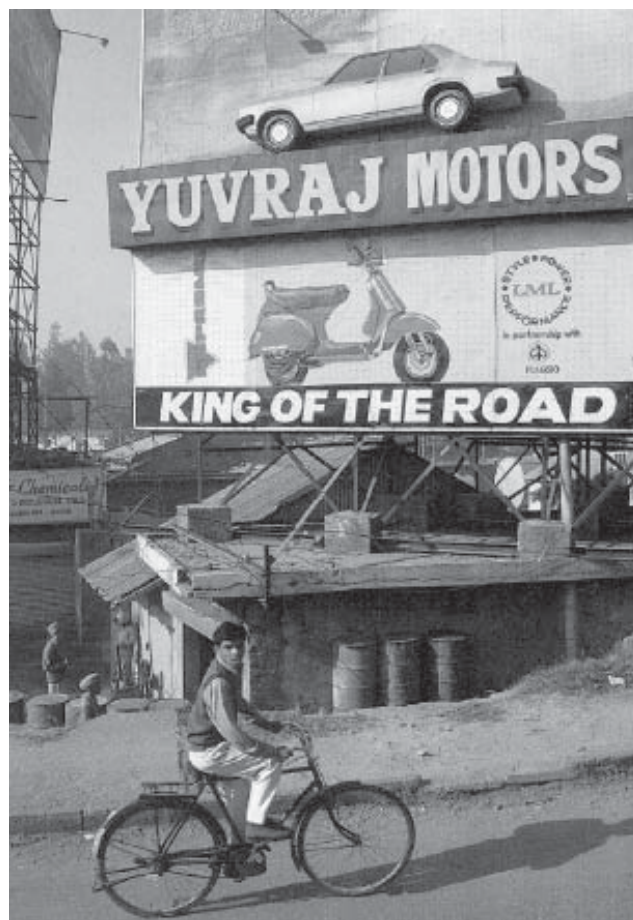


Figure 3 Transport and Lifestyle

Thus, the contemporary concern for urban design theories is not merely how to achieve sustainable urban form in the built environment, but how it can be extended into people's everyday behaviors. Therefore, the multidisciplinary research team, led by Oxford Brookes University, has been formed to seek out the balance between theories and practice.

The Sustainable Urban Form Consortium

Aims and Scope

The fundamental question for this multi-disciplinary research is the simplest and basic question, which is also the most difficult to answer. To what extent and in what ways does urban form contribute to sustainability?

Five key factors for the assessment of urban sustainability have been established, which are Spatial Sustainability, Environmental Sustainability, Transport Efficiency, Social Benefits and Economical Viability.

The most important study of this project is called "the core project," which is an integrated process in investigating the sustainable urban form according to the five categories. There are also three additional "Plus Project" to be carried out independently. These "Plus Projects" are Valuing Open Space, Urbanising Suburbia and Sustainable Urban Behaviour and Lifestyle (figure 4).

Core Research – Methods

Through the established criteria, fifteen case studies from five major cities; Edinburgh, Glasgow, Leicester, Oxford and Sheffield, have been selected. Each city represents the key urban forms in three core categories: suburbs, intermediate areas and city centres (figure 5).

Each case study covers the size of twenty hectares and two thousand households. The physical aspects of urban form as well as the socio-economic variables are measured and analysed such as connections with city, configuration, layout, connectivity, density, housing form, mix of uses, green public space and gardens,

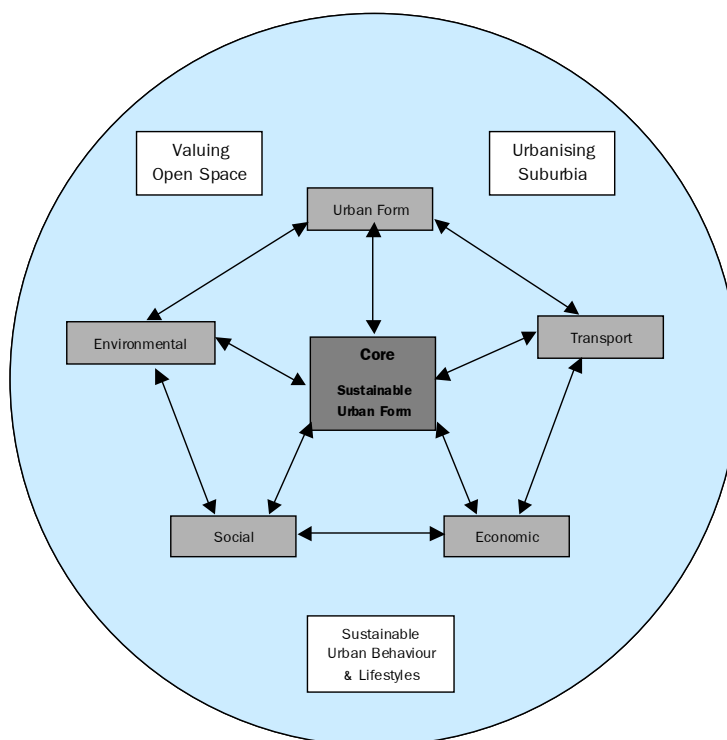


Figure 4 Research Scope

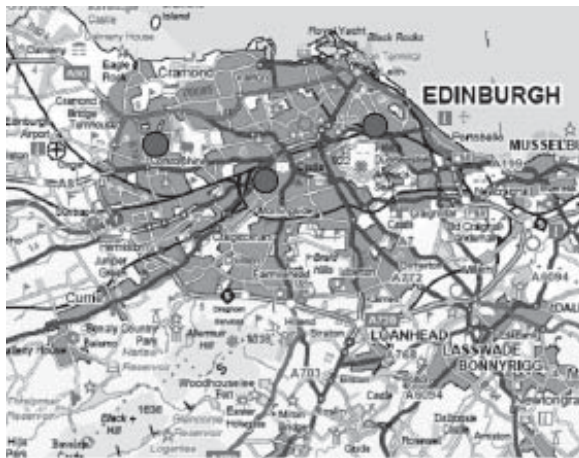


Figure 5 Characteristics of five major case studies: Edinburgh, Glasgow, Leicester, Oxford and Sheffield

household characteristics, property value and ethnic mix.

Numerous tools, ranging from site surveys to satellite imagery, have been selected to assist in the data collection. Large-scale city-wide data have been collected from National data-set, census, official surveys, land use modeling, mapping techniques and GIS. More specific data in the three core research categories; suburbs, intermediate and city centres, have been collected from land use, site surveys, questionnaires, interviews, market surveys, travel diaries, energy modelling and biodiversity assessments (figure 6).

The questionnaires and surveys are to cover the 4 aspects of sustainability: Social Sustainability, Economic Viability, Environmental Sustainability and Transport Efficiency. The research findings are then used in relations with the modelling of urban form to determine the correlation between sustainable urban form and sustainability.

Questionnaires were posted to 12,000 households in 5 subjected cities to collect basic data. They were designed to be easily understood by the public and consisted of 40 – 50 questions. They were eventually followed by 2 reminders. It was astonishing that the responsive rate was relatively high at 38%.

Interactive technologies have been used rigorously in the site surveys. Researchers are equipped with PDAs and affordable mapping software available in the market to collect the principal data, which are downloadable to GIS. The on-site data are then compared with the existing database to ensure accuracy (figure 7).

In the modelling of urban forms, the research team has collaborated with Milan University to experiment with a new form of analysis which improves and extends the widely-known Space Syntax, called Multiple Centrality Assessment (MCA). While Space Syntax is based on the cognitive distance in the analysis. MCA

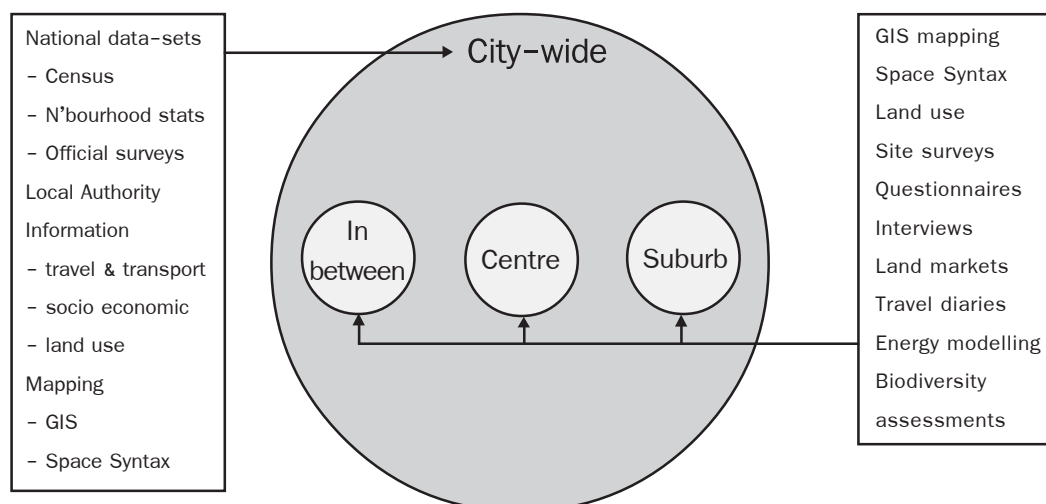


Figure 6 Research tools

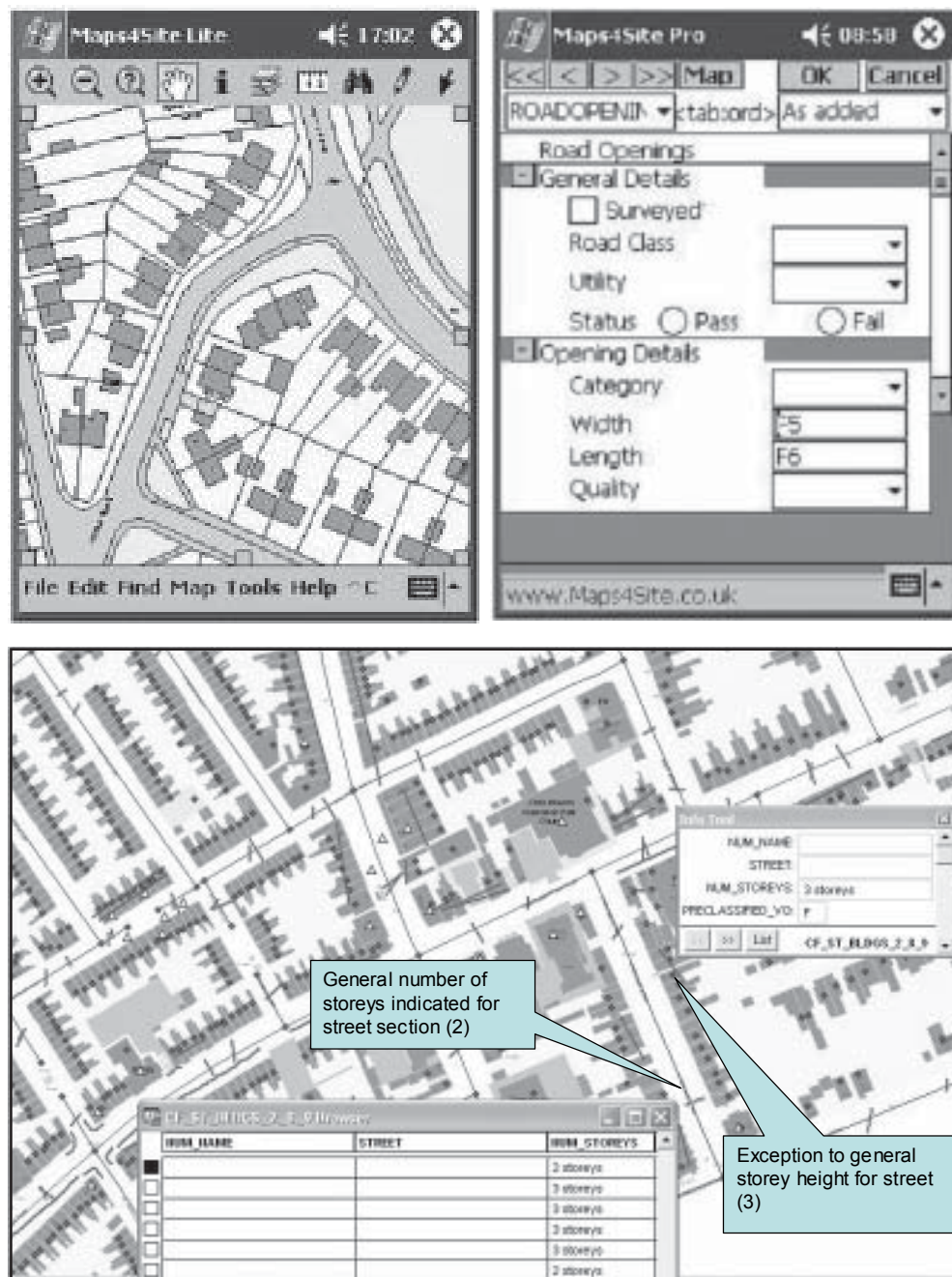


Figure 7 Interactive PDA database

also takes into account the real geographic distance (figure 8). Furthermore, the research team has also employed the mapping technique similar to those used by transport engineers in the measurement of streets and nodes in terms of the efficiency of access, geographical closeness or the degree of straightness (figure 9). The result of such combination of technique is an urban form

modelling which is more responsive to true geographical features of the city.

Core Research – Progress

The main emphasis of the multidisciplinary core research is to carefully study the relationships between the various aspects of sustainability to determine the degree of sustain-

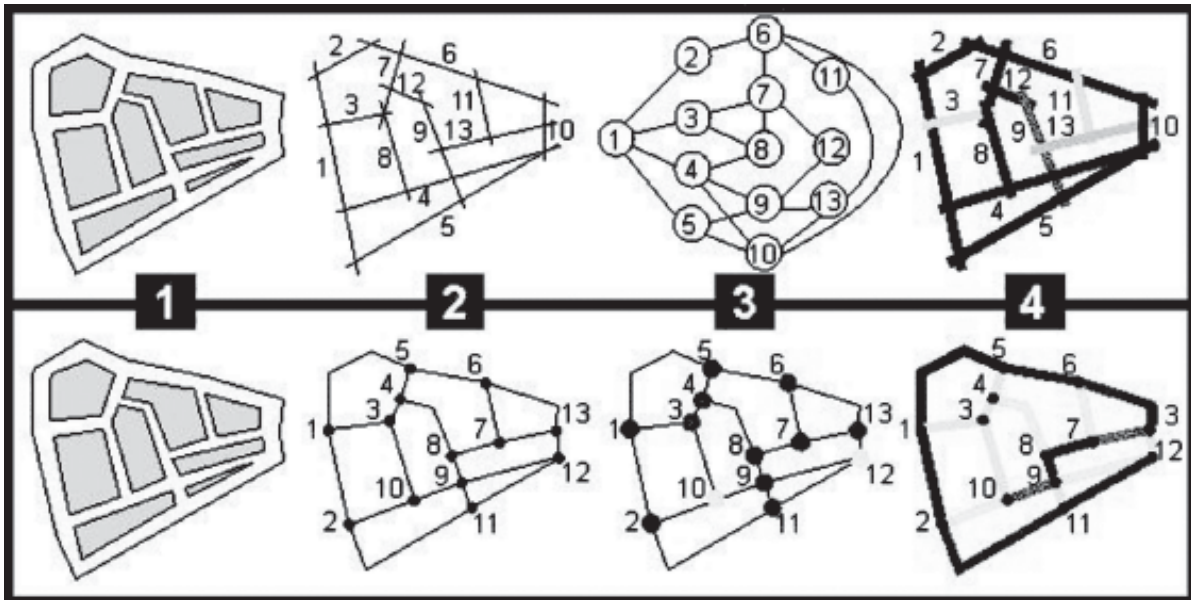


Figure 8 Above: Space Syntax method (cognitive)
Below: Multiple Centrality Assessment (cognitive and performance)



Figure 9 Space Syntax and MCA

ability. For example; an environmentally sustainable building would also have to respond to the social and economic criteria to be categorized as “sustainable.”

Results from the questionnaires have led to the identification of key issues in each sector. These issues are then followed up by detailed interviews and analysis. In the Economic Viability

sector, four main elements have been identified and intensely analysed: housing market, commercial and industrial market, microeconomic decision-making and lastly Infrastructure and Building costs. In the Environmental Efficiency sector the collected physical data and the satellite images have helped in the focus on biodiversity, run-off and the proportion of green space. The

Transport Sustainability has focused on travel time and distance by different mode of transport as well as the relationship between the choice of transport and the non-work activities and interaction within the household.

The work is still in progress. Much of the current work is focusing on the cross-sector analysis. It is found that there is a relationship between urban form and social sustainability variables. For example; there is a higher level of dissatisfaction at the higher densities. This finding has led to a further analysis of the effect of urban form variables on the social sustainability, which can be determined once other intervening variables are controlled. The research has also found that there are relationships between the house price and the distance from the city centre and shopping centres as well as the proximity to other land uses such as social housing and green belt (figure 10).

The Plus Projects

The purpose of the three stand-alone “Plus Projects” is to illustrate the relevance of sustainability in the ‘real world’ through real life projects involving many communities. They have revealed the hidden dimensions of United Kingdom urban contexts.

The first project, “Urbanising Suburbia,” looks at the cause of suburbia and establishes the existing quality profiles of the selected area. A regeneration programmes are then established based on the differences between the existing value profiles and the target value profile. Through area and data mapping; different regeneration options, each of which has a different level of impact, are modeled. Target group sessions are set up to determine the level of acceptability for each option and to find the appropriate sustainability tool and regeneration models.

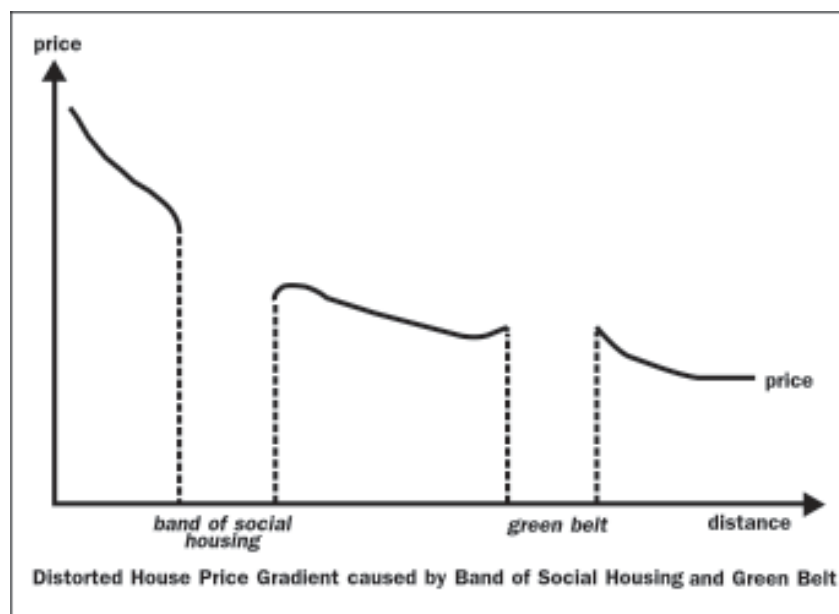


Figure 10 Impacts of social housing and green belt on a house price

The second project, “Sustainable Lifestyles,” questions whether “sustainable” development schemes actually lead to sustainable behaviour and lifestyles and if not to seek explanations. Do they live more sustainably in this environmental concern set of housing? It is evident that some sustainable built environments do not necessarily encourage any behavioral sustainability. The research process starts from measuring physical sustainability features in twelve new developments, scaling sustainable behaviour in the same developments and finally analysing the relationship between the two findings. The output from this project would lead to policies and guidelines to provide built form which is technically sustainable and supports sustainable behaviours (figure 11).

The last Plus Project is “Valuing Open Space.” The project is trying to determine the value of open space in terms of the relationship between the biodiversity and urban form as well as the housing market (figure 12).

Sustainable Urban Form?

Although the research is still a work in progress, there are some lessons that can be drawn. First of all, there is no such thing as ‘one size fits all’ in urban planning theories; each problem needs an intensive analysis with its own relating factors. It should be emphasized that the process of questioning and searching means for the most appropriate specific answer for each site can be obtained from looking at its complex relationships and cultures.

It should also be pointed that any urban theory such as Compact City can be defined in different ways. There are also different interpretations of what it entails to be “high density.” Thus, it is dangerous to assume universal applicability for any specific solution. A policy that excels in UK might not be effective in some Asian cities with their complex layers of culture such as Bangkok. Higher densities may succeed only if context and culture is taken into account. However, such diversity and flexibility is still under the larger umbrella that holds them together; Polycentric and transport-related development with varied densities.

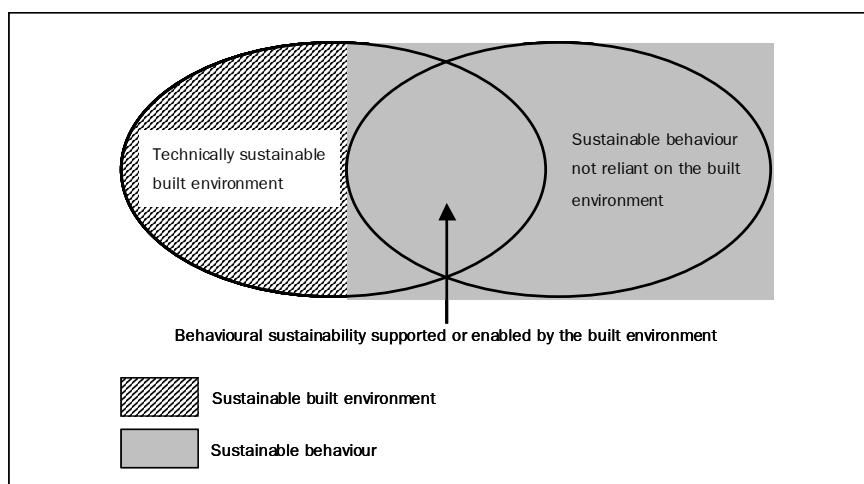


Figure 11 Sustainable lifestyle

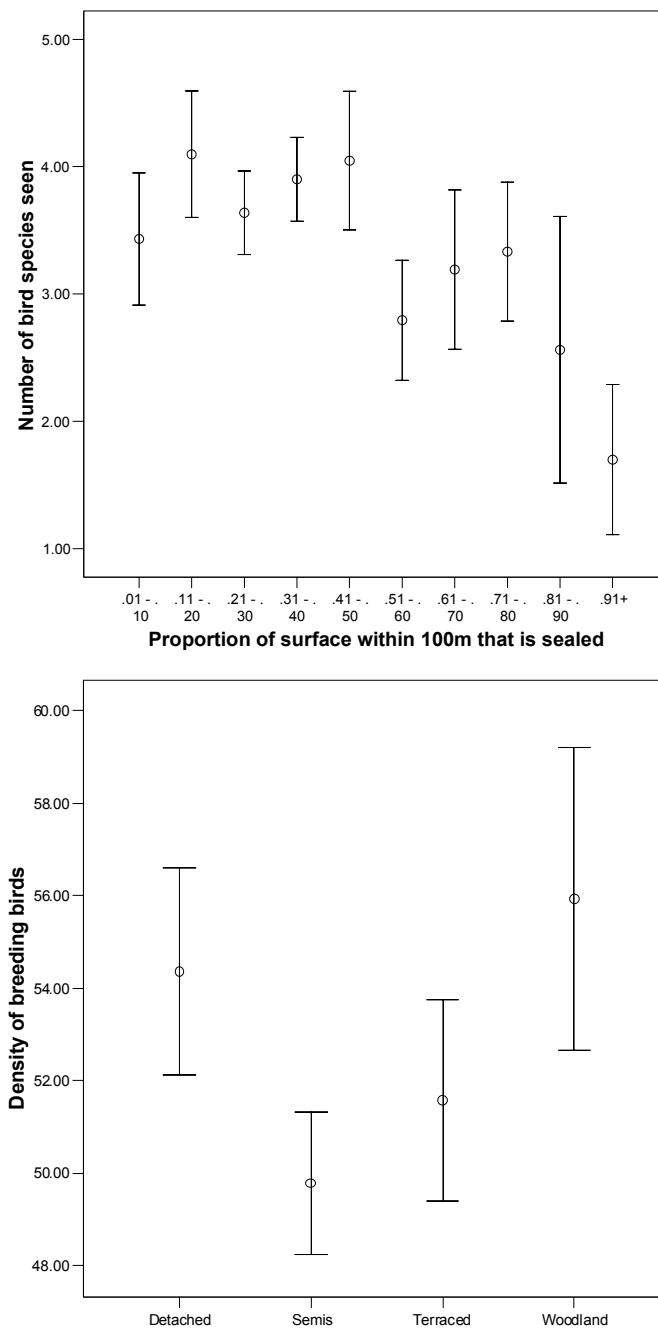


Figure 12 Valuing open space

Environmental and ‘sustainable’ designs have the potential to work, only if people are willing to adopt the sustainable behaviours. So far we must admit that such behavioural changes are still to be desired. The key change may be found in the power of popular culture to ‘promote’ sustainability in relation to realistic lifestyle aspirations.

Although difficult, such change is not impossible. The cooperative research project from the United Kingdom has demonstrated that sustainability involves multiple sectors in our society. Media and education will play a vital role in planting the seed of sustainability in the young minds. Ultimately, it is essential for each society and culture to engage in an “integrated sustainable thinking” to try to accomplish the sustainable world for the future.