

People, products and places

*Exploring sustainable-living
practices in masterplanned
communities*

Research Final Report



Contents

Summary	4
1 Introduction and background	6
2 Theoretical context and methods used	8
3 Australian fieldwork process and findings	18
4 UK fieldwork process and findings	28
5 Comparative analysis and conclusions	44
6 In conclusion	50
References	52

Summary

Entitled **People, products and places: Exploring sustainable-living practices in masterplanned communities**, this research report describes the process and findings from comparative research into sustainable-living practices in masterplanned communities in the United Kingdom and Australia. The work was undertaken by scholars at the Centre for Sustainable Communities at the University of Hertfordshire over a three-year period under the auspices of the *University of Hertfordshire Lafarge Tarmac Sustainable Living Partnership* which began formally in 2010.

The work has explored what motivates 'sustainable' behaviour and what acts as barriers to it in places claiming sustainable features in their housing and wider built environments. Among our research findings and conclusions are the following points:

- ◆ These are developments which are 'doing better' than the development norm in sustainability terms but which still raise intriguing issues that, if resolved, could improve their performance further.
- ◆ Planning and design approaches vary substantially from place to place within masterplanning practice. Once interpreted on the ground, there can be slippage in defining and undertaking sustainable practices as a result. It appears that clearer connections between guidance and practice are needed to avoid less than optimal outcomes.
- ◆ 'Technological determinism' – the 'fit and forget' idea for embedding sustainable infrastructure – didn't always work as intended. Residents and other place-users did not always respond in sustainable ways. This approach suggested a lack of understanding that sustainability comes from the interplay between people and things – it is relationally produced, not passively received.
- ◆ Closing the gap between performance ratings (such as of 'green buildings') and actual practice is obviously important if we are to achieve more sustainable outcomes in masterplanned and other new developments. This should happen at a number of scales – in particular, our research suggests that this is necessary at the level of the dwelling and the wider place in new developments.
- ◆ Unsurprisingly, the research has shown evidence of varying levels of commitment to sustainability among end-users of housing and related spaces across the five sites. This is for a range of reasons, some of which could be tackled at individual level,

but others are structural and need changes to be made beyond the site level.

- ◆ A notable point from across the research is that passive communications including 'home manuals', that is, guides for using homes and household technologies, lacked efficacy in promoting and embedding sustainable practices.
- ◆ Constraints and opportunities tied to different tenures appeared to have impacts on sustainable-living practices among end-users in the masterplanned communities we studied. For example, in more than one of our fieldwork sites a proportion of owners were buy-to-let landlords and their tenants did not necessarily have access to or benefit from sustainable features. With an expected rise in the proportion of private renters, how can we make sustainable living 'tenure blind'?
- ◆ It is clear from the fieldwork that where there is good leadership (from, for example, the developer, a management company, a tenants' organisation, etc.) the capacity to undertake sustainable behaviour rises considerably.
- ◆ Linked to the above, across our research we found that property managers' views about what kind of role they could or should play in promoting sustainable living was quite variable and this had impacts on sustainable-living outcomes.

Through this report and by means of other papers, briefings, website material and presentations we will be sharing our results with as many people as we can, now that we have completed this first substantial research study through the UH Lafarge Tarmac Sustainable Living Partnership. We believe that the whole area of sustainable living offers rich research possibilities that can have very positive impacts on practice 'on the ground'. As the need to make places more sustainable becomes ever more pressing, this is an opportunity for both theoretical and applied research to make a constructive contribution to that task.

1. Introduction and background

Purpose of this report

This report documents a major research project into sustainable living that has been undertaken by researchers at the University of Hertfordshire over the last three years under the auspices of the *University of Hertfordshire Lafarge Tarmac Sustainable Living Partnership*. The research has focused on the attitudes and practices of residents and 'place-users' in sustainable masterplanned communities. The work has explored what motivates sustainable behaviour and what acts as barriers to it among residents of places claiming sustainable features in their housing and wider built environments. These are masterplanned places which are doing better than the development norm in sustainability terms, but they still raise intriguing sustainability issues which, if resolved, could improve their performance further.

To that end we have undertaken comparative research in the United Kingdom (around London, and in Brighton and Bedfordshire) and Australia (in the Sydney metropolitan area). This research has been done in a range of fieldwork sites where claims have been made about sustainability. Their living spaces have had some sustainability features built in, arguably allowing a degree of sustainable living to be put into practice. We wanted to understand what actually happens when these theoretical claims meet lived reality for new residents and other place-users, and what we might learn about helping to make places sustainable in future.

The research has generated some fascinating findings. It has answered some questions about sustainable living but also opened up other lines of enquiry and intriguing research possibilities related to 'end-user perspectives' that we deal with at the end of this report. However, before that, the bulk of this report covers the aims, methods, process, findings, analysis and conclusions from this comparative research work. We start by providing some background information about the Partnership within which we have done the work.

About the Partnership

For over three years the Centre for Sustainable Communities at the University of Hertfordshire and Lafarge Tarmac have been running a research partnership focused on sustainable living. The research work has been funded by Lafarge Tarmac and we are reaching the conclusion of the initial partnership period. The Partnership was originally launched at the House of Commons on 8 November 2010 with a view to producing knowledge that can be used 'to inform and contribute to the debate on how to shape sustainable communities' (Lafarge Tarmac presentation, 2010). A core component of the activities of the Partnership has been this three-year study of sustainable living.

The Sustainable Living Partnership is directed by a steering group comprising senior Lafarge Tarmac staff and University of Hertfordshire academics, as well as invited representatives from the development, planning and design, building and housing sectors. The Partnership, including its research component, is managed day to day by Dr Susan Parham at the University's Centre for Sustainable Communities. Along with smaller-scale activities including the production of 'think-pieces' on a range of sustainable-living topics, the main research activity of the Partnership has thus far been carried out by two post-doctoral scholars.

The first stage of the research was undertaken by Dr Alasdair Jones who completed primary research on attitudes to 'eco-developments' in Australia. Dr Jones documented his research findings in a report, *Snakes and ladders: an interim report on the Australian fieldwork for the UH Lafarge Tarmac cross-cultural investigation of sustainable living* (2013). The second stage of the research was carried out by Dr John McCormack and focused on a comparable set of research questions and sites in the United Kingdom as the second half of the primary research work.

The research programme has been comparative, looking at masterplanned communities in both the UK and Australia. We have gathered views from residents and other place-users, and explored documentation about how sustainable such developments are perceived to be and how people living and working in them interact with their sustainable features, with some fascinating results reported on below.

Reporting on findings to date

This report is not the first documentation about our findings. We have provided regular updates on our Centre for Sustainable Communities website (<http://www.uh-sustainable.co.uk/LAF/>) and have presented papers at relevant conferences and seminars. We also reported in more depth on interim findings at a mid-term event entitled *Living sustainably – which way should we go?* which was held at the University in October 2013. The purpose of this one-day conference was to share the Partnership's research findings to that point on attitudes to sustainable housing developments, at around mid-way through the research project. The conference sessions offered participants opportunities to discuss and debate these and other issues in sustainable living, and to foreshadow the Partnership's future research directions.

The format was a one-day practitioner-friendly conference, to which both expert speakers and participants from around the United Kingdom were invited. Through keynotes and other presentations, panels and workshop sessions over the day, participants considered questions about both attitudes and actions in relation to sustainable living – and looked at how it will be possible to make places that work better for both people and the planet. Broad questions explored at the mid-term conference included:

- ♦ How can we create affordable, well-designed and sustainable housing and places?
- ♦ How can we build in 'resilience' – including for energy, water, food, waste...?
- ♦ How can we make getting around work well?
- ♦ How can we ensure development feasibility?
- ♦ How can we change behaviour toward sustainable living?

The Proceedings of that event (Parham, 2013) can be found at www.uh-sustainable.co.uk/docs/LAFARGEconference2013.pdf

This final report, meanwhile, has been written as we reach the culmination of our three-year programme of research and related activities. The end-of-research-project conference at which this report is being launched is discussing the full range of comparative findings and has a distinctly applied focus. In both this report and at the conference we are feeding back what we have found out from across the research and considering the complex interplay between the sustainable living intentions of masterplanners and the day-to-day lives and practices of people living in masterplanned communities. Both this report and the end-of-research-project conference allow us to give thought to how we can reflect people's living needs and make places that are resilient into the future. We are looking at what we have found out about sustainable living, what that means for end-users of products and places that are defined as sustainable, and how insights into sustainable living can really be applied in practice.

Thus, to augment this report, the conference programme sessions cover the following areas:

- ♦ Why we did the research, what we found out, what we think it means
- ♦ End-user perspectives – what's it like 'on the ground' in masterplanned communities? What happens after the keys are handed over?
- ♦ Making it happen – what are the opportunities and barriers people face in being more sustainable?
- ♦ What we can do differently in future – what we have learned from the day: where to next?

2. Theoretical context and methods used

Theoretical context for the research

Form, in and of itself, is not measurable in terms of sustainability. Asking whether a compact city, or any other form of the city, is sustainable is like asking whether the body is sustainable. The proper question is not if the body is sustainable, but rather does the being that inhabits the body live sustainably? (Neuman, 2005: 23)

The framework for the study came from a number of directions in theoretical and more applied research. We try to explain these as clearly as we can here. Core to the focus of the study was the observation that things are not always used in the ways in which they are intended to be used. Thus, materials manufacturers, development designers, builders and other placemakers may have intentions and expectations about how residents and other place-users will use their built environments which are not always reflected in the actual use of those places once developed. This interest in the intersection between something designed for a particular use and the user of that product of design speaks to a body of theoretical work in the social sciences referred to as 'material culture'. At the heart of work in this area is a focus on '[t]he relationships between people and things' (Thrift, 2000: 492).

Material-culture scholarship has historically comprised anthropological and archaeological studies of the ways that traditional cultures use and signify objects. However, recent work has brought the theoretical premises of material culture to bear on new research topics. For example, a material-culture approach has started to be used to consider the ways that objects and technologies are used by individuals in the sphere of climate change. A key contribution of these more recent deployments of material-culture theory is the observation that objects have to be used, arguably increasingly so, in skilled ways (esp. Hutchins, 1995).

Thus the use of an object as intended by the designer of that object is not a given, but rather the ways in which that object is used are a product of a human-object relationship. In turn, for the purposes of this study our contention is that elements of the built environment of masterplanned developments that have been designed with sustainability in mind are not inherently sustainable (cf. Figure 1 below), but rather their sustainability derives in large part from the way those elements are used (Jones, 2012a). Moreover, uses of the built environment by individuals are likely to be structured in cultural ways such that systematic differences in the ways that environments are used might be observable between cultures and culture groups.

Given the focus of the research on sustainable-living practices, we wanted to delve into the interplay between physical spaces and people's behaviours and attitudes in our fieldwork sites: places which were marketed as green or sustainable in terms of both their buildings and wider spaces but are located in different cultural settings. One striking context we found was that ideas about what constitutes green buildings tend to underplay the implications of how people interact with them, although this can dramatically impact on their sustainability performance over time.

For example, the following extract is taken from the 'frequent questions' section of the US Environmental Protection Agency 'Green Buildings' website. The extract demonstrates the ways that the 'agency' of the occupants of a dwelling or development can be absent from understandings of what makes that dwelling or development 'green', that is, environmentally sustainable. In the extract, the 'green-ness' of a building would appear to be a product of the design and agency of the building itself.

What makes a building 'green'?

A green building is a structure that is environmentally responsible and resource-efficient throughout its life-cycle. These objectives expand and complement the classical building design concerns of economy, utility, durability, and comfort.

Green buildings are designed to reduce the overall impact of the built environment on human health and the natural environment by:

- ♦ Efficiently using energy, water, and other resources
- ♦ Protecting occupant health and improving employee productivity
- ♦ Reducing waste, pollution and environment degradation

For example, green buildings may incorporate sustainable materials in their construction (e.g., reused, recycled-content, or made from renewable resources); create healthy indoor environments with minimal pollutants (e.g., reduced product emissions); and/or feature landscaping that reduces water usage (e.g., by using native plants that survive without extra watering).

Extract retrieved from www.epa.gov/greenbuilding/pubs/faqs.htm#2 on 31 st July 2013

Figure 1. What makes a building green?

For the most part, contemporary work in material culture focuses on everyday consumer objects and 'ordinary consumption'. Thus, in their influential book *The Design of Everyday Life* (Shove *et al.* [eds.], 2007), Elizabeth Shove and colleagues use interviews with consumers to analyse in detail the ways that mass-market goods are used on an everyday basis in households in the United Kingdom.

In the present study, however, the scale of analysis is of a different order, focusing on the ways that products

of design from the scale of the household to the neighbourhood are used in practice. The focus is on the ways that in masterplanned communities 'perception and use of the environment is culturally conditioned' (Duncan, 2000: 45-46). This is not an unprecedented approach – for instance, James Holston (1989) did ground-breaking work on Brasilia which explored the contradictions and congruities between the socialist ideologies embedded in the architectural design of Brazil's capital and the everyday practice of that city's built environment. These everyday practices turned out to be extremely influential on Brasilia's built form. At the same time the application of such approaches in relation to urban sustainability so far has been limited.

The notion of 'social practices,' or what has been referred to as 'the practice of everyday life' (de Certeau, 1984), is a core concern in the present analysis. That is, the study is interested in how people 'practise' the physical environment they encounter in and around masterplanned communities that incorporate design features oriented towards environmental sustainability. Importantly, looking at uses of the physical environment through the prism of social practice foregrounds the ways that people's uses of things are socio-culturally ordered or structured.

As the Social Practices Research Group (2011) puts it, '[p]ractices can be understood as habits which people share, such as the school run or regular meal times, and are shaped by cultural norms, regulations, technologies and infrastructures.' Through our comparative study, we believe we have collected data which sheds light on the role that such 'cultural norms, regulations, technologies and infrastructures' play in shaping the sustainability of everyday life in masterplanned communities (of which more below) in the United Kingdom and Australia.

Given the historical links between work on material culture and cultural geography and anthropology (as well as the subtleties of everyday practice) the research has sought to explore sustainable-living practices with these theoretical frames in mind. The study has been designed in such a way as to enable some cultural (as opposed to technical) aspects of sustainable living in practice to be 'unpacked'. One example is the way that the actual use of a design element or a feature of a masterplanned community might diverge from the intended use of that feature.

This brings us back to the concept of material culture with which we started, and which has its roots in the 'Berkeley School' of Geography associated with the work of Carl Sauer in the first half of the 20th century. As Sauer himself put it: 'The cultural landscape is fashioned from a natural landscape by a culture group. Culture is the agent, the natural area is the medium, the cultural landscape is the result' (Sauer, 1963: 343).

Relating our research work to principles of urbanism

Our research into sustainable-living practices is also grounded in more applied perspectives on the nature of urban settlement. To a greater or lesser degree, any study of sustainable living needs to grapple with spatial-design matters, and consider principles which seek to inform how places can function well. One notable aspect, though, is that such principles are not only about spatial design – they also cover 'process' aspects such as social vitality, diversity, governance, management and the ongoing engagement of communities. Thus we have taken a number of principles of urbanism covering both spatial and 'process' aspects as part of our framework for considering sustainability practices in the UK and Australian fieldwork sites. A short review of these principles is offered here.

It is worth noting that designers and urbanists have identified design elements or qualities important to different scales of placemaking, from the level of the individual building to the much larger scale of the urban sub-region (Marshall, 2005; Lessard and Ávila, 2005; Carmona, 2003; Moughtin, 2003; Jacobs, 1993; Broadbent, 1990; Bentley *et al.*, 1985; Bacon, 1982; Alexander, 1977; Lynch, 1985, 1961.). Place design, it is argued, can include experiential qualities of variety, accessibility, vitality, legibility, robustness, identity, cleanliness, biotic support and richness (Bentley, 1990), with vitality judged as 'probably the single most sought after characteristic of good urbanism' (Hayward and McGlynn, 2002). There is a shared view that good placemaking needs human scale, pedestrian freedom and lasting environments, in which the importance of place is stressed (Tibbalds, 1992). Mixed land-use and activities are also a preoccupation (Tibbalds, 1992;

Roberts and Lloyd-Jones, 1997) as is connectivity and accessibility for 'joined up urbanism' (Marshall, 2005: 367). All of these aspects play into the idea of sustainability being expressed in spatial design.

Clearly, for new developments of different sizes, a judgement needs to be made about how far each principle can be applied. A development of a few homes and workspaces, for example, cannot be expected to sort out regional transport connections or wider infrastructure issues, whereas a development of some scale would be expected to deal with principles of good placemaking at individual dwelling, street and neighbourhood level. In other words, development architects, designers and builders need to deal with design issues which are congruent with the scale in question. In any case, development at all scales should, for instance, strive for 'sense of place' and to build on existing positive aspects of character, to include vibrant streets and spaces, defined by their surrounding buildings, and focus on developing walkability and defining catchments for different kinds of services as a basis for spatial shaping.

The approaches to urbanist principles mentioned in this section have informed our analysis of findings at the fieldwork sites. It can be seen that these tend to be 'variations on a theme'. They all share considerable similarities because the principles are not judged as relative ones. They are very much defined as universal in nature by those who have developed them. Guidance documents like the *Urban Design Compendium* (2000), written by the planning and design experts Llewelyn-Davies, and published by English Partnerships and the Housing Corporation is a notable contribution of this kind. Further relevant guidance includes *Shaping Neighbourhoods: A Guide for Health, Sustainability and Vitality* (2003); *The Manual for Streets 1 and 2*, and other publications from the (now disbanded) CABE, which all support such an approach.

The widely used *Urban Design Compendium* (2000) suggests the following principles for making sustainable places:

Urban Design Compendium - Principles of Urbanism

1. Places for People – to be loved places must be safe, comfortable, varied and attractive. They also need to be distinctive, offer variety, choice and fun. Vibrant places provide opportunities both to socialise and to watch the world go by.
2. Enrich the Existing – places should enrich the qualities of existing urban places. Whatever the scales, new developments should respond to and complement their settings.
3. Make Connections – places must be easy to get to and well integrated both physically and visually with their surroundings so people can move around without effort.
4. Work with the landscape – places should use the site's intrinsic resources – climate, landform, landscape and ecology – to minimise energy use.
5. Mix use and forms – stimulating, enjoyable and convenient places meet a variety of demands from the widest possible ranges of users, amenities and social groups.
6. Manage the investment – for places to be successful they must be economically viable, well managed and maintained.
7. Design for change – places must be flexible enough to respond to future changes in use, lifestyle and demography.

Source: adapted from <http://www.urbandesigncompendium.co.uk/keyaspectsofDesign>

Table 1. Urban Design Compendium Principles of Urbanism

Another approach comes from the Academy of Urbanism, an autonomous, politically independent, cross-sector organisation formed in 2006 to expand urban discourse in the UK and beyond. The Academy seeks to identify and promote best practice in urbanism. It has set out principles of urbanism in its manifesto and they are reproduced here.

Academy of Urbanism - Principles of Urbanism

1. Successful urbanism is the result of a collective vision, realised through creative and enduring relationships between the community, government, developers and professionals involved in its design, delivery, governance and maintenance.
2. The culture or cultures of the people and the ecology of the place must be expressed at a human scale and through both physical and social structures.
3. The identity, diversity and full potential of the community must be supported spiritually, physically and visually to sustain a sense of collective ownership, belonging and civic pride.
4. Vibrant streets and spaces, defined by their surrounding buildings and with their own distinct character, should form a coherent interconnected network of places that support social interaction and display a hierarchy of private, commercial and civil functions.
5. There must be a permeable street network with pedestrian priority that gives maximum freedom of movement and a good choice of means of transport.
6. Essential activities must be within walking distance and there should be a concentration of activity around meeting places.
7. Places must provide a diversity of functions, tenure, facilities and services; have a mix of building designs and types; and include a variety of appropriately scaled districts and neighbourhoods.
8. The social, cultural and economic needs of all inhabitants must be capable of being met without detriment to the quality of the lives of others.
9. Security should be achieved by organising the urban environment in ways that encourage people to act in a civil and responsible manner.

10. The pedestrian environment should be closely associated with active frontages at street level and there should be an appropriate intensity of use in all areas at all times.
11. The design of spaces and buildings should be influenced by their context and seek to enhance local character and heritage whilst simultaneously responding to current-day needs, changes in society and cultural diversity.
12. The public realm and civil institutions must be supported and protected by sound and inclusive processes that respond to the local community and changing economic and social conditions.
13. Decision-making for the ongoing development and management of the urban fabric must engage stakeholders and the local community through public participation.
14. Diverse, accessible, affordable and active villages, towns and cities will encourage successful commercial activity, promote prosperity and support the well-being of their inhabitants.
15. New and existing places must respect, enhance and respond to their local topography, geology and climate and connect to the natural environment within and around them.
16. Urban parks and other landscaped areas should provide space for recreation, encourage biodiversity and help support a balanced environment.
17. New urban forms should be capable of adaptation over time to meet changing needs and to promote the continued use of existing resources, including the built environment.
18. The built environment must seek to minimise the use of carbon-based products, energy and non-renewable resources.

Source: www.academyofurbanism.com/

Masterplanned communities as a research context

The research has focused on a number of places in the United Kingdom and Australia which have been 'masterplanned'. It is therefore important to explore what a masterplan is and justify why we chose to focus our research on such communities as a setting for exploring sustainable living practices. There can be some confusion about what 'masterplanned' communities are. We are not referring here to gated communities but to accessible places which have been explicitly designed in certain ways (usually from scratch) *on greenfield, brownfield or greyfield sites*. In this research we have taken 'masterplanned' to refer to a process focused on area design and development which usually produces a masterplan to guide development. The Scottish Government has a useful definition of what a masterplan is from which we quote as follows:

'In broad terms, a masterplan comprises three-dimensional images and text describing how an area will be developed. Its scope can range from strategic planning at a regional scale to small scale groups of buildings. Most commonly, it is a plan that describes and maps an overall development concept, including present and future land use, urban design and landscaping, built form, infrastructure, circulation and service provision. It is based upon an understanding of place and it is intended to provide a structured approach to creating a clear and consistent framework for development.'

Whereas a development plan sets out the scale and type of development, and the key principles of character for a region, a masterplan is generally employed where there is a greater degree of certainty regarding the development of a specific site, and is linked to social and economic analysis and a delivery strategy. Although a masterplan may specify more detailed governing principles such as building heights, spaces, movement, landscape type and predominant uses, it does not necessarily preclude a degree of flexibility in designs within the plan' (Scottish Government Planning Advice Note 83, undated)

Frame	Context	Urban Structure	Connectivity	Place detailing	Implementation
Role of urban design	Community; Place	Movement framework	Walking	Positive outdoor space	Managing design process
Key design aspects	Natural resources	Mixed uses	Cycling	Animating the edge	Stages in implementation
	Connections	Density, facilities and form	Public transport	Building size and scale	
	Feasibility	Energy and resource efficiency	Streets and traffic	Building for change	
	Vision	Landscape	Parking and services	Public realm	
		Landmarks, vistas and focal points	Utilities	Safety and sense of safety	
		Blocks	Infrastructure		
		Parcels and plots			

Table 3. Design elements explored using masterplanning methods. Source: *Urban Design Compendium, Llewelyn-Davies, 2000*

The masterplan aims to gain a greater understanding of each neighbourhood's existing physical character and make sure the new place relates well to what exists already. The approach draws on the techniques of character appraisal and environmental appraisal (Urban Design Compendium, 2000: 24-27). As Table 1 summarises, there are different design considerations that need to be explored through a masterplanning process and reflected in its plan. The conventions of a masterplanning exercise see it begin with an appreciation of the site's context, move on to consideration of its urban structure, explore site connectivity, consider details of the place, and finally focus on implementation (see Table 3 above).

The reasons for choosing to study sustainable-living practices in masterplanned communities are worth explaining here. As we scoped the research and read through the relevant literature we came to the view that masterplanned developments offered very interesting possibilities of exploring sustainable built environments and people's responses to them from places created from scratch. This, we felt, might make it easier to define what elements of the built form people were responding to (at both individual dwelling level and in the wider place). By contrast, in an existing urban setting with all its complexity built up over time, and expressed socially and spatially, we felt that teasing out which relational elements were relevant would be more difficult to do.

We were also keen to explore the masterplanned place as a research setting because we had noted in examples of processes how common it was for documents to make sustainability claims. We saw this at both the level of the architecture and products used to construct individual buildings and in the wider urban design of such developments. Given the nature of conventional masterplanning process, we thought we could explore sustainable-living practices at three stages, using different methods:

- ◆ When development projects are being commissioned and set up – we reviewed documentation about the sites from this stage of their evolution
- ◆ During the design and development phase – we reviewed documentation and spoke to expert stakeholders relevant to each site about design and development intentions and actual implementation

and finally,

- ◆ When judging the performance of places once built – our primary research was largely focused on exploring these places at this stage, somewhat after their construction and during initial habitation

The study's research questions

The study's research questions have been informed by a number of contextual points. First of all, they reflect the Partnership's aim, which is to explore and encourage debate about aspects of sustainable living. Secondly, there has been a particular focus on 'end-user' perspectives in the built environment as the Partnership argues these may have been under-represented in work on sustainable living. Thirdly, the questions were the result of detailed discussion between the academic staff directing and undertaking the research

and the Partnership's expert steering group, which brought a range of highly experienced perspectives from practice. These insights were augmented by input from a wider expert consultative group. Fourthly, they focused on what was identified as a research gap in the area of the 'material culture of sustainable living' in the context of masterplanned communities.

Based on these inputs, the study has sought to explore three key questions:

- ◆ Do people use sustainable design features built into their homes and wider neighbourhoods in the ways that those features are intended to be used?
- ◆ Can we better understand cultural aspects of sustainable living and the use of sustainable features by focusing on social practices as much as physical infrastructure, materials and technologies?
- ◆ Can we use this understanding to improve urban resilience in the face of climate change?

While the last of these questions is addressed more fully in Section 5 (which looks at our comparative analysis and conclusions), this section and the next address the first two questions in the Australian and United Kingdom settings where fieldwork has been conducted.

Methods used

Overview

The research project has been based on primary research to develop comparative case studies on sustainable-living practices in masterplanned communities. It has compared experience in two national contexts which

share some urban characteristics. For example, they are both Western developed-economy urban settings with planning, building and urban-design regimes that are relatively similar. Their development and masterplanning process has been by way of partnerships between different development organisations. All the sites are reusing formerly used land, and once built, the tenure mix in each case has been relatively weighted towards home ownership rather than social or private renting. These two national settings have also offered certain differences, including their geographical location, climatic conditions and some variations in demographical profile between case-study sites (although we sought to ensure there was sufficient demographic basis for comparison between the populations studied).

This study has been primarily qualitative in nature, using social science-based research methods to generate empirical data. It is worth noting that qualitative data collection has broadly been advocated for 'research [that] studies participants' knowledge and practices' (Flick, 1998: 6) and that it is 'concerned with people's... everyday behaviour' (Silverman, 1999: 1). A focus on such qualitative research methods thus offered a good fit with the area of research enquiry. We explored the methodological possibilities and chose a set of mainstream social research methods which we felt were best suited to the data collection and analysis requirements of the project. We discuss this process in some detail below.

The fieldwork was conducted in five case-study sites. Within a broad case-study methodology as advocated by Yin (1994, 1993) we used a collective case-study approach (Stake, 1995, p.3-4), with data generated through semi-structured interviewing with place-users (Bryman, 2001).

Once we had determined the appropriate methods, we sought approval for the research from the University of Hertfordshire's Ethics

Committee to obtain consent for the study prior to its start, and to govern its conduct and reporting of outcomes.

Site-selection criteria overview

The same methodological considerations influenced our site-selection criteria and the actual process of shortlisting and selecting sites in both countries. We review the criteria here and describe and justify the site selection itself in each of the substantive chapters on fieldwork in Australia and the United Kingdom.

We were looking to identify and then select sites in which housing had been designed and developed at the Code for Sustainable Homes level 3 or to an analogous sustainability standard or set of principles. The Code is described on the UK's Planning Portal as 'the national standard for the sustainable design and construction of new homes. The Code aims to reduce our carbon emissions and create homes that are more sustainable' (Planning Portal, accessed 30 January 2015).

We were keen to explore places which were self-reporting that their overall design and their housing were sustainable. These obviously had to be developments which were inhabited, in order that there were fieldwork subjects (at least in theory) available to be interviewed about their experience and practices. We wanted to find places where we could examine sustainability discourse in marketing and publicity literature from the site developers themselves and then undertake academic analysis.

In terms of scale, we were looking for sites which were large enough to offer sufficient fieldwork subjects and physical built form to consider comparatively, and which were, in density terms, representative of the market in new development, that is at the lower end of 'medium density'. Clearly, to fit our research focus these had to be sites which had been masterplanned, reflecting in sufficient ways the nature of masterplanning noted above.

We were interested in obtaining a spread of sites in different settlement contexts. Thus we looked for a range of sites from inner city to outer suburban and wider urban conurbation. In the Australian case these were found within the same conurbation (Greater Sydney) whereas in the United Kingdom there were sites in both Greater London and in the East of England which covered the same range of settlement types but in different urban locations.

Through discussion of the demography of settlement we identified that a possible focus would be on older people's housing. However, in the end, while one of the Sydney case studies did have a component of older people's housing, none of the UK case studies had a focus on older person housing (and the needs of older people were conspicuous by their absence from corresponding masterplans).

We also intended that the tenure mix for our study sites would be in keeping with a wider urban-tenure profile. However, given the nature of the sites as new developments (an area of the housing market which often has a rather asymmetrical tenure mix) we acknowledged that it was unavoidable that there would be a greater proportion of buyers than either private or social renters in our fieldwork subject mix. We were open-minded as to whether the site developer was in the private or public sectors or represented a mix.

In both cases our initial search range was across Australia and the United Kingdom to maximize our site 'long-listing' options, and we were clear that the sites needed to be comparable but also to offer experiential contrasts that would help illuminate aspects of sustainable-living practices.

Methodological similarities and variations between research contexts

We did not assume that exactly the same set or balance between methods would be appropriate in the Australian and United Kingdom sites, given their differences as research contexts (noted above). So, although we were obviously keen to ensure all the fieldwork sites remained properly comparable as case studies of sustainable-living practices, by being explored in similar ways, we also noted particular implications for methods relevant to our two national contexts.

For example, in relation to household sustainability in the Australian context, Ruth Lane and Andrew Gorman-Murray (2011: 10) make the specific contention that: '[M]ore work needs to be done to see how sustainable practices are enacted in modern eco-homes. Here, cultural approaches help immensely, through ethnographic work, diaries and in-depth interviews.' This not only supported our theoretical focus on material culture as an appropriate framework for the research but in a more practical sense suggested kinds of methods that would work in the field.

Sticking with the methods used in the Australian fieldwork for a little longer, Lane and Gorman-Murray (2011) were also useful in helping us pin down some methodological specifics. For instance, they suggested that ethnographic work in and around case studies (as presented by our fieldwork sites) could include both observations and in-depth interviews. Various kinds of participant and non-participant observation have been widely used in urban research and Lane and Gorman-Murray's (2011) work supported our choice of observations conducted in the 'observer-as-participant' mould, as also classically advocated by Gold (1958: 221). Lane and Gorman-Murray's (2011) work also validated the use of in-depth interviews (one-to-one and paired) with residents of the masterplanned developments in which we conducted fieldwork.

In addition, for the Australian fieldwork, these primary 'corpora of data' (Bauer and Aarts, 2000: 19-37) were also supplemented by the following data-collection activities:

- ♦ Various stakeholders in urban development in Sydney (including planners, developers, academics and urban designers) were consulted at the case-study selection stage
- ♦ Written and online materials concerning urban development and urban policy in Australia (in particular in New South Wales and in relation to the two case-study sites selected) were compiled over the course of the fieldwork period
- ♦ Several hundred photographs of the case-study sites were taken over the course of the fieldwork period, exploring aspects of the nature and use of the built environment in each case and adding visual material to the data set then analysed

Notwithstanding the different contexts, the comparative nature of the research project meant that the methods used in the United-Kingdom-based case studies endeavoured to mirror those used in the Australian fieldwork (see Section 4.2 below). Thus, at the case-study selection stage, a combination of research into developer websites and correspondence with professional stakeholders (including developers, planners and builders) was used to construct a long-list of potential research sites. Similarly, hard-copy documents and web-based sources were consulted in order to inform the subsequent shortlisting and selection of case studies.

The fieldwork that was then undertaken comprised semi-structured interviews with end-users in the masterplanned developments chosen as case-study sites, using an interview topic guide designed initially for the Sydney-based research. These interviews were augmented by fieldwork observations, fieldnotes and photographs taken during visits to case study sites.

In the Australian fieldwork, a focus group was conducted with local residents in each case-study area. Our view was that complementing the in-depth interviews with focus groups enabled the researcher to explore consensus about findings emerging from the interviews and to observe how views and opinions about sustainable living in these areas could variously be deliberated on, challenged and agreed upon in a group setting (see Bauer and Gaskell, 2000: 44-49). A similar focus group exercise is planned for each of the UK case-study sites.

3. Australian fieldwork process and findings

About the section

This section of the report describes the process and summarises the findings of the Australian fieldwork component of the University of Hertfordshire Lafarge Tarmac Sustainable Living study. As explained above, this has been a comparative study of sustainable-living practices in masterplanned developments in Australia (Sydney metropolitan area) and the United Kingdom (London metropolitan area, Brighton and Bedfordshire). The fieldwork for the Sydney-based component of the study was carried out by the UH Lafarge Tarmac Partnership's first research fellow, Dr Alasdair Jones, over the period February 2012 to June 2013. For most of this time, Dr Jones was kindly hosted by the City Futures Research Centre in the Faculty of the Built Environment, at University of New South Wales. The research director, Dr Susan Parham, also visited City Futures in NSW during the fieldwork research phase.

In a research-process overview this section of the report explains the detailed justification for the study sites chosen in the Sydney metropolitan area (the overall study criteria were discussed in Section 2). It then sets out the social research methods used by Dr Jones to collect data, as well as the data analysis techniques adopted. The report section goes on to outline in a thematic way the findings of this component of the study. Finally, it foreshadows the comparative analysis section (5) of this report, which considers ways that these findings might ultimately be used as a basis for prompting approaches to masterplanning that better accommodate user-behaviour.

The research process – overview

Dr Jones conducted two extended visits (February 2012 to November 2012 and February 2013 to June 2013) to Sydney, Australia to carry out his fieldwork and collected the majority of his primary data during the second of these. In total, 57 residents took part in in-depth interviews (one-to-one or paired) and focus groups across the two Sydney metropolitan area case-study sites. Residents were recruited initially

through contact with local 'gatekeepers' (community facilitators, local community organisers and so on) and through notices posted in local media (both on- and off-line) with participant recruitment 'snowballing' from that. Towards the end of the fieldwork period direct mailing was employed in both case-study sites. As a thank you to research participants for sparing the time to take part in the study they each received a \$25 AUD supermarket voucher at the end of the interview or focus group they took part in.

Study participants were recruited according to a 'purposive sampling' strategy (Green and Brown [eds.], 2005: 122). This involved actively seeking out participants in such a way as to include the views of people with a range of characteristics (gender, age, country of birth and so on) that broadly reflected the local demography. Of the respondents spoken to, for instance, the gender split was 51% men and 49% women while 38.6% of the respondents were born overseas (the latest census data from 2011 indicate that 40.1% of the total population of the Sydney metropolitan area were born overseas [City of Sydney, 2013]).

The interviews and focus groups with residents were 'semi-structured' and proceeded according to a series of questions compiled by the researcher into a topic guide. Discussions were not restricted to the issues covered by the topic guide, however, and interviews often also included a great deal of (frequently fruitful) open-ended discussion. Respondents would initially be asked about why they moved to the masterplanned development in question, with a view to understanding what aspects of the development attracted them and, importantly, to what extent concerns about sustainability featured in their decision-making.

Out of this discussion, respondents were asked about their everyday life in the development (including energy use, transport and socialising) and about how their experience of the built environment impinged upon the ways they went about their daily lives. In this respect, the researcher sought to elicit, in an inductive way, a detailed picture of the relationship between the built environment, social practices and sustainability in the two case-study developments.

To augment the interview data, observational field notes were made either during the course of the case-study sites visit or immediately afterwards. These concerned, for instance, the walkability of the street layout of the masterplanned developments or other relevant observations about practices such as the use of facilities like communal clothes-drying areas. The in-depth interviews and focus groups with residents were digitally recorded before being professionally transcribed.

Prior to taking part in the research interviews and focus groups participants were given a summary of the research and then were asked to complete and sign a consent form if they were willing to participate. Participants also completed a short demographic questionnaire in order to provide the researcher with some background information on the profile of those who took part in the study. Participants were informed that they could withdraw at any time from the study and that their responses would be anonymised in anything published from the study.

The findings in relation to the Australian fieldwork presented here were made easier to sort and analyse by the use of thematic coding of the interview and focus-group transcripts, with this information supplemented by observations recorded in field notes.

Selecting the case-study sites

The interview, focus-group and observational data amassed for the Australian component of this study were collected in two case-study settings in the Sydney metropolitan area. While qualitative research does not, on the whole, seek to be 'representative' (in the vein of its quantitative counterpart, where 'big numbers' are often a feature), efforts were made to elicit data about sustainable living from different social contexts, as explained in detail in Section 2.

The process was as follows. As well as using the initial fieldwork period to familiarise himself

with the urban-development context, Dr Jones also used meetings with local experts and his readings of the literature to identify potential field sites for the study. Long-listed sites were selected according to a variety of 'inclusion criteria' noted earlier, including: medium-to-large scale; mixed use; prominent sustainability features (in terms of design and marketing); and practicable location.

Initially, the masterplanned developments sought by the researcher were high-end 'eco-developments' (terminology used in Australia) – that is, developments designed and built at the forefront of sustainability and according to measures that far exceed the statutory sustainability codes for housing. However, over the course of meetings with planners, developers, academics and urban designers in Sydney it became clear that, as one informant put it, 'the reality is that there is not much out there that fits your criteria.'

While very high profile eco-developments were under construction or in the pipeline, there were not enough eco-developments of sufficient scale, and that had been occupied for long enough, to meet the case-selection criteria for this study. For instance, the most high-profile ongoing development in Sydney at the time was Barangaroo. Despite some controversy over the use of this inner-city site for urban development, Barangaroo was being proposed as just one of 17 precincts worldwide selected to participate in the Clinton Foundation's 'Clinton Climate Initiative' which 'supports the development of large-scale urban projects that are striving to reduce the amount of on-site CO₂ emissions to below zero' (NSW Barangaroo Delivery Authority, 2012). However, this site was not yet built out so was unsuitable as a case-study location.

Given the need to find sites where at least some development had been completed and residents were *in situ*, the case-selection criteria were revisited and modified so that the types of masterplanned development sought were



Figure 2. Inner urban Sydney metropolitan area case-study location

no longer explicitly 'eco-developments' but were instead developments that incorporated in their design, construction and marketing some principles of sustainability, often referred to in an Australian context as 'environmentally sustainable design' or 'ESD'.

Adjusting the criteria in this way enabled the researcher to narrow down the long-list into a shortlist of ten potential sites across the Sydney metropolitan area, which Dr Jones sought to rank in terms of suitability for the study. From this shortlist, two masterplanned developments were selected for data collection (Jones 2012b). Dr Jones finalised his site selection at the end of April 2012 after discussion with the Partnership steering group and experts and other stakeholders in Sydney, including land-development companies and senior government planners.

The two masterplanned developments selected for this study were Park Central near Campbelltown (in the south-western outer suburbs of Sydney) and Jackson's Landing in Pyrmont (an inner-city suburb of Sydney in the local government area of the City of Sydney). Pyrmont is located at the other side of Darling Harbour from the Sydney Central Business District (CBD) (see Figure 2) while Campbelltown is located about 50km southwest of the CBD (see Figure 3).



Figure 3. Outer urban Sydney metropolitan area case study location

The specification of these two case-study developments is summarised below, with particular attention given to the sustainability (i.e. 'environmentally sustainable design') features built into each. A masterplan drawing for each development is included to enable the reader to get a sense of the layout and functionality of each site from an urban-design perspective.

Site summary – Park Central, outer Sydney

The Park Central development is located in the outer south-western Sydney suburbs. It was developed by the New South Wales government's large-scale public development agency on 37 hectares of land and included 723 dwellings. The location in the outer suburbs of Sydney is traditionally where the now very hard to achieve 'Australian Dream' of owning a detached house surrounded by a garden on a quarter-of-an-acre plot of land has traditionally held sway.

In this cultural and spatial context the development's sustainability features were notable and included a number of environmental sustainability aspects relating to water, energy and transport as well as some more socially and economically based ones. There were, for example, water-use and -retention related features, including fully constructed wetlands and reduced potable-water demand through building controls stipulating rainwater tanks, AAA fittings and dual-flush toilets. In relation to energy, there was an overall approach to reduced energy demand by using solar-design principles reflected in things such as the provision of outdoor clothes-drying areas and clotheslines as well as mandatory gas-boosted solar hot-water units (HWUs) and mandated energy-efficient appliances with minimum energy-consumption ratings.

In travel terms, there was some attempt to encourage mode shift through designs oriented towards walkability within the context of the 'car dependent' south-western Sydney region. In terms of social and economic need, there was provision of targeted housing types such as apartments and retirement units to fill market gaps identified in the local market and to retain local residents as their housing needs changed.



Figure 4. Park Central Development

A full list of 'environmental sustainability' and 'social sustainability' features incorporated in the design and construction of Park Central can be seen at Landcom (2011: 2). Park Central has been described by the developer as a 'model of sustainable development in Sydney's south-west' (Landcom, 2010: 2). The cited achievements include it being the first masterplanned mixed-use and medium-density development in the 3,067km² Macarthur Region of the south-western Sydney metropolitan area; it being seen as a demonstration project for the future South West Growth Centres; and it containing the first studio units, the first apartments for 40 years and the first office development for over 20 years in the area (Landcom, 2008: 6).



Figure 5. Jackson's Landing Development

Site summary – Jackson's Landing, inner Sydney

By contrast, Jackson's Landing is in inner Sydney, developed by another large-scale development firm, this time in the private sector, on a significantly smaller piece of land (covering 11 hectares) but encompassing a substantially higher number of dwellings (1,339) in an area marked by very high housing densities. Sustainability features include: communal recycling areas; a community garden; the application of solar-orientation design principles; a strong emphasis on provision of walking routes; a community hall; and Community Title in operation – through a Jackson's Landing Community Association (with a sustainability sub-committee). For more on how the Community 'Strata' Title operates in Australia see <http://www.stratacommunity.org.au/understanding-strata/community-title> (retrieved 1 August 2013).

While sustainability was not a core feature of early marketing materials for Jackson's Landing, the CEO of the development firm involved described Jackson's Landing as 'a wonderful example of a thriving community that has been created from a previously underused part of the city. It demonstrates how important it is to create a place that is culturally sensitive and environmentally sustainable for future generations' (quoted in Lend Lease 2012: 14). Moreover, the development, which is situated in the most densely populated urban area in Sydney (at 13,850 residents per km² [after Wade, 2013]), includes the 'Antias' building. This is the first apartment building in Sydney to be awarded a 4-Star Green Star - Multi Unit Residential Design v1 certified rating. Design features at Antias included cross-flow ventilation in residential units; naturally ventilated lobbies; solar panels on the roof providing common area electricity; rainwater tanks linked to toilet flushing; and smart meters for all apartments.

Research findings

The following discussion sets out some of the key findings of the Australian component of the study. This not only makes clear what we found out through the Australian fieldwork but provides a basis for the in-depth analysis which can be found in Section 4. In our view, the findings on sustainable-living practices have implications for urban-development stakeholders who are planning, designing, building and managing masterplanned communities.

An attempt has been made, where possible, to organise the findings that follow in a scalar way, starting with findings that relate to practices at the scale of the household and moving up to those that speak to the neighbourhood-level and wider. Some of the findings corroborate existing research into people's attitudes towards engaging in more environmentally, socially and economically sustainable practices. Others provide new insights into how the adoption of sustainable social practices can be enabled or undermined in masterplanned developments. It is these more insightful findings that are elaborated further in Sections 4 and 5 below and in the manuscripts being prepared for submission to peer-reviewed academic journals.

Sustainability 'costs'

The existence of sustainability 'costs' to individuals is well-rehearsed and so we do not spend too long on it here. However, it is important to make the point that for the Australian fieldwork participants, economic considerations were the primary control on their behaviour in relation to sustainability.

Respondents made clear economic calculations about the costs and benefits of changing their behaviour and were generally only minded to change once the costs outweighed the benefits. This was evident both at the household scale and at the strata-committee scale (strata committees being responsible for decisions about communal goods in strata-titled apartment blocks and precincts in Australia). Thus, for example, the following extract comes from a paired interview conducted with seemingly the most eco-minded respondents in Park Central to take part in the study:

Interviewee: We separate everything from the garbage. We do everything we're supposed to do. [...] Do stuff that will save money.

Interviewer: Money is the driver and the environment stuff comes second?

Interviewee: Yes

Thus, even for a couple who installed two sets of photovoltaic panels on their roof and a large awning at the rear of the house to help keep the indoor environment cool during summer, the primary goal for these measures was saving money, with environmental or broader sustainability outcomes seen as a bonus rather than a specific focus.

Importantly, respondents reported that in the context of significantly rising energy prices in Australia they were increasingly interested in investigating ways of reducing their energy consumption. Electricity costs were estimated to have increased by about a third on average in the three years prior to the fieldwork (King, 2013). However, if measures were to be taken up they would need to be cost-effective. As one interviewee put it to the researcher while discussing securing support from residents for strata-level decisions to reduce the consumption of energy in the communal areas of apartment blocks in Jackson's Landing:

The trick about selling sustainability is to tell people it will save them money, [...] to be] very focused on the payback, how much it costs upfront and what the payback period is.

Tensions between sustainability and security

As the preceding finding indicates, 'living sustainably' is not something that is done in isolation. Rather, decisions to behave in more sustainable ways are made in the light of other preferences and concerns; not least the financial considerations. As the fieldwork proceeded, it became apparent that particular tensions existed between dwelling and place designs and demands for security in the masterplanned developments studied. This had implications for the practicalities of engaging in more sustainable

practices (which those residents interviewed often saw as being focused on environmental aspects).

These tensions were perhaps most clearly evident in the accounts given to the researcher by a number of Jackson's Landing residents about the ways the lifts in their apartment blocks were programmed to operate. Specifically, with a view to strengthening security, property managers had stopped accessibility in apartment blocks between different floors. Residents reported that they were only granted access via the lift to their own floor of the apartment building they lived in. Moreover, while there were stairwells in the apartment buildings, these were reserved for use during emergencies and were alarmed to prevent their use at other times. Thus:

Not only for this development but just generally, people seem to think security is a very important issue these days. I was going to say maybe older people, but I don't know if that's necessarily true because I have a number of friends, and again I don't want to stereotype, but it mainly seems to be the female friends that are more concerned about security, and I can understand that.

So for those [security] reasons... a simple example is my neighbour upstairs, who I met through a friend, I'm in [apartment 71], she's in [apartment 81], so if I want to borrow an onion from her or something, I have to go down to the ground floor, go outside the building, buzz her, and then she gets to buzz me up.

There's no access between the floors at all because there's an alarm on the stairwell, and if you go in there, the alarm goes off, and it's also pressurised for fire and safety reasons... I have to use the lift to go right down to the ground floor, I'm on level 7 so just imagine if you're on level 18 and knew somebody in 17 you'd have to travel 35 floors to get one floor down, which is crazy.

In this instance, then, security priorities appear to have trumped sustainability prerogatives, and a situation has unfolded whereby mechanical elevators can travel tens of floors just to move

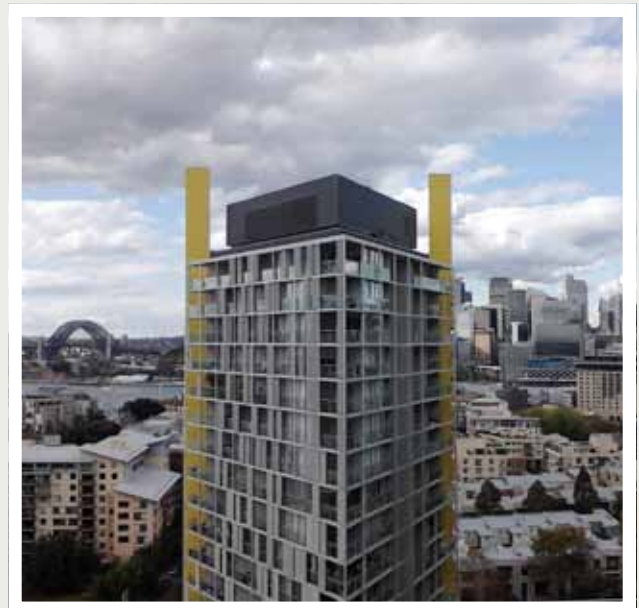


Figure 6. Hidden 'sociability' costs in high-rise development

someone one floor up or down. The supplementary travel (and so use of energy) by the lifts in this example is not insignificant if we take into account that a recent Australian study indicates that lifts are estimated to use about 8% of a building's energy consumption (Bannister, Bloomfield and Chen 2011: 1).

Moreover, the energy consumed in powering elements such as lighting and lifts in the communal areas of apartment buildings can often greatly exceed the total energy consumed privately by building residents. For instance, for one of the Jackson's Landing buildings, 'Regatta Wharf', a recent energy audit conducted as part of the City of Sydney 'Smart Green Apartments' program revealed that common-area electricity produced 1,223 GHG tCO₂ per year (in contrast to a total of 760 GHG tCO₂ per year produced through residents' activities in the building's 143 apartments [Net Balance, 2013: 4]). Thus, while the energy-consumption findings related to lift use they also at least raised the broader issue that buildings tall enough to require lifts were going to be more energy intensive than lower or medium rise ones.



Figure 7. Walkability issues at Park Central

Barriers to walkability

Walkability also emerged as an issue in relation to design at ground level in both masterplanned areas. For instance, Park Central is extremely close to shopping, public transport and entertainment facilities 'as the crow flies' and is marketed as such, but accessing these services and facilities on foot is not easy. The development has six-lane main roads to contend with on all sides and very short crossing phases for pedestrians on each of these roads. Some residents, especially the elderly (and nearly half of residents are in a retirement village), were thus dissuaded from walking by poor design cues and the reality of a heavily trafficked and potentially unsafe walking route out of the development to local shops and services. A number of interviewees (especially elderly interviewees) reported that they did not feel confident accessing local facilities on foot, opting to drive instead.

Park Central focus-group respondents similarly reported that they 'mostly drive' to do their shopping at Macarthur Square (800m from

home) and Marketfair (500m from home). One participant said of these roads, 'you can't cross in one go,' before adding that she 'wouldn't like to stop there' (on the central reservation), despite there being a button available to pedestrians to request a pedestrian phase if they only make it halfway across. A view was shared that the pedestrian phase was not sufficient to cross these roads, and this was so 'specially for some of our residents with walkers and that, because if you walk with them, it is very slow.'

This needs to be understood in the wider context of the interplay of traffic engineering and cultural norms which supports the dominance of the car in Australia (68.1% of Sydney trips), and in particular in outer suburban areas, as exemplified in the comments by two different interviewees below:

I would say, a lot of people if they wanted to go into Campbelltown would just drive. That seems to be a culture here. I've lived in this area – not this particular area but this greater area – for pretty much my whole life and that's the culture, like drive to your local shop.



Figure 8. Hidden pedestrian routes in Park Central

There's one crossing on Hyde Parade which I fought for, for three years. I'm a stirrer... A pedestrian crossing... [P]eople were going across to the newsagent and all the doctors... Every Sunday morning, the people come down to get their Sunday papers and there was no pedestrian crossing... [I]t took three years after we moved in of writing letters, talking to Aldermen, making friends of one particular Alderman who was on the Traffic Committee and really a long time.

And a phone call to a reporter, and for their photographer, organising a group of people from the hospital, walking frames, sticks, walking across there, about 20 of them.

A Councillor came to look at it one day to see how bad it was and that was an engineer from the Council, and I arranged for it to be very busy that day. But eventually it went in and it's been used every day. People want a zebra crossing here but it's too narrow.

Issues with walkability at Park Central also related to its perceived lack of legibility, especially to those who did not already live there and know their way around. It was designed in such a way as to feel 'private' (interviewee) and secluded. Thus, while the masterplan for the development included a number of pedestrian routes providing short cuts through the site, efforts to make visitors and passers-by aware of these cut-throughs were few and far between. On the ground, then, alleyways were not obvious to people on foot, visiting or passing through the area (see Figure 8). As one interviewee noted:

[I]f someone who's not familiar with the area is dropping me off at home, you do notice it's not well signposted, so you can get confused.

At the same time, in the masterplan of the area and even on Google Maps, routes such as these are absent from the mapping provided. Significantly, this lack of awareness about how the area could be accessed on foot arguably contributed to what residents described to the researcher as

the 'private' feel of Park Central. Notably, the 37-hectare development only had four vehicular roads allowing ingress. Moreover, the researcher was also told that one of the selling points of the development to prospective residents, and which was actively marketed to them, was that it only had a limited number of access points. In part this relates to concerns about strangers accessing the development and potentially posing a security risk to residents and in this sense is similar to the example in relation to lift use.

For both of these examples at Park Central (the constraints on lifts use and the lack of highlighting of pedestrian access routes) it must be stressed that many residents valued these features of their respective masterplanned developments and the sense of security that they fostered. While they might on the one hand see the need to take a lift 35 floors to go one floor as 'crazy' (see interview excerpt above), at the same time they understood the security rationale behind that state of affairs.

Sustainability design features aren't necessarily used as expected

The most striking finding in the Antias building in Jackson's Landing (the building designed according to the strongest ESD principles in the Jackson's Landing development at the time of data collection) related to a 'Switch Automation Energy Monitoring System' which had been installed in each house and apartment. This came with an eight-page 'energy usage operation manual' which offered instructions about how to use the complex monitoring system. As the interview reported below demonstrates, this has not been straightforward to use and none of the six Antias building residents interviewed was using it:

Interviewee 1: It measures energy use daily, hourly, instantaneous, weekly, monthly, yearly usage of all and graphs it out. 'It's a pretty smart unit and this is the most basic of this model that we have got. ...'

Interviewer: Do you use it?

Interviewee 1: No

Interviewee 2: I can work the five-day weather forecast. I use it for the weather forecast and assess whether I should book tennis at the planned-community tennis courts!

Interviewee 3: Never. It's a bit of a gimmick if I'm totally honest.

This gap between equipment offered and use in practice applied to other aspects of design too, as shown in the following comments:

Interviewee: Apparently I have a water tank, but I've never used it because I don't even know where it is.

Interviewer: Who told you you had a water tank?

Interviewee: The real-estate girl told me I had one, then I spoke to the builder who wasn't sure, then I spoke to someone else and they said no, and then one of the strata people said yes I do. Well, how do I use it? They weren't sure. Apparently it just gets put in with the rest of the water. I don't know.

We had solar but it broke. The landlord didn't fix it so now we're on the gas tank.

Unfortunately, most of this precinct has been designed so that you wash your clothes and then put them in a dryer; in fact it's a body corporate edict that you can't hang out washing on the balcony. I'm fortunate that I've got a cement section on my balcony and I hang it behind that.

There is no easy resolution to these tensions because residents sought the sense of security conferred as well as reflecting on what this meant in negative terms for other aspects of their daily life – sustainability, the chance of social encounters and so on. This finding suggested a need for sustainability initiatives in masterplanned developments that are sensitive to and find an appropriate balance between the sometimes competing needs of residential communities.

4. UK fieldwork process and findings

About the section

This section of the report describes the process and summarises the findings of the United Kingdom fieldwork component of the UH Lafarge Tarmac Sustainable Living study. The fieldwork for the United Kingdom based component of the study was carried out by the UH Lafarge Tarmac Partnership's second research fellow, Dr John McCormack, over the period June 2014 to October 2014, while Dr McCormack was based at the Centre for Sustainable Communities.

As with the Australian fieldwork, this section begins with a research overview describing the research process and explaining the social-research methods used by Dr McCormack to collect data, as well as the data-analysis techniques adopted. These are consistent with the approaches used in the first stage of fieldwork. The section then describes the case-study selection process of long- and shortlisting (based on the criteria described in Section 2). It goes on to provide an overview of the selected research sites. Following this, key findings emerging from the research are presented and discussed thematically. As for the stage 1 fieldwork, it foreshadows the comparative analysis section (5).

Research process – overview

As noted in our methods section, as far as possible the fieldwork research process in the UK sought to mirror that of the Australian fieldwork. This was to ensure we achieved a coherent dataset from which we could make comparisons, undertake overall analysis and draw conclusions across the research. Specifically, the processes of gaining ethical approval, long-listing and shortlisting to define sites to be studied, the recruitment of interviewees (including use of incentives, gaining consent and choice of interview locations), and the transcription of interview recordings were all similar in nature. As in Australia, we undertook fieldwork visits, site observations, took photographic records and studied documentation, including masterplanning drawings, plans, codes and related statements.

There were, however, some variations between the research process in Australia and that in the UK. First,

while a process of purposive sampling was again used in the UK context, the basis of this sampling differed from that in the Australian context. Given the difficulties associated with previous exercises in recruiting research interviewees, the basis of the purposive sampling in the UK research was the length of time residents had been *in situ* in their new homes (one year). A minimum of ten interviewees per site was identified, and a maximum of 20, for the purposes of what was intended to constitute a critical mass of data in qualitative terms. In total we undertook 43 interviews during the field-research exercise. These interviews included four instances in which couples were interviewed jointly, giving a total of 47 interviewees (21 male and 26 female).

Across the three sites, a combination of techniques was used to recruit interviewees. These included a press release at Grand Union Village, flyers at all three sites, the use of community noticeboards at One Brighton, gatekeeper introductions at all three sites, and 'snowballing' through the referral of potential interviewees by neighbours at Grand Union Village.

Interview transcripts were analysed using a combination of inductive and deductive methods rather than by way of coding which had been used for the Australian fieldwork component. The inductive methods used related to key themes included (explicitly and implicitly) in the interview questions (e.g. awareness of sustainability features, interaction with such features, value and efficacy of sustainability features). These specifically reflected the issues at the centre of the theoretical basis of the research: namely, the relationship between people and objects, and the potential for variation between intention and outcome.

The deductive analysis methods referred to those themes that arose in the course of data analysis and which were not anticipated by the semi-structured interview template, but which nevertheless have a strong bearing on the relationship between intentions and outcomes vis-à-vis sustainable living. They included matters such as the significance of housing tenure, governance

of sustainably built developments, and delivery of masterplans, and are further explicated in the detailed findings below.

Alongside the data gathered from interviews and document analysis, evidence for the research was also sought through observation and photographic ethnography. The latter deliberately did not involve photographs of people, but rather of features of each scheme that seemed to underscore the intentions of the masterplanners, or, in some cases, subverting of these intentions.

All of the research sites were visited on numerous occasions, and in each case study an initial tour of the site was conducted by the relevant 'gatekeeper'. Subsequent to this, observations were undertaken on an opportunistic basis before, in between and after research interviews.

Selecting the case-study sites

The selection of sites for in-depth, qualitative research was governed by criteria explained in Section 2. With those criteria in mind, a combination of internet-based research, document review and recommendations from colleagues including those on the project steering group, resulted in a long-list of 25 possible research sites being drawn up from across the United Kingdom. These sites were then considered in terms of suitability for case-study research based on the criteria and a shortlist of the following seven masterplanned developments was drawn up:

- ♦ One Brighton, Brighton
- ♦ Highbury Gardens, Islington
- ♦ Abode, Cambridgeshire
- ♦ Academy Central, Barking
- ♦ Grand Union Village, Northolt
- ♦ The Wixams, Bedfordshire
- ♦ Trumpington Meadows, Cambridgeshire

Following informal visits to five of these sites, three sites emerged as most suited to explore the case-study research topic based on the criteria

set up for the study: one inner urban, one outer urban, and one rural. These were One Brighton, in the south-east town of Brighton; Grand Union Village, in outer London at Northolt, and the Wixams, in rural Bedfordshire. As well as the formal selection criteria, we took into account the practicability of using them as research settings, thus locational accessibility factors were a consideration in terms of journey times to and from sites and resident-interviewee accessibility. Trumpington Meadows and Abode, for example, were ruled out for research purposes on the basis of their relative inaccessibility, compared to the other sites.

All three selected sites had a 'gatekeeper' with a formal or informal role in the community life of the development, through which it was hoped access to interviewees would be facilitated. All three agreed to assist with the recruitment of research interviewees, by promoting the project to residents and advising on ways of accessing interviewees directly.

Site summary – One Brighton

One Brighton is a development in Brighton on the south coast of England, within commuter range of London. It is made up of 172 apartments, including studios and three-bedroom flats, offices and community spaces (including a cafe and training rooms). Situated next to Brighton's main city railway station, the site consists of two residential apartment blocks with limited open space: the twelve-storey 'Brighton Belle' and the eight-storey 'Pullman Haul', named after historic locomotives.

Built by a joint-venture company which represents a large-scale housebuilder, a sustainable-development-focused charity and social enterprise, and a property developer, the development contains a mixture of private, shared-ownership and social-rented housing (the latter provided by the housing association, Moat). Development management services are provided by a combination of entities, such as employing an on-site caretaker.



Figure 10. Outer urban case-study site at Grand Union Village



Figure 9. Inner urban case-study site at One Brighton

The development has a range of sustainable-living features relating to areas such as its construction materials, food, energy, transport and management, including what is claimed to be the 'greenest concrete frame in the UK' (Crest Nicholson BioRegional One Brighton Impact Report, 2007-2014, p8). It also features rooftop allotments, communal gardens, on-site composting, organic-vegetable-box delivery points, photovoltaic panels, a biomass-powered boiler, a discounted car-club for residents and a 'green' caretaker service.

Site summary - Grand Union Village

Grand Union Village is a mixed-use development next to the Grand Union Canal in outer London at Northolt in Middlesex. It has been built on the site of the former Taylor Woodrow construction depot, on land which spans the boundaries of the London Boroughs of Hillingdon and Ealing. The 'Village' comprises more than 700 dwellings, ranging from studio flats to five-bedroom houses. There are also commercial, service and retail land-uses, including a restaurant, supermarket and nursery as well as police offices and a medical centre.

Grand Union Village has been developed by the large-scale house builder and a substantial housing association, which is part of a group made up of London's largest housing associations. The housing at Grand Union Village is mainly configured as medium-rise apartment blocks, with some terraced houses as well. Thirty-five percent of the dwellings are designated as key-worker housing and affordable housing. These are managed by three housing associations. There is also a management company with offices on-site for private-market housing residents.

Like One Brighton, Grand Union Village claims a number of sustainability features. These include dwelling design aimed at ensuring a BREEAM 'good' rating, a ten percent renewable energy target, plus a twenty percent renewable energy target for Phase 12 (which is the final phase of a multi-phase development process), and compliance with Level 3 of the Code for Sustainable Homes. There is also a designated Home Zone area where traffic speeds are restricted, twenty acres of public open space and a car-share club. The 'Village' has a Community Development Trust (GUVCDT) that covers the development area.

Site summary – The Wixams

The Wixams is a predominantly residential development on approximately 386 hectares in a rural area three miles to the north of Bedford town centre on the site of the former Elstow Storage Depot. Bedfordshire Borough Council explains that the Wixams New Settlement 'will eventually establish a community of around 10,000 people with the potential to expand to around 15,000. It will represent the single largest development in the county and straddles the border between Bedford Borough and Central Bedfordshire' (Bedfordshire Borough Council website, accessed 30 January 2015). The Wixams development plans for some 4,500 dwellings of mixed type and tenure at its core site, with the potential for a further 2,500 more dwellings in an extended area

The development includes proposals for four linked villages, with a mixed-use town centre at the core. Village 1, where our fieldwork was undertaken, is the first part of the development to be completed. Called Lakeview, it comprises some 900-plus dwellings, with associated public services including a school. It includes mainly housing for sale, but also some houses and flats for rent and shared ownership. The social housing is provided principally by a housing association. The project overall has been developed by a joint venture company which is led by a development firm, and includes other industry partners. In relation to its masterplanning, the developers argue that:

The concept for the Wixams is inspired by a modern interpretation of the design approach of Ebenezer [sic] Howard's Garden City Movement, where open space and landscape work together with buildings to create distinctive places. It is also inspired by the positive characteristics and features of towns and villages in Bedfordshire and the desire to recreate some of the character of a traditional market town (as outlined in the adopted Planning and Development Brief). The concept has also been underpinned from the outset by clear sustainability principles which apply at all levels of design (Wixams Design Brief, Barton Willmore, undated).



Figure 11. Semi-rural case-study site at the Wixams

Features of the development that underlie its claims to sustainability relate to environmental, social and economic aspects. These include energy elements such as solar water-heating panels, photovoltaic panels, solar-powered external lighting, solar-gain-designed 'fenestration' (i.e. windows) and charging points for electric cars (*The Wixams Sustainability and Energy Strategy*, Bedfordshire County Council, et al, 2005). Other environmental measures include recycling facilities and 'high quality' open spaces and landscape, including water-conservation-friendly designs and allotments (*Wixams Strategic Design Guide*, 2005). They also encourage homeworking through high-speed internet connection (*The Wixams Sustainability and Energy Strategy*, 2005).

In transport terms, the Wixams has sought to reduce car dependency through a number of accessibility infrastructure and design features. For instance, the proposal intended to encourage 'mode shift' through provision of a railway station next to the site. It also sought to encourage walking and cycling, both by having a fairly permeable connected street grid and through providing designated walking and cycling paths. Public transport use is also encouraged by the provision of comprehensive public transport information (2005, *The Wixams Sustainability and Energy Strategy*).

On the more social and economic side, sustainability features include community and educational facilities, as well as measures to encourage a 'balanced' community, including a limitation on the number of benefit-dependent households nominated to the social-housing units in the development (Section 106 Agreement, 2006).

Research findings

Implications of being a 'masterplanned' development

One of the first findings emerging from the research relates to the concept of masterplanning itself. CABE (2008, p.13) notes that the term 'masterplan' is often used alongside similar terms to describe strategies for the physical regeneration of an area, such as 'development framework', 'regeneration strategy', 'urban design framework' and 'vision'. It has defined masterplanning as a strategic process of addressing the physical, economic and social needs of place-based communities, and notes that it is a relatively recent phenomenon, resulting in different approaches to place-based design and planning to achieve sustainability outcomes (*op. cit.*, p.9). Perhaps unsurprisingly, therefore, our long-list of potential case studies highlighted varying practices in respect of masterplanning approaches and forms of documentation, including those aspects relating to sustainable living.

In the cases selected for fieldwork, at both Grand Union Village and the Wixams, for example, the masterplan encompassed two-dimensional

drawings highlighting what was to be built, where it was to be built, and how the various buildings, blocks, street patterns, open-space landscapes and other physical features of the development interacted. This was supported by written material explaining aspects of the masterplan. In the case of the Wixams this was of particularly high quality with a sophisticated, highly detailed design brief and design code to guide development. There were excellent aspects including the use of 'SUDs' approaches (sustainable urban drainage).

Notwithstanding these strengths, our research suggested that drawn elements alone cannot fully address issues of, for example, economic and social need or ongoing management and strategic planning relating to sustainable living. These aspects, including the sustainable-living intentions of the masterplanners, also needed other ways of being activated such as through strategic planning processes. Our finding is reflected in other research relating to masterplanned communities. As researchers for the Joseph Rowntree Foundation, which looked at Grand Union Village among its research sites, argue:

'Master plans need to be embedded in a spatial planning framework of sub/region, town and neighbourhood – which is the 'vertical dimension' of sustainable development... Too often master planning processes have to 'carry the can' for failures in local leadership and strategic planning – but seldom do so very well' (Carley & Falk, 2012).

Of course the masterplanning and related planning documentation for each site shows that social and economic sustainability issues relating to the case study areas were addressed to some extent by planning and design processes in both the development and implementation phases of the masterplanning process. At the Wixams, the masterplan for Village 1 featured in a design

Figure 12. Sustainable urban drainage (SUDs), the Wixams



brief that itself addressed issues relating to sustainability and also acknowledged the role of other strategic documents in understanding the rationale behind the masterplan. In this sense, the masterplan was part of a wider network of documents. In terms of identifying the sustainable-living intentions of the development at the Wixams, it was subordinate to the design brief.

In fact, each of the case studies dealt with the issue of sustainable-living intentions in different, or multiple, documents. For example, at the Wixams, aside from the design brief for Village 1, the Section 106 legal agreement between the joint venture company and the relevant local authorities (which covers the charges on the developer to fund community infrastructure) had lengthy sections on sustainability and how this principle was to be integrated into the overall plans for the Wixams. At Grand Union Village, on the other hand, a discrete sustainability report was produced, although this focused almost exclusively on the issue of energy consumption and carbon emissions. One Brighton, by contrast, was developed in accordance with One Planet Living principles. These principles functioned as the de facto masterplan in the sense that they outlined the sustainable-living intentions of the development.

Consequently, when it comes to establishing the sustainable-living intentions of new masterplanned areas, as understood by those who will live and work in them, the evidence from this research is that masterplan drawings may not necessarily be the best place to start. Only those adept in design may be able to 'read' the sustainability intentions embedded in such visual material. Instead, it may be that design briefs and, in some respects, written, explanatory information provided on developer websites may be more helpful in spelling out what is intended and why. This, of course, may well change over time, if, as argued by CABE (2004, 2008) masterplanning processes become somewhat more standardised (in relation to the principles of the masterplanning process) through development of best-practice models.

Delivering masterplans

Unlike One Brighton, at both the Wixams and Grand Union Village, the research discovered evidence of masterplans not being delivered in their entirety. For example, at the Wixams, a railway station, sited next to the housing development, was proposed as part of the masterplan. This station was due to open several years ago and a number of interviewees stated that the promise of a railway station was one of the main reasons why they decided to purchase housing at the Wixams. To date, the station has not been built and, according to some interviewees, this has resulted in a number of residents using cars to get to work and go shopping, rather than travelling by way of the promised rail service. Similarly, allotment provision at the Wixams is part of the masterplan and this, too, has not been delivered to date, thereby denying residents the opportunity to grow their own food there.

At Grand Union Village, a planned bus service through the development and a planned gym and sports centre on the periphery have both not materialised (although the community centre is used for children's and young people's activities). The research revealed differences of opinion amongst interviewees and others spoken to informally as to why these aspects of the masterplan have not been forthcoming. Reasons given included lack of funds and resident objections. Nevertheless, whatever the cause, in terms of understanding the relationship between sustainable-living intentions and sustainable-living practices, the research has highlighted the importance of delivery. Our results suggest that sustainable-living practices are unlikely to develop if corresponding infrastructure and service plans for sustainable living are not implemented.

In terms of services and amenities, the issue at One Brighton was not about non-delivery of proposed masterplanning features. Instead, it was the value of community-building features of the masterplan, such as the community café

and training facilities built into the development, which seemed to be called into question by some of the end-users. Some of the 'soft' features of the masterplan, including the development of a sense of community and common identity amongst residents, were not perceived as being delivered. This of course assumes that such an intangible thing is deliverable in the first place, an issue further explored in the sub-section on 'Community' below.

Interpreting sustainable living

Each case-study site has its own unique characteristics in relation to sustainability. However, perhaps the most striking observation relating to the sustainable-living intentions explored across the fieldwork locations is the fairly high degree of consensus as to which are core sustainable living intentions and which are optional. For example, all of the developments researched as case studies sought to reduce car travel (through the provision of home zones, car-share clubs, cycling lanes and walking paths, for example). In addition, all sought to use technology such as biomass-boilers, photovoltaic panels and low-energy lightbulbs to reduce carbon emissions and dependency upon non-renewable energy sources. They also each attempted in their own ways to foster a sense of community and community stability.

There are considerable variations within and between the sites in what is seen as perhaps more optional. The role of food is one example. At One Brighton, a striking feature of the sustainability strategy is the emphasis upon local and organic food-production and supply. While the Wixams also includes plans for allotments, the combination of allotments, organic-vegetable-box delivery points, proximity to a supermarket and composting at One Brighton reveals a multi-faceted approach to the role of food (production, supply, consumption and waste disposal) in sustainable living. Indeed, interviewees at One Brighton all commented upon the fact that their weekly or daily shopping did not involve car travel,

other than in exceptional circumstances, and in most cases shopping was reported to be within just a few minutes' walk from residents' homes.

At the Wixams, on the other hand, the provision for allotments in the masterplan has yet to materialise. Moreover, while there is a supermarket at the development, several interviewees commented upon it being too expensive and lacking in choice, and the majority explained that they did weekly shopping (rather than daily) by driving into town or, in some cases, ordering shopping online for home delivery. The semi-rural location of the Wixams, away from urban infrastructure and services, is clearly relevant in this response. Yet, a similar pattern of car travel for shopping (whether weekly or more often was unclear) was revealed by interviewees at Grand Union Village, although the development is within a suburban area and also has a small supermarket located within it.

There was a markedly stronger emphasis on food sustainability at One Brighton compared with the other two case-study sites. Its inner-urban location might suggest potentially fewer opportunities for food production but conversely it is better located in terms of walkable access to well-priced and good-quality food services.

In our view this highlights the fact that, while there may be certain core aspects defined as critical to planning for sustainable living, what these are is nevertheless open to interpretation from place to place and between different masterplanning processes. In One Brighton's case, food was clearly seen to fall into this 'core' category, less so in the other two places. It may be that within holistic approaches to sustainability through masterplanning, all of which reference the same overarching principles, distinct locational and cultural factors will come into play, which result in different balances being struck between sustainability features, amenities and practices.



Figure 13. Sustainable living practices – food related

Property investment and housing turnover

In contrast with the Wixams, data from interviewees and gatekeepers at both Grand Union Village and One Brighton appears to suggest high levels of buy-to-let dwellings and, correspondingly, relatively high tenancy turnover. This has had a number of implications for sustainable-living practices identified across the sites. First, as some resident interviewees acknowledged at One Brighton, while they had an understanding that they were living in a designated sustainable-living development, they had little idea of what this meant in terms of the nature of their building, its amenities and facilities, management structure, or expectations about resident behaviour.

For interviewees renting in the private market at One Brighton, information relating to this, they believed, was likely to be in the possession of their investor landlord. In addition, a number of other resident interviewees at One Brighton suggested that many of the apartments were rented to overseas students attending a nearby English language college, who, as short-term tenants, they felt had no stake in the sustainability of the flats.

Second, at Grand Union Village comments from a number of sources including from residents, from a stakeholder involved in the community life of the development, and from informal interviews with staff working on behalf of the managing agent, illustrated interesting perspectives on this point. A number of those interviewed pointed to three-bedroom flats being let by investor landlords to sometimes as many as six people, mostly professional, and many in possession of their own cars. This, it was suggested by one interviewee, resulted in significant parking problems at the development where such levels of car-ownership far exceed a planned ratio of 0.9 parking spaces per household. In turn, car-parking issues sometimes led to neighbour disputes and acrimony about parking entitlement. Problems of pavement parking and double parking were documented in a travel-plan document, *Parking at Grand Union Village*, and a parking scheme was introduced by Ealing Council in January 2011.

At the Wixams, by contrast, parking provision was far higher. At the same time this can be seen to be a masterplanning approach feeding into car dependence as the rural location, easy availability of off- and on-street parking space, and few local jobs or shops and other services all meant that there was little incentive to use other travel modes. It seems fair to say that, despite sustainability claims in relation to travel modes, car use at the Wixams was associated with higher levels of commuting, lower public-transport provision and less walkable space than the other two developments studied.

The role of social housing

Early on in the research process it became apparent that masterplanned schemes developed with housing association partners were more likely to have a higher specification in relation to sustainable-living features than those developed without such a partner. This appears to reflect the fact that many such partners seek government funding for their proposed new units of housing, and government is thereby able to use this financial lever to promote another of its objectives: sustainable-dwelling design. Indeed, at the Wixams, two interviewees commented that, in their opinion, what they understood to be the social-housing units at the site all had solar panels. This, one of them believed, indicated a privileging of social-housing tenants over owner-occupiers, as owners would have to 'arrange all that to be done ourselves':

It's all the social housing and the council housing that has all that in there. All the other houses don't have that kind of thing ... I imagine that was part of the deal to have all those kind of things on, whereas obviously we moved in and had to arrange all that to be done ourselves... (Interviewee, the Wixams).

Indeed, another finding of the field research relates to the way in which housing-tenure stratification has played out in a context of sustainable living. In particular, whether or not this was actually the case, several interviewees suggested that only those who had a financial stake in their dwelling (i.e. owner-occupiers) were committed to the sustainability of their home:



Figure 14. Managing sustainability - parking issues at Grand Union Village

[I]f a group of people have made an investment in where they live, financially, then they're more likely to want the community to move in the same direction, positively and sustainably. When you get a group of people who haven't really made an investment in that area, then they don't and that's really the difference between private housing and social housing..' (Interviewee, Grand Union Village.)

The thing is as well, because we've bought new builds before, when you look at the plans, you're looking at where the social housing is.

Because?

Because my experience has been that where you have social housing, there seems to be less care of the environment and that may just be perception, but often I think it's borne out by the way the house is looked after. From the front you can see...

just from the noise that comes from some of the houses as well. When you're in the park, you can hear from where the social housing is and there is a difference in the way that people behave as well, in terms of how they use the park and the space. (Exchange with interviewee, the Wixams)

This perception did not acknowledge issues of lack of control on the part of tenants in relation to the inclusion of sustainable-design features like solar panels. Nor did it reflect that lack of information may play a part. For example, one interviewee (renting from an investor landlord at One Brighton) made the point that she had no access to a manual or any other documentation explaining to her the sustainable living features of her home. Private tenants were thus in the worst position of all the tenures, as both private owners and social landlords could, if they wished, add in sustainable technologies to new dwellings, while tenants in the open market had no right or capacity to do so.

Private-investment landlords were thought in some cases to have a poor record in this area. A community stakeholder at One Brighton argued that, in their experience, the greatest problems in respect of commitment to sustainable living were amongst those who were renting from investment landlords, who themselves were absentee owners (source: comments made at Good Homes Alliance Annual Conference, 7 September, 2014). It is not clear from these comments whether or not such problems were a consequence of a perceived lack of commitment to sustainability on the part of short-let occupants, or a seeming lack of appropriate stewardship and mentoring from investment landlords vis-à-vis their tenants. Either way, when it comes to investigating sustainable-living intentions and practices, the impact of tenure came across from the research as a significant, complex issue.

Technological determinism'

Common to all of the sites researched as case studies was a strong sense of 'technological determinism': that is to say, a belief in the power of technology, design and construction alone to influence end-user behaviour in a sustainable way, with little dependence upon end-user consciousness and agency. There was, instead, a preference for infrastructure that could be 'fit and forget' in nature. In fact, a lot of the sustainable-living features within the sites studied did not appear to require the agency of the place-user (mostly residents) in order to be effective. These features included, for example, biomass-boilers to fire central-heating systems, photovoltaic panels, aerated showers, low-energy light fittings, and rainwater-harvesting systems. All worked without the need for place-user interventions.

However, many of the features, fixtures and fittings associated with sustainable living did require the conscious intervention and judgment of residents and other end-users. For example, cycle-ways, composting facilities, cycle sheds, car-clubs, allotments, outdoor play and community facilities (to name just a few) were seen to be dependent for their efficacy upon residents and others knowing about them in the first place and making the conscious decision to use them, or to use them in the ways intended. Consequently,



Figure 15. 'Fit and forget' – biomass boilers

if place-users were not minded to do so, these amenities might seem pointless, just a 'gimmick' and/or a waste of money, with the risk of trivialising sustainable-living objectives and undercutting their intentions. For example, at Grand Union Village, observations during study visits suggested that cycle sheds seemed to be used as much for flytipping as for storing bicycles.

In this instance, a measure aimed at promoting sustainable living appeared to have been subverted into an opportunity and location for anti-social behaviour. Likewise, at Grand Union Village, restrictions on parking spaces, designed to deter car travel, have not been successful, as noted above. Instead, as shown by both site observations and evidence from the Travel Plan (*Parking at Grand Union Village*), drivers at Grand Union Village have resorted to



Figure 16. Solar panels and green roofs at One Brighton

double parking and pavement parking, blocking pedestrian space, causing congestion and, in some cases, precipitating neighbour disputes as well.

There was evidence of agencies within each of the case-study areas seeking to encourage changes in behaviour patterns (see section on communication and learning below). However, on the whole, once residents moved into their homes, the fieldwork results suggested that they were largely expected to tune in to the sustainable-living intentions of the neighbourhood without much (if any) encouragement to do so from any of the key agencies involved: developers, local planners, managing agents or landlords. As one interviewee at One Brighton put it, when describing the role of the developer in promoting sustainable living, post-occupancy: *'[T]hey actually believe in what they're doing, but they've left it: "Here you are, people, get on with it. Live sustainably".'*

Communication and learning

Each of the case-study areas yielded data about communications with residents and other site-users from developers, managing agents and community groups, aimed at encouraging awareness of neighbourhood issues including those relating to sustainable living. Principally, these communication forms included resident handbooks, community notice boards, newsletters and websites. In addition, residents at the Wixams reported being visited by representatives of the developers shortly after moving into their homes. The aim was to ensure that these residents understood how to use the amenities within their new dwellings, including those explicitly related to sustainable living. Furthermore, many residents at Grand Union Village and the Wixams reported learning of the sustainable-living credentials of their new homes through staff at their developer's on-site sales office.

All of these forms of communication, including guidance on the use of sustainable-living technologies, were aimed at individual residents, rather than residents or other place-users more collectively. They also assumed a largely passive role for residents and other place-users. Thus, in terms of how to 'do' sustainable living, it was the developers and housing landlords who passed on this knowledge and competence to residents and other place-users in a way that focused on technical competence. Furthermore, with the exception of post-occupancy visits from developers to ensure understanding and competence in the use of the housing's sustainability features, these methods of communication were missing human interaction and were highly dependent upon the written word.

In fact, there is a considerable amount of evidence to suggest that educating residents and other users of masterplanned sites in a context of promoting sustainable living is more effective if it is undertaken in a collective context, and in which broader ethical issues are addressed as part of a mission (see, for example, Middlemiss and Parrish, 2010; Moloney, *et al*, 2010; Kahn, 2008; Heiskanen, *et al*, 2009; Diduck, 1999). However, the research revealed little evidence of such collective enterprise.

Interestingly, at the Wixams, a local civil-society group (Wixams Neighbourhood Watch) proved to be instrumental in ensuring a high level of resident involvement in this research project, by delivering flyers to the more than 900 homes in the area, and by offering to promote the research project on its Facebook page. Also, during the period in which the fieldwork research was taking place, this group successfully orchestrated a litter pick at the development, with more than 50 participants in adverse weather conditions. The Wixams Neighbourhood Watch is not a statutory body, or materially a powerful stakeholder in the area, although it does enjoy the practical support of Bedford Pilgrims Housing Association Community Development staff. Nevertheless, when it comes to promoting sustainable-living practices, its collective approach seems to fill a vacuum left by the developers and the landlord.

Leadership, governance and housing management

A theme cutting across interviewee responses in each of the case-study areas was a prevailing sense that a degree of ongoing leadership, or co-ordination, was required if sustainable-living practices were to be maximised. Several interviewees indicated that they did not wish to act alone in relation to sustainable living. They might for example alter their own practices, to walk or take public transport rather than using a private car, or to purchase locally sourced food rather than going to a supermarket further away. However, such interviewees suggested that their developers, landlords or managing agents had a role to play in terms of leading, or coordinating, sustainable living campaigns. This leadership was not always perceived to be in place. *'The trouble with this place is that no-one's in charge'* (*'Gatekeeper'*, Grand Union Village).

As one interviewee at One Brighton put it:

[I]t's all about being green, sustainable and a community. The whole thing was sold about being a community, so you would think that these activities would be encouraged for the residents to become a community, and then they could continue doing their own community activities afterwards, but it was never encouraged from the beginning.

And another interviewee at Grand Union Village made a similar comment:

I think everyone is doing their own thing. There's no leadership or one particular person who's actively making sure everything is getting done.

Of course, developers may assume, perhaps understandably, that, as sovereign consumers, those who have bought their own homes are free to live in them as they please and do not need the ongoing involvement of the developer in their lives. In addition, landlords and managing agents may consider the extent to which they get involved in encouraging sustainable living as limited to the technology installed in homes that they have built or manage, in addition to persuasion through newsletters, web announcements, and so on.

However, as highlighted above, some interviewees indicated a need for leadership on sustainable living. This begs the question: who should take the lead? At Grand Union Village, for example, there were three housing associations, a managing agent and a Community Development Trust, and development governance and management was fragmented. This, of course, presents a challenge common to mixed-funded and mixed-managed new developments, and in that sense those advocating sustainable living are not unique. Nevertheless, if residents and other place-users were saying that some degree of ongoing community leadership was needed to support sustainable living, this presents itself as an issue to be borne in mind when developing new, sustainable, mixed use, masterplanned developments.

Ethics and values

The research interviews sought to glean from interviewees their ethos and sense of values, as suggested by their choices about where they decided to live and why they chose to live there. Interviewees explained that they decided to live in their current homes for various reasons, including convenience (close to work, friends and family), developments in relationships, amenity, aesthetics, and affordability and value for money. Few stated that they did so with the explicit intention of contributing to sustainable living or having the chance to change their behaviour to be more sustainable. However, there was one exception to the rule, as an interviewee commented that they

just liked the thought of a new sustainable village being built close to Bedford...

You say you wanted a sustainable [unfinished]...?

Yes, I'd done a few environmental courses...so it was something I was keen to do and it seemed to tick all the boxes. I thought, 'Why not? Let's go for it!'

This individual's commitment to sustainability appears to have arisen from his particular background. Nevertheless, his comment also suggested that education (formal and informal, including that associated with the workplace) may

be a significant factor for some, when it comes to acquiring sustainable-living values and developing corresponding practices. Indeed, as another interviewee at One Brighton stated, their background in sustainability meant they were

naturally interested in that and my dream is I would build my own kind of earth-ship house.

Other interviewees also explained that although sustainability was not the primary driver leading them to buy or rent the home they currently occupy, it was still a consideration:

I had a property in Brighton, I wanted to be in Brighton, there's family close by. Why to move here particularly? Two reasons: one certainly the environmental aspect of the building was important, but secondly, it seemed to me that it looked like a good flat and the location was right.

So you were actually impressed by the sustainability claims?

Yes, that certainly was one consideration.

Similarly, when asked if they had ever considered the issue of environmental sustainability when they had moved house, this interviewee responded:

Absolutely... I've always had plans. I don't know if they'll ever happen but I've always had plans to build my own home and if I was to build my own home, it would be built in a very sustainable way, using the latest energy-saving technologies, harnessing rainwater, harvesting solar power, composting, all that type of stuff. So when I actually did see the development, there were quite a number of different aspects of it that tended towards sustainable living. It was obviously marketed as a kind of eco-sustainable-living type of place.

Sustainable-living features associated with the case-study sites were significant for some of those interviewed, with several residents (especially those in Brighton) making this point. For some of these Brighton residents, the sustainable-living aspect of their home reflected their values about diversity

and alternative lifestyles. We explained that we were interested in exploring whether or not some groups in society, some cultures, or some communities of interest, are more open to and active in relation to sustainable living than others. We were wondering if the interviewee thought that was the case.

Yes, for sure. I think you see that in Brighton anyway... I just feel like in Brighton there are a lot more people who are definitely health-conscious and you get all the eco-warriors and that stuff around here. But I think definitely – I come from [deleted] and when I go home, the things that I would do, they're, like, 'what?'

Overall, what the interview data seemed to suggest was that a number of those interviewed did give some degree of value to sustainability. Even if, for many, it was not the primary driver of decisions about where to live, it was a consideration, and sometimes an important one.

Community

The overarching question explored through the research refers to the nature of sustainable living in masterplanned communities. While we were focusing on sustainable living and masterplanning, we also wanted to understand more about 'community' in this context. One of the questions asked of interviewees therefore was whether or not they felt that there was indeed a 'sense of community' where they lived. Those designing, planning and managing all three developments had documented plans to foster a sense of community so this question sought to explore the extent to which residents identified with their fellow residents and other place-users, forming common bonds and neighbourliness.

In fact, at One Brighton almost all of the interviewees stated that there was no sense of community. This was in spite of there being community facilities including a community café, communal patios and a community notice board. Several interviewees at One Brighton lamented what they saw as the lack of collective spirit and sense of community at the development. As one interviewee put it, when asked if he felt there was a sense of community:

But I think a lot of the time, like all people, you stand in a lift and don't talk to people next to you 90% of the time, and it's quite a mixed ... I think there's quite a few places where the person only maybe works somewhere else and comes here at the weekend. There's a lot of international students who tend to keep to themselves and are perhaps not so into making a community than otherwise would be. So, no, I wouldn't say...there's not...apart from the occasional saying hello to someone as you pass them in the corridor, I imagine that'll be the same in any other building.

Ironically, one interviewee in Brighton suggested that there was indeed a sense of community as a kind of riposte to a perceived lack of formal support. Thus this interviewee sensed that there was a sense of community not because he believed the efforts on the part of the developer or managing agent to foster a sense of community had succeeded, but because he believed shortcomings on the part of these two bodies, in terms of costs and services to residents, had galvanised his community somewhat:

There is a sense of community in our building, because we've had a lot of issues in our building regarding service charges from the managing company, and what we see as work that should be carried out by the caretaker not being carried out. So you can imagine people moan and that does actually bring people together because you have that thing in common. So there is that sense of community within that building but it's not built on the right foundations, I don't think.

Interestingly, another interviewee at One Brighton suggested that he did feel a sense of belonging and community but at the level of the city, and not his particular development. Another stated that he did not feel a sense of community in his apartment building at One Brighton but speculated that there might be a greater sense of community in the other of the two blocks. This was perceived to be because the latter contained the development's quota of social-housing tenants, while his own block contained a lot of investment properties let to short-term tenants:

I think you might get a different story in Pullman Haul, because that's social housing so there might be more of a community there. We were quite disappointed that there doesn't seem to be any community at all where we are because so many of them are rented out to Chinese students.

It may be, of course, that the student population at One Brighton did feel its own sense of community of which this interviewee was not aware and this would warrant further research. At Grand Union Village, meanwhile, opinion was divided somewhat on this question, with some stating that there was no sense of community, and others saying that there were 'pockets' of community, but not a development-wide community.

At the Wixams, on the other hand, interviewees were very strongly of the view that there was a sense of community, pointing to such things as neighbourly trust (e.g. leaving keys with neighbours), the local school bringing parents into contact with one another, the range of activities going on in the Village Hall and so on. As well as these indicators, in contrast to the other two case-study sites, points made earlier about tenure issues and demographic profile may also be relevant. These included there being more home owners at the Wixams, lower levels of 'churn' of residents, a considerable number of young families, and more suburban lifestyles there. All these features offer some clues as to why such a sense of community may have been more perceptible.

There were also some indicative findings from interviewees at the other two sites from which we can draw tentative conclusions. At both Grand Union Village and One Brighton, interviewees made the point that the proliferation of buy-to-let properties (let mainly, it was suggested, to young, single, childless students or professionals) militated against a sense of community. Many of the latter were thought to intend only a relatively short-term stay at the development and spent relatively little time at home.

At the Wixams, none of the interviewees suggested the presence of investor landlords at the development. Moreover, the demographic profile of interviewees, plus evidence gathered from observation and visual ethnography, suggested



Figure 17. Community spaces at the Wixams

a community dominated by young, white British couples with school-age children, and with a significant number of stay-at-home mothers. Walking around the development, it was notable how many people, especially young women, were at home during the day. It is quite possible that this sense of connection – based on parenthood, cultural similarity and homemaking (in the sense of putting down roots in an area, as opposed to transient renting) – contributed to the reported sense of community among interviewees at the Wixams.

What all of this evidence seems to suggest is that fostering a sense of community is particularly challenging in neighbourhoods where there is a transient population, or at least a substantial number of residents with no long-term intentions of staying. Of course, it is worth saying too that these individual decisions are themselves driven by external structural factors relating to employment and education (for example) which impact on tenure, location and length of stay in one place. It also raises the thorny issue of creating a sense of community in neighbourhoods that are diverse in terms of age, wealth and income, housing tenure, family structure and household composition, race and ethnicity, and so on. Needless to say, all of these issues have implications for planning for sustainable living, not all of which can be resolved through masterplanning, however well thought through and delivered.

5. Comparative analysis and conclusions

Sources and process for the comparative analysis

In this section we explore the data collected through the study in a comparative way, looking at our findings from both the United Kingdom and Australia and coming to some conclusions about the findings and implications from the fieldwork and other sources. For the comparative analysis process we have considered in depth all data collected for the study:

- Literature-search findings from theoretical and more applied sources
- Masterplanning and other documentation for each of the sites
- Transcripts of the semi-structured interviews and focus groups
- Observational data including field notes and photographs recorded in the field
- Material from 'think pieces' produced over the course of the research and
- Results from our mid-term conference discussions

These sources have together acted as a basis for our analysis and writing this section of the report. This rich set of data is also helping us with writing a number of papers on research findings for peer-reviewed journals.

A key aspect of the analysis is the comparative nature of the case-study research: between different sites in the same metropolitan area or region, in different kinds of urban, suburban and semi-rural contexts and between sites across two different urban contexts in the northern and southern hemispheres. Our steering group was very interested in understanding the ways that the Sydney and United Kingdom contexts and sites showed similarities and differences, as touched on in Section 2.

The comparative analysis has been conducted according to the principles of the 'theory reconstruction' approach (Burawoy, 1991) whereby, in contrast to 'grounded theory' (e.g. Strauss, 1987), researchers 'look for theories that are refuted by our observations' (Burawoy, 1991: 10). In this instance, then, the 'theory' subject to reconstruction is the implicit assumption alluded to earlier that the built environment can be *inherently* sustainable.

Instead as we argue, the production of sustainability is a *relational* matter. It arises (or in some aspects does not) from the interplay of people and things – in this case the way that residents and other place-users interact with their built environments and each other. This is not just a technical matter. Instead the research data has been analysed with a view to understanding how social practices mediate the intended sustainability of design features built into the five masterplanned developments in which we undertook case-study research. As Cohen (2006: 68) notes,

'The last decade has seen considerable progress in the development of an expansive technical repertoire with which to [diagnose] currently unsustainable consumption practices. [...] These developments, however, have not been matched by commensurate progress devising actual policy initiatives to foster more socially and ecologically benign provisioning practices' (quoted in Jones, 2013).

At the end of the first stage of the research some thought was given to the comparative research yet to be done, and more broadly in influencing practice on sustainable living. Jones (2013) identified a number of questions which should be at the forefront of the next research stage, and these were taken into account in framing and undertaking the second stage of the research, and then in this analysis:

- What are the foci of sustainable design in the United Kingdom?
- How do they resemble Australian approaches; how are they different?
- Do principles of sustainable design in the UK fit everyday life and practices?
- If not, what is the theory of behaviour change that accompanies these principles? And how is it being applied?
- How does sustainability feature among concerns of residents of master-planned developments in UK (e.g. versus security, access, privacy etc.)?
- How are we thinking about creating mixed-use places in the UK that accommodate residents and others across the life-course?
- Are we doing enough to create places like this?

These points have helped us to frame our analysis and in the rest of this section we outline the areas of analysis and conclusions from the research.

Comparative conclusions from the research

Masterplanning practices

The research highlights that planning and design practices vary substantially from place to place within masterplanning practice. What constitutes a 'masterplan' is itself subject to fairly wide variation in different places. While a considerable amount of good-practice guidance has now been published, this guidance is clearly being interpreted and implemented differently (if at all) by different masterplanners. Our work at a range of sites demonstrates that masterplanning guidance is being interpreted in planning and design terms on the ground in relation to achieving sustainable-living outcomes in a variety of ways that are more or less successful, as described in the fieldwork sections and analysed in the rest of this section. It appears that clearer connections between guidance and practice are needed.

Figure 18. Masterplanning design 'slippage' – lack of footpaths as an example

Another related aspect that has emerged in the fieldwork is a number of gaps between the masterplan as advertised and the actual development on the ground. We saw a number of examples of what happens if elements of the proposed masterplan do not end up being built as part of the development (such as expected public transport infrastructure). To varying degrees at least some of the sites studied as sustainable-living projects were characterised by deficiencies in delivery of aspects of the masterplan. This had implications for sustainable-living outcomes as a result of this gap between the plan and reality.

We also saw that other structural aspects had impacts on delivery. These included legal structures, political decisions (such as fiscal policy related to house building) and the interplay of demographic and economic forces (like an overheated southeast in the UK context). For reasons that were site specific and related to other broader structural aspects we saw a number of examples of slippage between defined proposals and actual practice. In most cases, for at least some aspects of the scheme, this led to 'sub-optimal' outcomes. These slippages made it harder for residents and other place-users to behave sustainably.





Figure 19. Green systems infrastructure



Figure 20. The Antias 'green' apartment building

Technological determinism?

We have found a considerable amount of what we are terming 'technological determinism' which is of two kinds. The first kind of 'determinist' thinking is that the building-in of sustainable technologies and systems in buildings and place design and planning means decisions about being sustainable are made for residents and other place-users (the 'fit and forget' idea). Linked to this is a view that with the 'right' technology, infrastructure and systems in place residents and other place-users will simply respond in sustainable ways. But as we show, sustainability comes from an interplay between people and things – it is relationally produced. We are not suggesting there is no utility in building in sustainable technologies as these clearly can have positive impacts on building and place use. However we did find that elements of sustainability infrastructure are not always used as expected.

In all five cases we have found that end-users can support or subvert the expectations, techniques and infrastructures through their behaviours. So those involved in the masterplanning, development, building and construction fields

need to become more understanding about the behavioural implications that come into play with place-users and how these can affect sustainable living. How can they become more aware that places are produced in a relational way, rather than simply being passively received? One conclusion is that education needs to happen not just with those who use places but also with those who make them, to challenge some of the latter's sometimes deterministic assumptions.

What makes a building or place 'sustainable' in practice?

Closing the gap between performance ratings and actual practice is obviously important if we are to achieve more sustainable outcomes in masterplanned and other new developments. As noted by a steering group member, this could well be linked with the performance gap in the energy performance of buildings which is receiving increased levels of interest within the building industry at present, and is particularly relevant to products and services which can support improvements. This happens at a number of scales – in particular for our research,



Figure 21. Pedestrian crossing older residents fought for, Park Central

at the level of the dwelling and the wider place in new developments. At the building level, for example, our research shows that at least some residents have bought into 'green' buildings for resale value rather than sustainability per se, thus it is important that the features of design that render buildings green (in terms of accreditation) correspond to features of design that foster sustainability in practice. This is exemplified in the following interchange from our Australian research:

Interviewee: Antias has got a 3 star ['Greenstar'] rating, and one of the reasons I bought the apartment here was that I was impressed with that. I was kind of thinking forward, and I think it's pretty much based on sound research, that buildings that are green-rated will have greater value and greater propensity to sell in the future...

Interviewer: Resale value?

Interviewee: The resale value, the propensity of people to at least think that what's on the wall is an impressive thing. If it garners me an extra \$25,000 for the wizardry, then it's probably worth every bit of what I can't understand.

Different perspectives on and varying commitments to sustainability

The research has shown evidence of different perspectives on what sustainability constitutes. For some the balance was more towards economic aspects; for others the emphasis was mostly about social and environmental sustainability factors. Not only did the balance between these sustainability aspects vary; there were also different levels of expressed commitment to sustainability (however understood) among end-users of housing and related spaces across the five sites. This was for a range of reasons discussed in the last two sections but had sometimes negative results in terms of how sustainably people actually behave as place-users of the built environment.

Manufacturers, developers and builders to a greater or lesser degree are providing products which are intended to be applied in ways that support sustainability capacity, often understood primarily in environmental sustainability terms. Many of our interviewees, meanwhile, have understood sustainability as more social or economic: meaning they could live in an area for a long time or make a decent profit at resale of their dwelling.

An important point about sustainability and longevity emerged in the Australian fieldwork. This was that retirees living at the fieldwork sites were very active members of the communities studied and had the time and skills to push for change to increase the sustainability of buildings and especially wider areas. Even though, due to the somewhat different demographic profiles in our UK sites, we did not replicate these results, we think they are sufficiently pronounced to be worth considering in future practice. There are thus indications that designing communities that are desirable and affordable across generations is not only sustainable in terms of housing but also in terms of community engagement in carbon-saving activities.

The UK fieldwork results saw different findings in demographic terms in relation to commitments to sustainability. However, they equally show that even if not a primary driver, sustainable living is something where residents and other place-users demonstrate considerable goodwill and willingness to alter their day-to-day practices in relation to aspects like food-buying, consumption and waste. In our view, often a lack of 'commitment' to sustainability is as much structurally imposed as individually chosen: such as residents driving rather than using other more sustainable travel modes. The objective reality in some of our sites is inadequate transport infrastructure and overly large walkability radii for services and employment.

How to communicate sustainable practice?

Many of our findings are about spatial and materials aspects, but insightful data about the sustainable-living implications of the nature of communication and learning in masterplanned communities also emerged. A notable point from across the research is that passive communications including home 'manuals', that is, guides for using homes and household technologies, tend to lack efficacy in promoting and embedding sustainable practices.



Figure 22. Communicating sustainability, Park Central

In the Australian fieldwork, for example, we found that these very detailed and technical guides just 'went on the shelf', so more active approaches may make more sense. 'Welcome programmes' were reported through the fieldwork as an effective way of communicating and instilling more sustainable behaviours as long as these were followed up. Staff at the Macarthur Centre for Sustainable Living, interviewed as part of the Park Central case study in Sydney, explained that it took work and resources to encourage a shift to more sustainable-living practices but investment in this may be more cost-effective than underused technologies.

Similarly in the UK fieldwork, the issue of passive versus active communication was important, with more passive forms shown to be less effective than more ongoing and active, community-based methods. As in the Australian sites, in the UK too residents have often shown they do not wish to learn how to operate complicated systems for making their dwelling sustainable, or simply find these systems too intricate and onerous to grapple with. When green caretakers or resident support staff have been present they have been able to communicate sustainable ideas and support sustainable practices much more effectively than through other, more passive means.



Figure 23. Sustainability facilities, One Brighton

Impact of buy-to-let and mixed tenure on sustainable-living practices

Much of our focus has been on places where most of the housing is for sale or socially rented, but we have some interesting although informal findings in relation to the impacts of different tenures on sustainable-living practices among place-users. For example in several of our fieldwork sites a proportion of owners were buy-to-let landlords and it was thought by some interviewees that their tenants did not necessarily have the same level of access to or degree of benefit from engaging with sustainable features. This may have been part of an overall assumption that tenants would be less interested in sustainability than those with a more long-term investment in the place and thus no more than speculation. As a member of our steering group noted, amenity benefits, and other benefits such as energy-costs savings would be equally available across tenures, and this point should not be discounted.

However, a specific example highlighted in the findings was from one such tenant who explained that information about how to engage sustainably with their dwelling and the development was likely to be given to the landlord rather than being directly available to them. In this way the tenant had less chance to be aware of features like the site's community cafe and training facilities, recycling facilities and access to its allotment gardens.

Governance and place management

Some of the points that the research has raised are not so much about individual decisions, behaviours and attitudes about sustainable living but more structural aspects. It is clear from the fieldwork that where there is good leadership (from, for example, the developer, a management company, a tenants' organisation etc.), the capacity to undertake sustainable behaviour in an ongoing way rises considerably. We found that result across the fieldwork sites in both the UK and Australia.

Linked to the above, across our research we found that property managers' views about what kind of role they could or should play in promoting sustainable living were quite variable. Some felt it was part of their remit; others did not or only in a very narrowly defined or circumscribed way. Sometimes this was in part because their employers did not emphasise this aspect of their role as being important (their reasoning would be interesting to understand too). We found that this had implications for management attitudes and behaviours with flow-on effects on sustainability performance once the development was being lived in.

6. In conclusion

Building on the existing findings: areas for further research

The findings from our comparative research have highlighted a number of interesting areas we think would be very useful to further study in a theoretically grounded but predominantly applied way. These were raised in the preceding section in the form of research questions arising from our findings. Clearly there is a range of research areas that have emerged that we suggest could benefit from further research, including the following. It should be noted that this list is not definitive in terms of topics, methods or research scale. We list some of these areas here.

The nature of masterplanning practices as the right method for embedding sustainable-living practices – we think that further research into masterplanning practices as a route through which to embed such practices would be helpful. It would act to generate findings and conclusions about such methods and could focus in on the slippage that can happen between intentions and outcomes on the ground. Such work would help reshape and refine both guidance and practice in the field.

The issue of technological ‘determinism’ – exploring the active interaction of people, products and systems rather than treating place-users as passive receivers of products. Our research suggested that there is still work to be done to ensure that those involved in the masterplanning, development, building and construction fields understand the behavioural implications that come into play with place-users and how these can affect sustainable living.

Being sustainable in practice – the impact of gaps between masterplanning intentions and built form ‘on the ground’ on sustainable actions by place-users’ commitment to sustainability – to what extent is this personal, collective or structural? We feel that further primary research into actual practices relating to commitment to sustainability would be instructive. This would help further

tease out what commitments people do and don’t make to sustainability and why, and thus where gaps in commitment exist, what is causing those gaps and how best this might be approached to support sustainable living.

Communicating sustainable practices – how can this be made more active in nature? A research question stemming from this is how do those involved in design and delivery expect end-users to know, appreciate and work with design features and amenities that have a sustainability imperative? What theory of learning underpins this, and what are its implications for better future practice?

Tenure-related issues – how can structural impediments to ‘being sustainable’ be overcome? A research question this raises for us is how far do, or can, masterplanners and other professionals interested in supporting sustainable living address these issues? With an expected rise in the proportion of private renters, how can we make sustainable living ‘tenure blind’?

Governance and place-management – where are the best opportunities to support sustainable living through excellent leadership? A research opportunity exists to further explore the linked questions of whether such leadership makes a significant difference, as we found it did in our research sites. If it does, how do planners and other professionals respond now? How could place-makers respond to the need for some body or organisation to take a leadership and co-ordinating role in making sustainable living happen, post-occupancy?

Evaluating what it means to be sustainable – there is now a wide range of evaluation tools available that seek to capture in more or less quantifiable, technical ways whether, and the degree to which, practices are sustainable across a range of measures. Given the issues our research has raised such as in relation to slippage between intentions and reality we believe further research to explore the use of such evaluative techniques could help examine the usefulness of such techniques in really revealing the nature of sustainable practices in masterplanned (and perhaps other) communities.



Figure 24. Moving beyond car-focused urbanism?

Linked research question that stems from this – to what extent, if at all, do property managers and related organisations (agents, social landlords, private-sector landlords) view themselves as having a role to play in promoting sustainable living? What would that role encompass? How would that work on the ground? Again, while our own findings suggest that this promotion role is an incredibly important one, it would be helpful to broaden out the scale of such research to test this conclusion more widely.

Figure 25. Green place-making at the Wixams



Next steps

We will be sharing our results with as many people as we can, including through this report, now that we have completed this first substantial research study through the UH Lafarge Sustainable Living Partnership. The Partnership has made possible a research process and outcomes that bring together academic perspectives and methods with a great deal of applied knowledge and expertise from our professional partners.

We believe that the whole area of sustainable living offers rich research possibilities that can have very positive, applied impacts on practice 'on the ground'.

As the need to make places more sustainable becomes ever more pressing this is a vital area for both theoretical and applied research to make a constructive contribution to that task.

References

- Alexander, Christopher, Ishikawa, Sara & Silverstein, Murray (1977) *A Pattern Language: Towns, Buildings, Construction* New York: Oxford University Press
- Armitage, R. (undated) *Parking at Grand Union Village* Cheshire: Richard Armitage Transport Consultancy Ltd. <http://www.ratransport.co.uk/images/GUV%20PkgAlbum%20%28LoRes%29%20090709.pdf> (accessed 30 January 2015)
- Barton Willmore. (2006) *Design Brief: Wixams - Village 1* Reading: Barton Willmore Partnership
- Bacon, Edmund (1982) *Design of Cities* London: Thames and Hudson
- Bannister, P., Bloomfield, C., and Chen, H. (2011) 'Empirical Prediction Of Office Building Lift Energy Consumption', in *Proceedings of Building Simulation 2011: 12th Conference of International Building Performance Simulation Association*, Sydney, 14-16 November. http://www.ibpsa.org/proceedings/BS2011/P_1815.pdf (accessed 2 August 2013)
- Bauer, M. W., & Gaskell, G. (Eds.). (2000). *Qualitative researching with text, image and sound: A practical handbook for social research*. Sage.
- Bedfordshire Borough Council website, http://www.bedford.gov.uk/environment_and_planning/planning_town_and_country/search_plans_page/major_planning_applications/wixams.aspx (accessed 30 January 2015)
- Bentley, Ian et al (1985) *Responsive Environments: A Manual for Designers* Oxford: Butterworth Architecture
- BioRegional Quintain Limited. (2010) *One Brighton – One Planet Action Plan Annual Review* Surrey: BioRegional Development Group
- Brand, Stewart (1994) *How Buildings Learn: What Happens After They're Built* New York, NY; London: Viking
- Broadbent, Geoffrey (1990) *Emerging Concepts in Urban Space Design* London, New York: Van Nostrand Reinhold
- Bryman, Alan (2001) *Social Research Methods* Oxford: Oxford University Press
- Burawoy, M. (1991) 'Reconstructing Social Theories,' in *Ethnography Unbound: Power and Resistance in the Modern Metropolis*, edited by M. Burawoy et al. Berkeley, CA: University of California Press
- Carley, Michael & Falk, Nicholas (2012) *Building sustainable urban neighbourhoods*, Joseph Rowntree Foundation, Presentation, RICS 21st February 2012 <http://www.jrf.org.uk/sites/files/jrf/SUNN%20FINAL.pdf> (accessed 30 January 2015)
- Carmona, Matthew (2003) *Public Places - Urban Spaces: The Dimensions of Urban Design* Oxford: Architectural Press
- (2006) *Design Codes: Their Use and Potential* Amsterdam; Oxford: Elsevier
- Centre for Sustainable Communities (2012) *UH/Lafarge Tarmac Partnership*. <http://www.uh-sustainable.co.uk/LAF/LandingPage.php> (accessed 30 July 2013)
- City of Sydney (2013) *Metropolitan Sydney: Geography*. <http://www.cityofsydney.nsw.gov.au/learn/about-sydney/metropolitan-sydney> (accessed 1 August 2013)
- Code for Sustainable Homes*. Planning Portal, <http://www.planningportal.gov.uk/buildingregulations/greenerbuildings/sustainablehomes> (accessed 30 January 2015)
- Commission for Architecture and the Built Environment (2004 [2008]) *Creating Successful Masterplans: A guide for clients* London: CABE
- Crest Nicholson/BioRegional Quintain Limited. (undated) *One Brighton Impact Report, 2007-2014* Surrey: BioRegional Development Group
- de Certeau, Michel (1984) *The Practice of Everyday Life*. Berkeley, CA: University of California Press
- Diduck, A. (1999) 'Critical education in resource and environmental management: Learning and empowerment for a sustainable future', *Journal of Environmental Management* 57, pp.85-97
- Duncan, J. (2000) 'Berkeley School,' in Johnston et al. (eds.) (2000) *The Dictionary of Human Geography* (4th Edition). Oxford: Wiley-Blackwell
- Falk, N., and Carley, M. (2012) *Sustainable Urban Neighbourhoods: Building communities that last* York: Joseph Rowntree Foundation
- Flick, U. (1998) *An Introduction to Qualitative Research*. London: Sage
- Gold, R. L. (1958). Roles in sociological field observations. *Social forces*, 217-223
- Hayward, Paul and McGlynn, Sue (eds.) (2002) *Making Better Places. Urban Design Now* Oxford: Butterworth Architecture
- Heiskanen, E., Johnson, M., Robinson, S., Vadovics, E., and Saastamoinen, M. (2009) 'Low-carbon communities as a context for individual behavioural change' *Energy Policy* 38, pp.7586-7595

- Holston, J. (1989) *The modernist city: An anthropological critique of Brasilia*. Chicago: University of Chicago Press
- Hutchins, E. (1995) *Cognition in the wild*. Cambridge MA: Harvard University Press
- Jacobs, Allen B. (1993) *Great Streets* Cambridge, MA, London: MIT Press
- J.J. Gallagher Limited, Gallagher Estates Limited, Gallagher Elstow Limited, RWE Npower plc, Bedford Borough Council, Mid-Bedfordshire District Council, Bedfordshire County Council and Other Owners. (2006) *Section 106 Agreement* London: Clifford Chance Partnership
- Jones, Alasdair (2012a) *Eco-by design, eco-by practice? Urban development and the making of sustainable communities*. UH Lafarge Tarmac Sustainable Living Partnership, Think Piece 1. Centre for Sustainable Communities: Hatfield. Available to download at: <http://www.uh-sustainable.co.uk/docs/Think%20piece%20secure.pdf>.
- Jones, Alasdair (2012b) *Living in a material world: a cross-cultural investigation of sustainable communities – a working paper on the case study selection process in Sydney*. Centre for Sustainable Communities: Hatfield
- Jones, Alasdair (2013) *Snakes and ladders: an interim report on the Australian fieldwork for the UH Lafarge Tarmac cross-cultural investigation of sustainable living* Centre for Sustainable Communities, University of Hertfordshire
- Kahn, R. (2008) 'From Education for Sustainable Development to Ecopedagogy: Sustaining Capitalism or Sustaining Life?' *Green Theory & Praxis: The Journal of Ecopedagogy* 4 (1), pp.1-14
- King, M. (2013) 'Why electricity bills are rising,' published on the *Big Pond: Money* website. <http://www.bigpondmoney.com.au/why-power-bills-are-rising> (accessed 2 August 2013)
- Lafarge (2010) *New partnership seeks sustainable living solutions*. http://www.lafarge.co.uk/wps/portal/uk/7_2_1-LatestNews_details?WCM_GLOBAL_CONTEXT=/wps/wcm/connect/lib_uk/Site_uk/AllPR/2009/PressReleaseAggregates_1289306118183/PR_Header_Aggr (accessed 30 July 2013)
- Landcom (2008) *UDIA 2008 Submission for Park Central: Masterplanned Mixed Use Development Category*. Landcom: Parramatta. [Received as a personal communication]
- Landcom (2010) *Developing sustainable places: Examples of our work*. Landcom: Parramatta.
- Landcom (2011) *Project fact sheet - Park Central*. Landcom: Landcom: Parramatta
- Lane, R. and Gorman-Murray, A. [eds.] (2011) *Material Geographies of Household Sustainability*. Farnham: Ashgate
- Lend Lease (n.d.) 'Jackson's Landing: A waterfront neighbourhood on the world's greatest harbour.' Marketing brochure for Jackson's Landing. Lend Lease, Sydney
- Lend Lease (2012) 'Inside Jackson's Landing.' Lend Lease, Sydney
- Lessard, M., & Ávila, G. M. (2005) 'A contribution to urban sustainability: Analco, a historic neighbourhood in Puebla, Mexico.' *Urban Design International*, 10(1), 39-50
- Lock, David and Associates (2014) *Wixam Park Masterplan Document Consultation Draft – September 2013* Prepared on behalf of: O&H Properties Ltd & ORS Ltd in collaboration with Central Bedfordshire Council [accessed 30th January 2015]
- London Borough of Ealing, the Mayor and Burgesses of the London Borough of Hillingdon and Grand Union Village Limited (2002) *Section 106 Agreement* Birmingham: Wragge and Company
- Lynch, Kevin (1961) *The Image of the City* Cambridge, MA: MIT Press & Harvard University Press
- '(1985) *A Theory of Good City Form* Cambridge, MA. London: MIT Press
- Marshall, Stephen (2005) *Streets and Patterns* London: Spon Press
- (2005) 'Joined-Up Urbanism' *Town & Country Planning*, December, pages 367-371
- Middlemiss, L., and Parrish, B. (2010) 'Building capacity for low-carbon communities: The role of grassroots initiatives' *Energy Policy* 38, pp.7559-7556
- Moloney, S., Horne, R., and Fien, J. (2010) 'Transitioning to low carbon communities - from behaviour change to systemic change: Lessons from Australia' *Energy Policy* 38, pp.7614-7623
- Moughtin, Cliff (1992) *Urban Design. Street and Square* Oxford: Butterworth Architecture
- (1996) *Urban Design. Green Dimensions* Oxford: Butterworth Architecture
- Net Balance (2013) 'Regatta Wharf – Smart Green Apartments Level 2 Energy Audit Report.' Net Balance, Sydney
- Neuman, M. (2005) 'The compact city fallacy,' in *Journal of Planning Education and Research* 25: 11-26.
- NSW Baragaroo Delivery Authority (2012) *Clinton Climate Initiative*. <http://www.barangaroo.com/discover-barangaroo/sustainability/clinton-climate-initiative.aspx> (accessed 1 August 2013)

Parham, Susan (2013) *Living Sustainably – Which Way Should We Go?* UH Lafarge Sustainable Living Partnership Conference, Proceedings, University of Hertfordshire Centre for Sustainable Communities, Hatfield, October <http://www.uh-sustainable.co.uk/docs/LAFARGEconference2013.pdf>

Sauer, C. (1963) *Land and life: a selection of the writings of Carl Ortwin Sauer*. Berkeley, CA: University of California Press

Scottish Government Planning Advice Note Pan 83
<http://www.scotland.gov.uk/Publications/2008/11/10114526/2>
(accessed 16 January 2015)

Shove, E., Watson, M., Hand, M. and Ingram, J. (2007) *The Design of Everyday Life*. Oxford: Berg

Silverman, D. (1999) *Doing Qualitative Research: A Practical Handbook*. London: Sage

SPRG (2011) *Social Practices Research Group: Overview*.
<http://www.sprg.ac.uk/overview> (accessed 31 August 2013)

Stake, Robert (1994, 1995) *The Art of Case Study Research*
Thousand Oaks CA: Sage

Strauss, A. (1987) *Qualitative analysis for social scientists*.
Cambridge: Cambridge University Press:

Sustainable Urban Neighbourhoods Network (SUNN) (2011) *Lessons and action points from Grand Union Village, Northolt, London*. Report of the Grand Union Village Event. September, 2011. Urbed http://urbed.com/sites/default/files/Grand%20Union%20Village%20report_0.pdf (accessed 30 January 2015)

The Wixams Strategic Design Guide (2005) Bedford:
Bedfordshire County Council, Mid-Beds District Council, Bedford Borough Council

The Wixams Sustainability and Energy Strategy (2005) Bedford:
Bedfordshire County Council

Thrift, N. (2000) 'Material Culture' in Johnston et al. (eds.) (2000) *The Dictionary of Human Geography* [4th Edition]. Oxford: Wiley-Blackwell

Tibbalds, Francis (1992) *Making People Friendly Towns. Improving the Public Environment in Towns and Cities* London: Longman

Wade, M. (2013) 'Packed-in Pyrmont is Australia's most densely populated suburb,' in *The Sydney Morning Herald*, 1 May 2013. <http://www.smh.com.au/nsw/packedin-pyrmont-is-australias-most-densely-populated-suburb-20130501-2is5g.html#ixzz2ajQZBKdM> (accessed 1 August 2013)

Yin, Robert K (1993) *Applications of Case Study Research* Newbury Park, CA.; London: Sage