Exploring sustainable urbanism in masterplanned developments: a collective case study of slippage between principles, policies and practices

Susan Parham and Alasdair Jones

Abstract

This article is concerned with masterplan implementation and with exploring, via recourse to case studies, slippages between masterplanning principles, policies and practices. Framed by a growing body of sustainable urbanism literature we analyse evidence from five masterplanned communities in the UK and Australia to comparatively explore how some key theoretical principles are translated into placemaking in inner urban, suburban, outer urban and semi-rural contexts. We observe varying degrees of disjuncture between masterplanning principles and the urban form envisioned by, and realized through, actual masterplanning proposals and implementation. We postulate that various degrees of slippage at each stage from proposals to practices have occurred which can affect capacity to meet principles of sustainable urbanism. Analysis of the five cases demonstrates where some potential 'tripping-up' points lie in the masterplanning process, hinting at broader impediments to delivering masterplanning that is more closely aligned to sustainable urbanism principles in future.

Keywords: sustainable urbanism; masterplanning; collective case study; Australia; UK

Introduction

In this paper we are interested in the connections and disjunctures between the putative aims of masterplanning as urban design practice and the affordances of specific

masterplans, and actually-built masterplanned developments, in relation to these aims. Through a study of five masterplanned developments we explore the interplay between the aims of masterplanning and the urbanism qualities of actually-realized masterplans. Following Jepson and Edwards (2010: 418), 'conversion of sustainable development into actual principles or standards of development practice' is a major challenge for urban planners and designers. As observed elsewhere (Grant, 2009; McCrea and Walters, 2012), in our case study sites disjunctures between urbanism principles and outcomes on the ground were evident. In this paper we consider from a perspective grounded in social science and urban design what may be causing slippages between sustainable urbanism principles and masterplanning *as practice* in our cases, and we use this as a basis for proposing directions for further research. In doing so, we hope to contribute to addressing Talen's (1996: 248) observation, which we argue still pertains to a great extent, that there has been a curious lack of…enquiry into implementation in the planning field.' As is typical with exploratory studies, we identify areas that need more explanatory research and draw only tentative conclusions here.

The paper starts with a discussion of definitional, theoretical and applied aspects of sustainable urbanism before setting out our methodology. We then thematically discuss our analysis of our three case study sites and conclude by exploring whether there are any potential lessons that might be identified and worthy of broader research emanating from the masterplanning proposals, processes and outcomes analysed.

Setting the context and defining terms

We start by briefly reviewing the concept of sustainability and touching on recent debates in relation to its interplay with urbanism. Sustainability is a term that has routinely been characterized as, and critiqued for, being ambiguous (Pearce and Vanegas, 2002; Worster, 2005; Toman (2006). We suggest that even with some level of ambiguity it is possible to construct a nuanced approach to sustainability, taking into account its role as an overarching paradigm and then grappling with specific urbanism aspects and outcomes. Berke and Conroy (2000), for example, offer useful insights into the way that sustainability principles derived from Bruntland (1987) can be unpacked, represented and evaluated spatially in relation to specific plans. Work to tease out particular aspects of sustainability, including social aspects which have often been underplayed, strengthens its explanatory power (Dempsey, Bramley, Power, and Brown, 2011; Morelli, 2011).

Supplementing ideas about sustainability and sustainable development, in recent years the concept urban resilience has come to the fore. Although definitions are contested (Ahern, 2011; Meerow et al. 2016), we situate this paper within a resilience paradigm because 'resilience theory provides insights into complex socio-ecological systems and their sustainable management' (Meerow et al, 2016: 38). Place and design aspects are core to achieving resilience by helping create new norms and dealing with urban shocks and perturbations (Pickett, Cadenasso and McGrath, 2013: xxii). Resilience-based approaches to urban planning with elements of co-design are an important way forward (Crowe, Foley and Collier, 2016). Thus resilience should be at the heart of a process in which masterplans are 'the means to actually deliver change and adaptiveness' (Romice, Feliciotti and Porta, 2018: 3).

Within these wider concepts, our article is theoretically-situated in relation to a growing body of academic and applied work about what constitutes sustainable cities

(Williams, Burton and Jenks, 2000) and sustainable urbanism (e.g. Murrain, 2002; Talen, Bohl and Hardy, 2008; Calthorpe, 2010; Tachieva, 2010; Roggema, 2017). The sustainable urbanism literature internationally encompasses distinctive constructs like eco urbanism, neo-traditional planning (Sharifi, 2016), new urbanism (Ellis, 2010) and sprawl repair (Talen, 2011). We acknowledge the applied focus of sustainable urbanism debates within particular national contexts, including predominantly but not entirely in the United States in relation to new urbanism (Grant, 2011), TODs (Cervero, 2016), retrofitting and form based codes (Talen, 2013). The paper is framed in relation to urbanism guided by principles of diversity, connectivity, mix, equity, and the importance of public space (Talen 2005: 37) that can be counterposed with features of anti-urbanism which tend toward separation, segmentation, planning by monolithic (e.g. transport infrastructure) elements, and the neglect of equity, the public realm, historical structure and the human scale of urban form.

Urbanism principles matter here. As an example, Lehmann (2010a) has delineated green urbanism (analogous to sustainable urbanism) principles that should guide development of new places. Similar lists of specific principles are found in applied urban design guidance documents. These tend to share a focus on physical placeshaping but some spill over into process and social and cultural areas. Urbanism principles have provided both a conceptual basis for masterplanning theory and a means to analyse the outcomes of masterplanning practices globally (Rapoport, 2015; Primož, 2017). It is therefore not surprising that practice-based organisations have offered their own lists of principles. The Academy of Urbanism (2008) in the UK includes the following in their list of sustainable urbanism principles: collective vision; culture and ecology of the place; identity and diversity of the community; vibrant streets and spaces; a permeable street network; a focus on the public realm and pedestrian

environment; contextual design reflecting character; and accessible, adaptable and affordable built form, among others. By implication, the argument is that if framing principles are reflected in the placemaking of masterplanned developments then developments have an increased chance (compared with conventional dormitory housing designs) of enabling sustainable living.

We take masterplanning in this research context to constitute a strategic process of addressing physical, economic and social needs of place-based communities (CABE, 2008). Despite critiques (Fainstein, 2000; Maller and Nicholls, 2014; Roggenbuck, 2016) and a recent comprehensive 'rethinking' (Al Waer and Illsley, 2017), masterplanning remains a largely normative, practice-based process, focused on area design, and producing 'prescriptive and detailed' masterplan documents to help guide the urban form, timing and cost of development (Carmona et al. 2003: 259). Masterplanning tends to follow a typical format, beginning with a broad appreciation of a site's context (including considering its urban structure with a particular focus on site connectivity) before details of the place are developed and finally implementation is initiated (Llewelyn Davies et al., 2000: 24-27).

Urbanism's connections to spatial design

In recent years notions of sustainability and resilience have become embedded in the lexicon of spatial design (Luke, 2005) with 'eco-cities' argued to be becoming a mainstream concept (Joss, 2011) and practice (Joss and Molella, 2013; Shwayri, 2013; De Jong, Wang and Yu, 2013; Sharifi, 2016). Given the spatial design focus of our research, we first turn to sustainability-informed design principles. We acknowledge that there is some fuzziness in the urban design and planning literature about how to apply such principles. The notion of best practice in place design principles can itself

be critiqued as reflecting particular interests and dominant design perspectives (Moore, 2013). Claims to scientific objectivity in the urban design literature are highly contestable, with urban design positioned between art and science (Marshall, 2005a). A substantial number of designers and urbanists have identified design ‘elements’ or ‘qualities’ to apply to different scales of placemaking, from the level of the individual building to the much larger scale of the urban sub-region (e.g. Trancik, 1986; Moughtin, 1996; Carmona et al, 2003; Frey, 2003; Lessard and Ávila, 2005; Farr, 2011). Through holistic approaches these designers and urbanists seek to avoid an over-emphasis on enviromental aspects of place design at the expense of social justice concerns (Trudeau, 2018).

Integrative design is considered the basis for “joined up urbanism” (Marshall, 2005b: 367). Thus, at the level of applied design, practitioners have delineated the particular design qualities deemed necessary to make ‘eco-neighbourhoods’ (Barton, 2000; Rudlin and Falk, 2009. We contend that despite the issues with scientific rigour urban design approaches are grounded in broader principles of sustainability (vide Dresner, 2002; Ritchie, 2013) and reflected in urbanism principles (insofar as sustainability intersects with questions of place) which in turn inform masterplanning assumptions. The masterplanning-based analysis of findings at the fieldwork sites reflects this 'principles' chain.

It is worth briefly noting how the interplay between concepts guiding this study, sustainable planning principles and masterplanning implementation, has played out in the two national contexts of our study and where we draw the limits of our thesis. Importantly, while our focus is on UK and Australian contexts it touches on recent debates predominantly (but not entirely) focused on American practice (e.g. about New Urbanism, Transit Oriented Development, Smart Growth [Downs, 2005; Edwards and

Haines, 2007] and Form Based Codes [Talen, 2009; 2013]). These are acknowledged in this paper in two ways. First, these areas are connected to the paper's themes insofar as the underlying urbanism principles around which they are framed draw conceptually from the topic at hand. Thus, for example, urban design codes can be seen as an important or even critical aspect of the structuring of places in the UK and Australia (Marshall, 2011) and, if well-used, of 'successfully regulating the essentials of urban form' (Carmona, 2009: 2645). Second, there has been some applied and theoretical work explicitly referencing New Urbanism, Smart Growth and Form Based Codes, as well as the urbanism principles underlying these, in UK, Australian and New Zealand contexts (Baker, Sipe & Gleeson, 2006; Falconer, Newman and Giles-Corti, 2010; Gunder, 2011; Wear, 2016).

In the UK, urban design has increasingly become understood as a legitimate aspect of planning new places and redesigning existing ones (Carmona and Punter, 2013). Yet, while 'there has been a proliferation of types of design guidance…, their sheer variety only helps to illustrate the ambiguity of design guidance as a design/development tool' (Carmona 2017: 7). National government guidance on design broadly sympathetic to sustainability principles was extant in the decade running up to planning law reform in 2011 although even then a considerable degree of individual interpretation by those judging design quality was evident (Black and Sonbli, 2019). This included Planning Policy Statements on Urban Design and the now withdrawn *Urban design in the planning system: towards better practice* (DETR 2012) urban design guide and a key quasi-governmental *Urban Design Compendium* which has significantly influenced practice in the UK including being 'adopted' by some local authorities (Llewelyn Davies et al., 2000). Since 2011 however, while the National Planning Policy Framework in the UK in theory offered an opportunity for coherent design advice (Paterson, 2012),

much of this design guidance framework was dismantled as were housing sustainability codes [Cowell, 2014]). Since we completed our research there has been some re-emergence of spatial design guidance in the form of a National Design Guide (MHCLG, 2019) and a recent Living with Beauty report (Building Better, Building Beautiful Commission, 2020) but these occurred after the period the fieldwork focuses on. The UK developments included did not therefore have a statutory, comprehensive design code basis for their design, but their masterplanners would have been aware of guidance like the *Urban Design Compendium*.

In Australia, meanwhile, there is a considerable body of conceptual work, including, among others, pertaining to New Urbanism (Falconer, Newman and Giles-Corti, 2010), green urbanism (Beatley and Newman, 2008), and design-led approaches for diverse sustainability areas including water management (Wong, 2006; Mitchell, 2006), walkability (Giles-Corti et al, 2010), and development control (Gurran, Gilbert and Phibbs, 2015).

At the level of policy, in 2006 the Australian federal government produced the Australian Model Code for New Residential Development (AMCORD) which was sympathetic to New Urbanist principles although it does not have direct control over planning which is a responsibility of the states. In addition, the sustainable development implications of specific projects and code-based approaches at various urban scales have been explored (Curtis and Punter, 2004). While there has been less clear cut governmental withdrawal from this policy and guidance area at state and federal level than in the UK, the degree to which conceptual, research-based insights are applied varies markedly over time at national level, from city to city and from state to state within Australia's federated political and urban management system (e.g. MacDonald 2015 on the Sydney case). In relation to the studied sites, none included a

comprehensive design code in place within which the development was masterplanned. In each case our discussion suggests that the scale of the development owed more to existing constraints including land availability than to more 'in principle' bases for the appropriate or ideal scale to achieve particular urbanism outcomes. These considerations informed our site selection process.

Masterplanned communities as a research context

We situate our exploration of masterplanned communities in relation to masterplanning and to issues of plan implementation more broadly. Masterplanning is a long-standing approach to shaping cities with its origins ascribed *inter alia* to the Renaissance (Giddings and Hopwood, 2011), 19th century utopian experiments proposed by Owen and Fourier (Beecher, 1986; Kumar, 1990) and Haussmann's activities in Paris (Johnson, 2010). In the 20th century, masterplanning came to the fore in the top-down Comprehensive Redevelopment era generally associated with the 1960s (Giddings and Hopwood, 2006). A decline in favour of comprehensive approaches followed, before masterplanning principles were adopted with renewed interest in the late 1990s (Urban Taskforce Report and Rogers, 1999).

Starting with critiques in the 1970s, however, it has been argued that masterplanning is an outmoded way to understand place or to shape it (Todes, Karam, Klug, and Malazawe, 2010). 1970s era masterplans were seen to relate to a technocratic and comprehensive view of planning 'showing the projected density and intensity of various land uses and their spatial distribution' (Watson 2009 in Todes et al, 2010). Masterplans conceived as the highly prescriptive expression of end-state planning, such masterplans tended to produce sterile environments, assessed as being unsuited to accommodating the more dynamic urban issues and requirements of recent years

(Rudlin and Falk, 2009: 274). In addition, masterplanning has been judged harshly in contrast to approaches which foreground stakeholder engagement (Healey, 2006). While sustainable urban projects based on masterplans have by now become a global phenomenon (Rapoport, 2015: 110), concerns continue to be raised that in part echo earlier critiques. Anxieties include 'the notion that such plans are starting to become an end in themselves and bear little relation to real urban settings; that the built environment aspects are only considered two-dimensionally; [and] that the plans are deterministic, inflexible and based on the concept of a completed product whereas the evolution of the city is a process' (Giddings and Hopgood, 2011: NPR).

Perhaps the most damning criticism is about masterplanning's architecture-driven approach, reflecting its predominant association with particular space-shaping practices prevalent in the mid-to-late 20th and early 21st centuries (Ley, 2014). These practices may play into the development and housing industry's inertia vis-à-vis producing higher density, less car-dependent places (Filion, 2015; Filion, Lee, Leanage and Hakull, 2015). They include reliance on unproven technical or process innovations and disruption of fine-grained urban contexts (Feliciotti, Romice and Porta, 2017). Such practices continue to be highly influential despite their shortcomings (Bullivant, 2012; Firley and Gron, 2013). Within this paradigm, there may be a tendency for land developers to see masterplanning as about creating 'iconic' architectural statements (Sklair, 2010), rather than a more profound, holistic design-based placemaking method, which unfold over time and is influenced by many different players (Rudlin and Falk, 2009) through massive small change (Campbell, 2011).

Allied to this issue of masterplanning's problematised relationship with architecture is the emergence of fully gated communities, for which masterplanning instruments are central, as part of the wider privatization of urban space. This typology has emerged as

a form of suburban greenfield development in which neoliberal economic approaches are increasingly (though not unequivocally [McGuirk and Dowling 2009]) reflected in spatial planning and governance (Johnson, 2010; Thompson, 2013).

Notwithstanding these assessments, if deployed carefully and flexibly (Al Waer, 2014) contemporary masterplans can be valuable for activating more sustainable principles in planning and shaping space than is the mainstream development norm (Costly 2007: 169). This has been reflected in the UK through practice-oriented policy statements and guidance documents, and in Australia in urban design guidelines published by state and city governments for metropolitan areas and specific projects. Masterplanned developments thus offer *de novo* contexts for researchers to investigate the translation of urbanism principles into urban form. Moreover, they may make sustainability claims, which are a central research concern here. This can be seen at both the level of the architecture of individual buildings and in the spatial design of a whole development.

In process terms, difficulties in successfully implementing masterplans resonate with wider issues about plan implementation (and its evaluation) in urban planning. Talen (1996: 248) points out that since this area started to receive attention in other academic disciplines in the early 1970s, there has been 'a curious lack of parallel inquiry into the implementation processes involved in the planning field' – a point reiterated by Berke et al. (2018) more recently. A lack of evaluation of plans reflects paucity of relevant methods and the challenge of being able to clearly tie outcomes to plans, has been offered as reasons for this situation (Laurian, Crawford, Day, Kouwenhoven, Mason, Ericksen & Beattie, 2010). Given that plan implementation failure is an identified issue in planning (for exceptions see Berke and Conroy, 2000; Berke et al, 2006), effective plan implementation evaluation is seen as a means to help

merge planning process (i.e. planning decision making) with planning substance (that is 'effective planning practice in empirical terms') so that procedure does not simply dominate (Talen, 1996: 256).

'New plan syndrome' whereby 'plans are continually redone or updated without regard to the implementation status or the originally prepared plan' is also seen to beset planning practice (Talen, 1996: 248). Likewise, 'planning drift' which Talen (1996: 249) argues is 'the gap between plan and outcome' is under-explored empirically. Berke et al (2018: 581) agree that plan implementation has long been ignored in planning research and point out issues arise because 'studies that evaluate plan quality use different variants of plan quality criteria'. In moves towards performance based planning whereby codes, pattern books and design standards may be used to judge outcomes against predetermined performance criteria the question of how implementation is measured becomes particularly important (e.g. Baker, Sipe and Gleeson 2018). This is not just an evaluation matter. Elsewhere, Turner (2016) makes the case for more attention to collaborative, skills and leadership aspects in underpinning successful sustainable urbanism implementation processes. These various implementation issues and debates – and the lack of research in the plan implementation area – help frame the analysis that follows.

Case study selection

Empirically, this paper takes a collective case study approach (Goddard, 2010) to analyse five case studies of urbanism practice in masterplanned communities. Collective case study designs involve "studying multiple cases simultaneously or sequentially in an attempt to generate a…broader appreciation of a particular issue" (Crowe et al., 2011: 2). In this case the approach was used to better understand

slippages between masterplanning principles, policies and practices in two national contexts (Australia and the UK). These two contexts were deemed comparable on account of a range of shared research-relevant characteristics. Firstly, it has been observed that the two settings "share close cultural ties stemming from colonisation and similar legal systems" (Gurran, Austin and Whitehead, 2014: 186). Beyond this broad characterisation, when it comes to urban development it has been show that "[l]and use planning systems in Australia and the United Kingdom (UK) share a common history" (Gurran and Whitehead, 2011: 1193). Finally, notwithstanding differences in the urban design policy and guidance landscape discussed earlier, and while a divergence in land use planning approaches has been observed since the mid-20th century (Gurran and Whitehead, 2011: 1193), in recent years it has been argued that "differences [in approaches to spatial planning] are narrowing, with striking similarities in diagnoses of planning problems and in prescribed solutions" (Gurran, Austin and Whitehead, 2014: 186).

When it comes to sustainable urbanism, commonalities between the conceptual features of urban sustainability discourse in Australia and the UK are also evident (Mak and Peacock, 2011: 13). More practically, the UK and Australia (and in particular New South Wales [Newman, 2005]) have been prominent developers and adopters of metrics-based approaches to assessing the sustainability of urban development (e.g. Bond, Morrison-Saunders and Pope, 2012; Horne, 2006), with BREEAM (UK) and BASIX (NSW, Australia) now being established sustainability assessment tools in each setting. It is worth noting that such metric-based approaches that have been increasingly applied to the masterplanning process per se (Al Waer, Kirk and Somper, 2017).

In broad terms, all of the case studies in this paper are Global North urban settings with comparable planning, building and urban-design regimes that are relatively

similar, and which share a similar history of partnership-based urban development and masterplanning processes. As such, they are well-placed to offer, through a collective case study approach, insights into slippages between masterplanning principles, policies and practices in settings with broadly shared sustainability aspirations, discourses, planning systems and policy frameworks. The selection of case study sites themselves (within each country) was purposively conducted in such a way as to provide a range of different density and other design characteristics based on criteria outlined below.

This study is an example of flexibly-designed (Robson and McCartan, 2016), small-n collective case study-based (Stake, 1995: 3-4) research where fewer than ten cases are explored in depth. The goal is not to generate findings generalizable to all other instances of masterplanning. Rather, we seek to generate context-rich, and transferable (Devon, 2008), findings through the analysis of our five purposively sampled case study developments. To select cases we first long-listed recently or partially completed masterplanned developments in our two study regions (the Sydney metropolitan area and the wider Greater London, east of England and southeast England area). Using this longlist we applied inclusion criteria to select our cases. These included sustainability claims made by the developer – we wanted to find places framed and represented as 'sustainable' in masterplans themselves and in related marketing and publicity literature from the site developers studied through desk review. We selected sites that were broadly similar in physical scale, tenure and land use mix, as well as in the demographic profile of their inhabitants, and that were sufficiently complete to assess masterplan implementation. We purposively sampled different urban contexts, ranging from inner urban to outer suburban and urban-rural edge to metropolitan conurbation-

based settings, and for variation in the profile of developers (to include developers from the public and private sectors).

For scale, we were looking for sites which were large enough to offer sufficient physical built form to consider comparatively rather than those that would represent some 'ideal' size for masterplanned developments (if that could be defined). We focused on identifying sites which were, in density and housing typology terms, representative of the local market in new development. We were interested in obtaining a spread of sites in different settlement contexts (from inner city to semi-rural). Given the nature of the sites as new developments even if on previously developed land we acknowledged that it was unavoidable that there would be a greater proportion of buyers than either private or social renters represented in our field-sites (though our cases do include both private and social rental housing). The sites are predominantly residential developments, although sometimes with nominal mixed-use features. Finally, in contrast to much existing literature (e.g. Blakeley and Snyder, 1997; Glasze, Frantz and Webster, 2002; Low, 2003), an inclusion criterion was that selected sites were *non-gated* masterplanned developments. While physically non-gated, some did have spatial affinities with Master Planned Communities (MPCs) or Master Planned Estates (MPEs) which seek to offer comprehensive 'communities' (McGuirk and Dowling, 2007). Moreover, some sites demonstrated physical disconnection from surrounding built fabric characteristic of gated developments. We selected five masterplanned developments for inclusion (detailed in Tables 1 and 2), two in metropolitan Sydney in Australia and three in southeast England).

Table 1 : Salient site characteristics

Site name	Site Number	Characteristics

Jackson's Landing	Site A	An eleven-hectare inner-urban brownfield site in the central Sydney area of Pyrmont, developed as high-density, mid-to-high-rise apartment blocks and focusing on a small harbourside park.
Park Central	Site B	A low-to-medium density greenfield development on 37 hectares in the outer suburban area of Campbelltown in the Sydney conurbation, comprising primarily apartment blocks of two-to-four stories, with a hybrid (part cul-de-sac/part gridded) street layout.
One Brighton	Site C	A nine-hectare inner-urban brownfield site close to the railway station of the coastal commuter town, Brighton, in southern England, developed as a medium-to-high-density pair of mid-rise apartment buildings with significant green features.
Grand Union Village	Site D	A 22-hectare brownfield site in an outer suburban redevelopment area on the north-west edge of Greater London, adjoining a canal, comprising terraced housing and some apartment buildings with a hybrid (part cul-de-sac/part connected) street layout.
Wixams	Site E	One of four 'villages' within an overall 281 hectare (‘settlement core’) semi-rural brownfield site (in a greenfield area) in commuter range of a regional Bedfordshire town, developed as low-density detached houses, maisonettes and some terraces, with a traditional urbanism layout of connected streets.

Table 2: Scale, density, land use mix and location of each site

	Australian Sites	**English Sites**	**Scale**	**Density**	**Mix**
Inner urban	Jackson's Landing Sydney	One Brighton Brighton	Medium	High	Predominantly Residential,
Outer suburb	Park Central Sydney	Grand Union Village London	Medium to Large	Medium/Low	Predominantly Residential

Semi-Rural		Wixams Bedfordshire	Large	Low	Predominantly Residential

Data collection and analysis

The study employs mixed methods within a collective case study research design. We undertook multiple fieldwork visits to each of our field sites, conducted site observations, interviewed residents and key placeshapers (including planning authority, developer and community representatives), took field notes and made photographic records. Fieldwork covered urbanism themes including the nature of the built form, the legibility and walkability of street and path layouts, and the use of communal and public spaces. We collected and studied site documentation, including masterplanning drawings, community maps, design codes, strategic design guides, references to Section 106 (community infrastructure levy [UK]), development impact reports, action plan annual reviews, environmental evaluation documents, developers' case study documents (including websites), a development prize entry based on one of the Australian sites, development leaflets/marketing materials and community websites/newsletters.

With these materials we constructed a corpus of masterplanning documentation (Bauer and Aarts 2000) about the sites from their commissioning, to set up, development and post-occupancy stages. Given our interests here in the visualised and materialized qualities of masterplanned developments, in this article we predominantly present results from our qualitative analysis of primary and secondary visual materials and written documents rather than of end-user and stakeholder interviews data (which will be analysed elsewhere). Our analysis is neither a sustainability appraisal of the developments' urban design performance, which would systematically work through

every aspect of their placemaking, nor a technical analysis using quantifiable indicators. Rather, it is a qualitative analysis of the urbanism claimed and then realised at the sites as evidenced by our data, focusing on particular aspects we deemed most revealing vis-à-vis our research aims. To guide our masterplanning analysis we used the *Urban Design Compendium* (2000) to develop a matrix of place design aspects salient to our analysis (Table 3).

Table 3: Matrix of masterplanning design aspects salient to our analysis

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

Source: Adapted from Llewelyn Davies et al. (2000)

We argue masterplanning is relevant not simply as a case selection criterion but as a source of analytical purchase, and much of the next section is informed by the use of visually-based techniques in part drawn from masterplanning practice. As used in masterplanning, such methods tend to be structured in the form of guidance (Firley and Grön, 2014) and unreflexively directed towards shaping space (Madanipour, 2003). This is a trap we wished to avoid, especially given that ‘while there are theoretical models in urban design, a causal or even contingent association between

Masterplanning and a high quality urban environment seems to be based on scant anecdotal evidence' (Giddings and Hopwood, 2011: 1). We likewise needed to be cautious about the use of design analysis techniques given their practice orientation and a mooted lack of a strong grounding in scientific enquiry evidential norms (Marshall, 2012). Notwithstanding such criticisms, we contend that masterplanning-related analysis – including visual methods concerned with analysing spatiality and social processes in urban space (Parham, 2012: 22) – does have strengths relevant to research at the interstices of planning, urban design and social science. Visual methods from urban design can be useful to social scientists 'as another discipline not only concerned with social processes in urban space but providing a wealth of techniques to capture data on spatiality' (Parham, 2012: 22).

Analysing masterplanning practice in our study sites

In both national contexts the aspiration for, if not always the outcome of, undertaking masterplanning is to deliver substantial numbers of new dwellings rapidly, without sacrificing build quality or creating sprawl (Carmona, Carmona and Gallent, 2003: 119). While masterplanning was identified in the UK's Urban Task Force (1999) report as one of the critical tools for both private and public sector-led housing delivery, and despite sustainable masterplans being seen as a fairly standardised tool, recent analysis suggests the quality of design through masterplans varies considerably from place to place (Al Waer, 2013). Further, because 'buildability' is absolutely critical for developers, this can compromise design quality at the individual unit level as well as that of the wider place (Carmona et al, 2003b: 119). We argue that conventional placemaking strategies offer sub-optimal results at both the house and place-design level (Ejigu and Haas, 2014). As a result, the practical form that masterplanning takes

is obviously a pertinent issue in exploring specific masterplanned sites. In this section, we review study data using the masterplanning analysis matrix (Table 3) to explore these issues.

Our analysis of *masterplanning documentation* starts with framing and context aspects evident through the materials collected about the sites. The masterplans which least adhered to sustainable urbanism principles tended to replicate problematic design features: being fixed and inflexible, coarse-grained object building-centred, and overly reliant on a sole architect's design perspective (Rudlin and Falk, 2009). This, in turn, means that the architectural palette produced by one studio for a whole development may offer no more than a stylistic veneer of diversity. Conversely, the more successful examples by the same measure were not fixed but iterative masterplans (see Coulson and Wright 2013), designed to develop over time, and for which the input of stakeholders including designers, builders and other placeshapers was actively included and responded to.

The *urban structure* element of analysis of the masterplans relates to physical form, and we found that a formally greenfield masterplanned setting (Park Central [PC]) tended to replicate some aspects of sprawl in its urban structure despite its sustainability claims (Park Central Master Plan, Undated). At the greenfield-like Wixams this was ameliorated to an extent by particularly well-handled urban design coding which helped to produce a liveable place structure focusing on aspects of environmental quality and social inclusion (The Wixams –Village One Detailed Design Brief and Code. 2006). At both there was one overall masterplan, which in PC included a small number of live/work units, and the achievement of higher than usual housing densities for a suburban location in the Sydney context (as reported in an interview with a development director at Landcom [the developer for PC]). At Wixams there was a great

deal of design sophistication in developing a workable village structure for each part of the development reflected in design and masterplanning documentation (The Wixams - Village One Detailed Design Brief and Code. 2006; Wixams Masterplan Document Consultation Draft – 2013; Wixam Park Master Plan Document Approved as Technical Guidance, 2015).

However, at the place scale, the effectively zoned separation of different land uses at both PC and Wixams contributed to the housing elements being largely dormitory in character and spatial form. In PC a retirement village was part of the design and this was detached spatially from the rest of the development. Housing design was described in an interview with the developers as undertaken by way of a 'builder package delivery model' in which builders were commissioned to design the housing. These designs were reviewed by an architect, rather than being designed by architects in the first place. This may have affected the design quality of the overall urban structure given the predominance of residential architecture in the placemaking.

Both of these masterplans exhibited strengths in their environmental design features, with substantial green landscaping potentially contributing to biodiversity/habitats, development of wetlands at PC through the repair of the riparian environment of a degraded creek (Landcom Annual and Sustainability Report, 2011: 15; UDIA, 2008), and the creation of a sustainable urban drainage (SUDs) system at Wixams (Masterplan Document Consultation Draft, 2013; Wixam Park Master Plan Document Approved as Technical Guidance, 2015).

Weaknesses in practice were evident, however. At PC (Figure 1) for example, a developer interviewee acknowledged that there was no masterplanning design focus on water recycling at household level, or design focus on reducing parking to emphasise walking as a preferred movement mode. At Wixams the issue was more about getting

from the development, however well designed in itself, to anywhere else. We look at both these points more in relation to the movement economy below.

Figure 1: Park Central [Photo: A. Jones]

The three more obviously brownfield settings (Jackson's Landing [JL], One Brighton [OB], and Grand Union Village [GUV]) varied in their engagement with placemaking/retrofitting approaches that fitted with creating a well-designed urban structure, including in environmental sustainability terms. From our analysis of plans, observations and written material such as masterplans (Jackson's Landing Master Plan, Undated; New England Quarter Master Plan, Undated) and other reporting (One Brighton − One Planet Action Plan Annual Review, 2010; 2011, Urbed, 2011; One Brighton Impact Report, Undated) OB (Figure 2) was the most successful in urban structure, connectivity, density, grain, land use mix, and enclosure because of its extremely well connected inner urban location, its block structures of sufficient density, scale and medium rise height to support mixed use and walkability, and its provision of enclosed public space 'outdoor rooms'. Jackson's Landing, had also incorporated aspects including energy efficiency by developing an energy audit (Jackson's Landing Smart Green Apartments Energy Audit Report, 2013).

Figure 2: One Brighton urbanism [Photo: J. McCormack]

JL (Figure 3) had some strengths in a masterplan which showed a relatively formal urban structure of well-planted streets and green spaces. Through this plan it made good connections to surrounding park and walkable space, but high-rise elements of its

design (e.g. the Distillery Hill and Stonecutters apartment complexes) caused some observed overshadowing and wind effects (which were reported in several interviews with residents) in the immediate areas of surrounding space. In urban structure terms these were due to these buildings' 'object' nature, meaning the surrounding spaces were less able to be configured as either fully public space or private green space than other urban structures allowed. The instance of high-rise built form in JL (in some buildings) did not exploit opportunities for mixed use within the built fabric to the degree they might have given its high-density, inner-urban location.

Figure 3: Jackson's Landing urbanism [Photo: A. Jones]

Suburban located GUV (Figure 4) meanwhile, achieved some urban structure strengths where it met block and street requirements (Urban Design Compendium, 2000), but was less successful in its more hybrid, cul-de-sac based Radburn Layout areas where vehicle and pedestrian access appeared to be split. The site's masterplan shows that certain street sections where terrace forms predominate, did achieve some positive outdoor space, but in others where a more 'object building' approach was taken, spatial enclosure was less adequate.

Figure 4: Grand Union Village urbanism [Photo: J. McCormack]

The lower density nature of development characterising most of Wixams (Figure 5) and some of PC meant that the height-to-width ratios needed for streets to afford convivial outdoor space could not generally be achieved. Masterplan materials demonstrated that some of the short terrace street sections in PC were a spatial

'enclosure' exception, as was the village centre in Wixams as it was intended to follow traditional village shaping for that area of Bedfordshire.

Figure 5: Wixams urbanism [Photo: J. McCormack]

In summary in relation to urban structure, placemaking of high quality does not automatically confer sustainability. The fieldwork evidence showed a considerable variation in the way urban structure elements were used to support urbanism principles and some of the sites deployed these techniques more effectively than others or more in some aspects than others.

Analysis of *connectivity in the masterplans* explored each site's movement economy as characterised in the connectivity column of our analysis matrix (Table 3). The visual representations (plans and photographic evidence) and other material we gathered showed car-focused urban shaping embedded in all but one of the masterplans to varying extents, even the most urban and high density (JL). OB was the only development that was explicitly designed to be car free as part of its sustainability approach. As might have been expected, car orientation was most pronounced for the lower density, outer suburban and semi-rural based sites (PC and Wixams) although it was evident in the somewhat higher-density suburban GUV, and to a lesser extent the inner-urban, high-density JL. For PC and Wixams in particular the car-focused shaping was especially evident, and we would argue that this played into existing dominant spatial cultures of car-based movement. Thus, in PC (outer suburban Sydney), the entire site was a form of a large neighbourhood unit, surrounded by major arterial roads, with a few 'local connector' roads as ways into a largely hierarchical, internal road structure. In GUV, meanwhile, a perceived shortage of car parking in the development became a

source of contention reflected in a consultant's report and the production of a guide to parking. This indicated that even in a place developed at medium density, with relatively good access to public transport, some residents' assumptions were still of relatively unconstrained car use and access.

The analysis of *implementation* of the masterplans conformed to Carmona et al's (2003) findings: it was clear from the evidence that levels of design and process sophistication and depth in the masterplanning approach as implemented on the ground varied considerably across the five sites. This included in ways that were not simply congruent with the different site scales, a point that is relevant because the economic benefits accruing through excellent design for large masterplanned sites have tended to mean they attract significant design attention (Bell, 2005: 93, based on Carmona, 2002). To varying degrees across the sites, for instance, vexed issues of economic and social need for on-going management and strategic planning relating to sustainable living were relevant. Some sites had forms of social sustainability planning and strategy embedded in the masterplanning documentation.

OB was the most successful in implementation terms because there was the smallest gap between urbanism principles, initial masterplanning intentions and outcomes over time (see UK Green Building Council 2015). Sometimes the perceived implementation shortcomings were related to wider issues. As an example, in Wixams there was a delay in developing the promised local train station that was central to its travel mode shifting aspirations (and thus sustainability performance). The station development timing was something the developers at Wixams did not have control over, but which could substantially undercut critical sustainability outcomes in relation to wider connectivity of the site.

The gap between masterplanning proposals and sustainable urbanism principles

Following on from this review of urban design approaches across the five sites, judged against the analysis matrix, we next turn to the posited gap between masterplanning proposals and sustainable urbanism principles. We suggest that in the sample of developments there was, in certain cases, a significant lack of fit demonstrated between the inherent design qualities of the masterplan proposals and recognized sustainable urbanism principles (Lehmann, 2010a) given practical expression through urban design. Especially in PC, Wixams and to a lesser extent, GUV, the approach, to varying degrees, created new pieces of largely single land use (housing) that contributed to sprawl, rather than building-in town fabric from scratch, or repairing and reconnecting it in line with retrofitting, transect-based approaches (Tachieva, 2010; Dunham-Jones and Williamson, 2011). OB and JL, by contrast, were more successful at producing new pieces of urban fabric.

Thus, design outcomes were not necessarily congruent with the scale of work, nor were they inevitably allied to the level of design sophistication demonstrated in masterplanning documentation. Rather, we argue variations speak to the urbanism principles underpinning the work produced by the masterplanners and approved by their clients and planning authorities. In other words, disparities were not just about problems of plan implementation as highlighted in the literature. This was apparent not only in relation to dwelling quality (where buildability, kerb appeal, market research and responses to regulations tended to trump higher quality, bespoke design approaches [Carmona et al, 2003a: 121]), but was clear in relation to the way wider place design was handled.

It is worth observing too that relatively inadequate design outcomes are increasingly occurring in the regulatory contexts discussed earlier of withdrawal by government

from design guidance and regulation in the UK, and substantial variations in approach between states and metropolitan areas in Australia. We are not able to determine how far these changing regulatory contexts have been influential within the scope of the research. However, we found that appealingly drawn masterplan designs with attractive graphics and well-argued supporting guidance statements might still visualise places which function poorly in various terms. This may include connections to local character in terms of architectural vernacular and/or creating human-scaled, mixed-use, fine-grained space with a sufficiently dense structure, in which primacy is given to the public realm and active travel opportunities.

Instead, in our sample excellent quality drawings and well-produced plans could be seen to underpin (variously) car-dependent, inaccessible places with disconnected street patterns, poor block structures, overly wide height-to-width ratios, lack of walkable space, and insufficiently mixed uses. What results is effectively the development of largely dormitory suburbs, especially at PC and Wixams. The point here is not to suggest some form of causal relationship between well-drawn plans and adherence to sustainable urbanism principles, but rather to make the argument that aesthetically-pleasing plans can fall short of producing sustainable urbanism outcomes or affordances. Of course, the data showed that these outcomes were not uniform. Design perspectives ranged from a focus on high-density, medium-to-high-rise inner urban blocks (JL and OB) through low-density approaches (Wixams) to more conventional or hybrid 'branch-and-twig' cul-de-sac based site layouts and medium development densities (PC and to a lesser extent GUV).

The lack of fit between urbanism principles and built places was also apparent in relation to density, mixed use, connectivity and accessibility. On density and mixed-use, JL and OB were the clear standouts in responding to masterplanning guidance

about the sustainable urbanism principles that underlie compact development at medium-to-high residential densities, with Wixams included if the criteria cover the need to focus predominantly on redeveloping brownfields (cf. Carmona et al, 2003a). PC, GUV and Wixams, in particular, were masterplanned to substantially lower densities than JL and OB, and with less compaction and tenure or land use mix, with consequent sustainability costs. This was arguably in tune with house builder conservatism (Townshend, 2007), and developer experience of management problems with handling mixed tenure areas may have influenced outcomes at the sites even where a social landlord was closely involved in the process as at JL and GUV (Halsell, 2015).

In some cases (JL, OB and Wixams, in particular) the masterplans included some excellent, highly location-appropriate mixed-use intentions. This was especially in environmental aspects of sustainable urbanism including food, with allotments, community gardens and roof-top food growing opportunities all supported. Wixams' blue-green network of waterways and green space was particularly well handled in the masterplan. However, for PC, GUV and Wixams, the residential-heavy design, low densities, asymmetrical tenure mix weighted towards private ownership, lack of local jobs and services, and limited local retail (among other aspects) meant that the developments as built appeared much more similar to mono-functional housing estates than the respective masterplanning material might suggest.

Weaknesses in more sustainable transport connectivity to wider areas meanwhile were a concern in Wixams but to an extent in PC and GUV given their car-focused design. Although design guidance had by the early 2000s in theory spelled ‘the end of the road for the cul-de-sac’ (Carmona et al, 2003b: 125), some of the fieldwork sites’ masterplanning documentation demonstrated car-oriented design layouts (with OB's

car free design the most obvious exception) which appeared to be designed in line with outmoded neighborhood unit, Radburn layout- and superblock-inspired urban shaping.

In parts of GUV, and more substantially in PC, the layout of streets significantly compromised walkability radii, and created busy, unpleasant collector and distributor roads, through the imposition of road hierarchies rather than connected grids. In both developments these issues were further complicated by the interplay of sub-optimal street designs, with dendritic, hierarchical layouts and overall place design which privileged high car ownership levels and use. In these cases it may have been that designers were working within external parameters set by highway engineering norms which in privileging fast vehicle movement undermine sustainable movement design.

The poorly connected street layouts and poor street design described above also led to accessibility issues in some sites (especially PC and GUV). We observed a considerable amount of pavement parking in both PC and GUV (Figure 6), which led to reduced walking space (and so disrupted walking journeys) and to local disputes (Armitage, undated). Additionally, at PC and Wixams there was poor pedestrian connectivity to local public transport nodes, while in two sites (GUV and Wixams) there was a lack of promised public transport. Problems of lack of legibility or permeability in some cases amounted to street severance for walkers (again PC and GUV). At JL a so-called vertical cul-de-sac (Hwang, 2006) affect was evident, with floor-to-floor severance for high-rise or medium-rise building residents and other users.

Figure 6: Pavement parking issues at PC [Source: photo by A. Jones]

In PC, where pedestrian connectivity was theoretically afforded through the provision of some footpaths connecting residential streets (developer interview), in

practice these footpaths were often visually hidden and lacked signage. In Wixams, although the residential area street design was well organised as connected streets, which avoided the shortcomings of the Radburn Layout, the whole place was largely disconnected from anywhere else except primarily by car.

Although not explicitly so, these design shortcomings emphasize qualities in the design as built which are shared with gated developments (Glasze, Frantz, and Webster. 2002). They foreground issues that may be beyond masterplanning to resolve. Foreshadowing the conclusions, it is notable that other researchers who have studied GUV argue that the costs for maintaining and stewarding public and shared masterplanned spaces may be beyond what people are prepared to pay or that residents make changes not envisaged in the masterplan (Falk and Carley, 2012). Research from developments in Essex, UK, reinforces this point (Nelson, 2011). It may be that the sustainable urbanism intentions of the masterplanners need other ways of being activated, for instance through strategic planning processes, community and stakeholder engagement processes (Toker and Pontikis, 2011; Falk and Carley, 2012) and environmental management techniques (Turner, 2016).

Conclusions

Our focus in this paper has been on the relationships – both connections and disjunctures – between the theoretical aims of masterplanning in relation to sustainability and the ensuing urbanism realized at each site. Our analysis of slippage is framed by the work of other scholars on issues with plan implementation more broadly. As such, our study makes a contribution to evaluating plan – in this case masterplan – implementation and thus effectiveness as called for by Talen (1996). We

do not claim that our results can be generalised across developments in the regional and national contexts of our study more broadly. We argue that they do offer some interesting (and transferable [Devon, 2008]) evidence-based insights into the rocky pathway from sustainability claims to outcomes; ones that are at least suggestive of slippages between principles, proposals and practices in relation to masterplanned developments. For background, we have touched on the background of design-based approaches, guidance, codes and regulations but we have not focused on these as the theoretical emphasis of paper is on masterplanning aims, process and outcomes.

We have followed a logic of analysis from urbanism theory and principles through masterplanning proposals and finally into masterplanning practices. A comparative review of urban design approaches across five sites in two countries was justified on account of similarities in planning and design regimes and a similar history of partnership-based urban development and masterplanning processes in the case study contexts. Case study sites were chosen through a clear set of masterplanning analysis criteria and used to explore a posited slippage between masterplanning proposals and sustainable urbanism principles. We observed degrees of slippage and gaps at each stage from proposals to practices vis-à-vis meeting principles of sustainable urbanism. In certain cases, there was a significant lack of fit demonstrated between the inherent design qualities of the masterplan proposals, and recognised sustainable urbanism principles given practical expression through urban design.

We delved into why that might be the case and found that – understandably – each site was both oriented towards and constrained at the outset by an overarching need to produce new housing quickly and at considerable scale. Practical issues of perceived 'buildability' seemed in some masterplanned developments to take precedence over more holistically grounded concerns with sustainable urbanism as defined here. In some

cases, the nature of the proposed urbanism was problematic from the outset arguably being too coarse-grained, based on inappropriate spatial structures, envisioning places with poor connectivity, and lacking appropriate density gradients among other shortcomings. The least successful masterplans in our sample had awkward features in relation to a lack of variety and fine grain, which was sometimes masked by stylistic veneers suggesting diversity in design inputs. They offered urban structures, movement economies and place details that included overly separated land uses and an almost complete dominance of housing, itself overweighted in tenure terms towards dwellings for sale rather than adequate land use mix, leading to a dormitory feel to the placemaking.

Gaps of varying sizes across the sites between sustainable urbanism principles and masterplanning proposals occurred despite an extensive and largely consistent literature on urbanism principles for both new places and for place repair and retrofitting. As Carmona (2017) has pointed out, and as we found in reviewing the practice guidance within which the sites were developed, things are not so clear in applied guidance terms with a plethora of material available to influence and guide masterplanning in both national contexts. Guidance documents and other support could still underpin successful place design, but in reality the gradual withdrawal by national government from design guidance and regulation in the UK, and the comparative weakness and unevenness of design input in the largely state based Australian public policy context, may have played a part in the principles-practice slippage observed. More research on these points is needed to explore the structural forces and process related causes at play in producing this situation.

Turning to our conclusions from the findings about implementation of masterplans, masterplanning has been postulated as a fairly well-developed and standardised tool for

placeshaping. Despite this, its application in the five cases demonstrates an elastic set of practices: across our sample, masterplanning guidance has been interpreted in planning and design terms on the ground in ways that are more or less successful in contributing to sustainable urbanism outcomes.

As Al Waer and Illsley (2017) note, the experience of masterplanning is diverse globally so its use as a tool both reflects this diversity of local drivers and contexts and offers evidence of variable implementation quality: many masterplans fall short if judged as a process of collaboration and coproduction of sustainable urbanism. We argue that like sustainability, masterplanning has become an overused and overburdened term. Its connections to sustainable urbanism principles have sometimes been lost while distinct typologies of masterplanning have emerged (Al Waer and Illsley, 2017). Given this, to achieve sustainability outcomes, a distinctively urbanist masterplanning typology may be advocated as a response.

Finally, looked at comparatively, the evidence in our collective case study of sites challenges the notion that masterplanning has an inherent capacity to work from sustainable urbanism principles, through proposals, to development processes and into post-occupancy practices (a theme we will be exploring further elsewhere) always as intended. Slippages and gaps from principles to proposals and practices are possible at any and all of the stages and design areas explored here. It follows that achieving sustainable urbanism is not a given, even where a masterplan is well conceived, developed and implemented. At the same time the evidence and analysis does demonstrate some of these potential 'tripping up' points in the masterplanning process.

Aspects that seem promising or suggestive for further, broader comparative study into plan implementation across a larger number of places include the following. Plan implementation research could further explore how insights into the role of resilience

in framing masterplanning can be built into guidance and practice; how tools like coding can be better employed in masterplanning practice; how government can play a facilitating role in underpinning these techniques; and how 'market realities' that foreground housing delivery above other considerations can be better balanced with wider urbanism principles for placemaking in plan implementation. Further investigations are needed to explore more broadly and deeply the slippages that may undermine successful plan implementation, in order to deliver masterplanning that closely aligns with sustainable urbanism principles in future.

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Figure One

Figure Two

Figure Three

Figure Four

Figure Five

Figure Six