University of Reading

Sustainable neighbourhood masterplans: An analysis of the role of BREEAM Communities in green infrastructure evaluation

Thesis submitted in partial fulfilment of the requirements for the Degree of Doctor of Philosophy at the School of Built Environment, University of Reading

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March 2018

A CASE Industry Studentship sponsored by the Engineering and Physical Sciences Research Council and the Building Research Establishment

Dedication

This thesis is dedicated to my father, poet and chemist, Dr. Duncan Gardiner.

Abstract

Evaluative practice is described as an integrated or 'embedded' part of urban design processes, helping to establish, trace and refine designers' intentions, supporting the rational enhancement of design decisions and associated actions. This assumption is central to standard evaluative frameworks, such as the UK sustainable neighbourhood masterplan standard, BREEAM Communities (BC). There is a need to better understand this concept of 'embedded evaluation', by examining how evaluation functions in the transition from masterplan design to end-use. This includes examining to what extent standard evaluative frameworks like BC promote an embedded evaluative approach, directing decisions and material outcomes towards the standard's definition of a sustainable neighbourhood.

Adopting an empirical lens of green infrastructure (GI) evaluation and an analytical framework of Strategy-as-Practice, this research examines the enactment of formal evaluative practices in six English masterplanned sites. Based on 48 interviews and document analysis, thirteen evaluative episodes are presented, reviewing how different actors structure, enact and respond to evaluative practices. The findings reveal dynamic relationships between evaluation, design, construction and in-use practices. In most of the episodes (11 of 13) GI intentions are compromised in the transition from design to construction. Four drivers of evaluative embeddedness are identified that affect these relationships: external drivers, responsibility, negotiation and reflexivity. The research considers the potential implications for GI evaluation and BC, including the need to address dominant evaluative practices, such as cost appraisal, to build non-specialist knowledge of GI and to assign evaluative responsibility throughout the masterplan journey.

Keywords*:* *masterplan, evaluation, strategy as practice, green infrastructure*

Publication declaration

The following papers were produced during this PhD:

1. Callway, R., Dixon, T. and Nikolic, D. (2016) *BREEAM communities: challenges for sustainable neighbourhood evaluation*. In: RICS COBRA 2016 The Construction, Building and Real Estate Research Conference of the Royal Institution of Chartered Surveyors, 20-22 September 2016, Toronto, Canada

2. Callway, R., Dixon, T. and Nikolic, D. (2017) *Embedded evaluation? Examining green infrastructure evaluation in neighbourhood masterplan journey*. In: ARCOM 2017, 4-6 Sep 2017, Cambridge, UK.

Acknowledgements

This research is the result of a growing personal and professional interest in how cities and their neighbourhoods can be planned and designed to support the long term needs of humanity in harmony with the natural environment, of which we are but a part.

The research was kindly sponsored by the Engineering and Physical Sciences Research Council and Building Research Establishment as a CASE Industry Studentship. This thesis would not have been possible without the considerable support of my two internal supervisors, Prof. Tim Dixon and Dr. Dragana Nikolic, from the School of Built Environment at the University of Reading, BRE industry supervisor, Helen Pineo, as well as the inspirational tutorial provided by Prof. Libby Schweber. Thanks is also due to the two internal assessors for their constructive questions and encouragement, Prof. John Connaughton and Dr. Michael Peters, as well as to the external examiner, Prof. John Henneberry. I am indebted to all the interviewees who kindly gave me their time and provided rich insights into the fascinating world of neighbourhood masterplans. Considerable thanks go to the administrative team at the School, particularly to Katy Saxelby-Smith who was always positive, encouraging and answered numerous practical queries along the way. The University Graduate School were also a great source of support and training. Special thanks must go to my brother, Thomas Gardiner, for kindly undertaking to proof read the thesis. Personal thanks to my family and friends who have kept me going, especially Tomas, Lily, Theo, Jane, Eric, Barbara, Cathi, Ellie, Neil, Alex, Lydia, Daniel, Bob, Sara, Anders, Eva, Sue, Dilek, Beibei, Hua, Nurulaini, Pippa, Fi, Helen, Tim, Rachel, Jon, Ali, Richard, Annie, Sophie, Paula, Steve, Joss, Jo, Dorrie and my canine friends, Lani, Luna and Bijou.

Declaration

I confirm that this is my own work and the use of all material from other sources has been properly and fully acknowledged.

Rosalie Callway

February 2018

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Abbreviations and Glossary

BC	BREEAM Communities
BRE	Building Research Establishment
BREEAM	BRE Environmental Assessment Method
CLT	Community Land Trust
CPO	Compulsory Purchase Order
DAS	Design and Access Statement
EA	Environment Agency
EIA	Environmental Impact Assessment
EqIA	Equality Impact Assessment
GI	Green Infrastructure
GLA	Greater London Authority
HCA	Homes and Communities Agency
LEP	Local Economic Partnership
LNR	Local Nature Reserve
LPA	Local Planning Authority
LVIA	Landscape Visual Impact Assessment
MoD	Ministry of Defence
NHBC	National House Building Council

NMA	Non Material Amendment
NPPF	National Planning Policy Framework
OPL	One Planet Living
POE	Post Occupancy Evaluation
PPS	Policy Planning Statement
SAC	Special Area of Conservation
SANGS	Suitable Alternative Natural Green Space
SaP	Strategy as Practice
SEA	Strategic Environmental Assessment
SHMA	Strategic Housing Market Assessment
SIA	Social Impact Assessment
SINC	Site of Importance to Nature Conservation
SLAA	Strategic Land Availability Assessment
SPD	Supplementary Planning Document
SRoI	Social Return on Investment
SSSI	Site of Special Scientific Interest
SuDS	Sustainable Drainage Systems

"Life is easy to chronicle, but bewildering to practise."

E. M. Forster, *A Room with a View* (1908)

Chapter 1: Introduction

1.1 Background context

There has been a steady global growth in the proportion of people living and working in an urban context (Seto et al., 2013). Even in the UK, there is growing pressure to build more new and affordable homes, as the population of the country continues to increase (Akotia and Sackey, 2017; BSRIA, 2016). New neighbourhoods, towns and even cities are being planned and built which must address local, national and global threats from climate change (such as flooding, storms and overheating), ecological decline, poor air quality, growing social inequality, political and financial volatility (Steffen, et al., 2015; Turner, 2014; Fainstein, 2014; Hall and Day, 2009; Satterthwaite, 2008; Godschalk, 2003; Madden, 2000). Housing, and its construction, is also known to be a significant contributor towards greenhouse gas emissions and requires significant consumption of natural resources in its production, including the use of land (Rauland and Newman, 2015; Jones, 2013). Existing and new communities need to address present and future challenges of urban living, creating places that are resilient, equitable, economically viable, ecologically sensitive and 'good' to live in.

1.2 The challenge of sustainable neighbourhoods

A growing number of built environment standards have been produced to try and promote more sustainable neighbourhoods, to address urban challenges whilst promoting good quality of life now and in the future. These standards aim to establish a common evaluative framework for sustainable design in neighbourhood masterplans (Joss, 2013). The Building Research Establishment Environment Assessment Method (BREEAM) for Communities is a UK

standard which is one of a number that have emerged globally that focus on promoting sustainable development at the neighbourhood scale (BRE, 2011), such as LEED Neighbourhood Development from the USA and the Green Star Communities from Australia. Various researchers have contrasted the content of these standards (e.g. Joss et al, 2015; Sullivan et al., 2014; Sharifi and Murayama, 2014). The main criticism of these standards stems from their primary focus on the technical content and less about how and why particular issues have been identified, how they are evaluated and whether the standards actually play an role in affecting decisions and material outcomes in the masterplanned neighbourhoods (Schweber and Haroglu, 2014; Pettigrew, 2012). This thesis addresses the question of how standards are applied in practice, looking at six English masterplanned sites. The research presented in the thesis examines an assumption that is common to all the sustainable neighbourhood standards, that encouraging the evaluation of certain sustainability issues will result in the rational reflection and incorporation of those issues within decision making and material outcomes (BRE, 2014; DiMaggio and Powell, 1983). Evaluation in this context is also described as an 'embedded' part of urban design practice, where the practice of evaluation can establish, trace and refine design intentions (HCA, 2014; Preiser and Schramm, 2005; van der Voordt and van Wegen, 2005; Schön, 1983). There has been limited research into what this concept of 'embedded evaluation' means and how it functions empirically, considering whether and how evaluation influences, not only how neighbourhoods are designed, but also constructed and used. The research therefore addresses an important gap in our knowledge and understanding of evaluation and masterplan processes.

1.3 Aim and objectives

The study aims to empirically examine the concepts of embedded evaluation and sustainable neighbourhoods. It does this by focusing on the UK sustainable neighbourhood standard BREEAM Communities (BC) and looking at how one issue or evaluative intention in the BC standard, 'SE 11 - Green Infrastructure' is evaluated within six masterplanned neighbourhoods case studies, located in England. The overall aim of the study is to address a central research question:

> *To what extent does BREEAM Communities promote an 'embedded' approach to green infrastructure evaluation?*

The objectives of the study are to:

(i) **understand *what* evaluative practice is:** examining empirically how evaluative practices are defined, enacted and responded to;

(ii) **examine the concept of 'embedded evaluation':** studying how GI evaluation is reflected in masterplan visioning, design, construction and in-use/operational decisions, contrasting sites with and without BC certification; and

(iii) **clarify practical and conceptual implications**: considering the potential wider implications of the empirical findings for BC, GI evaluation and masterplan practice, particularly in terms of the future development and implementation of the standard.

1.4 Methodological approach

'Strategy as Practice'(SaP) is adopted as a conceptual framework to help shape a chronological mapping of the enactment or 'praxis' of masterplan evaluation, design, construction and in-use practices by various practitioners at different stages of the neighbourhood masterplan (Whittington, 2006). A combination of interviews and planning-related public documents are analysed, supplemented by site visits and opportunistic observations, to understand how Green Infrastructure (GI) evaluative praxis was perceived, applied and responded to by the different practitioners involved in the process. The interview data was then analysed to identify the drivers that are perceived to affect the 'embeddedness' or degree to which evaluative praxis influence design and construction decisions.

1.5 Structure

Chapter 2 starts with a critical examination of peer-reviewed and grey literature regarding neighbourhood design value, evaluation and the use of standards, to clarify the gaps in knowledge and research need. **Chapter 3** outlines the conceptual approach and methods that have been applied to address the question of embedded evaluation, and clarify why that approach was adopted. A set of empirical evaluative 'episodes' are then presented in **Chapter 4**, selected from six English masterplanned sites.

Chapter 4 provides a brief background for each case study site, before analysing evaluative episodes that took place on each site. The SaP framework is applied to map out the sequence of events and practitioners involved in each episode. This is followed by a matrix analysis, combining SaP with thematic drivers to consider how different practitioners structure, enact

and respond to evaluative practices. The common and distinct findings from the case studies are drawn together in a cross-case analysis in **Chapter 5**, highlighting three different types of evaluative transition - static, regressive and progressive - in the journey from masterplan design to end-use. **Chapter 6** discusses the wider relevance of the empirical findings, contrasting these with wider literature regarding GI, standards and SaP. The chapter identifies the apparent barriers to embedding evaluative practice in masterplans, and makes recommendations for enhancing the embeddedness of GI evaluation and the application of BC. **Chapter 7** concludes the thesis, outlining the implications and contribution of the study, reflecting on the potential limitations of the research, and identifying future research needs.

Chapter 2: Evaluating the quality of neighbourhood design: A critical review of BREEAM Communities

2.1 Background

This chapter is concerned with the concept of 'embedded evaluation' which assumes that evaluative practices are used to positively shape, inform and refine urban design practices (Flyvbjerg, 2016; HCA, 2014; Preiser and Schramm, 2005; van der Voordt and van Wegen, 2005; Schön, 1983). The chapter examines literature relating to concepts of urban design quality, sustainable development, neighbourhoods, and masterplan evaluation, including standards, to understand *what* it is that is being evaluated and *how* 'embedded evaluation' is thought contribute to improving the quality of new neighbourhoods.

The chapter critically reviews two broad strands of literature regarding questions of neighbourhood quality: the literature relating to 'sustainable development', which the Building Research Establishment (BRE) has set as its main objective for BREEAM Communities (BC) in promoting neighbourhood quality; and, specific to the masterplan process, the literature on 'urban design' which approaches the question of quality from a more practitioner-driven angle. The chapter considers the cross-over between these two strands of literature, to clarify the concept of 'sustainable urban design' (Figure 2-1).

The review contrasts the literature regarding 'sustainable urban design' with how the UK BREEAM Communities (BC) defines it, to see how closely they parallel one another. This is further contrasted with how the US standard, LEED Neighbourhood Design defines a

sustainable neighbourhood, to consider whether two similar neighbourhood standards offer very distinct or similar definitions of neighbourhood quality.

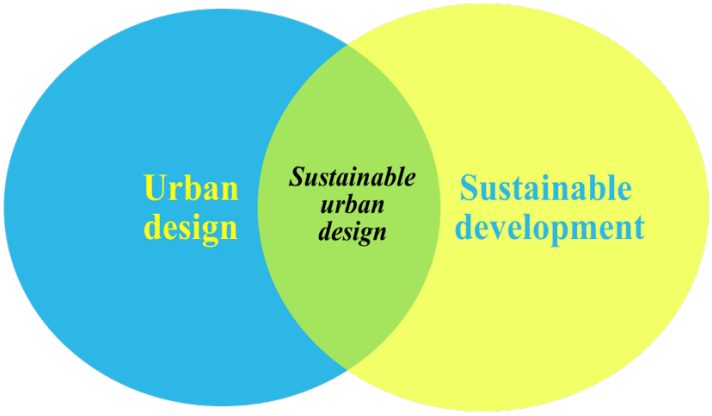


Figure 2-1 Sustainable urban design: The nexus between urban design and sustainable development literature

The chapter then moves on to consider the evaluative practices that are thought to be undertaken in masterplan processes and how they contrast with what is included in BC. The review concludes by outlining the implications of current definitions of urban quality and evaluative practice for BC, as a standardised evaluative framework that seeks to parallel and influence masterplan evaluative practices.

2.2 Definitions of sustainable urban design

2.2.1 Sustainable development

BC was first produced in 2008 and it set '**sustainable development'** as the principle intention. Sustainable development has been variously defined. The most oft-quoted definition arises from originators of the concept, the (Brundtland Commission, 1987), who describe sustainable development in an anthropocentric way, referring to managing natural resources to *meet the*

needs of present and future generations of humanity. Others, like BRE, refer to sustainable development as a process of human development that seeks to 'holistically' balance three interdependent dimensions of development: *environment*, *society* and *economy* (Yigitcanlar et al., 2015; Heeres et al., 2015; Ayre and Callway, 2005; Batty, 2001; Bordass, 2000). The Egan Report on 'Skills for Sustainable Communities' (2004), thought to have inspired the creation of BC, combined both the intergenerational Brundtland definition and the three dimensions to define a 'sustainable community'[1]. A common intention of these different sustainable development advocates is the urgent need to address the imbalanced or unsustainable approach of past and current modes of development that prioritises economic growth but inadequately accounts for social and environmental intentions and boundaries (Raworth, 2017; Jackson, 2011; Pearce et al., 1989). This attempt to re-balance development priorities, gained some international political traction under the 1992 United Nations Agenda 21 Earth Summit agreement, and more recently at the 2012 United Nations Sustainable Development goals Figure 2-2).

It is increasingly common to read about a fourth *technical* dimension of sustainability, referring to specific technical intentions that can vary between different sectors. In relation to urban design, technical sustainability is described as relating to the quality of urban morphology, form and function, such as the technical need for infrastructural integration (Williams, 2014b; Oltean-Dumbrava et al., 2013; Engel-Yan et al., 2005; van der Voordt and van Wegen, 2005).

[1] "***Sustainable communities*** *meet the diverse needs of existing and future residents, their children and other users, contribute to a high quality of life and provide opportunity and choice. They achieve this in ways that make effective use of natural resources, enhance the environment, promote social cohesion and inclusion and strengthen economic prosperity*." (Egan review, 2004, p7)

Two further 'meta-dimensions' are also referred to in relation to sustainable development, that of *governance* and *time,* which shape and constrain the other dimensions (George and Reed, 2015; Griggs et al., 2013; Rydin, Y., 2007; Ayre and Callway, 2005; Hardin, 1968).

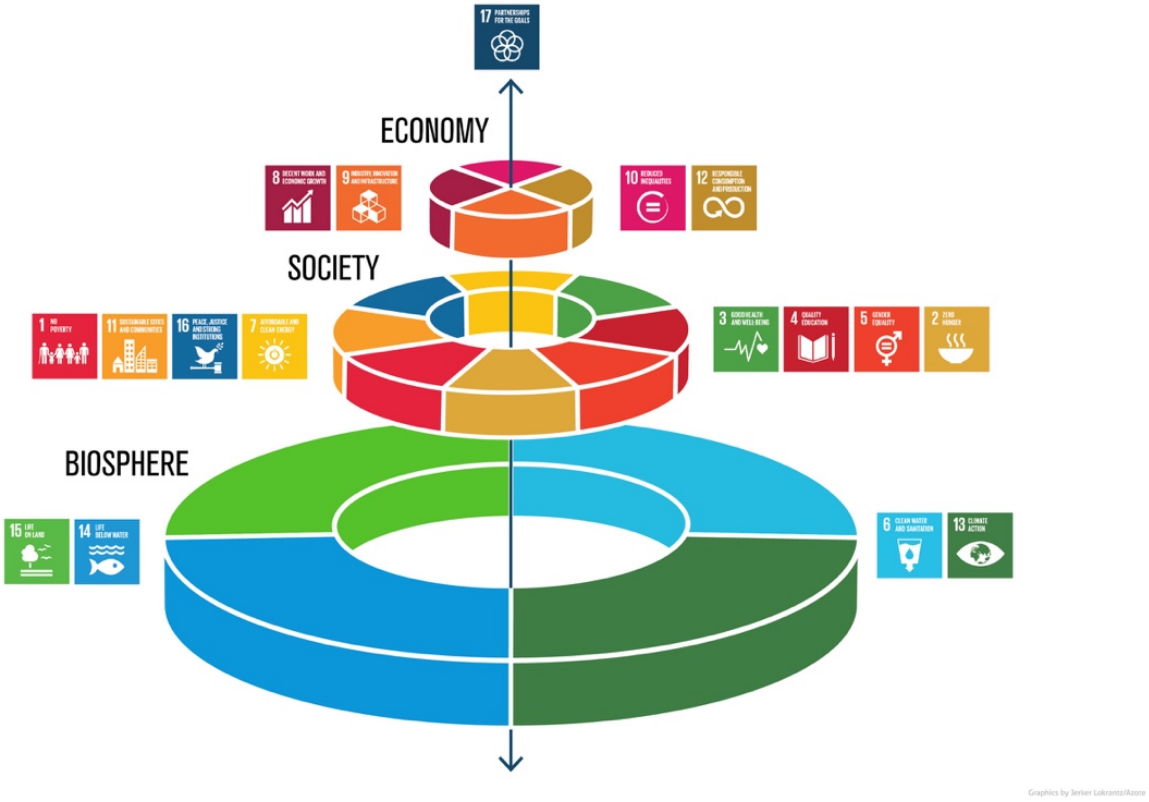


Figure 2-2 The UN Sustainable Development Goals[2]

(Source: Azote Images for (Stockholm Resilience Centre, 2016)

[2] UN Sustainable Development goals: 1. End poverty in all its forms everywhere; 2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture; 3. Ensure healthy lives and promote well-being for all at all ages; 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all; 5. Achieve gender equality and empower all women and girls; 6. Ensure availability and sustainable management of water and sanitation for all; 7 Ensure access to affordable, reliable, sustainable and modern energy for all; 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all; 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation; 10. Reduce inequality within and among countries; 11. Make cities and human settlements inclusive, safe, resilient and sustainable; 12. Ensure sustainable consumption and production patterns; 13. Take urgent action to combat climate change and its impacts; 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development; 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss; 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels; 17. Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development (UNGA, 2015)

Just how such a balance can be *practically* achieved between these contested dimensions of sustainability has been the subject of decades of academic and political debate however (Oltean-Dumbrava et al., 2013; Davidson and Venning, 2011; Batty, 2001).

2.2.2 Urban Design

'**Urban design'**, as a field of study and practice appears to have emerged in the early 20th century although it is likely to predate that in practice, if not in name (Boelens and Boelens, 2009). Urban design is thought to draw not only from architecture but also landscape architecture, planning, law, engineering, sociology, psychology and other disciplines (Carmona, 2014; Carmona et al 2010). Like sustainable development, the concepts of urban design and 'urbanism' have been subjected to a varied discourse regarding how they are defined and applied (Campbell, 2011; Alexander, 1988; Marshall, 2012; Punter, 2010; Worthington and Bouwman, 2012)

Urban designers are often described as tasking themselves with something analogous to the utopian quest, seeking, through design, to stimulate the more positive aspects of urban living whilst ameliorating more negative elements (Mehta, 2014; Carmona 2014; Hollis, 2013; Alexander, 1988; Jacobs, 1961; Lynch, 1981). Urbanist and sustainability narratives do appear to have become more aligned in recent years (Batty, 2001). This includes inter-governmental calls for towns and cities to confront global challenges such as climate change and social inequality, including a specific Sustainable Development Goal 11 for sustainable cities (UN GA, 2012).

2.2.3 Sustainable Urban Design

As with sustainable development and urban design, the concept of '**sustainable urban design'** varies depending on who is defining it (Berardi, 2012; Boyko et al., 2006; Sullivan et al 2014). Some argue that 'good' urban design principles and practice are distinct in that they emphasize the importance of 'bottom-up', contextually-based, intentions whilst rigid sustainability values emerge from more technocratic top-down processes (Joss, 2013; Carmona, 2001; Norberg-Schulz, 1976). Urban designers do apply more technocratic generic principles however when evaluating and designing places. This includes applying concepts such as 'transparency', 'legibility', 'character', 'enclosure', and 'permeability' to describe the design quality of a place (Ewing and Clemente, 2013; Lynch, 1981; Alexander, 1988; Norberg-Schulz, 1976). Sustainability proponents also advocate bottom-up ideologies, such as principles of 'subsidiarity', 'intra' and 'intergenerational equity' and 'participation' (UN SD, 1992). The systemic semantics of 'place-making' and 'place-shaping' (Carmona, 2014; Alexander, 1988) certainly appear to parallel the 'holistic' view of sustainability, both seeking a dynamic balance of multiple intentions and meanings within complex and interconnected urban systems (Duany and Plater-Zyberk, 1994). Both fields of sustainability and urban design have been critiqued for lacking practicable tools to realise their utopian objectives (Marshall, 2012; Batty, 2001). BC is one of a burgeoning group of standards and tools that have been produced to try and respond to that criticism (Joss, 2013).

2.3 BREEAM Communities and 'sustainable neighbourhood design'

This section contrasts how *sustainable neighbourhood design* is described in literature and in BC. After a brief background to the history of the BC standard, there is an analysis regarding

whether BC addresses core urban design concepts and principles that are described in literature to be of benefit to distinct sustainability intentions. Various issues are outlined which BC could reflect in future iterations of the standard as a response to the analysis.

2.3.1 Background to BREEAM Communities

BC is a UK-based independently assessed and third-party verified certification standard that evaluates large (neighbourhood-scale) developments, combining a mix of uses from residential to light industrial uses. BC was created by the Building Research Establishment (BRE), a formerly public institution that has become a charitable trust and not-for-profit consultancy. BC was formulated by BRE in response to a UK government review, the Egan Review of Skills for Sustainable Communities, which called for the standardised evaluation of sustainable communities (Egan, 2004). Shortly after the Egan report, an independent task force produced '*Towards a Strong Urban Renaissance*' (UK Urban Task Force, 2005), a report which identified a number of problems with UK urban regeneration and development projects. The study found that most new UK developments were "*poorly designed, with public realm and buildings of a very low quality*" (Urban Task Force, 2005, p5). This failure of quality, the taskforce argued, was the result of four factors: A lack of clear vision at the early design stages; the fragmentation and lack of integration in procurement and delivery; the failure of public institutions to consider design quality; and a lack of core skills in the public sector.

It was in this political backdrop that the first technical manual for BC was created in 2008, at a similar time to a growing number of neighbourhood-scale standards globally, including the US LEED Neighbourhood Development, Japanese CASBEE for Urban Development, German DGNB Urban Districts and Australian Green Star Communities (see Table 2-1).

Table 2-1 Comparative summary of five sustainable neighbourhood standards

Standard	BREEAM Communities	LEED® Neighborhood Design	CASBEE for Urban Development	DGNB Urban Districts	Green Star Communities
Institution	Build Research Establishment (BRE)	US Green Building Council	Institute for Building Environment and Energy Conservation	DGNB	Green Building Council Australia
Country of origin	UK	USA	Japan	Germany	Australia
First and most recent version	2008 and 2012	2009 and 2014	2006 and 2014	2012 and 2014	2012 and 2016
Stage of evaluation	Planning and design phase (outline and detailed)	Planning, design and completion phases	Planning, design and completion phases	Planning and design phase (outline and detailed)	Planning, design and completion phases (5yr)
Scale of focus	Neighbourhood and district scale	Neighbourhood and district	Neighbourhood, district and city	Neighbourhood and district	Neighbourhood 'large-scale development'
Core themes	• Governance • Socio-economic wellbeing • Resources and energy • Land use and ecology • Transport and movement • Innovation	• Smart location and linkage • Neighbourhood Pattern and Design • Green infrastructure and buildings • Innovation • Regional priority	• Site quality: • Environment ($Q_{UD}1$) • Society ($Q_{UD}2$) • Economy ($Q_{UD}3$) • CO^2 emissions from development	• Environment quality • Economic quality • Socio-cultural and functional quality • Technical quality • Process quality	• Governance • Livability • Economic prosperity • Environment • Innovation
No. of issues	41	56	42 (+CO^2 emissions)	30	31
Issues weighting	Differentiated weighting	Differentiated weighting	Equal weighting	Differential weighting	Equal weighting
Performance rating scale	Outstanding = 85% Excellent = 70-84% Very good = 55-69% Good = 40-54% Pass = 25-39%	Platinum = 80% Gold = 60-79% Silver = 50-59% Certified = 40-49%	Excellent = 60% Very Good = 30-59% Good = 20-29% Fairly poor = 10-19% Poor >10%	Platinum = 80% Gold = 65-79% Silver = 50-64%% Bronze = 35-49%	6 Star =75+ points 5 Star = 60-74 4 Star = 45-59 3 Star = 30-44 2 Star = 20-29 1 Star = 10-19

These standards all aim to promote their definition of sustainable urban development and seek to address, at a local scale, various threats facing an increasingly urbanised society, including climate change, natural resource insecurity, social inequality and economic volatility (Joss et al 2015, Yigitcanlar et al., 2015; Seto et al., 2013; Griggs et al., 2013; Hall and Day, 2009). Although there are some differences in the themes and specific issues that each standard seeks to evaluate, they also share many common features, including ranking neighbourhood developments on a multi-criteria semi-quantitative performance scale.

2.3.2 BREEAM Communities and definitions of neighbourhood and community

There are varying accounts in literature about the terms 'community' or 'neighbourhood' and how they are understood in terms of the boundaries, characteristics, scale and social meanings that they can hold and how best to organise them (Raco, 2007; Falk and Carley, 2012; Carmona et al., 2010; Miers and Fisher, 2002; Donovan, 2013; Latham et al., 2009; Norberg-Schulz, 1976). An earlier UK Urban Task Force (Power and Burdett, 1999), commissioned at the time by the Labour government to examine how to revitalise UK towns and cities and enhance urban development, was quite specific in their definition of an 'ideal' neighbourhood. They described a neighbourhood boundary of around 600m from a person's home, containing sufficient land for a park, a small green, community centre, local shops, primary school, pub, and post office. This fairly prescriptive account has parallels with Christopher Alexander's concept of an 'identifiable neighbourhood' (Price, 1999; Alexander et al., 1977)), and is similar to the approach adopted by the US LEED ND standard (see Figure 2-3).

Some studies, such as Dempsey el al. (2010) and Falk and Carley (2012), suggest that neighbourhoods require a certain minimum level of density, in terms of numbers of residential units, in order for facilities and services (e.g. bus services, NHS practices) to have sufficient numbers of users to be viable[3], and to avoid the negative impacts of urban sprawl in terms of increased car use, air pollution, reduced walking and negative health impacts (Arbury, 2005; Jacobs, 1961; Frumkin et al, 2004; Sherman, 2000; Anderson, 2015; Boyko et al., 2006; Cooper and Boyko, 2009). Conversely, other studies describe the consequences of social and spatial overcrowding in neighbourhoods having detrimental impacts to individual wellbeing and social

[3] Dempsey et al (2010) suggests a minimum of 2,000 residences for a neighbourhood, whilst Falk and Carley (2012) propose a neighbourhood requires a minimum of 500 to 1000 units (p.12)

cohesion (Boyko and Cooper, 2011; Baum and Davis, 1980; Baum and Koman, 1976). This suggests planners and urban designers need to seek some form of happy medium in terms of seeking a kind of optimum population density at a neighbourhood-scale (Hofstad, 2012; Arbury, 2005; Sherlock, 1991; Burton et al, 2003).

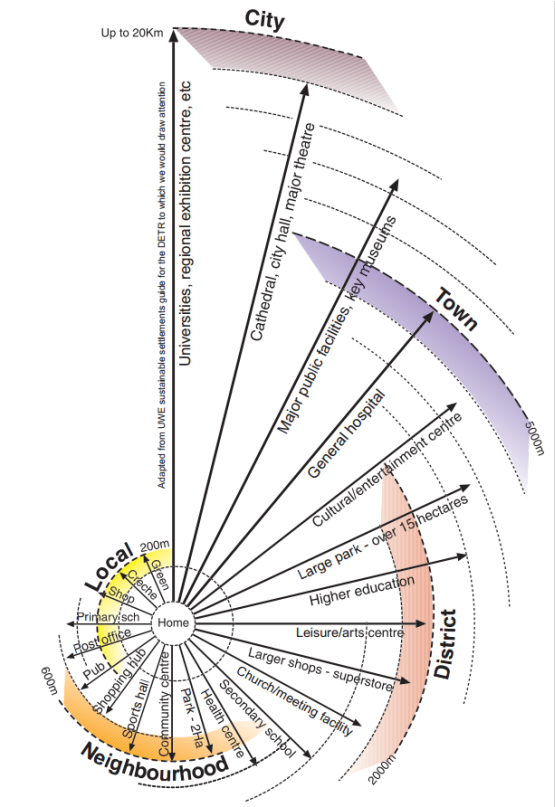


Figure 2-3 City scales (Urban Task Force, 1999)

The notion that there is a simple definition of ideal neighbourhood characteristics, with an optimum size, density and identity that can be clearly demarcated and promoted has also been critiqued however. Larice and MacDonald, (2012) comment that just as it is argued that buildings should not be evaluated in isolation to their wider context, neighbourhoods should not be planned or viewed as islands within cities. Alexander (1961) and Lynch (1981) also warn against organising cities as a series of zoned neighbourhoods, at the risk of supporting social segregation, disconnection and a restrictive separation of functions within a city.

Similarly, the idea that there is such a thing as a single 'community' entity that represents a certain group or groups of people has been challenged (Jenkins and Forsyth, 2009). A standardised definition of 'community' risks excluding those people or groups who do not fit into the formalised notion (Latham et al., 2009; Imrie and Raco, 2003). Hollis (2013) argues that the idea of a community identity could still be valuable however, in terms of understanding the relationship between people and the built environment. At the heart of the debate about the concepts of 'neighbourhood' and 'community' appears to be the intention to clarify how the design of urban form contributes to supporting (or undermining) a sense of both personal (individual) and communal (group) identity and belonging (Miers and Fisher, 2002; Donovan, 2013; Carmona et al., 2010, p.118).

In terms of BC, BRE appears to have taken on board the ambivalence in urban design field about fixed definitions of neighbourhood and community. The technical manual does not provide a textual definition of either term, nor does it define a certain scale of development or level of density that should be applied. In terms of the scale of development that can apply for BC certification, it simply refers to '*large-scale developments'* (BRE, 2011, p.vii)[4]. The manual also avoids prescribing the kinds of services and facilities a 'sustainable community' should provide but instead invites a consultative process to clarify local priorities (in BC issue **SE 02 – Demographic needs and priorities**). Regarding the 'community' actors that might be consulted in the process of defining priorities, the manual does list examples of the types of groups that could be engaged[5] but again avoids being overly prescriptive, indicating:

[4] Although in practice BRE does appear to adopt an informal threshold. During a BC training workshop (December 2014) the BRE trainer said as 'a rule of thumb' they included sites over 100 units.

[5] BC 'local community': Actual/intended occupants (if known); If the site is near one or more existing communities, representative consultation groups from the existing communities; If the site is a new development

"*This is not an exhaustive list and other appropriate stakeholders and members of community may also need to be considered for consultation*" (BRE, 2011, p.22).

In this way, the standard adopts a pragmatic stance and avoids getting too bogged down in prescribing the more challenging aspects of defining an ideal community or neighbourhood that have been debated elsewhere.

2.3.3 BREEAM Communities and definitions of Sustainable Urban Design

Where BC is prescriptive is in detailing specific evaluative requirements regarding the 41 issues that essentially outlines BRE's definition of a how to design a sustainable neighbourhood. The UK Review of Skills for Sustainable Communities (Egan, 2004) prescribed seven broad intentions that define how to promote a better quality 'sustainable community'. BRE adapted these themes to produce a standardized technical manual to evaluate the sustainability of neighbourhood masterplan design (Figure 2-4).

and there are no existing community representatives, representatives are sought from surrounding communities or from a similar type/size of development; Potential users of any on-site or shared facilities (e.g. operators of clubs and community groups); Representatives from the local authority; Local or national historic/heritage, ecology, cultural, residents, business groups, etc. (beyond any statutory requirements); Specialist service and maintenance contractors.

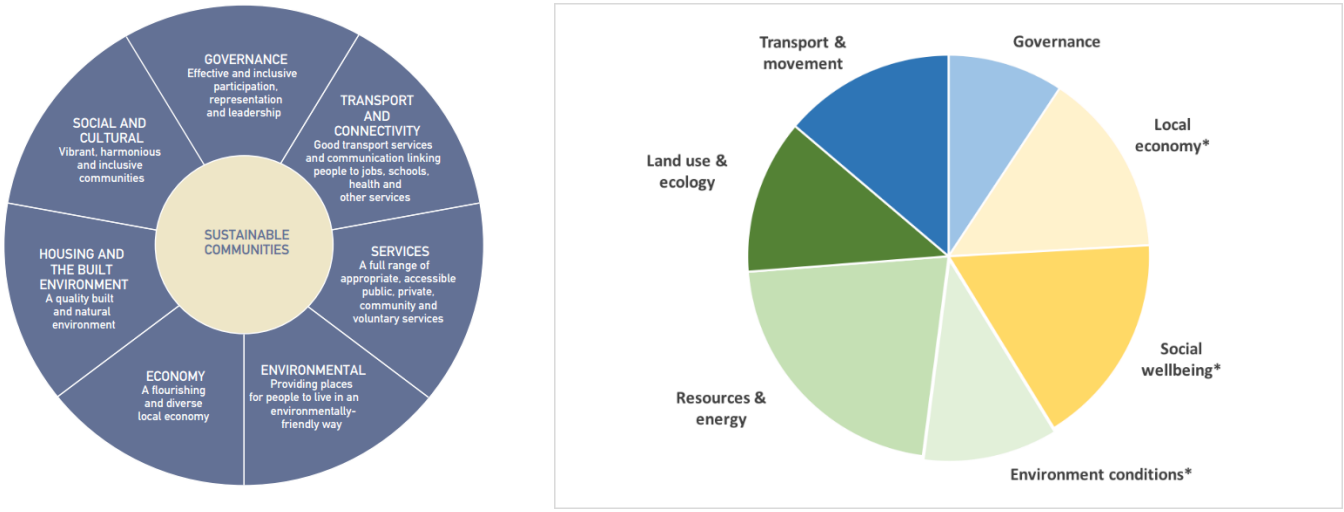


Figure 2-4 Sustainable community themes (Egan Review, 2004) (left), BREEAM Communities themes (BRE, 2011) (right) **these themes are part of a broad Social and Economic wellbeing category*

Within the seven themes, BRE specifies 41 separate 'issues' or sustainability intentions with which to evaluate the sustainability intentions in the design phase of a masterplan. The issues are divided into three 'steps' which seek to align with three design stages contained in a masterplan process: Step 1: Outline; Step 2: Layout; and Step 3: Details (see Table 2-2).

Table 2-2 BREEAM Communities evaluative steps and issues

Steps	Issues*	
1. **Establishing the principles** The priorities and constraints for maximising sustainability. All these issues are mandatory before Steps 2 and 3 can be completed.	GO 01 - Consultation plan SE 01 - Economic impact SE 02 - Demographic needs and priorities SE 03 - Flood risk assessment SE 04 - Noise pollution RE 01 - Energy strategy	RE 02 - Existing buildings and infrastructure RE 03 - Water strategy LE 01 - Ecology strategy LE 02 - Land use TM 01 - Transport assessment
2. Determining the layout Spatial arrangements of masterplan. These issues are all optional (except Consultation GO 02)	GO 02 - Consultation and engagement GO 03 - Design review SE 05 - Housing provision SE 06 - Delivery of services, facilities and amenities SE 07 - Public Realm SE 08 - Microclimate SE 09 - Utilities SE 10 - Adapting to climate change SE 11 - Green infrastructure	SE 12 - Local parking SE 13 - Flood risk management RE 04 - Sustainable buildings LE 03 - Water pollution LE 04 - Enhance ecological value LE 05 - Landscape TM 02 - Safe and appealing streets TM 03 - Cycling network TM 04 - Access to public transport
3. Designing the detail More detailed requirements, refining masterplan design. These issues are all optional.	GO 04 - Community management of facilities SE 14 - Local vernacular SE 15 - Inclusive design SE 16 - Light pollution SE 17 - Training and skills RE 05 - Low impact materials	RE 06 - Resource efficiency RE 07 - Transport carbon emissions LE 06 - Rainwater harvesting TM 05 - Cycling facilities TM 06 - Public transport facilities

**plus a separate 'Innovation' issue which can apply at any stage*

These three steps do appear to parallel how masterplans are broadly outlined elsewhere, where a masterplan is described as a strategic process with three core elements: the vision, plans and programme for delivering a development project (Al Waer, 2013; Bell, 2005; Cowen, 2002). Others describe masterplans in more detail, outlining how a masterplanned development occurs over several stages, with variation in when and how these stages occur (if at all) for different projects (RIBA, 2013; Boyko et al., 2006; Preiser and Schramm, 2005; Marmot et al., 2005), see Figure 2-5. None of these sources tell us whether BC presents an evaluative framework that parallels how a masterplan is evaluated in practice, nor do they indicate whether focusing on the design phase of a masterplan is sufficient to influence change during construction and once a site is in-use.

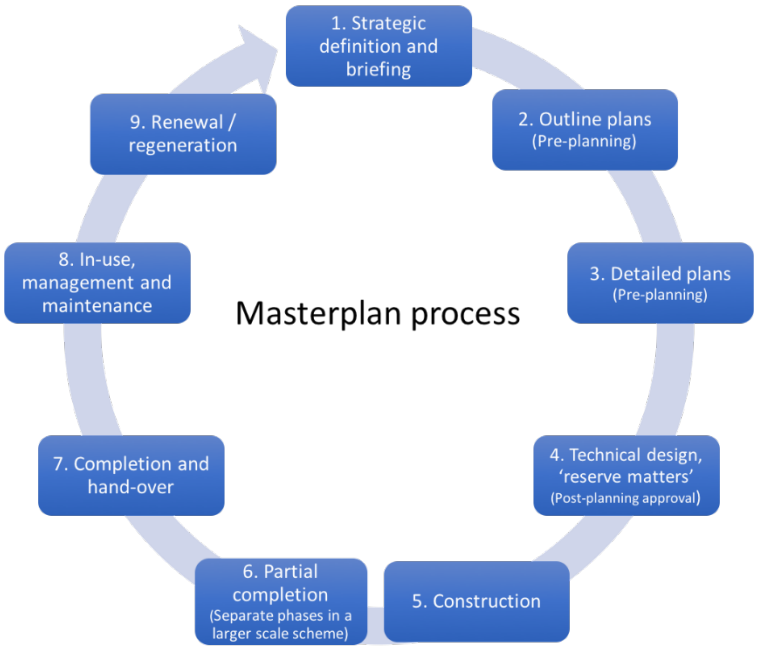


Figure 2-5 Masterplan stages

BC requires the gathering of quantitative and qualitative evidence to demonstrate compliance with each evaluative issue, which is subsequently scored against specified evaluative criteria. For example, the BC issue 'SE 11 - Green Infrastructure' is classified in the step 2 stage, and is defined with the social intention of ensuring "*access to high quality space in the natural*

environment and/or urban green infrastructure for all". Credits can be obtained if the applicant can evidence they meet various 'assessment criteria' that, according to BRE, will promote the central aim.

For Green Infrastructure (GI), consultative processes play a strong role in BRE's criteria[6]. The scoring of credits is further clarified in detailed 'compliance notes' which a BC assessor uses to evaluate conformity with the evaluation criteria. For example, for 2 credit points BRE specify a maximum 'walking distance' to a green space to be ≤650m in an urban development OR ≤1300m in a rural development. The total credit score for each issue is weighted to account for the significance of each issue' in contributing to the three pillars of 'sustainable development' (environment, society and economy), according to BRE, and the weighting also supports 'normalisation' of the scores onto a common scale. All individual issue scores are aggregated to give an overall 'sustainability' performance rating for each masterplan proposal, from pass to outstanding (Figure 2-6)

This process of normalisation has been critiqued regarding the degree to which different issues are substitutable or tradable with each other (Garmendia and Gamboa, 2012; Munda and Nardo, 2005) and this is discussed further in 2.4.2.2.

[6] SE 11 GI is scored as follows:

- *1 credit* = undertake stakeholder and community consultation, and create a green infrastructure plan
- *2 credits* (if 1 credit is achieved first) = a green space is within walking distance via a safe and accessible pedestrian route and clear arrangements made for its *long-term maintenance*.
- *3 credits* (if 1 and 2 are achieved) = the design and use are as specified in response to the consultation and the Accessible Natural Greenspace Standard is applied in urban areas.
- *4 credits* (if all other credits achieved) = the quantity and location of green space is agreed through a consultation process

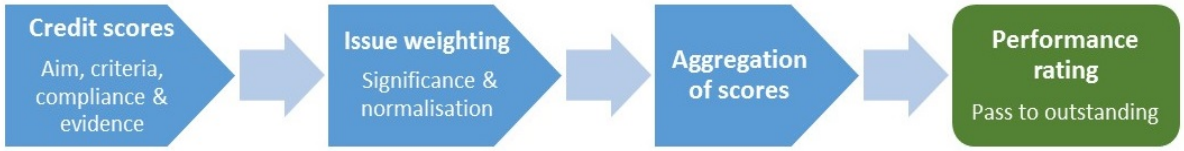


Figure 2-6 BREEAM Communities integrated evaluation process

A textual analysis has been applied to BC to consider the degree to which the standard refers to particular urban design attributes that have been reported to be of benefit to different sustainability intentions. Certain urban design approaches or attributes have been attributed as contributing to a range of sustainability intentions. For example, the social intention of neighbourhood safety has been related to sites designed with 'greater natural surveillance' with design features, such as putting front doors at street level, and keeping building heights low to mid-rise so they are at a more 'human scale' (Boyko and Cooper, 2011; Gehl, 2010). Similarly, investment in good quality soft landscaping, has been attributed as adding to real estate value of properties, helping increase footfall, reduce crime and improve wellbeing, amongst a number of other environmental, social and economic benefits (Mell et al., 2016; Princes Foundation for the Built Environment, 2007; Ewing et al., 2014; RICS/CBRE, 2014; Landscape Institute, 2014; Scottish Executive, 2006; Carmona et al., 2001). The textual analysis adopts these reported associations and compares them with how BC defines the first twelve mandatory issues (Step 1) contained in the standard. The analysis only includes the mandatory issues, since they are issues that must be completed by all applicants, unlike the issues included in Steps 2 and 3 of the standard which are optional. The non-mandatory issues in Steps 2 and 3 were then later reviewed, if any gaps regarding different urban design attributes were identified in the twelve mandatory issues, to see if BC addresses the potential gaps elsewhere.

The text analysis involved applying a single point score to a BC issue if there is a direct reference to urban design attributes that are associated to specific sustainability intentions from

the literature (see Appendix 1, Table 1.1 for a summary of the references). A half point was applied for indirect references, i.e. where a sustainability intention has been connected to another issue with a relevant attribute (see Appendix 1, Table 1.2 for scoring details).

Based on this analytical approach, the mandatory issues in BC indicate a higher proportion of references to urban design attributes that are associated with enabling environmental intentions, closely followed by references to attributes associated with economic intentions. There is a lower proportion of references in BC to technically-associated (form and function) attributes and design attributes associated to social intentions. Two BC issues stand out in the analysis for covering a wide range of references to sustainable urban design attributes: **GO 01 – The consultation plan**; and **SE 02 - Demographic needs and assessment**. Both BC issues require applicants to conduct a broad contextual assessment. Perhaps unsurprisingly, more thematically discrete issues, (e.g. **GO 02 - Consultation and engagement**, **RE 01 - Energy strategy**, **SE 04 - Noise pollution**, **SE 03 - Flood risk assessment**, **LE 02 - Land use**) score proportionately lower overall in terms of the types of attributes they refer to. It is arguable that these issues may not need to address a wide range of attributes, especially if already linked to broader issues, such as GO 01 - the consultation plan which includes cross-references to several issues elsewhere in the manual. The analysis does point to certain aspects of sustainability that may have been missed however. These include inconsistent references to local engagement (regarding the social dimension), as well as a lack of reference to attributes that promote design adaptability and spatial integration (regarding the technical dimension).

By way of comparison, the same textual analysis and scoring system was also applied to the mandatory (termed 'pre-requisite') issues in the equivalent US Standard, LEED Neighbourhood Development (ND) (see Appendix 1, Table 1.3). The analysis indicates that the US standard is less extensive in its references to sustainable urban design attributes in its pre-requisite issues

when contrasted with BC. LEED ND appears to be less process-focused and more prescriptive about urban design principles that applicants should apply. Notably, like BC, LEED ND also has a lower proportion of references to urban design attributes associated with social and technical benefits (Figure 2-7)

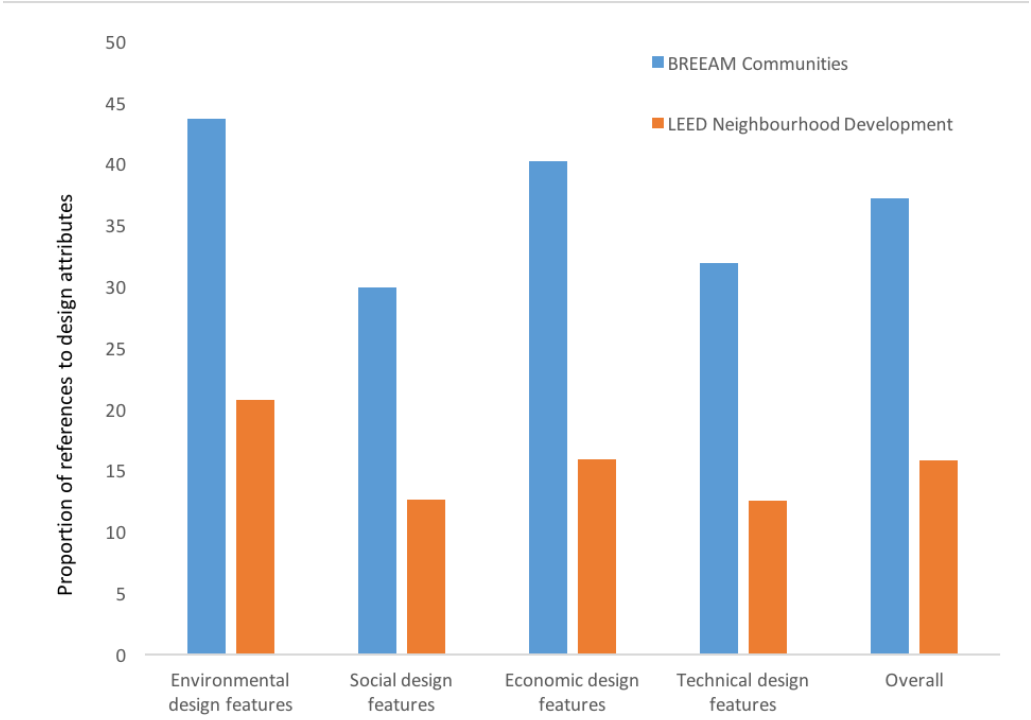


Figure 2-7 References to sustainable design features in BC and LEED ND

Whilst the text analysis is helpful in highlighting the relative breadth of BC in its definition of sustainable urban design compared to LEED ND, as well as the potential areas that could be strengthened in BC, this approach is not without problems. Boyko and Cooper (2011) amongst others, are clear to point out that any relationships between urban design attributes and sustainability outcomes are often context-specific, nuanced and contradictory. For example, they found evidence that some higher density (compact) neighbourhoods were linked to increased crime rates but they also found other papers reporting increased safety in streets where there were greater levels of social activity. Great care is therefore required before assuming

linear 'reductive' causal links between certain urban design interventions and sustainability outcomes (Gasparatos et al., 2009).

2.4 Challenges for evaluating sustainable neighbourhood design

Evaluation is described as an embedded part of urban design and masterplan processes, where a reflexive process leads towards iteratively refined design solutions (HCA, 2014; Preiser and Schramm, 2005; van der Voordt and van Wegen, 2005; Schön, 1983). This raises an important question about the whether the technical content of BC aligns with how current masterplan processes are enacted (Schweber and Haroglu, 2014), and whether BC promotes sustainable intentions as a part of masterplan processes.

This section identifies the types of formal (and more informal) evaluative practices enacted during masterplan processes, and considers the degree to which BC reflects those practices. Second, it looks at some of the potential challenges for BC as a standardised evaluative framework, and considers the need for further research regarding understanding real world evaluative practice in masterplan processes.

2.4.1 Background to masterplan evaluation

A central question for this research relates to when, how and why different types of evaluative practice are enacted during a masterplan process and what are the consequences of that enactment? There is a wide range of different types of formal evaluative practices that are reported to be undertaken to assess the impact of urban design during masterplan processes (Preiser and Schramm, 2005; van der Voordt and van Wegen, 2005; Mehta, 2014; Alexander,

2015; Brandon et al., 2005; Dryden, 2004; Moughtin et al, 2003). Table 2-3 summarises these broad types of urban design evaluation with some examples referred to in the literature.

Table 2-3 Levels and types of urban design evaluation

Level	Type	Examples
1. Direct evaluation (on-site)	**Observational review**	• Design audits: checklists, inventories, Score cards (e.g. Place check) • Field surveys: observing human behavioural patterns, infrastructural mapping, ecological monitoring, Landscape Visual Impact Assessment • Residents onsite surveys / questionnaires: in-situ customer satisfaction surveys, post occupancy reviews
	Interactive review	• Immersion: Team or individual ethnographic research e.g. Participatory site walk-abouts, user observation and opportunistic conversations • Design workshops and exhibitions, expert and community input to photos, maps and designs (e.g. Planning for Real, Charrettes, Enquiry by Design)
	Prototyping/ trials	• Tactical urbanism, 'learning through doing' e.g. temporary street pedestrianisation, life size mock-up structures • Meanwhile spaces, e.g. pop-up shops and restaurants
2. Indirect evaluation (off-site)	**Participative/ consultative assessment**	• Design review panels (* these can include direct site visits in process) • Design workshops, surveys, exhibitions, focus groups with non-resident users and practitioners
	Remote / desk-based research	• Visual assessment: analysis of drawn plans / aerial photos e.g. visual contrast assessment, geological surveys, flood risk assessment • Desk research: examining cultural, historical, archaeological, geological, economic, demographic, real estate, records and reports • Simulation, modelling, (e.g. energy modelling, flood risk modelling, financial modelling, overshadowing models, virtual reality, BIM)
3. Generic principles (off-site)	**Design standards**	• Benchmark standards: comparing appraising design principles and approaches (e.g. BREEAM Communities, DGNB Urban Districts) • Local / National / European / international standards and regulation (e.g. ISO 9001, 14001, EU Strategic Environment Appraisal, UK National Planning Policy Framework, Building regulations)
	Design codes and guidance	• Street, urban and public space design codes: encouraging public intentions (e.g. bicycle and pedestrian circulation, safety, minimum traffic flows, public realm, vernacular of building types) and the relationship to public space • Architectural / building codes: context, image and character principles relating to geography and history of place, use of materials, and even construction methods. (e.g. Lifetime Homes, Building for Life 12, British Standards) • Ecosystem and landscape codes: seeking to contributing to existing or new GI areas (e.g. Landscape Visual Impact Assessment (LVIA) Guidelines)

Sources: Cranz, 2016; Poe et al., 2014; Sussman and Holland, 2014; Tam, E., 2014); Andres, 2013; Gehl and Svarre, 2013; Carmona et al, 2010; Sandhu et al., 2007; Van der Voordt and Van Wegen, 2005; Duany and Plater-Zyberk, 1994.

Evaluative practices can be categorized into three levels of evaluation: direct, indirect and generic evaluation. Direct evaluation refers to first-hand on-site information, obtained through

a site or location visit and evaluated through direct object or user observation (e.g. landscape visual impact assessment). Indirect evaluation relates to off-site or desk-based evaluation of site information (e.g. maps, reports, drawings), such as early geomorphological and flood risk surveys. There is also a third level of evaluation that specifies a generic approach to undertake a direct or indirect form of evaluation or some combination of the two. Generic evaluative frameworks include design codes and standards, such as BC. These involve a more top-down evaluative style, adopting consistent principles to appraise a range of contexts (Joss et al., 2015; Timmermans and Epstein, 2010; Bowker and Star, 2000). The BC standard is a 'generic' type of evaluative framework that refers to range of specific 'direct' and 'indirect' evaluative practices within the technical manual (See Appendix 1, Table 1.4). In fact, there are only two types of evaluation listed in Table 2-3 that BC does not refer to. There is no reference in BC to more 'immersive' evaluative practices, where an individual or team of evaluators, spend a short or longer period with a community to gain an in-depth ethnographic understanding of local experiences and requirements (Rishbeth et al., 2018; Cranz, 2016; Cranz et al., 2014; Powell, 2010). Another evaluative practice increasingly referred to in literature and by urban designers but not by BC, is that of trialling or prototyping different design options to test and refine a proposed solution (Mould, 2014; Gehl and Svarre, 2013).

There is a growing body of research that examines the relationship between the different types of evaluative practices and the consequences of such practices, such as the role of design review panels in helping to refine urban masterplans through peer review (Punter, 2003, 2010). There is more limited literature, however, about how evaluation can influence urban design decisions, actions, and material outcomes (Marshall, 2012; Cuthbert, 2006), including how standards such as BC affect those outcomes (Sullivan et al., 2014). Marshall and others have called for a '*more systematic verification and critical assimilation of scientific knowledge within urban design*

theory' (Marshall 2012, p267; Carmona et al 2014) and it is arguable this need for greater critical rigor should also relate to how urban design practice is evaluated.

Standards have been criticised for focusing primarily on technical definitions and less on the processes underlying how and why particular issues or evaluative intentions are included, how those intentions are evaluated in practice (Schweber and Haroglu, 2014; Pettigrew, 2012; Timmermans and Epstein, 2010; Bowker and Star, 2000) and whether the practice of evaluation actually plays a role in affecting decisions and outcomes. In terms of the role of BC, BRE (2014) states that BC contributes to a number of benefits for those that apply it, including: (i) better integration of sustainability intentions into construction procurement and design decisions; (ii) cost savings in the design and construction by addressing sustainability concerns earlier and avoiding costly changes; (iii) a smoother planning application process because BC brings together a number of regulatory requirements and provides third part verification of quality; (iv) non-prescriptive guidance allowing applicants flexibility in how they apply the standard in a local context; (v) reputational benefits by gaining certification; (vi) sustainability benefits to BC certified neighbourhoods if the developer applies the recommendations of the scheme during construction; and (vii) BRE *hope* that the standard will support wider mimicry in the construction market, producing a sustainability uplift (Joss et al, 2014; Interview 1, BRE BC Coordinators). Central to these benefits is the assumption that the application of the standard will support the formalisation of evaluative intentions (Vlaar et al., 2006), improving rational masterplan decision making in favour of sustainability outcomes.

Sullivan et al. (2014) indicate, however, that there has be minimal empirical examination of these reported benefits or of the costs and challenges of enacting the standard. This is in part because BC is still relatively new (the last revision was in 2011) and because masterplan processes are long term, lasting for 20 years or more, making any evaluation of outcomes an

extended longitudinal exercise. Despite these research problems it would be valuable to examine how BC and masterplan evaluation are applied in practice, to look at how the standard, evaluation and wider masterplan processes are perceived to interact, and consider whether BC actually plays a role in shaping design decisions and has any effect, regarding what is ultimately constructed.

2.4.2 Challenges for BREEAM Communities as a standardised sustainable neighbourhood evaluative framework

A fundamental problem with evaluating urban design quality is how to address the complex web of interactions in dynamic urban settings (Yigitcanlar and Teriman, 2015; Carmona, 2014; Bentley and Kiddle, 2015; Boelen, 1996). As a result of this complexity, various challenges may affect how evaluative practices are carried out and whether they influence wider design and construction decisions. This may in turn impact the opportunities present for BC to seek to shape such practices. Evaluative challenges include: the non-linearity of urban design impacts; the top-down nature of standards and evaluative processes; the dynamic temporal quality of places and need for validation; the complexity of stakeholder collaboration required in masterplan decision-making and delivery; and the impact of wider market and political contexts upon how masterplan processes are conducted and evaluated. These evaluative challenges are considered in turn.

2.4.2.1 Non-linear evaluative interactions

The literature on urban design evaluation often defines the process of impact in a fairly linear way, referring to a cause and effect relationship, where some design action *causes* in a direct *impact* to particular *receptors* (e.g. humans, flora, fauna, water, land, air, financial, technical, political etc.) (Hull, A., 2011; Ewing and Clemente, 2013; Boelen, 1996), see Figure 2-8.

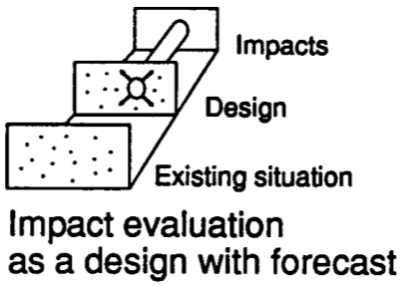


Figure 2-8 Linear cause-effect design impact relationship (Boelens, 1996, p75)

Part of the difficulty with evaluating the impacts of a masterplan, is that the cause-effect relationships between different receptors in urban design are likely to be non-linear and interactive (Bentley and Kiddle, 2015)(Boelen, 1996). A building or landscape design once constructed and in-use, may not directly influence the intended receptors or may have unintended consequences or interactions with other receptors (Frank and Pivo, 1994). For example, 20 Fenchurch Street in London (known as the 'Walkie Talkie'), despite various impact studies, produced unintended microclimatic impacts on the local neighbourhood in terms of excessive wind flow and intensity of light reflecting from the curved glazing (Futcher and Mills, 2015).

BC does reflect some degree of *positive* interaction across the 41 issues it seeks to evaluate. Whilst it might not be immediately apparent to the organisations who apply BC, BRE are clear that they intentionally try to adopt an integrated approach in all their standards. As the BC technical manual indicates, it aims to promote:

> "*Strategic principles and requirements which define an integrated approach to the design, management, evaluation and certification of the environmental, social and economic impacts of the built environment*." (BRE, 2011).

For example, although the issue **SE 11 – Green Infrastructure** is an optional 'Step 2' BC issue, the standard contains numerous direct and indirect linkages between GI and other issues. As Figure 2-9 indicates, every issue in BC except two (**RE 07 – Transport Carbon Emissions**; **SE 16 – Light pollution**) includes a reference to an aspect of GI (see Figure 2-9). The reasoning being, that if a developer applies for BC certification, they will be encouraged to adopt a more integrated approach to how they evaluate GI in relation to other issues as well.

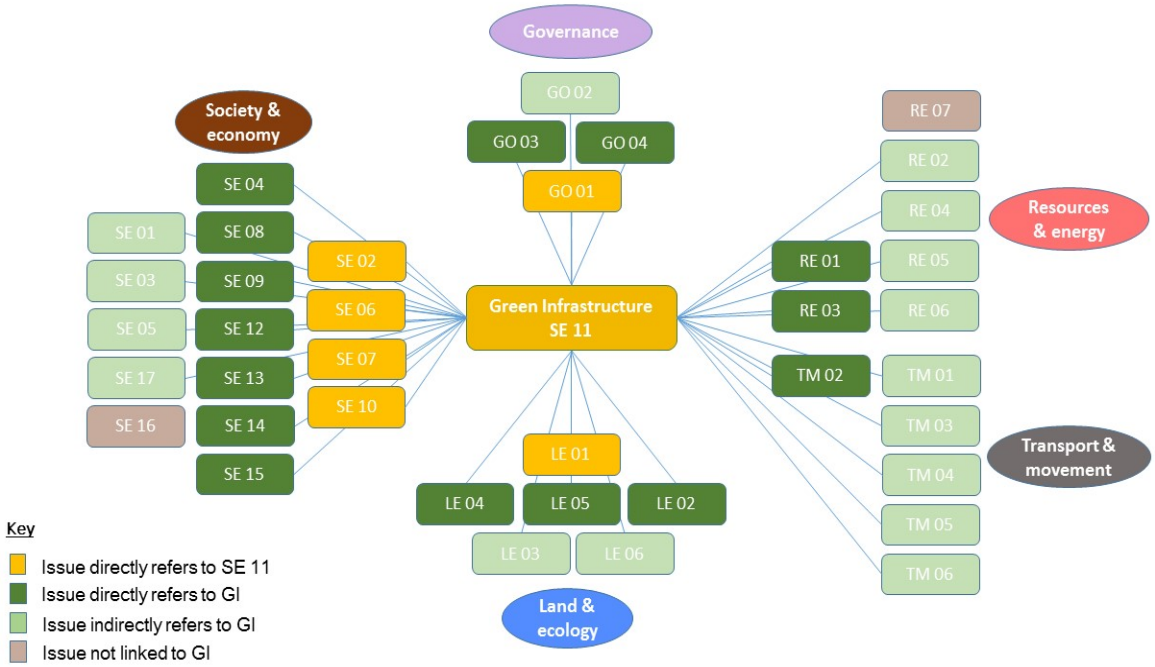


Figure 2-9 Direct and indirect links to Green Infrastructure within the BC manual

Either, there is a direct reference made to the SE 11 issue (seven issues, including the innovation issue), or a performance credit directly awarded for design proposals that relate to GI (16 issues), or there is an indirect reference to an aspect of green infrastructure (16 issues). For example, in **SE 05 – Housing provision** there is a reference to developers providing a minimum

area for external recreational space provision, including gardens[7]. Another example of integration is where BRE have sought to address the social intention of health and wellbeing. Whilst there is no distinct 'health' issue to evaluate in BC, there is a core intention of all the issues in the 'Society and Economy' thematic group that those issues aim to support health and wellbeing, including SE 11 - Green Infrastructure. Again, looking across all 41 issues, there are only five issues that do not include a direct reference (awarding a credit) or indirect reference to health and wellbeing (Figure 2-10). A further analysis was conducted of other distinct sustainability intentions (social inclusion, ecosystems services, financial viability and infrastructural integration) which arose in the textual analysis as common intentions in masterplan processes (see Appendix 1, Table 1.5). The analysis indicated direct and indirect references to these intentions. Notably, *all* the issues in BC refer to financial viability concerns because all the issues are likely to incur financial costs (and benefits) if they are implemented.

Weber, R. et al. (2014), Boyko and Cooper (2011), Forsyth et al. (2010) and Rodríguez López and Fernández Sánchez (2011) all refer to the benefit of using a combination of quantitative and qualitative indicators and methods, to gain a richer and more nuanced insight about the quality of a neighbourhood or building. By proposing a variety of qualitative and quantitative metrics, BC may therefore get closer to a more comprehensive overview of neighbourhood quality. These different types of data increase the complexity of both interpretation and efforts to combine evaluative information however (Lyons et al., 2016).

[7] SE 05 Minimum space standard for external recreational space (balconies and private gardens): 3m^2 for 1 person or 2 person dwellings plus 1m2per additional person (BRE 2011, p66)

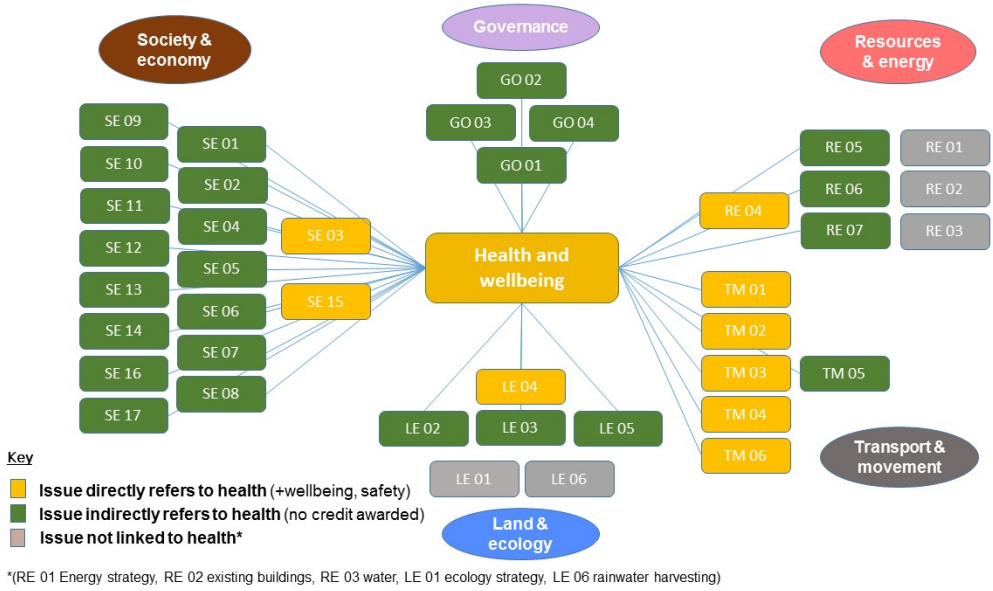


Figure 2-10 Direct and indirect links to Health and Wellbeing within the BC manual

So, despite BC making positive connections across issues and evaluative intentions, it does not clearly address potential conflicts between and within issues. For example, investment in GI landscaping may benefit the environmental quality of a site, raise the visual amenity and increase real estate values (Mell et al., 2016; DG Environment, 2012; Landscape Institute, 2014), but the consequence of increasing property values may be to displace people on lower incomes who cannot afford higher real estate prices or the associated landscape management fees. This displacement of lower-income households as a result of GI enhancements is described as 'environmental gentrification' (Hansen and Pauleit, 2014; Curran and Hamilton, 2012; Dale and Newman, 2009; Jim and Chen, 2010). By adopting a solely positive performance scale BC does not account for any similar negative interactions between the issues it is seeking to evaluate.

2.4.2.2 Balancing local to global priorities

Various academics and built environment practitioners have critiqued sector standards and codes as too bureaucratic and rigid, creating homogenous 'one-size fits all' solutions, lacking in flexibility to allow diverse and creative design responses (Campbell, 2011; Joss et al., 2015; Leach et al., 2015; Schweber and Haroglu, 2014). They refer to the procedural importance in design practice of evaluating the strategic and local *context* of a place (Carmona et al, 2010; Lynch, 1981; Sharifi and Murayama, 2014; Madureira and Andersen, 2014). BC does require contextual appraisals in Step 1 of the technical manual, and it includes a clear intention to avoid prescribing how solutions to the issues it raises are derived (BRE, 2011). However, whilst it is largely flexible about *how* baseline appraisals are conducted, by promoting global sustainability priorities, BC is prescriptive about *which* issues should be evaluated (except in unusual circumstances when a bespoke process may apply). Whilst BC cannot realistically expect applicants to cover all potential impacts arising from a development (Bell and Morse, 2013), an applicant could be encouraged to be transparent about what is and what is not evaluated, and have a clear rationale as to how this was decided and why (Forsyth et al., 2010).

There is also a critique about the process of assigning weight to each issue to normalise scores onto the same performance scale, as well as prioritise certain issues over others. Normalisation implies that different issues are of 'substitutable' and 'tradable' values (Garmendia and Gamboa, 2012). For example, **SE 11 - Green infrastructure** (issue weight = 1.8) is weighted less than **RE 04 - Sustainable buildings** (weight = 3.2). Differentiated weights may incentivise applicants to prioritise one issue over another (as BRE intends), but without clear regard to the variable significance of those lower weighted issues in a local context, or to the interdependencies between issues and potential trade-offs involved in prioritising one issue over another (Munda and Nardo 2005). Other standards, CASBEE for Urban Development and

Green Star Communities both apply a neutral weighting scale, but this assumes every issue is of equivalent significance regarding their contribution to sustainability intentions which may not be the case in a particular context. BRE wants schemes to be on a consistent ranking scale so that the performance of different BC certified sites can be generally understood and comparable, but it may need to revisit how issue credits and weights are assigned, to support more contextually relevant evaluative practice.

The textual analysis, described in 2.1.3, suggests certain issues may also be too narrowly defined. For example, **SE 04 - noise pollution** makes limited reference to environmental, social and technically-orientated urban design attributes. This could be enhanced, through a broader definition of 'noise attenuation measures', allowing contextual and user-focused consideration of possible mitigating measures, such as vegetative noise buffers, and through encouraging community and stakeholder engagement in the evaluation of noise impact. Similarly, **LE 06 - Rain water harvesting** is a very specific solution which might not be relevant in all climatic / local contexts. A more general and reflexive approach, initiated in Step 1 with the **RE 03 - Water strategy** issue, would be to allow for relevant water-efficient integrated design solutions to be specified in Steps 2 (layout) and 3 (detail). BC could adopt a more consistently generic approach, allowing more locally appropriate issues and responses in the latter steps, whilst not losing sight of the 'global' sustainability intentions it is trying to encourage developers to address (Joss et al 2015).

2.4.2.3 Temporal dynamics of place

A third aspect that complicates urban design evaluation relates to the fact that places are temporal and not static (Norberg-Schulz, 1976, p.132). Design qualities change over time, and yet evaluation often only deals with a single period or moment in time (Carmona et al 2010;

Lynch 1981). Evaluations of urban design quality needs to reflect the time-based quality of places to better reflect technical and social intentions such as resilience, durability, adaptability and intergenerational equity. BC does not currently require validation of the standard's performance rating through requiring a post-construction evaluation. The 'Ecology Strategy' (LE 01) is the only issue with a requirement to monitor outcomes (although GO 02 includes a recommendation). BC therefore does not follow-up on whether its aims are met (Bell and Morse 2013, Sullivan et al., 2014). Post Occupancy Evaluation (POE) is used by developers and architects to evidence the quality of past developments to clients, enable problems to be addressed at completed sites, and provide valuable lessons for future sites (RIBA, 2015; Way and Bordings, 2014). For example, Bordass (2000) in reviewing the 'triple bottom line' value implications of designing more environmentally friendly buildings, adopted a model that evaluated six stages of a project lifecycle, from inception to in-use. Examining the process over time enabled Bordass (2000) to identify the weak points in the project lifecycle, such as the poor communication of the design brief. Post construction evaluation requirements to BC would therefore seem an obvious addition to the standard, yet ex-post evaluation can be problematic. This is partly due to the complexity of extracting causal links that might exist between evaluative practice and outcomes, but also from a potential lack of ownership as regards who should undertake it:

> "*POEs are not the norm. Why? Architects say that they are not paid to carry out POEs and so they are unaffordable*" (RIBA, 2015)p34).

Few original members of a design team may still be involved in a project which can take decades to complete (Langmuir, 2015). A developer may not wish to uncover negative POE findings, due to reputational risks with potential clients. The One Planet Living communities standard, created by Bioregional, involves Bioregional conducting annual site reviews

themselves to appraise the implementation of the standard (Bioregional, 2016), but this in-house model would have clear resource implications for BRE. Developers with a long-term investment interests in a site may be more inclined to conduct a POE (Princes Foundation for the Built Environment, 2007), but this is not always the case and so ex-post validation remains a significant gap in the BC evaluative framework.

2.4.2.4 Masterplan collaboration and engagement

Masterplan processes requires a high degree of collaboration between a complex array of different practitioners or 'actor groups' (Designing Buildings Limited, 2017; Henneberry and Parris, 2013; Owen et al., 2010; Sebastian, 2006; Whittington, 2006).

Table 2-4 summarises the different actor groups reported to be involved in masterplan processes.

Table 2-4 Key actors involved in masterplan processes

Actor groups	Masterplan role	Detail
National government	External	Political representatives and government departments creating national policy guidance and planning regulation i.e. ministers, civil servants
Statutory and regulatory bodies	External	National and regional bodies with planning or regulatory roles with an interest in the built environment and to urban design (e.g. Homes and Communities Agency, Environment Agency)
Local authorities	Peripheral / external	Local political groups and officers creating planning policy and managing building regulation and development control i.e. inspectors, planners, councillors
Local actors	External	Residents (Tenants, leaseholders and freeholders), lay public, community groups (civic / faith-based / resident groups), businesses, workers / commuters, amenity providers (health care, schools and nurseries etc.)
Land owners	Peripheral	Public and private clients
Developers	Internal	Public, private (contractor developer) and arms-length organisations i.e. housing associations
Investors	Peripheral	Public and private financial investors
Building 'providers'	Peripheral	Housing associations, community-led associations, public and private landlords
Designers	Internal	Architects, urban designers, master planners, landscape architects / designers
Construction actors	Internal	Engineers (civil, structural, electrical), builders, site foremen, managers, estimators, surveyors, directors
Consultants	Internal / peripheral	Lawyers, employer's agents, planning consultants, environmental consultants, Arboriculture (tree) consultants

Sources: (Farrells, 2014; van der Voordt and van Wegen, 2005; Gray and Hughes, 2007; Boyko et al., 2006)

The 1999 UK Urban Taskforce (Power and Burdett, 1999) depicted the relationships between the actor groups they envisaged should engage with a masterplanned design process (See **Figure 2-11**). The Taskforce picture broadly accords with the stakeholders listed in Table 2-4 but both the table and figure depict the actors in a static way, failing to reflect the likely dynamic patterns of engagement and disengagement that may occur at different stages of a masterplan.

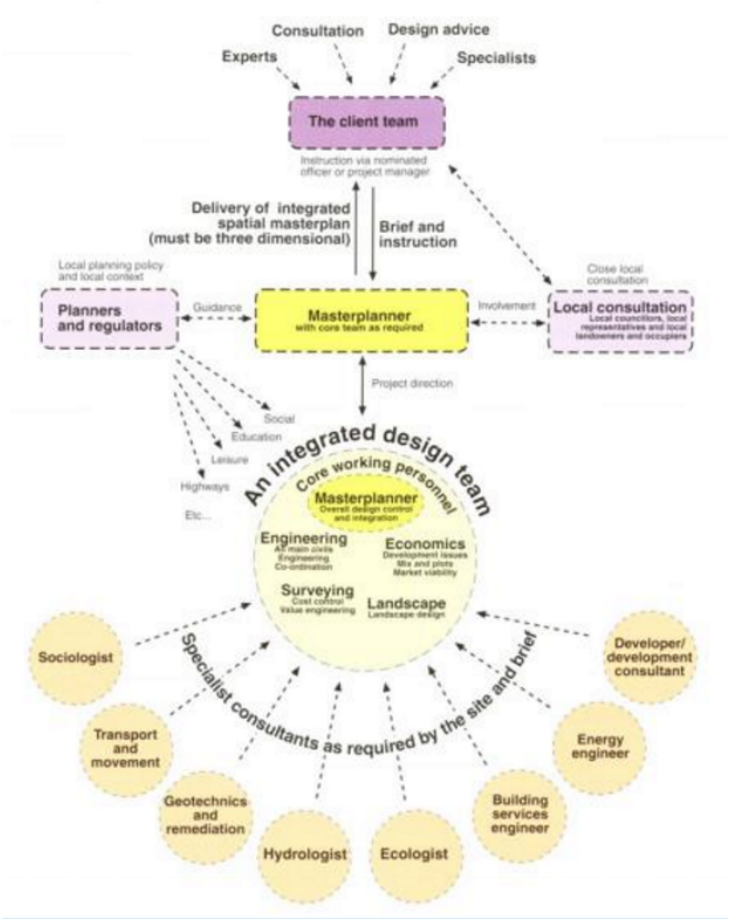


Figure 2-11 Representation of the stakeholders involved in masterplans (Power and Burdett, 1999, p.46. By Andrew Wrights Associates)

Various studies have critiqued how evaluative standards affect the dialogue between different stakeholders (Rydin and Pennington, 2000; Schweber, 2013) . The breadth of stakeholders involved increases the complexity of how and when masterplan intentions are established, recognised and evaluated, as well as how far different stakeholders can engage, and who takes

final decisions (Gray and Hughes, 2001; RICS/CBRE, 2014; Carmona, 2014). If stakeholders do not identify with a masterplan or evaluative process, there may be no rationale for engagement (Stensaker and Falkenberg, 2007). Clarifying the motivations and capacity of stakeholders to engage is therefore a critical part of the process of establishing dialogue and common ground (Schweber and Haroglu, 2014; Stensaker and Falkenberg, 2007; Rydin, 2007), as well as the need for open acknowledgement of the boundaries of engagement, that agreement is not always possible (Forsyth et al., 2010).

In terms of BC, the technical manual requires a consultation plan to be formulated by the standard applicants in issue **GO 01 – Consultation Plan**, outlining the methods and timing of consultation during a masterplan design process (BRE, 2011). Engagement in BC is therefore limited to structured 'consultation' with feedback. BC requires local consultation in just five out of eleven mandatory issues and in less than half of the standard overall (16 out of 41 issues). Some issues are however connected. For example, while **SE 01 - Economic impact** does not require local consultation, it refers to using data from **SE 02 - Demographic needs and priorities** which does. BC does not prevent other issues from being part of a consultative process, but fundamentally, BRE does not consider that the selection of consultative issues included in a consultative plan could occur through a consultative process itself. The standard lacks transparency about how and why certain BC issues require stakeholder consultation and not others. Despite listing potential actors, BC lacks detail about the scoping processes by which interested parties are identified and enabled to engage. BC also only offers a single (optional) credit if applicants conduct one consultative workshop to address the overall masterplan (**GO 02 – Consultation and Engagement**, BRE, 2011). It is questionable whether one workshop is sufficient to build relationships and clarify stakeholder positions. Weak expectations about the depth of stakeholder participation and influence, and how stakeholders can have a role in

shaping the consultation plan and ultimately the masterplan (Forsyth et al, 2010; Hemmati, 2002), is therefore something of a problem in BC.

2.4.2.5 Political and market context

BC is a normative evaluative framework that aims to influence masterplanned development projects that are situated within complex market and policy contexts (Henneberry and Parris, 2013). These wider contexts are likely to have implications regarding the perceptions, uptake and application of BC. BC is still relatively new, with a total of 32 sites at the 'interim' (Step 1) and 'final' stages (Step 3) of certification in 2017 including sites in the UK, as well as in Bulgaria, China, Iceland, Kazakhstan, Mauritius, Poland, Sweden and United Arab Emirates internationally (BRE Green Book Website, accessed 24.11.17). A further group of schemes are registered to be assessed, but have not yet progressed to formal certification. This contrasts with over 40,000 BREEAM certified buildings and more than 300 LEED ND projects certified globally (Clark et al., 2013). The slow uptake of the standard may be affected by various factors beyond the control of BRE, such as the 2008/09 economic downturn slowing the numbers of larger developments coming onto the market and the increasing timeframes involved in masterplan application processes, as investors are lost and sought. Anecdotally, it was estimated that over half of masterplanned sites do not even progress beyond the planning stage. Another concern relates to the scale of sites BC is targeted at. Small to medium-scale infill and brownfield housing are suggested to constitute two-thirds of all new UK housing (Pharoah, 2015). Many development sites may be smaller-scale and with fewer resources to apply the kind of comprehensive evaluation required by BC. This suggests there is a need for further analysis of the types and scale of development across the country (Cowen, 2015) to see if BRE should also focus on this smaller scale.

Sharifi and Murayama (2014) suggest that the lower uptake of BC could be due to its voluntary nature, in contrast with the large number of US authorities who require use of LEED ND. Only three English councils currently require BC (Eastleigh, Bristol and Swindon) as a part of the planning application for larger-scale developments. With on-going public sector financial cuts, there are concerns local authorities will have less capacity to deliver and require good quality developments (Williams, 2014a; Farrells, 2014). It has been hoped that housing associations will partially fill the gap in provision by the public sector but associations are also subject to capacity and financial challenges that may limit their uptake of new developments (Wilcox, Perry and Williams, 2015).

In relation to factors where BRE may have more influence, one concern relates to external market perceptions about the standard and its relevance to current masterplan practice on top of the 'onerous' task of seeking planning consent (Sharifi and Murayama, 2014). BRE argues that BC is designed to reflect the design cycle, consolidating key planning requirements, supporting a smoother planning application process and reduce risk of costly changes (Pineo, 2013). As noted earlier, however, masterplan processes may vary considerably in practice (Boyko et al., 2006). Therefore, the BC structure needs to be sufficiently flexible and generic to remain relevant in this variable context. A second concern is that whilst BC incorporates various national policies and regulations, it does not address key market questions of financial viability and risk, deferring the responsibility of local authorities and developers (BRE, 2011, p7). It is arguable, however, that finance is central to a sustainable neighbourhood development. Cost and revenue appraisals conducted early and throughout the masterplan process, aim to ensure sufficient returns on investment to enable a development to be delivered and provide a premium to cover unforeseen risks (GRI, 2014; Tiesdell and Adams, 2011; Princes Foundation for the Built Environment, 2010, 2007). Financial viability and investor requirements define

the scope of a masterplan and can result in missing or downplaying environmental and social 'market externalities', such as not prioritising affordable housing supply (Crosby et al., 2013; Social Integration Commission, 2015). BRE touches on affordability concerns in **SE 05 - Housing provision** but there is still a need to consider whether financial decisions need to be better addressed in BC, such as through a new issue requiring triple bottom-line reporting for a site, or similar tools to enhance financial transparency. A further challenge for BRE is therefore to reflect on these wider issues that may affect BC uptake and implementation: the dominance of financial markets, market perception and declining political capacity and pressure.

2.5 Summary

Through BC, BRE is trying to create a standardised framework by which a developer can evaluate the sustainability of their masterplan designs. A central assumption in BC is that, by applying the standard's evaluative framework, applicant developers will be better informed and able to make more sustainable design decisions. Further, that by promoting certain evaluative practices at the design stage of a masterplan, the standard will encourage the developer to take more sustainable decisions which in turn will have sustainable material outcomes regarding how each certified neighbourhood is constructed and used. They also argue that such influence could also play a wider role in promoting a sustainable transformation across the sector (BRE, 2014; Joss et al., 2015; van de Voordt and van Wegen 2005). This means that BC certification aims to serve as a 'proxy' for sustainable neighbourhood performance (Schweber and Haroglu, 2014, p302).

This comparative review has helped identify five issues that challenge the assumption of rational 'evaluative embeddedness', relating to the technical structure of BC and wider market context:

(i) the nonlinear interactions between differing evaluative intentions;

(ii) the balance of 'global' sustainability issues within differing local contexts;

(iii) the negotiation of multiple stakeholder agendas;

(iv) how to support validation of performance through post-construction evaluation.

(v) how the wider construction sector and policy context affects the uptake and application of BREEEAM Communities.

It is these technical and contextual challenges that may ultimately determine how 'successful' a standard can be in achieving its intended aims. To some degree all tools used to evaluate urban design quality need to take account of the intrinsic and extrinsic complexity of masterplan processes. A balance needs to be struck between accounting for complexity, whilst retaining clarity about what is 'important' to evaluate, and gaining a meaningful overall sense of 'performance'.

Two questions arise from this review: first, how BRE can create a sufficiently consistent, comprehensive evaluative framework that provokes a change towards more sustainable intentions without placing an unrealistic burden on companies seeking certification? Second, do developers already adopt evaluative practices in masterplans that support outcomes oriented towards sustainable neighbourhoods, in which case is BC really required at all? Based on this review of literature, BC certainly contains many references to core principles of masterplan processes referred to in urban design. There is limited empirical evidence however, about whether and how such evaluative standards actually contribute to masterplan evaluative

practices and outcomes (Sullivan et al., 2014; Bell and Morse, 2013; Marshall, 2012; Bell and Morse, 2013), or indeed how evaluative practices, as they are currently practiced, relate to wider masterplan processes. This means there is a clear need to look at how the standard and evaluative practices are applied within 'real world' masterplans, looking beyond the design stage of a masterplan to consider the transition from masterplan design to construction and once a site is in-use.

The aim of this research is therefore to address this empirical knowledge gap: examining how BC fits with masterplan evaluation as it is currently practiced in the 'real world', and to consider the extent to which BC plays a transformative role in masterplan processes, from design to end-use. The next chapter outlines the approach adopted to address this research need.

Chapter 3: Conceptual approach and methods

This chapter sets out the conceptual approach and methods adopted to respond to the research need. It starts by reviewing the research needs identified in chapter 2, outlining how those needs have been framed in terms of the central research question, aims and objectives. A range of theoretically-based conceptual frameworks are then considered, examining two frameworks in more depth, before identifying Strategy as Practice as a framework that structures information in a way that helps address the research question. The chapter then outlines the methods for data collection and analysis and how potential limitations of those methods were addressed.

3.1 Research question, aims and objectives

A core assumption in BREEAM Communities (BC) is that conducting various evaluative steps during the design stage of a masterplan (defined by BRE as important to sustainable development) will ensure developers are better informed to incorporate sustainability intention within design, construction and in-use decisions. For example, in relation to stakeholder engagement, BC posits that when stakeholder concerns are evaluated earlier in the masterplan process, there is a reduced risk of disagreement later in the process, thus avoiding potential costly delays and changes to designs as a result (Figure 3-1).

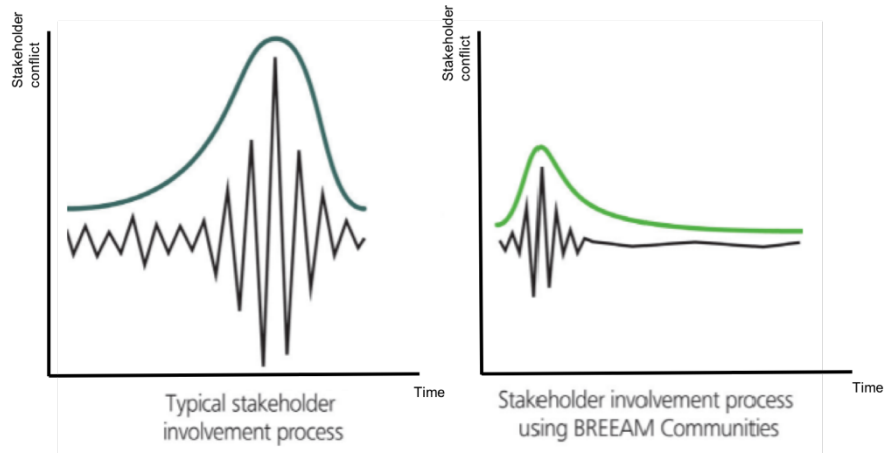


Figure 3-1 Stakeholder engagement in masterplan processes (BRE, 2014, p.3)

This study assumes that evaluative practices can be understood as a social (as well as technical) phenomenon in that it is people who define, conduct, interpret and respond to evaluation (Jones and Hughes, 2001; Smithson and Hirschheim, 1998; Brayrooke and Lindbrom, 1963). Schweber (2014), referring to Wilhelm Dilthey (1833-1911) and Max Weber (1864-1920), points out that human behaviours (the decisions and acts we take) are shaped by a variety of personal factors, such as their understanding, intentions, and motivations. This requires a more empirical and interpretivist perspective to extract the more personal sociological processes underlying how evaluation and related 'technical fixes' (in this case the BC evaluative framework) work or do not work as intended. As the Homes and Communities Agency (HCA) commented, *"There is no substitute for seeing how a scheme works first hand"* (HCA, 2007).

In considering the extent to which BC contributes to masterplan evaluation and outcomes (Sullivan et al., 2014; Marshal, 2012), the literature review in Chapter 2 indicated that there is a need to better understand how evaluation and decision-making are practiced in 'real world' neighbourhood-scale masterplanned developments. The current study pays particular attention to the evaluative practices that take place during a masterplan process, considering how evaluative practices are applied and interpreted at different masterplan stages, from design to

construction to in-use. The study seeks to examine the key actor groups (practitioners) and decisions involved, and their perceptions of evaluative practice as a part of a masterplan process. The study also considers whether and how BC, as a standardised evaluative framework, affects how those evaluative practices are applied and responded to.

Due, in part to the wide scope and protracted nature of neighbourhood-scale masterplans it is not practicably possible, as an individual researcher with a limited timeframe, to track all the evaluative practices that are undertaken during a development or even to follow the evaluative journey of all 41 issues outlined in the BC technical manual. Therefore, to gain a richer understanding of the possible interactions between evaluative practice and other masterplan practices, this study examines a single BC evaluative issue, 'SE 11 - Green Infrastructure' and how it is evaluated in the context of six different neighbourhood masterplan projects in England.

Green infrastructure (GI) is used as a thematic lens because, as an issue that is thoroughly embedded in BC, it is likely to be illustrative of many of the challenges faced when undertaking evaluation and seeking to deliver a sustainable neighbourhood (Szulczewska et al., 2016; Campbell, 1996). GI is indicative of BRE's attempt at holistic thinking, (see Figure 2-9) with various direct and indirect linkages to GI throughout the BC technical manual. The potential contribution of GI to sustainability is recognised in all but two of the issues that BC encourages applicants to evaluate. There is also a growing body of literature that reports the wide benefits that multi-functional, multi-scalar and inclusive GI can provide to promote sustainable development (Amati and Taylor, 2010; Benedict and McMahon, 2002; Callway, 2013; EC DG Environment, 2012; EFTEC and Sheffield Hallam University, 2013; Forestry Commission, 2010; Lee and Maheswaran, 2010; Mell, 2017). As outlined in Chapter 2, these intentions can be complementary, but may sometimes be contradictory (Madureira and Andersen, 2014; EC

DG Environment, 2012). This raises questions about how practitioners balance short term goals, (e.g. financial intentions), with the potential longer-term intentions (e.g. GI), within masterplans. It is these characteristics of GI that make it an appropriate empirical 'lens' through which to examine evaluative practice, including how different practitioners understand and respond to it empirically. Examining GI evaluation, that directly focuses on the challenges reported in literature regarding holistic thinking and short termism, will help indicate whether these are genuine challenges and, if so, how they are managed in practice. Such findings may also indicate wider lessons regarding the technical structure of BC (e.g. (Sharifi and Murayama, 2013, 2014; Fredericks, 2014; Sharma and Kearins, 2011; CIHT, 2010).

Therefore, the study seeks to address the broad underlying question: How does a standardised evaluation framework promoting sustainability, contribute to neighbourhood masterplan evaluation and wider processes? This general question will be clarified empirically through the following specific question:

- *To what extent does BREEAM Communities contribute to a more embedded approach to green infrastructure evaluation within neighbourhood masterplan processes?*

The aims and objectives of the research question are three-fold:

1. **To understand what evaluative practice is:** To examine empirically how evaluative practices are defined, enacted and responded to, reviewing practitioner involvement in masterplan processes, with an emphasis on enactment of GI evaluation;

2. **To examine the concept of 'embedded evaluation':** To study how GI is reflected in masterplan visioning, design, construction and in-use/operational decisions, contrasting a range of masterplan sites with and without BC certification, to consider:

a. The distinct intentions (social, economic, environmental, technical, governance and temporal dimensions) reflected by different evaluative practitioners;
b. The drivers that affect how GI evaluation and masterplans are practiced;
c. How BC is perceived to influence GI evaluation and masterplan practices and outcomes.

3. **To clarify practical and conceptual implications**: To consider the potential wider implications of the empirical findings for BC, GI evaluation and masterplan practice, particularly in terms of the future development and implementation of the standard.

3.2 Conceptual approach

This research is somewhat less concerned with *what* is being evaluated and more concerned with the processes of evaluation, examining *how* and *why* evaluation and decision making processes are practiced (Robson, 2011b; Silverman, 2011). As Sutton and Staw (1995, p 378) point out:

> "*Theory is the answer to queries of why. Theory is about the connections among phenomena, a story about why acts, events, structure, and thoughts occur. Theory emphasizes the nature of causal relationships, identifying what comes first as well as the timing of such events. Strong theory, in our view, delves into the underlying processes so as to understand the systematic reasons for a particular occurrence or non-occurrence*."

The research contrasts how evaluation is practiced in different neighbourhood masterplan projects with how it is idealised in BC and by literature. As such, it is necessary to understand how BC, evaluative practice and masterplans are understood and practiced by the various actors involved. Therefore, the research question, aims and objectives are strongly focused on the *process* of evaluation. (Van de Ven, 1992) in his recommendations for studying any process, suggests there is a need to:

- *understand* the theoretical basis or logic behind a process;
- *clarify* how a process is described and structured; and
- *observe* a process in way that tests the theory and current definitions.

Addressing Ven's first point, there are various potential alternative conceptual approaches and theories that might be useful to address the research question. These range from theories at a more organisational-scale, such as decision-making and institutional theories (Langley and Haridimos, 2010; Murray et al., 2010; Wallenius et al., 2008; Davidson and Venning, 2011; DiMaggio and Powell, 1983; Battilana and D'Aunno, 2009; Teh, 2014), to more empirically derived theories from urban design, planning, landscape architecture, natural environment and built environment fields.

Institutional theories, including institutional logics and institutional work, potentially offer a useful approach to understanding the broader macro-scale factors that externally shape how masterplan processes are undertaken (Thornton and Ocasio, 1999; Battilana and D'Aunno, 2009). However, these theories may be less well suited to understanding the interaction between more macro-scale factors and the micro-scale enactment of evaluation by actors, which is necessary to clarify *how* and *why* evaluative practices may affect masterplan decisions and material outcomes.

Decision-making theory considers how 'decision makers' address complexity and trade-offs (Tierney, 2008; Wallenius et al., 2008). Various decision-making theories offer conceptual frameworks to examine the psychology and sociology underlying how people are driven by normative behavioural factors (instinct, perceived reason or local environment) or learnt factors when making decisions (e.g. (Phillips-Wren et al., 2008; Saaty, 1990; Lederman and Johnston, 2008). *Multi-criteria decision-making* theories, such as 'Analytical Hierarchy Process' and 'Multi-Attribute Utility' describe 'rational' systems of classification, extracting positive and negative attributes of alternative decision options, and their potential interconnections, to produce an overview of an issue (a decision hierarchy) from which a clear decision can be made (Saaty, 1990; Lederman and Johnston, 2008). Although BC does contain multiple criteria, it is not formulated to aid the comparison of *alternative* design options, as described in multi-criteria decision-making, and only classifies positive attributes. Rather, BC aims to strategically influence the evaluative criteria that frame the design-stage of the masterplan process, as plans becomes iteratively more refined towards a single masterplan 'solution'. Multi-criteria theories may not therefore be the most appropriate conceptual framework to help reveal the relationship between evaluative practices and decisions made or changed.

Others have applied decision-making theory to look at *collaborative processes*, which masterplanned neighbourhood developments are commonly described as (Bell, 2005; CABE, 2002). (Lederman and Johnston, 2008) describe the 'deliberative' and 'situated action' approaches to collaborative decision-making, examining the social structures, tools or artefacts, rules and procedures adopted to aid decisions and how they are used (e.g. white boards that table individual staff schedules to aid coordination of activities). The ideological foundations of sustainable development also seem, to a certain extent, to require collaborative decision-making processes (Sharma and Kearins, 2011 ; Glasbergen et al., 2007). In this case,

the research could focus on how collaborative decisions are enacted to solve the multi-disciplinary 'problem' of creating a sustainable neighbourhood masterplan. This research is not solely concerned with the decisions that arise from collaborative processes in isolation however, but it is concerned more specifically with the *relationship* between *evaluative practice*, decisions and material outcomes made by distinct actors. Therefore, collaborative decision-making theory may not be the most appropriate conceptual approach to address the research question. Nevertheless, elements from these various theories may still offer valuable insights for the research.

The following section considers in more depth two alternative conceptual approaches that appear most relevant to helping to examine the evaluation / masterplan relationship. The first approach emerges empirically from the urban design arena (Carmona, 2014) and the second is from a more generic organisational origin, derived from a combination of practice and process-theories (Whittington, 2006; Jarzabkowski and Spee, 2009):

1. The place-shaping continuum – empirically derived theory
2. Strategy as Practice – practice and process-based theory

Both approaches have been considered to decide which one offers a more directly relevant conceptual and analytical framework to help analyse masterplan processes. The following section considers each theory, providing a brief background and discussion about their suitability as an analytical tool to support the research, as well as considers how the research might contribute to each theory. One theory is then selected based on this discussion.

3.2.1 The 'place-shaping continuum': an empirical theory of urban design

3.2.1.1 What is the theory?

Matthew Carmona's 'place-shaping continuum' (2014) is a theory of urban design that offers a potential theoretical starting point for understanding neighbourhood masterplans and their evaluation. Carmona developed the theory through various empirical studies of urban design in the public realm, in combination with reviewing wider practitioner and academic literature. In a London-wide study of public squares, visual analysis, in-depth case studies and interviews were used to understand the dynamic quality of the squares and identify intended and unintended influences that act on those places and how they are experienced. The theory distils these influences into three general concepts: context, process and power, that help to describe how a place, in this instance a public square, is designed, organised and experienced over time.

3.2.1.2 Why and how would this theory contribute to the research?

Masterplanned neighbourhood-scale developments have been defined as top-down '*place making*' processes (Andres, 2013, p.761). Masterplans are also described as a tool for urban designers, situating the practice within the broader concept of place-shaping. It is therefore valuable to consider the relevance of Carmona's framework for this research, looking at each of his three place-shaping constructs in turn. First, the historical and contemporary *context* and polity of a place are likely to play a role in defining the scope of neighbourhood masterplan processes and its evaluation. This includes market research that clarifies the demographic and economic background of an area, as well as the role of local and national planning policies and regulations in framing design and construction decisions (Henneberry and Parris, 2013; Carmona et al., 2010; Pickvance, 2009).

Second, regarding *process*, examining the broad masterplan stages would help clarify the types of evaluation and when evaluations take place in the process, how they were implemented, by whom and what role those evaluations play in making design decisions. Carmona groups place-shaping processes into intended and untended influences that act upon a place, and describes four broad stages in a place shaping process, which can run both sequentially and concurrently: design, construction, in-use and management. Neighbourhood masterplans are distinct from Carmona's study of public squares, in that they are larger scale and combine a greater mix of public, private and combined spaces, but the processes underpinning how plans are designed may be similar (RIBA 2013, Boyko et al 2006, Preiser and Schramm 2005, Marmot et al 2005).

Finally, in terms of *power,* Carmona seeks to identify the perspectives, role and capacity of different actors involved in assembling, using, organising and experiencing a place. Carmona describes a 'bewildering array' of stakeholders involved in place shaping activities. This also appears to apply to masterplan 'place-making' (see Table 2-4), where the lead design team are described as something akin to conductors in an orchestra, who seek (through bottom-up, collaborative and/or top-down processes) to intermediate a harmonious masterplan solution, one that tries to balance a multitude of intentions raised by different stakeholders (Woodcraft, Et al., 2012; Lindstrom, 2011; Ren et al., 2011; Bebbington, 2009; Medd and Marvin, 2007; van der Voordt and van Wegen, 2005; Hill, 1982).

Whilst Carmona's theory provides a list of actor groups[8] and classifies their degree of influence (low to significant) over place-shaping, the model does not offer much analytical guidance about how to examine the interactions between or within these stakeholder groups, how

[8] Place-shaping stakeholders: local authorities, private developers/investors, masterplanner, designers, planners, conservation, users, managers and wider community (Carmona, 2014)

'power' can be measured or, particular to this research, how to extract the different roles and relationships with evaluative practices.

3.2.1.3 How would this research contribute to the theory?

Reviews of Carmona's paper suggest that the place shaping theory needs to be further tested to see if it is sufficiently general and comprehensive in its definition of urban design to apply to a fuller gamut of situations (e.g. different locations, streets, large infrastructure projects, transport systems) (Barnett, 2014; Lang, 2014). The current study would test the relevance of the theory at a different scale of place-shaping. In addition, the research focus on the role that evaluative practices play in the collaborative (and sometimes combative) neighbourhood masterplan decision-making process is distinct as Carmona's theory, which does not explicitly look at evaluation.

Whilst Carmona's theory of urban design may provide a useful contextual underpinning to help understand the broad factors acting upon neighbourhoods and actors involved, it does not specifically provide a framework to examine in more detail the sociological and strategic masterplan practices, particularly as regards understanding how actors interact with and apply 'evaluative practices' (Egels-Zandén and Rosén, 2015). As such Carmona's theory may not directly help to address the research question as it is currently framed.

3.2.2 Masterplans as a 'strategy-as-practice'

3.2.2.1 What is the theory?

'Strategy as Practice' offers an alternative theoretical approach to help conceptually understand the interaction between *micro*-scale praxis (enactment of practice), *meso*-scale strategic practices and *macro*-scale structural drivers, and how practitioners are affected by and affect

change. Strategy as Practice (also called SaP) is derived from a combination of social practice, process and strategy theories, and typically applied in the study of individual corporate institutions (Whittington, 2006; Jarzabkowski and Spee, 2009). It has been applied to analyse the rationales and activities that occur during strategic processes, across different organisational levels (Jarzabkowski and Spee, 2009), both within an organisation (Grant, 2003; Vaara and Whittington, 2012) and arising from external or 'extra-organisational' practices (Stensaker and Falkenberg, 2007; Whittington, 2006). SaP therefore looks not only at how strategies and associated practices are created but also how practitioners (within and outside an organisation) influence processes at different scales, from micro praxis – the enactment of practice (Hoon, 2007) – to macro-scale social systems.

Masterplan processes broadly fits the SaP framework in that they are strategic processes that seeks to intentionally create or redefine a neighbourhood (both physically and functionally) (Andres, 2013; Adams and Tiesdell, 2013; Al Waer, 2013; Bell, 2005). Some masterplan practices are more 'intra-organisational' or core to the project (e.g. urban design, construction and formal evaluative practices). Whilst others, like BC, can be viewed as an 'extra organisational' strategic practices, external to the core practices but which seek to alter masterplan design and construction practices, in the case of BC towards the BRE's definition of a sustainable neighbourhood. A masterplan is more 'inter-organisational' than Whittington's conception, as multiple actors (e.g. architects, developers, and clients) collaborate across different organisations to enact it. This research would therefore make an additional contribution to SaP discussions about inter-organisational collaboration or what (Medd and Marvin, 2007) describe as 'strategic intermediation'.

3.2.2.2 Why and how would this theory contribute to the research?

Whittington (2006) describes how SaP applies three concepts to examine strategic processes: practitioners, practice and praxis. SaP theory supports examination of internal and external, intentional and unintended strategic practices and praxis, the enactment of masterplan practice (Egels-Zandén and Rosén, 2014; Whittington, 2006). The three SaP constructs appear to accommodate core masterplan features:

- **Practitioners:** internal strategic actors (e.g. client, developer, design team) and external actors (e.g. subcontractors, local planning authority, local community, business, other stakeholders) involved in strategic masterplan decisions and practice.
- **Practice:** describes the routine or habitual 'bundle' of activities that contribute towards strategic objectives of masterplans, such as visioning, designing, planning, resource allocation, construction, as well as evaluation. Evaluative practices applied in masterplans include financial viability appraisal, landscape visual impact assessment and environmental impact assessments, 'lifetime homes' assessment, demographic and geological appraisal.
- **Praxis:** refers to the enactment of strategic practice by various practitioners through various activities. For evaluative practice this includes activities and material tools applied during an evaluation, such as: onsite or off-site surveys conducted by the design team or subcontractors; community events, design review or design team workshops with presentations, debates and 3D models; virtual modelling, formal and informal conversations.

Applying Whittington's (2006) conceptual framework, BC can be understood as an 'external' strategic practice (item 4 in Figure 3-2) which is applied by an external practitioner (BC

assessor, item D in Figure 3-2), and seeks to intentionally change 'internal' masterplan practices and practitioners (1-3 and A-C in Figure 3-2).

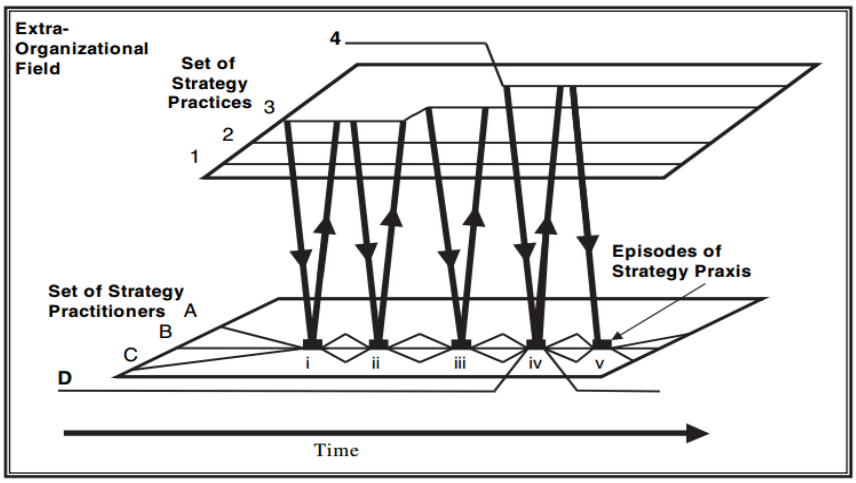


Figure 3-2. Integrating Practice, Praxis and Practitioners (Whittington 2006)

This is conceptualised more fully in Figure 3-3 where the BC assessor and practice are external to the masterplan actors and practices, but still act upon them. In addition, the conceptual framework allows for internal evaluative practice to also interact with external practices, as indicated by the arrow on the farthest right (praxis number 5) in Figure 3-3, pointing to a change in BC due to feedback to BRE from a BC assessor and masterplan design team.

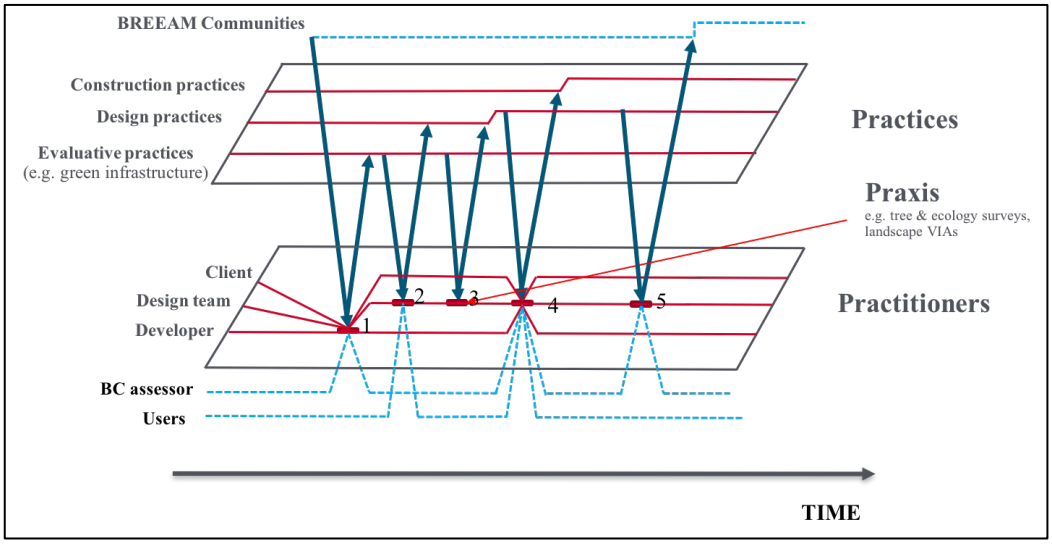


Figure 3-3 Masterplan process as a Strategy as Practice

According to SaP theory, practitioners or 'strategic actors' (Jarzabkowski and Spee, 2009) lie at the heart of how all strategies are formed, reformed, interpreted and responded to. The degree to which a standard has a 'tight fit', embedded within organisational practice, or is simply a peripheral 'tick-box' exercise has been linked to three 'C's: capability, commitment and coordination (Schweber and Haroglu, 2014; Timmermans and Epstein, 2010; Gagne et al., 2005):

- **Coordination:** The quality of lines of communication and liaison between client, developer, and standard assessor;
- **Commitment:** The organisational commitment (or lack) of provision of resources in terms of staff, financing and time assigned to include the standard within the design and construction process, and personal commitment (of lack of commitment) to sustainability principles and the scheme;
- **Capability:** Previous and present understanding, experience and resources invested in the scheme, sustainability aims and of other actors, including the degree of control practitioners have over the practice.

These factors were adopted in the study, during the initial coding of the qualitative case study data, to help examine GI evaluation within neighbourhood-scale masterplan processes, where BC has and has not been applied (see 3.3.5 in the method). This discussion suggests that the research would be particularly focused on evaluative practice as a unit of analysis and its enactment (praxis), as perceived by various masterplan practitioners who are engaged in the masterplan process, including the 'internal' masterplan actors (e.g. design team, client and / or developer), the 'peripheral' actors (e.g. ecology assessors, BC assessors, EIA managers and other consultants) and 'external' actors (e.g. regulators, local users, BRE, other stakeholders).

It should invite their perspectives on the definition and enactment of evaluative practice as 'praxis', considering:

- **What?** The definition and prioritisation of different evaluative intentions;
- **Who?** Who assigned evaluations to be conducted, carried them out and engaged with them in some way;
- **How?** The modes of evaluation that were adopted (e.g. workshops, expert on-site surveys, desk-based analysis), timing of evaluation; resources (human, financial, scheduling) attached to evaluative praxis, and how did the practice was perceived relate to design and construction decisions and/or material outcomes;
- **Why?** What were the underlying drivers behind why was a particular praxis undertaken in a certain way? Was BC perceived to play a role in shaping praxis/practice?

3.2.2.3 How would this research contribute to the theory?

One study (Egels-Zanden and Rosen, 2015) applied SaP to look at the formation of a sustainability strategy in a Swedish industrial company. The study commented that 'evaluative' strategic activities take place at the interface between top-down (intentional) and bottom-up (emergent) strategic processes, noting:

> "*Evaluative activities are activities that are informed by and that inform the strategy intentions: in other words, activities follow intentions and intentions follow activities*" (p145).

Egels-Zanden and Rosen (2015) suggest that evaluative activities have been a neglected area of SaP research. By focusing specifically on formal evaluative practice associated with GI and the impact of external strategic practice and practitioners (i.e. BC via BRE), this research would make an interesting contribution to SaP theory, as well as to empirical practice. There are four distinct elements that this research would potentially add to SaP theory:

- Exploring the relationship between evaluative practice with other strategic practices (masterplan design, construction and in–use practices) (Egels-Zandén and Rosén, 2015);
- Examining collaborative (internal and external) organisational strategic processes or 'strategic intermediation' (Medd and Marvin, 2007);
- Tracking the role of external 'extra-organisational' strategic practice (e.g. the BC standard) on 'intra' organisational practice and practitioners (Whittington, 2006; Vaara and Whittington, 2012); and
- Expanding the use of SaP into sustainable development and urban design fields by further clarifying sustainable neighbourhood design narratives, evaluative practices and strategic outcomes (Sharma and Kearins, 2011).

3.2.3 Selection of conceptual approach

Based on the potential contribution to the research question and to theoretical work, **Strategy as Practice (SaP)** offers a clear conceptual and analytical framework upon which to base an empirical review. This supports an exploration of the interplay between evaluation and masterplan design, construction and in-use practices as they are managed by different strategic actors. Aspects of Carmona's urban design theory, decision-making theory and wider literature,

remain of potential value to clarify the wider relevance of the research findings, and these are drawn upon in the discussion section (chapter 5) of the thesis.

3.3 Methods: a mixed-method empirical examination of evaluative practice

The following section outlines the research methods proposed to support an empirical examination of evaluative practice within masterplan processes, using SaP as the principle conceptual basis. The research examines the assumption that a standardised and embedded approach to evaluation can influence decision-making and outcomes. It is not looking to 'prove' this assumption, but to examine the potential relationship between BC and masterplan processes, contrasting the BC structure with evaluative practice as it is applied within a group of different sites.

More exploratory empirical studies, Grant (2003) argues, enables a richer examination and understanding of how people and systems interact and interrelate, more deeply than a more superficial sector-wide survey might offer for example. This research is therefore predominantly qualitative and interpretivist in nature as it will focus on the social interactions and processes of evaluation and decision-making. It also requires some degree of reflexivity – feeding emerging issues and understanding into the analytical process to refine the research question and analytical focus (Boell and Cecez-Kecmanovic, 2014; Grant, 2003). Many of the studies that applied SaP have adopted a variety of qualitative interpretative approaches to examine macro to micro-scale strategic practice, praxis and practitioners. SaP methods include literature reviews and single empirical or multiple case study examinations using various approaches, such as ethnographic observation of everyday activities (e.g. Sage et al 2012), critical discourse analysis of documentation and statements (e.g. Laine and Vaara, 2007), semi-

structured interviews (e.g. Grant 2003) or some combination of these methods (e.g. (Egels-Zandén and Rosén, 2015; Stensaker and Falkenberg, 2007).

This study undertakes a multiple case study comparative analysis, adopting a two-level method that incorporates a least difference pairing of cases within three different types of case (estate regeneration, urban infill and rural urban extension). Three English sites (of each type) applied BC certification and are contrasted with three sites (of each types) that have not. Jordan et al (2011) describe how the cross-case method is useful when there are only a limited number of projects available (as in this case). Yin (1984) also points out, case studies are like experiments, they do not seek to generalise the probability of an event based on a representative population sample, but rather to offer findings of potential theoretical value. This allows an examination of similarities and variance potentially arising from different practices across broadly similar masterplan processes (Langley et al., 2013; Jarzabkowski and Spee, 2009; Jordan et al., 2011). Focusing on the three constructs of SaP (Practitioner, Praxis and Practice), and empirical *a priori* aims within GI evaluation will help to clarify common elements for comparison between sites. This enables a more focused examination of how practitioners evaluate and reflect upon different evaluative approaches involved. For example, contrasting bottom-up and locally-defined evaluative practices with top-down and centrally-led formal evaluations, and more collaborative, participatory and transactional approaches (Egels-Zanden and Rosen, 2015; Kuhnert and Lewis, 1987). Fundamentally, SaP will help consider what impact BC may have had upon these different approaches.

In summary, the units of analysis are the evaluative practices and practitioners (actors) involved in masterplans (i.e. those who take an active part in various evaluative practices, how they are engaged, as well as those who are not involved but affected by it). The study looks at both the meso-scale practice of evaluation within masterplans, and the micro-scale enactment or praxis,

to consider what, how, and why different evaluative practices are enacted by which practitioner groups (e.g. design team, clients, local communities, regulators). In order to understand the concept of embedded evaluation, the study contrasts masterplan evaluative practices and key decisions (design, construction and in-use), as they relate to GI through a list of qualitative variables (Appendix 2, Table 2.1). The qualitative analysis was data rich and time intensive, so it was only possible to conduct the research on a selection of discrete GI evaluative episodes from a small group of six development sites. The research therefore does not seek to generalise the findings to all neighbourhood developments in the UK or more generally, but aims to clarify and contrast the practices undertaken in the six sites (Yin, 1984). The range of sites included may still offer insights of wider relevance however, but always with an awareness of site-specific contexts (historical, cultural, physical, political, economic, social, environmental).

Empirical studies are not without risks however, including participant and observer biases:

> "*Empirical research ... involves arenas where many powerful actors operate, where secretive strategies are part of the battle for competitive success, where data is scarce and produced in ways which are often difficult to penetrate, and where publicly available documentation and public talk is often deliberately distorted for the purposes of competitive advantage*." (Healey and Barrett 1990, p11)

To address these potential risks, qualitative data about evaluative practice was obtained using a variety of methods to 'triangulate' and cross-check data. The mixed method included: review of wider literature, semi-structured interviews, desk-based analysis of masterplan documentation, non-participant observation, and a proposed industry questionnaire or workshop (Table 3-1).

The mixed-method approach also involved interviews from a broad range of individuals from a range of different actor groups involved in each site masterplan. Using multiple sources of data recognises that, for example, in interviews participants may not always recall events in detail or may represent accounts as they think the researcher or organisation they represent expects. Written accounts, reports and planning applications may present a biased portrayal of evaluative praxis, focusing predominantly on a positive account of evaluative findings.

Table 3-1 Research aims, objectives and methods

Aim	Objectives	Methods and techniques
1. Evaluative practice	To obtain a broad understanding of the intentions and critique of evaluative practice as it is enacted within masterplan processes in general, and regarding GI evaluation in particular	Desk-based background research and early empirical case study analysis. *Techniques:* 1. Literature review 2. Informal and semi-structured interviews 3. Data records, maps and archives 4. Non-participant observation (e.g. workshops, site visits)
2. Evaluative embeddedness	To examine how GI evaluative practice interacts with masterplan decision making and other masterplan intentions	Tracking evaluative practice in 4 – 6 case study sites, with and without BC certification. *Techniques:* 1. Informal and semi-structured interview 2. Data records, maps and archives 3. Non-participant observation 4. Post occupancy review of GI (for completed case study sites)
3. Practice implications	To consider potential implications of findings from aims 1 and 2 for BC and GI evaluation in particular, and for masterplans in general	Examining common and distinct findings across the case studies and more generally. *Techniques:* 1. Cross-case comparison and analysis 2. Contrast empirical findings with wider literature 3. (If time) Multi-stakeholder consultation (e.g. stakeholder workshop or survey)

By combining both a broad range of interviews and documented evidence, with some supplementary site visits and observations, there was an opportunity to corroborate accounts,

fill-in any gaps, gaining a broader sense of how evaluative practice is enacted and perceived, as well as retaining a degree of openness regarding the potential drivers of evaluative embeddedness (Robson, 2011a, pp.166–167). Potential problems with accessing and interpreting data, such as missing an actor group in a case study site, as well as possible inconsistencies between methods are acknowledged and were actively reflected upon as the research was carried out. For example, it was not possible to obtain an interview with a developer on the 'RUE 2' site (see list of case study sites in section 3.3.3). Instead an opportunistic site visit was undertaken which included some informal dialogue with developer staff that meant it was possible to gain some limited observational insights regarding the developer's evaluative priorities.

A three–year research plan was formulated that comprised three phases: scoping, application, and appraisal (see Figure 3-4). Management and communication activities ran in parallel to the three phases with written and/or spoken outputs produced at key stages. These outputs contributed to both the production of the thesis and provided opportunities to share elements of the research with wider academic and practitioner networks, and invite their feedback.

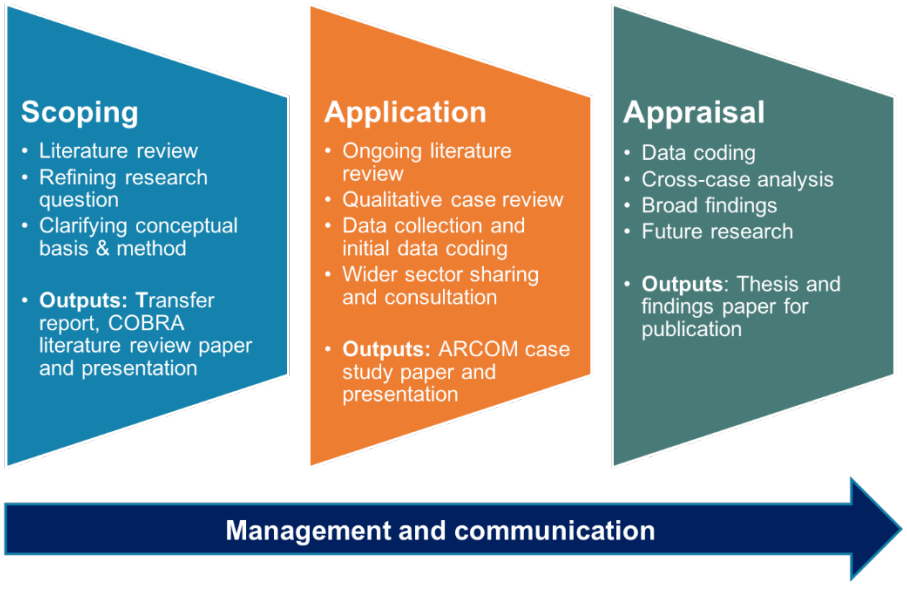


Figure 3-4. Research plan: Scoping, application, appraisal and management

The following section outlines each of the research activities in more detail that were carried out to address the three research aims and associated objectives: understanding evaluative practice; clarifying 'embedded evaluative' practice; and distilling practical and conceptual implications.

3.3.1 Literature review

The review of literature contributed to addressing all three research aims. An initial literature review was conducted in the first year of the research, and presented in Chapter 2 of this thesis. It examined peer-reviewed, policy and practitioner documentation in order to gain early insights into the language and research needs regarding urban design, masterplan processes, sustainable neighbourhood design and specifically the evaluation of neighbourhood quality. This established a broad framework with which to contrast the reported intentions of urban design with those aims and approaches regarding 'sustainable communities' contained in the BC technical manual. The review highlighted the lack of empirical research into the practice of evaluation and the assumption that evaluation was an embedded part of design processes. It also indicated some potential challenges that could affect the uptake and application of BC, providing a useful backdrop within which to situate the case study analysis. A summary paper of the early literature review, '*BREEAM Communities: challenges for neighbourhood-scale evaluation'*, was presented at the Royal Institute for Chartered Surveyors 'COBRA' conference in Toronto, in September 2016.

Further exploration of literature continued throughout the following two years to keep up to date with new literature as it was published and to consider, in more detail the application of the conceptual framework (SaP), to examine research relating to green infrastructure and evaluation, as well as literature regarding the four emerging thematic drivers: external drivers,

evaluative responsibility, negotiation and reflexivity. This later material provided a useful basis to contrast with the empirical case study data in the discussion in chapter 6.

3.3.2 Exploratory observation work and learning

In parallel to the literature review in the first year, some informal exploratory observational work was conducted, with the objective of improving the researcher's understanding of urban design evaluation and practice. Exploratory activities included:

- Participant support for a cycling design audit in the city of Reading, including gathering photographic evidence of the cycle routes' design and a participatory workshop with residents and cyclists;
- Non-participant observation of a social sustainability assessment client feedback meeting, in a housing estate regeneration project, London;
- Non-participant observation of a design review panel and site visit, London;
- Non-participant observation of a site visit by masterplan design lead and heritage consultants, London;
- Non-participant observation of a design workshop involving residents, housing association, and architect, regarding the design details of a masterplan phase, London;
- Non-participant observation of a public exhibition day for a masterplan proposal, Hampshire.

A number of public and training opportunities were also attended and participated in. These activities provided an important additional insight into contemporary academic, practitioner and policy discussions regarding research methods, urban design, masterplan processes and evaluation, as well as offered an opportunity to receive feedback and advice regarding presentations made at events (See Appendix 2, Table 2.3).

3.3.3 Case study site selection

The case study review addresses all three research aims, examining how evaluative and other masterplan practices (design, construction, in-use) are enacted in the 'real world', and how such practices are affected when BC certification is (and is not) applied. Flyvbjerg (2001, p.134) argues that a 'phronetic' approach, looking at empirical 'everyday' enactment of practice, is helpful to consider the role of the potential drivers underpinning that practice.

Case study research is described as useful when an 'a priori' specification already exists about how the area of research is constructed, where it can be triangulated through examining existing literature and cross-case analysis (Shenhar and Dvir, 1996, p.613). Here the a priori construct is partly defined by BC definition of GI evaluation (BRE, 2011), partly by reported challenges for embedding evaluation using a standardised evaluative framework that emerged from the literature regarding technical content and external drivers (see chapter 2), and partly by the SaP literature which focuses on interrelationships between practice, practitioners and the enactment of practice or 'praxis' (e.g. (Vaara and Whittington, 2012; Jarzabkowski and Spee, 2009; Whittington, 2006).

BC is designed to apply to a range of different neighbourhood developments, therefore to examine the influence of BC as a strategic tool, the case studies include three broad types of neighbourhood developments (estate regeneration, urban infill, rural-urban extension). Two cases were examined for each type, where one case site has applied BC and the other case where the standard was not practiced, resulting in a total of six sites overall (Table 3-2**)**

Table 3-2. Case study site data

	Estate 1*	Estate 2	Infill 1*	Infill 2	RUE 1*	RUE 2
Masterplan type	**Estate regeneration**	**Estate regeneration**	**Urban infill development***	**Urban infill development**	**Rural urban extension**	**Rural urban extension**
Location	Central London	Outer London	North East England	Inner London	South West England	South West England
Area	28 hectares	25 hectares	12.1 hectares	1.85 hectares	47 hectares	73 hectares
Dwellings	3,575 units	2,517 units	800 Units	257 units	1400 units	4,000 units
Density	125 dwellings per hectare	101 dwellings per hectare	66 dwellings per hectare	138 dwellings per hectare	30 dwellings per hectare	55 dwellings per hectare
Affordable units	50%	50%	25%	35%	30%	35%
Client (current landowner)	Local authority (Developer at completion)	Local authority (Developer and housing association at completion)	Local authority and private land holders (Developer at completion)	Regional authority (Developer and housing association at completion)	Local authority	HCA / developer
Masterplan timeframe	2010 - 2032	2011-2027	2011-2032	2012 – 2020	2011-2035	2012-2037

**BREEAM Communities applied on site masterplan*

In terms of case site selection, it is recognised that it would be impossible to identify a 'representative' sample of neighbourhood masterplan sites, as each site and project will have a unique set of contexts, actors, and requirements (Bassioni et al., 2004; Shenhar and Dvir, 1996). In addition, only a limited number of sites have applied or are in the process of applying the BC standard (16 sites in 2015/2016). Most the sites that have applied BC are in England, so it was decided to select only English sites to simplify the comparability across the different sites. As such, an element of opportunism was applied when identifying potential sites where the practitioners involved were willing to allow access to case study data and their personal views of the project. Nevertheless, a broad categorisation of masterplan types was developed in order to aid comparison and obtain a group of case studies that would offer a range of different contexts. For example, although there is no single definition of a 'typical' neighbourhood-scale (Carmona, 2010; BRE, 2014) a minimum scale of development was considered (over 100

residential units), involving some mix of uses, amenities and services, to capture a neighbourhood-scale rather than single building or street-scale.

The case study selection criteria included the following range of contextual factors:

- **Size and density of site**: hectares, number of units (minimum 100 residential units);
- **Mix of use:** principally residential sites with some commercial, industrial, and / or retail space and amenities (e.g. public transport facilities), private and public realm;
- **Timing:** all sites are at a similar masterplan stage, with at least one phase complete;
- **Site history:** new build and regenerated sites, brownfield (previously developed) and greenfield sites;
- **Location and landscape**: English sites with some regional variation. Urban, suburban, rural land-types;
- **Site ownership**: local authority, housing association, developer, investor, or community-led masterplan;
- **Application of BC**: three sites where BC was applied, and three where the standard has not been practiced.

Some early desk research and observational visits were carried out on potential candidate sites, to assess the status of the developments and the potential accessibility of practitioners to engage with in-depth interviews. It was decided to anonymise the final list of sites, as two of the eventual 48 interviewees asked for confidentiality and it seemed more straightforward to anonymise the whole set to protect all parties concerned.

Whilst none of the selected case sites are ‘representative’ of all English neighbourhood-scale masterplans, they do provide a cross section of different types of neighbourhood developments

at a similar stage of development. As such the data obtained and lessons drawn may offer relevant lessons for other UK sites of a similar type, and for BC more generally.

3.3.4 Semi-structured interviews

The purpose of the semi-structured interviews was to examine how different practitioners perceived evaluative practices, including the intention of the practice, how it was enacted and responded to, and how they engaged with it (e.g. commissioned, conducted, or sought to influence it), as well as their perspectives of different practices, other practitioners and BC. This is valuable in helping to capture their understanding, commitment and capacity to enact an evaluative practice and gauge the perceived impact of that practice on masterplan design, construction and in-use decisions.

In developing the interview schedule, there was a need to avoid bias in terms of overly leading or closed questions (Robson, 2011a). An initial draft schedule, information sheet and consent form were developed in consultation with the project team and the university ethics committee, which was piloted with three interviewees on two separate sites (Estates 1 and 2). This test process resulted in the questions being refined from twenty questions to twelve, referring to the site context, actors involved, masterplan processes and evaluative practices (See Appendix 2, Table 2.3 and 2.4). The consolidation of questions was mainly the result of learning that interviewees required more time and opportunity to respond to those questions that most resonated with them. Fewer questions allowed more room for more open discussion, creating space to actively listen and seek further information to better understand why they responded in a certain way to a question. This meant there was less expectation to cover all the questions in the interview protocol that the *researcher* wanted to understand, and prioritise those areas that the interviewee felt able and willing to talk about i.e. more depth and less breadth. There

are also a few pictures that interviewees were invited to respond to, but it became clear that the responses to these might not provide useful insights regarding the analysis of evaluative practice as it was applied to each case study site.

The interview questions applied SaP as the conceptual basis, using the three theoretical constructs to frame the questions: practitioner, practice and praxis (see Appendix 2, Table 2.3 and 2.4). SaP offers a useful analytical framework to examine the research questions i.e. seeking to understand the connections between different strategic activities (e.g. evaluation), practitioners and outcomes (e.g. design decisions). The interview schedule was particularly designed for those involved in implementing evaluative practice and representatives from the masterplan design team. However, other practitioners were interviewed as they were involved or affected by the evaluative practice (developer, clients, local authorities, residents and local businesses). Up to 10 interviewees were identified for each site, across the masterplan actor groups, to seek a broad account of the perspectives from the different actor groups involved in the process. Ideally, an individual would have been to have interviewed from each group but securing participation could be challenging or that actor group was not involved in the masterplan process (e.g. no housing association was involved in RUE 1). Some flexibility was retained in how the questions were presented to account for different actors and the timing of the development (Table 3-3). It is recognised that individual interviewees might not present a full or 'true' picture of evaluative practice or masterplan processes (Silverman 2011), and only offer discrete perspectives of the practices and decisions made. Greater balance was therefore sought by obtaining a range of interviews from various actor groups (or 'practitioners' as SaP calls them) involved in the sites, seeking additional corroboration from data sources that recounted evaluative events and outcomes, in terms of reports, online forum, and other relevant publications about a site, as well as through non-participant observation where possible.

Table 3-3 Interviews conducted by actor group

Actor group	Estate 1	Estate 2	Infill 1	Infill 2	RUE 1	RUE 2	
Developer	√	√	√	√	O	√	
Local authority	√	√	√	√	√	√	
Housing association	√	I	I	√	n/a	√	
Urban designer	√	√	√	√	√	√	
Landscape architect	√	√	√	√	√	I	
EIA assessor / ecologist	√	√	√	√	√	√	
Arboriculture (tree) surveyor	√	I	√	√	I	I	
Community facilitator	√	√ x 2	√	√	I	√	
Resident / neighbourhood group	√	√	√	√	√	√	
BC assessor	√	n/a	√	n/a	√	n/a	
Employers agent / other consultants	I	I	I	I	√	√	
Engineer	I	I	√	I	I	√	**Total**
Count	**10**	**8**	**7**	**7**	**7**	**9**	**48**

Key: √= interviewed; O = opportunistic conversation; I = invited but not available; n/a = not applicable

The semi-structured interviews were conducted after a scoping exercise was undertaken to clarify the key actor groups for each case study site. Each interview was recorded, anonymised, transcribed and then coded, to examine how GI evaluative practices and strategic masterplan decision-making were enacted and perceived (see 3.3.5 below).

3.3.5 Interview data analysis: deductive and abductive coding of interview data

The aim of applying codes to categorise the qualitative interview data was to clarify the technical practice of evaluation, as well as the *probable* emergent drivers of 'embedded evaluative' practice from the various participant accounts of praxis. The first round of coding of the interview data included a directed or 'deductive' set of codes to categorise the interview data, using codes loosely tied to SaP and literature review elements, before moving into a more abductive approach:

> "*Deduction proves that something must be; induction shows that something actually is operative; abduction merely suggests that something may be*" (Charles Pierce, quoted by (Locke et al., 2008, p.907)

The deductive coding started with two preliminary themes and a small sub-set of codes attached to each theme. The first theme related to the *technical details* of evaluative praxis, this included: the actors involved, methods used (e.g. on-site, off site), and timing (which masterplan stage a praxis took place). The second thematic set of codes classified the interviews according to the different *enabling or constraining factors* that affected actors' relationship with evaluative practices. This was based on the three C's and external drivers that had been described as explaining the 'fit' or embeddedness of evaluative practice in wider literature (e.g. Schweber and Haroglu, 2014; DiMaggio and Powell, 1983), as outlined in chapter 2 and above. These initial codes were then expanded to over 100 codes, through a reflexive process of adding, refining, and removing those topics that appeared to be commonly associated with how evaluative processes were applied in the six sites (Fletcher, 2017). This large set of codes was then abductively consolidated into four broad themes or drivers that appeared to explain how the influence of evaluative practice over masterplan decisions was constrained or enabled:

(i) ***External drivers*****:** the rules, norms and mimetic cultures that influence evaluative practice (Lounsbury, 2008; DiMaggio and Powell, 1983);

(ii) ***Responsibility*****:** the mode of agency (iterative – past; practical evaluative – present; and projective – future), evaluative intention, and control over the structure and use of evaluative information (Battilana and D'aunno, 2009, Jarzabowski, 2005);

(iii) ***Negotiation*****:** the processes of integration (consolidation) and prioritisation (distribution) of different evaluative intentions between practitioners (Filzmoser et al., 2016; Holland, 2014);

(iv) ***Reflexivity*:** the learning, interpretation and decision-making response to evaluative information (Flyvbjerg, 2001; Schön, 1983).

This abductive approach draws from a critical realist perspective that recognises there will be incomplete information about what has taken place. The critical realist researcher seeks to distil down the common themes that *potentially* indicate the drivers of evaluative practice, rather than suggesting that these drivers are *definitive* or *inferred* factors (Danermark et al., 2001; Fletcher, 2017). Langley et al (2013) refer to the potential of abductive coding to make connections between theoretical principles of SaP and the empirical accounts that emerge from qualitative data. In this instance, an open abductive approach allowed for a consolidation of both empirical and reported drivers and therefore helped to address the first two research aims, of understanding the process and clarifying drivers of evaluative embeddedness (Table 3-1), see **Figure 3-5.**

There are some risks associated with this reflexive process of coding data however. For example, 'observer drift' can occur where there are small changes in how the researcher interprets particular codes over time, affecting how the codes are applied to different data sets (Robson, 2011b), i.e. the transcribed interviews. This issue of changing interpretation is problematic in that it is an inbuilt part of the reflexive abductive process. The process of coding can be improved through intra or inter-observer checks on the coding categories applied (Robson, 2011b). In this instance, the researcher applied an intra-observer approach, returning to earlier coded interviews to ensure a consistent approach was applied once a clearer categorisation had emerged.

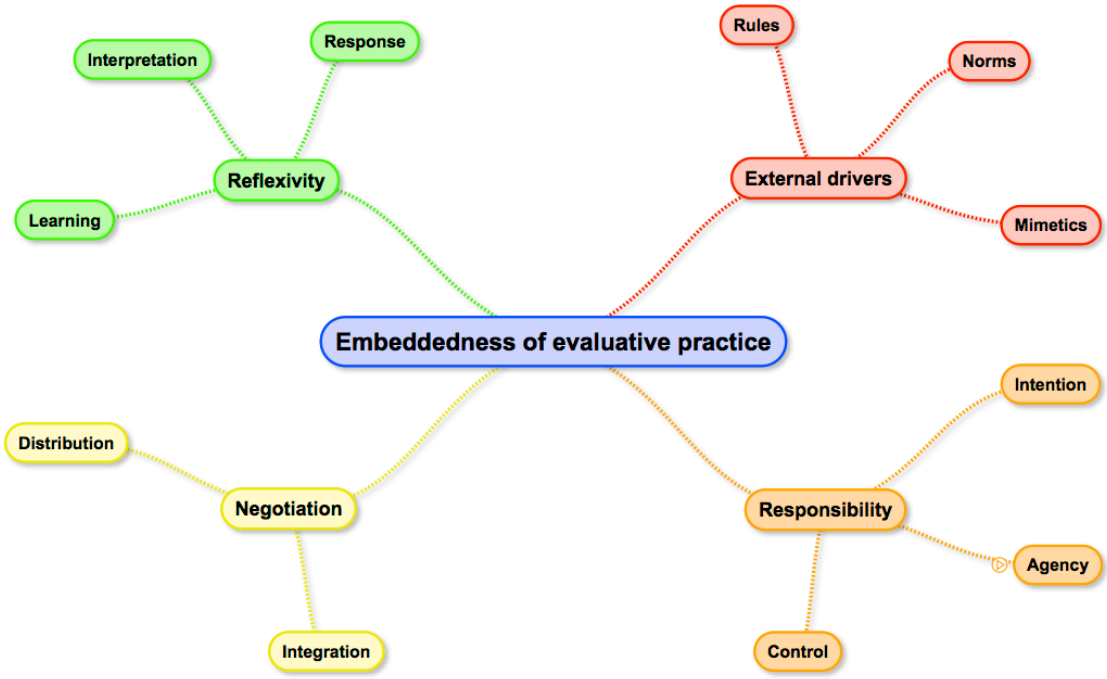


Figure 3-5 Constraining and enabling drivers that shape evaluative practice

3.3.6 Desk-based analysis of public documents

The aim of this method was to cross-check interview accounts with case study documentation (such as landscape plans and community consultation reports) and relevant background publications. This helped to further clarify the technical details in the sequencing and enactment of the green infrastructure evaluative practice, praxis, and role of practitioners, as well as offer reported associations with evaluative practice and outcomes, regarding design, construction and in-use decisions. The analysis of public documents helped to address the first and second research aims about the enactment of evaluative practice and the embeddedness within masterplan processes (Table 3-1).

A range of documents were analysed in each case study site, based on a range of 'evaluative episodes', which encapsulates a time-bound series of evaluative praxes (enactments) which relate to a specific aspect of GI (e.g. tree survey), where GI here is understood to refer to multi-

functional and multi-scalar ecosystem services (Mell, 2017). Each episode is examined and chronologically mapped out, using publically available planning documents that referred to key evaluation and decision-making events (e.g. outline plans, detailed plans, design review minutes, design access statements, evaluation reports such as ecology and landscape surveys, consultations). These documents were vital to supplement gaps in the interview data, to clarify when practices and decisions were undertaken, how and by whom.

It was sometimes hard to extrapolate clear connections between masterplan decisions taken and evaluative practice through documentation. On some occasions a report would refer to a specific evaluative practice with a direct attribution and recommended response, but this was not true for all the evaluations studied, and did not capture more informal evaluative practices (e.g. one-to-one conversations and emails) that might have occurred. Linking documentation to interview data filled in some of these gaps but it was clear that any assumed relationship would always be an abductively plausible connection rather than deductively certain or inductively inferred.

3.4 Summary

The application of the SaP conceptual framework (of practice, praxis, and practitioner) in combination with a mixed-method qualitative case study review provides a means to help chronologically map out and analyse the complex collaborative process of neighbourhood masterplans and the role of evaluation within that process. Retaining a critical realist perspective (Fletcher, 2017) in the coding of the interview data means that the empirical findings, that emerged from the individual cases (presented in chapter 4) and from the cross–case comparison (presented in Chapters 5 and 6), are always situated within an awareness of

certain constraints. Critical realism supports the abductive abstraction of the *likely* drivers underlying the relationship between evaluative practices and other masterplan practices, but does not definitively infer that all the drivers that affect evaluation in all masterplan processes have been identified, or that these drivers will apply to other types of strategic processes more generally. Nevertheless, the mixed-method cross-case comparison applied does help to address some of the risks involved, in terms of cross-checking the process and creating a rich account of the range of perspectives of the process that may be of wider relevance (Henneberry and Parris, 2013). Further research involving masterplan practitioners (see chapter 7), as well as regarding evaluative practices in other strategic projects and processes, would help to clarify the wider relevance of the thematic drivers that have been identified here.

Chapter 4: Case reviews: analysing evaluative practice

4.1 Introduction

The following chapter presents a series of thirteen evaluative episodes from six masterplanned neighbourhood developments, located in England. Each episode outlines a series of evaluative praxes (enactments) relating to a specific aspect of GI. For example, one episode looks at the evaluation of a green roof design (episode 9, Infill 2), and seeks to clarify the various intentions by different actors (such as ecological connectivity, providing invertebrate habitats, building insulation, reducing rainwater runoff, aesthetic value), how the evaluative data obtained was used, interpreted and responded to by various actors.

As outlined in the methods, each evaluative episode is situated within the context of the six case study sites. The sites were originally selected to offer a range of distinct neighbourhood masterplan types: estate regeneration, smaller urban infill sites and rural urban extensions. Each site was at a similar stage of construction, with at least one phase complete or near completion Each case study provides a short background to the history, masterplan process and green infrastructure on a site, to situate the analysis of the evaluative processes within a broader historical, procedural, and physical context. This context is an important backdrop to support the interpretation of interviewees' statements, observations and planning documents. The background description is followed by a short overview of the evaluative practices undertaken, including BC, on the three sites where it was applied, before presenting two or three evaluative episodes that took place during the implementation of the masterplan for that site.

The interviewees were identified to offer a range of practitioner perspectives about the masterplan, from the practitioner or 'actor groups' that were identified in the literature about masterplan processes (e.g. Bell, 2005; Carmona et al., 2001) and based on early pilot interviews (in Estate 1 and 2), as participants of potential relevance to masterplan evaluation and decision-making.

The episodes were selected from each site, as they were referred to by several of the interviewees involved in each case study as being of interest in illustrating how GI was evaluated in the masterplan (**Table 4-1**). Each episode is first mapped out using the SaP analytical framework of practice, praxis and practitioners (Whittington, 2006), based upon the perspectives of strategic actors, obtained in the interviews, alongside analysis of public documentation, to cross-check events and key decisions. This was supplemented by site visits and some opportunistic conversations to provide additional triangulation of events. A short narrative of each episode is presented, to clarify how particular practices were enacted and who was involved.

Table 4-1 Overview of case studies and episodes

Case study	Interview count	Episodes
Estate 1*	10	1. Inclusive view of park 2. Neighbours street view 3. Overshadowing of gardens and public space
Estate 2	8	4. Courtyard block trees 5. Trees and allotment external to block
Infill 1*	7	6. Soft SuDS 7. Street trees
Infill 2	7	8. Link to local park (SINC) 9. Green roof
RUE 1*	7	10. Link to ancient woodland (SINC) 11. Soft SuDS
RUE 2	9	12. Street trees 13. Amphibian wildlife corridor

**BREEAM Communities applied.*
SINC = Site of Importance to Nature Conservation; SuDS = Sustainable Drainage Systems

The episodes are then analysed in relation the four thematic drivers that appear to affect the 'embeddedness' of evaluation within masterplan design and construction practices, as outlined through the coding of interview data:

- **External drivers**: the rules, norms and mimetic cultures that influence evaluative practice;
- **Responsibility:** the mode of agency, evaluative intention, and control over the structure and use of evaluative information;
- **Negotiation:** the processes of integration (consolidation) and distribution (prioritisation) of different evaluative intentions between practitioners;
- **Reflexivity:** the learning, interpretation and decision-making response to evaluative information.

These thematic drivers are quite interconnected within each episode and specific case site, for example external rules can require a more projective mode of agency (the evaluator needs to take account of future needs) and steer the negotiation of different evaluative intentions (e.g. some species are legally protected). Each case study, and associated episodes, is therefore examined separately to facilitate the analysis of those interconnections, before drawing together potential shared findings across episodes in the cross-case analysis in chapter 5.

4.2 Estate 1

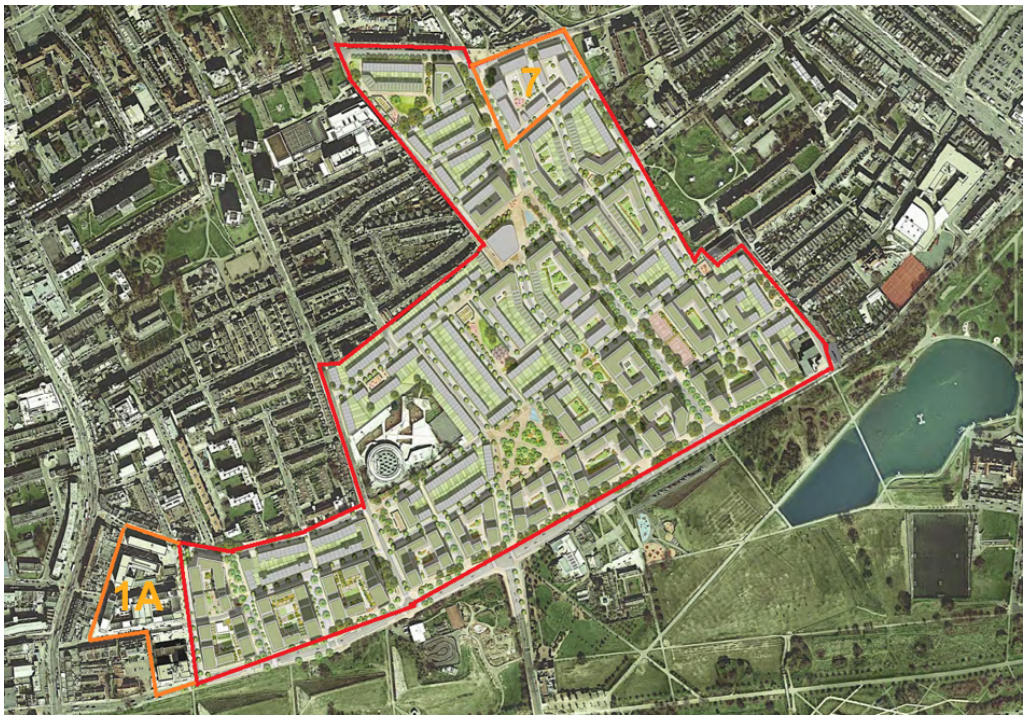
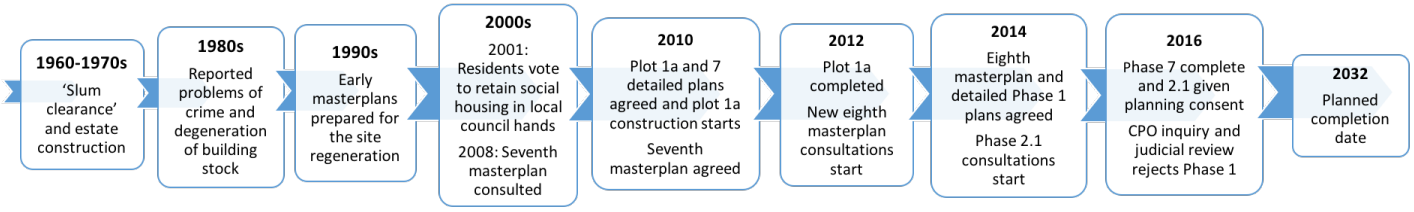


Figure 4-1 Outline Masterplan (Transport Assessment report, 2014)
Bottom left and top right boxes indicate two early plots (1a and 7)

Site data

Masterplan type:	Estate regeneration
Area:	28 hectares
Number of units:	2,758 units, to be increased to 3,575 units
Density:	125 dwellings per hectare
Affordable units:	50%
Location:	Central London
Client (current landowner):	Local authority (Developer at completion)
Masterplan timeframe:	2010 – 2032

Key dates



4.2.1 Brief site background

The original estate, named hereafter 'Estate 1', took around ten years to build between the mid-1960s and 70s. Designed by the local authority's in-house architect, it replaced Victorian streets as part of the 'slum clearance programme' taking place across South London and sought to increase the density of housing on site, providing homes for around 7,000 people. It used the Jespersen panel system to construct the pre-fab concrete residential buildings (Estate 1 Engineer's planning report, 2014). This panel system was subsequently found to be structurally weak in terms of load bearing (Currie et al., 1987), but did use the Parker Morris interior space standards (Affordable Housing Statement, 2012) and offered large areas of landscaping (Interviews 37, resident; and 16, architect). Planning documents indicate that 78% of residents were tenants living in socially rented accommodation, with the other 22% living in private rental and ownership (Statement of Community Involvement, 2016).

4.2.1.1 Masterplan process

Described by some as the archetypal 'failed estate', Estate 1 was subject to over twenty years of debate about the possibility of an estate-wide regeneration. The local authority invited residents to vote in a ballot about the redevelopment in 2001. It was felt there was some confusion, however, about what people were being asked to vote for (Interview 2, community facilitator; and 37, resident). The residents voted against the stock transfer and building demolition by most (73%) residents, based on a 73% resident turn out (Council Report, 2005, para 2.3 p2). However, the local authority decided to go ahead with the transfer and redevelopment in 2005 (Interview 28, regeneration officer; and Council Report 2005). The local authority argued this was based on the estate's insufficient provision of 'decent' homes, and lack of capacity of the local authority to continue maintain the estate (Council report, 2005,

para 8.4). A resident and architect both felt that the old buildings needed to be knocked down, describing structural problems, leaky buildings, decaying pipes, and poor insulation (Interviews 37, resident and 16, architect). The resident felt that the cost of refurbishment (for the local authority and private leaseholders) meant the local authority would have to spend a disproportionate amount on the estate, which would impact unfairly on residents elsewhere in the rest of borough (Interview 37, resident). Local campaigners and others offered an alternative view. They felt the local authority had intentionally failed to invest properly in the estate, and had run the buildings down before taking the decision in 2005 to go ahead with the stock transfer and redevelopment (Lees, 2014). The resident conceded that the decline and disrepair of the estate had been poorly addressed by the local authority, despite a long-standing knowledge of the problems (Interview 37, resident).

It is within this challenging historical context that a masterplan vision began to be formulated in 2007. Since 1996 the estate had seen numerous iterations of estate-wide redevelopment masterplans, with anecdotal reports that this was the seventh plan:

> "*It's really difficult actually to find out precisely how many there are. I believe that there was seven.*" (Interview 16, architect).

The plan was formulated by an urban design practice contracted by the local authority in 2010. The first plot (site 1a on Figure 4-1) to be demolished and rebuilt was already under construction prior to the 2010 masterplan receiving planning consent. The plot was completed in 2012, with a second pilot site (plot 7) completed in 2016. After the construction of these two plots was underway, the local authority decided to adopt a less piecemeal approach and in 2012 selected a new housing association / developer to manage the redevelopment as a single project.

The housing association commissioned a new urban design practice to produce an eighth outline masterplan. This revised plan was given planning consent in 2014, alongside the detailed design plans for a 'first development phase'. The urban design practice describes the 2014 masterplan as building upon many elements of the seventh plan, but with adaptations, including regarding the green infrastructure layout (described in more detail below). **Figure 4-2** outlines the main steps leading to the preparation of the 2014 masterplan.

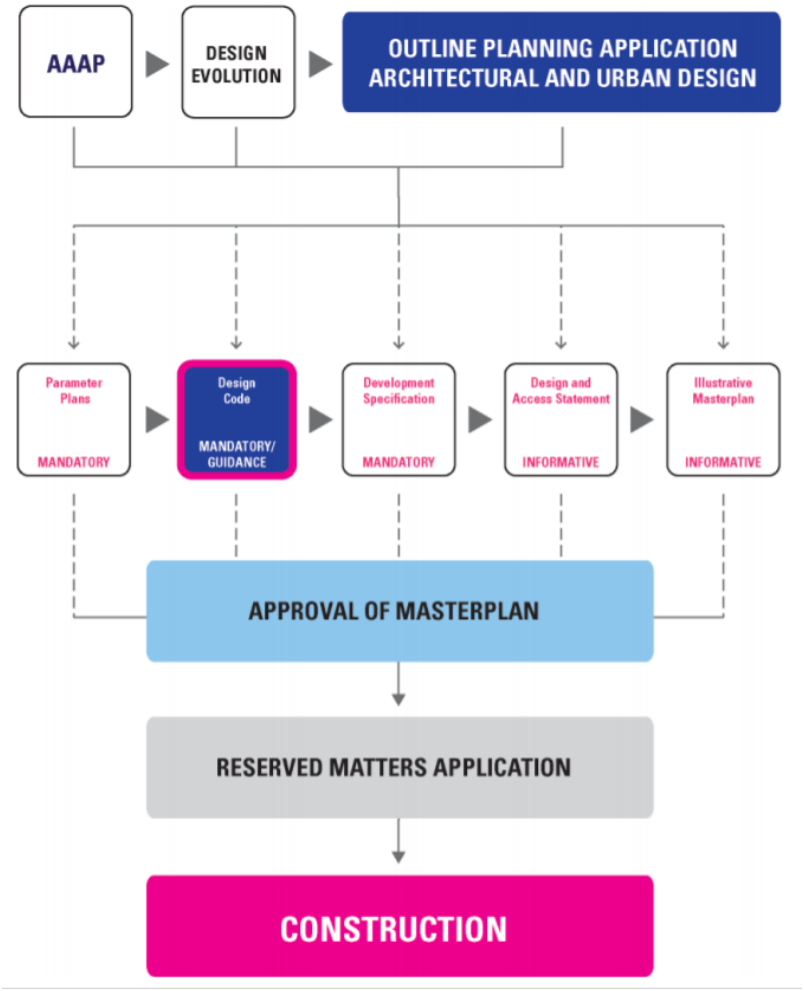


Figure 4-2 Overview of pre-planning documents and key stages (Source: Design and Access Statement, 2014)

4.2.1.2 Green infrastructure context

The site benefits from its proximity to a large park which runs alongside the southern edge of the estate. The estate has ten smaller parks, as well as playgrounds and squares, allotments, verges, and young and mature trees across the site. There is also a large amount of impermeable and hard surfaces. The existing area of green spaces were estimated at the time of 2010 masterplan to be 56.02ha (or 138.4 acres), which includes the park (46.07ha). The new 2014 masterplan reconfiguration proposed a slight loss of green spaces, reducing the total open spaces by 1.77ha (4.37 acres), mainly due to an increase in density of residential buildings (Landscape plan, 2014, p30). The 2014 masterplan also reconfigured the 2010 masterplan's layout for GI, changing from a concept of three 'green fingers' running north to south through the estate, to a smaller set of diffuse green spaces. The community facilitator and landscape architect suggested that the new configuration would improve landscaping, usability and layout, with greater access to green spaces for more people in the estate and re-connecting the estate to the wider community (Interviews 2, community facilitator; and 7, landscape architect).

4.2.2 Formal evaluative links to BREEAM Communities and Green Infrastructure

A broad analysis of formal evaluative practices conducted during the design phase of the masterplan was undertaken to look at whether they addressed questions relating to GI. Appendix 3. Table 3.1 summarises the findings and shows that most practices involved some consideration of GI. Two key evaluative practices, quantity surveying and financial appraisal, were not publically reported. According to the interviews, these evaluations did refer to questions of GI costs however (Interviews 4, EIA assessor; 7, Landscape architect; 8, Housing association / developer; 16, design team lead architect; 28, local authority regeneration officer).

The BC standard was proposed by the design team who had designed the most recent masterplan. **Figure 4-3** outlines the scoring system applied to the site. The BC assessor was from the same company as the design team and predicted an interim score of 'Very Good' with 69.2 points, very close to an 'Excellent' BC score of 70 points and above.

BREEAM Communities Credits **Summary**

Identifier	Issue name	Responsibility	Have mandatory standards been met?	Credits assumed	Credits available	% of credits achieved	Issue weighting	Issue score	Category score
Governance									
GO 01	Consultation plan	Client	Yes	1	1	100%	2.3	2.32	6.4
GO 02	Consultation and engagement	Client (consultation team)	Yes	1	2	50%	3.5	1.74	
GO 03	Design review	Architect	N/A	2	2	100%	2.3	2.32	
GO 04	Community management of facilities	Client	N/A	0	3	0%	1.2	0.00	
Social and economic wellbeing - Local economy									
SE 01	Economic impact	Client	Yes	2	2	100%	8.9	8.88	10.8
SE 17	Labour and skills	Client (Contractor)	N/A	1	3	33%	5.9	1.97	
Social and economic wellbeing - Environmental conditions									
SE 03	Flood risk assessment	Engineering	Yes	2	2	100%	1.8	1.80	8.4
SE 04	Noise pollution	Engineering	Yes	1	3	33%	1.8	0.60	
SE 08	Microclimate	Engineering	N/A	3	3	100%	1.8	1.80	
SE 10	Adapting to climate change	Architect	N/A	3	3	100%	2.7	2.70	
SE 13	Flood risk management	Engineering	N/A	2	3	67%	1.8	1.20	
SE 16	Light pollution	Engineering	N/A	1	3	33%	0.9	0.30	
Social and economic wellbeing - Social wellbeing									
SE 02	Demographic needs and priorities	Client	Yes	1	1	100%	2.7	2.70	10.5
SE 05	Housing provision	Client	N/A	1	2	50%	2.7	1.35	
SE 06	Delivery of services, facilities and amenities	Architect	N/A	3	7	43%	2.7	1.16	
SE 07	Public realm	Architect (Landscape Architect/Urban Design)	N/A	2	2	100%	2.7	2.70	
SE 09	Utilities	Engineering	N/A	1	3	33%	0.9	0.30	
SE 11	Green infrastructure	Landscape Architect	N/A	2	4	50%	1.8	0.90	
SE 12	Local parking	Architect	N/A	1	1	100%	0.9	0.90	
SE 14	Local vernacular	Architect	N/A	1	2	50%	0.9	0.45	
SE 15	Inclusive design	Architect	N/A	0	3	0%	1.8	0.00	
Resources and energy									
RE 01	Energy strategy	Engineering (energy)	Yes	3	11	27%	4.1	1.11	15.3
RE 02	Existing buildings and infrastructure	Architect	Yes	2	2	100%	2.7	2.70	
RE 03	Water strategy	Engineering (water)	Yes	1	1	100%	2.7	2.70	
RE 04	Sustainable buildings	Architect	N/A	4	6	67%	4.1	2.70	
RE 05	Low impact materials	Architect	N/A	3	6	50%	2.7	1.35	
RE 06	Resource efficiency	Architect	N/A	3	4	75%	2.7	2.03	
RE 07	Transport carbon emissions	Engineering (transport)	N/A	1	1	100%	2.7	2.70	
Land use and ecology									
LE 01	Ecology strategy	Landscape Architect (ecologist)	Yes	1	1	100%	3.1	3.15	7.7
LE 02	Land use	Architect (Landscape Architect/Urban Design)	Yes	1	3	33%	2.1	0.70	
LE 03	Water pollution	Engineering (water)	N/A	2	3	67%	1.0	0.70	
LE 04	Enhancement of ecological value	Landscape Architect (ecologist)	N/A	1	3	33%	3.1	1.05	
LE 05	Landscape	Landscape Architect	N/A	5	5	100%	2.1	2.10	
LE 06	Rainwater harvesting	Landscape Architect (ecologist)	N/A	0	3	0%	1.0	0.00	
Transport and movement									
TM 01	Transport assessment	Engineering (transport)	Yes	1	2	50%	3.2	1.59	10.1
TM 02	Safe and appealing streets	Architect (Landscape Architect/Urban Design)	N/A	4	4	100%	3.2	3.18	
TM 03	Cycling network	Architect (Landscape Architect/Urban Design)	N/A	1	1	100%	2.1	2.12	
TM 04	Access to public transport	Architect	N/A	2	4	50%	2.1	1.06	
TM 05	Cycling facilities	Architect (Landscape Architect/Urban Design)	N/A	2	2	100%	1.1	1.06	
TM 06	Public transport facilities	Engineering (transport)	N/A	1	2	50%	2.1	1.06	
Innovation									
Inn	Innovation		N/A	0	7	0%	7.0	0.00	0.0
								Final BREEAM Score	**69.2**
								BREEAM Rating	**VERY GOOD**
								Excellent Score >70	

Figure 4-3. BREEAM Communities step 1 outline phase, interim score (Urban design team, 2014)

The Design and Access Statement (DAS, 2014) contains a commitment to undertake plans and activities relating to all the BC issues except four. The DAS abbreviates what is written in the BC technical manual regarding the GI issue (SE 11), defining point one as "*1. Consultation has taken place to understand the desired uses of green space"* (Sustainability statement, 2014, p30). The BC manual states that consultation is about understanding, not only desired **uses**, but also residents' wishes for '***design, quantity*** *and* ***location*** *of accessible natural greenspace*'. In terms of the GI issue (SE 11), the design team made a commitment to obtain two credits out of a possible four. They do not seek credits where the GI plan required '***reasonable justification***' as to why plans deviate from the residents' expressed desires (BRE 2011). It was not explicitly clear why they did not seek those credits, except that perhaps the developer recognised that they had not consulted with the residents in a way that allowed for green space refinements at the outline stage.

Table 3.1 in Appendix 3 provides a gap analysis of issues where BC could bring additional clarity, including the principle of 'inclusive visual amenity' in SE 11 (GI plan) and LE 01 (Ecology Strategy). The potential implications for BC emerging from the following three evaluative episodes are discussed at the end of this case study site, and further considered in the cross-case analysis in chapter 5, and the discussion in chapter 6.

4.2.3 Estate 1: Evaluative episodes using SaP and matrix analyses

Various GI issues were raised during the interviews when participants were asked their views about the evaluation of GI during the masterplan. This included changes in landscape layout, the retention of trees, social housing views over the park and overshadowing impact for

courtyards and private amenity spaces. Three evaluative episodes are considered below that represent these issues and their associated formal (and informal) evaluative practice. Each episode is presented sequentially as they arose within the masterplan process:

- Episode 1: Landscape visual impact assessment and inclusive visual amenity (plot 1a, phase 1)
- Episode 2: Trees, visual amenity and wider neighbourhood inclusion (phase 2.3)
- Episode 3: Daylight, sunlight, overshadowing assessment and wellbeing (phase 1)

The following analysis is based on interviews with **nine** individuals from distinct 'actor groups'[9] that commissioned, conducted, engaged with or were influenced by the masterplan process. The analysis considers individual perceptions of specific praxes, and practices in general, alongside analysis of documented accounts from those groups that were publically available.

4.2.4 Episode 1. Landscape visual impact assessment and inclusive visual amenity

This episode contrasts the formal evaluation of landscape visual impact assessment (LVIA) and the evaluation of community engagement in Plot 1a and phase 1 of the Estate 1 masterplan, when residents called for a socially inclusive view of the local park.

[9] Developer (Housing association) (Interview 8), local authority (planning dept.) (28); Design team's Landscape Architect (7); EIA assessor / ecology (4); Tree surveyor (9); Community facilitator (4); Resident (37); neighbouring resident (14); BC assessor (6)

4.2.4.1 Episode 1 as a strategic evaluative practice

Inclusive access to the park view was raised as an evaluative concern by a resident interviewee who was actively involved in a residents' organisation on the estate, independent of the local authority. The resident contrasted the evaluation of the park view with an earlier evaluative practice. In the earlier community consultation, the local authority and design team had convened various training and participative events for residents during an early 'plot 1' pilot development, prior to the 2010 masterplan being agreed. One event involved residents being asked their preferences for the internal layout for the plot 1 flats. A full-size mock-up of a flat was created inside a community hall and residents were invited, over a series of weekends, to walk around and vote for the layout they preferred:

> "*We asked residents to vote which one they liked and it turned out a third, a third, a third.…So actually that's what we built*" (Interview 16, architect).

This first evaluative praxis is represented by the **praxis 1** box in **Figure 4-4** below[10].

[10] Figure 4.4 presents reported practice, praxes and practitioner involvement, based on interviews and public documents. It is a simplification of events, consolidating practices in 2010 and 2014 masterplan processes. The upper dark arrows indicate external practices influencing internal masterplan practices and practitioners. The dotted lines indicate the separate practices and engagement of separate actors. When a particular practice is enacted by a practitioner, the small 'praxis' box is indicated, along with those actors who also engaged with the enactment. The dotted circle indicates an open and reflexive evaluative response to residents regarding the internal layout options. The full circle indicates a closed response, which does not result in a change to design or construction practice. Each individual praxis is numbered in the chronological order that they took place.

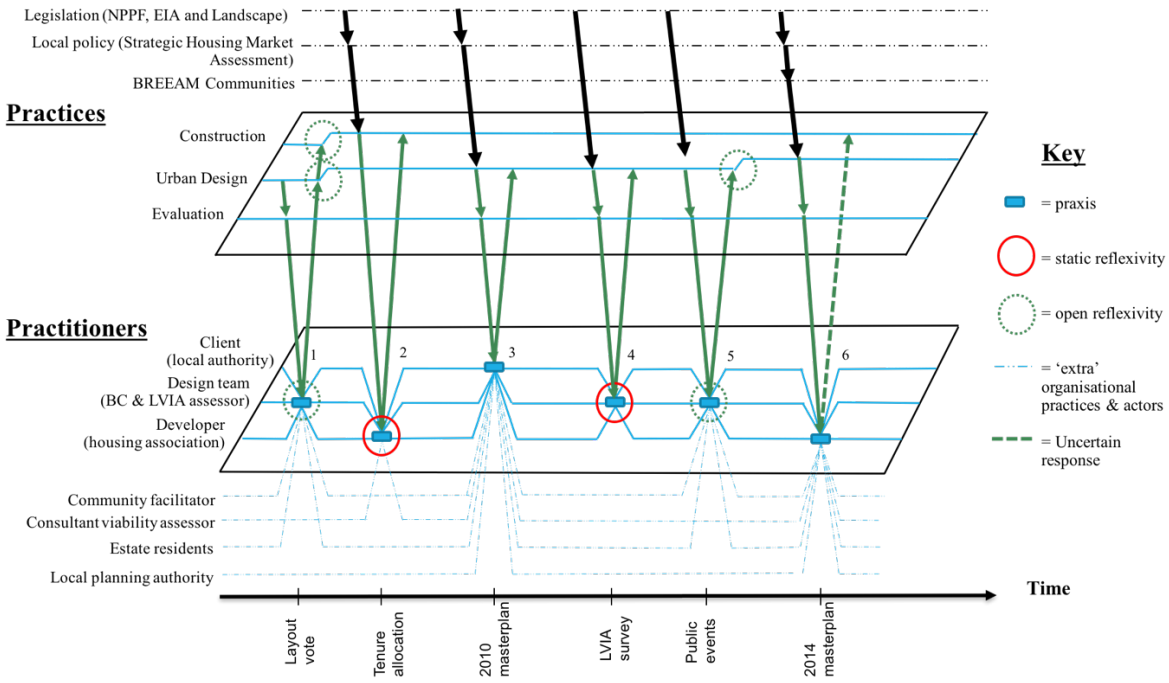


Figure 4-4. Episode 1 as a SaP: evaluation of visual amenity (adapted from Whittington, 2006)

The second praxis in this episode (praxis box 2) was an internally conducted evaluation regarding flat allocation. The residents were not involved and no social flats in plot 1 were allotted a view over the park. The allocation of tenures without resident involvement is shown using a full circle around **praxis 2** in Figure 4-4 to indicate it was a 'closed' reflexive praxis. The resident described their loss of trust due to this praxis, linked to their sense of developer bias toward private tenants:

> "*The private goes up when the social housing is done so that the private isn't living with a building site while the social housing goes up, OK? But what they did was, the result of that was that the private housing got built in the park and the social housing got built behind*" (Interview 37, resident).

A Landscape Visual Impact Assessment (LVIA) was conducted in 2012 by a landscape architect in the design team, in preparation for the first phase of the 2014 masterplan **(praxis 4,**

Figure 4-4). They did not consult directly with residents, depicted by a closed circle on the fourth praxis box in Figure 4-4. The LVIA was reported as a formal part of a wider Environmental Impact Assessment (EIA) which considered the impact of the development on two 'receptors': the potential effects on *landscape;* the effects on *people*'s *visual experience* of that landscape (O'Connor 2015). The formal practice of LVIA structures people as a single group and does not account for the distributive impact for different types of people and did not require local consultation to assess people's experience.

Separate to the LVIA praxis, various general resident consultations events and activities were conducted **(praxis 5,** Figure 4-4**).** Based on their experience of the earlier plot 1 events, the resident interviewee indicated they and other residents had called for some social housing to have views over the park during these events. In interview both the design team and local authority indicated that, in response to these resident requests, the principle of an inclusive park view would be applied (Interviews 7, landscape architect; and 28, regeneration officer).

The 2014 masterplan documents offer differing accounts of this commitment however (**praxis 6**, Figure 4-4). The Statement of Community Involvement writes that the first phase will include '*target rent homes on the park edge'* (p.3) and the Affordable Housing Statement refers to '*target rent and shared ownership homes*' (p.14) having a view (see **Figure 4-5**). Neither these nor the interviews specify the proportion of affordable homes involved, leaving this question either intentionally or unintentionally undecided. The Landscape Statement refers to ensuring 'nearly' every home has a view of an open space (p.75) but makes no reference to the park or tenure arrangements. There were no references in the Design and Access or Sustainability Statements to this commitment. An inclusive view also appears to be subject to financial concerns. Although the viability assessments were not public, a barrister representing private

tenants in a Compulsory Purchase Order (CPO) inquiry, referred to an estate-wide Equality Impact Assessment (2005). The 2005 assessment suggested the park view carried a real estate uplift value. The barrister argued that this 'added value' (for current and future homes) meant the local authority would be unable to pay existing residents sufficient compensation for the loss of their properties, making the phase unviable:

> "*On page 15 of the equality impact assessment there is a reference to higher value sites (e.g. overlooking the park). So, in my submission this is a significant, substantial and high value part of the site which is not deliverable and the CPO must fail. It simply isn't viable or deliverable now.*" (Barrister, CPO inquiry, 14 Oct 2015)

There was no planning condition requiring the developer to deliver a certain proportion of affordable units with a park view and so this issue remained unresolved.

Figure 4-5 Room with a view (Source: Landscape Statement, 2014, p37)

4.2.4.2 Episode 1. matrix analysis

A complex web of interactions emerges from this episode, where evaluative practices are affected by four drivers: external drivers, differing degrees of evaluative responsibility,

negotiation of priorities and reflexivity. Figure 4-6 presents a matrix analysis that combines the SaP framework with the four drivers that appeared to enable and constrain how evaluative practices were structured, enacted and responded to in this first episode. The following analysis considers the role of each thematic driver in turn.

External drivers

The evaluative practice in this episode was shaped by 'extra-organisational' regulative, normative and mimetic drivers. For example, public engagement was generally not supported by the rules, guidance or mimetic practice relating to the formal conduct of an LVIA so the public opinion regarding the park view was not reflected at that early design stage. EIA requirements are defined in an EU Directive (1987) and the UK Town and Country Planning Act (2010, updated in 2015), neither of which refer to local consultation in LVIA. The European Landscape Convention (2000) prescribes certain principles regarding landscape policy and management but makes no specifications regarding public engagement during an LVIA. The UK LVIA Guidelines (2013) contain certain 'non-prescriptive' principles of conduct and suggests an initial 'scoping' assessment but does not require local consultation. The rules and guidelines therefore leave it to a developer's discretion as to whether to consult publically when conducting an LVIA. In addition, none of these guidance or rules refer to the concept of 'social inclusion' with regards to access to visual amenity.

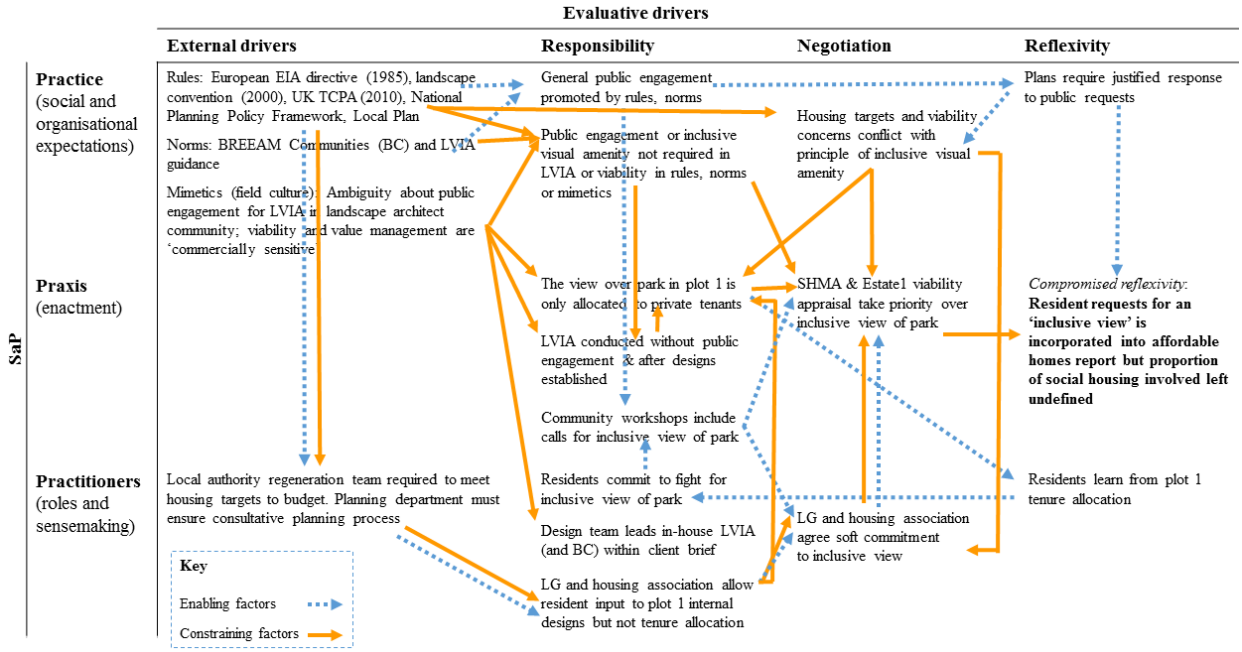


Figure 4-6 Matrix analysis of Episode 1 - Evaluating visual amenity

In terms of the normative guidance provided by BC, the masterplan commits to evaluate Landscape (LE 05) and GI (SE 11) (Sustainability statement 2014, p30, Figure 4-3). LE 05 encourages a landscape evaluator to consider ecological impacts, and SE 11 calls for inclusive access to green spaces, and notes how 'good quality' GI can make places 'visually stimulating'. Neither BC issue considers *who* accesses the visual amenity of GI however. Thus, BC does not expect evaluators to consider the social distribution of the impact of the development on visual amenity.

Planning requirements and BC do encourage the general accommodation and response to resident views. These consultative requirements however came in direct conflict with housing targets and viability concerns that the local authority was expected to meet. The authority needed to ensure the developer could sell a certain (unknown) number of higher value private properties, including those properties which benefitted from a park view. This constrained the local authority's agency to respond to the residents' request for an inclusive view.

Therefore, the rules, norms and mimetic factors external to the masterplan process did little to enable the residents in their campaign for an inclusive view.

Responsibility

A dominant driver running throughout this episode is of the 'practical evaluative' agency adopted by the local authority and housing association to meet differing evaluative intentions within and between different actor groups. The local authority was faced with the need to encourage the developers (housing association) to take on the project and build sufficient private units to finance the project, so they could meet (external) government housing targets.

The residents reflexively learnt from the earlier enactment of evaluative practices in plot 1 and earlier. These past experiences help ferment their 'projective' agency to press for an inclusive view of the park. This agency was enabled by regulatory and normative requirements that required community engagement and accountability, but undermined by a normative and mimetic culture for prioritising questions of cost and conducting LVIAs late in the design process without resident engagement.

Both the initial LVIA and BC evaluations were conducted in-house by the same design team contracted by the developer, posing certain perceptions of risk regarding conflict of interest. An evaluator who is paid by those they are assessing may face pressure from their client regarding how different evaluative intentions are prioritised. Despite referring to the projective intention for providing an inclusive view of the park the original design team were ambiguous about the numbers of homes involved, as this was not an area they carried significant control over.

Negotiation

Figure 4-4 refers to a separate evaluative agent, a consultant viability assessor, because this emerges as a dominant evaluative practice that impacts decisions throughout the masterplan. This dominance was alluded to by the EIA assessor, landscape architect, housing association officer, plot1a designers, regeneration officer, and resident who all referred to persistent financial questions and pressure from clients and contractors (Interviews 4, 7, 8, 16, 28, 37). The EIA assessor noted how there were regular meetings reviewing the cost and delivery of the project, which led to refinements in design decisions. Financial viability was continually appraised and updated by the same consultant throughout the process (Interview 4). In contrast, landscape evaluation came later in the design process, was more intermittent, and involved different peripheral contractors at each phase. The late timing and lack of local engagement in the LVIA suggests there was limited opportunity for the LVIA praxis to influence design decisions. These differences in evaluative continuity give an indication of the commitment attached to financial questions, in comparison with the evaluation of landscape amenity. It was these ongoing financial questions that were therefore likely to be prioritised over the delivery of the inclusive view of the park, which was left unspecified.

Reflexivity

The residents had been involved in consultative processes for a number of years, so their position was also situated within a certain reflection on past events, including the local authority overriding the residents' vote to retain public ownership of the estate. This historical experience, combined with the experience from plot1, had compounded their projective agency to fight for visual amenity:

> "*One of the major things that I would tie myself to railings for is that people now living in social housing have a view of [the] Park*" (Interview 37, resident).

The design team were keen to show their responsiveness to residents for planning purposes but it was their clients, the housing association and local authority, who dominated decision-making and reached a 'practical evaluative' response, referring to the principle of inclusive visual amenity without making specific commitments about the proportion of affordable homes involved.

In this case, BC seems to fit what Schweber and Haroglu (2014) describe as a 'bolt-on' exercise, where the standard was used to legitimise rather than transform practice. The episode points to two particular gaps and challenges for BC, regarding: dominant or deeply embedded strategic evaluative intentions (i.e. finance); and responsibility for validation. First, although BC seeks to rebalance intentions towards social and environmental ends, it explicitly avoids evaluation of financial intentions. This is problematic as it is the very area BC is seeking to counterbalance and, in this episode at least, carries greater evaluative embeddedness or influence over decision-making. Second, once planning consent is granted, the site constructed and handed over to the developer (housing association), it is uncertain whether the local authority retains sufficient control to affect the delivery of affordable homes with a park view. Simply introducing some form of post-construction assessment to track the fulfilment of the commitment would not of itself ensure that a failure to follow-through would be addressed. Follow-through of evaluative recommendations depends on a clear expectation of a response, including through the assignment of responsibility and resources to enable that response.

4.2.5 Episode 2: Trees, visual amenity and wider neighbourhood inclusion (phase 2.3)

Episode 2 is linked to Episode 1 in that it also considers the visual amenity provided by GI. However, this empirical example looks specifically at the visual amenity provided by the trees (and buildings) for residents living on a neighbouring street at the north-west corner of the site. This analysis particularly focuses on the evaluation of the trees in the production of the detailed designs for phase 2.3, which drew on the 2014 outline masterplan.

4.2.5.1 Episode 2 as a strategic evaluative practice

Figure 4-7 portrays the events around the evaluation of the visual amenity from trees for neighbouring residents as an SaP.

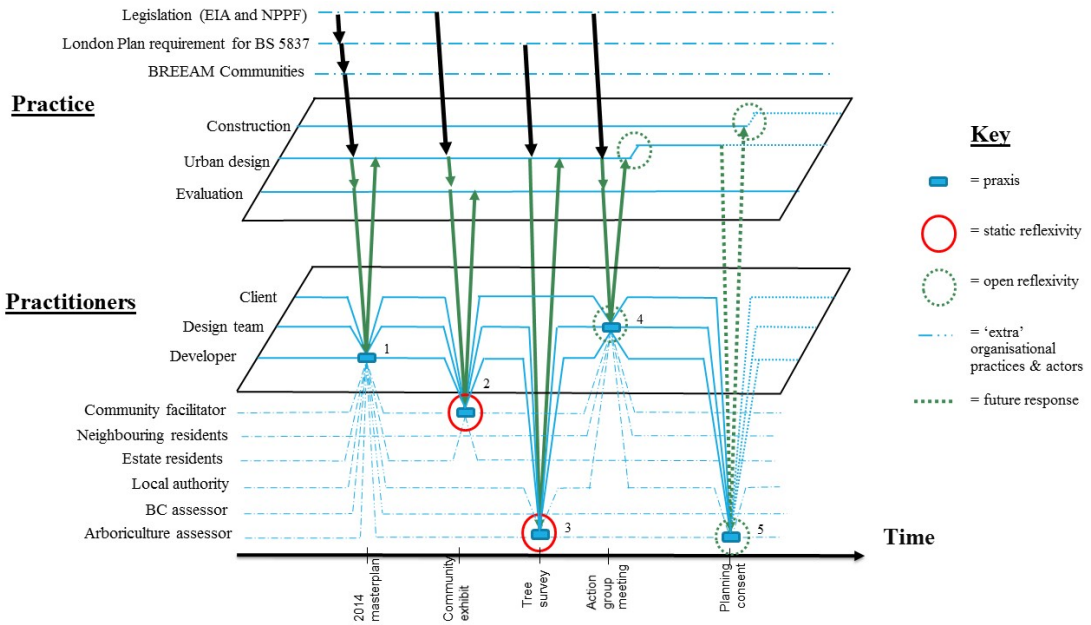


Figure 4-7 Episode 2 as a SaP - neighbouring visual amenity

Figure 4-7 indicates 'static' detailed design consultations with residents where there was limited reflexive evaluative response in relation to GI design **(praxis 2).** An arboriculture survey proposed to remove three trees in phase 2.3 at the northwest corner of the site, to 'facilitate the

development' **(praxis 3,** Figure 4-7**).** There was no community engagement as a part of that technical evaluation. The arboriculture assessor was clear that arboriculture surveys, like LVIA, need not involve resident input and that the guidance (the British Standard, BS 5837) did not require it. Whilst the arboriculture assessor said they might attend consultative events organised by the design team they were wary of the high emotional value some people attached to trees and thus cautious about engaging with residents at all:

> "*If we're asked to feed into any events through the design team sure. It's very dangerous to talk to local residents. Things can get reinterpreted very quickly 'I spoke to the tree guys and he said…' you know. So, we tend to be robotic so that things don't get misrepresented.*" (Interview 9, arboriculture assessor)

The assessor felt the main purpose of the arboriculture survey was a technical one, to identify which trees to keep and which to remove. They also did not refer to assessing any ecological or landscape impact (although assessing the impact of trees on landscape amenity is recommended in BS 5837).

Local concern about the loss of the three trees at the end of their street (and the change in building massing) was only raised late in the formal planning consultations. It had not been raised during earlier consultative activities conducted in the phase 2 planning process. The neighbouring residents on the road overlooking the NW corner only actively engaged when a local architect, who lived on the same street, created a visual depiction of the view, showing the view before and after the development (see **Figure 4-8**).

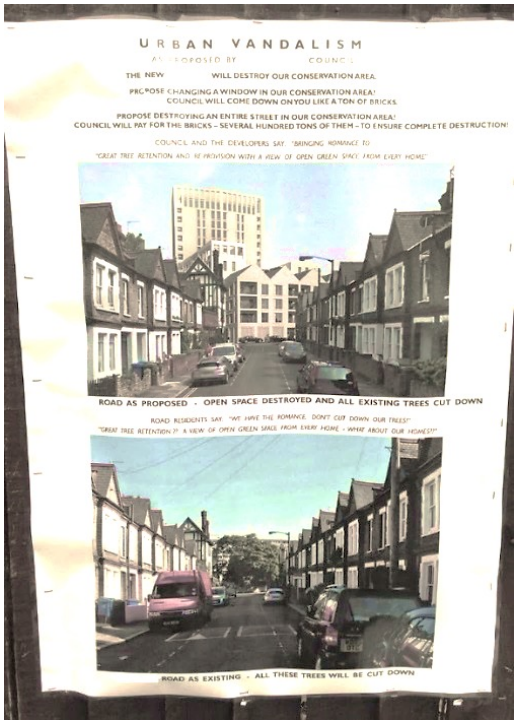


Figure 4-8. Local architect's representation of the Phase 2.3 proposal

Another resident from the street described how, until that point, they had had no sense of what was going on, despite information being available through the local authority's website:

> "*Of course the council will say they had things on the website, it's been visible to the world for many years, all the planning applications are up there. But frankly, I consider myself an intelligent person most of the time, but I had no awareness of it at all. Nothing." (Interview 14, neighbouring resident)*

They felt the council was mainly concerned with consulting estate residents and had found it difficult to find information online. The neighbouring resident acknowledged they had received a leaflet invitation to a weekday daytime exhibition event located on the estate. They had felt the timing was prohibitive, as they worked in central London and that it did not seem targeted to them as they did not live on the estate so they decided not to go. An estate resident described the hundreds of planning documents involved that people were expected to access and respond

to. They felt this was problematic for public engagement, especially if people were not regularly involved and did not know how to filter through the information to find or understand what might be relevant to them. The resident commented that it was only when they proactively engaged did they gain more of a sense of what was going on in the masterplan process (Interview 37, estate resident).

The poster produced by the local architect (Figure 4-8) drew resident local attention to the proposal. It used impassioned language about 'urban vandalism', how all the 'trees would be cut down'. As a result, a small group of the street's residents met and set up a temporary action group to lobby the developers and local authority. This appeared to be principally led by the local architect, "*as a knowledgeable architect-type person I think he drove that conversation*" (Interview 14, neighbouring resident). After an article in the local press and informal meetings with councillors, the design team agreed to organise an additional meeting with the action group (**praxis 4,** Figure 4-7). The meeting was initially confrontational but became more constructive:

> "*We just gave them hell. And they were both taken aback. Because they hadn't realised that there was anybody really objecting… we were so angry. But we were attacking the wrong people, because they weren't, the architects weren't the people who hadn't been telling us. It was the council and [the housing association] who hadn't been telling us*." (Interview 14 neighbouring resident)

At the meeting the design team agreed to consider move back the proposed building a small distance, providing more space for street trees (Statement of community involvement 2016, p68-70). This was reiterated in the DAS submitted in the planning application (**praxis 5**, Figure 4-9).

Figure 4-9 Revised view (DAS 2016, p59)

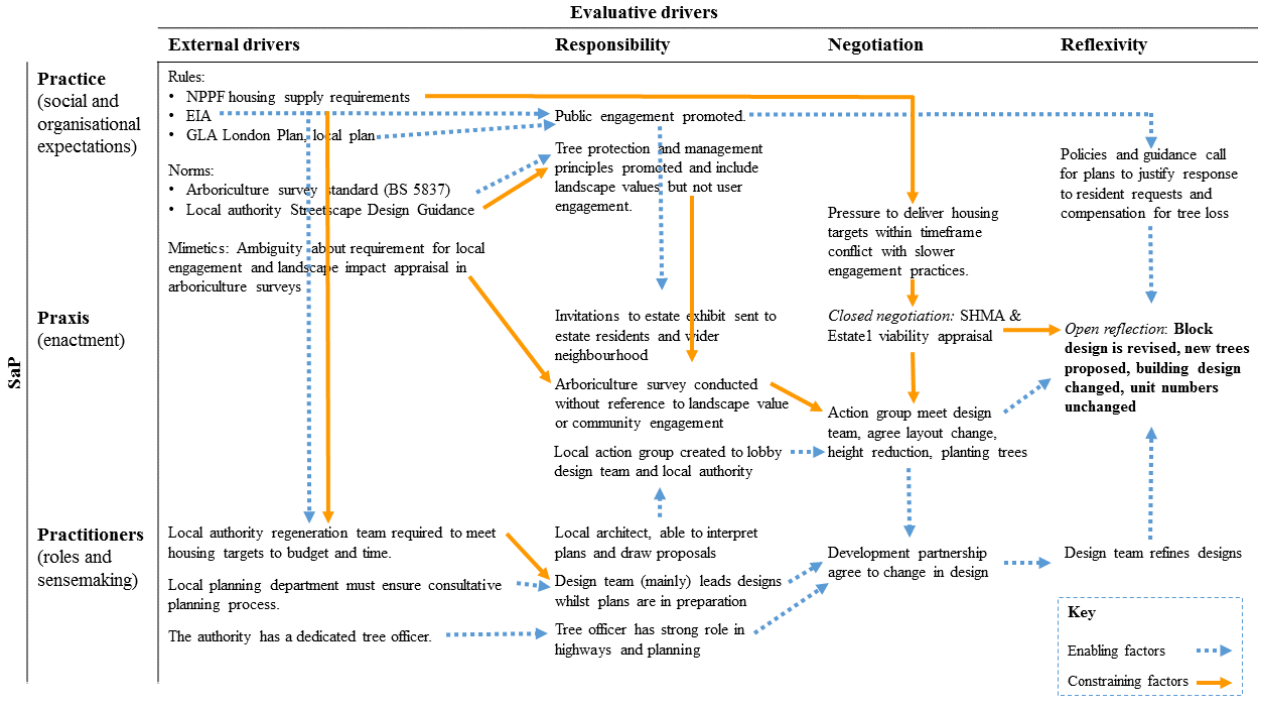
4.2.5.2 Episode 2. Matrix analysis

This episode highlights an example of *projective* agency by the neighbouring residents and local authority and *iterative* agency adopted by the design team in response. Figure 4-10 depicts a matrix analysis of the episode combining SaP structure with the four thematic drivers.

External drivers

The mimetic practice for various formal evaluative activities underpinned why the visual impact to neighbours was not addressed earlier in phase 2. Like LVIA, the normative and cultural requirements around arboriculture surveys did not specify a need for estate resident or wider neighbourhood engagement regarding the evaluation of trees. The transport appraisal did not directly account for the contribution of trees to visual amenity. The utilities appraisal described trees as a 'removable' obstacle to the delivery of necessary services.

Figure 4-10 Matrix analysis of Episode 2: Visual amenity for neighbours



The local authority did have strong guidance in place promoting trees, as a result of having learnt from a past experience on another estate where the authority had failed to take into account residents' value of trees:

> "*It is hugely controversial. They don't want to see the same thing happen as [the other estate]. I think trees weren't the priority in the [other] redevelopment and there were quite a lot of good quality trees on the site. People were up in arms about the development. I think that informed [the local authority*]." (Interview 37, estate resident).

The authority had created specific guidance about tree installation and maintenance in a Streetscape Design Manual. The local authority officer commented that new trees were not being installed correctly by contractors, reinforcing the need for clear guidance around street tree management, with clear tree pit requirements:

> "*We've got a situation here where a lot of the trees are dying because they haven't been correctly installed."* (Interview 28, local regeneration officer)

This policy context increased the incentive for the design team to respond to the local action group. The design team responded reflexively and just in time, with revised plans that were influenced both by the local authority policy support for trees and by local pressure.

Responsibility

The design team knew the local authority tree officer and felt that the officer was particularly influential in terms of planning decisions and with the Highways department, resulting in the council's strong requirements regarding trees (Interview 7, landscape architect). This in turn meant the design team were more likely to pay attention when local concerns were raised about trees.

The local action group had benefitted from the skills of the local architect in interpreting the plans and they had additional projective agency because of the local authority's political commitment to promote trees and the design team's awareness of that situation. The local action group felt that becoming a more formalised group had also made them more visible in the process, as one resident noted, reflecting on how they had been treated prior to establishing the group:

> "*I don't think they paid any attention to us. Because one of the reasons, going back, is we're not a residents' association…they look on the list, say, oh, who should we engage with? Tenants' association? Maybe [x] society, because they're a known body? These people. These people. No, not the people who are actually living in the street…we don't*

exist, because we don't have a group with a chair." (Interview 14, neighbouring resident).

Negotiation

Like episode 1, the design team had to negotiate the evaluation of trees with financial intentions, which were a dominant factor in decision-making:

> *"In truth trees are so insignificant they are often an afterthought...The biggest financial problem is not mitigating [for the loss of] the trees. It's the wrong trees affecting the site footprint, if that means a loss of units that's going to hit the purse strings.*" (Interview 14, arboriculture assessor)

Time pressure also seems to have limited opportunities for this issue to be raised earlier through the general community engagement activities. Both, the community facilitator and developer (the housing association) indicated that the local authority had been keen to drive through planning consent as fast as possible:

> "*[the local authority] were very clear from the outset they wanted to have planning in ASAP… I have never seen a planning application on this scale going so quickly*" (Interview 8, housing association)

This may have impacted the opportunities for wider neighbourhood engagement. The detailed phase documents were submitted for planning approval the same month that the local action group formally met with the design team. The action group felt it was almost too late to really influence change as so many conversations had already taken place. The estate resident made a similar comment, that the design team had already had various conversations with the local

authority so that by the time they formally submit the plans to the planning process the proposal is already fairly fixed:

> "*The architects are always saying to us; all these things have been thought through with the planning department. So they're kind of, working with the planning departments to come up with the parameters, the parameter plan. And then they go into the detail, knowing that planners are going to say yes, because they've already been discussing it with them in great detail*." (Interview 37, estate resident).

Reflexivity

There was an element of chance in this episode. The presence of a resident architect who identified the issue just within the planning timeframe, meant there was still an opportunity for the design team to respond to the action group. The timing and agency of the local action group, meant they could engage with the formal planning consultation process, supported by planning guidance. The design team iteratively refined the footprint and massing of the buildings in response to the neighbouring residents' views, without having to compromise on the number of units provided or other key requirements. If the neighbouring residents had engaged a few weeks later, it is unclear whether the formal evaluative processes would have identified the issue, or whether the local authority tree officer would have picked it up through reserve matters. If the neighbours had not engaged, it looks likely that the phase designs could have resulted in a more negative visual amenity and environmental impact on the street.

Regarding BC, it seems to have made little contribution to the evaluative practice in this episode. The DAS (2016) for Phase 2 only refers once to BC, regarding the '*outline planning stage',* and makes no reference to BC in relation to evaluation of the detailed phasing or

specifically to trees. Within the BC manual there is no reference to arboriculture surveys. BC refers directly to trees in three non-mandatory issues[11]. Of relevance to this episode, **SE 12 - Local Parking** recognises trees give a visual buffer to parked cars. Nowhere in BC does it consider that trees (and other GI) could create a visual buffer to roads or indeed to tall buildings however. So even if the design team had further reflected upon BC during the detailed design of Phase 2, they would not have been provoked by BC to ensure trees were incorporated on the street corner.

4.2.6 Episode 3: Wellbeing and overshadowing assessment (phase 1)

This episode focuses primarily on an overshadowing assessment that took place during the first detailed phase of the masterplan and the perceived impact on resident wellbeing. It examines the evaluative practice and praxis of overshadowing assessment, but also touches on the assessment of impact on internal spaces (daylight and sunlight) as the assessments were conducted in conjunction.

4.2.6.1 Episode 3 as a strategic evaluative practice

Figure 4-11 maps out the strategic practice of the episode. Two sets of daylight, sunlight and overshadowing assessments were conducted as a part of the preparation of the outline masterplan and detailed first phase documents to be submitted to the local planning authority (**praxis 3, Figure 4-11**).

[11] 'LE 05 - Landscape' refers to planting native species, and consideration of the water requirement of trees; 'SE 08 – Microclimate' recognises trees can offer summer shading; SE 12 – Local Parking, trees act as a visual buffer to parked cars.

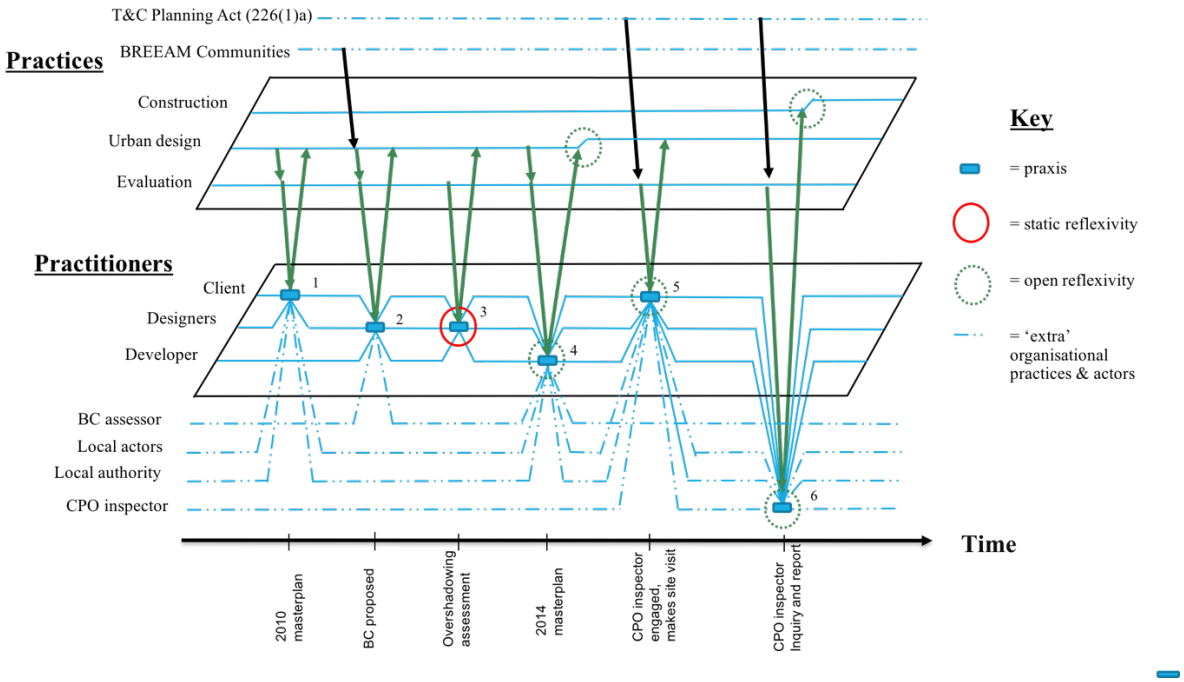


Figure 4-11 Episode 3 as a SaP: Evaluating overshadowing of GI

The assessments used 3D models of the proposed buildings, testing two seasonal daylight patterns, spring and autumn equinox (21 March and 21 Sept), to visualise and calculate the degree of light that reaches windows, internal and outdoor spaces at different times of day and year (**Figure 4-12**).

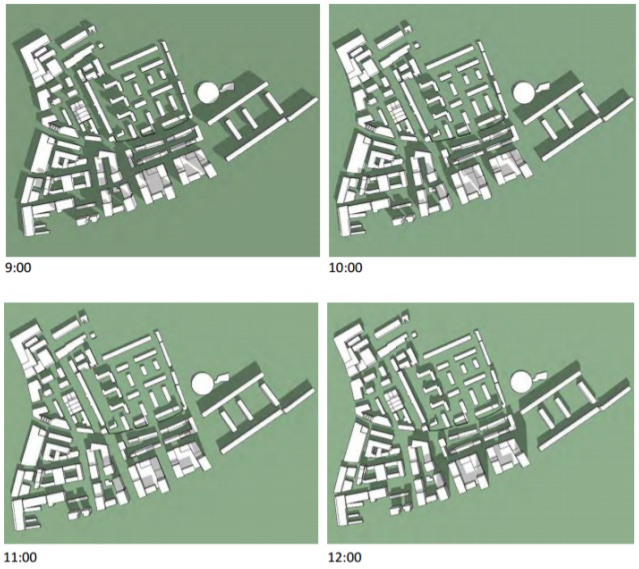


Figure 4-12 Overshadowing assessment of phase 1 on existing properties at various times, 21 March 2016 (Env. Statement, Vol 2, p800)

The findings of the overshadowing assessment for Phase 1 were presented in an assessment report, which found that two (out of four) courtyards and 46 (out of 49) private gardens failed the winter season overshadowing test i.e. more than half of the total space received less than two hours of sun in the winter:

> "*The main reason for failure is sunlight being obstructed by towers located on the south side of each block and narrow courtyards as well as gardens being open to the northern half of the sky*" (Env. Statement Vol 1, 2014).

The summer models indicated better results, where only two private gardens failed the test, due to shading from upper level balconies and neighbouring blocks (Env. Statement Vol 1, 2014). Notably the assessment of sunlight and daylight impact to internal spaces only reported the impact to living rooms, and the impact to other rooms was excluded. The masterplan sustainability statement indicated that the application met the BRE recommended standards for daylight and sunlight access (Masterplan Statement, 2014, p11).

The Daylight, Sunlight and Overshadowing assessment was revisited after planning consent had been given, when the local authority applied for a Compulsory Purchase Order (CPO) to move residents out of the first phase blocks (**praxis 5,** Figure 4-11). The assessment data was used by the government CPO inspector during an investigation which ran between 2015 and 2016. According to Section 226(1)(a) of the Town and Country Planning Act (1990) a local authority can exercise their power of CPO only *if* they evidence that a proposal is shown to improve the economic, social and environmental wellbeing of the area involved. The contribution of the development to wellbeing came under question during the CPO inspection and at a later judicial review (**praxis 6,** Figure 4-11). The CPO inspector conducted an open consultative investigation. They undertook site visits, met residents and others, held a series of public meetings, and examined desk-based evidence to collate a picture of the wellbeing impact of the first phase plans. The principle concern of the CPO inspector related to the financial offer to existing private leasehold tenants, who felt discriminated against on racial grounds. Regarding the impact to GI, the inspector recognised the proposals would largely improve the landscaping of the estate, but they were concerned about the wellbeing impact from the overshadowing that would be incurred. The inspector indicated that the site visits had highlighted the good levels of daylight present on the existing site. The inspector recognised the BRE daylight standard was a guide, to be applied flexibly, but they felt the proposed loss of light to both interior and exterior spaces would negatively impact people's 'environmental wellbeing' when compared to the relatively good light on the existing estate (CPO report, 2016, paras 268-370). This impact, along with reimbursement concerns, led to the inspector decide to refuse the CPO request:

> "*I conclude that the CPO would not fully achieve the social, economic and environmental well-being sought"* (CPO report 2016, para 377).

The decision had the consequence of delaying the first phase, indicated by the change in construction practice (**praxis 6**, Figure 4-11). The local authority appealed this decision but a judicial review also found in favour of the inspector's decision, referring to the inspectors' finding that;

> "*It was an important part of her task to evaluate the effect on environmental wellbeing of the claimant's proposals*" (Judicial review, December 2016).

The local authority again appealed the judicial decision and at the time of writing the process was awaiting further legal review.

It is notable that BC appeared to have no bearing on the overshadowing assessment or the CPO process, and the BRE daylight guidelines are not referred to in the BC standard. This raises a question about whether the BRE guidelines should be incorporated into BC in the future.

4.2.6.2 Episode 3. Matrix analysis

Applying a matrix analysis to episode 3, using the SaP framework in combination with the thematic drivers, helps to clarify how the overshadowing was appraised by the different actors involved (see **Figure 4-13**).

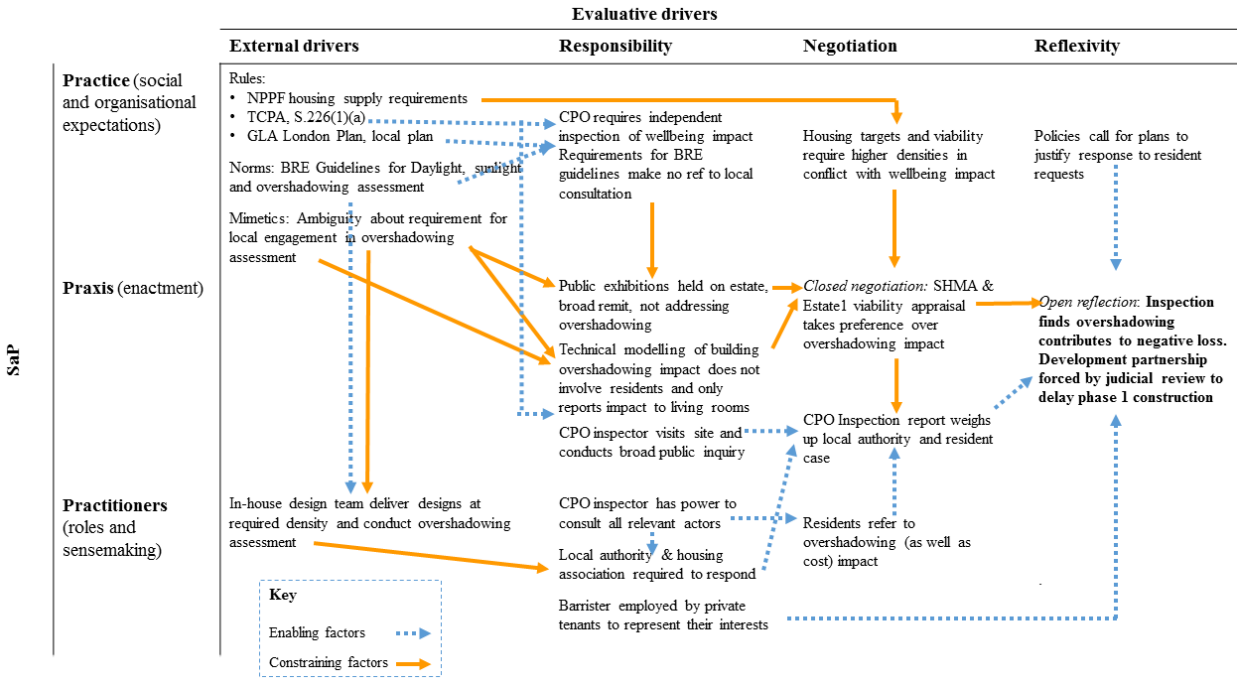


Figure 4-13. Matrix analysis of Episode 3: Evaluating overshadowing of GI

External drivers

In terms of the main external drivers, the requirement to do a daylight, sunlight and overshadowing assessment arose from national, regional and local government policies which required either a general evaluation or referred specifically to meeting the BRE Guidelines for Daylight, Sunlight and Overshadowing. The episode highlights the controlled, closed and technical mimetic culture of Daylight, Sunlight and Overshadowing assessment. For example, there is no requirement in the BRE Guidelines to involve local residents in the assessment, yet it was local residents and not the overshadowing model that pointed out to the design team there might be an issue.

The CPO process was shaped by the Town and Country Planning Act (1990) which endowed the CPO inspector with legal powers to consider the wellbeing impact of the proposal, to consult a range of actors and even to call a halt to the development process. The developer and client

(housing association and local authority) had no choice but to either accept the decision or appeal it. They appealed for a judicial review but the judge also found in favour of the CPO inspector. These external evaluations meant the whole process was stifled by delays and uncertainty, precisely what the local authority had been hoping to avoid.

A second set of national requirements came into conflict with the CPO wellbeing evaluation. These relate to the housing targets established by the national government. These targets placed the local authority, developer and design team under considerable pressure to meet the housing requirements within a certain timeframe, limiting their evaluative intention to account for the overshadowing effect.

Responsibility

Whilst some residents were given training opportunities during the 2010 masterplan process, the same social investment was not given regarding the external landscaping (see episode 1) or repeated later in the 2014 masterplan process. Residents and neighbouring residents were invited to engage with general consultative events but expected to do so proactively. Yet the landscape architect recognised that people living in social housing didn't have much sense of control over the realm outside their homes:

> "*It's with the local authority or the landlord, people feel they have no influence over, controlling their journey to the front door.*" (Interview 7, landscape architect)

The EIA assessor felt that some residents on the estate did demonstrate a capability to assess certain impacts for themselves and were more aware of their rights regarding loss of light (Interview 4, EIA consultant). This was demonstrated by estate residents seeking a change to

the phase 2 layout due to overshadowing concerns. One resident commented that residents should be given greater opportunity to shape external areas in general:

> *"It would be a generous act to give people ownership over what happens in the open spaces – it would be better to give people more scope to define exactly what they want in their communal gardens / courtyard within block, rather that second-guessing —At the very least, if you do have to define what happens in the spaces on the first [phase], learn from what works here as you move through the development phases" (Statement of Community Involvement 2014, p67).*

Various accounts suggest residents were generally concerned with the impact of overshadowing and control over the public realm. For example, at one small workshop focusing on open spaces, a resident said the designers needed to consider the shading effect of surrounding buildings of fifteen stories or more (Statement of Community Involvement, 2014, p68). The closed mimetic culture of overshadowing assessment did not reflect such views however.

This episode suggests that *private* tenants carried greater projective agency than social housing tenants because they had the resources to employ a barrister. Whilst the social housing tenants' views were referenced in the Community Statement, it wasn't until after the plans had been agreed and the CPO inspector had identified the negative contribution of overshadowing to environmental wellbeing that the issue was taken seriously.

Limited local authority capacity may have also have affected this episode. The regeneration officer referred to the small team of typically two people who managed the process (although sometimes involving others). Previously the local authority had had an architecture department of over 100 people but during the time of Estate 1 regeneration they had outsourced the

technical evaluations and legal advice (Interview 28, regeneration officer). This small team contrasted with the contracted design team:

> "*At its height, we had about 50 people involved in the scheme, 25 architects, 10 landscape architects, 2 or 3 from my team" (Interview 6, in-house BC assessor)*

These differing capacities point to potential challenges for the planning authority to prioritise all the potential wellbeing impacts of the proposal, including overshadowing. The design team, seeking to retain the density requirements, controlled the communication of the negative overshadowing assessment results, only reporting the living room data, and the local authority did not pick them up on this.

Negotiation

This episode was dominated by negotiating conflicting values. The local authority acted as both the client, through the regeneration department, and regulator, through the planning department. The regeneration officer commented that due to the reduced in-house capacity they had also contracted out certain technical and financial evaluative activities. This meant activities were more compartmentalised and managed in a more piecemeal way, with less clear lines of responsibility regarding who should connect-up different intentions, despite different elements being highly interdependent:

> "*It's a question of ownership really, and the more remote it is, the more down cascaded it is, the less you can, the less ownership and less holistic understanding there is, and with a thing like this everything is complex, everything is interdependent*….I*f you change one thing it has knock on effects elsewhere… it's interdependent on viability and*

all sorts of things, and viability of this affects the viability of something else." (Interview 28, local regeneration officer)

The negotiation of viability requirements and housing targets on the one hand, with economic, social and environmental wellbeing requirements of the Town and Country Planning Act (1990) on the other, placed the client (local authority) and developer (housing association) in an almost impossible situation. Potentially, if they had addressed the daylight and overshadowing affects earlier and more openly, it might have allowed them to find an alternative design solution but either way the consequences have been one of costly delay. The EIA consultant felt the local authority faced something of a conflict of interest in terms of balancing the need to prioritise environmental conditions against meeting housing targets:

"They are caught between a rock and a hard place. If they've got a local plan that says they have to build so many houses in the next five years…" (Interview 4, EIA consultant)

Whilst the local authority regeneration officer disagreed and did not recognise a conflict of interest, the planning documentation contained an explicit recognition of a tension between delivering higher numbers of homes and therefore higher density on the estate and the impact to overshadowing:

"*The density of the proposals compared to the existing site is approximately 50% higher, whilst every effort to minimise the impact on daylight and sunlight has been made, the impacts are partially the results of an increase in density*" (Planning statement 2015, p56).

The implication being that the overshadowing impact was accepted as the inevitable compromise for achieving the (priority) objective of providing the required number of homes.

Reflexivity

In terms of reflexivity, the design practices during the outline masterplan appeared to be more open and responsive to resident comments about the potential negative impact of buildings, in terms of the loss of access to light to internal and external spaces, as compared with the detailed design phase of Phase 1 plans. This may be because there was more possibility to rearrange the layout and alignment of buildings in the outline plan without reducing unit numbers, than during the detailed design phase. The EIA consultant also questioned the timing of the overshadowing assessments. They felt that if it had been conducted earlier there could have been greater opportunity to influence design decisions:

> "*It's a bit easier at the outline stage cause you've got a bit more flexibility to allow that possibility. I think it was something we always knew about it but it didn't get picked up that early. It just didn't get dealt with early enough*" (Interview 4, EIA consultant)

However, the EIA consultant also recognised that sometimes potential problems only really come into focus once the details are more established, suggesting that the episode would have benefitted from more time when evaluating the detailed phase to allow for emergent conflicts to be better addressed.

The CPO inspectors had the authority to take a broad view of wellbeing impacts in their evaluation. They were *allowed* therefore to adopt a more 'projective' mode of agency in their approach and ultimate response to the evaluative data they obtained and reviewed, as was the judge in the judicial review. But it is arguable that the inspector and judge were not expected to negotiate the 'practical evaluative' financial consequences of an increased pay-out to the private

tenants, or a reduced number of units that might have been the consequence of their evaluative findings.

4.2.7 Implications for BREEAM Communities

BC appears to have had a limited impact on the masterplan design process and enactment of GI evaluation in Estate 1, especially examining these three episodes.

4.2.7.1 Episode specific implications for BC

Specific findings were identified during this case study regarding the technical details of the BC manual. The following four issues emerge:

(i) *Inclusive visual amenity*

The **SE 11 GI** BC issue talks about inclusive access to green spaces but it does not consider the inclusive access to the *visual amenity* of green spaces. In addition, **LE 05 Landscape** issue does not refer to the principle of *inclusive* visual amenity, it focuses on the landscape architect making the connection to ecological impact. Both issues could incorporate the principal of 'inclusive visual amenity, including a requirement to consult and respond to stakeholders on the visual impact of the development.

(ii) *Transparent financial and viability appraisal*

BC explicitly leaves reporting of financial objectives outside of the technical requirements for applicants. However, all three illustrations were constrained, either directly or indirectly by the financial considerations of the developer and / or client. BC could consider including a new financial reporting requirement to increase the transparency of financial decision-making.

(iii) *Trees and arboriculture survey*

The potential contribution of trees to sustainability need to be better incorporated within BC. The role of trees (and other GI) to mitigate transport impacts needs to be reflected across various number of transport-related BC issues, including **'TM 01 – transport assessment'**. The regulatory or buffering role of GI (acting as a noise, soil, water, air quality and visual buffer) could be included as contributing to the landscape design of pedestrian routes objective, in '**TM 02 - Safe and Appealing Streets**'. In '**LE01 Ecology strategy'**, BC could support better coordination between the arboriculture survey, which focuses on the impact of trees to humans, with the ecology appraisal, which focuses on the natural function of trees for other species.

(iv) *BRE Guidelines on daylight, sunlight and overshadowing (2011)*

BC could refer to the BRE's own guidelines on daylight, sunlight and shading, recognising that this is as an important aspect contributing to community wellbeing, potentially by requiring the application of the guidelines within BC issue **SE 08 - Microclimate**.

Additional GI gaps relating to BC identified in this case study site are listed in the Appendix 3. Table 3.1.

4.2.7.2 General interviewee perspectives on BC

It was the design team who instigated the use of BC and it was introduced long after the principal 2010 masterplan vision, upon which the follow-up 2014 plan was largely based, had been formulated. In interviews, none of the respondents, except the BC assessor in the design team, mentioned BC until directly asked about it. At the time of writing the estate had not passed

beyond 'interim' BC certification, i.e. the steps 2 and 3 regarding layout and detail had not been evaluated, but this may be due to the delays caused by the CPO legal process.

(i) Bolt-on tick-box exercise

Neither the developer (housing association) nor the client (local authority) referred to BC in interview, until directly asked. The developer didn't feel BC had made them do anything differently, rather:

> "*It was more kind've confirming that we were doing the right sort of things."* (Interview 8, developer/housing association).

The principle function of BC for the developer and design team seems to be predominantly about legitimising their plans to the local authority and enabling the design team to win the bid and helping the developer to gain planning consent:

> "*In order to the win the project, it helps to then use something standard like BC you can then demonstrate what it is you mean with having to say it with millions of words because you often don't have millions of words. By having this standard, it gives people confidence that we know what we're talking about and that we going to deliver and demonstrate best practice. LG in particular are like that, they like to hear that. So when we've used BC it's often as part of a bidding process*" (Interview 6, landscape architect)

From the point of view of the design team, BC conveyed represented an assurance about the quality of the designs they offered (both to the client and the planning authority). BC symbolised an independent stamp of quality but not necessarily a tool that influenced their design practice.

(ii) Consolidation of external requirements

The BC assessor indicated they liked BC for the benchmark of performance they established:

> "*They're independent and there's been a good deal of research put into them to get them to where they are. These can be used as best practice and even if they fall short in certain areas it doesn't stop you from going further. It's sort of like standing on the shoulders of giants. You've got the information available, other people have done the work." (Interview 6, in-house BC assessor)*

The local government interviewee agreed that BC can help establish a baseline of good practice across various issues:

> "*it helps collate all the regulatory stuff and creates an evaluation profile but not reinventing the wheel…Pulling together and making linkages across from design to end users and that kind of thing, which obviously policy doesn't cover. So it has those benefits*." (Interview 28, local regeneration officer).

Although the developer felt BC had little direct impact on the masterplan process, they did think it confirmed they were doing 'the right thing' (Interview 8, housing association/developer). The episode analysis suggests BC does not refer to all the regulations that are potentially relevant to sustainability however. This includes consideration of parallel evaluative processes, such as Environmental Impact Assessment (EIA) and Equality Impact Assessment (for public land). Equality Impact Assessment is not referred to in BC but had a significant influence to play on this site, including in shaping the evaluation of GI. The EIA consultant clearly recognised a cross-over between EIA and BC but was not involved in the BC appraisal. The consultant saw them as entirely separate evaluations:

> "*EIA and BC they do complement each other. Although BC is probably more detailed. I do kind of know what it is. We do do it but I don't get involved in it. It's a separate report and separate stream. There is huge cross over*" (Interview 4, EIA assessor)

The masterplan community facilitator was aware that BC had been used but indicated that they also had not been involved (Interview 2). The facilitator commented that they liked how BC promoted use of multiple modes of engagement to reach out to different groups of people, and this approach was supported by their experience when wide engagement is 'genuinely' sought.

Contextual verse generic intentions

The BC assessor recognised certain limitations with regards to the adaptability of standards (in general and not just BC) to the differing contexts, which mean that it wasn't always practicably possible to achieve higher credit scores for some sites:

> *"I suppose where standards fall down is trying to be generic when every site and situation is different and circumstances sometime just prevent you from doing the things you would like to. Sometimes the opportunities aren't available and that's where standards, and mandatory components can fall down. Or some bureaucratic things get in the way*." (Interview 6, BC assessor)

The idea that it is not always possible to achieve a higher level of standard also suggests that certain locations may be essentially be less 'sustainable' than others, according to BC's definition of sustainability. BC does not go into much detail about this question of location but it is an issue that is raised by the other case studies as well.

A more fundamental point, raised by the analysis of Estate 1, is that the episodes highlight certain limits for BC in the face of conflicting external drivers, i.e. housing targets and market expectations limiting the responsibility to evaluate longer term GI and wellbeing intentions. As a voluntary standard BC may be unable to influence developers significantly without greater cross-policy coherence at national and regional levels, as well as cultural acceptance of the need to prioritise longer term intentions within the processes of negotiating different masterplan intentions.

4.3 Estate 2

Figure 4-14 Illustrative masterplan (Design and Access Statement, 2012)

Site data

Masterplan type:	Estate regeneration
Area:	25 hectares (not including open spaces)
Number of units:	1800 units to be increased to 2,517 units
Density:	101 dwellings per hectare
Affordable units:	50%
Location:	Outer London
Client (current landowner):	Local authority (developer and housing association at completion)
Masterplan timeframe:	2011-2027

Key dates

4.3.1 Brief site background

This section provides a short outline about the history of the site, the masterplan process and green infrastructure on the site, to situate the analysis of the evaluative episodes within a broader historical, procedural, and physical context. It is principally based on information from public planning documents and interviews.

The estate, hereafter 'Estate 2', was built at various stages between 1949 and 1970 (estate website, accessed 01.05.16), covering 25 hectares and providing 1,800 homes for around 5,000 people. It was ranked amongst the lowest ranked estates in London's Index of Multiple Deprivation (Mental health and wellbeing assessment, 2008) and has faced problems with disrepair, crime and overcrowding.

4.3.1.1 Masterplan process

A first masterplan was produced in 2003, after a series of council-led community dialogues in 2000 (Council Cabinet Report 2004). This plan informed the design and construction of two early phases, the first completed in 2008 and second in 2011. After a delay around the time of the economic downturn, the original developer dropped out (Planning Report, 2009). The local authority wanted to speed up the process and increase the number of homes proposed. They retendered for a new masterplan in 2009. Both the council panel and a group of selected residents voted independently for the same development partnership (Interview 40, community advisor) (Council Cabinet Report, 2009). The most recent masterplan and first phase were given planning consent in 2012. The Phase 2 plans were agreed alongside the outline masterplan for the whole estate in 2012, involving an 11 month 'iterative' design process, structured around community consultations, technical evaluations and design team meetings, including with local

authority planning officers. The key design aims for the masterplan included reconnecting the site into the wider area, through 're-establishing a well-connected street grid' and a 'network of green spaces' (Design and Access Statement (DAS) 2012, p82). Phase 3 was given planning permission a year later in 2013 and the first three phases were completed by the end of 2016. Phase 4 was submitted to planning in 2014 and nearing completion at the time of writing. The redevelopment process appears to have been more rapid and less conflict-laden than experienced with Estate 1 in the first case study site, after an initially slow start.

4.3.1.2 Green infrastructure background

The 2012 masterplan vision was to create a 'green estate' with a new network of green spaces, using existing and new trees to create 'legibility' (i.e. wayfinding and connectivity) throughout the site, landmarks, and a sense of 'identity' (DAS 2012). The Strategic Landscape Plan (see right picture in **Figure 4-15**) proposed avenues of street trees, allotments, private and public garden areas.

Figure 4-15 Estate 2's existing GI (left, DAS, 2012), proposed GI plan (right, Cultural Heritage, 2011)

The total green spaces onsite were estimated as 40km^2. The site was described as 'deficient' of green spaces as there were no large green areas (over 2 hectares) within 400m of the site. The 2012 masterplan proposed a 7km^2 increase in green space, with two new parks and more allotment provision (DAS, 2012, p55-56).

4.3.2 Formal evaluative links to green infrastructure

Regarding formal evaluative practices, there were many similarities with Estate 1 (Appendix 3, Table 3.2), except that BC was not proposed for Estate 2. However, potential implications from this analysis relating to BC are touched upon in the final section of this case review. References to GI arose throughout the evaluative practices. A swale (surface water filter strip) was provisionally proposed in the climate adaptation assessment and sustainability statement, but later dropped by the highways authority (TfL). The transport assessment described introducing an avenue of street trees, but made no reference to the buffer function the trees (or other GI) can provide to mitigate transport impacts (noise, air quality, visual), the trees seemed more about meeting aesthetic intentions. In the tree survey, 291 out of a total 669 trees were proposed to be removed but there was a commitment to plant more new trees than would be lost. A group of mature street trees were also successfully moved and relocated onsite to accommodate new utilities in Phase 3.2.

Regarding resident engagement, one survey involving 500 residents listed 'green space' as the third most important reason why people liked to live on the estate. Residents also asked for improved parks and play space management (Statement of community involvement, 2012). Distinct evaluative practices (to Estate 1) included a **mental health and wellbeing impact assessment**, commissioned by the council, which referred to a workshop were residents cited green space access as a 'very important' contributor to their mental health and wellbeing

(Wellbeing assessment 2008, p9, 2009, p9). Also unique to Estate 2, was the use of a 'fluid dynamics modelling tool' called ENVI-met[12] which assessed the **microclimate impact** of different quantities of GI on the site. However, the report found that modelling GI with the ENVI-met was 'of limited value' as the tool was thought better suited to larger-scale (city-wide) modelling.

Interestingly, during interview, the lead architect had to clarify the definition of GI at one point:

> "*When you're talking about GI are you talking about sustainability, such as district heating networks or actual green?*" (Interview 12, architect).

This question of the definition of GI was also raised by other interviewees (resident, developer, community facilitator), as well as during interviews in other case study sites, suggesting that the concept of GI is less established concept in practice than implied by recent literature (e.g. Mell, 2017).

4.3.3 Estate 2: Illustrative episodes using SaP and matrix analysis

Two evaluative episodes, relating to GI and their associated formal (and informal) evaluative practices, are considered below:

- Episode 4: Evaluation of GI in an internal courtyard block (phase 2)
- Episode 5: Evaluation of GI around an external block (phase 2.3)

[12] ENVI-Met is a holistic microclimate modelling tool developed by a German consultancy: www.envi-met.com

The analysis is based on interviews with ***eight*** individuals each from distinct 'actor groups'[13] that commissioned, conducted, engaged with or were influenced by the masterplan process. The analysis includes individual perceptions of practices from differing actor groups, analysis of documented accounts from those groups that were publically available, and some reference to opportunistic observations.

4.3.4 Episode 4: Evaluation of GI in an internal courtyard block (Phase 2)

This episode examines the evaluation of GI within Phase 2's semi-private courtyard. Concerns regarding the evaluation, design, use and management of the Phase 1 and 2 courtyards were raised by two residents, the community facilitator and the developer in the interviews. Special attention is paid to Phase 2 as it was part of the 2012 masterplan. Phase 1 is also touched upon as it has a bearing on Phase 2 evaluation. Phase 2 adopted a square-shaped perimeter block of 211 flats, around a raised podium courtyard over ground-level parking. This is of interest as, like Estate 1, the use of perimeter blocks was the dominant urban form proposed for residential buildings in the Estate 2 masterplan.

4.3.4.1 Courtyard GI as strategic evaluative practice

Figure 4-16 presents an SaP diagram of the appraisal of GI in the courtyard of Phase 2, highlighting occasions where evaluative praxis was linked to a reflexive change in practice, mainly with regards to overshadowing assessment altering layout designs and an open space assessment encouraging the creation of a residents association and courtyard activities. An examination of the planning application documents provides a useful starting point to look at

[13] Developer / Housing Association (36), Local Authority (the council, planning dept.) (46); Design team lead architect (12); Social Impact assessment consultant (21), Community facilitators (40); Resident (43), Allotment member (45), EIA evaluator (3)

how GI was evaluated with regards to the courtyard. A variety of formal evaluative practices were undertaken on Phase 2, relating to GI in and around the courtyard, including ecology and noise surveys (**praxis 1**), arboriculture (tree) survey **praxis 2**), townscape (Landscape) VIA (**praxis 3**), overshadowing modelling (**praxis 4**) and community consultations (**praxis 5**). This site also included two post-construction evaluative praxes, one looking at open spaces and including Phase 1 (**praxis 7**) and the second, a site-wide social impact assessment (**praxis 8**) that included appraisal of landscape design in the courtyards.

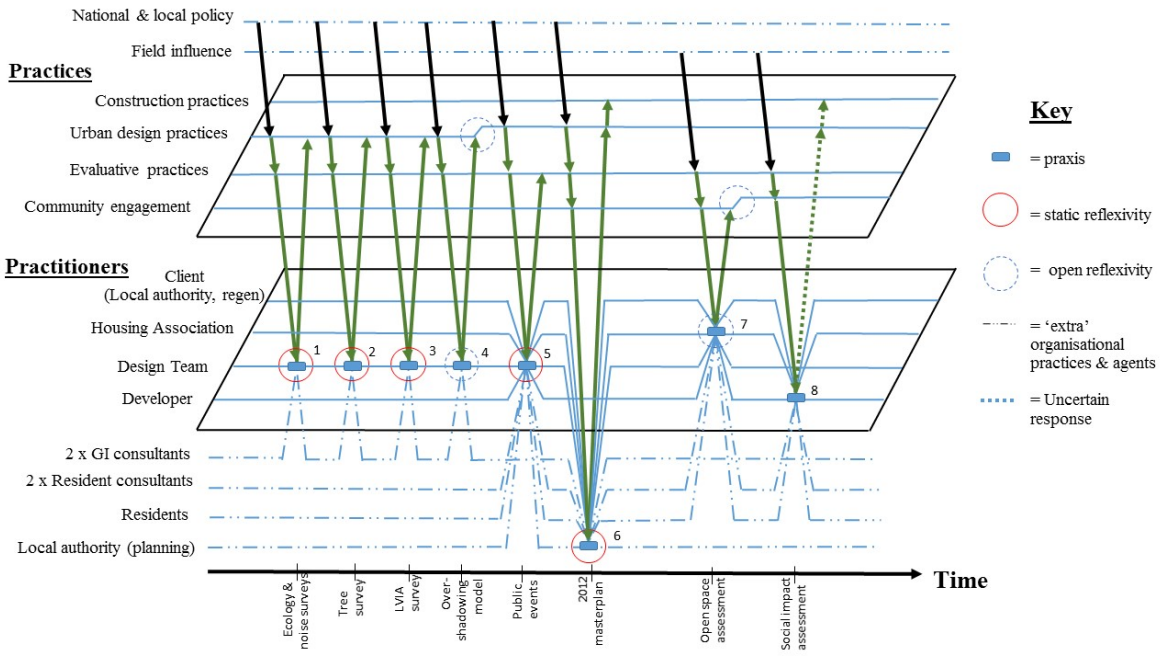


Figure 4-16. Episode 4 as a SaP: Evaluating courtyard GI

This account starts at the end of the episode, examining the two post-construction assessments (**praxis 7** and **8**) which highlighted certain challenges relating to GI whilst in-use, before tracking back to see how those issues were evaluated during the planning and design stages.

The development partnership, led by the developer, commissioned a site-wide Social Impact Assessment (SIA) in 2015 (Interview 21, SIA consultant), with a plan to conduct the SIA

assessment again at later phases of the regeneration, to track how resident feelings as the site changed over time. The consultants commissioned door-to-door market surveys to evaluate residents' views relating three themes: five indicators relating to 'social-cultural life'; two indicators regarding their 'voice and influence'; and six indicators representing the quality of 'amenities and infrastructure' (**Figure 4-17**).

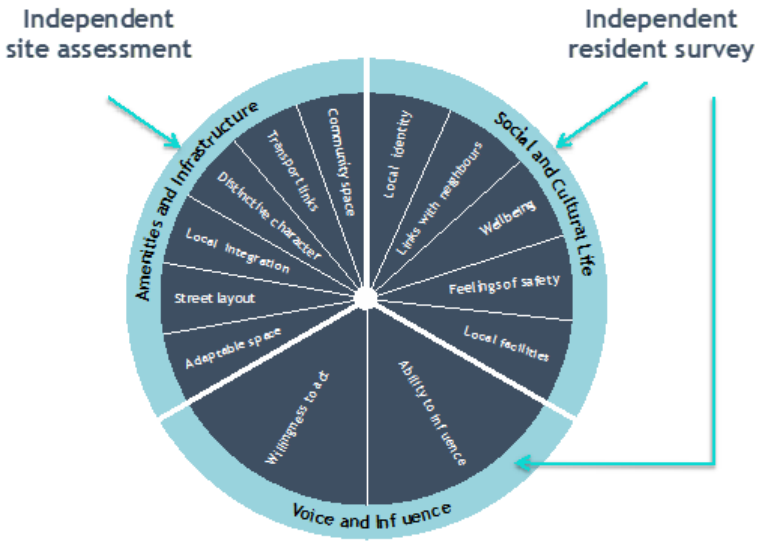


Figure 4-17. Indicators and methods (Social Impact POE, 2015, p43)

An urban designer was employed to assess the 'amenities and infrastructure' theme. They described the internal courtyard spaces as adopting a '*strictly controlled'* form of design with limited opportunities for adaptation and spontaneous or ad-hoc uses i.e. for resident to make the spaces their own (Social impact assessment, 2015, p.55). Their criticism of overdesign visually accords with the somewhat cluttered courtyard designs implemented on Phase 2 (**Figure 4-18**), where multiple soft and hard features are incorporated in the enclosed space.

Figure 4-18. Phase 2 courtyard plan (source: Microclimate assessment, 2012) and photo, right (source, Estate 2 website)

This design outcome was associated to an intention to provide '*secure'* and '*clearly defined'* spaces (DAS, part 2, p.67).

The housing association had conducted an earlier evaluation (2014) examining shared open spaces in four of their estates, including Estate 2. Their evaluation took in the Phase 1 courtyard block, surveying nearly half the residents in the block (101 out of 212 private and affordable tenants). The survey found that, although 78% were very satisfied with the courtyard space, 88% rarely or never used it. The evaluation identified positive and negative design attributes in the Phase 1 courtyard. Specifically in terms of GI, the assessment found that some trees were dying due to lack of sunlight and maintenance (**Table 4-2**).

The Open Space report described how the courtyards on all four estates were 'over-designed' and subject to problems with noise when people opened courtyard-facing windows because their rooms were hot. The open space report identified that surveyed residents were uncertain about how the spaces should be used and who they were for (Open Spaces report, 2014, p71-77).

Table 4-2. Phase 1 courtyard design assessment findings (open spaces report, 2014)

Report benefits	Reported negatives
• Central 'lawn' with seating is well-designed. • Two spaces with different tenures do not feel separate. • Sculpting of block heights allows good sunlight penetration. • Generally higher quality of materials, specification and construction than other examples.	• Few signs of inhabitation and community ownership, slightly sterile environment. • Some restrictive uses signage. • Planter/car park vents are intrusive and create barriers. • Some trees dying where no sunlight. • Proportion of courtyard (width vs height of buildings) is too narrow. • Lack of visual connection with the street.

The community advisor and resident interviewees both raised similar concerns about a lack of clarity about the intended use and a potential for user conflict in the courtyards (Interviews 40, community facilitator; 43, estate resident). The open space evaluation highlighted certain '*potentially contradictory'* or conflicting design intentions arising from the courtyard blocks (e.g. Privacy and sound absorption verses inhabitation and community ownership). These contradictions were partly a consequence of living at higher levels of density and the mix of people who might live around the courtyard, with potentially differing needs. The SIA consultant indicated that the architects had been aware of potential user conflicts and sort to address it through 'zonation' to compartmentalise use:

> "*It's just difficult. If you are in an apartment and you need somewhere for your kids to play and it's also legitimate if you're an adult and you want to sit outside. One of the [phase 1] architects made some drawings about how you could make some spaces more multi-use and be clearer about how you zone them for different activities within the courtyard*" (Interview 21, SIA consultant)

The developer also referred to signage introduced to try and influence resident behaviour:

> "*There are restrictions on how you use the space, just because we don't want it becoming a nuisance to other people. So you can't…you get the usual thing, 'No ball games' and stuff like that. We've tried to discourage that, but encourage people to use it and use it as a meeting place.*" (Interview 36, developer)

GI and hard infrastructure were placed into zones, using distinct landscaping forms, in both Phase 1 and 2, to create a clear physical definition of intended use in each zone. It was unclear from any of the interviews whether this 'zonation' did in fact produce greater clarity for users however, in what were relatively small courtyard areas. The findings from the open space and social impact evaluations, as well as comments from the community advisor (Interview 40) and resident (Interview 45) about continued under-use, suggest otherwise.

The Open Space report made various recommendations to improve courtyard design, use and maintenance (see Appendix 3, Table 3.7). It called for activities to foster resident relationships and '*create ownership*' of the space, such as setting up summer events (e.g. BBQs) and creating a mixed-tenure residents group to encourage people to get '*involved in decision-making'* and sharing information. The development partnership undertook to respond to both these relational recommendations. Regarding design, the report suggested some strategies to increase courtyard adaptability and ownership, such as movable furniture, to encourage '*informal encounters'*. The assessment found that resident satisfaction with open spaces seemed, at least in part, linked to maintenance. It noted that, where residents maintained things themselves, there were less problems with plants dying (**Figure 4-19**).

Figure 4-19. Symbols of ownership: Plants maintained by residents (left) and managed by housing association (right) (Source: open spaces report, 2015, p.21)

The report also proposed placing features, includings trees and plants away from courtyard edges to ensure they benefitted from adequate daylight. It was unclear however whether the development partnership had understood or communicated any of the design recommendations, from either report, to the design teams involved in the next masterplan phases. The masterplan architect, involved in designing two detailed phases, was unaware of either study (Interview 12, architect).

Tracking back to earlier evaluations we consider if any the problems identified in the two post-construction assessments were considered and could have been picked up earlier. The **Daylight, Sunlight, and Overshadowing assessment** suggested that the high levels of overshadowing was:

> '*to some extent to be expected where acute housing need requires dense urban development such as at [Estate 2*]' (Daylight, sunlight and overshadowing assessment report, p4).

The consultants iteratively modelled five alternative massing layouts before opting for final version which included stepping in building height at each corner and setting back the facade, to reduce the impact to the Phase 1 block, standing behind (see **Figure 4-20**).

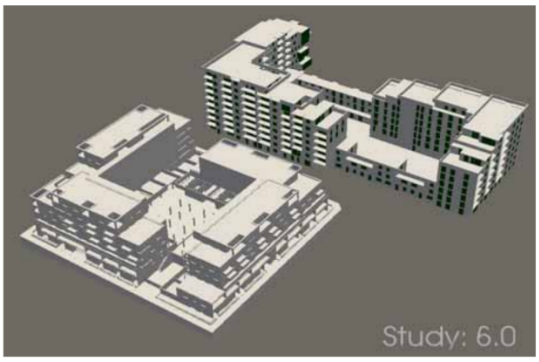


Figure 4-20. Massing for Phase 2 (bottom left building) and Phase 1 (top right)
(Source: Microclimate report, 2012)

The Phase 2 overshadowing assessment recognised the courtyard would receive limited sunlight, especially in the winter – with sun only reaching the courtyard at midday (Figure 4-21).

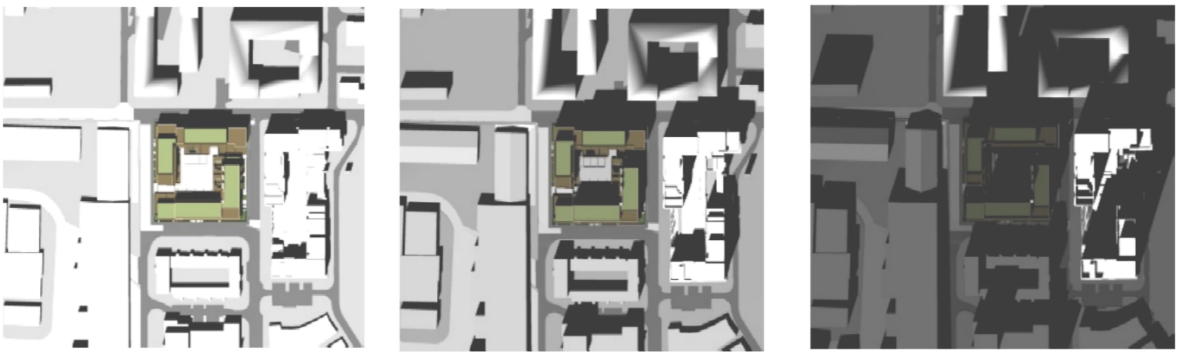


Figure 4-21. Phase 2 overshadowing model left to right, 21 June (summer solstice), 21 Sept (autumn equinox), 21 Dec (winter solstice) 12pm (Source: Microclimate report, p.40-41, 2012)

There was no consideration of the impact of this on GI within the courtyard. Unlike Estate 1 (and Phase 3.1 addressed below) the evaluation did not present data for '*annual probable*

sunlight hours' so there was no way of gauging whether the courtyard would meet or fail the BRE overshadowing test (i.e. at least half of the space should receive sunlight for two hours).The landscape statement and tree plan made no reference of the potential impact of the buildings to courtyard GI, based on either the LVIA or arboriculture surveys. The ecology assessment (Environment statement 2012) considered the potential impact of buildings upon bats (a protected species), but again made no reference to the potential impact of the buildings on proposed GI in the courtyard space. The landscape statement suggested that the courtyards could have multiple functions:

> "*Communal courtyards will accommodate a range of activities including doorstep play, meeting and sitting areas, garden spaces with hard and soft landscape, and biodiversity*" (DAS, part 3, 2012).

In terms of this last objective of supporting biodiversity, the sustainability statement (2012) indicated the masterplan would invest in native species. The ecology assessment[14] (Natural Heritage Report, 2012) however refers to planting of 'non-native' shrubs and flowering herbaceous plants, and offers no rationale as to why native species were not considered.

There was a brief reference to open spaces and GI in the Statement of Community Engagement, regarding the potential for '*opportunities for community gardening*' in the courtyards, proposed in an exhibition poster. But it was unclear where this idea for community gardening had originated from. The community advisor indicated that resident discussions around the masterplan had mainly focused on buildings and was unclear whether consultations had referred

[14] The principle aim of the ecology assessment was stated as assessing the current level of nature on the site and nearby, identify whether there are 'notable species' to support and protect, whether the proposed development was likely to have a significant effect on habitats and species, and, if yes, mitigation measures that should be incorporated into the design (Natural heritage report 2012).

specifically to courtyards (Interview 40, community advisor). He suggested that consultation questions had been overly general because the development partnership had commissioned a market research company to interview a large number householders i.e. they had prioritised quantity over quality:

> *"[the housing association] when they were appointed, did a lot of household, house to house surveying, but only in really quite general terms and that did, they, I think they saw about, oh they saw about 700 or 800 households, it's a lot…"* (Interview 40, community advisor)

The SIA consultant supported this view, contrasting Estate 2 with consultations at another estate where they had had:

> "*so many more in-depth conversations with residents, rather than just through [market] researchers.*" (Interview 21, SIA consultant).

The courtyards and other issues were alluded to during an opportunistic conversation with a resident living in Phase 2. The resident described themselves as a professional who lived in a privately owned flat. They indicated they were '*having an absolute nightmare'* in the block, including problems with people breaking into the courtyard through the bike store and noisy children (n.b. the noise assessment for Phase 2, praxis 1, did not model for how internal courtyard noise might impact residents. It only considered the impact of sources of noise external to the block). The Phase 1 resident interviewee (Interview 43) offered a more positive view of courtyard living. They lived with two children in a family maisonette on a corner of the Phase 1 block. They clearly valued the courtyard space in terms of the safety, community and recreational aspects it offered:

> "*As a mother, you want your kids to be safe…I don't have to worry that they're not going to get kidnapped, whereas in the park across the road all sorts of things could happen. And within that courtyard you know some of the neighbours there as well and you know that they will look out for each other.*" (Interview 43, resident)

However, corresponding to the findings from the Open Spaces assessment, the Phase 1 resident, SIA consultant (Interview 21), and community advisor (Interview 40) all noted that adults were not using the courtyard spaces. The consultant felt this was linked to uncertainty about how the space should be used:

> "*There was just huge things about 'You can't use this bit, you can use that bit' and I think that's why people got a bit confused at what could be done*" (Interview 21, consultant)

Limited access to sunlight on the courtyard was also thought to restrict use. The Phase 1 resident described how only smokers used the space in the winter and how sunlight was even limited in the summer:

> "*What I've noticed is that around 12.30pm the sunlight will come and hit it for about an hour or two, so by 2 o'clock the sun goes. If I want to go out and sunbathe I've got to come up by 12.30 ...*" (Interview 43, resident).

The resident and community facilitator commented about the use of design measures to 'define' or control courtyard use. Hard and soft features like undulating lawns, raised planting and large plant pots were installed in Phase 2 (Figure 4-22) aiming to limit noisy ball games like football. This attempted zonation of uses and users did not appear to have worked in practice however:

"*The lawned area, which is quite a big part of the phase one courtyard, is done in ripply effects. So the theory of that is you can't use it to play football, but nobody told the kids that, so they still play football on it.*" (Interview 40, community advisor)

Figure 4-22. Design control measures in Phase 1 (Design team photo, Estate 2 website)

As outlined above, the restricted nature of formal evaluative practices conducted during the masterplan did not support an earlier identification of the problems that emerged from the post-construction evaluations. The developer and housing association were unforthcoming when asked about how they were responding to the design-specific recommendations from both reports, in terms of the future masterplan phases. The developer did recognise some issues with courtyard use:

"*Even though it's been two years now in occupation, I think people are still getting used to the idea that it's a space they can go out there and use.*" (Interview 36, developer).

The development partnership did reflexively respond to the two socially-orientated recommendations from the Open Space assessment and SIA however. Firstly, they sought to encourage social interaction, organising a summer BBQ (Interview 36, developer). Although

they recognised that encouraging courtyard activities was only part of the answer to increasing adult use of the space however:

> "*You can't force people, but you can give people opportunity to engage with people perhaps that they would otherwise not say hello to*" (Interview 36, developer)

Secondly, the development partnership encouraged the formation of a resident association:

> "*First of all we had the Phase 1 residents and then Phase 2 came along and because there wasn't enough for Phase 2 we combined them together until more people come so we'll separate it. But no, that started up very quickly because I think there was a few issues*" (Interview 43, resident).

The following section examines why there was appeared to be less openness to respond to the design recommendations as compared to the social factors emerging from the post construction evaluations.

4.3.4.2 Episode 4. Matrix analysis

Figure 4-23 outlines a matrix analysis of this episode, summarising the constraining and enabling factors that appear to have influenced how evaluation of the courtyard GI was enacted. These factors are discussed below.

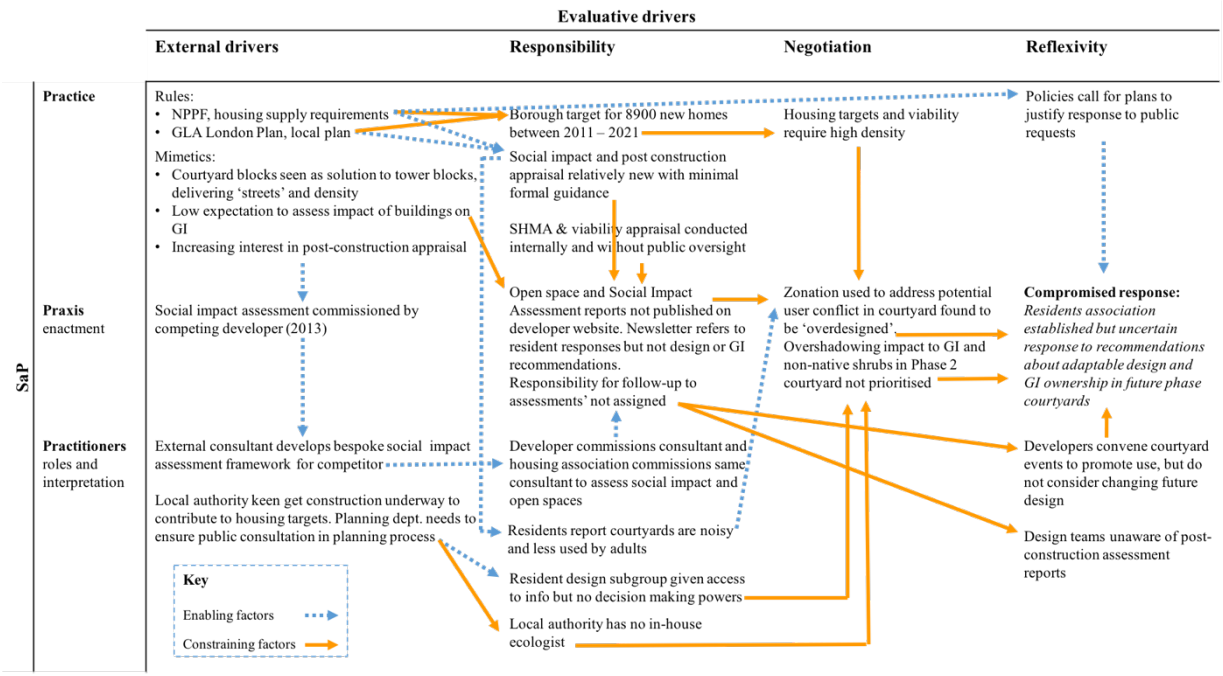


Figure 4-23. Matrix analysis of Episode 4: Evaluation of GI in an internal courtyard

External drivers

Influential external drivers in this episode include government pressures to build at higher levels of density, within set timeframes and financial objectives, juxtaposed with growing expectations to track and respond to the social experience of the transition process. As with Estate 1 there were strong local and national government pressures to meet affordable housing targets pushing up site density and constraining the scope of evaluation with regards to GI impact. The dominant evaluative priority seemed clear to the community advisor:

> "*The intention of the project is that, as well as increasing the density, selling properties on the open market, which you then cross subsidise and that's where, that's how this financially works. Most regenerations work like that in London"* (Interview 40, community advisor)

Changing normative and mimetic (habitual / cultural) drivers encouraged the post-construction assessments. The developer interviewee indicated that a competitor had recently carried out an SIA, provoking their own interest in adopting a similar approach.

More generally across the housing sector, organisations such as HACT (a housing association member body) and the BSI have been developing tools regarding post construction assessment, to improve knowledge of social performance and value in the built environment. Central government also requires that public bodies provide evidence of the sustainability benefits for publically funded projects through the UK Social Value Act, 2012 (RIBA et al., 2017). In fact, four of the architect practices interviewed across all the case studies indicated they were increasingly concerned with the need to evidence the performance of their work post construction. Cumulatively these hint at a growing cultural climate for conducting post-construction assessments beyond building performance. In terms of GI evaluation, it seemed more narrowly defined in normative and cultural evaluative practice, including no expectation to assess the microclimatic impact of buildings on either existing or proposed GI.

Responsibility

The practical evaluative agency and control of the development partnership appears to have played a strong role shaping the evaluative practice and praxis in this episode. Certain evaluative practices were closed to residents, in that they were not consulted as a part of the process, e.g. residents were not involved in financial appraisals, as per Estate 1. The housing association/developer seemed to want residents to understand financial arrangements but not necessarily influence them (Interview 43, resident). The community advisor felt there was a general lack of transparency about how consultative information had been used by the partnership in general:

> "*I think it's really good in consultation to set up a pattern where you're feeding back to people and saying, 'We asked you this. You told us that' and 'We are changing what we're going to do in light of what you said to this'. Because that then encourages people. It makes people feel that they didn't waste their time... I don't think this project was particularly good at that*" (Interview 40, community advisor)

Looking specifically at the evaluation of courtyard spaces and GI, the communication of both the social impact and open space evaluation findings were also quite controlled. For example, the full evaluation reports were published online by the independent consultant but not the development partnership. There was a brief item about the social impact assessment in an online resident newsletter (Sept. 2015) but it made no reference to the design findings or how to access the full report.

The design and maintenance-related findings of the Open Space review were referred to by the developers when asked in interview. They seemed unaware that the housing association had undertaken the courtyard evaluation although they referred to some of the recommendations that had emerged. The developer felt commissioning the Social Impact evaluation indicated a willingness on their part to face up to regeneration challenges. They indicated a resident design 'subgroup' had been created to address future phase design issues (Interview 36). The estate website indicated that this subgroup had '*no decision-making powers*' however, rather that the phase architect and development partnership would '*consider all points and recommendations made*' (Website, accessed May 2017). In this episode, the developer principally reported the positive comments from residents rather than more nuanced design recommendations, suggesting the intention of commissioning the post construction assessments seemed to be more about PR and engaging residents than about learning and improving design in response to the

findings. In addition, resource issues may have had an impact regarding the quality of GI introduced to the courtyard. The local authority did not have an in-house ecologist and so did not appear to pick up on the fact that the native plants proposed during the outline planning process were not included in the detailed design plans.

Negotiation

It is clear from the analysis of evaluative praxis that block density and hard infrastructure took evaluative priority over the potential impacts to residents' use of the space or to GI. For example, it was explicitly recognised that hard infrastructure would be prioritised over trees in the DAS:

> "I*t is accepted that not all high quality trees can be retained due to the constraints that they may impose on the development of a perimeter block layout and a clear street network*" (DAS 2012, p88).

Intuitively, it seems somewhat inevitable that living at higher levels of density around a courtyard raises greater potential for negative social and environmental consequences. Historically and throughout many cities internationally, the perimeter blocks with courtyards remains a popular form of design used by urban designers for higher density living (Hofstad, 2012; Sonne, 2009; Edwards, 2005). Recent reviews regarding questions of density (e.g. Boyko and Cooper, 2011) suggest there remains much work to be done in this area however. It would be of both practical and academic value to track how residents' experience changes over time as a site intensifies, to examine how and whether individuals adjust to semi-communal living. It would be particularly interesting to consider how courtyard landscape design functions and

is experienced in-use with and without design interventions, as well as to consider the functioning and use of GI in courtyards in different cultural contexts and climates.

Reflexivity

Opportunities for reflexive response were constrained in this episode, linked to questions of agency and control. Crucially, there was no sense that any of the design teams involved in future phases of Estate 2 redevelopment were involved or provided information about either post-construction evaluation, preventing opportunities for reflexive learning and design refinements in the later phases. The developer recognised there was often design teams involved in the design and delivery phases:

> "*When you drill down, putting that into practice, what it actually means on the ground in terms of planting beds and shrubs and what have you, somebody else will interpret that vision*." (Interview 36, developer)

They could still have communicated the evaluative findings regarding design to help the later design and construction teams to take them on board. The two post-construction assessments clearly elicited useful information regarding the use and functioning of the courtyards. When asked how they were responding to the design recommendations however, (e.g. about making courtyard spaces more adaptable and avoiding planting GI at the edges of courtyards), the developer gave no direct response. The developer planned to repeat the SIA evaluation to examine whether any of the initiatives they had implemented had 'improved things at all' since the first evaluation (Interview 36, developer). But it remained uncertain whether the designs concerns raised would be responded to after future evaluations. Both assessments were commissioned by the developer and housing association voluntarily but there was a lack of

ownership regarding the communication of the more detailed design findings. Assignment of reflexive responsibility, in terms of establishing *who should respond* to evaluative recommendations, including regarding GI, and with *what resources* would be set aside to ensure a response, appears to have been a crucial missing element in this episode.

4.3.5 Episode 5. Evaluation of GI around a perimeter block (phase 3.1)

Phase 3.1 was given planning consent in 2014 and completed in 2016. The 124-unit residential development is a mixed tenure block and includes (ground floor) commercial units. The phase consists of an open horseshoe shape, with three blocks surrounding a semi-private courtyard with landscaping, overlooking some allotments and a railway line. This episode focuses on the evaluation of the GI external to the block, including a group of street trees within a small public square and an adjacent allotment. The episode highlights the balancing act of issues and agendas that the design team try to negotiate in seeking an 'integrated solution'.

4.3.5.1 Perimeter GI as strategic evaluative practice

This fifth episode is presented as SaP in **Figure 4-24**. The evaluative praxis of GI in phase 3.1 contributed to two clear reflexive refinements to earlier design and construction decisions.

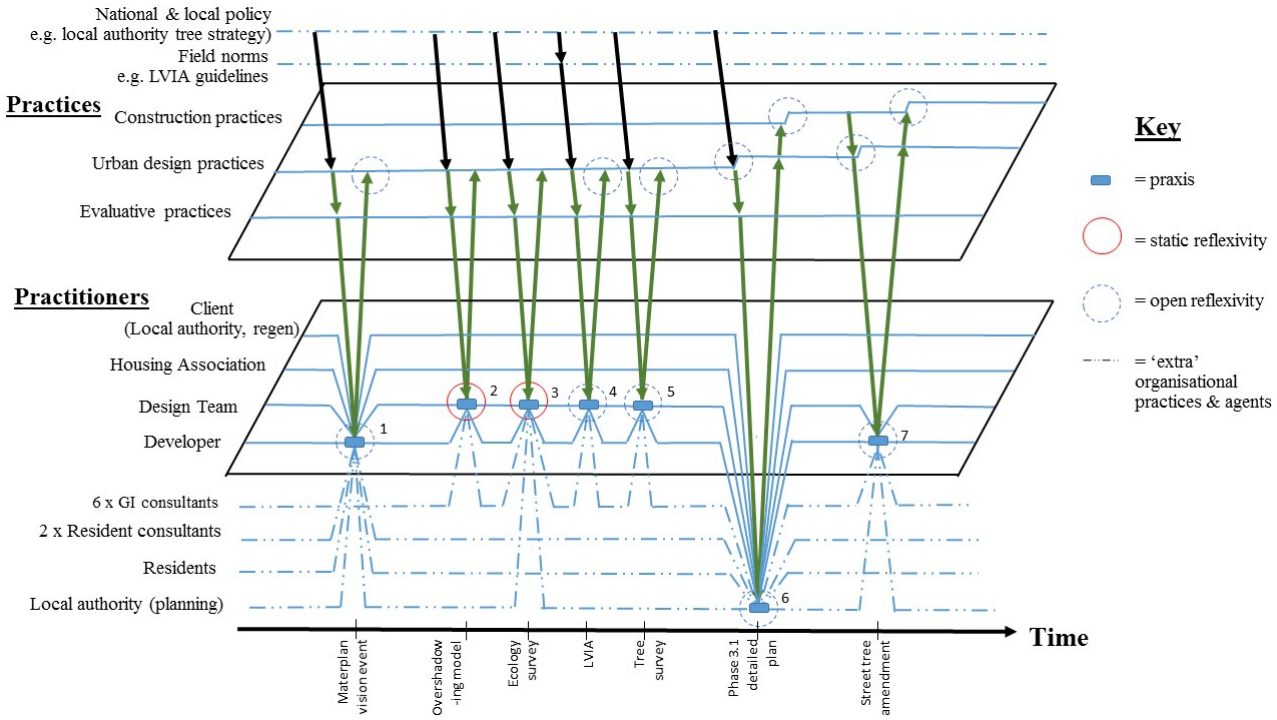


Figure 4-24. Episode 5 as a SaP: GI appraisal around courtyard blocks

The first change related to two mature trees at opposing corners of the block (**praxis 1, 4, 5 and 6,** Figure 4-24). It was proposed to cut away the building at the two corners to allow for the retention of the trees, enhancing daylight and reducing overshadowing (DAS, landscape statement, 2013) (Figure 4-25). The architect implied that the decision to keep the mature trees was linked to a design intention to provide *'glimpses of green'* throughout the estate:

> *"I kind've thought it was really important in the masterplan that wherever you were you could always see another green space or always see the routes to another green space, so there was that kind've continuity of a green experience" (Interview 12, architect).*

The design intention for the architect appears to have been predominantly about using GI to improve the aesthetics and wayfinding on the site.

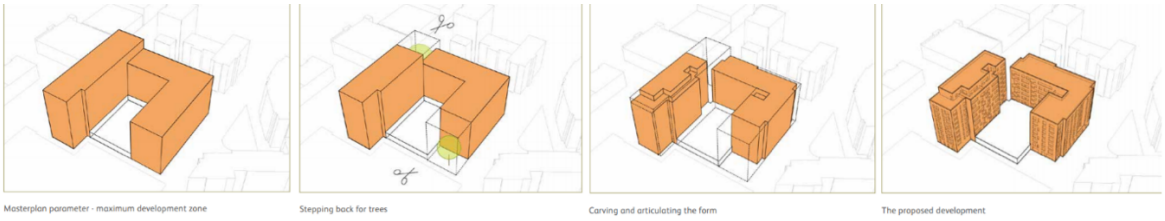


Figure 4-25. Iterative refinement of block form, phase 3.1 (source DAS 2013)

There were also cultural and heritage aspects attached to the evaluation. The architect noted how the historical design of 1960s tower blocks surrounded by open landscaping had provided the trees plenty of space to mature with full canopies:

> *"It means that these trees can just keep growing and their canopy just gets bigger and bigger. They're absolutely amazing*." *(Interview 12, architect)*

Residents clearly valued the estate trees. At a consultative event (**praxis 1,** Figure 4-24**)** about the masterplan layout and design (attended by 100 participants), residents requested to retain "*as many of the existing trees as possible*" (Statement of Community engagement, 2012 p19). The architect recognised residents often attached a strong emotional value to trees:

> *"It feels nice doesn't it. Everyone loves them" (Interview 12, architect*)

This value was also supported by local authority who were described as:

> "*Very hot on their trees. If you knock a tree down you must replace it, we've been told to replace it, and you're only allowed to take it down if it's diseased. And if a tree has got to be moved it must be replaced" (Interview 43, resident).*

Unlike episode 4 on this site, the overshadowing consultant applied the BRE Guidelines for Daylight and sunlight minimum requirements when evaluating the impact of the development

on open spaces (**praxis 2,** Figure 4-24). The same consultancy practice undertook both assessments but it was carried out by different people in different sections of the organisation (an engineer carried it out in Episode 4 and a 'light designer' in episode 5). It is unclear but it seems possible that it was the change in evaluator that affected this application of the BRE Guidance. The local planning officer also indicated that the council applied the BRE Guidance internally when assessing planning applications:

> "*We use the BRE, the 50% guidance, two hours of sunlight and more than 50% of the space.*" (Interview 46, planning officer).

The overshadowing report for phase 3.1 stated that the courtyard met the BRE threshold and had a 'negligible' impact on the allotment. The views of allotment holders or residents were not included in the overshadowing evaluative praxis however, and the potential impact of overshadowing to GI was not addressed in the assessment.

The EIA ecology survey (**praxis 3,** Figure 4-24) considered the existing trees and shrubs with regards to the provision of roosts for bats and birds, but did not consider how the block might affect the ecological functioning of the trees themselves. The technical praxis of the LVIA for this phase (**praxis 4,** Figure 4-24**)** involved:

> '*Field studies and desk studies of photographs, aerial photographs, map information, landscape character assessments and statutory and emerging planning policy documents*' (LVIA, 2013).

Like the overshadowing appraisal, LVIA praxis did not include resident consultation, only the local authority was invited to identify key views. The LVIA report did call for mature trees to be retained, the planting of new street trees '*subject to service utilities*' and '*structural planting'*

to screen the development from a neighbouring conservation area. The arboriculture (tree) survey (**praxis 5,** Figure 4-24) identified six (out of 21) trees to be retained in the phase, including the two mature trees at each corner of the block; a Sycamore of B1 quality (according to BS 8537), and an Ash tree of B2 quality (denoted by arrows in **Figure 4-26**). Unlike Phase 3.2, there was no consideration of relocating any of the good quality trees that had been identified for removal however.

Figure 4-26. Tree Protection plan, Phase 3.1 (2013)

The second, more minor, change in Phase 3.1 related to the planting of two new street trees. It was proposed to relocate the two trees to sit alongside the retained mature Ash tree at the south-east corner (Left picture in Figure 4-27) (**praxis 6**). The change was the result of a previously unplanned gas mains for a commercial unit on the corner. Due to the depth of the service route and the depth required for the tree roots, it was proposed to move the trees to ensure they had an unobstructed root ball area (Reserve matters, non-material amendment, 2016) (**praxis 7**, right-hand picture in **Figure 4-27**).

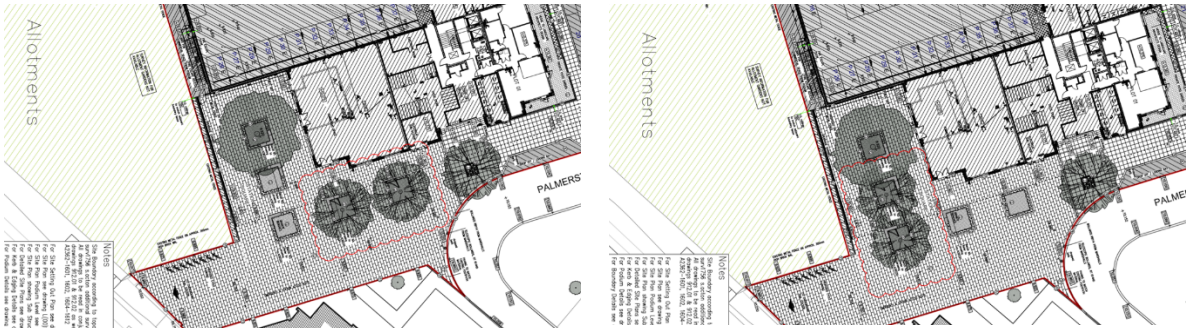


Figure 4-27. Original plan (left picture) and adjusted tree plan (right) to accommodate gas mains (Reserve matters, 2016)

The landscape architects managed to retain the same number of trees in their design plans, however, despite this change being agreed by the planning authority, one of the trees was not planted in the allotted space (**Figure 4-28**) although the reason for this is not known.

Figure 4-28. Missing tree, phase 3.1 (Photo: R. Callway)

Post construction, the block arrangement was positively reviewed by an urban design assessor who conducted a site survey for the SIA (2015). The assessor found that the external realm around the new blocks, including 3.1, "*integrated well with the wider neighbourhood*" and made the street layout seemed "*very pedestrian and bicycle friendly*". This positive appraisal was linked to the use of traditional urban design principles, such as placing front doors on streets

and lowering of building heights (compared to the original estate) (SIA, 2015, p54-55). In phase 3.1, the block heights were in fact raised however. Originally the block was five to six stories and the new block was nine to ten stories. Concerns about the block height were raised by the allotment holders and they felt these concerns had been ignored. The overshadowing assessment looked at the impact of the phase to other buildings, in terms of loss of light to rooms, but did not consider the impact to GI:

> "*They ignored the point about our objections to the height because it stops the afternoon sun…it creates shadow but, as you know, a planner's view of shadow, they're not taking any account of horticultural impact.*" (Interview 45, Allotment member).

4.3.5.2 Episode 5. Matrix analysis

The episode is an example of how a design team can adopt shifting iterative, practical evaluative and projective modes of agency and achieved an, albeit compromised, reflexive response to GI evaluative information. But it is also an illustration of the limits of projective agency, where dominant mimetic evaluative practice deprioritised GI in comparison to hard infrastructure, particularly in the transition to construction (**Figure 4-29**).

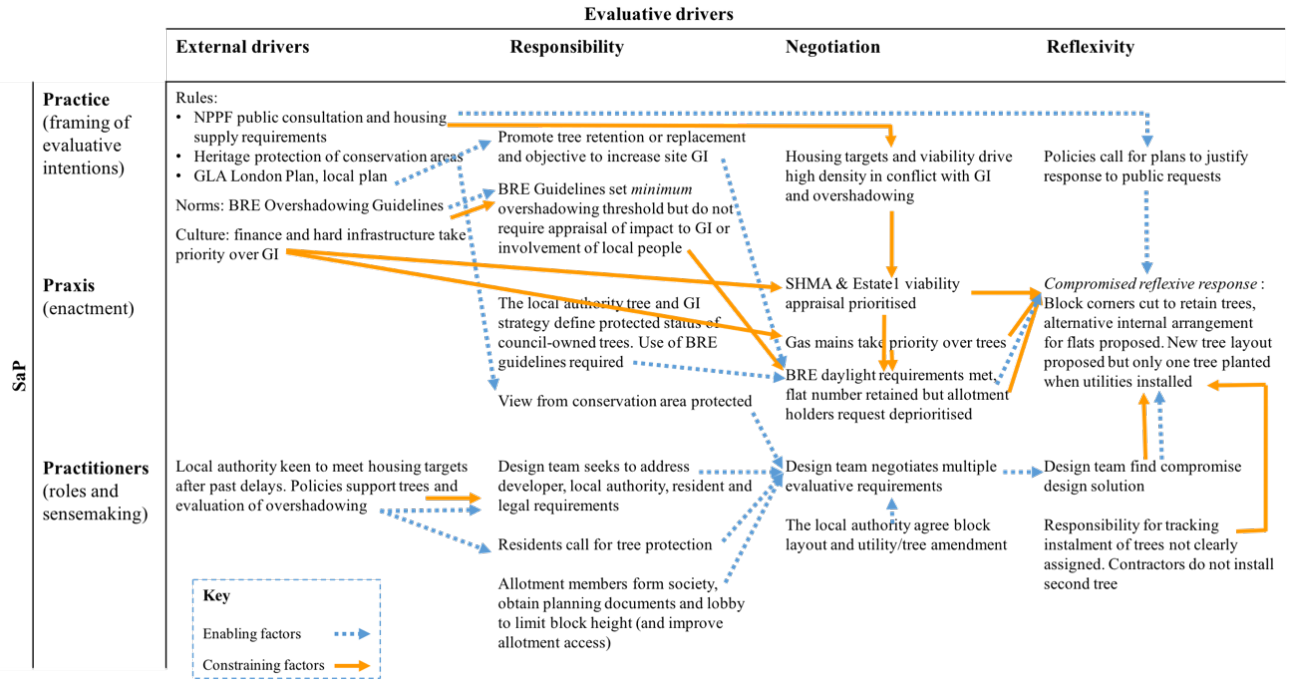


Figure 4-29. Matrix analysis of Episode 5: Evaluation of GI around a perimeter block

External drivers

A range of external drivers shaped the responsibility, negotiation and reflexive responses in this episode. Both the design team and allotment holders were enabled and constrained by external evaluative rules, norms and mimetics. London and local policies supported tree evaluation, through requirements to protect and replace existing trees. The local authority tree strategy specified how trees on public land should be evaluated:

> "*Council owned trees, due to their high amenity value, will always be treated as though they are protected by a Tree Preservation Order when planning applications are assessed*" (Tree strategy 2013).

The authority also required the application of BRE Guidelines regarding minimum threshold for overshadowing as a part of the planning process. The neighbouring authority whose conservation area overlooked the site was also able to exert projective agency, with planning

controls to protect their visual amenity, which the designer reflexively responded to by retaining the mature trees and additional planting. Formal evaluations such as LVIA, overshadowing and tree surveys did not consider the agency of GI in its own right, however. The normative guidance and mimetic behaviour that define how GI should be evaluated, prioritise the anthropogenic impact of changes in GI and do not fully recognise the GI as a living agent. For example, the masterplan describes the *visual amenity* provided by groups of trees, stating:

> "*Trees which have been planted in groups generally derive their value as part of that grouping.*" (DA Statement, LVIA 2013 p88).

There was no consideration regarding how grouping the trees could also benefit ecological functioning, where trees (depending on the species) have been found to be communal and potentially more resilient than individual trees (Wohlleben, 2016). This failure to consider GI as an *agent* rather than object in formal evaluations was also reflected in the microclimate evaluation of the courtyards in this and episode 4 which did not consider the microclimatic impact of buildings on the courtyard trees.

National and local housing targets required a maximisation in the densification of the site, constraining opportunities to consider impacts of overshadowing on GI however, despite referring to local context. For example, the GLA Sustainable Design and Construction SPG required that:

> '*Development density should be maximised based on local context, design principles, open space provision and public transport capacity*' (Sustainability Statement 2012).

Regarding the second, more minor change to the tree layout, it appears to be mimetically and normatively accepted (culturally and in terms of policy guidance) that hard infrastructure takes

precedent over GI, where the policies promoting GI included the caveat '*subject to utilities*'. If there had not been space to accommodate the new trees in a different configuration it seems unlikely they would have been planted, as indeed one eventually was not.

Responsibility

A combination of projective, iterative and practical evaluative agency was demonstrated by the design team as they sought to synthesise numerous demands from internal and external (or core and periphery) practitioners. The lead architect described a range of skills they adopted during the masterplan, including integration, listening and creative problem solving:

> "*The key skill in masterplanning is seeing through all the thousands of different things that people want and finding a path that suits as many of them as possible. So the creativity is in listening and finding a path because you're never going to do everything. You can't do it by yourself. You can't just draw a masterplan and hope for the best. It has to be the result of an integrated…it is very much an integrated process*." (Interview 12, architect)

This adaptive approach to agency was adopted despite of the fact that the design team did not have an in-house landscape architect and was much smaller than the team on Estate 1 (between 3 to 5 people as compared with up to 50 people on Estate 1). The allotment holders demonstrated projective agency in this episode, establishing a formal Allotment Society (linked to the National Society for Allotment and Leisure gardeners) to be better heard in planning and consultations:

> "*It really was about making sure that where the allotments were impacted that we created a mechanism that our voice was heard and our interests were considered.*" (Interview 45, allotment member)

The lack of external drivers promoting GI as an agent meant that the design teams and developer, lacked intentionality to account for the microclimate, overshadowing impact of the development to GI however. These actors dominated the design decisions and paid limited attention to the allotment society comments in relation to GI impact.

Negotiation

This episode, as with other sites, was subject to a degree of compromise where the design team and development partnership had to negotiate between consultation requirements, evaluation of GI and the need to maximise density on the phase.

To a certain extent, the design team can be thought of as successful in accommodating many of these different agendas, but they were constrained by the dominant agendas of achieving density levels, viability and provision of hard infrastructure. The design team were not (externally) expected to address the allotment overshadowing issue, where additional massing refinement might have meant a loss of units (and therefore financial returns). Although it must be recognised they could have originally proposed a fourth block on the phase, backing on to the allotment, which would have had an even greater overshadowing impact and given the developer a greater number of units. As such it is arguable that at an early design stage the design team had already accommodated the allotments quite considerably.

Whilst it is unclear why one of the new trees in the southern corner square was not planted, it would seem a lack of assigned responsibility and resource constraints are likely to have played

a role. The small square, would not be adopted back to public responsibility but retained by the housing association (Interview 46, local planning officer). The architect recognised that it was common for GI to face funding pressures:

> "*Having the green space costs more to maintain. Maintenance is always a big issue* (Interview 12, architect)

The architect felt that GI required a clear designation of responsibility, particularly regarding the budgeted provision for GI maintenance once the site was in-use, hinting that this was often a problem post-construction.

Reflexivity

The episode offers a largely positive example of reflexive learning and response by the design team, regarding both the retention of mature trees through refining the massing and internal design of the flats, as well as in terms of adjusting the street tree plans to accommodate the gas mains without losing the proposed new street trees. But the episode also points to how reflexive responses are still constrained by dominant intra- and extra-organisational demands, such as density targets. The episode also indicates that changes in agency, negotiation priorities and reflexive responses continue to occur moving into the construction phase, where other evaluative priorities and importantly strategic actors take the lead.

This episode highlights how mimetic practice relating to formal assessments contributed to reflexive responses regarding GI design, most notably the LVIA and community engagement which supported the retention of the mature trees. Policy practices regarding trees and protection of visual amenity for conservation areas also appear to have played a role. The design team applied a combination of iterative, practical-evaluative and projective agency to respond

to these and other demands. There were limits to how far the design team could accommodate the concerns of the allotment holders however. As with the first episode, external drivers did not encourage a response, particularly the guidance and mimetic practice around overshadowing assessment which did not expect the evaluator to consider the impact of the development to GI itself, or prioritise it over the potential loss of units. Finally, the installation of the two additional trees lacked assigned responsibility, during construction to track delivery and as a result remained incomplete.

4.3.6 Implications for BREEAM Communities

4.3.6.1 Episode specific implications for BC

The document analysis and episodes highlighted certain findings that could be further addressed in BC. Three issues emerge:

(i) *Transparent cost and viability appraisal*

BC explicitly leaves reporting of financial objectives outside of its technical requirements. However, both evaluative episodes (as per Estate 1) were constrained, either directly or indirectly, by the financial intentions of the developer and / or client. In both episodes, the design team had to retain the number of units which meant a certain level of density and therefore overshadowing was likely. This negatively impacted the quality of GI installed internally and externally to the courtyard blocks.

(ii) *Trees and arboriculture survey*

Trees need to be better incorporated into BC (as with episode 2 in Estate 1). In relation to Estate 2, this includes highlighting the need to carefully mediate between street-based trees (and other

GI) and underground utilities which can come into conflict, in **SE 09 - Utilities**. There should be consideration of replanting of viable trees and other vegetation on or off-site, if their removal is unavoidable, in '**RE 02 - Existing Buildings and infrastructure**', as suggested in BS 5837. BC could also incorporate a requirement to assign responsibility to report and respond to tree planting and management commitments post construction, as per highways requirements, for up to five years after planting (e.g. in **GO 04 – Management of Facilities**).

(iii) *Microclimate impact*

BC could refer to the BRE's own guidelines on daylight, sunlight and shading as an important aspect of community environmental and social wellbeing. BRE needs to consider whether to supplement their guidelines in BC by referring to evaluation of microclimate impact of urban morphology on *existing and proposed GI* in **SE 08 – Microclimate** and potentially **LE 05 Landscape** and not just account for the impact on human wellbeing.

4.3.6.2 General interviewee perspectives on BC

Few of the interviewees discussed BC in any detail, although the developer was aware it existed. The same urban design organisation was involved in producing the masterplan for Estate 2 as Estate 1 but it is unclear why they did not encourage the developer to apply for BC on this site as they had with Estate 1. One factor may lie with the fact that different design teams and lead architect were involved in each site. Specifically, the lead architect for Estate 2 left to set up their own practice as the masterplan was being developed. This lead architect continued to advise the developer regarding the delivery of the masterplan and produced a revised phasing plan from their new practice (Interview 12, architect). The two practices continued to be separately involved in the detailed designs of different phases on the site. The lead architect

seemed unaware that an early version of BC existed (2008), equating it with 'Building for Life 20' which they thought pre-dated BC and they had chosen to use on the masterplan. They commented that Estate 1 design team had an in-house sustainability team, which their new practice did not have, seeming to imply the new practice had less capability to undertake BC. The architect questioned how much 'traction' BC had in the developer market, commenting that it was not a mandatory requirement to undertake BC as it had been in relation to Code for Sustainable Homes. They implied developers would not have much incentive to apply BC unless required to do so. Secondly, they questioned the applicability of any standard in masterplan processes, which they felt needed sufficient openness to allow for complex and creative problem solving;

> "*I often find that kind've of stuff is like 'Hey - make connections' – what exactly do you mean by that? Because you can make connections very badly in the wrong place and it could be awful. So how well you can* ***break*** *the rules is actually the key sometimes to the best masterplan! ...It's like an oversimplification, the nature of masterplanning is so complex.*" (Interview 12, architect)

Echoing views from Estate 1 however, regarding the consolidation of regulatory and normative requirements, the architect did see a role for BC in clarifying some of the key steps that should be covered in a masterplan. The planning officer commented that there was some value if BC involved a post-construction monitoring requirement, as planning officers didn't have a monitoring role to check implementation:

> "*It's not even just the resource thing. It's that there is no actual requirement in planning to go back and monitor and see how successful something was… I think it would certainly*

*be valuable for us to go back and see how things work" (*Interview 46, local planning officer)

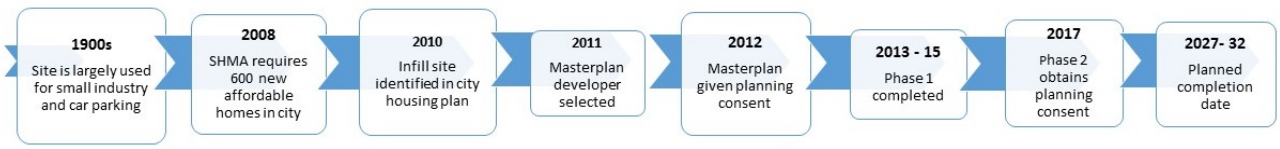
4.4 Infill 1

Figure 4-30 Infill 1 masterplan (Source: Design and Access Statement 2012)

Site data

Masterplan type:	Infill development
Area:	12.1 hectares
Number of units:	800 Units
Density:	66 dwellings per hectare
Affordable units:	25%
Location:	North East England
Client (current landowner):	Developer / local authority (and private land holders)
Masterplan timeframe:	2011-2032

Key dates



4.4.1 Background

Infill1 is situated in a small but growing city in the north of England. Between 2011 and 2028 the city's population is predicted to grow by 10% (an increase of over 25,000 people). Data from two past censuses (2001 and 2011) indicated that the number of people described as living in 'overcrowded' homes in the city increased by 60%, from 4,623 to 7,453 people. This increase was linked to factors such as social deprivation, limited supply of affordable housing, increases in house prices and constraints on mortgages (Strategic Housing Market Assessment, SHMA 2013). An earlier SHMA in 2008, targeted the city authority with delivering 600 additional affordable homes by 2013. The council prepared a housing market plan in 2010, which included a proposal to develop land between the station and city centre, labelled here 'Infill 1'. According to one local resident there had been more than a decade of discussions about the need for more homes and to improve the character of the Infill 1 site (Local resident blog, 2014).

4.4.1.1 Masterplan process

The development is a joint venture between the city council and developer, spanning five phases over 20-25 years, linked to a wider regeneration plan for the city:

> "*The regeneration is a key element of the [council's] Cityscape Masterplan, aiming to provide a highly sustainable, mixed-use urban village on what was an underused brownfield site on the edge of the city centre*." (Interview 10, developer)

The pre-masterplan site, located close to the city station, included a lot of hard surfacing, industrial properties, car parks and low density residential properties. It connects the main town to the station but pedestrians were reported to prefer walking around the site as it felt unsafe at

night (Interview 10, developer) and was '*unattractive and therefore under-used*' (DAS, 2012, p27).

The masterplan proposed that when complete, Infill 1 would feature 800 new homes, 35,000 sq. ft. of commercial retail space, a primary school and community spaces. In a Site Appraisal report the design team suggested that the existing utilities provided a useful street grid layout for the masterplan (**Figure 4-31**):

> "*It makes sense to retain the existing infrastructure. The network of routes is a well-established pattern and the block pattern it forms is a useful starting point for the masterplan*" (DAS, 2012, p19)

Figure 4-31. Infrastructure-led masterplan layout

The successful bid received planning consent in 2012 and Phase 1 was completed in 2015. Phase 1 included a new boulevard to better link the railway station and city centre. The phase includes 164 new homes, including 25% affordable homes (i.e. 41 social rented and/or shared ownership homes) (Infill 2 website, accessed June 2017). Phase 2 only received planning consent four years later, in June 2017 despite being planned to start works in 2014. The

developer suggested this delay was tied to problems with purchasing various privately-owned plots of land on the site (Interview 10).

4.4.1.2 Green infrastructure context

Nearly three quarters (8.8ha) of the pre-developed site was covered by impermeable hard surfaces (Flood risk report, 2012) leaving a quarter of the site with permeable surfaces and green infrastructure. The developer (Interview 10) indicated there was limited GI onsite when they evaluated the site, however the consultant engineer (Interview 42) thought the masterplan only made limited proposals to improve this situation (this is discussed further in episode 7). The Code for Sustainable Homes (CfSH) interim appraisal only awarded two out of a possible eight credits for the contribution the proposals would make to ecology. According to the CfSH ecology appraisal of Phase 1, the area of land covered in hard infrastructure would increase from 1.3ha to 1.85ha, reducing the green infrastructure area from 37% of the site to 22%.

4.4.2 Formal evaluative links to green infrastructure and BREEAM Communities

Like Estate 1, BC was proposed by the design team leading the masterplan design of Infill 1. An earlier version of BC, created in 2008, was applied. Albeit lengthier and a greater number of issues, the technical content addressed in the 2008 version meant that similar (but fewer) issues of broadly equivalent content are contained in the 2011 version. The in-house BC assessor gave the site an interim and final BC score for the masterplan and first phase of 'good' (43.2%), which is relatively low compared to other two sites that applied BC. The general perceptions of actors regarding BC as discussed further at the end of this case review.

The majority of formal evaluative activities enacted in Infill 1 were similar to Estates 1 and 2. No Equality Impact Assessment (a local authority responsibility) was applied on the site as it

was not entirely publically land or housing. Appendix 3 (Table 3.3) examines the evaluative practices undertaken during the outline masterplan and phase 1, whether they referred to GI in any way and any potential links to the 2008 and 2012 versions of BC. The document analysis of formal evaluative practice indicates similar gaps as were identified in Estate 1 and 2. This includes no reference to the role of GI in mitigating transport impacts (in both Infill 1 evaluative praxis and BC 2008/12), a lack of consideration of potential conflicts between GI and utilities, as well as a lack of public engagement in many of the formal evaluative practices relating to GI, including the arboriculture surveys, LVIA and ecology survey.

4.4.3 Infill1: Illustrative episodes using SaP and Matrix analyses

Two evaluative episodes, relating to GI and their associated formal (and informal) evaluative practices, are considered below. Each episode is presented sequentially within the masterplan process as they arose:

- Episode 6: Soft SuDS evaluation
- Episode 7: Street trees evaluation

The following analysis is based on interviews with *seven* individuals, each from distinct 'actor groups'[15] that commissioned, conducted, engaged with or were influenced by the masterplan process. The analysis includes individual perceptions of practices from differing actor groups, analysis of documented accounts from those groups, and some reference to opportunistic observations.

[15] Developer (Interview 10), local authority (11); Design team's Landscape Architect (7); EIA assessor / ecology (38); Engineer (42), Resident (47); BC assessor (6)

4.4.4 Episode 6. Soft SuDS in design to construction transition

This episode focuses on how the transition from the masterplan vision to detailed construction shaped the way that soft (GI-based) Sustainable Drainage Systems (SuDS) were evaluated and delivered in one block (Block 3) of the site.

4.4.4.1 SuDS as a Strategic Evaluative Practice

Visualised as an SaP (**Figure 4-32**) this episode highlights the role formal evaluative practices had to play in the construction outcome for the design of SuDS along a street (block 3) in Phase 1.

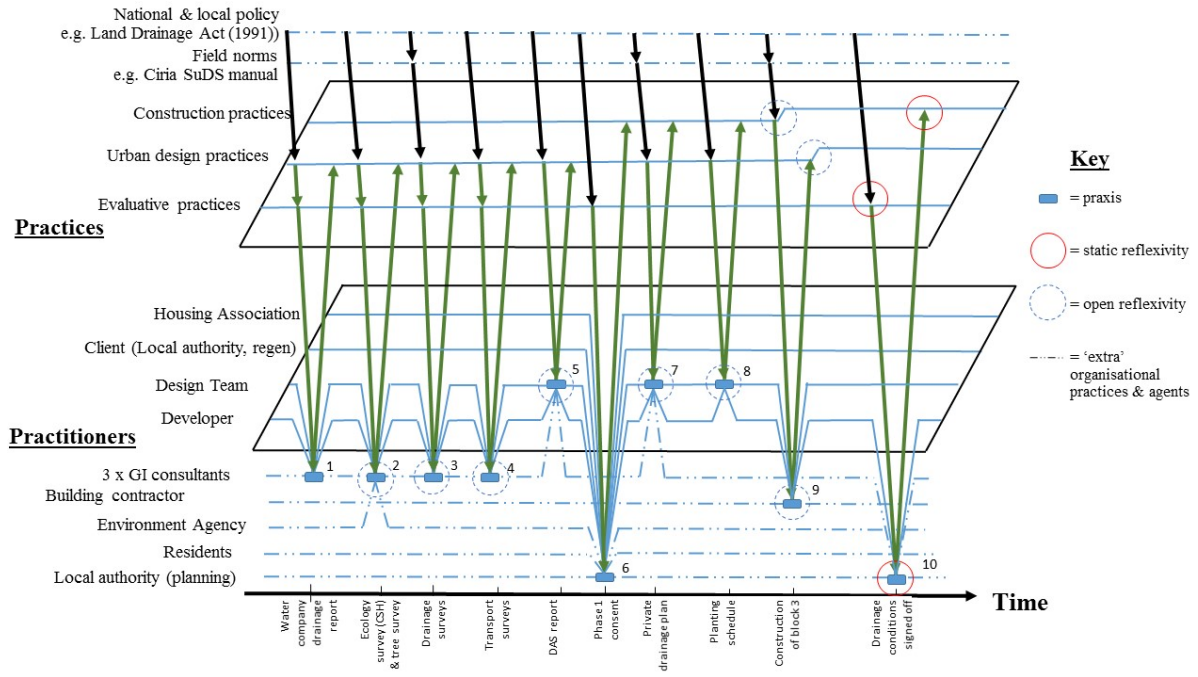


Figure 4-32. Episode 6 as SaP - SuDS in design to construction transition

Various recommendations promoting trees and SuDS emerged from different formal evaluations during the design of Phase 1. For example, the ecology appraisal, tree survey (**praxis 2**) and masterplan transport assessment (**praxis 4**) all recommended tree planting,

including along streets to provide a psychological traffic calming effect (Transport assessment, 2011). The water company report (**praxis 1**) did not refer to SuDS, but the drainage assessment (**praxis 3**) indicated some soakaway infiltration could be viable and Design Access Statement (DAS) landscape and drainage report (**praxis 5,** 2012) proposed the use of a 'small swale' (natural grass-based filter strip to mitigate rainwater runoff) at Block 3 in Phase 1.

These recommendations resulted in the design proposal for a small line of 'Golden Alder' trees to be planted with the swale, '*incorporating a mix of rushes and native herbaceous species (e.g. Common Spike Rush, Meadow Buttercup)'* running the length of one of the side streets (Block 3), off the main boulevard of phase 1 (Landscape DAS phase 1, 2012, p20 and 23). This is highlighted by the oval ring marked in **Figure 4-33**.

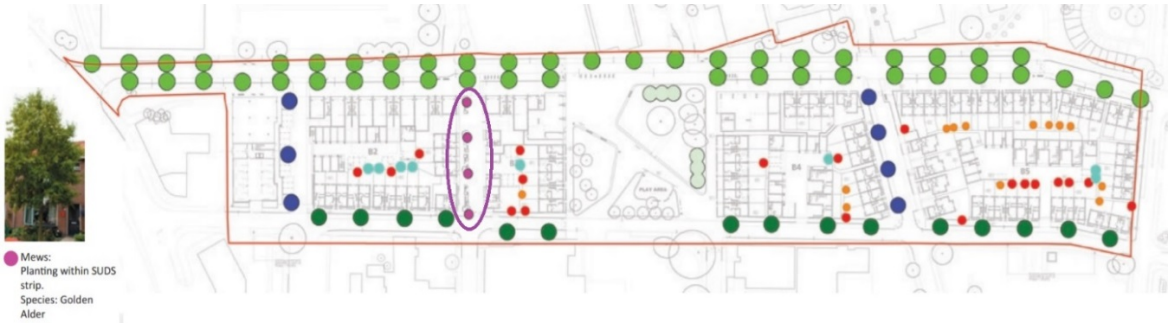


Figure 4-33. Phase 1 proposed trees and swale highlighted by oval outline (DAS, 2012, p20)

After obtaining planning consent (**praxis 6,** in Figure 4), the Phase 1 drainage plans (**praxis 7**) and planting schedule (**praxis 8**) detailed five trees within small filter strips along the street, highlighted by the oval ring in **Figure 4-34**.

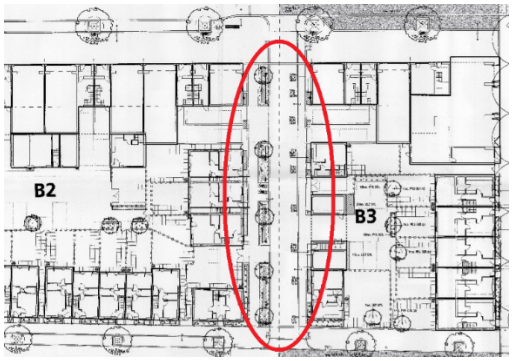


Figure 4-34. Planting plan, block 3, Feb 2013

The engineer who managed the drainage plans for Phase 1, described how this plan changed during construction however. The contractor who constructed the street had used the 'wrong' substrate material which meant that trees could not be planted in the filter strip (**praxis 9,** Figure 4-32 and **Figure 4-35**). The engineer thought that the developer did not have the mistake corrected because of cost:

> **"***There is a very small amount of grasses planted in there – it should have had trees but they used the wrong material. We used the [design team] drawings to make our detailed plans but then [the contractor] built something that wasn't on either of drawings. It would have been a cost thing as to why they didn't pull it out and build it all again properly. Somebody who put it in did it without asking***."** (Interview 42, engineer)

Figure 4-35 Filter strip photo (left), street plan (centre) and cross section (right) indicating water drainage system

The developer recognised the filter strip was only a small SuDS but still felt it offered a drainage function:

> "*There are some planting beds that provide some sort of natural drainage system. We put those in new. It's not a huge system, they are fairly small beds but you know they provide a bit of green and also assist with the drainage*." (Interview 10, developer)

The engineer suggested that the filter strip didn't really 'work' as intended however, indicating that the filtered (i.e. relatively clean) water would then be piped, unnecessarily, into the sewerage treatment system for additional cleaning:

> "*All of it is going to sewerage and residents will pay to clean that water. They'll be forever treating it, so it's not very sustainable*." (Interview 42, Engineer)

This outcome does not accord with the Environment Agency definition of sustainable drainage on the site:

> "*Sustainable Drainage Systems (SuDS) are an approach to maintaining surface water run–off which seeks to mimic natural drainage systems and retain water on-site as*

opposed to traditional drainage approaches which involve piping water off-site as quickly as possible" (EA Letter, June 2012)

So, whilst the filter strips as constructed might make a small (but reduced) contribution to visual amenity and biodiversity, they only provide a minimal role in reducing rainwater run-off that went into the main sewerage system. Despite this outcome, the local authority signed off the drainage planning conditions for Phase 1 in June 2013 (**praxis 10,** Figure 4-32).

4.4.4.2 Episode 6 Matrix analysis

This episode points to a lack of evaluative responsibility regarding the evaluation of soft SUDS. It also indicates resource constraints during the construction phase resulted in a failure to fulfil the original designs for SuDS landscaping in Block 3. This section tries to unpack further why this occurred, using the four thematic drivers (external drivers, responsibility, negotiation and reflexivity), and summarised in Figure 4-36.

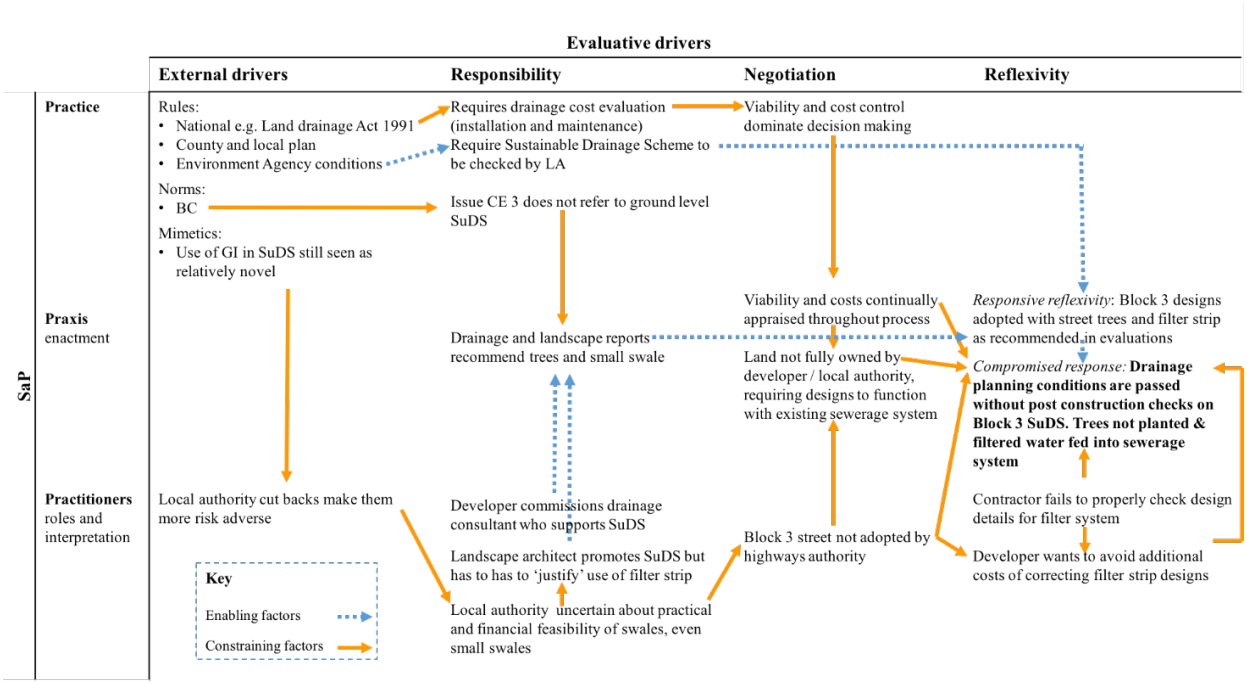


Figure 4-36. Matrix analysis of Episode 6 – SuDS in transition

External drivers

In terms of regulations, the Land Drainage Act (1991)[16] requires an evaluation of the cost of installation and maintenance of drainage features, including small drainage features on private land, posing a challenge for practitioners with relatively limited experience of calculating the costs for a GI-based SuDS system.

The Environment Agency (EA) gave a planning condition for the local authority to check the SuDS proposals:

> "*Development of site shall not begin until surface water drainage scheme, based on sustainable drainage principles, has been submitted to and approved in writing by the local planning authority*" (EA letter, July 2012).

The EA did not ask for post-construction validation of the delivery of those proposals however, and it did not appear to have been validated by the local authority who had not adopted the street back. Neither were there any validation requirements in BC that would have encouraged the developer to check and revisit the designs upon completion. As a normative requirement, the 2008 version of BC only addressed soft SuDS on roofs, i.e. rain gardens, but not other types of SuDS involving GI (in BC issue **CE 3 - Rainwater SuDS**). It would therefore appear that BC did not play an enabling role in this episode, as it did not directly promote the positive evaluation of ground-level soft SuDS.

The CIRIA 'SuDS manual' (Woods-Ballard et al., 2007) did offer guidance for calculating the drainage rates for SuDS but the manual was not referred to in any documentation. Interestingly,

[16] http://www.legislation.gov.uk/ukpga/1991/59/section/18

a more recent edition of the manual from 2015, does not recommend planting trees in small filter strips[17]. It states that, while trees may improve the aesthetics:

> "*It is difficult to preserve the healthy dense vegetated groundcover, slope uniformity and stability that are required for a well-functioning filter strip*" with trees (CIRIA SUDS Manual 2015, p297).

Based on the 2015 guidance it may actually have been a better outcome in terms of the *drainage* function that trees were not planted in the strips. Nevertheless, this does not address the issue that the 'filtered' water would still be piped through a second unnecessary treatment via the sewerage system.

Looking at mimetic perceptions of drainage construction, the interviews suggest an awareness (by the developer and local authority) that soft SuDS were beginning to become more widely adopted. Their installation in a more urban setting was still perceived as relatively novel however, potentially adding to the perception of risk by the local authority:

> "*[SuDS] aren't that new but they are quite new to the average ground worker. They have for 100s years been putting pipes and manholes in the ground." (Interview 42, Engineer)*

Responsibility

According to the engineer, they had often experienced unclear lines of responsibility and a resource gap when delivering soft SuDS:

[17] http://www.ciria.org/Memberships/The_SuDs_Manual_C753_Chapters.aspx

> *"Who is it that's going to own that once it's built? You have to set up a management company to do it. It's one of the biggest issues – the water companies don't have to take on ownership of SuDS – surely a swale and pond they should consider it to be land drainage?... [Filter strips] take a lot of management and maintenance. If they're properly put in then they need routine mowing every few weeks, pick out the crisp packets from filters. Someone to occasionally check for major issues. Local authorities should do it but they haven't got the money and water companies won't do it." (Interview 42, engineer)*

It is clear on this site that the local authority had concerns regarding swales that affected their support for the proposals which in turn may have constrained the developer, in terms of their commitment to ensure the filter strip was constructed as designed. The local planning officer indicated that the authority had accepted certain SuDS features such as permeable paving but they suggested that swales had been rejected for practical or feasibility reasons (Interview 11, planning officer). Despite being promoted by the engineer and landscape architect, the developer thought that the authority was reluctant to try a technology they were less experienced with:

> "*It was really just getting the council to sign off and adopt it. They just backtracked… At the time we started the council didn't really understand it, so it was kind've 'stick with what we know'*." (Interview 10, developer)

The local authority's risk averse position regarding swales would also explain why the design team produced a 'SuDS Justification' document for planning approval (**praxis 6**, in Figure 4-36) which expressly stated that a '*filter strip was not the same as a 'swale'*. Furthermore, the street was not being adopted back by the highways authority which had potential resource

implications for the developer and / or future users. There was certainly little benefit in terms of planning process for the developer to adopt swales (or filter strips) as a drainage solution. Nor were they expected to do so by BC.

Negotiation

The negotiation between differing political priorities, land ownership and financial imperatives came into conflict with the evaluation of the filter strip during the construction phase. The engineer felt that the developer had a clear sense of the constraints on their role, seeing the site as a time-bound (albeit long term) cost-constrained project. They felt this mind-set which dominated developer decision making:

> *"Most developers make decisions because of cost and deliverability – they want to build and walk away and no ongoing liability – how are they going to make money?...They are a builder not the maintainer of public open space. (Interview 42, engineer)*

Land and finance were therefore dominant evaluative intentions. The engineer indicated that the developer did not own all the land on the site at the beginning of the masterplan so they had had to work in a more piecemeal way, with and around existing sewerage infrastructure (and other utilities). This limited the developer from acting in a more integrated way, updating the drainage systems across the site:

> "*There were constraints on landownership which prevented them from thinking slightly more strategically…. The [roads] have been rebuilt but the infrastructure remains in place. In an ideal world you can knock it down and do it properly"* (Interview 42, Engineer)

The developer recognised they were constrained from acting in a more projective (forward looking and strategic) way:

> "*You're developing a new neighbourhood, some of those things could actually be incorporated into it but there are so many stumbling blocks to doing it*" (Interview 10, developer)

The 'practical evaluative' agency adopted regarding land and financial concerns constrained the more 'projective' evaluative intention of creating a swale. For example, the flood risk report (**praxis 6**) stated that whilst SuDS principles would be applied in Phase 1, this would be '*subject to viability*'. The engineer was clear that larger swales and filter beds would have been technically possible on the site, but they felt the contingent finance hadn't been planned to deliver the works:

> *"In [the contractors] defence, [the developer] probably didn't cost it right to do it*." (Interview 42, Engineer)

Reflexivity

Whilst the local authority did check the SuDS designs, there was no post-construction check carried out which would have identified that the filter strip was not functioning as specified by the Environment Agency.

The compromise outcome would seem to be tied to the low sense of responsibility by different actors but also a lack of capacity in the local authority. This raises the question whether, if the finance, access to the whole site and local authority support of SuDS had been present, the

developer would have kept a tighter rein on the interpretation and delivery of the filter strip designs during construction.

4.4.5 Episode 7: Street Trees

This episode looks at the various ways street trees on Phase 1 were evaluated and how this contributed to the construction outcome.

4.4.5.1 Street trees as a Strategic Evaluative Practice

This episode can be visualised as a SaP in Figure 4-37. An arboriculture (tree) survey (**praxis 1**) was conducted by a subcontracted consultant, who established the number and quality (according to BS 8537) of existing trees present on the site pre-development.

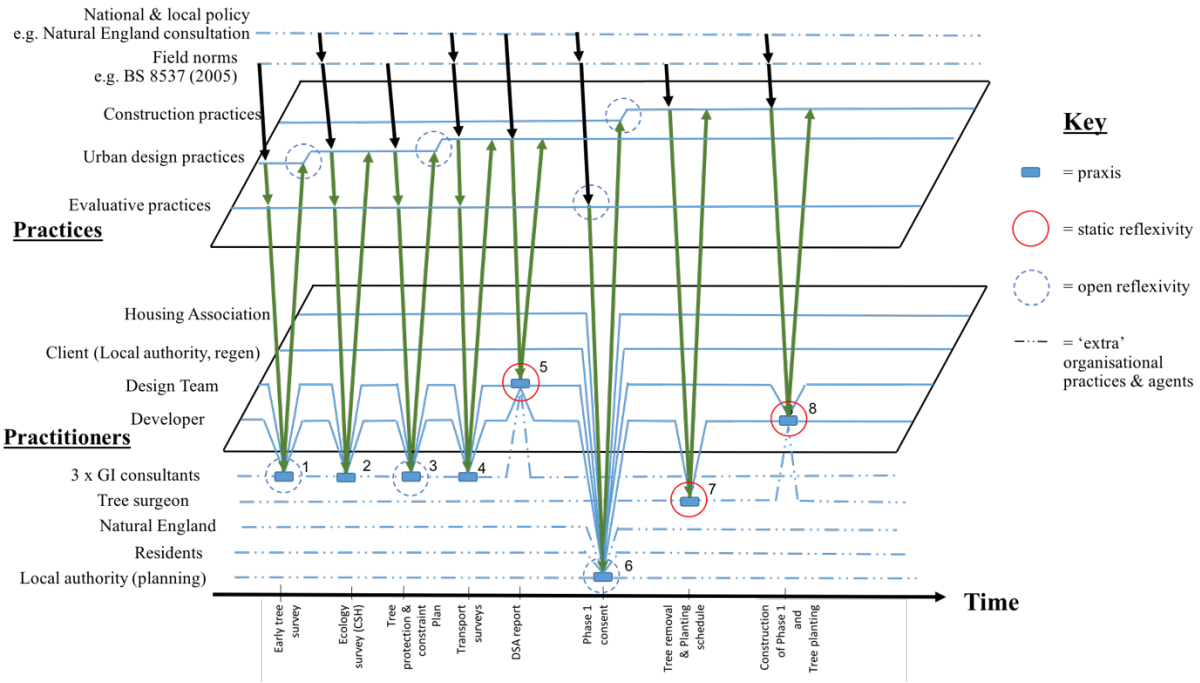


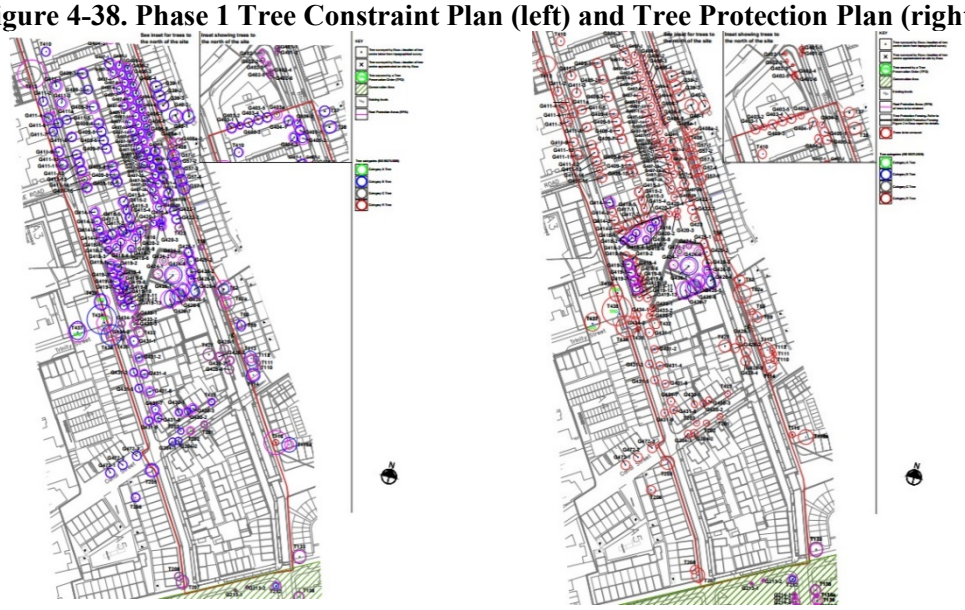
Figure 4-37. Episode 7 as a SaP – Evaluating street trees

Of the total 228 trees, three were found to be 'A' category high quality trees and protected under a Tree Protection Order (TPO), with at least a 40-year life expectancy. There were 165 trees

were identified as 'B' category moderate quality trees with at least a 20-year life expectancy, 58 trees described as 'C' category low quality trees and only two 'U' category trees recommended for removal due to their poor quality (Arboriculture survey, 2011). The Ecology Survey (2011, **praxis 2,** Figure 4-37), part of CSH, recognised the potential habitat provided by trees would be lost and that diversity of species would be reduced post-development, as a result the consultant awarded no credits regarding the protection of existing ecological value and just two out of four credits regarding the ecological contribution by the development. This finding did not appear to influence the decisions regarding trees for the site.

The Tree Protection Plan (**praxis 3,** Figure 4-37) proposed to remove most of the existing trees, including the three TPO trees and a large number of 'B' quality trees. Just 17 trees were proposed to be retained in the central public square, along with planting of 125 new trees throughout the phase (Tree Protection plan, 2011; DAS, 2012), meaning that there would be an overall loss of 86 trees. Figure 4-38 contrasts the Tree Constraints plan (left hand picture, Figure 4-38) which recommends that most existing trees *should* be protected under BS8537 (highlighted in purple) '*subject to development*'. The later agreed Tree Protection plan (right hand picture, **Figure 4-38**), indicates that a large proportion of the trees will be lost, except in the public square in the centre of the plan.

Figure 4-38. Phase 1 Tree Constraint Plan (left) and Tree Protection Plan (right) (2011)



The transport survey (**praxis 4,** Figure 4-37**)** recognised to the role of street trees in benefitting traffic calming. The masterplan and landscape report (**praxis 5,** Figure 4-37) referred to the role of trees in supporting a broader design objective to connect the site with the wider area (Masterplan and Phase 1, DAS, 2012, p 31). The landscape evaluation recommendations regarding street trees referred to trees providing a visual connection between the station and town centre (**Figure 4-39**).

Figure 4-39. Right photo: Main Boulevard before development in 2008 (Source: Google maps); Left picture: Boulevard design, Landscape report (DAS 2012)

The landscape architect referred to visual amenity and sense of connection the boulevard trees provided (Interview 7, landscape architect). Similar evaluative intentions were outlined for the trees around the square:

> "*The square has been designed around the retention of existing trees, providing maturity and visual amenity."* (Landscape DAS, 2012)

The retention of existing 'good quality trees' was one of the main open space design principles emerging from the design review of the site. The DAS also called for an increase in:

> "*Ecological value through protection of existing assets, diversification of habitats and management*" (DAS, 2012, p26).

None of these formal assessments directly involved local residents. The Statement of community involvement (**praxis 6,** Figure 4-37) refers to various site walks, exhibits, focus groups and information shared about the masterplan. The statement makes no reference to residents calling for the protection of trees or indeed any other GI (DAS, 2012). This finding contrasted with independent resident objections however which were submitted as part of the formal planning process public consultation. Residents expressed concerns about the loss of existing trees on the site, which were well established:

> "*At least one person was up in arms and put little cardboard grave stones underneath our hoarding and wrote 'RIP lovely trees', when we took them out. It was unfortunate because it was the first thing we had to do. So it looked as though we were coming on site and removing things rather than actually building things*." (Interview 10, developer)

Another resident felt there had been poor communication regarding how the trees were appraised and managed onsite:

> "*The problem here is not so much the removal of the trees, but people not knowing why. And whether they will be replaced. A note to local residents to let them know that the trees are dying, that rots are setting in, would have been appreciated. And now that he knows, the local [political] campaigner in the area…will be telling people what's happening… that replacement trees will be planted*" (Local resident blog, 2013)

This resident appeared to think the trees were rotten but the arboriculture survey made no reference to the presence of any disease. Instead the decision to remove the trees was reported to be linked to the location of the utilities and roadworks that would run along the streets:

> "*The existing street trees are close together and their roots are likely to be damaged by the proposed works in the highway to form the boulevard.*" (Development control report, Council meeting, 2012).

The design code also justified the removal of the trees in terms of how trees 'restricted' the proposed development and how the trees *might* be prone branch growth at their bases and dripping honeydew (Masterplan Design Code, 2012, p20). The honey dew tree resin was thought to cause a nuisance for vehicles under the trees, which is linked to aphid infestations on Lime trees. It is possible to manage the resin problem through the introduction of ladybirds (Lommen et al., 2013) but this was not proffered. Similarly, it is possible to cut back basal tree growth. Nevertheless, despite the ability to manage these problems without removing the trees, it was agreed that most of the existing trees would be removed and new trees would be

introduced to replace them, with new root protection systems (Masterplan Design Code, 2012, p10) (**praxis 6 and 7,** Figure 4-37).

There was no evidence that any of these evaluations recommended the relocation of the 'A' category TPO trees nor any of the 'B' category trees that were identified for removal, either onsite or elsewhere once the highways work was complete. According to the developer the removed trees were:

> "*Chopped for logs – so a large number of log-burners and open fires will be working through them the next few winters courtesy of [Infill 1].*" (Interview 10, **praxis 8)**.

While the wood was therefore not wasted entirely, there was no consideration that the healthy trees could be re-planted. Although unclear, presumably this is because relocation would have incurred additional costs in terms of labour and time to move, store and relocate the trees. The planning officer felt there had been a reasonable mitigation on the site for the loss of trees:

> "*I think overall yes we did get a successful green infrastructure scheme… a good level of tree planting and general planting within the streets and the development area as well*" (Interview 11, planning officer).

The engineer and resident interviewees did not accord with this perception however, as both were broadly critical about the treatment of GI in Phase 1. The resident described the site as looking like a '*prison*', saying '*it's just not attractive*' (Interview 47, resident) (See **Figure 4-40**).

Figure 4-40. Back to front: View of Phase 1 houses from side-street, parallel to main boulevard (photo: R. Callway)

The engineer indicated they would not want to live on the site. They felt it was too constrained and there was a missed opportunity to include more GI:

> "*My personal view of [Infill 1] is that it hasn't excelled. There are lots of buildings that you look at and you feel very trapped by the buildings. You're surrounded by buildings and brick work – there's layers of walls and gates everywhere. It's all brick and the balconies looking over you. I want a proper garden and I'm that kind've guy. I don't want to live like that. It's such a strange site. It's so constrained. It's not been opened up for nice green infrastructure.*" (Interview 42, engineer)

This raises a question as to why earlier evaluative praxis recommending greater habitat and particularly tree protection, were unable to support a better outcome.

4.4.5.2 Episode 7 Matrix analysis

This episode, like episode 6, points to the physically constrained nature of the site but also how mimetic and normative perceptions of what counts in terms of cost contributed to a less strategic approach to trees during evaluation, design and construction practices (Figure 4-41).

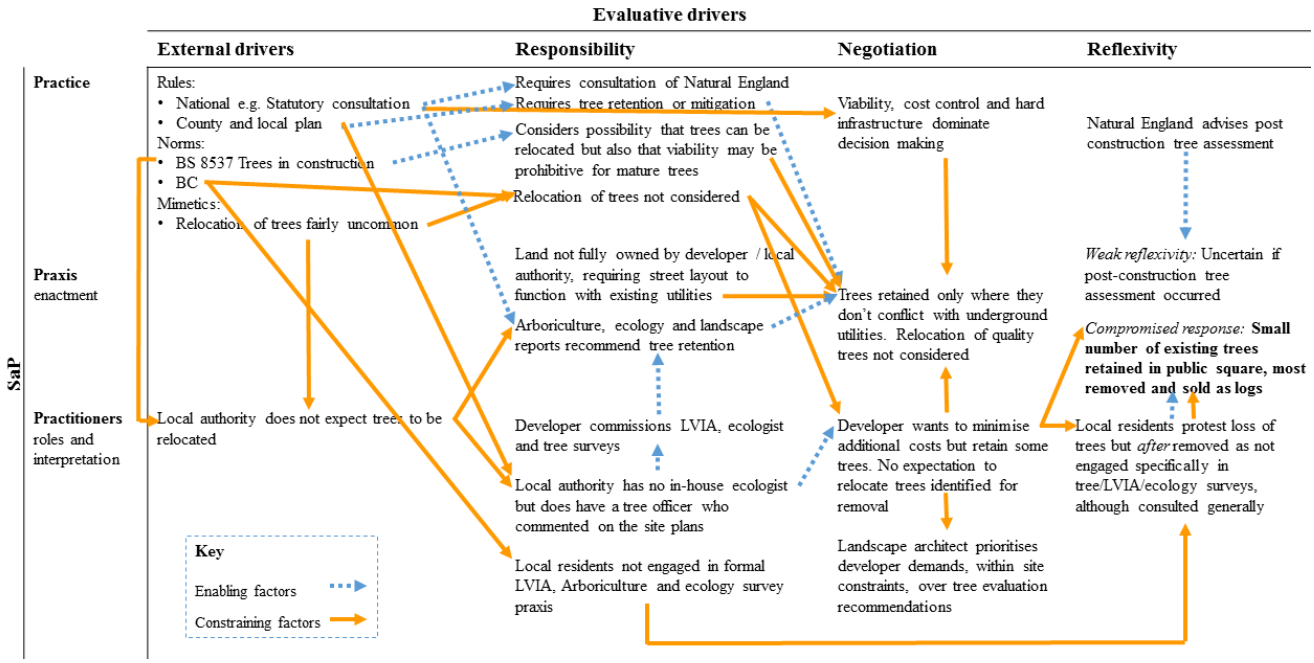


Figure 4-41. Matrix analysis of Episode 7: Street Tree evaluative practice

External drivers

External rules weakly supported the protection of existing trees in Phase 1. Natural England gave clear normative support for trees as a statutory consultee (**praxis 6,** Figure 4-37), indicating that the trees provided habitat for a range of wildlife:

> "*Habitat loss should be absolutely minimised, and existing habitats incorporated into and enhanced by the new scheme wherever possible.*" (Natural England, Letter May 2012).

Natural England also referred to the need for further tree assessment and protection of trees during construction on the site. Whether a post-construction assessment of trees was undertaken however, particularly on roads not adopted back by the highways authority, remained uncertain, based on the interviews and an opportunistic site visit (Figure 4-42).

Figure 4-42. Side-street root protection grill with missing tree (Photo: R Callway)

In terms of more normative guidance, a local policy called for the retention of existing good quality trees where present. The policy conceded that if this was not possible, new trees should be planted to mitigate for the loss. In this instance fewer, and lower quality, trees were proposed to be planted than had existed on the site. The British Standard for trees in design, construction and in-use (BS 5837:2005) also refers to the possible relocation of younger trees (under a stem diameter of 150mm) and indicates it might also be possible to relocate mature trees but also recognises that moving trees can be a:

> '*costly and complex operation with variable chance of success, it is a viable option only in exceptional cases*' (BS 5837:2005, p10).

Thus, BS8537 explicitly accepts that other development costs can take priority over the cost of tree relocation. The Phase 1 tree plan includes planting of less mature trees along the side streets, so there had been an opportunity to retain and/or move some of the younger trees at least, as well as consider whether the TPO trees could be relocated if the developer had budgeted ahead and prioritised to do that. Based on the interviews with different practitioners and the

documentation it seems that tree relocation was also not an established habit or practice during budget allocation for even smaller young trees, as suggested in the BS8537 standard.

The normative and cultural practice around LVIA, tree and ecology surveys did not encourage direct involvement of community actors in their technical evaluative praxis. This contributed to the situation that some local people reported being uninformed about why so many existing seemingly good quality trees were removed. They were only able to engage in the form of protest after the trees had been removed.

Responsibility

The landscape architect described the difference in perspective (and thus agency) between the arboriculture surveyor and themselves, referring to the kind of integrating pragmatic (practical-evaluative) skills they adopted, as compared to the more idealistic (projective) mode of agency adopted by the arboriculture surveyor when considering whether to retain trees:

> "*It's a collaboration. He's a tree expert but he's not a designer. We understand all the requirements and we translate what he's suggesting as a robust strategy*." (Interview 7, landscape architect)

They felt that the loss of trees could be mitigated ecologically;

> "*There's a lot of disruption [during construction]. We talked about retaining trees but a lot of trees have to come out in order to facilitate this kind of development. So we wanted to make sure we were replacing all those trees and more, to create a good quality place but also replace the ecosystem benefit that good tree cover provides.*" (Interview 7, landscape architect)

However, the ecologist consultant who conducted the CfSH Ecology evaluation (**praxis 2**, Figure 4-37) and site engineer did not consider that the equivalent ecosystem benefit was being introduced in Phase 1. It was clear that in practice, the design team and developer had limited intentions regarding GI (Interviews 6, design team; 10, developer) and the landscape architect had not considered, nor were they encouraged to consider, the possibility of tree retention and/or relocation.

The planning officer hinted at resource constraints regarding the local authority's capacity to evaluate designs, installation and ongoing maintenance of GI at Infill 1. The local authority had adopted back the public square but not the side roads where other trees were proposed (including the street in episode 6). They hoped that the quality of the square's design was such it would not require '*exceptional amounts of maintenance'* as this would place additional resource pressures on an already stretched team (Interview 11, planning officer).

As mentioned earlier, the site also involved various private land owners. As the developer did not own all the land upfront, they acted in a piecemeal way, while a legal process was undertaken to obtain the private land and sufficient funds were raised to compensate the owners. As a result, the developer was constrained from adopting a more strategic site-wide approach that might have been more integrated and sustainable. Lack of up-front finance constrained both evaluative reflexivity and strategic thinking about designing GI in a more integrated way:

> "*Originally there was proposal to open it all up – 'not possible' isn't correct, it was not economically viable…The site isn't fantastic from a masterplan point view. There was so many elements they don't control or are constrained by…You would like to think, what is an urban area, you could open it up with green areas and places for water.*

When you don't have control of site from day one you can't do that... it would be easier to put hoarding up and flatten the whole site and start afresh." (Interview 42, Engineer)

Negotiation

The conflicting negotiation between tree evaluation (and their landscape amenity and ecological benefits) and the proposed street layout tied to existing utilities, was tightly constrained by the normative and evaluative controls present on the site. The engineer felt that the local highways department played an important role in establishing the dominant evaluative requirements that underpinned many of the masterplan and phase design decisions, such as regarding the provision of sufficient parking space and access, over and above GI design:

"*The council may have all these sustainability criteria but no one can get out of the highways demands. [Why?] Highways are front line for councils complaints wise. I'll phone the council about poor roads or waste collection service but would I call about a lack of green space?"* (Interview 42, Engineer)

The pre-eminence of highways and utilities significantly reduced the possibility of retaining many of the existing trees. According to the engineer, financial considerations were also likely to have played a significant role in preventing the developer from thinking about retaining or relocating trees once the design decision had been made to base the street layout on the existing utilities.

Reflexivity

Some reflexive attention was paid to the recommendations from the local authority, ecology and tree surveys, in terms of the landscape designs regarding trees for Infill 1. For example, the

Local Planning Officer indicated that the developer had changed the new trees species proposed, to meet planning requirements (Interview 11, planning officer). There was an overall loss in the total number of trees in the Phase 1 and the plans did commit to mitigate the lost trees by planting new ones in other phases.

The formal evaluative praxis around the evaluation of trees did not directly involve local residents and was poorly communicated at the pre-planning design stage. This constrained the opportunities for the landscape architect to engage with, interpret and respond to local perspectives specific to trees as a part of their design process and resulted in the belated local protest about the large numbers of trees that were lost.

It is easy to be critical of these processes where GI is compromised but the episode does point to other regulatory, normative and cultural practices, as well as contextual factors (in this case, land ownership) that can actively constrain the ability of design teams and developers to adopt a more integrated or 'holistic' approach to GI in masterplans.

4.4.6 Implications for BREEAM Communities

4.4.5.3 Episode specific implications for BC

Regarding the two episodes BC appeared to play a limited role in enabling evaluative practice of the issues addressed. The episodes point to two evaluative gaps of relevance to BC, firstly regarding the evaluative treatment of soft SuDS, and second, the treatment of trees.

(i) *Soft SuDS*

This site used the 2008 version of the standard. The more recent 2011 scheme appears more detailed in promoting SuDS that adopt GI (LE 02 - Land Use; SE 11 - Adaptation to climate change; SE 13 - Flood Risk Management). In this instance, the developer was willing to consider using a soft SuDS approach. The problem was a lack of intention and responsibility to verify whether it had been correctly installed. BC could include a requirement to assign responsibility to verify the correct installation / construction, as well as to support resourcing of the long-term maintenance of the system (potentially **SE 13 – Flood risk management** and **GO 04 – Community management of facilities**).

(ii) *Street trees*

There is a need to promote appraisal of trees that aims to rebalance the dominance of hard infrastructure intentions, and to better accommodate the retention or relocation of high quality trees (e.g. Category A and B trees), as outlined in BS 8537. The BC issue **SE 09 – Utilities** should address this conflict more overtly. BC could also promote the on/off site relocation of viable healthy trees, if their removal is deemed essential, in issue **RE02 – Existing buildings and infrastructure**.

4.4.5.4 General interviewee perspectives on BC

The data gathered on Infill 1, like Estate 1, did not suggest that BC had played a strong role in influencing evaluative practice or decision making in terms of design and construction decisions, particularly in relation to the episodes examined here. The developer made no reference to BC during the interview. It wasn't until a question was specifically raised about the role of BC that they responded, indicating that they already had their own in-house sustainability model:

> "*I don't think there was a lot in that that we wouldn't have picked up. I think probably there's a discipline in there and made us tick some boxes we might have just ignored had we not used it. I don't think it made a fundamental difference*." (Interview 10, developer)

The developer was clear that the site's main contribution to sustainability was in relation to location, which supported BC credits regarding sustainable transport, due to the proximity to the city centre and station promoting use of public transport, cycling and walking and reducing the need for cars.

At a public event on the same day as the interview, the developer proceeded to acclaim BC to the audience, which included a representative from BRE. Afterwards, as an aside, the developer said, '*that's what I should have said to you*'. On their website, the developer was also positive about the benefits of BC. Like Estate 1, this positive perspective seemed tied to the legitimising role the standard played in helping the developer to win the bid:

> "*BREEAM Communities helped us secure planning approval and it helped us secure the project…. Using BREEAM as the framework enabled us to give them something that was very clearly structured, auditable and understandable,*" (Design blog 2014, accessed 21.06.17)

The difference between the interview and these public accounts highlights something of a qualitative data analysis issue, not just regarding the use of data from public meetings but also from interviews. It seems some people paint a different picture of a situation depending on their audience and how they think it *should* be represented, rather than sharing a more nuanced but consistent personal experience. This experience also highlights the benefit of obtaining multiple

accounts from different actors, as well as from documented sources to provide a broader overview of what took place.

Looking at other practitioners, the local authority was also unforthcoming about BC until asked about it directly. They admitted a general lack of awareness about BC prior to the project:

> "*For most of us within the planning authority we'd never heard of BC when they submitted. It was very new and they came to us and said you know we want to do it to this standard. It was more that they came to us with it. We didn't require it as a policy.*" (Interview 11, planning officer)

Their lack of experience meant they did not engage much with BC during the masterplan design phase:

> "*I don't know a lot about the standards. It's not something that we do on a regular basis and very few developments that we get actually have it as part of their applications…. We didn't have a lot of direct input or influence on that process*" (Interview 11, planning officer)

The use of BC seemed quite controlled by the design team who had proposed it to the developer originally. For example, the ecology consultant had no direct involvement in BC and was not even aware it had been used on the site (Interview 38, ecology assessor). The engineer did not feel that BC had enabled a more integrated approach to evaluation amongst the 'swaths' of other requirements. They suggested that standardisation was encouraging the growing specialisation of professionals making it harder to act in a more strategic and coherent way:

> "*Issue we have about codes is that it's just layers upon layers of things you have to think about it. 500 steps. These are terrifying lists. The industry has become very fractured as a result. Most housebuilders are faced by too many guides and codes and things to satisfy. No one company can keep a handle on everything, it's not possible. Like there's all these specific guides and requirements for flooring so you end up with a floor specialist. That's why everything takes so long in this country*." Interview 42, Engineer

The engineer questioned the capability of BRE staff to design guidance relating to specialist areas of which they were not specifically trained:

> "*The people they've got there [at BRE] are not engineers. They are expected to know about so many things. It's written by people from the southeast where there is chalk. It simply doesn't work in Derbyshire or Buckinghamshire.*" Interview 42, Engineer

This suggests that BRE is right to consult with expert practitioners in the formulation of each issue in the standard, as BRE has done in the past, but perhaps also to retain a degree of contextual flexibility regarding how the standard is applied in different regional contexts.

4.5 Infill 2

Figure 4-43 Infill 2 masterplan (DAS 2013)

Site data

Masterplan type: Infill development
Area: 1.85 hectares
Number of units: 257 dwellings proposed
Density: 138 dwellings per hectare
Affordable units: 35%
Location: Inner London
Client (current landowner): GLA (developer and housing association at completion)
Masterplan timeframe: 2012-2020

Key dates

4.5.1 Background

This infill site is smaller in terms of land area that Infill 1, and the smallest of the six case studies. The site has historical interest with two grade II listed buildings. In the 1800s it was used as a workhouse before becoming an infirmary and latterly a hospital until the site was closed in 2005. It sat derelict for six years before being identified for redevelopment by the local authority and HCA.

The borough has one of the highest levels of population density in England, and is one of the most deprived in London, with three-quarters of children living in low-income families (Local authority open space strategy, 2011). According to a SHMAA in 2009 the inner London borough is projected to experience a 41% increase in population of 91,632 people between 2006 and 2026. The borough was targeted by the GLA to build 3,150 new homes every year to 2016/17, of which 50% should be affordable. This target aimed to contribute to a shortfall in affordable homes across the borough. Affordable housing tenants faced issues of overcrowding, with around 10,000 residents reported as living in overcrowded accommodation (Local authority housing strategy, 2009)

4.5.1.1 Masterplan process

According to the borough's planning database, there have been earlier attempts to redevelop the site (in 1972, 1982, and 2005) none of which progressed beyond an initial scoping exercise. The coordinator of a local Community Land Trust (CLT) indicated that they had initiated a local consultative process which identified the Infill 2 site as a potential location for a CLT housing development (Interview 17, CLT coordinator). HCA, who had adopted the site after the hospital closed, issued an invitation to tender to develop the site in 2011. The CLT submitted

a bid with their preferred development partner. A different developer was selected by the HCA, GLA and local authority but they were keen to retain the involvement of the CLT to see how the model worked and whether it could be more widely applicable. They invited the winning developer to work with the CLT in formulating the outline masterplan and detailed phases. A small number of affordable units on the site (23 homes) were retained as part of the CLT. A large housing association was also involved in the winning bid and they were responsible for managing a further 67 homes out of the total 257 homes proposed (i.e. 35% of units and not the targeted 50%).

4.5.1.2 Green infrastructure context

The borough suffers from an under-provision of green spaces compared with the national average, highlighting the importance of GI provision:

> "*Overall provision of open space across the Borough in 2005 was 1.2 hectares per 1,000 population, just half of the national guidance standard of 2.4 hectares*." (Local authority open space strategy, 2011).

Due to population growth, GI provision decreased to 0.98 hectares per 1000 people in 2010 and was predicted to further decline to 0.72 hectares by 2025 (Local authority open space strategy, 2011). Prior to development, Infill 2 was dominated by hard surfacing and buildings, with minimal amounts of landscaping, trees and other GI, covering just 0.32 hectares (17%) of the site. The masterplan proposed to increase the GI onsite to 0.76 hectares or 40% of the site, through tree planting, semi-public gardens, a micro-allotment area (bottom right corner) and introducing green roofs to all the new blocks and bike sheds, see Figure 4-44. Landscape Masterplan (DAS, 2013, p238). It was also proposed to raise the diversity of plant species onsite

from 14 to 33 plant species (Ecology survey, 2013). As a result of these proposals, the site was provisionally allocated seven out of seven credits under the Code for Sustainable Homes Ecology evaluation.

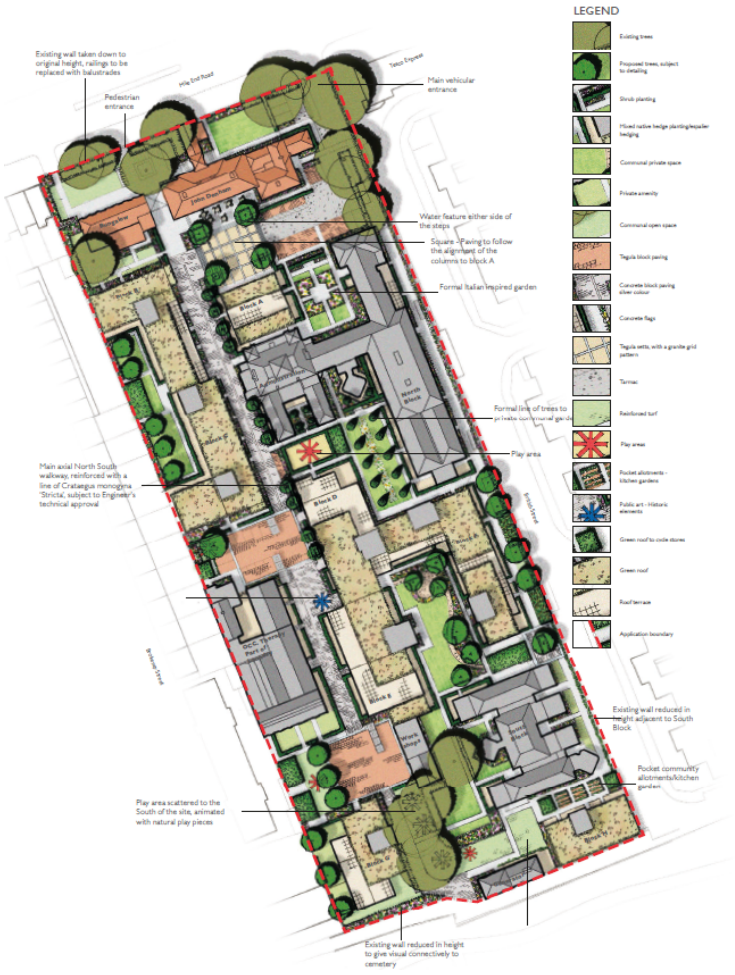


Figure 4-44. Landscape Masterplan (DAS, 2013, p238)

4.5.2 Formal evaluative links to green infrastructure

The masterplan process for Infill 2 included many of the typical formal evaluative practices that were applied in the other case study sites. Table 3.4 in Appendix 3 outlines the formal evaluative practices undertaken. Various gaps in BC are highlighted in the table, including how

arboriculture survey referred to the National House Building Council's (NHBC) guidance on buildings near trees, which is not addressed in BC. The guidance indicates that houses are at risk of not being insured for subsidence if planned too close to trees without a proper appraisal (NHBC, 2011). This and other implications regarding BC arising from this site are discussed at the end of the case review.

4.5.3 Infill 2: Illustrative episodes using SaP and matrix analyses

Two evaluative episodes, relating to GI and their associated formal (and informal) evaluative practices, are considered below. Each episode is presented sequentially within the masterplan process as they arose:

- Episode 8: Links to local woodland
- Episode 9: Green roof evaluation

The analysis is based on interviews from eight distinct 'actor groups'[18] that commissioned, conducted, engaged with or were influenced by the masterplan process. The analysis includes individual perceptions of practices from different actor groups, analysis of documented accounts from those groups that were publically available and some reference to opportunistic observations.

[18] Client (Community Land Trust) (Interview 17); Developer (13); Design team (architect) (5); Local authority biodiversity officer (32); Landscape Architect (outline design phase) (30); Landscape architect (detailed design and construction phase) (31); Neighbouring actor (park manager) (24); Regional government (GLA) (35).

4.5.4 Episode 8: Ecological links to wider neighbourhood GI

This episode examines how the Infill 2 site was evaluated regarding the relationship to a neighbouring park. The southern end of Infill 2 overlooks a large former cemetery that is being managed to be rich in biodiversity and designated a Local Nature Reserve (LNR) and Site of Importance to Nature Conservation (SINC) (Figure 4-45). The park manger described some of the biodiversity of the park:

> "*We're the only woodland in this borough. We're the most urban woodland in London. We're a designated Local Nature Reserve and we're a Site of Metropolitan Importance for Nature Conservation. There are plants and animals found here and nowhere else in London… we've recorded 32 different species of UK butterfly. Britain's home to 59…only about one month ago we had a rare migrant turn up in here called a 'Long Tailed Blue' which is as common as muck on the continent but since 1859 there has only been 160 sightings in the UK and we've got one in here....* (Interview 24, Park manager)

The park team described how the park provides a space for local people to find nature, fresh air, peace and tranquillity in a crowded and busy London borough, including three thousand volunteers every year. The park is also an important historical site as one of the 'Magnificent Seven' cemeteries in London.

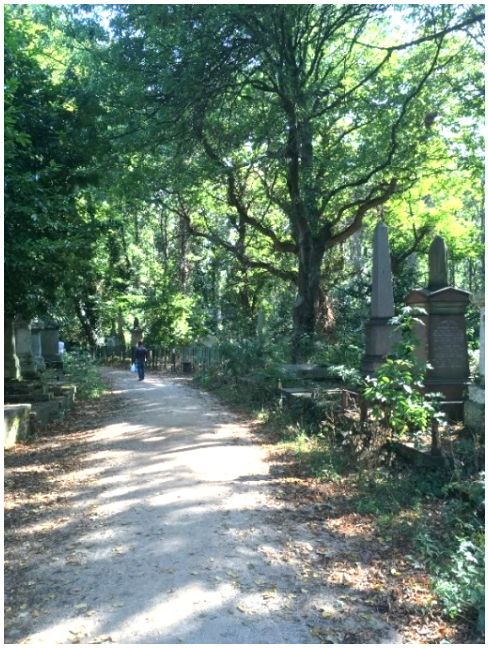


Figure 4-45. The cemetery park, adjacent to Infill 2 site

4.5.4.1 Ecological links as a strategic evaluative practice

The episode is presented as an SaP in Figure 4-46. When preparing their bid the Community Land Trust (CLT) and the Park team co-facilitated dialogues with a variety of local groups (**praxis 1,** Figure 4-46). The dialogues produced a clear recommendation about making GI linkages between the park and Infill 2:

> "*Everyone who attended the community consultations led by [the CLT] were very supportive of the cemetery park, feeling it flowed into the site. Not a caricature of it but the planting scheme: our choice of trees, our choice of bulbs, our choice of wild flowers and grasses. It felt that it creeped into the estate and kind've flowed through it and led you up to the [northern end] road and also brought you down to us." (Interview 24, Park team manager)*

So there was a reflexive response in the CLT bid designs to include the local plant species and increase connectivity between the site and park, as proposed during the local consultations.

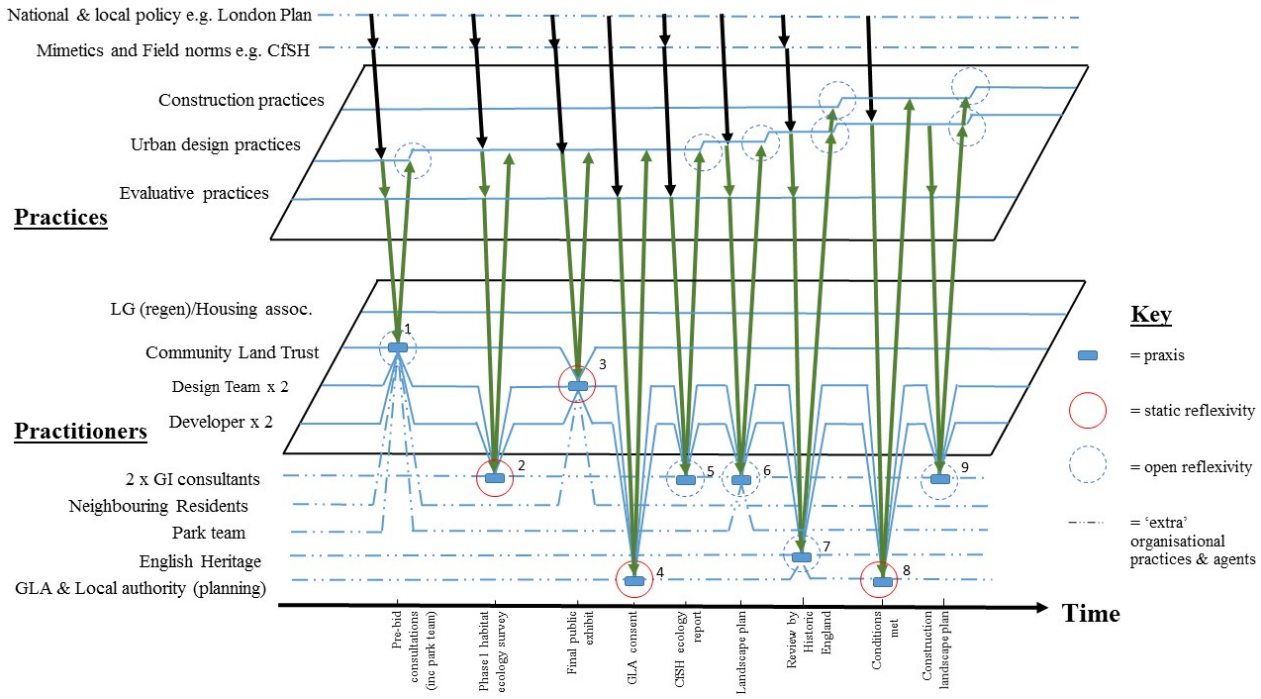


Figure 4-46. Episode 8 as a SaP: Evaluating GI links to the adjacent park

The CLT bid was unsuccessful and a different developer was awarded the Infill 2 project. The winning developer contracted a Phase 1 Habitat survey **(praxis 2,** Figure 4-46) which made no direct reference to the plant and tree species present in the cemetery park, nor did the Statement of Community engagement (**praxis 3,** Figure 4-46), or the GLA review (**praxis 4,** Figure 4-46). The design team's final public exhibit to the local community (**praxis 3**) did recognise that there had been call for a more 'open' site, stating:

> "*People are keen to see [Infill 2] regenerated with a high quality, sensitive and transformational housing-led development that opens up the site and helps meet local needs.*" (Report back document, December 2012).

The design response to the community idea of opening the site looked at creating better links to the cemetery park. This included design features such as lowering the boundary wall and introducing railings to increase visibility of the park and a new wider gate to linking the two (Figure 4-47 and Figure 4-48).

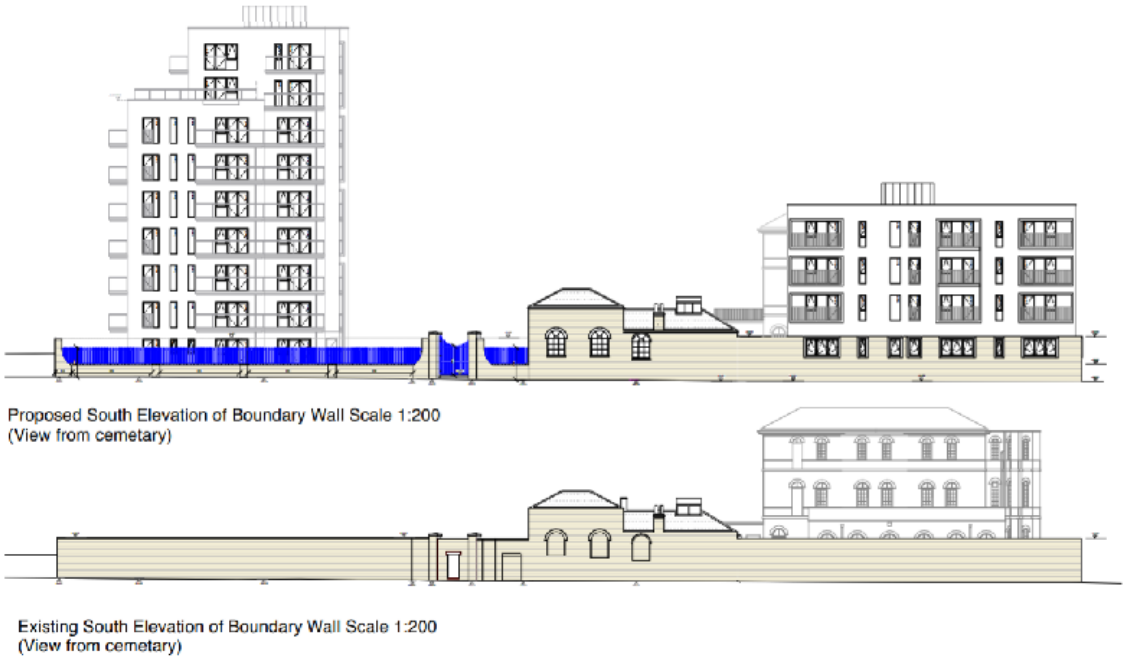


Figure 4-47. External view of southern boundary wall, before (bottom) and after (top) the proposed development (DAS 2013)

The GLA, who reviewed the plans (**praxis 4,** Figure 4-46), did not refer to their own policy, the All London Green Grid Supplementary Planning Guidance (2012) when evaluating the site. The ALGG states that "*boroughs should ... identify, protect and enhance corridors for movement of species*." (ALGG SPG, 2012, p51-52). The ALGG SPG also talks about enhancing areas that are deficient of green spaces, indicating that where sites exist, there should be provision of:

> '*New entrance points to a site providing a significant experience of nature'*; and or open-up '*access to a restricted site*" (ALGG SPG, 2012, p50).

Figure 4-48. Internal view of proposed southern boundary in Infill 2 (Public exhibit, 2013)

In terms of ecological links, both ecology surveys (**praxes 2 and 5,** Figure 4-46) only directly considered the bat species which should be protected. The CfSH report (**praxis 5**) talked about reducing the boundary wall at the southern end to '*give visual connectivity to the cemetery'* (CfSH report, 2013, p21). The surveyor also called for planting of native English flowering plants to attract and support insect populations (p24) i.e. promoting some biodiversity value, but there was no direct reference to creating links between the plant species present in the cemetery park or accounting for *locally* native species. Neither ecology surveys involved public engagement or consultation with the Park Team.

The original landscape architects, involved at the design phase, met with the Park team manager when preparing their landscape plans for the site (**praxis 6,** Figure 4-46). The park manager surprised the landscape architect by being very critical about the plans and selection of plant species:

> "*One of the most heart-breaking moments was when the landscape architects turned up at our door or contacted us to arrange to share with us their landscape plan… Rather*

> *than kind've attack it I kind've asked that question, 'Where was your inspiration? Where did you get this from?' And he goes; 'Well we walked round [Infill 2] and it reminded us of Italy so we've come up with an Italian planting scheme' and I went 'That's horrible!'. I said 'I'm not going to pull punches with you. This in no ways mirrors or reflects the hours and days I've given, my colleagues have given, local people have given into what people envisaged the [Infill 2] landscaping green plan would look like*'." (Interview 24, Park manager)

Due to the conversation, the landscape architect refined the plans to create a graduated change in landscape character through the site. Starting with more formal landscaping at the northern end becoming steadily less formal in arrangement as the site reached the southern end closest to the cemetery park. There was no (publically available) account in their landscape plans however about the shrubs and bulb species that the Park Manager had recommended to link better with the park.

Historical England conducted an evaluation when it was decided that the boundary wall should not be removed or lowered (**praxis 7,** Figure 4-46). The wall would be largely retained and the proposed widening of the gateway linking the site to the park was dropped. During the construction phase, on an (observed) site visit the Historical England consultant agreed with the developer about limiting the gate size, to avoid potentially damaging the listed wall, as well as the greater cost of installing a 'heavy' and expensive security system required for a wider gate. As a result, the architects refined the plans, reducing the visual and physical access to the cemetery park:

> "*The whole idea of it being an open estate has gone. I think that's gone. It's now a closed gated community*." (Interview 24, park manager)

Some residents on an adjacent estate had also communicated that they didn't want the site to be opened-up, during community events (**praxis 3,** Figure 4-46):

> "*That was weird. We asked everyone on the estate next to [Infill 2]; 'Do you want us break the wall on your side?' and they said 'No'*" (Interview 17, CLT coordinator)

The CLT coordinator didn't go into details about why the adjacent residents did not support the wall being removed. There did not seem to have been much deliberation with the adjacent residents about the intentions of the new site. Their view tied-in with Historical England and there was no reference to earlier (wider) community recommendations about opening-up the site.

The landscape proposals were given planning consent by the local authority (**praxis 8,** Figure 4-46) who accepted the retained boundary wall with no reference to the earlier proposals to open the site and connect to local plant species (Figure 4-49).

Figure 4-49. Original small entrance retained (photo: R Callway)

A new landscape architect (and architect) was contracted during the detailed planning and construction stage. They had to interpret the outline masterplan designs. The new landscape architect understood the intention to change the landscaping character towards the southern end (**praxis 6,** Figure 4-46):

> "*It was definitely more formal towards the front of the site and then towards the south a bit less formal*" (Interview 31, construction-phase landscape architect)

They were unaware of the Park Team recommendations regarding local species however and there was no reference to the recommendations in other documents. Independently the construction-phase landscape architect proposed two locally appropriate woodland bulb species, Snow drops (*Gallanthus Nivalls*) and Blue bells (*Hyacinthoides non-scripta*) for the southern end of the site in their planting scheme. The rest of the species in the planting plan where a mix of native and non-native species with no clear reference to the cemetery park (**praxis 9,** Figure 4-46).

During an on-site observational visit, it was possible to view some of the shrubs that had been already installed along the southern edge. As proposed, they included some nationally native and non-native shrubs. It was not possible to observe whether or which bulbs had been planted but the layout suggested the developer had retained the formal landscape style at the southern end instead of adopting the more informal style that had previously agreed (Figure 4-50).

Figure 4-50. Early planting at southern end of Infill 2 (photo: R. Callway, June 2016)

4.5.4.2 Episode 8 Matrix analysis

The evaluative praxis in this episode did not prioritise a direct ecological or physical link between the park and Infill 2, except for species protected by legislation i.e. bats and birds. The journey from design to construction saw numerous drivers constraining the link (Figure 4-51).

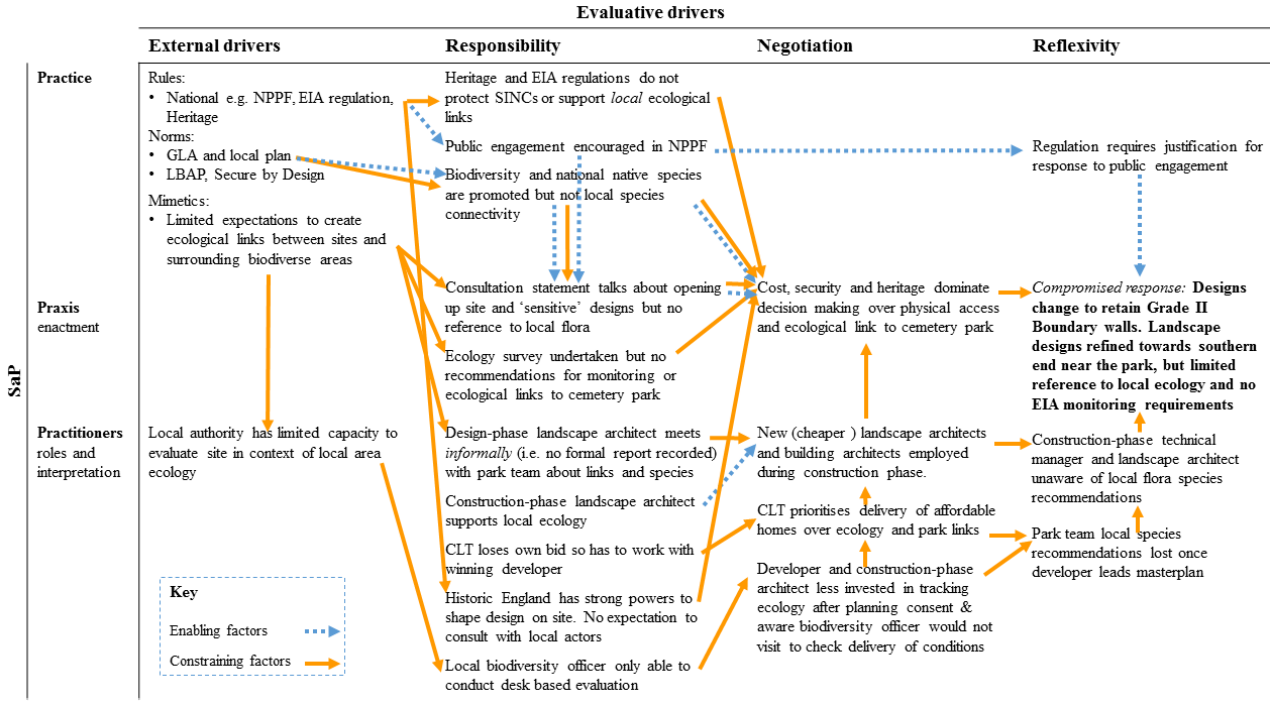


Figure 4-51. Matrix analysis of episode 8: evaluation of GI links between Infill 2 and the local park

External Drivers

In terms of the formal status of the Cemetery Park, it was not identified as a 'sensitive' area which would have required a full Environmental Impact Assessment (EIA) exercise. Although the cemetery park was listed as a metropolitan Site of Importance to Nature Conservation (SINC), the revised EIA regulations (UK Government, 2011) only refer to national parks, nature reserves or Sites of Special Scientific Interest (SSSIs) as sensitive, therefore SINCs lack statutory protection.

The site had undergone an EIA screening evaluation in 2005, informed by the earlier 1999 EIA regulations. The 2005 scoping evaluation found significant potential for environmental impacts:

> '*Given the scale of this intensification the development is likely to give rise to significant cumulative environmental effects within the area, particularly in lieu of the increase in traffic emissions and noise*'. (EIA Scoping Report, 2005)

However, the EIA screening was repeated again in both 2011 and 2013 and the impact was not found to be significant. The consultant who undertook the later EIA scoping pointed out that the developer had undertaken many of the environmental surveys that an EIA process required. The EIA regulations also require monitoring during and post construction however, which was not the case in Infill 2.

The National Planning Policy Framework (NPPF, UK Government, 2012), in line with EIA regulation, supports distinct treatment of different sites according to the 'hierarchy' of designated protected sites. It states that when determining planning applications, local authorities should encourage opportunities to '*incorporate biodiversity in and around*

developments' (NPPF, 2012, para 118). There is therefore no mandatory requirement in the NPPF however, for developers to promote **ecological connectivity**.

In terms of more normative principles, GLA planning officers had reviewed the site for compliance with various London-wide policies but made no direct reference to their own ALGG SPG which outlined the importance of green corridors and ecological connectivity. Their response to the developers' application gave no expectation for floral species connectivity. The local authority's Local Biodiversity Action Plan (LBAP, 2009-14) referred to the need to link together areas of biodiversity and increase people's access to nature. It also highlighted the important contribution that parks and burial grounds made towards these objectives. But again, when evaluating new developments, the LBAP only referred to the general need to promote **biodiversity** at the pre-planning application stage, without any reference to the concept of ecological connectivity between sites (LBAP, 2009, p16, p38).

With regards to formal Heritage constraints, the site was physically and legally limited by the fact that the boundary wall was classified as a Grade II listed (along with some of the buildings). This was supported through regulations (**Planning (Listed Buildings and Conservation Areas) Act 1990)**, by the NPPF (2012) and local policy. There was no regulatory expectation for Historical England to take account of local views as a part of their evaluative process. Furthermore, other codes, such as the Secured by Design code, also meant they were not encouraged to lower the wall:

> "*There's a footpath along [the southern boundary wall] which at night was really dangerous. So we were really keen to get some sort of active surveillance from these properties and lower this wall. You'd meet the Secured by Design police officers, as part of any normal application process as well, and they did not want us to lower that*

> *wall. They were even talking about putting bars at the lower levels and all that sort of thing. Which is totally counter to how we would do this*." (Interview 5 design-phase architect)

Looking to cultural mimetics, there did not seem to be any of the interviewees apart from the cemetery park manager who even considered the possibility of an ecological link to the park, despite recognising this regarding bird and bat species. The concept of ecological linking, or evaluating the sites at different scales of 'bio geography' (Gasanov et al., 2016; Pickett and Cadenasso, 2008; Connell and Irving, 2008; Kent, 2007; Opdam and Wascher, 2004; Kent et al., 1997) did not therefore appear to be a common evaluative practice by those involved on this site (or indeed in the other case studies).

Responsibility

It is notable in Figure 4-46 that much of the praxis relating to site landscaping and GI was implemented by actors who were not part of the core masterplan team, pointing to a potential weaker influence by the consultants and lack of ownership by the developer, also alluded to in the interviews. It seems only down to the projective agency of the construction-phase landscape architect that any *nationally* native plant species were proposed for the site.

The CLT coordinator described how they had started with a more projective mode of agency during the early dialogues about Infill 2. They proactively reached out to local residents in local schools, places of worship, community halls, and conducted walkabouts to talk about what people would like to see happen (Interview 17, CLT coordinator). They felt their bid was particularly participative in that it involved residents in decisions typically closed to them, including about cost, site location, and who might get to live there:

> "*For me those are the kind've truly radical unusual conversations to have with local people… These are often the things that are decided by the client and the architect has to say, 'I'm sorry that's not part of my brief but I will let you decide whether its yellow or red brick"*". (Interview 17, CLT coordinator)

Infill 2 was the only site of the six case studies where there was an attempt to involve residents in these 'larger' questions. The CLT coordinator contrasted these activities with the community charrettes later organised by the masterplan design team. They felt the charrettes had been 'good' but were more conventional, noting that the more strategic decisions (e.g. unit numbers, tenure allocation and costings) were taken without direct resident involvement (Interview 17, CLT coordinator).

Once the bid was allocated to another developer, the CLT had felt the need to adopt a more 'practical evaluative' approach and limit what they asked of the new developer. Their number one priority was to ensure the provision of affordable housing and they put aside the more detailed design ideas that had emerged from the early community conversations, including the outcomes of the Park Team dialogues about the relationship between Infill 2 and the cemetery park. The CLT did not facilitate further debate between the developer and the cemetery park team regarding landscaping (Interview 17, CLT coordinator). So, the park manager felt the outcomes of the early consultative work were largely lost:

> "[The landscape plan] *was completely done in isolation. So it was horrible, it was really horrible. And I remember contacting [the CLT coordinator] and he hadn't seen it and I said 'It's horrible' and he didn't really know what to say. I think he was kind've between a rock and a hard place to be honest. I think he was in that kind've difficult place where he needs to tread carefully*." (Interview 24, park manager)

The design-phase landscape architect did indicate that after talking to the park team they had tried to link the landscape with the cemetery, within the constraints of the boundary wall:

> "*It was about how can we knit into the local community but obviously we did have the heritage so things like the existing wall does contribute to the character and heritage so it's not just a case of knocking it down*." (Interview 30, design-phase landscape architect)

The local authority biodiversity officer indicated that they had looked at the ecology surveys and particularly if protected species had been identified. Their 'practical evaluative' praxis was predominantly desk-based and they never visited the site. In their view Infill2 was too small to justify a visit, despite the proximity to the SINC cemetery park (Interview 32, biodiversity officer).

The new construction-phase landscape architect adopted more 'practical evaluative' agency in managing GI onsite, as compared to the design-phase landscape architects. They felt the original landscape plans were overly aesthetic and less 'realistic' at the design, which meant things were missed such as the water consumption of trees and problems with obtaining building insurance if trees were too close to the proposed buildings. The construction-phase architect's knowledge of technical guidance led them to refine the tree planting proposals:

> "*We tend to follow the NHBC guidelines in terms of water demand. That's really for clay soils with a certain amount of clay content. The National House Building Council. I think they tend to provide insurance for buildings. So, one of the things they probably require to sign things off is that you don't have these high water demand trees*." (Interview 31, in-construction landscape architect)

The construction-phase landscape architect did not observe much ownership of the site landscaping or ecology by the developer or indeed the new (cheaper) architect who had also been taken on for the construction phase. When the landscape architect came on site there didn't seem to by anyone directly responsible for hard or soft landscaping:

> "*The client hadn't allocated certain tasks for the team very well. Like the external works for instance, hadn't been allocated. That was particularly when we came to the really detailed design*" (Interview 31, Construction-phase landscape architect)

They described how the new design team had seemed unaware of some of the evaluative recommendations arising from the ecology survey:

> "*The architect or the client weren't aware about the ecology surveys that had asked for certain kind've lighting for the bats, so that's sort of an issue. Sometimes you have information at the beginning of a project and it kind've gets lost and forgotten about…I had to sort of point it out to them. So, it's just quite surprising how architects aren't always very aware of these issues.*" (Interview 31, Construction-phase landscape architect)

In contrast, the cemetery park team had huge amounts of commitment for the cemetery park and promoting wildlife links:

> "*While we're only 31 acres we're often more biodiverse than an equivalent sized space in the countryside space because of the effort and energy that goes into installing biodiversity through planting it in, and seeding. So you know I walk around here and every patch of the ground pleases me.*" (Interview 24 Park team manager)

They had engaged with the CLT bid because the CLT had taken the time to listen to them but the park team were fairly pragmatic regarding who they talked to:

> "*We felt because it's in our boundaries, it's in our interest to work with the people who want to work with us because it will help defend the cemetery park and we might be able to support some good ideas in there. So it wasn't that we preferred them but we were constantly trying to defend our boundaries and influence planting within our environs*" (Interview 24, Park team manager)

They engaged to the point of voluntarily leading some of the consultations about the landscaping for the CLT masterplan bid:

> "*We led community consultations… we led guided walks or took part in guided walks through the estate, discussing the masterplan*." (Interview 24, Park team manager)

The park team did not feel listened to or informed once the developer had been selected however. They had limited time and resources to engage in formal consultations and had no sense of whether their informal meeting with the design-phase landscape architect had had any influence on the planting scheme.

The CLT coordinator indicated they had had limited meetings with the developer once construction was underway, further restricting opportunities to remind the developer of the early recommendations. This contrasted with Historical England who had an officer that engaged in regular meetings with the developer's technical manager throughout the design and construction phases, providing detailed design advice and contributions to amend and refine designs (including regarding the southern gate).

Negotiation

Heritage, security and cost saving intentions were prioritised over the site's permeability and ecological connection to the park. This was seen played out in the negotiations regarding the boundary wall. According to the design-phase architect, the GLA had wanted to bring down the boundary wall but Historical England would not negotiate on this:

> "*The officer from Historical England was absolutely adamant we couldn't do it.*" (Interview 5, design phase architect)

Although the park team had intentionally recommended local species that would require low maintenance (e.g. perennial bulbs), the CLT coordinator was very clear they associated all landscape maintenance as a potential burden to affordable housing tenants:

> "*When there was a conversation about landscaping and what we're here to do well is provide a decent quality but it's got to be affordable. We've assumed these certain service charges and the cost of these homes…* (Interview 17, CLT coordinator)

The CLT had supported the early GI-specific conversations but was more concerned with delivering the affordable homes to budget. The design team architect also described how plans to put climbing plants along one of the other side boundary walls had also been dropped because of cost.

The change in landscape architect and building architect during the construction brought in cheaper companies but also ones who were more pragmatic in line with developer objectives to limit costs whilst prioritising real estate values. The park manager felt that the dominant priority for the landscape architects was one of cost and risk minimisation:

> "*My experiences of landscaping architects aren't good. They're good at drawing pictures but they don't know plants. And often they're regurgitating plant lists for the same projects over and over again because they know nurseries have them and they have them in mass quantities so they don't have to do things bespoke. Bespoke costs lots of money because it takes up a huge amount of thought energy and to design a bespoke planting plan according to soil, light and all those kind've of things and conditions that you're offering and how you want the plant to ultimately behave."* (Interview 24, park manager)

The construction-phase landscape architect appeared to support the view that cost had been paramount to decision making. They felt it was necessary to deliver more financially and technically realistic plans in the construction phase. This requirement led them to create a completely new landscape plan:

> "*I think we produced our own masterplan as well, just trying to make it work realistically in terms of cost but also technically as well in terms of tree species, close to buildings and all this sort of thing.*" (Interview 31, construction-phase landscape architect)

The landscape architect did refer to the benefits of having an interdisciplinary consultancy team to better address the relationships between different evaluative praxis, which may have contributed to their positive selection of the two-bulb species:

> "*We're actually a multi-disciplinary firm and we have ecologists and arboriculturalists so it quite good, quite often we do all the different plans and surveys for a site and that's*

> *really good you can work quite closely with our people and ecologists so that seems to work really well."* (Interview 31, construction-phase landscape architect)

Despite the park providing numerous GI services to Infill 2, such as visual amenity, cultural and historical, recreational / wellbeing amenity, urban cooling, improved air quality, amongst other social and environmental benefits, there was no mechanism to ensure the funds the local authority derived from the development S106 agreement would be reinvested back into the park to provide support for the management and maintenance. The Park manager was in fact unaware of the S106 funds raised from the developer and indicated that the only funds they had received from the authority was allocated for the repair of an old building and not towards the park.

Reflexivity

Reflexive learning was restricted in the development in part due to the discontinuity in personnel and prioritisation of other agendas (as discussed above).

The CLT coordinator described how the selected design team had engaged formally with the community through a series of charrettes and exhibits enabling some reflection on community priorities in the design phase (Interview 17, CLT coordinator). The cemetery park team did not have the time to engage in these formal events however nor had they been consulted during the technical ecology surveys (including the bat survey). It wasn't until the design-phase landscape architect undertook to proactively meet with them that they were able to engage with those undertaking evaluative praxis and make local species recommendations. This initial reflexive response to the park team recommendations was partially lost in the design to construction transition however, when the landscape plans were re-designed by a new landscape team.

The developer's Technical Manager was only brought into the process once the project was six months into construction. The manager said they had had to interpret the earlier evaluative data and plans without a formal handover. The manager's role was essentially reviewing and ensuring compliance with planning and regulators, delivering the project within agreed timeframes and budget. The technical manager was highly responsive to the recommendations made by statutory actors such as the heritage officer. In contrast the technical manager indicated that the local authority biodiversity and tree officers were unlikely to revisit the site once construction was underway so there was minimal expectation of being checked (Interview 13, developer). This was confirmed by the local biodiversity officer (Interview 35, local biodiversity officer). The construction-phase landscape architect had indicated their surprise that the developer had not been keeping proper track of some of their planning obligations relating to these areas. This included the ensuring the proper treatment of trees in accordance with protection plans:

> "*I think this site we did try and encourage them that they needed to have the follow up protection plans and things because actually, I don't know if you should put this in, but there was tree damage happening that should have been retained so they should have been protected*." (Interview 31, landscape architect)

Based on the poor handover and lack of external pressure and scrutiny to follow through on these 'softer' issues, the final compromised outcome regarding the treatment of ecological and physical connectivity was perhaps not too surprising.

4.5.5 Episode 9: Green roof design to construction transition

This episode is a slightly shorter account than episode 8 as it is quite closely linked to that episode. It looks at the treatment and evaluation of green roofs on infill 2 site.

4.5.5.1 Green roof design as a strategic evaluative practice

A central design proposal to add to the GI on the site was to install 'extensive' wildflower mats on the new buildings, and wildflower and sedum roofs on the bike and bin sheds. The proposal was outlined in the design-phase landscape plan (Figure 4-44. **Landscape Masterplan** (DAS, 2013, p238). The various evaluative, design and construction praxis are outlined in Figure 4-52.

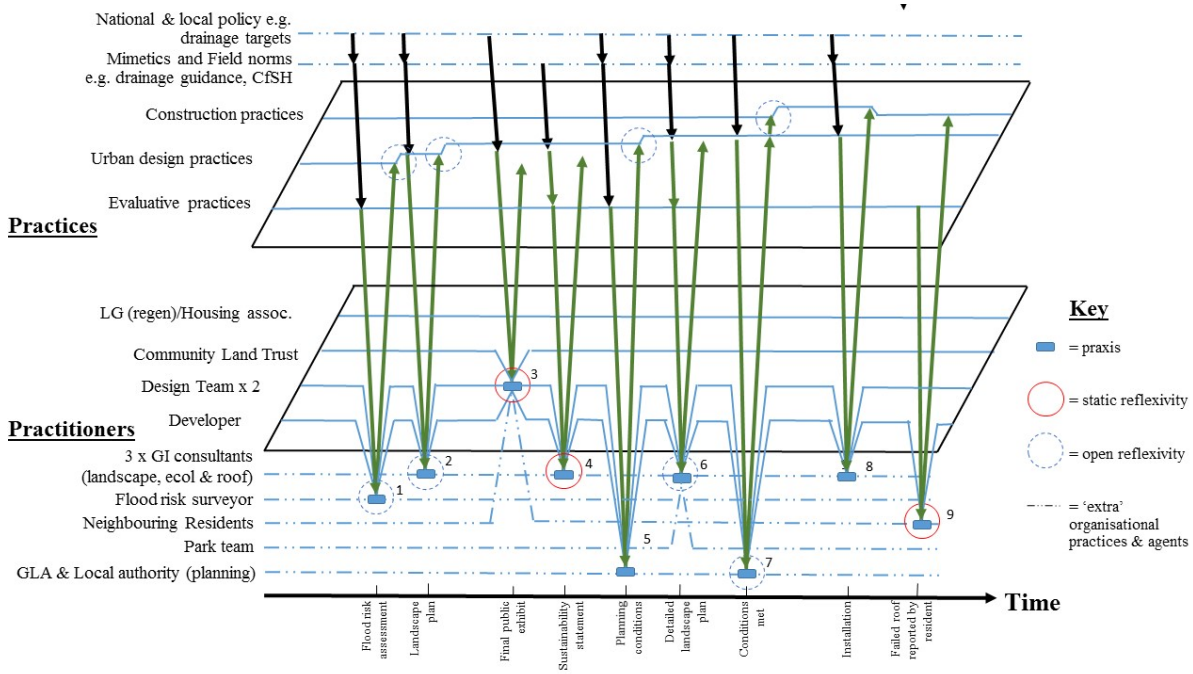


Figure 4-52. Episode 9 as a SaP: evaluation of green roof plans from design to construction

The proposal to introduce the green roofs appears to have occurred through a recommendation from the Flood Risk and Drainage assessment and report (**praxis 1**) in order to meet the national drainage targets and then incorporated into later drafts of the outline landscape plan (**praxis 2**)

for the site (Sustainability Statement 2013; Interview 5, design-phase architect; Interview 30, design-phase landscape architect).

The green roof proposal was not referred to in the final public exhibition (**praxis 3,** Figure 4-52) and no direct connection was made to the potential visual amenity lower green roofs might contribute to residents on the site.

The sustainability statement (**praxis 4,** Figure 4-52) presented to the local authority referred to the green roofs among various proposals intended to reduce flood risk and rain water run-off on the site. It supported the award of a credit in the CfSH water drainage issue (SUR 2). The statement made no reference to the contribution that the green roofs might make to improving building insulation, cooling, ecology or aesthetics.

The biodiversity officer set conditions in the planning consent (**praxis 5,** Figure 4-52) for the green roof plans to meet London Plan policies 7.1 – 7.5 and local authority green roof policies. They advised the roofs followed BugLife guidance (Gedge et al., 2011) on the construction, depth, substrate and planting in order to promote biodiversity including invertebrate species. The detailed landscape plans responded by referring to extensive biodiverse roofs on the buildings and sedum roofs on the smaller sheds (**praxis 6,** Figure 4-52) although the plans made no reference to the BugLife guidance. These matters were given consent by the biodiversity officer (**praxis 7,** Figure 4-52).

One of the first blocks to be built installed a green roof in the autumn of 2015 (**praxis 8,** Figure 4-52). The technical manager indicated that a resident, in a tower block that overlooked the block, had contacted them a year after the block had been completed to inform the developer that the roof did not appear to be growing (**praxis 9,** Figure 4-52). The technical manager had

told the resident that it was still winter and therefore it would not look green. However, shortly after this contact, the technical manager was asked (by the PhD researcher) about the status of the roof. At which point they decided to go and look at the roof from the neighbouring tower block. They found that the resident had been correct and the biodiverse roof had not established, and no plants had grown (Figure 4-53). The technical manager was left uncertain about the status of all the building green roofs. They contacted the roof installer to ask them to rectify the works but indicated that the installer was being 'difficult' about returning to resolve the problem.

When further enquiries were made with the installer it also appeared to be the case that the developer had not adopted the more biodiverse roofs on the buildings but had used the same mats as the sheds. This was not what had been agreed by the local authority biodiversity officer in the planning condition.

Figure 4-53. Phase 1 block, during construction September 2015 (left photo) after completion in February 2017 (right)

4.5.5.2 Episode 9 Matrix analysis

The following analysis looks at the treatment of the green roofs at Infill 2, considering how the four thematic drivers constrained and enabled evaluative practice (Figure 4-54).

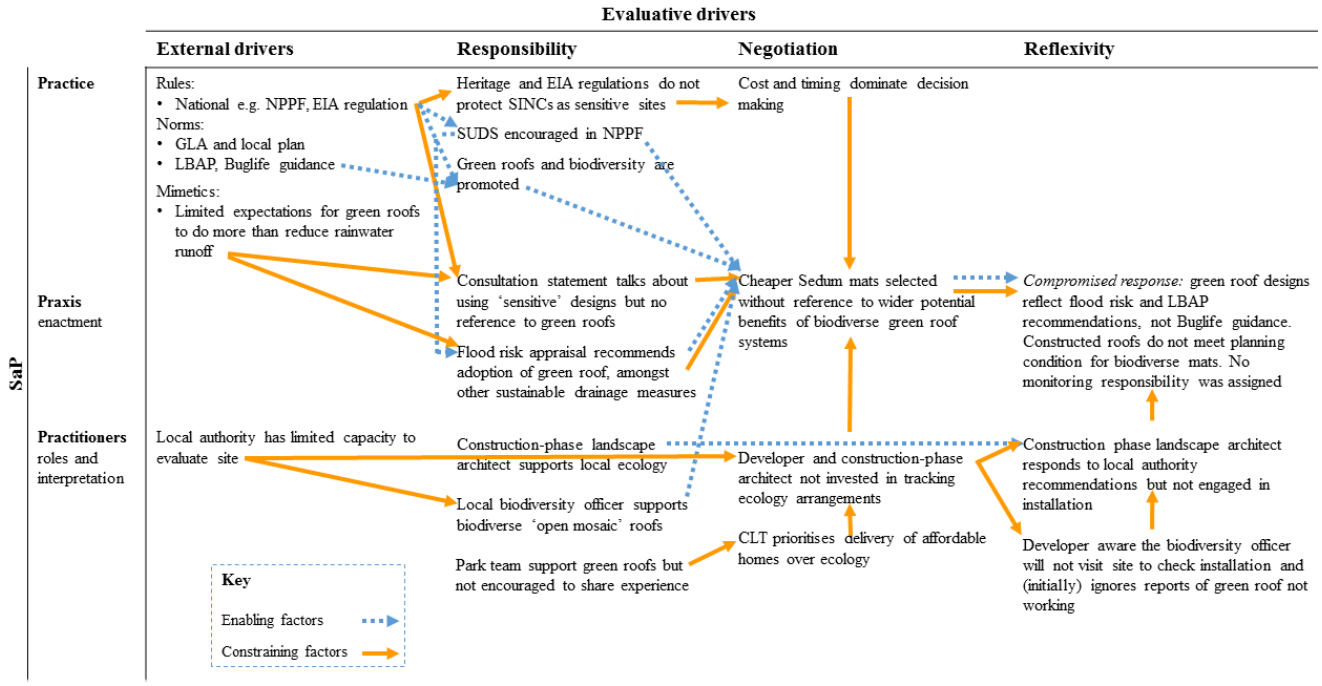


Figure 4-54. Matrix analysis of Episode 9: The evaluation of green roofs on Infill 2

External Drivers

The drainage requirements identified by the flood risk assessment related to the need for developers and their designers to conform with the NPPF (2012) or PPS25. The NPPF requires developments to be safe from flood risk without increasing the risk elsewhere, and '*where possible'* to reduce overall flood risk through the use of sustainable drainage systems, including green roofs (Environment Agency comments, 2013, p.vi). The site had to meet surface run off targets which the green roofs would support:

> "*We had to hit the run off requirements for any new development - you can't have a higher run off than when you had the site."* (Interview 5, Site technical director)

The London Borough also had a strong policy within their Local Biodiversity Action Plan (LBAP) supporting the use of green roofs:

> "*[The London Borough] has over a third of London's living roof and living wall area... The Borough installed 26,520m2 or 11% of London's green roofs between 2004 – 8*" (LBAP, 2009-2014)

The local authority Biodiversity officer indicated that their Biodiversity Action Plan listed several priority habitats, including promoting 'open mosaic habitats' on roof spaces, which they felt was important to promote in the Infill 2 site:

> *"The habitat that is probably the most important intrinsic habitat in East London… what we sort of think of it as wasteland or brownfield habitat…. 'Open mosaic habitat' [in previously developed land] is a Biodiversity Action Plan priority habitat...It's very difficult to protect and so that's all being lost..."* (Interview 32, local biodiversity officer)

Responsibility

Like episode 8, it is notable in Figure 4-52 that most of the evaluative praxis relating to the green roof was implemented by actors who were not part of the core team of masterplan practitioners. The prompting for the green roofs appears to have come from external drivers (national flood and drainage targets and local biodiversity policy) and not as an initiative of the developer or design team.

Again, the biodiversity officer had limited capacity to check the delivery green roofs despite a strong endorsement of them. The officer described struggling with hundreds of applications, making it impossible to visit smaller sites unless the planning department thought there might be a significant impact to the environment, according to the Local Biodiversity Action Plan (LBAP):

> *"Well we've got 1000s of applications a year. No we don't have time to go… I think it would be very difficult to check some of the green roofs."* (Interview 32, Local authority biodiversity officer)

The construction-phase landscape architect had also found a lack of ownership in the management of the external works and ecology onsite, resulting in uncertainty about who was responsible for different activities (Interview 31, construction-phase landscape architect). This apparent lack of ownership appears to have impacted the delivery of the green roof, illustrated by the fact that the technical manager did not immediately followed up resident concern about the green roof. In interview the manager also indicated they had little knowledge about what had been installed;

> *"We've got some green roofs on the new builds and green roofs on the bike sheds. No PV or anything like that…. We're using things like a Sedum. [Intensive or extensive roofs?] I don't know."* (Interview 13, technical manager)

The design team architect was similarly limited in their knowledge of what had been proposed:

> *"We've got green roofs on all the new builds [Sedum?] I don't know" (Interview 5, architect)*

For both the developer and architect it was sufficient that the site included green roofs and there seemed little clear interest or ownership about promoting the wider potential benefits the roofs could provide the site or how they functioned.

As per episode 1, the CLT coordinator indicated that they had not prioritised GI on the site and there were no references to the green roofs in the formal community exhibitions or report back despite references to other landscaping features (**praxis 1**, Figure 4-52).

Negotiation

The green roofs were evaluated from a narrow view of contributing to flood alleviation, affecting how it was valued in comparison to other evaluative priorities. The architect in the design team felt there was a lack of awareness by the developer regarding how GI could add-value to the site. They felt GI quality was being compromised by other evaluative intentions:

> "*Unfortunately, it's the thing that always gets slashed and actually it's of immense value. Our clients tend to be rather short sighted on it… I think it's more the commercial people who look at their spreadsheet and they think; 'Oooh, I can make a huge saving there' without affecting the home at all. It's just not very joined up really*." (Interview 5, design phase architect)

In this case, the developer only benefitted from the green roofs in terms of meeting regulatory and planning requirements, and they were less interested in the potential 'projective' contributions (e.g. biodiversity, cooling, insulating or possible aesthetic benefits). This episode points to an evaluative failure in recognising these multiple functions that green roofs could provide for the site and wider area.

A general question arises from this episode about why the green roofs were not treated as contributing to wider landscaping and sustainability intentions. Although it requires specialist knowledge to install green roofs they could complement other GI features that are outlined in the wider landscaping plan, including floral and invertebrate ecology, ecological connectivity

with the cemetery park, visual amenity, building insulation, etc. as well as reducing water run off that had been identified in the flood risk and sustainability evaluations (Gedge et al, 2011). It seems that the green roofs on this site were treated in a narrow way and still seemed quite novel, and further works needs to be done to build mimetic understanding and practice of green roof values.

Reflexivity

Interestingly the adjacent Cemetery Park Team had first-hand experience of installing a green roof, with their main office using one (Figure 4-55). They were not encouraged to engage in the delivery of the Infill 2 green roofs or landscaping onsite (unlike elsewhere in the borough) and so there was no opportunity for the team to share their own knowledge and learning:

> "*Our green roof was done very poorly. It was done when knowledge was still quite sparse…So this was made not deep enough and with the wrong substrate but it has created a unique habitat. It's a very drought tolerant green roof. It's got some really nice things on there.*" (Interview 24, park team manager)

Figure 4-55. Small green roof on Park Team office (front building, photo: R Callway, June 2016)

The local authority was unable to do more than a desk based review of the green roof plans and did not visit the site. The developer was aware that this was unlikely and appeared to have opted for the cheapest green roof option (sedum mats), rather than the diverse open mosaic habitat that the LBAP was seeking to promote:

> "*The type of green roof is important [Do you mean extensive verses intensive roofs?]… No much more than that. I mean biodiverse rather than a sedum mat. If a roof is just a mat of sedum on a flat roof… it's a green roof but it's not a biodiverse roof. It's better for biodiversity than no green roof…but not much. There's probably three or four species of one genus there. But there's no habitat structure. So what I would ideally like is substrate depth varying between 18mm and 150 mm so you've got dips and mounds and things like that."* (Interview 32, local biodiversity officer)

Whilst the construction phase landscape architect did reflectively incorporate the local authority biodiversity requirements (**praxis 6)** in the green roof designs but they were not directly involved in installing the green roofs (unlike the ground level GI), and therefore did not contribute to ensuring compliance with the planning condition for a biodiverse roof. The contractor involved in installing them certainly seemed unwilling to return onsite to address the problems that later emerged without additional payment, which the developer was clearly reluctant to pay. Again, this episode highlights problems with evaluative ownership and the assignment of reflexive responsibility over GI.

4.5.6 Implications for BREEAM Communities

These episodes point to three gaps which should be further addressed by BC, regarding: ecological connections, green roofs and creating a regulatory baseline.

4.5.6.1 Episode specific implications for BC

Three issues were raised in these two episodes from Infill 2 that BC could consider addressing in future versions, including regarding ecological connectivity, biodiverse green roofs and references to tree standards. These are outlined further below.

(i) Local ecological / bio-geographic connections

If the site had adopted BC, the developer would have been required to undertake an full ecological survey and consequent monitoring requirements, as well as take account of local knowledge about ecology (i.e. the park team) as a ***mandatory*** part of the standard's 'LE 01 - Ecology Strategy issue'. The overall aim of the LE 01 issue is to '*enhance biodiversity on site and in the locality*', it also calls for the creation of an ecology which should support the '*Protection, enhancement and creation of wildlife movement/migration routes*'. The ***optional*** issue '*LE 04 - Enhancement of ecological value'* would give two credits if:

> "*The masterplan enhances ecological value through the protection, enhancement and/or creation of wildlife corridors on the site, linking established and/or new wildlife habitats on or adjacent to the site*". (BC Technical Manual 2011, LE 04)

It also awards three credits for integrating ecology into a **GI plan** that would seek to maximise multiple GI benefits on and near the site. So if the developer had applied BC there would be some optional but not mandatory encouragement to promote local ecological connectivity. BC

also fills a gap in EIA legislation since it is less likely that brownfield sites such as Infill 2 would indicate a 'significant' environmental impact, whereas BC requires all sites to consider the ecological impact and particularly enhancement.

In BC, there are optional credits awarded for the proportion of native species adopted in the landscape plan (LE 05 – Landscape), however it also awards optional credits for the creation or enhancement of habitats (in LE 04 – Enhancement of Ecological Value) so it would address the biodiversity officer's concerns regarding promoting habitats. BC does not refer to protecting SINCs however, only SSSIs and Area of Outstanding Nature Beauty and only in relation to two issues (**SE 04 – Noise pollution, SE 13 – Flood Risk Management). LE 01 – Ecology Strategy** is very generic, referring to the protection of habitats and contains (like EIA) an opt-out clause of allowing a developer to undertake mitigating actions if a development is 'unavoidable'.

(ii) Biodiverse green roofs

BC refers to green roofs in terms of climate change adaptation (reducing the urban heat island effect), reducing flood risk (one of a number of listed SuDS) and reducing water pollution in three *optional* issues (LE 03 – Water pollution, SE 10 adapting to climate change and SE 13 – Flood risk management). There is also a small reference in LE 04 about how green roofs might provide a habitat to enhance the ecological value of the site but no credits are attached to that. There is therefore no mandatory requirement or credit awarded in BC to consider the potential *multi-functional* contribution of green roofs as part of a masterplan GI strategy or plan. BC does refer to the CIRIA SuDS guidance but not to specific guidance regarding green roofs (e.g. CIRIA 'Building greener' guidance (Early et al 2007) and the BugLife Guidance (Gedge et al, 2011).

(iii) Baseline standards

As well as the green roof guidance referred to above, a number of tree standards were applied on this site that are not referred to in BC, including those mentioned in earlier case studies regarding BS8537. This case study also referred to the issue of trees having different levels of water demand depending on species and canopy size, which can impact buildings on particular soil types through 'heave' (i.e. raising foundations or soil through root growth). Therefore, BC could refer to standards BS8545:2014 part 10 (tree planting), BS 5837: 2012 (design demolition and construction) and NHBC guidelines regarding building near trees (NHBC, 2011).

4.5.6.2 General interviewee perspectives on BC

In terms of more general remarks, interviewees referred to issues around the BC scoring system and challenges related to local engagement.

(i) BC scoring framework

The biodiversity officer was critical of BC because the standard only adopts a positive scoring system which means that the potential negative impacts are not accounted for. The officer also felt it was problematic using 'the number of native species per unit area' as an indicator of ecological quality because certain low diversity habitats can still make an important ecological contribution:

> "*I hate the CfSH biodiversity things and BREEAM biodiversity things… You get positive credits for not doing harm. That should be zero. Not doing any harm should be zero…You can build on a heathland and put a formal garden there and quite easily get*

a positive score on that because heathlands have a low plant diversity." (Interview 32, local biodiversity officer)

The biodiversity officer asked whether, like EIA practice (CIEEM, 2016), BC could adopt a broader scoring scale (DeVellis, 2012) that allows for negative performance to be recognised.

(i) Timing of and openness to local engagement

The CLT coordinator described a bell curve of local engagement (Figure 4-56). The coordinator suggested that whilst BC recognised the second half of the curve, i.e. more engagement produces better outcomes, it ignored the risks of engagement, such as creating unrealistic expectations from participants if the limits of the consultation are not clear from the outset. The CLT coordinator commented that it was unlikely for BRE to admit that there was a left-hand side to the curve, where developers might risk doing little or no consultation, so that they can '*squeeze it through planning permission without anyone noticing*' (Interview 17, CLT coordinator). But they also pointed to the risks to that approach:

"*The left-hand side is very volatile so it can be quick but it can shoot up immediately. [More risk of conflict?] Yeah much more risk. You're not really sure. Whereas if you stay very engaged it's more likely to be like that [on the far right of the curve]* (Interview 17, CLT coordinator).

This point challenges the BRE representation about the benefits of upfront consultation. More effective and potentially 'successful' engagement takes time, resources and willingness to accommodate viewpoints. Developers, at least based on these six sites, are often under pressure (internally and externally) to deliver within tight timeframes and within a limited budget. This may be especially so for smaller sites, such as Infill 1 and 2, where these time and resource

pressures may be greater than larger scale projects. BC makes no acknowledgement of such differences in capacity to undertake effective engagement.

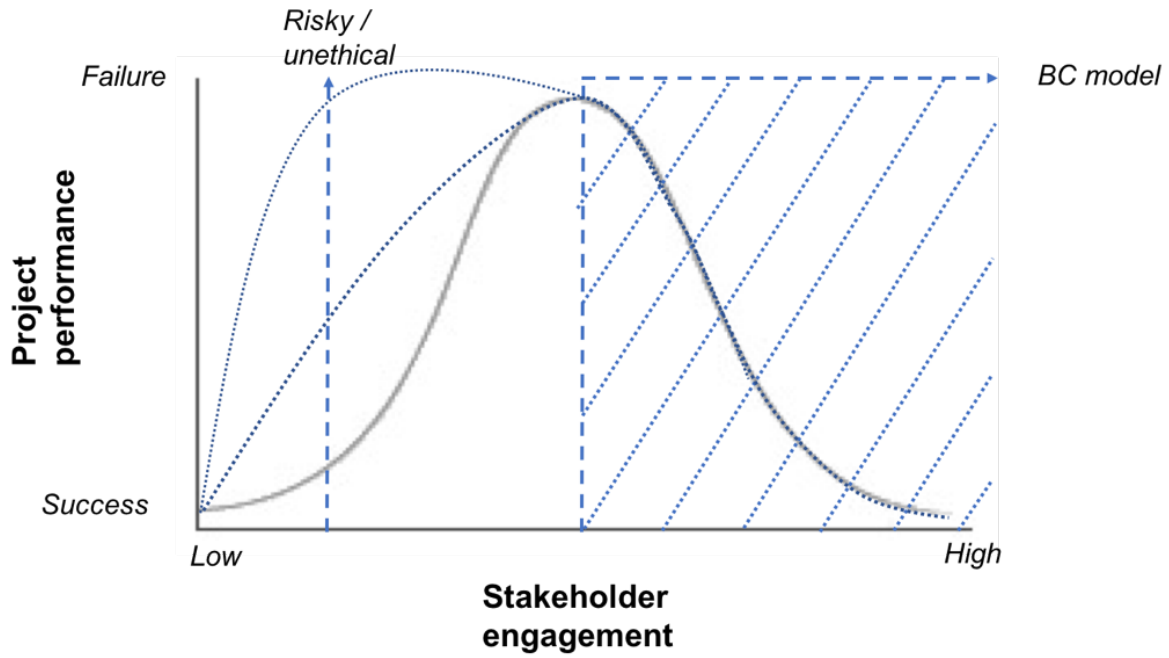


Figure 4-56. Bell curve of engagement (adapted from interview with CLT coordinator, interview 17)

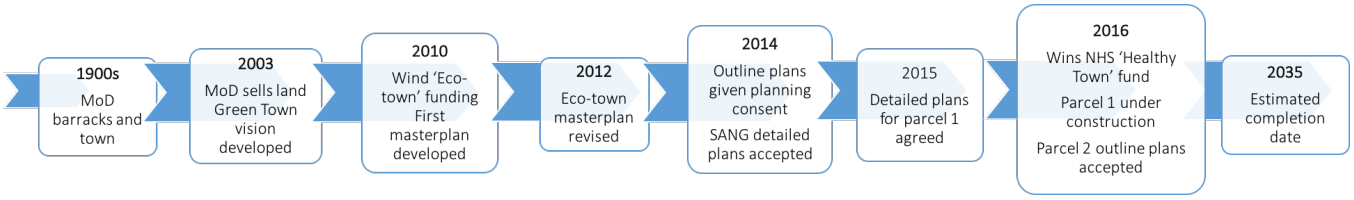
4.6 Rural Urban Extension 1

Figure 4-57 Masterplan (Phase 1, DAS, 2016)

Site data

Masterplan type: Rural urban extension
Area: 81 hectares (47 developed)
Number of units: 1400 dwellings proposed
Density: 30 dwellings per hectare
Affordable units: 30%
Location: South West England
Client: Local authority (Developer on completion)
Masterplan timeframe: 2011-2035

Key dates



4.6.1 Background

Rural Urban Extension 1 (hereafter RUE 1) is situated in Hampshire. It is a greenfield development on a former golf course and farmland, extending an existing village and close to a small parish town of just over 5,000 people, named here as 'T1'. In 2009, the local authority was targeted to deliver nearly 10,000 homes between 2011 and 2029 (just over 500 homes per year). This target was defined through a combination of the local Economic Development Strategy, Strategic Housing Market Assessment (SHMA), Strategic Land Availability Assessment (SLAA) and demographic projections for the sub-region that T1 was situated within the county. When undertaking the SLAA, the local authority identified the RUE 1 site as one of various potential locations that could have contributed to meeting these targets.

4.6.2 Masterplan process

RUE 1 faced a difficult public consultation process. The outline masterplan was developed and submitted in 2012, and given planning consent a year later. The plans were taken to judicial review and appeal in 2014 by the local parish council and a community action group who were concerned about the location, density, flood risk and traffic implications of the development (Figure 4-58).

Figure 4-58. Local protest against RUE 1 (Source: Basingstoke Gazette, Feb 2013)

The parish council felt that the SLAA process that had identified RUE 1 for development had not accounted for their views regarding an alternative site, which they felt was better situated in terms of employment opportunities and existing infrastructure:

> "*Most of the thousands of residents in the development will have to use a car to go shopping, to get to work, secondary schools and so on. There seems no logic in choosing [RUE 1] compared to other locations*." (Parish news, Spring 2013)

In November 2014, the protesters' objections were rejected by the high court. A revised masterplan was then produced along with the detailed plans for the first phase in 2015. The development changed hands from the original developer to a consortium of three developers. The delays due to the judicial review meant that the developers were under pressure to deliver the second phase plans before the outline planning consent deadline ran out at the end of 2016.

The developers defined specific site constraints (including planning requirements and S106 financial contributions, together with land-use, landscape, density, access and movement and building height parameter plans) which they used to produce a revised outline masterplan in 2016 (Figure 4-59).

4.6.2.1 Green infrastructure context

The overall masterplan was described as '*a landscape and green infrastructure-led proposal'* which would '*integrate into the wider landscape setting'* (Planning statement, 2017). The total area of the site is 81 hectares of which over half would be developed, with about 30 hectares retained as public green (and blue) space including swales, ponds and landscaping, as well as a community allotment and private gardens. The site is situated adjacent to a one hectare copse of ancient woodland, a designated Site of Importance to Nature Conservation (SINC) with a

local tributary, lake, and two smaller areas of woodland within the site, as well as pasture fields and existing properties.

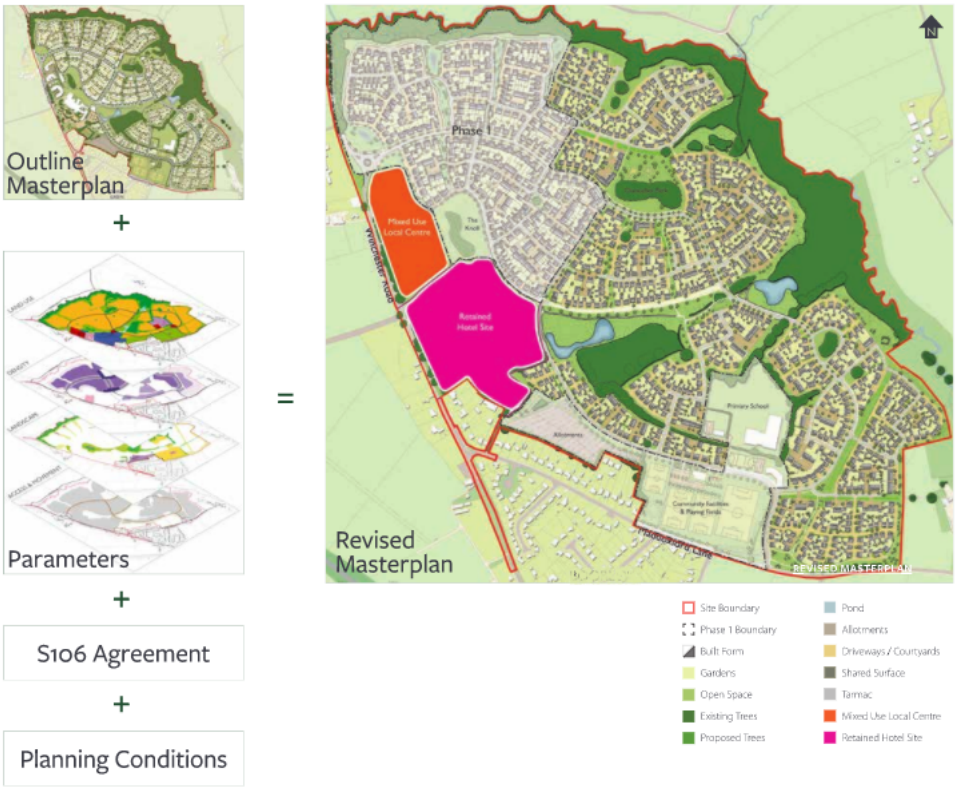


Figure 4-59. Masterplan development process (Design Code, Oct 2016)

4.6.2.2 BREEAM Communities and Green infrastructure

Unlike the other two sites where BC was applied, the local planning authority required all developments in their district, over a threshold of 100 dwellings or greater than 10,000m^2 in land area, to undertake BC and obtain an 'excellent' rating for sustainable development issues 'at the masterplan stage', as well as fund post occupancy evaluation studies (Local Plan 2011-2031, 2013, p91). BC was assessed by a consultant on RUE 1, recruited by the original developer but retained by the consortium of developers.

The consultant gave the site an interim 'excellent' performance score of 74.55% and final score of 76.09%. In terms of scores directly relating to GI, two out of four credits were given for **SE 11 – Green Infrastructure**, missing the credits relating to responding to local consultation recommendations regarding design, use, quantity and location of GI. The assessor gave RUE 1 four out of a possible five credits for **LE 05 – Landscape,** again missing a credit which referred to responding to community needs and consulting with an independent design review panel on the landscape design. Regarding drainage and flood risk, RUE 1 was awarded full credits for **SE 10 - Adapting to Climate change, SE 3 - flood risk assessment and SE 13 – flood management**. It gained no credits for **LE 04 – Enhancement of Ecological Value**, which related to protecting, enhancing and creating new habitats, as well as wildlife corridors within and / or adjacent to the site.

4.6.3 Formal evaluative links to green infrastructure and BREEAM Communities

The details of the analysis of formal evaluative practices in summarised in Appendix 3, Table 3.5. RUE 1 included some novel evaluative elements. The waste assessment and management plan included recommendations to recycle soils within the site, as part of the waste strategy and a target to recycle 80% of waste. The air quality survey considered ecologically sensitive receptors in the assessment (in accordance with Habitat Regulation, 1994), and included recommendations to revegetate earthworks and exposed areas (p20, Oct 2012). The LVIA desk and field surveys also did report using feedback from public consultation events to inform the evaluation, which was not referenced on other case sites.

4.6.4 RUE 1: Illustrative episodes using SaP and matrix analyses

Two evaluative episodes, relating to GI and their associated formal (and informal) evaluative practices, are considered below. Each episode is presented sequentially within the masterplan process as they arose:

- Episode 10: Ancient woodland and ecological connectivity (phase 1)
- Episode 11: Soft SuDS (phase 2)

The analysis is based on interviews with **six** individuals from the different 'actor groups'[19] involved in the masterplan process. The analysis includes individual perceptions of practices from differing actor groups, alongside analysis of documented accounts from those groups that were publically available, and some reference to opportunistic observations.

4.6.5 Episode 10: Treatment of ancient woodland and ecological connectivity

This episode looks at the evaluative treatment of a copse of ancient woodland which runs along the north edge of the RUE 1 site and its links with the wider site ecology (Figure 4-60).

[19]Local authority, sustainability officer (29); Design team, architect and landscape architect (39); EIA consultant and Employers Agent (25); Two neighbouring residents/parish councillors (41); BC evaluator (consultant to developer) (38). There is a slightly lower number of interviews on this site although some interviewees represented more than one actor group (25 and 39). The developer was non-responsive to interview requests, but opportunistic conversation with a representative of their marketing team was undertaken during a site visit. The arboriculture surveyor initially agreed to be interviewed but then was moved from the project.

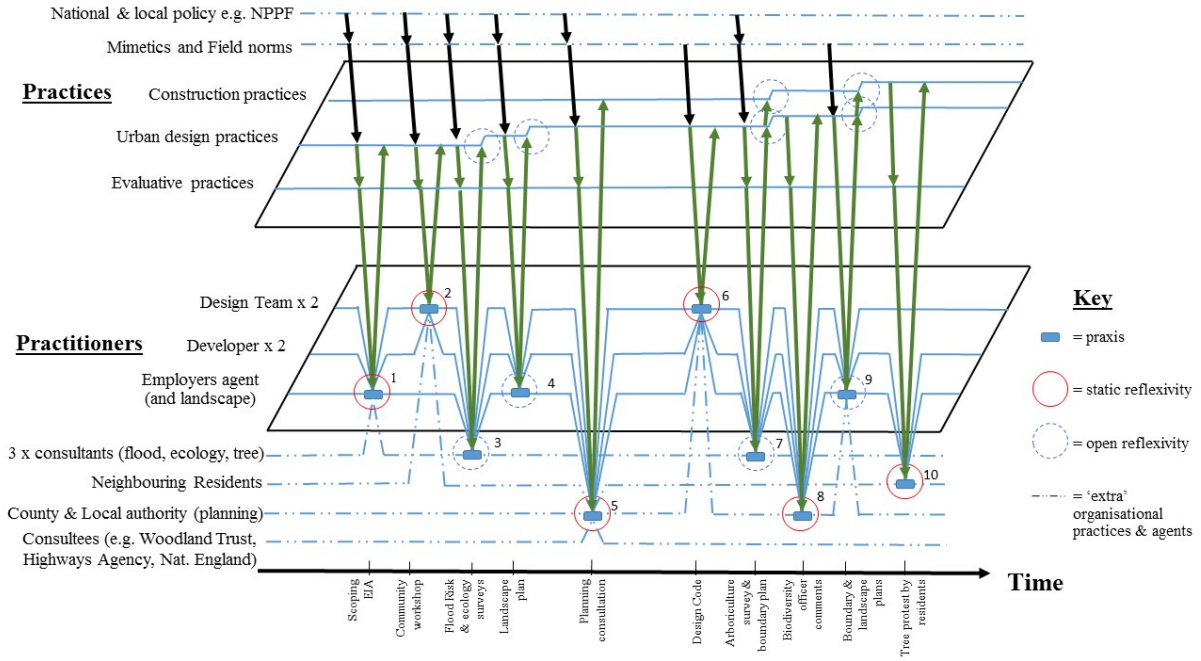


Figure 4-60. Episode 10 as a SaP: Evaluation of ancient woodland and ecological connectivity

4.6.5.1 Ancient woods and ecological connectivity as a strategic evaluative practice

The 'ancient' nature of the woodland was not referred to in an early EIA scoping process (2011) compared alternative sites nor did that EIA refer to the adjacent SINC river valley and lake, despite discounting similar assets on other sites compared for similar reasons (**praxis 1**). A community workshop held at the beginning of the masterplan process (**praxis 2**) did refer to these assets but was poorly attended and there was no reference to community views about the wood or onsite ecology. A participant commented that the event felt 'premature' as the authority's local plan process, relating to site selection, was still in draft form.

A Flood Risk Assessment (**praxis 3,** Figure 4-60) identified a tributary running through the wood and required a 15m buffer zone, along with other SuDS measures, to reduce the flood risk. The grass buffer was included in an outline Landscape Strategy (**praxis 4,** Figure 4-60) to address this risk (Figure 4-61). The buffer was also referred to as a measure to mitigate the

potential ecological impact to the wood in an Environment Statement produced at the same time. It also suggested other measures, such as orientating back gardens away from the wood to reduce the risk of garden waste dumping, distributing wildlife packs to new householders and producing an ecological monitoring plan. The planning consultant referred to the buffer in relation to protecting against flood risk and ecological damage:

> "*because it was a SINC we had to keep a 15-metre buffer of no development away from that woodland area, so everything was outside of the flood zone*" (Interview 25, planning consultant, employer's agent)

Figure 4-61. Woodland edge with 15 m buffer (landscape strategy, 2012)

A Woodland Trust officer raised concerns about the impact of the development on the ancient woodland, during a formal planning consultation (**praxis 5**). The officer commented that the NPPF (2012) requires protection of ancient woods (para 118), as 'irreplaceable' habitats that take centuries even millennia to evolve. They suggested urban development can impact woodland microclimate (temp, humidity, light) a distance up to three times the height of the canopy from the wood edge. The officer noted that woodlands adjacent to housing can become a 'magnet' for activities which can damage the ground flora and understory, such as off-road

cycling and garden waste tipping. They advised extending the buffer to 30m, suggesting greater separation would better protect the wood. The Parish Council also objected to the plans, raising their dissatisfaction with the location, highlighting two local SINC sites and well as concerns about off-site flood risk (see episode 11, RUE 1) and density.

The judicial review found in favour of the developer, after which the detailed evaluations and plans for Phase 1 got underway. The landscape architect revised the boundary edge and landscape plans five times (Revised landscape plans, May 2016) in response to local authority feedback. It would appear however there was no response or justification for not responding to the Woodland Trust comments about extending the width of the buffer.

In terms of the intended ecological links between the adjacent wood and wider site, a design code (**praxis 6,** Figure 4-60) (required as a condition by the local authority) linked the woodland and buffer zone within plans to establish (primary, secondary and tertiary) ecological corridors using trees, hedges and shrubs across the site (Figure 4-62).

Figure 4-62. Wildlife links (Design Code, 2016, p23)

The arboriculture assessment (**praxis 7,** Figure 4-60) identified five A category trees in the (ancient) woodland in phase 1 for removal, as they lived within a proposed footpath running parallel to the buffer zone. The assessment proposed to retain remove other A and B category trees in phase 1, including two 'A' category Oak trees to be removed to make room for infrastructure and a temporary access road, a third 'B' category Oak tree which was '*within the footprint'* of a proposed round about, as well as small clusters of C category trees (Figure 4-63). The arboriculture assessment identified twelve 'C' category trees for '*potential*' retention and relocation, however none of the eight A or B category trees proposed for removal were suggested.

Figure 4-63. Tree protection plan for phase 1. A and B class trees proposed for removal indicated with black arrow (Arboriculture assessment, 2015)

During the construction of the temporary road, some local people protested about the loss of one of the Oaks (Figure 4-64). They were too late to influence the process however and the tree was removed shortly after, without being relocated (**praxis 10,** Figure 4-60).

Figure 4-64. Residents stage six-hour sit-in against Oak removal
(Source: Hampshire Chronical, August, 2016)

In terms of other planting, the boundary layout plans (**praxis 7,** Figure 4-60) only depicted short 'ornamental' hedges (lower than 0.5m) for 72 of the 441 phase 1 residential plots (16% of plots), and the only natural hedgerow in Phase 1 was proposed around the 'Knoll' (Figure 4-65)

Figure 4-65. Natural hedgerow limited to knoll on southern edge
(Phase 1 Landscape plan, May 2016)

The local authority Biodiversity Officer reviewed the landscape plans (**praxis 8,** Figure 4-60) and repeated earlier concerns about a lack of natural hedge and tree connectivity, as well as paucity of indigenous (native) species in the shrub mixes:

> "*If this is the final opportunity to agree landscaping, this development in its current form will block dispersal corridors and isolate protected species." (Biodiversity Officer comments, March 2016)*

The final boundary and landscape plans depicted some additional street trees and back garden trees (**Praxis 9,** Figure 4-60) (although during a site visit in July 2017, the developer indicated that residents would have to plant the trees in the back gardens themselves). Additional trees were not proposed in all the plots the local authority had requested due to conflicts with pedestrian routes, roads and parking requirements, such as Lifetime Homes which required larger parking bays. No additional natural hedge was introduced or additional native shrub species (Figure 4-66).

Figure 4-66. Shrubs and low ornamental hedge (right hand wall) (Photo: R Callway)

The local authority accepted the revised landscape plans in May 2016, and did not require any of the trees identified for removal to be relocated. A later review of ecology by a planning officer (April 2017) again raised concerns about the integration of biodiversity into the '*finer grain*' details of the site whilst '*all other sites have agreed to these enhancements*', referring to the need for additional features to stimulate wildlife, such as wildflower areas, bat, bird and insect boxes and log piles, and for more 'naturalised' surface level SuDS features (see episode 11, RUE 1).

As per the other case study episodes, the story here is quite nuanced but points to some negative impact to the ancient woodland adjacent in terms of loss of mature trees at the wood edge and uncertain in-use impact (microclimate and user). Homes were re-orientated as requested, but there was a lack of response to justify the buffer size, as well as limited reflexivity about enhancing the ecological assets and links within the site. Phase 1 was still in construction at time of writing and Phase 2 still being reviewed in the planning authority's reserve matters process, with ongoing discussion. This leaves the post construction consequences, in terms of woodland treatment and ecological integration, uncertain.

4.6.5.2 Episode 10 Matrix analysis

This episode highlights the lack of clearly assigned responsibility regarding ecological enhancement evaluation and the dominance of the 'practical evaluative' agency and control by the developers in the prioritisation of different evaluative recommendations relating to the ancient woodland and site connectivity (Figure 4-67).

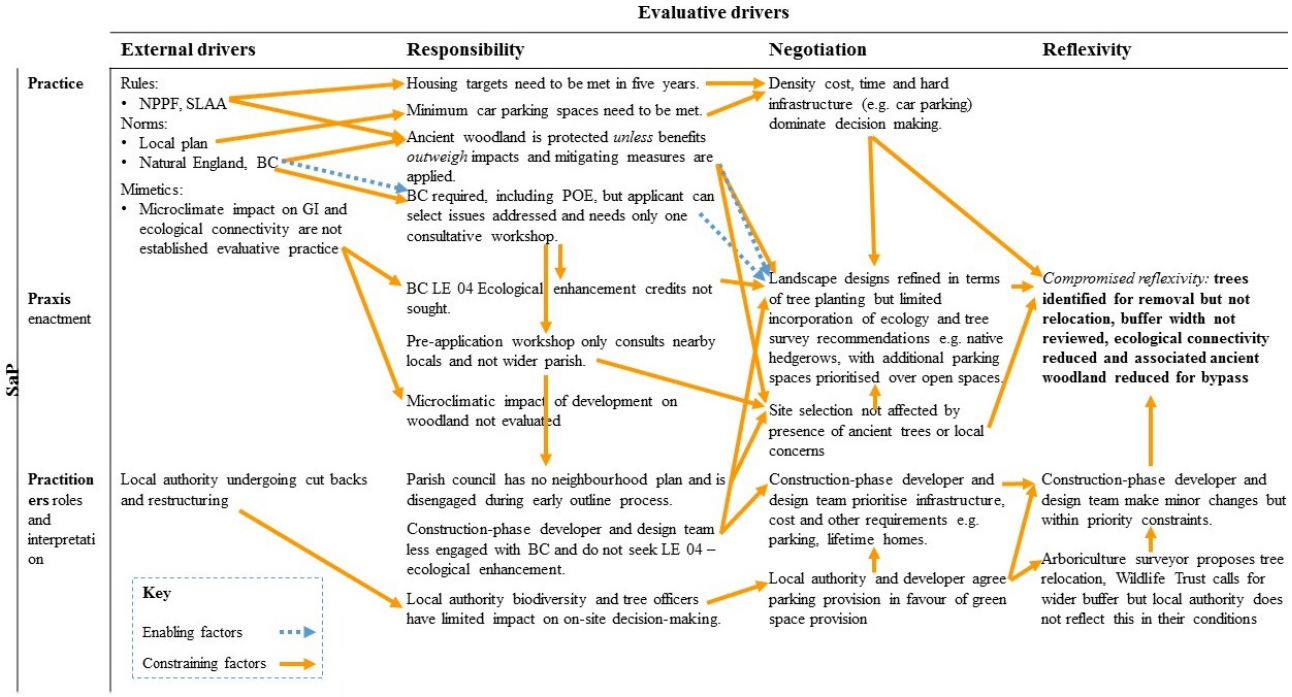


Figure 4-67. Matrix analysis Episode 10: Evaluation of ancient woodland and ecological linking

External Drivers

Although the Employers Agent referred to planning requirements regarding flood risk requiring the buffer area next to the wood (and water course within it), there are no details regarding woodland buffers in the Flood Water Management Act (2010). Instead the 15m buffer seemed to emerge from normative guidance relating to Ancient woodland. The local authority Planning Officer linked the treatment of ancient woodland to national guidance:

> "*Natural England's standing advice on ancient woodland, which includes a checklist which should be considered in order that the [local planning authority] makes a comprehensive assessment of the impact of the proposal on ancient woodland before deciding whether or not to grant planning permission*." (Planning officer comments, Jan 2013)

The statutory consultee, Natural England and Forestry Commission, advice regarding ancient woodland indicates that a local authority must first ask whether a development must happen in a certain location. At RUE 1 the local authority had already decided in favour of the location as a part of their SLAA process (despite the disagreement of the Parish council). The advice then indicates if the woodland (or veteran trees) are likely to be impacted, a development should only be allowed *if* the benefits outweigh the cost in terms of the impact (in accordance with NPPF, 2012, para 188) *and* mitigating measures are applied, such as planting a large area of the same native tree species trees (whilst recognising new trees cannot replace what was lost). This is the broad approach endorsed in BC regarding habitat protection, where developers should protect "*existing natural habitats wherever possible/practical and where not, minimises and mitigates its impact"*. Both formal advice and BC therefore allow mitigation without recognising the 'irreplaceability' of ancient woodland. A buffer area is suggested in the national guidance as a mitigating measure, with an example case where a 15m buffer was applied, but the guidance clearly states the size of buffer depends on the circumstances of each site.

The standing advice regarding evaluation of ancient woodland, whilst adopting a seemingly logical decision-making process (see Appendix 3, Table 3.8 for flow chart) is quite ambiguous about how benefits and costs might be weighted up. It is equally unclear about the proportion and mix of mitigating measures that might be sufficient. This suggests considerable room for broad interpretation of the guidance, depending on the negotiation of potentially conflicting evaluative intentions.

As per the NPPF (UK Gov, 2012), the local plan policy contains a mitigation clause regarding SINC or ancient woodland protection, based on meeting three tests; first, '*the benefits of the development clearly outweigh the need to safeguard the nature conservation value of the site';*

second, no alternative site is available, and; third, if development is permitted then the council must require mitigating measures. The planning officer commented (in 2013) that "*imperative reasons of overriding public interest including those of a social or economic nature" were present on the site, including the need for affordable housing".* These public interest issues placed the development "*on a par with that of the value of the [woodland] habitats on the site*". It is also clear the local authority decided that the proposed mitigating measures – 15m buffer and street tree planting - were sufficient to mitigate for the loss of the five veteran trees and the potential edge effects of the development. There was also no planning expectation to evaluate the size of the buffer according to local context as outlined by the national guidance.

Regarding the legislative powers of the Parish Council, who opposed the site for social as well as ecological reasons, the councillors indicated that they had not had time to produce a Neighbourhood Plan, as per the Localism Act (2011) before the site had been selected. As such they had had little recourse, beyond judicial review, to try and prevent the development;

> "*2011 Localism came in, but then the tools to do the job were not there and neither was the funding."* (Interview 41, Parish Councillor)

The local authority had signed up to a sub-county GI strategy in 2010 with the central aim of providing:

> "*A long-term framework (to 2026) to shape and enhance an integrated and multifunctional green network of south Hampshire's distinctive local environments to ensure they can adapt to climate change and are managed and valued as part of sustainable, prosperous and healthy lifestyles*" (Sub-regional GI strategy 2010).

The strategy directly refers to the benefit of landscape and habitat connectivity to ecological systems, however it contains no explicit objective regarding the protection and enhancement of ancient woodland. In terms of the normative role of BC, there is no direct reference in BC regarding the treatment of the ancient wood or trees beyond more generic statements about 'habitat' protection with a caveat that if habitat must be lost then it should be 'mitigated' (**LE 01 - Ecology**), so there is no recognition of the 'irreplaceable' nature of ancient woods.

Based on the comments in the interviews it did not appear to be normative or mimetic practice to consider the microclimatic effect of changes in the built environment on the trees and nor did it seem common practice to undertake microclimate assessments in more rural settings, despite evidence regarding potential impact of developments to fragmented ancient woodland (e.g. Schmidt et al., 2017; Ryan, 2012; Corney et al., 2008)[20].

Regarding the mimetic external drivers behind the evaluative treatment of ecological connectivity across the site, it seems other issues like parking requirements and hard infrastructure (e.g. Lifetime Homes wider parking requirements) took precedence over woodland protection and ecological enhancement. This was even though the plans recognised there was an 'over provision' of informal and visitor parking spaces onsite. The local authority eventually accepted the level of parking provision losing an opportunity for greater tree planting and other GI.

[20] *"only 617 out of a total of approximately 40,000 ancient woods in Britain exceed 100 hectares (one square kilometre) …48 per cent are smaller than five hectares. Therefore, many are very vulnerable to edge effects from surrounding land use."* (Corney et al, 2008)

Responsibility

There was a lack of awareness and commitment towards the ecological significance of the ancient woodland by several actors. When the site changed hands, the new developers brought in a new design team and architect who were cheaper and less invested in BC and more concerned with financial intentions, this meant the design team adopted a more 'practical evaluative' approach to assessing the sites assets:

> *"[The developers] need to know that the site is going to stack up from a financial point of view and you can't do that with the information that you have that was granted at outline, you have to then look at it and you have to interrogate it in much more detail…what often happens is that we, and in this case as well, what happened also is that we basically we re-drew the master plan, based on a more practical proposal for how we were going to get 1300 dwellings on site"* (Interview 39, construction phase architect)

More marketable issues, like the provision of sufficient parking spaces were prioritised over concerns such as ecological linking where the commercial benefit was more tenuous (see also 'negotiation' below). The developer opted not to obtain credits for LE 04 Ecological Enhancement in BC, whilst credits were sought relating to flood management and parking. This highlighted a weaker emphasis on ecological connectivity in decision making. Although the local authority required the developers to fund a POE to monitor the delivery of BC commitments, as no credits were sought for LE04, ecological enhancement would not be included in that later POE.

The local authority biodiversity officer, despite commenting on the need to improve ecological connectivity, seemed to have limited 'projective' agency to influence further significant changes, once planning consent had been given. The tree officer also did not appear to take a strong lead in pressing for the developer to attend to the recommendations that emerged from the arboriculture survey (e.g. the relocation of healthy trees).

The Parish Council took a while to commit to engaging with formal evaluative practices due to their opposition to the site selection, including that it was adjacent to ancient woodland. Had they had time to put in place a local neighbourhood plan, they would have had greater local 'projective agency' to define alternative locations to develop in the Parish. As a result, they felt disempowered and that they had missed early strategic discussions before the site received planning consent, regarding key decisions such as the location, density, vernacular, and management of the public realm. This (and presumably the judicial review) limited their contribution to evaluative practices undertaken during the outline and phase 1.

Negotiation

Financial costs, meeting housing targets and the delivery of hard infrastructure dominated much of the decision making in this episode. In terms of site selection, potential infrastructural and cost implications had come into play in the decision not to opt for the alternative location, where the infrastructural costs were thought to outweigh the ecological costs for RUE 1:

> *"[The alternative site] needs a better access, there's a railway line cuts across the main access, so there is an expensive, some expensive roadworks associated with it*" (Interview 41, Parish Councillor)

The selection of a more remote location had knock-on consequences regarding the prioritization of car parking over green space provision. Several residents had highlighted concerns about the increase in car traffic and air pollution due to the development, during the formal planning consultations. The planning consultant recognised there was a compromise due to the site location:

> "*You can't really get away from the fact that the vast majority of people are going to be using their car*" (Interview 24, planning consultant, Employers Agent)

The local authority sustainability officer also acknowledged that the location would have unsustainable consequences:

> "*There was huge pressure on parking and because it's not a very sustainable location, it's going to be quite car dependent…*" (Interview 29, Sustainability Officer)

The planning consultant described a process of 'horse trading' with the local authority where proposed parking spaces meant a reduction in the open space previously agreed at the outline masterplan stage, undermining some of the ecological mitigation recommendations in the original EIA.

Reflexivity

The developer and architect did show some reflexive responses to evaluative praxes in this episode, protecting small patches of woodland onsite, planting some additional trees and installing the 15m buffer to protect the wood but these responses were quite constrained by parking, built environment and infrastructural priorities. The outcome did not appear to entirely fulfil the 'landscape and green infrastructure-led' vision described in the outline masterplan.

The parish councillors felt that the early outline masterplan consultative process had been very limited in terms of the developer's reflexive responsiveness:

> *"We were not consulted on the design at all…it's a definition of what you mean by consulted… Consultation to us is before decisions are made.***"** (Interview 41, parish councillor)

The Parish Council felt they had not been properly informed about the first masterplan workshop (only residents in the immediate vicinity were leafleted and eight people turned up). Representatives did go to a later feedback session which was '*reasonably well attended by residents'*. However at that point, the developers and design team "*weren't receptive to any changes*". From the parish councillors' point of view the developers did not want to hear additional feedback after the first workshop i.e. the pre-application outline masterplan was not an iterative consultative process. BC communities GO 02 Community consultation issue only requires one consultative workshop at the outline stage but that did not appear to be sufficient in this instance to allow additional refinement after the feedback session.

RUE 1 was also associated with a compromise on the protection of a second section of ancient woodland, to construct a new bypass. Like RUE 1, the local authority judged that various mitigating measures[21] were sufficient to justify the loss of 0.24 hectares of 'irreplaceable' ancient woodland.

[21] Mitigating measures included: *Planting 1.16 ha of new trees, constructing a single span bridge over the copse to retain a corridor of woodland beneath, a 15m buffer (like RUE 1 site), and provision for on-going management of the wood to limit future potential adverse effects from the new development.*

4.6.6 Episode 11: Soft SuDS

This episode looks at the evaluative treatment of 'soft' Sustainable Drainage Systems[22]' (SuDS) in RUE 1, which related to proposals to use GI such as swales and ponds throughout the site.

4.6.6.1 Soft SuDS as a strategic evaluative practice

Figure 4-68 outlines the episode 11 as a SaP. Soft SuDS were proposed as a mitigating strategy in an ecology appraisal that was conducted during the masterplan phase, to protect water quality during and post construction (**praxis 1).**

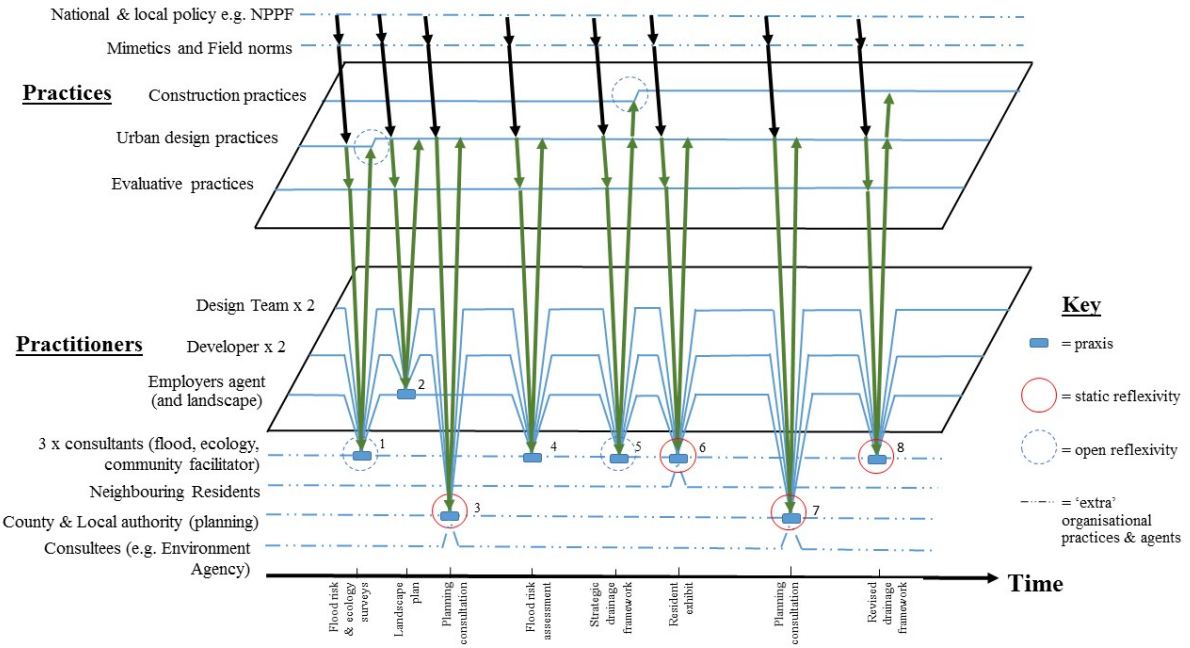


Figure 4-68. Episode 11 as a SaP: Evaluation of soft SuDS

[22] Legal definition of Sustainable Drainage: "*Managing rainwater (including snow and other precipitation) with the aim of— (a)reducing damage from flooding (b)improving water quality, (c)protecting and improving the environment, (d)protecting health and safety, and (e)ensuring the stability and durability of drainage systems*" Flood Water Management Act 2010, para 2

A strategic flood risk assessment conducted around the same time and identified potential locations of flood risk, including highlighting the southeast corner as an area of off-site risk.

The side-wide landscape strategy (**praxis 2,** Figure 4-68) proposed a series of hard and soft SuDS to contribute to multiple aims including, slowing and reducing surface water run-off, promoting biodiversity, creating 'attractive' pedestrian routes and landscape amenity, and habitat at the woodland edge (Figure 4-69).

Figure 4-69. Swale basins and green links in Landscape Strategy, October 2012

A follow-up flood assessment report (**praxis 4,** Figure 4-68) recommended the SuDS network for the detailed phase 1. A Flood Risk and Drainage Strategic Framework (**praxis 5,** Figure 4-68) was produced in response to a planning condition, with three stated intentions for SuDS: drainage, landscape amenity and wildlife.

The 2015 drainage framework was revised a further six times between August 2016 and July 2017. The final plan (**praxis 8,** Figure 4-68) proposed a larger number of hard engineered SuDS in phase 2 than phase 1, with seven underground tanks compared to two tanks in phase 1. Phase 2 includes one soft swale, one basin and four ponds, compared to one swale and five basins in

phase 1 (Figure 4-70). According to the interviews some proposed soft ponds were dropped from phase 2 although the plans highlighting this change were not available.

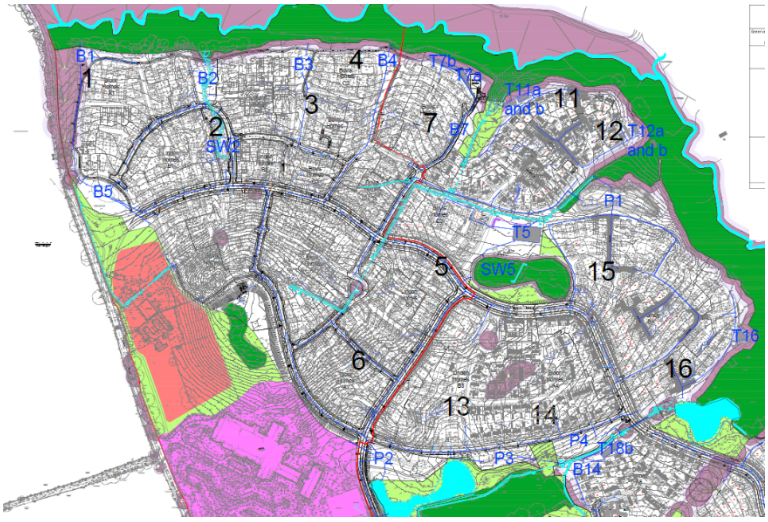


Figure 4-70. Phase 1 and 2 drainage plan (July 2017)
Key: large numbers = water catchments, B = basin, P = pond, T = tank)

The local residents were not specifically consulted as a part of the flood assessments but some residents raised concerns about off-site flooding as a part of the formal planning consultations (**Praxis 7,** Figure 4-68). These and other GI-related concerns were noted but not directly responded to in the Statement of Community Involvement report. The report only outlined responses to comments relating to the provision of affordable homes, housing design, layout and massing.

The Parish Council had argued there was inadequate accounting for potential off-site flood risks during the early masterplan phases (**praxis 3,** Figure 4-68). They thought river basin-scale drainage should have been included as a parameter plan for the outline masterplan (see Figure 4-59). They later repeated concerns that drainage provisions were '*insufficient*' and needed to account for a wider area when reviewing phase 2 in 2017 (**praxis 7,** Figure 4-68). The off-site

risk had been identified in the strategic flood risk assessment (in 2012) but no off-site mitigating measures were proposed for water catchments outside the site.

Reviewing the flood risk strategy, the local authority Biodiversity Officer commented that the drainage measures were '*less than satisfactory*'. They indicated that much of the drainage for phase 2 proposed hard engineering, and adopted just one filtration method. The officer commented that other smaller sites elsewhere had achieved three types of filtration and finer grain biodiversity enhancements, and they could not understand why a larger site was unable to do so. They also raised concerns about the management of soft SuDS which would likely to be undertaken by a landscaping organisation:

> '*that did not contain the skills for drainage maintenance'* (Biodiversity Officer comments, **praxis 7**).

Indeed, the landscape management plan, produced by the proposed landscaping subcontractor, made no reference to managing the soft SuDS (May 2016).

The county council held statutory responsibility for flood management and monitoring. They sent three separate letters (between December 2016 and April 2017) requesting details of surface water volume by catchment area, exceedance flows, provision of a 10% allowance for increase in impermeable surfaces, and long term management arrangements. A revised flood risk framework was produced in response to the county council and local authority comments (July 2017). This indicated that it had been agreed, during a meeting, that ponds, basins, wetlands and ditches were acceptable filters (Figure 4-71), as well as mechanical 'water quality devices' and underground tanks. Due to this redefinition of acceptable filters, the number of

catchments in Phase 2 using a 'three-step' filter, increased from two to seven out of the ten catchments without any significant design changes. According to the revised document:

> "*The surface water strategy provides attenuation discharge rates that will not exceed the current greenfield run-off rates…Thus there is no detrimental off-site impact to flood risk.*" (Amended Flood Risk and Drainage Strategic Framework, July 2017, p19).

Despite this statement, the document later calculates that half of the catchments would exceed the allowable rate of discharge. The overall discharge rate comes just within the allowable rate (allowable level: 438.9 litres / second; estimated level: 438.7l/s) but the potential for off-site flooding from localised exceedance in the individual catchments was not addressed. The report offers no specific details about who should take responsibility for long term SuDS management, beyond stating that a management company, housing association or even individual households might '*potentially*' adopt it '*as appropriate*'.

Figure 4-71. Phase 1, swale in construction (left), a completed basin (right) (photos: R. Callway)

4.6.6.2 Episode 11 Matrix analysis

This episode highlighted a lack of ownership in terms of the long-term maintenance of the soft SuDS onsite, as well as limited reflexivity regarding requests for more soft drainage filters and concerns about off-site flood risks. The following analysis looks at how different constraints and enablers influenced how the soft SuDS were evaluated (Figure 4-72.).

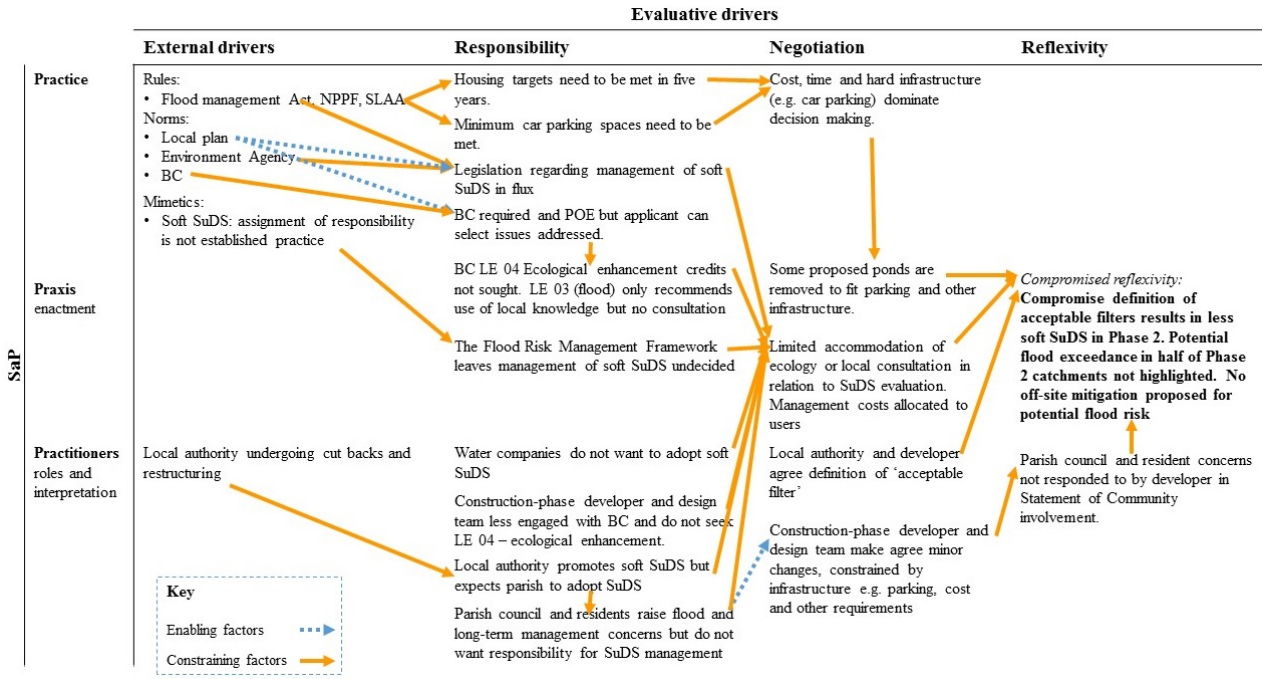


Figure 4-72. Matrix analysis of Episode 11: Evaluation of soft SuDS

External Drivers

A range of rules that promoted the use and management of SuDS in new developments were being developed during the same period that plans for RUE 1 were underway. RUE 1 flood assessment documentation referred to the Flood Water Management Act (FWMA, 2010) which indicates SuDS would be compulsory for all new developments from April 2014. The NPPF (2012) requires local authorities and developers to assess, avoid and mitigate flood risk (para 100), and suggests SuDS can be applied to mitigate flood risk. More recently, the Town and

Country Planning (Development Management Procedure) (England) Order (2015) stated that SuDS should be provided unless demonstrated to be "*inappropriate*".

The county council policy promoted the adoption of SuDS in developments to address an 'increase in impervious areas' or 'urban creep'. The Local Authority also promoted the uptake of SuDS within their Local Plan policy. There was less clarity regarding who should take responsibility for management and maintenance of the SuDS however. A clear legislative approach had not been formalised until late in the formulation of RUE 1 masterplan and the normative and mimetic practice regarding the treatment of soft SuDS seemed far from established. Section 3 of FWMA[23], recognises that financing of SuDS operation is a potential gap. The 2015 TCPA Order clarifies things somewhat, indicating unitary authorities or county councils have responsibility to ensure arrangements were in place for SuDS maintenance over a development's lifetime. The practice for establishing such 'arrangements' was clearly far from straight forward in this instance however.

Regarding the evaluation and mitigation of potential off-site impact, there seemed to be minimal reference to this in legislative terms, beyond flood risk guidance that asks planning authorities to consider "whether the proposed development will increase flood risk elsewhere". The European Water Framework Directive (2000) and UK Act (2003) call for management and assessment at a river basin-scale but does not assign obligations regarding new developments. None of the policies or guidance directly refer to involving local actors (who raised off-site

[23] DEFRA Consultation in SuDS (2011) https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/82435/suds-consult-faqs-111220.pdf

concerns) in flood risk evaluation, and although BC issue **SE 03 - Flood Risk Assessment** requires the use of 'local knowledge' to inform evaluation, it does not specify local consultation as such.

Responsibility

Despite the local authority sustainability officer having a strong background and commitment to landscape architecture, urban design and sustainable construction, it seemed the wider local authority had been subject to cut backs and staffing cuts and restructuring, reducing their capacity and resources to adopt back open spaces, including SuDS on new developments:

> "*The whole council's being reorganised at the moment… Complete fundamental restructure so I don't know if my particular role will exist in a few months' time"* (Interview 29, sustainability officer)

The authority assumed the parish council would take responsibility for open spaces in RUE 1:

> "*Outside [the] town we actually convey the land to the Parish. They end up managing it so [RUE 1], all that Open Space will be managed by [the Parish]" (Interview 29, sustainability officer)*

However, the Parish Council did not expect to take on the responsibility. Whilst thinking of themselves as 'green' with recycling facilities in the village, they did not want to take on management responsibility of any soft SuDS, including a green roof that had been proposed for a sports centre elsewhere on the site, which they called 'hairy fairy fancy stuff'. They felt the responsibility would:

> *"give the parish council a huge burden in years to come*" (Interview 41, Parish Councillor).

Despite acknowledging the potential public benefits provided by soft SuDS, (e.g. climate mitigation, supporting biodiversity, as well as drainage services), the parish councillor struggled to see why the whole community should pay for local SuDS and did not think they benefitted from it. Their lack of experience with managing soft SuDS appeared to make them wary of taking on the uncertain costs and responsibility. In contrast the parish councillors supported some proposed allotments onsite, referring to a waiting list for spaces and how this was an area where they had existing experience. The councillor felt the decision about SuDS management should have been agreed earlier and that BC had not contributed to making that decision clearer (Interview 41, parish councillor). It seemed the water company was also unwilling to adopt responsibility for surface drainage either. Due to this lack of ownership, there seemed a growing consensus towards to handing the soft SuDS management over to a private company, paid for by individual households:

> *"At the moment everyone's saying 'not me'... If for example, [the] Borough say it's them, do [they] just charge those residents there or do they spread it out and all of us pay?... It looks like it will be again a management company with a levy on each household that's what looks like it's going to happen.*" (Interview 41, parish councillor).

There have been recent reports raising concerns about the structure and affordability for householders of this type of private GI management and maintenance model, (e.g. Todd, 2016;

and Home Owners Alliance, 2016)[24], where poorly designed maintenance contracts can result in uncompetitive fees and poor service. There seemed little awareness of the potential risks of the privatised model in the interviewees.

Negotiation

As with episode 10, the location of RUE 1, away from an urban centre, meant that the site had to accommodate a certain level of car parking, resulting in ponds initially proposed in Phase 2 being lost:

> "*There was a recent meeting the ecologist attended where the developer explained that they took out quite a few of the proposed ponds, attenuation ponds*" (Interview 29 sustainability officer)

The developers owned the site and therefore dominated much of the negotiation of different evaluative intentions, in terms of prioritisation of cost, (perceived) risk minimisation and infrastructural integration. This was demonstrated in the negotiation with the local authority over the definition of 'acceptable filters' which resulted in the compromise on the numbers of soft SuDS proposed for phase 2 in favour of hard engineered SuDS. The outcome of that agreement meant that the flood management plans did not require much further revision. Furthermore, the developer was not invested in the long-term management of the soft SuDS.

[24] Todd, A. (2016) The end of deeds of conditions? The Journal, The Law Society of Scotland http://www.journalonline.co.uk/Magazine/61-1/1021197.aspx
Home Owners Alliance (2016) Problems facing homeowners of new developments http://hoa.org.uk/2016/11/problems-facing-freeholders-new-developments

Reflexivity

The outcomes of the evaluative practice and practitioner negotiations relating to the soft SuDS seemed quite constrained and risk adverse in this episode. During Phase 1 the original developer seemed more open to including soft SuDS but as the new developers stepped in they preferred to adopt more familiar hard engineering solutions. This was despite encouragement from the local authority and county council who had made three requests by the county council and others for the developer to produce discharge rates at a catchment level. Although flood exceedance was then identified in half the catchments, this was presented in small print, whilst the overall exceedance was presented to be within the regulatory limits. Neither BC nor local authority called on the developer to respond to residents' concerns about localised (catchment-scale) offsite exceedance, and so these concerns were never fully addressed.

4.6.7 Implications for BREEAM Communities

Both episodes in this case study took place with a background of legislative change that impacted how evaluative practice was carried out. The Localism Act had only been established in 2011 impacting the ability of the Parish Council to take a stronger role in site selection which had a number of knock-on impacts regarding their early engagement. The Flood Risk and Management Act (2010) was also still establishing norms regarding the treatment, ownership and payment of SuDS (including soft SuDS) management. Both were external drivers that BC could not have addressed, however specific findings and interviewee perspectives regarding BC are discussed below.

4.6.7.1 Episode specific implications for BC

Two episode specific issues arose from the case study, first regarding the evaluation of Ancient Woodlands and second, regarding the responsibility to deliver soft SuDS during construction and in-use.

(i) Ancient Woodland

Regarding the specific evaluative treatment of Ancient Woodland BC should refer to relevant legislation and guidance in relation to encouraging ecological and microclimate assessment of the potential impact of the development *towards* Ancient Woodland (e.g. under issue **SE 08 Microclimate**). This would ensure an evaluation of ecological buffering requirement. BRE also needs to consider whether mitigation should be allowed under **LE 01 – Ecology strategy** where habitats are clearly defined as ecologically sensitive and / or irreplaceable, such as Ancient Woodland and SINCs. As BC currently stands it does not go beyond the NPPF (2012) requirements.

(ii) Responsibility for soft SuDS

In terms of improving ownership of soft SuDS, the BC issues relating to Flood Risk assessment and management (e.g. SE 03), should promote local consultation and engagement, not just use of 'local knowledge'. The site was awarded full three credits for **GO 04 - Community Management** of Facilities. The assignment of responsibility sounds good in principle, but community actors must be an active part of the process of deciding if they *want* and have the capability to manage / adopt facilities. BRE also needs to reflect emerging concerns regarding binding contracts and monopoly contractors, to ensure fair and affordable management is supported.

4.6.7.2 General interviewee perspectives on BC and standards

Interviewees raised some broad issues about the value of BC as well as more specific points, including about the system of scoring, validation and independence of the BC assessors. More generally, the local planning officer was clear that BC had some value as a national standard with nationally defined weighting. They felt this consistency was something of value in terms of quality assurance:

> "*One of the strengths of the BREEAM (and the CfSH) is that it is a nationally recognised assessment standard. So everyone understands an excellent or outstanding standard. With variable weightings that consistency and ability to compare schemes across the country would go.*" (Interview 29, Sustainability officer)

The sustainability officer also felt that BC was useful in that, unlike other BREEAM standards, it focused on earlier strategic and design stage decisions, addressing key questions about layout and GI:

> "*Sometimes decisions have already been made by the time you get to [the detailed] design stage.*" (Interview 29, local authority)

It was the sustainability officer who had proposed to introduce BC as a planning requirement. They had sought an 'excellent' rating to encourage developers to go beyond the norm and exceed the regulatory baseline:

> *"I was aware when we were writing the policy that it was only Bristol at the time who had a policy but they didn't specify anything. They just said, 'well you've got to do an*

assessment' and we wondered about the value of that because it could be just a paper exercise." (Interview 29, local authority)

The officer indicated they had had to persuade people within the council, as well as the developer and architect that BC was useful and not too onerous however. Once the scheme changed hands there seemed to be a loss of ownership in BC on the developer-side. There was no publicity claiming BC certification and minimal reference to it in the detailed site plans for either Phase. The new developers on site also reduced commitments for energy efficiency once CfSH was removed (previously the site had applied CfSH level 4). Based on the comments by the BC assessor, it seemed that the developers had not been interested to do much more than the paper exercise the sustainability officer had wanted to avoid:

"*The [developer's] strategy is to do enough to get planning which is understandable..."* (Interview 39, BC assessor)

(i) BC scoring system

Key questions about the selection of site location were poorly addressed by BC in this case study. Although the site scored no credits for carbon emissions from transport (RE 07) this was compensated for by points awarded elsewhere in the standard. As the biodiversity officer at Infill 2 pointed out, it is not possible to get a negative score so, poor performance in one issues do not detract from the total score of a site. As such negative impacts are simply not picked up.

(ii) Validation of evidence

The Parish Council critiqued the checks in place when reviewing BC evidence. They had read the criteria for BC and disagreed with the full credits awarded for all consultative issues in the scheme (GO 01 – 04):

> "*Looking at GO 02 CN1 of mandatory criteria: 'involved in developing a range of options in a timely manner', well there was one option made on the table. Asked to select their preferred option, well there was only one option: 'Involved in the preparation of their preferred proposal', well that didn't really happen, because very few people turned up at the workshop…I snagged them on, but unfortunately it wasn't taken into account, it still sailed through. They didn't like us critiquing it, so I think they knew we'd probably got them something*" (interview 41, parish councillor)

They indicated that there had been no opportunity for people to make further comments during the feedback meeting, since BC only calls for one consultative workshop in the pre-planning outline design phase. This was insufficient consultation in this instance to allow new participants who had not attended the original event to seek further reflexive responses from the developer. Furthermore, they challenged the evidential requirements of this by the BC assessor. They wanted the BC scoring process to undertake greater due diligence and validation by seeking evidence additional to the documentation supplied by the developer, including some wider stakeholder validation.

The employer's agent also raised concerns about a potential lack of follow-through in BC from planning to construction:

> "*For me from a planning perspective it's, 'How do you monitor that?', and 'How enforceable is that? Who actually goes and checks that 85% of the materials used in that road construction are from recycled sources?... there are some elements of BREEAM Communities where you do think from a planning perspective, well who is actually, on a practical level, doing that monitoring, and is it feasible, really*?" (Interview 25, *Planning consultant, Employer's agent*)

The Parish Council questioned whether introducing post construction monitoring alone would ensure good performance:

> "*Supposing they don't get their BREEAM at the end of the day… In reality if they've built it and done it, that's nothing you can undo for that, but if you take [our] example earlier with some of the other regulations, if we don't meet the interference regulation, radio interference regulations we can't sell our products." (Interview 41, Parish councillor)*

Contrasting BC with standards that are legally required, the councillors called for BC to be given greater 'teeth' to ensure developers adhered to the standard:

> "*It's going to get disregarded and fall into disrepute because people will say, it's a put up job for the developers and unless and until the Building Research Establishment say, no, we are going to put teeth into this and we are going to reject some people….*" (Interview 41, Parish Councillor)

(iii) Assessor independence

The independence of the assessor seems like a real challenge for BC since the assessors was recruited and paid for by the developer. In this case, the assessor worked very closely with the developer and exhibited a strong commitment to them, highlighting a "*determination on my part to help get the site as many credits as possible, with much appreciated support from [the] client*" pointing to less independent evaluative practice. For example, they sought to help the developer restructure how evidence was written to fit BC requirements, rather than invite the developer to change what was planned:

> "*I keep saying; 'No, do what you were originally going to do but let's see how we make sure that we meet all of the evidence requirements in what you were going to do'…I want it to go ahead and I've got to help them to meet excellent*." (Interview 38, BC assessor)

The parish councillors had been unaware that the assessor was meant to be independent of the developer:

> "*The independent assessor, I'm surprised they had one, they should have engaged with the community, certainly with the parish council and say have you got any comments on this assessment and we certainly had comments, but they were submitted to Eastleigh Borough Council"* (Interview 41, parish councillor)

This question of BC assessor independence should be revisited by BRE. Adopting a wider scope of evidence gathering could also help address both questions of validation and independence.

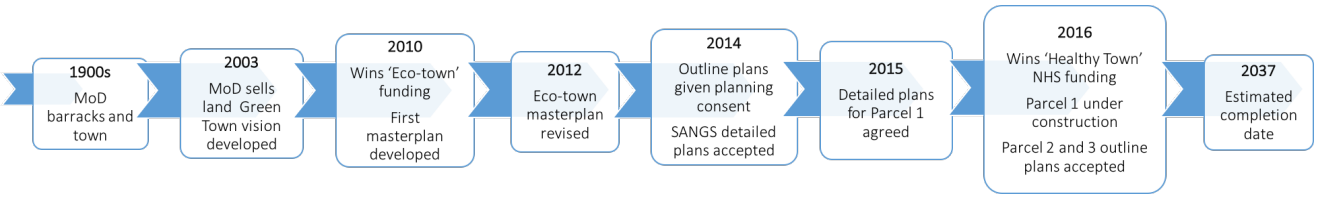
4.7 Rural Urban Extension 2

Figure 4-73 Early masterplan for new 'Green town' (2009)

Site data

Masterplan type:	Rural urban extension
Area:	73 hectares
Number of units:	4,000 units
Density:	55 dwellings per hectare
Affordable units:	35%
Location:	South West England
Client (current landowner):	HCA (Developer and housing association on completion)
Masterplan timeframe:	2012-2037

Key dates



4.7.1 Background

The RUE 2 site is a brownfield development within a former Ministry of Defence (MoD) owned barracks in Hampshire. After over 100 years on the site, the army announced it was leaving in 2003 and the HCA acquired it in 2005 to develop an extension to the existing town that had grown up around the barracks. In 2003, the district authority consulted with local actors to produce a vision document proposing to become a 'Green Town'. This vision became redefined as an 'Eco-Town' in 2010, aligning with a central government programme through which the local authority received funding to develop their plans. Later in 2015 this title was 'rebranded' again towards becoming a 'Healthy town', again in response to a national initiative led by the NHS. The town was awarded NHS funding towards addressing health and wellbeing objectives as a part of its future development.

4.7.1.1 Masterplan process

The land for RUE 2 was divided into three development parcels and put out to tender by the HCA, resulting in three separate developers, including a housing association who adopted the smallest piece of land and two private developers for the other two sites. A masterplan for the full site was developed by a consortium of HCA, district and county councils in 2010, involving local actors. This was revised again in 2012, reducing the density of the site (from 5,300 to 4,000 homes) and adding additional green space protections and other facilities (a school and sports centre) in response to local consultations. The outline plan was given planning consent that same year. Detailed plans for the first parcel of land was given planning consent and commenced construction in 2014, involving 167 homes – five blocks. The first residents moved in in 2017. A hybrid masterplan was developed for the second and largest piece of land developed in 2015.

4.7.1.2 Green infrastructure context

As a contribution to the Green Town vision, a strategic GI assessment was conducted in 2009 and GI strategy was developed linked to the Eco-town masterplan in 2011. The masterplan established an objective to support an overall 'net gain' in biodiversity and new GI networks and corridors, with a 'green loop' linking three Suitable Alternative Natural Green Spaces (SANGS) funded through S106 agreements with the developers (Figure 4-74).

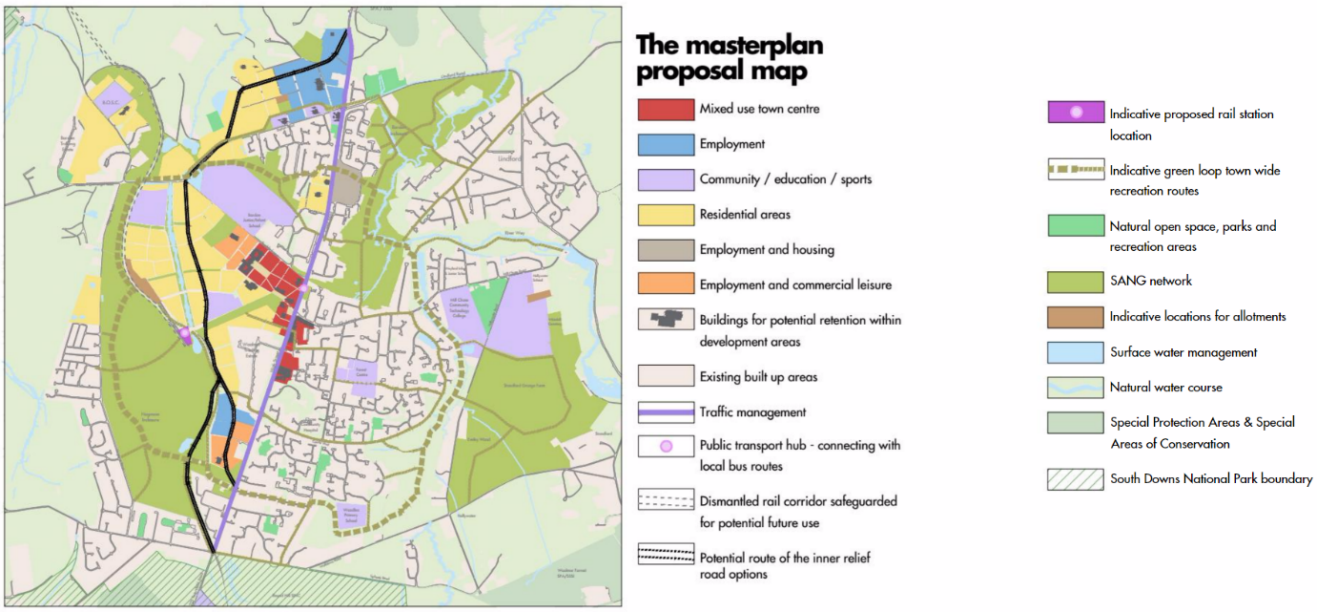


Figure 4-74. Masterplan (2011)

The proposal described opening-up 127 hectares of what had previously been SINC status land, to become three new publically accessible areas of green space defined by Natural England as SANGS. As well as providing space for local residents, the SANGs were intended to provide a mitigating space protecting two sites, one a Special Area of Conservation (SAC) and another area which was also a SAC and Site of Special Scientific Interest (SSSI). During the preparations for outline masterplan stages a catchment analysis (July 2011, Figure 4-75) examined existing and proposed GI uses (allotment, informal amenity space, natural GS, parks,

sport and recreation, and equipped play space). The study proposed to introduce a more balanced GI provision in the North West of the site, including the 'Green Loop', a pedestrian and cycling route linking to three SANGS, green spaces for people to use which would act as a buffer protecting the more significant SSSI sites beyond the SANGS.

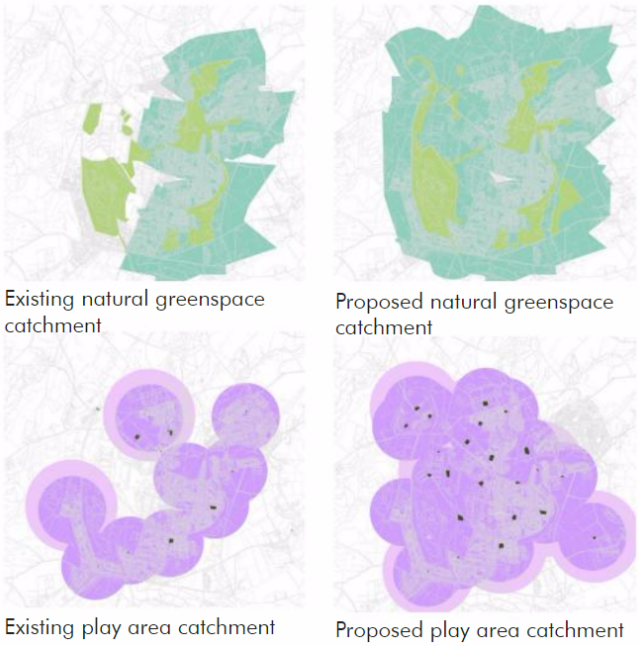


Figure 4-75 Catchment Analysis of GI uses (GI strategy, 2011) p37

4.7.2 Formal evaluative activities and links to Green Infrastructure

Various formal evaluative practices were applied during the development of the outline masterplan, and for the individual detailed phases. The practices were consistent with those carried out in the other five case sites and similar gaps were raised regarding evaluative steps proposed in BC (see Appendix 3, Table 3.6). One practice, unique to this case study site, was that the HCA and developers considered the potential of GI to derive economic benefits, including the potential to stimulate tourism in the town through landscape design and benefitting from the proximity of the site to the South Downs.

4.7.3 RUE 2: Illustrative episodes using SaP and matrix analyses

Two evaluative episodes, relating to GI and their associated formal (and informal) evaluative practices, are considered below. Each episode is presented sequentially within the masterplan process as they arose:

- Episode 12: Tree evaluation
- Episode 13: Ecological connectivity and amphibian evaluation

The analysis is based on interviews with **eight** individuals from distinct 'actor groups'[25] that commissioned, conducted, engaged with or were influenced by the masterplan process. The analysis includes individual perceptions of practices from differing actor groups, analysis of documented accounts from those groups that were publically available, and some reference to opportunistic observations and conversations.

4.7.4 Episode 12: Tree evaluation, parcel 1

This episode looks at the evaluation of trees and infrastructure in the preparation of detailed plans for first parcel of land in RUE 2, hereafter called 'Parcel 1'. A core aim was established in the masterplan for Parcel 1 to deliver a mix of housing tenures and employment space, creating '100 homes and 100 jobs' (Interview 15, housing association), although in the final plans this was reduced to 97 homes and 50 jobs.

[25] Developer / Housing association (Interview 15); Developer (34); Local authority sustainability officer (19); Design team, Architect (20); Employers agent (22); HCA (18); Neighbouring resident (23); Community facilitator (in-house to developer) (33).

4.7.4.1 Tree evaluation as a strategic evaluative practice

Figure 4-76 outlines episode 12 as a simplified SaP diagram.

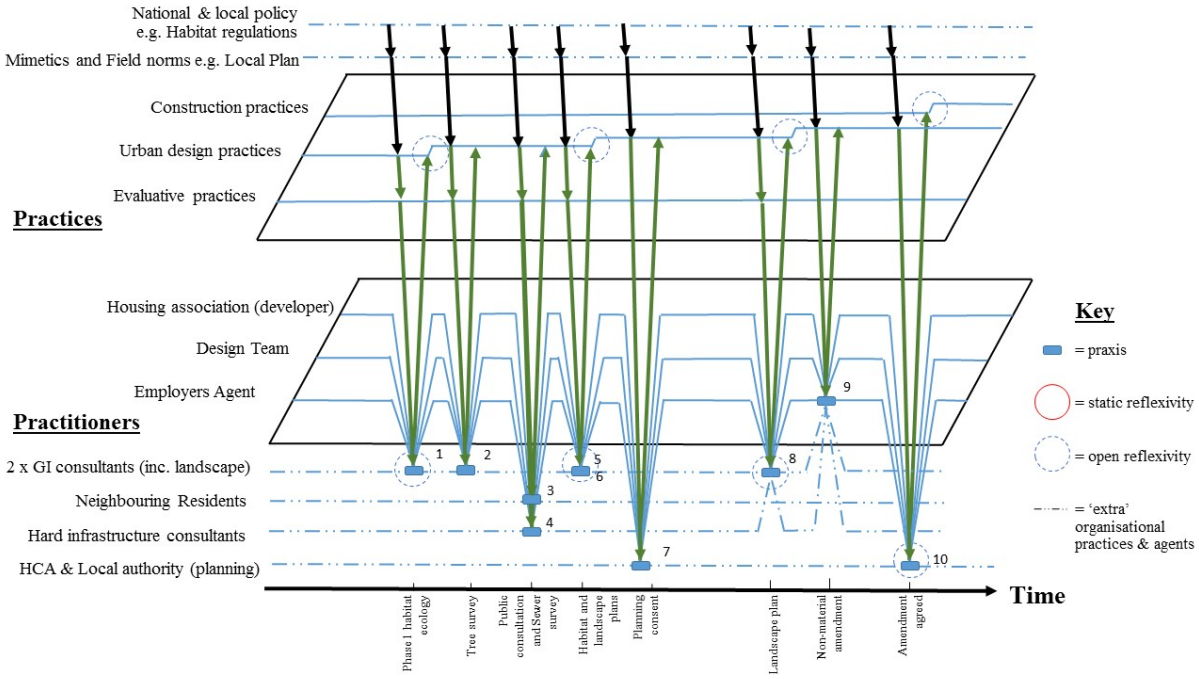


Figure 4-76. Episode 12 as a SaP - Tree evaluation

An ecology assessment (**praxis 1,** Figure 4-76) referred to the role of the trees as roosts for nesting birds and identified scattered native and non-native trees across the site, including some 'veteran' trees. It thought the trees were not used by identified bats. The report called for 'at least' an equal number of trees to be planted if any had to be lost, ideally native species (Phase 1 Ecology appraisal report 2014, p12).

The arboriculture evaluation (**praxis 2,** Figure 4-76) identified 133 trees, of which 30 were 'A' category, 15 'B' category, 80 'C' category and 8 'U' category trees (according to BS 5837: 2005). The plan proposed to remove all the trees in the centre of the site, without any bearing on their category, retaining 43 perimeter trees. It was not proposed to relocate any of the better

quality trees but to plant the same number of 'new' trees to replace those that have been removed. It then stated 85 trees would be planted, resulting in 128 trees, 5 less than the original number.

Two public consultation events, plus a Town Hall exhibition were held prior to planning submission (**praxis 3,** Figure 4-76). Regarding GI, participants called for locally appropriate native trees and plants to be used and for the site to be better connected to the SANG on the western edge. They also called for greater provision of parking spaces which the design team indicated would reduce the number of street trees that could be planted. That same month a sewerage diversion plan outlined the route of an existing sewerage system than ran across the site (**praxis 4,** Figure 4-76).

A habitat assessment (**praxis 5,** Figure 4-76) presented a tree strategy which only showed 76 new trees (p26), making a total of 119 trees, 14 trees less than originally present. A landscape plan (**praxis 6,** Figure 4-76**)** proposed a range of 'character areas', including a Pine Walk area along the perimeter edge of the site leading to the SANGS area at the eastern edge. The local authority gave planning consent to the outline plans in April 2014 (**praxis 7,** Figure 4-76), subject to the condition that if any trees were damaged, removed or died within five years of planting they should be replaced and that all trees should be protected in accordance with the Tree Removal, Retention and Protection Plans. The local authority made no reference to the number of trees that should be planted.

A year later (**praxis 8,** Figure 4-76) the landscape plans were revised and all the proposed trees along Pine Walk were removed, reducing the number of trees by another 20 (Figure 4-77 and Figure 4-78).

Figure 4-77. Pine walk (circled) before (left) and after (right) trees removed (Soft landscape plan, 2014 and revised 2015)

Figure 4-78. Pine Walk character area, 2014 design (left) and 2015 design (right)

The loss of the proposed pine trees was reported to be due to the underground sewer:

> "*It actually ran though the site, so we had to divert that…to save going through the road. [Did you know that before you went into the site?] We knew, we knew that, we knew there was a sewer there …we've ended up now with some mounds with some planting and shrubs on basically.…*" (Interview 22, Employers Agent)

The developer sought a 'Non-Material Amendment' to change the plans in June 2015 (**praxis 9**), abandoning the existing sewer, and building a new one which ran alongside the road (Figure 4-79). This change was agreed by the council in Feb 2016; "*Proposed changes were discussed in detail with Planning Officers and [the] Councillors. It was agreed that the amendments were acceptable and would constitute an NMA, without loss of design quality of the development*." (NMA application). The outcome, prior to construction, was that 56 new trees were proposed to be planted, meaning that a there would be **34 trees** less than originally agreed as the *minimum* number in the outline plan.

Figure 4-79. Sewer diversion layout, abandoned sewer (passing under new homes), and new sewer (along the road), Feb 2016

4.7.4.2 Episode 12 Matrix analysis

Figure 4-80 outlines the dominant drivers influencing the valuation of trees in contrast with hard infrastructure in this episode. There was strong mimetic practice to sacrifice trees in the face of hard infrastructure requirements, with regulatory caveats that also allow for this evaluative prioritisation.

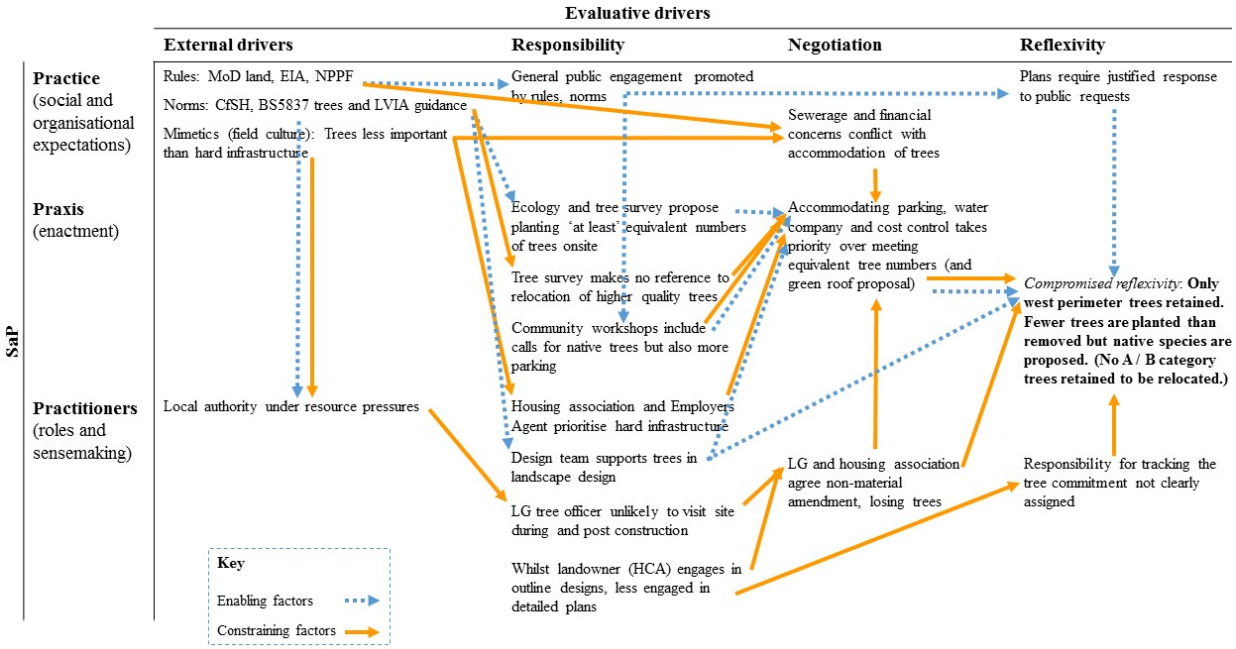


Figure 4-80. Matrix analysis of Episode 12: Examining the dominant drivers behind tree and hard infrastructure evaluation

External drivers

Overtly the main reason for the loss of the Pine Walk trees was because the water company required 'easements' to access the sewerage system and needed to protect the pipes from potential damage from roots (Interview 22, EA). Underlying the reduction in the number of proposed trees however was a lack of external drivers promoting the positive evaluation of trees over and above other issues. For example, the loss of the Pine Walk trees was defined as a 'Non Material' Amendment (NMA) by planning norms, i.e. an insignificant change[26] to the agreed plans, despite the clear ecological and arboriculture recommendations that the developer should to plant *at least* one tree for every tree that would be 'sacrificed'. In contrast, hard infrastructure

[26] According to Section 96A of the Town and Country Planning Act 1990, amended by the Planning Act 2008, applications can make non-material amendment to planning permissions if it is agreed that changes are not 'significant' by a local authority.

and buildings were typically defined as 'material' amendments which could incur additional conditions or even a whole new planning application to be submitted:

> "*'Material' is actually, or relocation of buildings, more, changing the size of, the size of a building, so if we were to increase size of units or something like that*" (Interview 22, EA)

The good quality trees that were identified to be removed were also less protected from the outset on the site because it was MoD land and, it was suggested, the MoD do not use TPO on A category trees on their land (Interview 15, Housing Association). This meant the planning guidance that supported the retention of existing and planned trees was weaker than for hard infrastructure and there was limited regulation supporting the protection of the best quality trees.

Responsibility

It seems early designs for Parcel 1 were largely driven by the housing association (developer), with a strong emphasis on cost and issues like energy efficiency, as they sought to meet their mandatory CfSH requirements. They felt that the HCA had taken a stronger role at the early design stage but that this influence had shifted once the outline plans were given the go ahead. The housing association considered GI to include energy efficiency measures, such as solar panels and insulation, and were less invested in promoting trees beyond the money they had already given to the S106 for the SANGS (see episode 13 below). The housing association felt that too much emphasis was given to trees, noting that design changes had been made to retain trees on the west edge of the site:

> "*Arboriculture can kill a scheme. It depends which way you look at it. There's lots of people that say it should kill a scheme and there's lots of people who are trying to develop things who are saying look you've got that prime development site that's got a tree in the middle of it, if you just got rid of that tree then you could open it up… As a result of the arboricultural [survey] all the units had to shift away from that road. [was that a problem?] It presented a problem in the sense it reduces back gardens and you are squashing up the rest of the site but from a planning point of view it's non-negotiable*" (Interview 15, housing association)

The housing association officer did not refer to the trees providing multi-functional benefits (e.g. a visual, air quality and noise buffer for the houses from the road) to the site or potentially adding commercial value by making the site more attractive. The architects described how the association had also pushed against certain native fruit trees that might drop fruit and 'attract insects':

> "*[Who didn't want to attract insects?] The client. They have to try and sell these so. Put from one point of view - 'Ok well yeah let's have them' - but as soon as they see it from somebody who says, 'Well these plums are going to fall on drive and I'm going to have to clean them up'. Not everybody in Bordon shares the green aspirations of the project team."* (Interview 20, architect, design team)

The housing association indicated that the planning authority applied a 'practical evaluative' approach when it came to evaluating the trees. They were also aware that local authority resource pressures meant that trees were less a priority as compared to other evaluative intentions:

> "*The problem is local authority planning officers are really stretched and increasingly so. With Government cutbacks. So, what we're finding is there's a lot of will for them to do things but they just don't have the time to do."* (Interview 15, housing association manager)

For example, the developer thought than an ecologist might return onsite to supervise the removal of the (legally protected) bats, but thought it unlikely that the tree officer would come back, despite conditions to ensure the trees were alive five years after planting. The local authority officer, although uncertain, also supported this perception:

> "*I don't think we go out and inspect whether people have done things. I think we respond to complaints if they haven't. I think is the way it works. I think that's just a result that we just haven't got the time to do it."* (Interview 19, Local authority sustainability officer)

The Employers' Agent seemed to gain in dominance over decision making and the use of evaluative data as the plans became more detailed. They were involved early on, contributing to activities such as selecting the architect, managing the planning application and cost control. They indicated that the senior housing association manager had handed over the project to more junior staff once the site had planning permission, at which point the Employers' Agent had taken a stronger role in the detailed pre-construction process:

> "*They've now given it to less senior people to run it basically. There's still quite a few things to resolve...we manage the onsite a little bit more than, or we do the pre-construction.*" (Interview 22, EA)

Like the housing association officer, the Employers Agent did not demonstrate strong ownership or commitment to GI and saw the loss of different GI in the evolution of the plans as a 'minor' concern:

> "*There's some minor changes to some of the landscaping, some of these trees have gone here for instance*" (Interview 22, Employers Agent)

Neither of these two key decision makers were strongly invested in the 'projective evaluative' recommendation, emerging from the arboriculture and ecology evaluations, calling for an equivalent number of trees were delivered onsite post construction.

Negotiation

The housing association officer pointed to the burden of juggling so many requirements and hinted that it had become difficult to keep track of every commitment and resulted in inevitable conflicts:

> "*The planning process generally is painful and on a big site you've got so many things to consider, be it arboriculture, bats, drainage, contamination etc. There's always a lot of plates to keep spinning. As hopefully I've demonstrated sometimes the different consultants contradict each other.*" (Interview 15, Housing Association officer)

As with the other five case studies financial prioritisation pressures meant other types of GI were also deprioritised on Parcel 1 in favour of areas perceived as better 'value'. For example, Green roofs proposed for 16 garages were dropped in favour of investing in a more familiar technology, permeable paving, as a part of the cost saving process:

> "*We did have some green roofs but they got taken out as part of the 'value engineering' exercise. They were very expensive and delivered very little benefit…my cost consultant was begging me as project manager to get rid of them and my architect was begging me as the architect to keep them.*" (Interview 15, housing association officer)

This negotiation also hinted at the dominant 'practical evaluative' agency of the Employers Agent (cost consultant) over the views of the architect, whose original vision had included the green roofs and Pine Walk.

Reflexivity

Despite having the information about the sewer at an earlier stage, it was not until the negotiations with the water company took place that the developer responded and required the landscape architect to revise the proposal. The design team referred to the poor communication about the constraints of the perimeter road that they were expected to work within:

> "*What would be helpful would be a section through [the perimeter] road here that said - 'This is what we're aiming to produce'. We'd say 'Ok that's clear then. We know we can provide 5m back from the curb line and there's this, that and houses start here so it's clear. Thank you'…It was all very vague*". (Interview 20, architects design team)

A site engineer referred to the problems of evaluating maps on former MoD sites where underground infrastructure can often differ from how it is drawn in plans: '*We also find pipes and cables in funny places. They are not built like anywhere else. It's all very ad hoc and unplanned*.' (Opportunistic conversation, public exhibit, June 2016). Perhaps more significant than communication and inaccurate maps was the issuing of timing however, where the mimetic practice was to avoid talking to the water company until the designs had outline permission and

reached a more detailed phase. This meant that the design conflict was not made apparent at the time when the design team were reflecting on site constraints.

Throughout this episode, the evaluative recommendation to deliver a certain number of trees was pitted against other site intentions: the water company requirements, costs, timing, and parking spaces. In each case the developer responded in favour of those intentions, and compromised on the tree commitment. It should be acknowledged that there were still trees proposed for retention and planting, and there was some reflexive response to use native trees and support local biodiversity. So there was a degree of impetus from external drivers and internal commitment to ensure trees were not entirely lost from the designs and construction plans. In general, however this episode points to trees being a secondary evaluative intention, one that was of less importance to the developer in comparison with costs, hard infrastructure and layout requirements.

4.7.5 Episode 13: Evaluation of amphibians and ecological connectivity, parcel 3

In 2014, a private developer applied for a 'hybrid' outline plan for Parcel 3, the largest of the three parcels of land in RUE 2. This episode looks at the evaluation of amphibian wildlife corridors in the Parcel 3 'Suitable Alternative Natural Green Spaces' (SANGS).

4.7.5.1 Amphibian wildlife corridors as a strategic evaluative practice

Figure 4-81 outlines the praxis in this episode using a simplified SaP diagram.

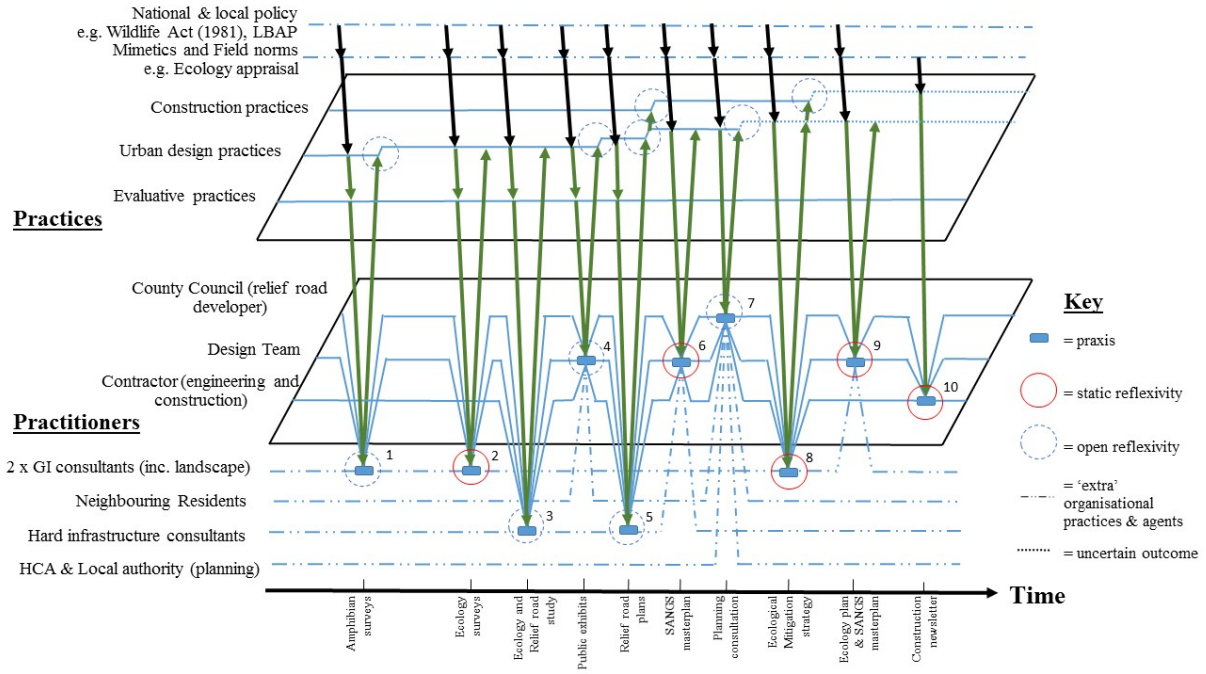


Figure 4-81. Episode 13 as a SaP - evaluating amphibian wildlife corridors

The hybrid plans for the Parcel 3 SANGS included an early Amphibian survey (**praxis 1**) which found ten ponds and identified six amphibian species in a 2km zone around the SANGS, as well as four species present in four of the site's ponds (Figure 4-82).

A later survey (**praxis 2**) found no new species but it was conducted at a time when some of the ponds were temporarily dry[27]. The second survey recommended the retention of some of the ponds and ensuring maintenance of mosaic woodland and heathland around the SANGS. The survey did not consult local stakeholders and made no assessment of an amphibian corridor between one pond within the SANGS and another pond to the east of the site.

[27] Invertebrates, birds, bats, badgers and other fauna surveys also took place in 2009 and 2013.

Common Toad (*Bufo Bufo*)
(Photo credit: Wikipedia, Ridinghag, 2010)

Common Frog (*Rana temporaria*)
(Photo credit: Wikipedia, Bartz, 2008)

Smooth Newt (*Lissotriton vulgaris*)
(Photo credit: Wikipedia, Benston, 2014)

Palmate Newt (Lissotriton Helvitcus)
(photo credit: Wikipedia, Fischer, 1999)

Figure 4-82. Some amphibians identified in Parcel 3

The wildlife corridor was later reported by a local resident and amateur ecologist (**praxis 7**), who indicated they had observed the local amphibian population migrating between ponds:

> "*The frogs cross from there to there. They spawn from there and go back again*" (Interview 23, local resident).

The County Council contracted an ecological desk study (**praxis 3**) presenting the findings of the 2008 and 2013 surveys. The study mapped the results against various options for a proposed relief road that would run along the eastern edge of the SANGS. They proposed two options for southern end of the road. One route cut through two ponds, separating the amphibian corridor (as well as badger and bat corridors) (Route Option 2 on Figure 4-83). The second

route cut through a small industrial business park (Viking Park on Figure 4-83). The County Council decided to opt for the first route between the ponds (**praxis 5**) (Statement of Community Participation, Dec 2014).

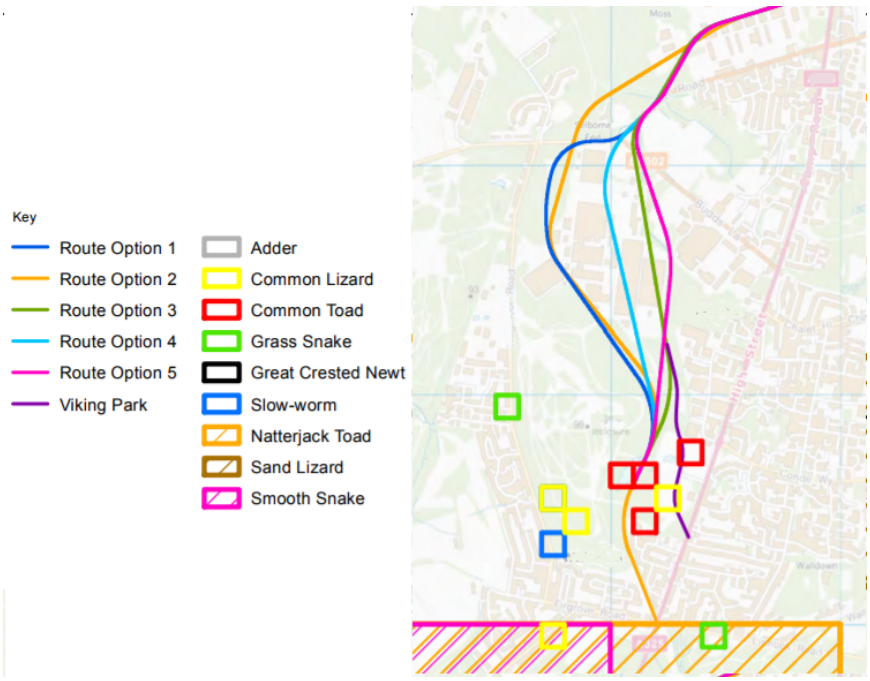


Figure 4-83. Relief road options with reptile and amphibian sightings (Ecological Desk Study, Nov 2013)

Some concerns were raised during public consultations held between February to March 2014 (**praxis 4**) about the public use of the SANGS and the relief road. A third of the (274) respondents indicated they did not support the route, several of whom lived in close proximity to the proposed road. An issue was raised about defining land, previously deemed a 'Site of Importance to Nature Conservation' (SINC), as 'SANGS'. They felt public access would have negative implications for the ecology present in the SANGS:

> "[The] *developer needs to be aware of wildlife responsibilities, to maintain the existing wildlife interest. This includes species in the sandy soil, as well as the reptiles and*

> *amphibians. These areas are not just public open space*" (Resident comment, Statement of Community Participation, December 2014, p61)

In response to these comments, the statement indicated it would move the pedestrian footpath 40m away from the ponds where amphibians had been identified (p22) and support the restoration of the sandy heathland that pre-dated the pine forest. Neither this report nor the masterplan for the SANGS (**praxis 6**) referred to creating a crossing for amphibians between the ponds on the west and east sides of the proposed road.

The local ecologist submitted several objections to the relief road and public access during the formal planning consultations (**praxis 7**). They recommended construction activities be timed to avoid the toad migration period, and called for the introduction of tunnels and retention barriers to guide the amphibians to the tunnels to enable safe migration. Around that time Natural England also picked up on the need for a badger crossing in their response but did not refer to the amphibians.

Once the SANGS had received planning consent (2015) the developer produced a response to the reserve matters (planning conditions), including on ecology. The design team prepared an ecological mitigation strategy (**praxis 8**). Part of the strategy included a proposal for 'fauna tunnels' to allow particular fauna to cross under the proposed relief road.

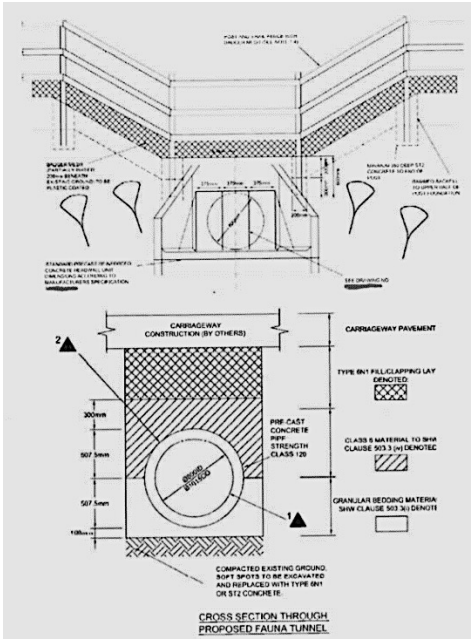


Figure 4-84. Specifications for proposed fauna tunnels and barriers (Ecological mitigation plan, November 2015, p12)

The report was inconsistent about the details of this mitigation response however. The same report referred to **one** tunnel early in the document, and elsewhere to **two**. It proposed two tunnel crossings for badgers; "*One mammal crossing/faunal tunnel suitable for the passage of badgers will be constructed…and another at the southern end of [the] Pond*" (p11). But later in the document it only describes one tunnel, for hedgehogs as well as badgers (p13). The drawn plans are also inconsistent. An annex plan depicts **one** fauna crossing and **two** amphibian tunnels but a detailed plan in the same document shows the fauna crossing and just **one** amphibian tunnel (Figure 4-85) with no reference to the amphibian tunnels in the text of the document at all.

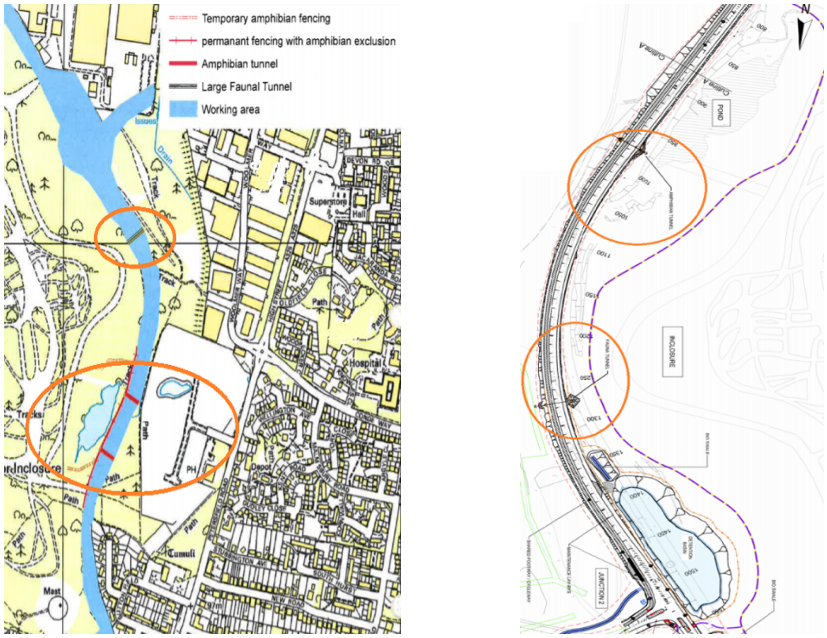


Figure 4-85. Proposed amphibian tunnels, annex plan (left), detailed plan (right) (Ecological Mitigation Plan, Nov. 2015)

This inconsistency continued into later documents. A SANGS ecological mitigation plan (**praxis 9**) proposed **four** fauna tunnels to provide crossing points along the relief road:

> '*The details of these fauna tunnels will be provided by HCC as part of the discharge of conditions pertaining to the Relief Road consent, but will largely comprise of a culvert with the dimensions set to allow amphibian, reptile and badger access', as well as the retention of sandy banks and paths for 'important invertebrate' species* (Ecological mitigation plan, June 2016, p23-24).

The emphasis in the document and associated appendices is regarding the protection of badgers and not amphibians however. A newsletter by the engineering contractor about the road construction depicts **three** wildlife tunnels (see circle in Figure 4-86, **praxis 10**) but this is contradicted again in a site-wide plan on the developer's website that illustrates just **one** fauna and **one** amphibian crossing (May 2017).

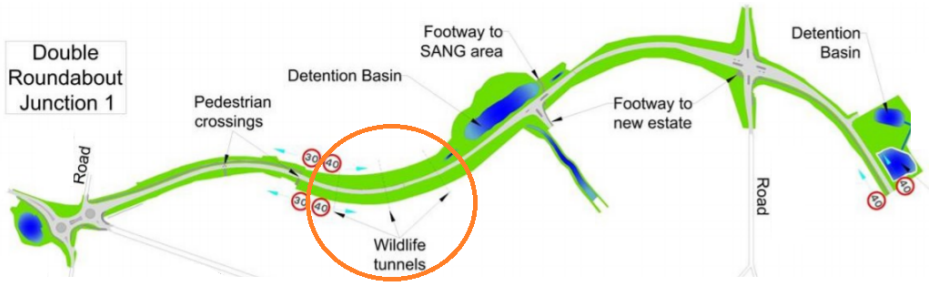


Figure 4-86. Changing plans for wildlife tunnels (Developer newsletter, November 2016)

The relief road was due for completion mid-2018, so the outcome regarding the tunnels remains uncertain. At the time of writing tunnels were being installed. A site visit highlighted that various problems had occurred during their construction. The first issue was that the tunnels had initially been fenced off by rubber panelling, preventing the amphibians from accessing them. The rubber panels were then pulled down by an unofficial actor (Figure 4-87):

> "*This was helped by, shall we say, an 'enthusiastic' local ecologist who had kicked in some of the panels*" (Interview 48, Project manager).

The Clerk of Works felt the unrequested intervention of the local actors had been problematic. When the dismantled panels were discovered, works had had to be halted until the 'official' ecologist was brought back onsite to check 100m around the tunnels for any impact (Interview 49, Clerk of works).

Figure 4-87. Rubber sheets pulled back to allow wildlife to access tunnel (Photo: R Callway)

A second problem occurred when one of the amphibian tunnels had to be constructed three times because of mistakes in interpreting the plans by a subcontractor. The first attempt was installed incorrectly. The second attempt was put in the wrong location, along a telegraph mast route. And a third attempt at the tunnel was under construction at the time of the site visit (Figure 4-88).

Figure 4-88 Third attempt to construct amphibian tunnel. (Photo: R. Callway)

A third problem was raised regarding the validation of evaluative recommendations. The Clerk of Works and Project Manager were both unclear whether or how the tunnels would be checked to see if the fauna and amphibian tunnels were actually being used by the wildlife once they were installed. The Project Manager was concerned that the process of construction could have

been sufficiently disruptive that the badgers (at least) might have moved location, somewhat negating the location of the tunnels.

4.7.5.2 Episode 13 Matrix analysis

This episode traces the journey of a specific design recommendation which emerged in the transition from detailed planning to construction (Figure 4-89). The ownership of and commitment to delivering an (externally introduced) recommendation fairly late in a large-scale construction project comes into question. The main compromise on ecological connectivity occurred early in the process however when the project team selected the relief road route to save time and cost. A weak internal commitment toward the wildlife connectivity appears to have impacted the communication and assignment of responsibility regarding the delivery and operation of the tunnel recommendation. This produced a somewhat disordered reflexive response in terms of the construction outcome.

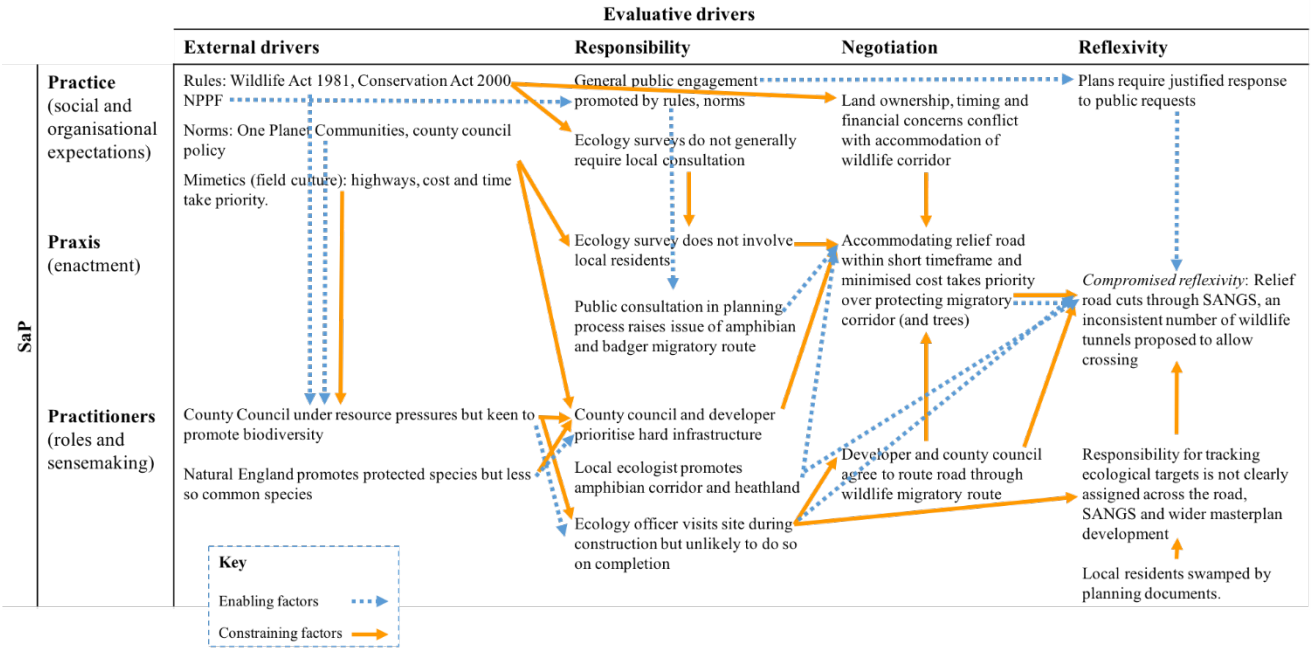


Figure 4-89. Matrix analysis of Episode 13. Examining the dominant drivers behind evaluation of wildlife corridors

External Drivers

The external drivers seemed weak in this episode, in terms of supporting ecological connectivity and the protection of the amphibian migratory corridor. Originally Natural England had objected to the entire RUE 2 development but around the same time the government was calling for a change in focus of the organisation, as well as a reduction in their budget. This meant that Natural England was increasingly pressed for resources and forced to adopt a narrower and positive approach to new developments:

> "*Natural England I'm afraid is now, since Cameron, they've got to promote development. They used to be a conservation organisation. Cameron and Osborne changed them to a pro-development organisation. It says so if you look at the 2012 autumn statement. It says 'you've got to change your ways'... They decimated Natural England to achieve their ends."* (Interview 23, resident)

Natural England produced 'Supporting Sustainable Growth' report which talked about 'green infrastructure as a catalyst for growth' (EFTEC and Sheffield Hallam University, 2013, p10) and presenting an offer to Local Economic Partnerships (LEPs) to '*help develop Strategic Economic Plans and growth deals*' (Natural England, 2014b, pp.9–10). This meant a shift in their core priorities away from ecological promotion for its own sake towards prioritising the anthropogenic benefits derived from ecology.

In the case of RUE 2, Natural England then dropped their opposition and accepted the development. Instead they prioritised the protection of the more 'significant' SSSIs and SPA near the site, over the land defined as a SINC. They called on the developer to use the SINCs as a buffer for the new development, redefining them as SANGS, to protect the SSSIs. In their

planning responses, Natural England prioritised legally protected species in the SANGS, notably badgers and bats, but were less active in defending more common species, including the amphibians and invertebrates. None of the amphibians were identified as formally protected[28] although the Common Toad is listed as a 'priority' species in the UK Biodiversity Action Plan, where 50% or more of the species has experienced rapidly decline numbers in rural areas of South, East and Central England over the last 30 years (JNCC 2010).

Normatively and mimetically, it was not typical to engage local people in the formal ecological surveys. This meant that despite a local ecologist being aware of the amphibian migratory patterns, there was no opportunity for them to share this knowledge until the formal public planning consultation for the SANGS when the route for the relief road had already been agreed.

Responsibility

The local ecologist applied strong 'projective agency' in this episode in terms of their commitment towards the local amphibians and wider local ecology of the site. As a retired civil servant who understood the planning system, they had some capability and knowledge to engage with the formal process and raise awareness about amphibians, as well as other species and habitats, including invertebrates, ground nesting birds, trees and the historical heathland. They combined iterative historical knowledge of the site and projective agency to put pressure on key actors, formally and informally, meeting with officials and their formal objection. The local ecologist sought to influence decisions, within a complex planning context of three parallel development processes: the SANGS, mixed-use development and relief road. This

[28] i.e. Common amphibians are not addressed in the 1981 Wildlife Act and 1994 Habitats Regulations or in the updated Conservation Regulations 2000.

involved numerous and changing actors which complicated the efficacy of the local ecologist's intervention. The local ecologist was not alone in complaining about the opacity of the planning process. Another resident complained about the sheer weight of documentation (over 600 documents for the three processes) which, they felt, was intended to confound those wishing to engage:

> "*I am, concerned that the huge quantity of documents with so much notional information - so many survey methodologies and assumptions - gives this whole application a spurious authority. Not solving a problem or prescribing an answer, but overwhelming it with the sheer weight of less than clear and often repetitive background documentation. Due to the impenetrable titling of so many documents, and the size of others, it is almost impossible to find answers to particular questions of concern.*" (Public objection, Jan 2015)

The relief road plans were separately managed by the County Council, whilst the mixed-use site and SANGS were managed by the private developer under the scrutiny of the local authority. This might also explain the disconnection between the ownership and communication of the wildlife tunnels, recommendations and what was communicated by the different parties. The county council also held responsibility over planning issues relating to ecology which may have resulted in reduced engagement by other regulators and actors regarding ecological intentions. For example, the masterplan architect was aware of the heathland restoration in the plans but didn't know why heathland was being promoted for its historical ecological significance (Opportunistic conversation, public exhibit, June 2016). The episode points to the highly technical and specialised treatment of certain evaluative intentions, including ecology, which appeared to absolve others of that responsibility.

Negotiation

As with the other episodes, this episode involved complex evaluative negotiation and compromise. The developer representative talked about how even the planners struggled to make sense of the 'dark art' of planning (Interview 34), hinting at the multitude of agendas that needed to be evaluated. The Parcel 3 engineer similarly referred to the complexity they had faced in meeting all the site constraints and priorities and how they had had to work together with the ecologist and landscape architects to "*balance ecology with landscape and the function of the water courses*" (Conversation, public exhibit, June 2016).

The local ecologist felt that changing the status of the inclosure from a SINC to SANGS meant that the process inevitably prioritised people over ecology:

> "*The trouble with the natural green space is it's for people. It's not for the wildlife. The wildlife is an add-on… It's the wildlife that always loses out*." (Interview 23, local resident)

But it wasn't necessarily people that were prioritised in the Parcel 3 process but financial intentions. This was illustrated by a negotiated drop in the proportion of affordable homes on the site, from an original target of 35% affordable homes to 15%, less than half the target set by the local authority (Interview 15, Housing association officer). In terms of how this short term financial dominance impacted the evaluation of ecological connectivity, the developer, local authority and local ecologist all alluded to how financial and time concerns had informed the decision for the relief road route to run through the SANGS. The alternative relief road route would have crossed into privately-owned land which would have incurred additional time and money to obtain and start works:

> "*The County Council as the highways authority wouldn't put the road through land that was owned, that was outside their ownership…their general policy is not to because of the potential to grab strips and increase costs from delays in delivery.*" (Interview 34, developer)

This prioritisation meant that any existing ecological links were already compromised from an early stage.

Reflexivity

Two separate actors were involved in leading the evaluative (and other) practices in this episode. The county council led the relief road construction, whilst the SANGS and mixed-use site were led by the private developer. There was some public criticism about the developers' responsiveness during the earlier SANGS consultations:

> "*It's called a public consultation day.....but they do not listen. They have made their plans. We have been ignored from day one."* (Public comment in local newspaper, 20 Oct 2016)

There was minimal justification offered regarding the issue of the route selection. Although the county council and their contractor did demonstrate a degree of responsiveness to the local ecologist's request to address the amphibian migratory route. Nevertheless, the specific design details of this response kept changing, raising questions about the commitment to that response and uncertainty about what would finally be constructed.

Fundamental to this episode seems to be a problem in assigning adequate responsibility to deliver clear targets and to keep track of recommendations that had been agreed at earlier stages.

Despite having the early evaluative target of a 'net gain in biodiversity' across the site, the Parcel 3 plans and relief road resulted in a division of ecological habitats (as well as a loss of 25 hectares of woodland), which would be hard to replace within a built-up development. As one of the objectors pointed out:

> "*I object to the absence of a Monitoring and Action report, which is a serious omission. In view of so many reports making assumptions and basing conclusions on them, monitoring is crucial not least to discover whether these assumptions were correct. They seem to be absent from all the documents. I can find no Monitoring list of factors and indicators"* (Public objection, Jan 2015)

The County Council talked about the responsibility of monitoring ecological impacts lying with the developer – but in the case of the road they were the developer. The parcel 3 developer specifically recognised this was an issue and questioned why standards and indeed the planning system required so many of the evaluations to be 'front loaded' early in the process with little emphasis on validation and on-going checks during construction:

> "*The problem with the whole assessment / sign off in the building contraction process is that nobody ever goes back to check, or very rarely, later on to see actually what happened. Which is why I'm interested in the performance gap of buildings. There's always something that I've not quite understood, all this work is front loaded, signed off and approved and then pretty much there's no, very little follow up. It's very light touch*." (Interview 34, developer)

It is clear from this episode that responsibility for tracking targets, monitoring, communicating and responding to evaluative findings needed to be clarified at a much earlier stage and followed through over the duration of the project.

4.7.6 Implications for BREEAM Communities

There are some parallels between these two episodes and earlier episodes regarding problems with assigning evaluative responsibility over GI.

4.7.6.1 Episode specific implications for BC

Specific findings from these two episodes related to: the evaluation of trees and ecological connectivity, and the transition from design to construction. These are discussed below, regarding their potential implications for BC.

(i) Ecology and tree evaluative mimetics

There seems an established mimetic culture in both episodes for RUE 2 that hard infrastructure, costs and time took priority over ecological intentions. Whilst the interviewees indicated a reluctant acceptance to meet regulatory protections regarding species and 'listed' habitats, it also seemed acceptable that more general ecological values could be sacrificed when they came into conflict with these other intentions. BC could do more to promote greater transparency about such compromise, such as through a new issue requiring triple bottom line project reporting, so that negotiated compromises are made more visible and subject to greater scrutiny at an early phase. BC should also consider how to address the potential conflict between street-based GI (trees, vegetation, SuDS) and underground utilities, as suggested elsewhere, through an explicit requirement to accommodate GI within the '**SE 09 - Utilities' issue**. Finally, BC

should promote the replanting of viable trees and other vegetation if their removal is unavoidable in '**RE 02 - Existing Buildings and infrastructure**'.

(ii) Evaluative transition

BC does not currently address the challenge of evaluative intentions changing in construction and operational phases, as occurred in episode 13, as well as in other episodes. There are separate standards within BRE (and elsewhere) that aim to evaluate buildings during operation (e.g. BREEAM In-use) but they do not address external landscaping or the scale of a masterplanned neighbourhood. In RUE 1 the local authority addressed the issue of dynamic evaluative intentions by requiring the developer to fund a POE process once the site was developed. Perhaps, more important than monitoring however, is a need to assign responsibility and resources to respond to the findings that a POE produces.

4.7.6.2 General interviewee perspectives on BC

Few of the interviewees had any specific comments about BC as it was not applied on this site. Parcel 1 design team felt BC was something that should be required by the client or regulator. They had applied it on a separate site in Eastleigh and did not think it had changed much about how they had delivered the project, except adding to meeting times.

More specific comments related to the consolidation value of BC and potential parallels with the One Planet Living Communities system which was adopted at the early design stages of the masterplan. These are discussed further below.

(i) Consolidation of policy and regulatory requirements

Like other interviewees they referred to the consolidation value of BC, making sure certain existing requirements were covered but not necessarily adding anything new:

> "*I think BC is a good way of focusing in on wider sustainability issues and making sure things are covered and you're doing a process which moves you towards a sustainable approach. As a practice we tend to do that anyway…. We find that with BREEAM as well to some extent it's about working through ticking the boxes.*" (Interview 20, parcel 1 design team)

(ii) One Planet Living Communities

The original plans refer to the site becoming an official 'One Planet Living' (OPL) community but references to this, and identified targets for tracking progress, were largely dropped in later documentation. The local authority sustainability officer was unaware of BC but had direct experience of the OPL principles having worked in a local authority that had applied them elsewhere. The officer recognised that OPL had had limited role in framing the masterplan agenda in the more detailed phases:

> "*We haven't monitored this scheme in that, strictly against the 10 principles within One Planet Living. But we have considered in terms of its impact on transport, energy, water, waste, including community, so essentially all of the components come within the One Planet Living system.*" (Interview 19, local authority sustainability officer)

No interviewee referred to the OPL principles until specifically asked about them. The early documentation relating to OPL introduced several strategic targets, including the one on delivering a 'net gain on biodiversity' but no one had been assigned responsibility to establish a baseline regarding the targets, or to keep track how the proposals were progressing towards

those targets. The Parcel 3 developer indicated they decided not to formally adopt the OPL principles to avoid complicating the 'eco' and then 'healthy' town status:

> "*OPL is a feature of the work, but we did not go down the route of the OPL Communities due to the added layer of confusion in relation to the Green Town Vision and other project labels*" (Interview 34, developer)

As such OPL appeared to have only been applied at a very early stage to legitimise the intentions of the project but later played no role in shaping evaluative practices. This suggests a similar problem existed with the OPL Communities principles as compared to BC, where a lack of assigned responsibility towards the standard meant it was poorly embedded as the plans became more detailed.

Chapter 5: Cross-case analysis

This chapter provides a synthesis of the findings from the case studies and individual evaluative episodes outlined in chapter 4. The analysis is divided into three parts. The first part provides a broad overview of the evaluative episodes and outcomes to analyse the shared and distinct findings looking across the case studies. The second part reviews the specific findings in relation to GI evaluation and the extent to which evaluative practices may have influenced the decisions made related to design and construction. The third part explores the broader implications of the analysis regarding the role of BC in embedding evaluative practices in the masterplan process.

5.1 Broad empirical overview

The SaP analytical framework combined with the four thematic drivers (external drivers, responsibility, negotiation and reflexivity) served to help map out and clarify the dominant drivers that shaped how practitioners shaped, enacted and responded to evaluative praxis. Table 5-1 summarises the dominant actors and thematic drivers identified as influencing GI evaluation in each episode, during the aggregated stages of masterplan decision-making that emerged from the empirical data: outline design, detailed design, construction and in-use. Three broad types or categories of evaluative 'transitions' (Jallow et al., 2011) emerge from the empirical data: regressive, static and progressive evaluative transition. These transitions relate to the patterns of relationships (Jarzabkowski, 2005, p102) between dominant actors, external drivers, modes

of agency, prioritisation and responses to GI evaluative practice at different stages (from design to in-use). They are discussed further below.

5.1.1 Type 1: Regressive evaluative transition

A regressive transition is the first type of evaluative transition identified from the episodes. A regressive evaluative transition refers to a process of subordination of an evaluative intention between one strategic stage and another, as summarised in **Figure 5-1.**

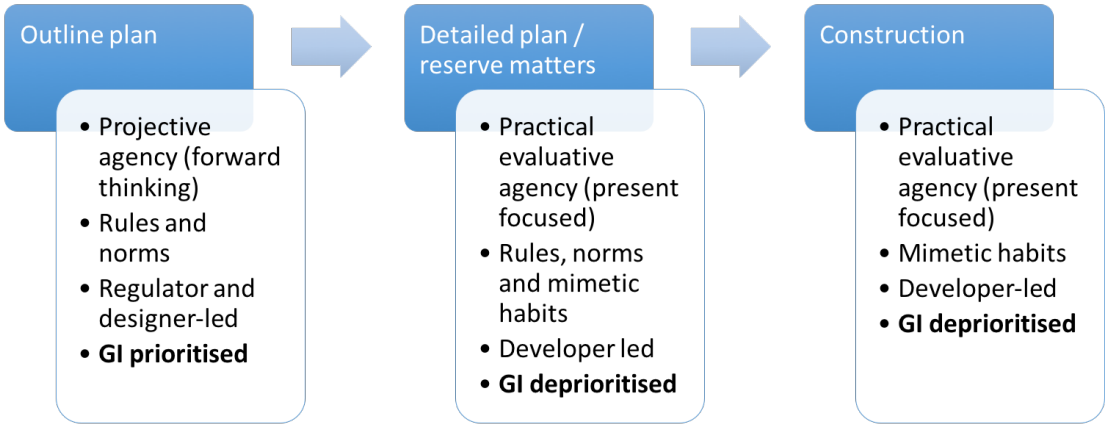


Figure 5-1 Dominant drivers supporting a regressive evaluative transition

A regressive transition is identified in six episodes (episodes 5,6,8,9,11 and 12 in **Table 5-1,** shaded yellow), across five of the sites (Estate 2, Infill 1 and 2, and RUE 1 and 2). This group of episodes indicate a downgrading of GI evaluative intention during the transition from the *outline* design stage to the *detailed* design and/or construction stages. In all six episodes, the design teams took a leading role in the evaluative praxis, resultant recommendations and design outcomes during the outline design stage. Their approach combined a mix of iterative agency with more projective agency, and was supported by the rules and norms attached to the planning application process that favoured the GI issue in question.

Table 5-1 Dominant actors and drivers for GI evaluation and decision-making *(*BC applied)*

Site	GI episode	Decision-making stage	External drivers	Dominant actor	Agency	Negotiation of GI	Reflexive response
Estate 1*	***1. Inclusive view of park***	Outline - detailed plan	Rules, norms and mimetic practice	Developer (Local authority – LA)	Practical evaluative	Deprioritised	Compromised
	2. Neighbours street view	Outline plan **Detailed plan**	Rules, norms, and mimetic practice **Rules, norms**	Design team **Design team**	Iterative and practical evaluative **Iterative and projective**	Deprioritised **Prioritised**	Compromised **Embedded**
	3. Overshadowing of gardens and public space	Outline - detailed plan **Detailed plan**	Rules, norms and mimetic practice **Rules**	Developer **National regulator**	Iterative and practical **Iterative and projective**	Deprioritised **Prioritised**	Compromised **Embedded**
Estate 2	***4. Courtyard block trees***	Outline - Post-construction	Rules, norms and mimetic practice	Design team Developer (LA)	Iterative and practical	Deprioritised	Compromised
	5. Trees and allotment external to block	**Detailed plan** Construction	**Norms and mimetic practice** Mimetic practice	**Design team** Developer	**Iterative and projective** Practical evaluative	**Prioritised** Deprioritised	**Embedded** Compromised
Infill 1*	***6. Soft SuDS***	**Outline - detailed plan** Construction	**Norms and mimetic practice** Mimetic practice	**Design team** Developer	**Projective** Practical evaluative	**Prioritised** Deprioritised	**Embedded** Compromised
	7. Street trees	Outline - construction	Rules, norms and mimetic practices	Developer	Iterative and practical	Deprioritised	Compromised
Infill 2	***8. Link to local park (and SINC)***	**Outline plan** Detailed – construction	**Rules and norms** Mimetic practice	**Design team** Developer	**Iterative and projective** Iterative and practical	**Prioritised** Deprioritised	**Embedded** Compromised
	9. Green roof	**Outline - detailed plan** Construction	**Norms** Mimetic practice	**Design Team** Developer	**Projective** Iterative and practical	**Prioritised** Deprioritised	**Embedded** Uncertain
RUE 1*	***10. Link to ancient woodland (and SINC)***	Outline – construction	Rules, norms, mimetic practice	Developer	Iterative and Practical	Deprioritised	Compromised
	11. Soft SuDS	**Outline – detailed plan** Detailed plan	**Rules, norms** Mimetic practice	**Local authority** Developer (phase2)	**Projective** Iterative and practical	**Prioritised** Deprioritised	**Embedded** Compromised
RUE 2	***12. Street trees***	**Outline plan** Detailed plan	**Norms** Mimetic practice	**Design team** Developer (private)	**Projective** Iterative and practical	**Prioritised** Deprioritised	**Embedded** Compromised
	13. Amphibian wildlife corridor	Outline - detailed plan Construction	Rules, norms, mimetic practice Norms, mimetic practice	Developer (private) Developer (LA)	Iterative and practical Practical and projective	Deprioritised Deprioritised	Compromised Uncertain

The longer term GI concerns were therefore included as an intentional priority in outline design planning documents. For example, in episode 5 (Estate 2), strong local authority policies encouraged the design team to account for good quality trees and green spaces. As a result, the design team used a combination of iterative and projective agency to orientate residential block designs around two existing mature, A-category, trees and an allotment.

In the detailed design and construction stages however, the developer became more dominant in decision-making processes. Once planning permission had been obtained, the rules and guidance regarding GI were not evaluated to the same degree by either regulators or consultants, with lower expectations for checking that the developer had retained responsibility over delivering the GI recommendations. The developers adopted a more practical evaluative mode of agency at that stage, focusing on more immediate intentions of hard infrastructure, cost and time. This also aligned to mimetic evaluative habits of construction practice, where these evaluative intentions tend to be prioritised over the longer-term evaluative recommendations regarding GI. Therefore, the dominant mimetic and practical evaluative drivers in this group of evaluative episodes supported a *regressive* transition in GI evaluative practice, where earlier evaluative recommendations regarding GI were later downgraded or even dropped during the detailed design and/or construction stages.

5.1.2 Type 2: Static evaluative transition

The second type of evaluative transition identified is a 'static transition'. This refers to a continuous evaluative approach towards an evaluative intention over different strategic stages, regardless of the findings from evaluative praxis. A static transition occurred in five episodes (1,4, 7, 10, 13, shaded blue in **Table 5-1**), where the GI issue in question was treated as a

secondary evaluative intention from the outset and continued to be so through the whole process, regardless of evaluative information obtained.

Three of the episodes referred to the evaluation of site connectivity with neighbouring GI, such as designated Sites of Importance to Nature Conservation (SINCS) or Local Nature Reserves (LNR) (episodes 1,10 and 13), while the remaining two episodes involved the evaluation of trees (episodes 4 and 7). All five episodes revealed a paucity of regulatory, normative guidance or mimetic culture to encourage the dominant actors to adopt a more projective mode of agency, and give those aspects of GI greater priority when negotiating different evaluative intentions. The developer dominated the evaluative practice throughout in these episodes, taking evaluative responsibility over negotiation and responses. The developer adopted more traditional modes of mimetic behaviour and practical evaluative agency, limiting opportunities to respond to GI evaluative recommendations, which required a longer-term projective mind-set. Figure 5-2 summarises the dominant drivers in this group of episodes, outlining this static evaluative transition.

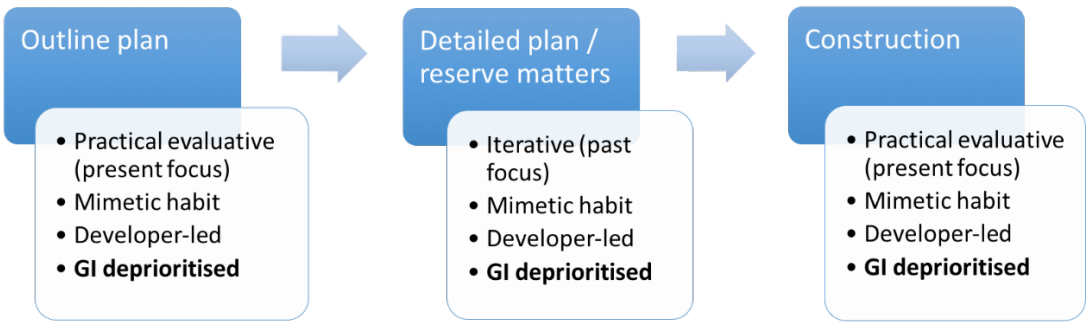


Figure 5-2 Dominant drivers supporting a static evaluative transition

5.1.3 Type 3: Progressive evaluative transition

The third group of just two episodes (2 and 3, regarding neighbourhood visual amenity and overshadowing impact – shaded green in **Table 5-1**), both in Estate 1, involved a 'progressive transition'. A progressive transition occurs when an evaluative intention starts as a low priority which then increases during the negotiation with other intentions. In episodes 2 and 3, the design team and a national regulator were more dominant and adopted a more projective (forward thinking) mode of agency in the evaluation of GI issues during the detailed design stage. Regulations and normative guidance further strengthened their projective approach to evaluation, overriding earlier practical-evaluative and mimetic praxis that had deprioritised the GI in question during the outline design state. This resulted in the enhancement GI evaluative intentions in the negotiation of different evaluative intentions and reflexive responses. **Figure 5-3** summarises the drivers behind the progressive transition towards prioritising GI in these two episodes.

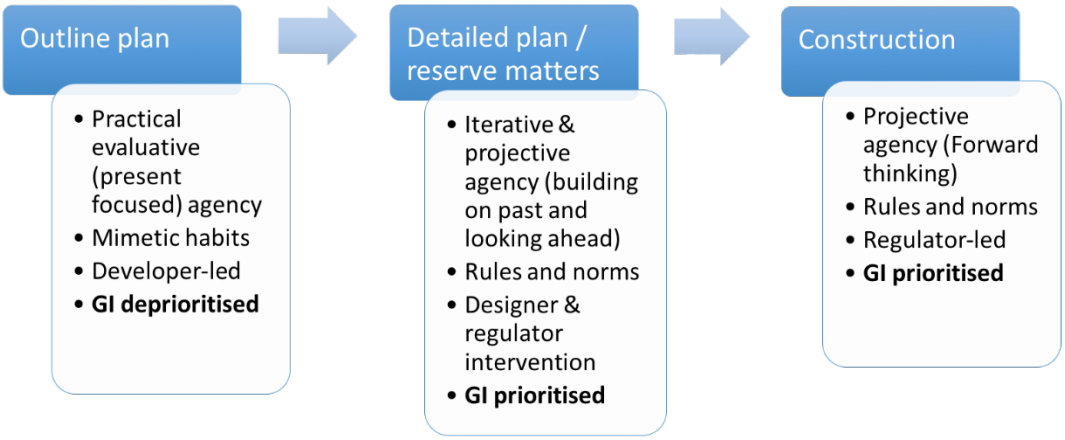


Figure 5-3 Dominant drivers supporting a progressive evaluative transition

Based on this broad comparison of the three types of transition, it appears that where both the rules and normative guidance supported a more projective (forward-thinking) agency regarding

GI, overruling mimetic practice that typically deprioritised it, the dominant actor was more likely to prioritise GI evaluative findings and recommendations when negotiating different evaluative intentions. Such rules and norms tended to be stronger during the design stage, when the regulator had greater involvement and capacity to enforce compliance (i.e. they would not give planning consent unless the developer addressed those issues). Once planning consent was obtained, however, the regulators ability to encourage compliance was reduced, unless additional legal powers were specified to reinforce evaluative intentions at that stage, as was the case with Compulsory Purchase Orders regulation strengthening requirements regarding the overshadowing of green spaces and indoor spaces in episode 3 of Estate 1.

The presence or lack of regulatory powers and norms appeared to have played a strong role in the mode of agency adopted by various actors involved in these episodes. Four local planning officers referred to how a decline in resources (human and financial) had reduced their capacity to keep track of compliance during construction (Interviews 28, 29, 35, 46). As a result, planning officers would be more likely to conduct a desk-based evaluation of documents to validate certain GI evaluative recommendations rather than carry out onsite visits to check what was being constructed, unless the GI issue in question had legal protections or was thought 'significant' in relation to local or national requirements. Consequently, the developers faced less pressure from regulators to account for GI in a more projective way, especially during construction, and tended to switch into familiar mimetic habits and a practical-evaluative mode of agency, prioritising short-term evaluative intentions, including cost control.

Even where onsite checks did take place, the local authorities accepted that certain GI issues could be compromised. For example, despite having ecology and tree officers onsite at various stages, good quality trees were lost in episodes 7 (Infill 1) and 12 (RUE 2), and ecological

connectivity deprioritised in episodes 10 (RUE 1) and 13 (RUE 2). All the local authority officers interviewed indicated that such compromises were, to a certain extent, the inevitable consequence of the requirements set by regional and national government to deliver housing targets within a specified timeframe, compelling authorities to prioritise housing density and infrastructure over other evaluative intentions. Limited resources also reduced their willingness to take responsibility for GI in terms of long term management and maintenance, preventing local authorities from adopting back certain GI in all the sites (Interviews 19, 28, 29, 35 and 46). This external context meant there was limited pressure to projectively account for GI as a priority evaluative intention, which, in turn, constrained the reflexive response to evaluative information in design and construction decisions by the dominant actors for whom certain aspects of GI were not established mimetic habits.

5.2 Findings regarding Green Infrastructure evaluation

GI evaluative recommendations were compromised in 11 out of the 13 episodes. This was a result of the dominant mimetic culture and short-term practical-evaluative agency when enacting certain formal GI evaluations along with a weak enforcement of rules and norms, particularly during the construction stage. GI evaluative praxis was narrowly defined, tightly controlled by the dominant actors, and sometimes poorly accounted for in the episodes. The study of the dominant thematic drivers in 13 episodes, has produced findings in relation to GI evaluation in relation to the broad strategic practice of GI evaluation, as well as in relation to the detailed enactment of GI evaluative practice i.e. ‘praxis’.

Two issues emerged around the general strategic practice of GI evaluation:

(i) GI was not an established concept for all masterplan practitioners; and

(ii) GI was principally treated as an object for anthropocentric intentions.

Two mimetic (habitual) cultures in evaluative praxis emerged from the empirical data:

(iii) weak responsibility for GI in the masterplan process; and

(iv) a lack of local engagement in formal GI evaluative praxis.

These issues regarding GI evaluation are analysed in more detail below.

5.2.1 Practice 1: GI as an established concept

All the episodes point to a lack of established practice of evaluating GI in a way that considered long term multiple functions or made multi-scalar connections (Mell, 2017; Ahern, 2007; Bélisle, 2005; Pickett and Cadenasso 2008, Gasanov et al 2016). As Ahern, (2007, p70) describes it: '*The spatial configuration [and interaction] of landscape patterns and ecological processes at multiple scales'* did not appear to be an established evaluative practice by those involved in formal evaluations, particularly at the construction stage.

There is currently no legislation that clearly supports evaluating and creating multi-functional and multi-scalar GI. In all six sites, whilst there was some form of public planning policy guidance which advocated enhancing ecological quality in new developments, the implementation of policies and checks promoting ecological *functionality* and *connectivity* was more limited. As a local biodiversity officer pointed out:

> "*A member of our local plan team was, plan delivery team, did look at major applications from a 'green grid' point of view but he's left and I don't think anyone is doing it now*" (Interview 32, Biodiversity Officer, Infill 2)

The interviewees did not display an established *mimetic* practice or understanding of GI as a multi-functional and multi-scalar concept. For example, some interviewees referred to 'green' energy solutions as a part of the GI concept (Interviews 10, developer, Infill 1; 36, developer; and 12, designer, both Estate 2). Those interviewees who worked in direct relationship with the rules, norms and mimetic practices that directly referred to GI displayed a broader understanding, and adopted a more projective mode of agency when evaluating GI, including urban designers, architects, landscape architects, and ecologists. In comparison, local authority planning, biodiversity and tree officers indicated a similar understanding and multi-faceted intentions, however they were subject to greater internal (human and financial resources) and external (housing targets, budget cuts) constraints that meant they were more likely to adopt a practical-evaluative mode of agency regarding GI evaluation. For example, it was more common to hear that an officer had conducted a desk-based review of documents, rather than onsite checks during construction (unless the GI issue in question was legally protected):

> "*We've got 1000s of applications a year. No, we don't have time to go*" (Interview 32, Local authority biodiversity officer, Infill 2)

> "*The problem is local authority planning officers are really stretched and increasingly so*." (Interview 15, housing association / developer, Estate 2)

The interviews with developers, housing associations, residents and some consultants presented an even more constrained understanding of GI functions, prioritising one or two GI intentions,

such as the contribution of GI to ecology, aesthetics or flood relief, rather than a more comprehensive concept. For example, in Infill 2 the ecologist's recommendations did not refer to wider ecological connectivity with the neighbouring Local Nature Reserve, nor account for the additional ecological functions the park could provide (e.g. air filtering, cooling, soil retention and quality).

In terms of the limited intentionality towards *multi-scale* GI connectivity (Ahern, 2007), all study sites, except for RUE2, the intention to support GI connectivity was limited, with limited evaluation of local ecological connectivity or the 'bio-geography' (Gasanov et al., 2016; Kupfer, 2012; Kent, 2007) between sites and their surrounding areas. RUE 2, on the other hand, was included as part of a wider area GI strategy, which the HCA and local authority had jointly produced. RUE 2 was surrounded by areas of GI specifically protected under European legislation (SSSIs or SPAs) with protected species (e.g. bats, badgers). Even at RUE 2 however, connectivity in non-protected GI areas was undermined by overriding highways and financial priorities, with a major A-road permitted to cut through the GI space and the county council unwilling or unable to spend money to buy the private land which would have reduced the ecological footprint of the road on the SINC/SANGS.

A lack of a consistent and widely accepted working definition for GI evaluation within rules, guidance and mimetic practice, discouraged a more projective (forward-looking) mode of evaluation by developers, and limited their prioritisation of GI against other evaluative intentions.

5.2.2 Practice 2: GI as an object of impact

Despite a lack of a shared conceptual understanding of GI in the episodes, there was a common view that GI functionality was predominantly for *anthropogenic* intentions. In non-anthropogenic ecological evaluative practice, the scope of what was included as ecologically 'significant' to warrant evaluation (or impact assessment) was quite narrowly defined, focusing on specific species and habitats to be protected through legislation. Microclimate, overshadowing and transport surveys did not conceive of GI as a subject or agent of impact. For example, the arboriculture (tree) surveyors could have adopted a more protective (iterative and projective) approach towards trees, but they generally seemed to be more concerned with ensuring trees were safe for humans, and even where trees were classified as good quality (A or B categories under BS 8537), other development priorities could still outweigh that healthy status (Episodes 7,8, 10 and 12).

Formal GI evaluative practice predominantly accounted for the potential impacts of the development to humans and paid minimal attention to the impact of and to GI. The human-centric interpretation contributed to the failure of some GI to be evaluated and responded to (e.g. dead courtyard trees in episode 4, Estate 2; failure for green roof to establish in episode 9, Infill 2) and restricted GI productivity (e.g. overshadowed allotment in episode 5, Estate 2;). Furthermore, the formal evaluations did not recognise that GI can actively mitigate some of the negative impacts from a development, acting as a regulator of microclimate and other effects. For example, in episode 3, Estate 1, trees and vegetation were not evaluated for their potential role in creating a visual, air, soil, water, and noise pollution buffers, or to provide physical protection for the pedestrian space from a proposed road. This meant that GI was not included in the original street designs, until the neighbouring residents protested about it.

5.2.3 Praxis 1: GI as a subordinate intention in neighbourhood masterplans

Short-term financial and hard infrastructure intentions were prioritised over GI intentions in masterplan decision-making in all but two of the episodes. Unlike financial and hard infrastructure evaluations, most formal GI evaluative praxis took place up-front during the outline design stages. GI evaluation was conducted more intermittently than finance and hard infrastructure, especially during the construction stage. Surveys relating to GI (e.g. ecology, arboriculture and landscape) were often conducted by contracted consultants, peripheral to the core design team, and lacking in influence over evaluative responses, with variable continuity of engagement and limited decision-making role. In comparison, financial appraisals took place almost on a weekly basis, involving the core masterplan team and centralised consultants such as the employer's agent.

The developers' practical-evaluative intention regarding GI evaluation seemed predominantly focused on obtaining planning consent. Beyond that stage, they had little incentive to assign responsibility to monitor delivery of GI evaluative recommendations, increasing the risk of compromise in the transition to construction. This deprioritisation was not only reserved to private developers but also for public actors who accepted design changes that negatively affected earlier GI recommendations, due to pressures to deliver housing targets and dwindling budgets. As one interviewee indicated:

> "*[The developer will] say 'Oh you know we've got this site which is hardly viable' or 'We can't afford to do this or that' and there is pressure for the council… to accede to some of this because they have their own pressure from members who want numbers of houses to be built*." (Interview 29, Sustainability Officer, RUE 1)

Public and private developers also displayed a reluctance to take responsibility for the management and maintenance of GI in the long term, including green roofs and soft SuDS due to the resource implications (Estate 1, Estate 2, Infill 1, Infill 2, RUE 1). Both the local authority and consultant interviewees referred to resource pressures:

> *"Councils have less and less money for managing existing green spaces, our green team are very very reluctant to take on any new green infrastructure unless there is some funds*." (Interview 32, Local Biodiversity Officer, Infill 2)

> *"The council had always said during the bid process, I think it came from them, that they would prefer the soft landscaped areas, so effectively parks, to not to be [publically] adopted because there was a concern that they didn't have sufficient resources to manage them.*" (Interview 8, Community Facilitator, Estate 2)

This was despite the long-term benefits the GI could bring in terms of wellbeing, biodiversity, reducing rainwater run-off, summer cooling and winter insulation of buildings and reducing air and water pollution (Mell et al., 2013; Amati and Taylor, 2010).

The weak intentionality regarding GI may be partly because a developer might not appear to directly benefit from maintaining these services. And, as identified in 5.2.1 regarding GI evaluative practice, regulations that would have encouraged developers to take greater responsibility over GI were narrowly defined. The rules, and more importantly the interpretation of those rules by evaluators, tended to focus on individual species of flora, fauna, and habitats specifically classified as 'endangered' or 'special' (e.g. bats, birds, badgers, SSSIs and SPAs). To some extent the narrow definition of rules is to be expected, as they need to be measurable and enforceable. This discrete framing however, had implications for the evaluative

treatment of GI. Developers in all the sites commissioned consultants to check and report on the status of protected species (e.g. badgers and bats) on-site during construction but they did not need to check on species that were not legally protected (e.g. common native plants, invertebrates and amphibians) nor did they consistently evaluate the ecological integrity and functioning of the site, or the relationship with neighbouring habitats. Despite policy guidance existing on all the sites, referring to wider ecological values, the evaluators were not legally required to conduct a broader appraisal, further supporting the narrow interpretation of GI intentions. For example, on Infill 2 site, the recommendations emerging from a (legally required) ecology appraisal, only referred to the management of trees in the context of providing a habitat for (legally protected) birds, and not regarding the trees as of value in themselves, nor the services they might provide including towards promoting ecological connectivity. Similarly, the arboriculture survey, which could have adopted a more protective (iterative and projective) approach towards trees, seemed more concerned with ensuring trees were safe for humans, and even where trees were classified as good quality (A or B categories under BS 8537), other development priorities often outweighed that healthy status (Episodes 7,8, 10 and 12).

5.2.4 Praxis 2: Lack of local engagement in GI evaluative praxis

A lack of specification regarding stakeholder engagement in rules, norms and mimetic culture meant that local actors were not expected to be engaged when conducting formal technical praxis of GI evaluation. This requirement was lacking in the *LVIA, microclimate, over-shadowing, flooding, tree and ecology surveys.* In all six sites, there were local actors who displayed knowledge and commitment regarding each of these issues during the interviews but indicated that they had not been engaged when the surveys were undertaken. This included

local knowledge and intentionality relating to important views that could have contributed to LVIAs (e.g. Estate 1, Infill 2, RUE 1 and RUE 2), as well as local knowledge regarding flood history (RUE 1), arboriculture (Estate 1, Infill 1 and RUE 1), ecology (Infill 2, RUE 1 and RUE 2) and financial appraisal (Estates 1 and 2, and RUE 1). Engaging with local actors during, or in advance of a technical evaluative praxis would have allowed them an opportunity to share knowledge that could have informed design decisions and avoided conflicts that occurred later. For example, if the arboriculture surveyors and landscape architects had sought out local opinions about GI, as a part of their praxis, there would have been an earlier call to protect and enhance that GI function in the spatial plans (Episode 3, Estate 1; episode 7, Infill 1). This did occur in episode 8 (Infill 2) but was later deprioritised when consultants and landscape architects changed. As the CLT manager commented (Infill 2), deeper engagement in formal evaluative praxis was balanced with the need to prioritise which issues were a local priority, manage local expectations, limit consultation fatigue and overload of the different parties involved.

5.3 Findings regarding BREEAM Communities

Each episode also offers some lessons of potential value regarding how BC is defined and structured. The episodes highlight certain issues but also opportunities which BC could apply in future iterations of the standard. These are summarised below.

5.3.1 Issues for BC implementation

Despite being applied as a normative evaluative standard in three of the sites, various issues emerged regarding the technical structure of BC from the episodes:

(i) neglected evaluative intentions and habits;

(ii) lack of responsibility over the evaluative transition;

(iii) narrow definition and optional classification of GI in BC;

(iv) restricted engagement of local actors.

These issues meant that BC was limited in influencing the greater prioritisation of GI and reflexive response in design and construction practice. These issues are discussed in more detail below.

5.3.1.1 Neglected evaluative habits and intentions

As discussed in 5.2, the mimetic culture around GI evaluative practice is heavily front loaded in comparison with more dominant evaluative practices, most notably financial cost appraisals and highways infrastructure. These practices deprioritised GI-related evaluative recommendations in all but two of the episodes. For example, living green roofs proposed at the outline design stage were dropped during a detailed design stage for installation and maintenance cost reasons at RUE 2 and Infill 2. As two interviewees commented:

> "*All these green things, they add cost.*" (Interview 15, Housing association officer, RUE 2)

> *"We do do green roof stuff occasionally. It's expensive and the developers don't like it*." (Interview 42, Engineer, Infill 1)

Biodiverse green roofs were downgraded to cheaper, single plant variety (Sedum), mat roofs during the construction of Infill 2. The failure of the plants to establish on the roof was not rectified, again for cost reasons. Similarly, despite the developer being aware that a soft SuDS

filter-bed system had not been correctly installed at Infill 1, the system was not corrected for cost reasons. Good quality 'A' and 'B' category trees, as defined according to the BS 5837, were identified for removal to make way for hard infrastructure, and were not considered for onsite relocation onsite for financial reasons at Estate 1, Infill 1, RUE 1 and RUE 2. BS 5837 does invite developers to consider retaining and replanting trees, however it includes an opt-out clause by suggesting that replanting is not necessary if a developer deems it unviable. As replanting of trees was not a common practice, it was unlikely that the costs involved were well understood, constraining the evaluation of the replanting option. Good quality mature trees were moved and replanted onsite at Estate 2 but it is unclear whether the trees were replanted because the local authority had strong tree protection requirements or because the developer had decided it was 'viable' to do so.

Dominant mimetic practices also had consequences regarding evaluative intentions relating to socially inclusive GI provision. Higher value, private tenure, properties were given exclusive park views on both Estate 1 and Infill 2. In Estate 2, only higher value private tenants had access to a roof garden on one block. As one interviewee noted:

> "*They split tenures quite starkly. So you quite often have differentiated use. So you have owner-occupiers coming to this bit and social housing users going to that bit. The bit that worked best was on a block where there was a very nice roof garden but that was open to owner occupiers, there won't be shared ownership people there."* (Interview 21, community facilitator, Estate 2).

At Infill 2, affordable housing tenants were allocated a smaller courtyard space with more limited GI landscaping, compared to a private tenure block where the tenants had a larger area and more extensive landscaping provision. This inequality in provision was accepted by the

CLT coordinator (Interview 17) as the inevitable compromise required to obtain any affordable units on the site.

Another interviewee suggested that it was difficult for developers obtain short term benefits from investing in longer term values, including GI:

> "*Where you've got a developer who's going to retain ownership of properties on the site and have a long term interest in [sustainability] then I think that approach would be so much easier. The big difficulty is where you've got the volume home builders who are just geared up for buying a site, building and leaving. They have no stake in it what so ever*" (Interview 38, BC assessor, RUE 1)

Financial evaluation is not directly addressed by BC, despite being a primary evaluative practice in all the episodes, and despite all the issues in BC containing some form of financial cost implication. By explicitly ignoring this dominant evaluative practice, the BC is unlikely to influence the practical-evaluative and mimetic process of evaluative negotiation between different intentions, especially during the construction stage. BRE should consider whether a more open negotiation of intentions needs to be promoted in BC, to clarify the longer-term sustainability intentions that might be compromised by prioritising short-term goals.

5.3.1.2 Lack of responsibility over evaluative transition

BC (and planning) currently relies on documented reports to evidence design decisions, but the episodes studied here suggest that written reports do not in themselves guarantee that designs will be fully translated into construction delivery. BC is a normative and voluntary tool that applicants choose to undertake, unless required to do so by the local planning authority, as in the case of RUE 1. The impact of the standard is therefore largely dependent on the applicant,

and the degree to which they decide to embed BC within their evaluative practices and decision-making throughout the masterplan process, particularly in the transition to construction. The BC assessors, designers and developers interviewed (Interviews 10, 12, 20, 29, 38, 39) referred to the legitimisation value of BC helping to get them through planning but not in terms of BC transforming how they evaluate construction:

> "*When we've used BREEAM Communities it's often as part of the bidding process*" (Interview 6, BC assessor, Estate 1 and Infill 1)

The lack of checks to validate the implementation of evaluative recommendations across all stages of a masterplan undermines the intention by applicants to embed BC and the possibility of BC influencing decision-making beyond the planning stage. BC needs to require applicants to assign responsibility and resources to respond to recommendations that emerge from evaluations. BRE should require applicants to assign long-term responsibility, resources and checks on GI delivery during construction and post-construction stages. In addition, to enhance the credibility of BC assessors, BC assessors need to have sufficient access to be able to conduct on-site checks, including with key local actors, to validate delivery on-site, and not depend solely on written reports and the verbal accounts of the clients who employed them to undertake the assessment and have a vested interest to present a largely positive account of design intentions.

5.3.1.3 Narrow definition and optional classification of 'SE 11 – GI'

The interviews and documentation studied here, suggested that BC played a very limited role regarding the evaluative treatment of GI in the three case study sites that applied it. In BC, the GI issue (SE 11) is narrowly defined, focusing on the inclusive access to green spaces and

comes in as an optional 'Step 2' issue, rather than mandatory 'Step 1' issue (Holland, 2014). There is a lack of recognition of the potential financial costs and benefits of GI in BC. The limited focus on one intention (physical access to green spaces) in SE 11, weakens opportunities for integrated and strategic thinking about GI, failing to address the long term, multiple functions, multi-scale, and inclusive principles of green and blue infrastructure intentions (Mell, 2017; Natural England, 2009; Ahern, 2007).

To encourage a richer definition and deeper integration of GI in masterplan evaluation, BRE could consider making GI a mandatory issue, encouraging applicants to adopt a broader definition of GI principles and intentions, as well as more transparently integrated evaluative approach (including regarding financial implications). This would help establish a more consistent approach to GI evaluation, through requiring applicant developers to adopt a more strategic approach to planning for and delivering GI. A broader definition should also include a reference to the social distributional impact of visual amenity (i.e. who can access a view of GI and who cannot), as this was poorly addressed on at least two sites (Estate 1 and Infill 2).

5.3.1.4 Restricted engagement of local actors

Although a range of community engagement practices were applied in the episodes studied (e.g. site visits, exhibitions, workshops and impromptu events), each episode demonstrated quite controlled practice regarding the engagement of local actors and the use of the information obtained through such engagement processes to influence decisions. For example, in Estate 1 the design team engaged residents in design conversations around internal block layout but not about the allocation of tenancies with a view over the park. At Infill 2 site, the community facilitator encouraged local actors to pro-actively engage with what the facilitator perceived as key strategic decisions, notably target revenues, location, tenure mix, and spatial layout.

However, once the developer was selected and took control over the detailed designs and construction practices, the local engagement waned and narrowed in evaluative focus, and earlier recommendations were lost as the opportunities to influence design decisions reduced (Interviews 17, CLT manager and 24, Park manager).

Seven of the local actors (residents, associations and park groups) were interviewed about their perspectives of the masterplan process on each of the sites. They had differing experiences of the opportunities they had to engage with and influence evaluative practice, but those that were actively encouraged to engage in both evaluation and decision making felt they did have a voice and a part to play. Some residents described how training, including onsite workshops and offsite visits, in the early planning and design stages helped them engage more, to better understand the language and something of the complex compromises that needed to be negotiated in the masterplan process (Interviews 37 and 45, residents, Estate 1 and 2 respectively). Although BC supports consultative practice, it does not encourage a more deliberative process underpinning how evaluative intentions and practices are defined and controlled (Beauvais and Baechtiger, 2016; Bianchin and Heylighen, 2010). A more openly deliberative process would aim to encourage local actors to play an active role in shaping which intentions are priorities, how much influence they should have regarding decisions around those intentions, and involve them in considering the potential distributive impact of different decisions (Holland, 2014).

5.3.2 Emerging benefits of BC

Although the case study findings outline numerous challenges for BC, certain BC benefits were also raised, including:

(i) clarifying a baseline of evaluative practice;

(ii) assigning evaluative responsibility; and

(iii) the timing of evaluative practices.

These benefits of BC are discussed further below.

5.3.2.1 Clarifying baseline intentions for evaluative practice

Several interviewees thought that BC had helped to create a structured paper trail or evidence base, as well as outlining core elements that should be included in a masterplan process, regarding the evaluation of and decision-making for different issues (Interviews: 10, developer, Infill 1; 12, architect, Estate 2; 20, architect, RUE 2; 29, planning officer, 38, consultant, and 39, architect, all RUE 1). The two architects thought however, that good practitioners would be adopting a similar approach to that which was advocated by BC anyway (Interviews 20 and 29, architects, Estate 2 and RUE 2). One in-house BC assessor (Interview 6, Estate 1 and Infill 1) was clear that despite not radically changing what the design team would have done anyway, BC had provided a legitimising role (Fox-Rogers and Murphy, 2014; Schweber, 2014) that supported their successful application for the masterplan:

> "*By having this standard, it gives people confidence that we know what we're talking about and that we going to deliver and demonstrate best practice*." (Interview 6, BC assessor, Estate 1 and Infill 1)

Interviewees felt BC was helpful in compiling the regulatory obligations and normative guidance that needed to be addressed, as well as potentially pushing developers to act beyond those requirements (Interview 29, planning officer; Interview 6, BC assessor). As such BC could contribute to establishing a more consistent procedural approach to neighbourhood masterplans, enabling both regulators and developers to structure the evidence and information upon which to base their decisions. A standardised approach could also contribute to create a more level-playing field between companies, clarifying what was expected to be evaluated within the masterplan process. The episodes exposed various regulations and guidance that may need to be included in BC if the standard is to fulfil that regulatory compilation role however (See **Appendix 4, Table 4.1**).

BC also offers a potential role in making visible the evaluative negotiation between different intentions, clarifying the prioritisation process and distributional effects of such decisions. For example, developers in Infill 1 prioritised BC credits for sustainable transport but not green infrastructure provision, and in RUE 1 the developers prioritised credits for flood management over credits for ecological enhancement. These choices were only made visible by the developers' application for specific BC credits and not overtly referred to in any of the planning documentation.

5.3.2.2 Assigning evaluative responsibility

In an increasingly under-resourced and disempowered planning system BC may help local authorities and communities to fill-in certain evaluative gaps that result from the UK Government 'Red-Tape Challenge' programme that reduced the planning requirements imposed on developers and moved others into building regulation (UK.gov, 2014). For example, the government withdrew CfSH which required developers to conduct ecological appraisal as well

as energy saving targets (UK.gov, 2015). The energy targets were partially transferred to building regulations but not the ecology requirements. Ecology is an area that BC continues to promote and could be strengthened with a more strategic GI definition to encourage developers not to lose sight of the issue. BC could also address potential concerns attached to long term GI management and financing, through requiring clarification of long term responsibility.

5.3.2.3 Timing of BC and evaluative practice

BRE recommends the 'early' application of the standard to reduce conflict and improve identification of, and by assumption intentionality towards, certain sustainability priorities. It is somewhat ambiguous at what stage in the design of a masterplan 'early' is but it is notable that in both Estate 1 and RUE 1, BC was introduced after key decisions were made, such as location and numbers of units. Both sites were beset with conflict and a lack of trust from on-site and neighbouring residents in the process. BC was introduced at an earlier stage in Infill 1 which appears to have experienced less public criticism and generally more positive engagement in the process, with none of the legal challenges experienced by the other two sites. As the local authority planning officer indicated, BC aims to affect key strategic decisions, whilst other standards can come in too late to affect significant change:

> "*It's all very well having BREEAM New Construction and Code [CfSH] but sometimes decisions have already been made by the time you get to that design stage*." (Interview 25, local planning officer, Infill 1)

Whether the smoother process experienced in Infill 1 is directly linked to the timing of when BC was introduced or other factors, relating to how the sites were identified for regeneration or development, would need to be examined in more detail however.

What is clear from the three sites that adopted BC is that early application of a standard is insufficient to ensure strategic follow-through by a developer. The sites did not have a clearly assigned plan to keep track of sustainability intentions that were established by BC. They evaluated, interpreted and responded to the intentions differently at different masterplan stages. As such, BRE will need to look at how BC can encourage more projective and embedded evaluative practices across the masterplan journey, and not just during the design stage.

5.4 Summary

The analysis of episodes suggests that there are certain shared aspects of evaluative practice in masterplan processes. Common elements included the types of formal GI evaluative praxis applied, from contextual surveys, such as LVIA and arboriculture surveys applied in the design and planning stage, to operational (practical evaluative) cost control and time management appraisals, which were applied throughout the process. The analysis also points to three types of evaluative transition (Jallow et al., 2011) - regressive, static and progressive - regarding how changes in the dominant thematic drivers (external, responsibility, negotiation and reflexivity) appear to affect the relationship between evaluation, design, construction and in-use decisions at different masterplan stages (Schweber and Haroglu, 2014; Beunen et al., 2013; Battilana and D'Aunno, 2009; Jarzabkowski, 2005; Schön, 1983). Over half the episodes presented a 'regressive' shift from iterative and projective agency supported by rules and norms in the design stage, towards a mimetic and practical evaluative agency during construction (Emirbayer and Mische, 1998a). A smaller group of five episodes displayed a 'static' evaluative transition for certain GI intentions which were less established in external rules, norms and mimetic practice (e.g. multi-functionality and connectivity). This meant the short-term practical

evaluative and mimetic approach dominated at the outset preventing GI issue from becoming an evaluative priority. The weak external drivers and evaluative responsibility regarding these issues in turn affected the negotiation between evaluative intentions, where short-term intentions were prioritised. As a result, the design, construction and in-use responses regarding longer-term intentions, such as relating to GI, were often compromised.

Of the three sites that applied BC in this study (Estate 1, Infill 1, and RUE 1), none of the developers had proposed to use BC themselves. It had either been suggested by the design team involved (Estate 1 and Infill 1) or it was required by the local planning authority (RUE 1). It could be useful in future research to examine other sites where the developer had taken the initiative to undertake BC themselves, to examine if this has an impact on the evaluative intentionality of the developer, particularly in relation to the transition from the design stage (where obtaining planning consent is paramount) to construction (where time and financial constraints predominate).

It would appear from this analysis, that even with refinements, BC can only go so far in promoting an embedded evaluative approach towards issues, such as GI, that BRE defines as important for sustainable communities. By nature of being a voluntary standard BC can encourage rather than enforce a more embedded approach unless BC is made a planning requirement by local or national regulators (as in RUE 1). Even if BC were required an applicant can chose not to address certain issues, even if that issue were of salience to the sustainability of a certain site. For example, the location of RUE 1 was recognised as having negative sustainability implications, in terms of transport impact and loss of green space to provide sufficient car parking and road infrastructure. In relation to BC, the developer simply did not

seek credits in those optional issues which indicated a negative impact (**RE 07 – Transport carbon emissions** and **LE 04 – Enhancement of ecological value**).

It is necessary to recognise that a normative standard can only encourage, but not enforce a more mimetically embedded approach to evaluating sustainable intentions. BRE may need to consider refining BC as it is currently designed, including revisiting how it awards accreditation to improve the rigour of how the standard is awarded. For example, BC could allocate negative credits for negotiated compromises (as suggested by Interview 41, parish councillor) or even not awarding certification if the compromise to sustainability intentions is judged to be too great. It may also be necessary to consider alternative or supplementary tools to a standard that better target transformative changes in mimetic and practical evaluative behaviours.

Chapter 6 further discusses the implications of these findings, alongside the wider literature on sustainable neighbourhood design and evaluation.

Chapter 6: Discussion

> "*See, we should measure on a long long scale. But no need to worry, it's all about the money. And nature came in second place. So we learn to break the things we take for granted.*" Gareth Davies-Jones, 'Nature Report' from 'The Beauty and the Trouble' album

6.1 Introduction

The review of six masterplanned neighbourhood developments and how Green Infrastructure (GI) was evaluated during the implementation of those masterplans has provided rich insights from the perspective of different practitioners, as well as from the documented accounts of decisions made. This section draws upon the empirical analysis from chapters 4 and 5, to consider how the findings from that analysis accord with the wider literature about evaluative practice, urban design and sustainability. The discussion considers from a conceptual perspective, how evaluation is understood as a strategic practice, and the degree to which it is embedded with other strategic practices. The discussion then turns to look at the practical barriers limiting the influence of GI evaluation and BREEAM Communities (BC) in masterplan processes, before considering the potential opportunities to enhance evaluative embeddedness.

6.2 Masterplan evaluation as a strategic practice

This section focuses on the learnings about evaluative practice that have emerged in relation to the use of SaP as an empirical analytical framework, as well as examining what the research indicated regarding the four thematic drivers that appear to shape the relationship between evaluative practice and other strategic practices.

6.2.1 From concept to application

The research has examined a central assumption that exists in standards and the field of urban design, that evaluative practices are an 'embedded' part of masterplan processes (RIBA and Hay et al 2017; Beunen et al., 2013; van der Voordt and van Wegen, 2005). Embedded evaluation implies that evaluation actively influences other strategic practices, where practitioners are being informed by, interpret and respond to the information derived from the enactment of those evaluative practices. This connection between practices and practitioners has been described elsewhere as the 'filiation' or 'fit' (Schweber and Haroglu, 2014; Bowker and Star, 2000).

In this research, the 'organisation' that is studied is the collaborative masterplan process and the 'strategic practices' associated with that process have been aggregated into evaluative, design, construction and in-use practices. The research has examined the assumption of *evaluative embeddedness,* by seeking to clarify the connections between evaluative practices and design, construction and in-use 'outcomes' (Pettigrew, 2012), in terms the potential of evaluative practices to influence other practices at different stages. The basic meso-scale constructs of the strategic masterplan process are depicted in **Figure 6-1**.

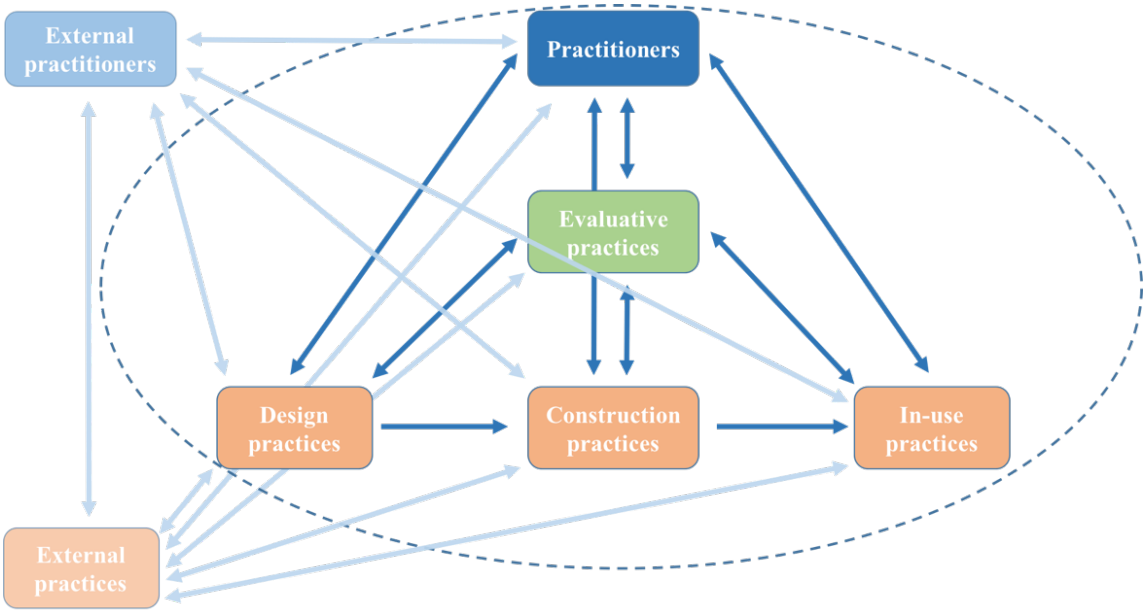


Figure 6-1 Conceptual diagram of embedded evaluation within masterplan processes (lighter shade = external factor)

The arrows in Figure 6-1 indicate the assumption of embeddedness, where evaluative practice is not linear, but multi-directional (Gasparatos et al., 2009). Embedded evaluative practice is described as reflexive and transactional (Schön, 1983; Jarzabkowski and Spee, 2009), in that those who enact it can influence and are also influenced by other practices and practitioners as evaluative information is captured, interpreted and relayed between different practitioners.

The empirical study supports the idea of interconnection and adds three additional layers of complexity to this abstract relationship. First, the research has identified different distinct 'actor groups' or 'practitioners' in SaP literature (Whittington, 2006) as being involved in the masterplan process (Farrells, 2014; Rydin, 2010; Power and Burdett, 1999). The placement of practitioners as central or peripheral to masterplan process was helpful in clarifying the different relationships with evaluative practices, particularly in relation to evaluative responsibility and the 'control' different practitioners have over the enactment of evaluation and the use of the evaluative information produced. Evaluative control refers to those practitioners who dominate

the definition, use and responses to evaluative information and whether the information contributes to changes in design, construction and in-use practices. Some practitioners, such as design teams, developers and clients (landowners) were found to be more internal to the evaluative practice, with daily decision-making roles and more control over the evaluative practices. Whilst others, such as local residents and regulatory bodies, were more external to the masterplan process, seeking to influence rather than lead the decision-making and actions of the internal practitioners. Some practitioners, like evaluative consultants, can shift from being at the fringes of the masterplan process with intermittent engagement, to being more central and having greater control. In the empirical episodes, the practitioners who dominated evaluative control changed at different masterplan stages. The design teams often dominated evaluative practices during the masterplan design, and developers often took the lead during construction. External practitioners, such as regulators and residents, showed an influence but it was only in episode 3 (Estate 1) where an external government inspector (Compulsory Purchase Order inspector) dominated the enactment and use of evaluative information during their inspection.

Multiple evaluative practices undertaken during masterplan processes add further to this complexity. For example, there are various discrete aspects of GI (e.g. landscape, tree and ecology surveys) that are evaluated, alongside other evaluative practices relating to finance, transport, utilities, waste, energy and demographic context. Figure 6-2 presents a 'simplified' diagram of the dynamic interactions of masterplan as a Strategy *in* Practice (SiP) (Jarzabkowski, 2005, p177).

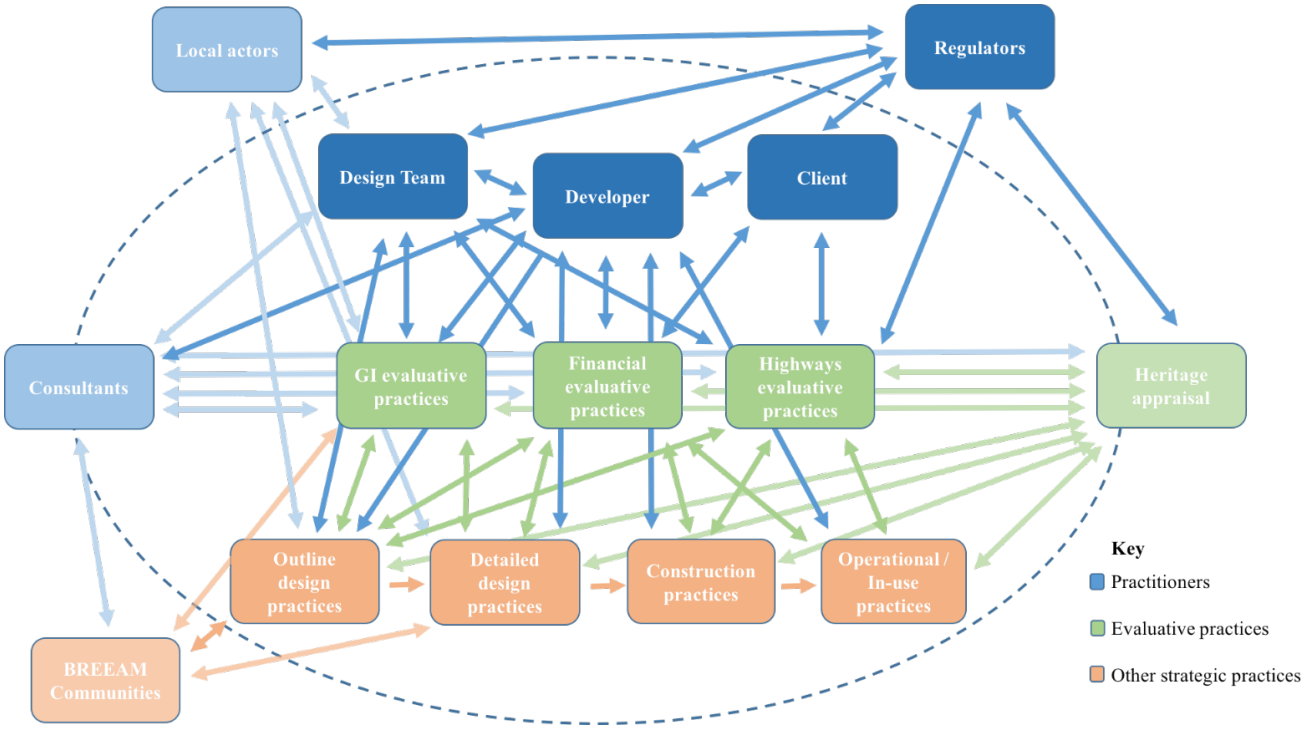


Figure 6-2 Applied diagram of practice – practitioner relationships in masterplan processes

Figure 6-2 outlines a complex web of inter-relationships between internal, peripheral and external practitioners and practices. The oval dotted line the boundary between internal and external practices and practitioners, with some practitioners (e.g. consultants) and practices (e.g. heritage appraisal) placed at the periphery between the two. Three evaluative practices (GI, finance and highways) and other strategic practices (outline design, detailed design, construction and in-use) are presented in the figure as internal to the masterplan. BC is shown as an external strategic practice that only influences GI evaluative practice, outline and detailed design practices, unlike Heritage evaluation which is more influential (or embedded), affecting the four internal masterplan practices and three other evaluative practices.

Figure 6-2 helps to demonstrate the challenge of examining how, when and why certain evaluative practices interact with other strategic practices. It also offers a hint of the real-world complexity of undertaking and engaging with the collaborative and strategic process of

masterplans. This is further complicated by the fact that masterplans are often conducted in a phased way, with strategic practices are duplicated in each new masterplan phase cycle (each cycle involving evaluative, outline, detailed design, construction and in-use practices), further adding to the complexity of information flows.

The analysis of evaluative episodes combined both the SaP framework (Practice, Praxis and Practitioner) with the four thematic drivers (external, responsibility, negotiation, reflexivity) to examine the relationship between evaluative practices and other strategic practices. The analysis of episodes and deductive/abductive coding process indicated that there are a series of sub-themes associated to each thematic driver, which offer more detail regarding how the thematic drivers affect the enactment of evaluative practice.

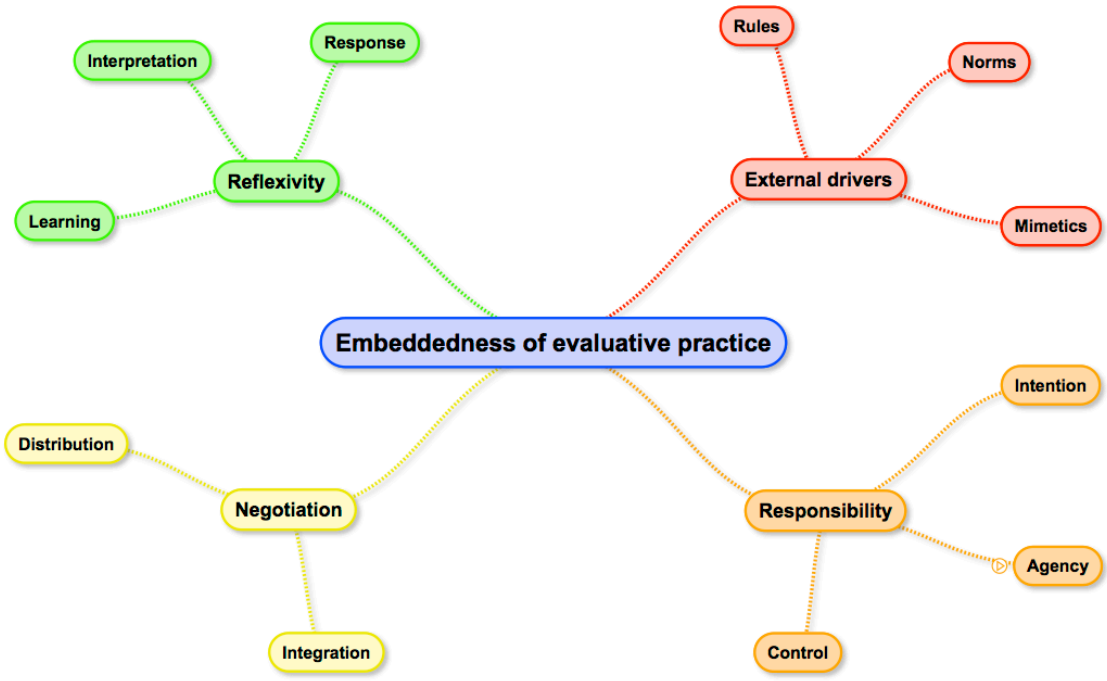


Figure 6-3 Themes and sub-themes that affect the influence of evaluative practice

These sub-themes do not function independently, but seem closely interconnected in how they affect evaluative practice. For example, more dominant mimetic behaviours (as an **external driver**) coincided with iterative and practical-evaluative agency, affecting the evaluative **responsibility** of the developer attached to particular evaluative intentions, the **negotiation** of that with other intentions and ultimately their **reflexive response.** This meant that more immediate and familiar (*mimetic*) intentions, such as cost control and time management were prioritised (practical-evaluative *agency* combined with evaluative *integration*) over longer term evaluative intentions, such as those relating to GI. The result was a 'regressive' *response* to GI evaluative intentions, with limited changes to detailed design and construction practices.

The potential for interaction across thematic drivers is recognised elsewhere in literature (Bresnen et al., 2005; Emirbayer and Mische, 1998). For example, Jarzabkowski (2005) links mimetic habitus (Bourdieu, 1977) and iterative agency, where the enactment of evaluative practice builds upon past knowledge, experience and interpretations. Whilst this interactivity between evaluative drivers makes analysis of evaluative praxis more complicated, the empirical analysis did point to three broad types of transition in evaluative practice during a masterplan process:

- **Progressive evaluative transition**: an evaluative intention may be initially constrained by internal and external evaluative drivers but is later enabled and reflected in strategic practice outcomes;
- **Static evaluative transition**: an evaluative intention that is consistently constrained (or enabled) by evaluative drivers and strategic practices are consistently less (or more) responsive to evaluative information;

- **Regressive evaluative transition**: an evaluative intention may be initially prioritised but later constrained by evaluative drivers and less reflected in strategic outcomes.

These types of evaluative transition parallel what Jarzabkowski (2005, p163) calls 'patterns' of strategic activity. There are two patterns of strategic activity, described by Jarzabkowski, that closely fit what has been identified in this study[29]. The 'shaping change' pattern aligns with both progressive and regressive evaluative transitions i.e. the evaluative practice is linked to a change in other evaluative practices. Whilst the pattern of 'inertia' matches the episodes that were subject to a 'static' evaluative transition, i.e. the treatment of evaluative practice does not change at different stages of the masterplan, regardless of evaluative findings.

Yet, the evaluative transitions identified in this study differ from Jarzabkowski's 'patterns of activity' concept in that the transitions that took place were not necessarily explicitly *intended*. Rather, the transitions in the evaluative treatment of GI intentions, were more the consequence of the predominant thematic drivers at particular stages of the masterplan (e.g the short-termist practicial-evaluative and mimetic practice that dominanted the detailed design and construction phases) (Jallow et al., 2011). In terms of the 'shaping change' pattern, six of the thirteen episodes displayed a regressive transition, where developers returned to familiar routines of evaluative reponse, after initially appearing to respond to evaluative recommendations. A static or inert pattern of evaluative activity (practice) was identified in five of the empirical episodes. In just two episodes (both in Estate 1), the 'projective' intervention of an internal practitioner (design team) and external practitioner (CPO inspector) helped to shape a 'progressive' evaluative response in the later design stages. The data therefore points to a tendancy to

[29] Patterns of strategic activity: Introducing localised activity (intended and unintended); Inertial activity; Shaping change activity; Stabilizing activity; and Unresolved activity (Jarzabkowski, 2005, p164)

maintain or move towards the regressive treatment of GI evaluation. Jarzabowshi suggests that practitioners are more likely adhere to procedures which have 'structural legitimacy', as they are part of routine (i.e. memetic) practices (Jarzabkowski, 2005). Others describe strategic inertia as an active process of 'dynamic conservatism', where individuals and organisations proactively resist change and work to keep things the same (Kim et al., 2006; Schön, 1983), which was certainly the case with the episodes that displayed regressive and static evalautive transitions to maintain various mimetic and pratical-evalautive priorities. Structural inertia has also been associated with prevalant external norms, rules and mimetics which reinforce mimetic, iterative and practical-evaluative ways of working (Gluch and Bosch-Sijtsema, 2016). Jarzabowski also suggests that, where multiple strategic practices and intentions are combined, as is the case with masterplans, the potential for conflict is increased, further reducing willingness to prioritise less familiar intentions. A conflictual setting was clearly present, to a greater or lesser degree, in all the episodes studied here. Jarzabrowski, like Schweber (2014), argues that part of the solution to structural inertia issues is to adopt a more explicit or visible 'change-shaping' and 'integrative' strategic approach.

The implication of this more abstract discussion is that strategic evalautive practice cannot be assumed to be an 'embedded' part of organisational (masterplan) processes and associated strategic practices. Evaluative embeddedness or the capacity of evaluative practices to influence and and be influenced by other practices, is dependent on the underlying intrinsic and extrinsic drivers that exist to constrain and enable those practices. This leads us to consider each of the drivers identified in this case study review in turn.

6.2.2 Drivers of evaluative embeddedness

To understand the roles of the different thematic drivers, the following discussion considers each driver of evaluative embeddedness separately. As already discussed in 6.2.1, this is a somewhat artificial separation and therefore the discussion also touches upon the interactions between the drivers where they were found to be present in the empirical study.

6.2.2.1 External drivers: Rules, norms and mimetics

External evaluative drivers refer to a wide range of coercive rules, normative guidance and mimetic cultures (Lounsbury, 2008; DiMaggio and Powell, 1983) that have influenced all the evaluative practices and praxes outlined this study of six masterplan sites. The external drivers dynamically shaped the evaluative intentions and mode of agency adopted in the masterplan process. The cross-case analysis in Chapter 5: revealed a transitional shift in which external drivers played a more dominant role (Maitlis and Sonenshein, 2010), affecting how different evaluative practices were enacted at different masterplan stages. This change in influence of external drivers was linked to which practitioners came to dominate evaluative practice at each stage, and the degree to which those dominant practitioners were affected by those external drivers. In most of the episodes, external rules and norms were dominant during the design stage, when the practitioners responsible for those rules (regulators and planners) had greater control to enforce compliance. During construction, although rules and norms were still attended to, at least rhetorically, the mimetic habits of dominant developers became more influential (in conjunction with more iterative and practical evaluative modes of agency). A lack of capacity to enforce planning requirements during construction was also referred to by several interviewees. This decline in regulatory capacity is supported by reports regarding how local government in the UK has experienced over a decade of spending cuts, reducing their in-

house resources to adequately scrutinise housing developments in the planning system (Innes and Tetlow, 2015; Williams, 2014a; Farrells, 2014; Carmona, 2011).

The implication from this study is that, whilst these external drivers can play a role in shaping how evaluative practice is enacted, interpreted and responded to, this relationship was affected by the degree of *extrinsic* control of external practitioners and sense of *intrinsic* responsibility internal practitioners felt regarding external evaluative intentions. This leads directly to the second driver of evaluative embeddedness: evaluative responsibility.

6.2.2.2 Responsibility: Intention, agency and control

Within the concept of evaluative 'responsibility', or the sense of *commitment* to undertake and respond to evaluation (Maitlis and Sonenshein, 2010; Schweber and Haroglu, 2014), are three sub-themes: (i) the intention/s underlying an evaluative practice (Flowerree, 2017; Vollink et al., 2002; Ouelette and Wood, 1998); (ii) the time-bound mode of agency adopted when enacting an evaluative practice (iterative, practical-evaluative and projective) (Gluch and Bosch-Sijtsema, 2016; Bresnen et al., 2005); and (iii) the degree of control different practitioners have over a particular practice (Schweber, 2014; Andres, 2013).

As already discussed, intentionality appears to be driven by factors internal and external to the masterplan process. The external drivers can require, encourage and motivate practitioners to address certain intentions in a certain way. Chapter 5 indicated that in relation to GI, the external rules, norms and mimetics were quite narrow in their conceptualisation of GI, focusing on discrete issues, such as the protection of individual species, so formal evaluative praxis was also narrow in how GI intentions were understood and responded to (Han, 2016). Internally, the strength of intentionality is also defined by organisational and individual negotiation of

different intentions, where some intentions are prioritised over others. This prioritisation of intentions was exhibited by the commitment of staff, time and financial resources to undertaking and responding to certain evaluative intentions, where fewer resources were committed to GI evaluative praxis in comparison with cost appraisal for example.

In terms of agency (Battilana and D'Aunno, 2009; Jarzabkowski, 2005), the empirical data indicated transitional shifts in the mode of agency that the different practitioners applied and how they negotiated and responded to a particular intention. Jarzabkowski suggests that a practical evaluative mode of strategic practice is sometimes necessary to '*get things done'* (2005, p34). In relation to these episodes however, the 'things' that 'got done' at the construction stage related to the most familiar (iterative and memetic) and immediate (practical evaluative) intentions (cost savings and integrating hard infrastructure) to the detriment of longer-term and more forward looking (projective) intentions, such as the promotion of trees and ecological connectivity. In each episode, the shift in agency was partly tied to those external drivers that dominated evaluative practice at different stages of a masterplan. Rules and norms were more dominant during the design stage, supporting a more projective approach to decision-making, whilst mimetic habits were more dominant during construction, supporting the iterative and practical evaluative mode of agency (Ouelette and Wood, 1998).

The mode of agency adopted was also linked to who *controlled* (or dominated) the enactment of evaluative practices at any one time. Mapping out the dominant practitioners in the masterplan process and for GI evaluation highlighted that control of evaluative practice changed at different stages, both in terms of who took decisions and the degree of intentionality they might have toward an issue. In terms of GI evaluation, more control was applied when the GI issue in question was thought to have negative implications for other (priority) evaluative

intentions. For example, in RUE 1 the tree survey recommendations were initially responded to in a more projective way when the design team dominated the process but when greater control was handed over to the developer, the plans were revised when the trees came into conflict with the proposed layout of underground utilities.

One implication of this discussion on evaluative responsibility, is that it is not sufficient to expect evaluative recommendations at the design stage to produce a static and maintained response, as numerous changes can take place after that point. Even if a post-construction evaluation is required to validate how an evaluative intention has been performed, there needs to be an additional emphasis on assigning responsibility to *respond* to the findings of that evaluation (RIBA, Hay, et al., 2017), including the allocation of sufficient resources (human and financial) to deliver that response. Without clearly assigned responsibility *at each stage of the masterplan*, longer term intentions, like GI, will always be vulnerable to short term priorities and a regressive evaluative transition.

6.2.2.3 Negotiation: Evaluative integration and prioritisation

The ideological foundation of sustainable development requires, to a certain extent, collaborative negotiation processes between different sustainability intentions (Sharma and Kearins, 2011; Glasbergen et al., 2007). This is also true for masterplans, in terms of the multi-disciplinary visioning and decision-making involved in solving the 'problem' of creating a sustainable neighbourhood. Yet the process of seeking integrated solutions may also be an inherently conflictual negotiation between different parties with different organisational and personal interests, where some interests will be given greater weight than others, and where parties may struggle between different organisational and cultural approaches (Sharma and Kearins, 2011; Foucault, 1982; Thomson et al., 2009; Vlaar et al., 2006). In these empirical

examples, there was often a vast array of evaluative information, with reams of documentation and hours of meetings between different practitioners, each with differing individual and organisational approaches and sense-making (Maitlis and Sonenshein, 2010) of the evaluative intentions being examined. The sheer weight of information and perspectives complicates the negotiation process of *integration* and *distribution* that dominant practitioners need to undertake to consolidate different evaluative intentions (Filzmoser et al., 2016). *Integration* of evaluative information relates to practitioners trying to make sense of which intentions are complementary, conflicting or neutral in their relationship with other intentions, and prioritisation of different intentions in their response. Evaluative negotiation also involves differing *distributional* impacts as a result of that integration process, where particular evaluative responses (Holland, 2014), will differentially affect who (and what) will benefit or lose as a result of prioritising particular intentions.

When the external rules and norms did not refer to an evaluative intention, or included caveats that favoured a short-term practical evaluative and mimetic behaviour, or where the regulators faced their own conflicts of interest (e.g. protecting trees verses meeting housing targets or cost savings), there was an opportunity for a negotiated compromise or regressive evaluative practice regarding that intention. For example, arboriculture surveys were conducted on all the sites, as a normative evaluative practice in planning. The surveys identified trees suitable for protection but despite these recommendations, high quality trees were consistently 'sacrificed' when they did not fit with the proposed spatial layout for highways and other hard infrastructure; infrastructure that was mimetically, iteratively and practically accepted as the principle priority.

Some writers suggest the practice of evaluation helps to make issues or intentions visible to support the rational negotiation of different evaluative priorities and responses (Chenhall et al., 2013; Flyvbjerg, 2001). The thirteen episodes examined here suggest that the mere act of evaluation was insufficient to affect the balance of negotiation in favour of those issues being evaluated. Flyvbjerb (2001) suggests that quantitative environmental factors are often perceived as more objectively measurable than social qualitative intentions, so environmental intentions may carry greater weight. This research finds however, that even where social or environmental intentions were made visible through evaluation, they were still secondary to financial or other mimetic concerns.

Even in the seemingly 'objective' practice of financial appraisal however, there are various subjective decisions taken in the process of establishing future real estate values and predicted costs (Tiesdell and Adams, 2011; Lorenz and Lützkendorf, 2011; Abidin and Pasquire, 2007; Ellison et al., 2007; Green and Liu, 2007; Bell, 2005). Financial appraisal includes its own explicit and implicit negotiation processes, where practitioners decide which costs are 'necessary' and which deemed suitable to be 'value engineered' out at later stages if budgets overrun (Green and Liu, 2007). In the case studies examined here, financial evaluation was largely undertaken behind closed doors and often subject to confidentiality clauses, due to risks from 'commercial competition' (Colenutt, 2015; Warren, 2016). The lack of transparency in financial evaluation makes the process of evaluative negotiation highly controlled by the dominant actors and means that non-market intentions are undervalued or ignored as there is no expectation to make these a part of the negotiation (Nicholas, 2016; Pearce et al., 1989).

In summary, multiple issues or evaluative intentions press upon a developer throughout a masterplan process. This suggests that some element of negotiated compromise is an inevitable

part of a development process (Jarzabkowski, 2005). The question remains however, what degree of compromise to environmental or social intentions of sustainability is acceptable to meet short term technical or economic intentions, or vice versa? And, how is it decided who should take responsibility for making that decision? It is clear that normative tools like BC should aim to increase the expectation that such negotiations are made more openly (discussed further in 6.4), in order to redress the imbalanced preference towards short-term evaluative intentions that often occurred during construction practice.

6.2.2.4 Reflexivity: Learning, interpretation and response

The (external) rules and guidance in the planning system encourage the internal masterplan practitioners to establish a baseline of information upon which to frame the future designs and construction of a new neighbourhood. As such, the planning process is, at least according to the case studies examined here, 'heavily front-loaded' (Interview 34, Developer) requiring evaluation (of public intentions such as ecological impact) to take place predominantly at the outline and detailed design stages. Each new phase of a masterplan site entails the production of hundreds of documents and evaluative reports, some running to hundreds of pages, to provide an evaluative context as a part of the planning process. The morass of documents and multiple practitioners involved do seem to make evaluative negotiation and strategic reflexivity highly challenging. According to Hirschman's 'hiding hand' (1967) too much information can make people risk averse and prevent action. However, without evaluative data there is also a risk of missing the negative consequences that could arise as a result of a particular design or construction decision, and of becoming increasingly tied into that negative course of action (Staw and Ross, 1989). As Flyvbjerg (2016) states:

> "*Mistakes are not a problem. Not learning from them is.*" (Blog item, accessed 24.08.16)

Instead of assuming that evaluation is always worthwhile to improve decision making, the question should also focus on *who* it is that is shaping, learning, and responding to evaluative information, *how* they enact evaluative practice and *why*. The discussion regarding the other three thematic drivers (external drivers, responsibility and negotiation) directly addresses these questions, suggesting that evaluative reflexivity is affected by each of the other three. Reflexivity is affected by the sense of evaluative **responsibility** that different practitioners attach to a certain intention or issue, the type of agency they adopt in evaluating that issue and who controls the praxis. Intentionality and evaluative control (incorporated in the concept of responsibility) are affected by **external** rules, norms and mimetics - the external expectations that press upon an evaluative practitioner. Reflexivity is also affected by how practitioners **negotiate** between different evaluative intentions, where the learnings and interpretation from one evaluation practice can be complementary or come into conflict with another. For example, an arboriculture surveyor, as a peripheral practitioner, has limited control over the design and construction decisions that may impact trees. They can only *projectively* recommend which trees are protected, managed or cut down. The normative standards and mimetic practices around tree evaluation encourage the surveyor to take a narrow interpretation of how they evaluate trees, one that pays minimal attention to the wider ecological contribution of a tree or group of trees. It is then up to the landscape architect and more dominant developer to reflexively respond to the surveyor's limited recommendations, in conjunction with other evaluative intentions (e.g. regarding underground utilities, building layout etc.), potentially missing the cultural, ecological, even economic services (e.g. real estate uplift value) that the trees can offer.

There is an assumption that evaluation will support some kind of positive change over time (Flyvbjerg, 2001; Schön, 1983) through increasing rational understanding and knowledge.

These and other writers (RIBA et al., 2017; Way and Bordings, 2014; van der Voordt and van Wegen, 2005) endorse BRE's view that evaluative practice is 'good' for decision-making. However, the discussion here has indicated that the use of evaluative information is not a linear reflexive progression. The learning, interpretation and any response to that information is dynamic and transactional, shaped by a range of external and internal drivers as outlined above. As such, organisations like BRE should recognise the limits to which a standard evaluative framework (and external norm) can be expected to influence a masterplan process, especially if the standard only seeks to shape evaluative practices at a single stage of that masterplan.

6.3 Barriers to embedding Green Infrastructure and BREEAM Communities evaluation

The following discussion considers the practical barriers to embedding GI evaluation that were presented in the six case studies, before outlining the barriers that emerged from the research, regarding the uptake and implementation of the BC standard.

6.3.1 Barriers to GI evaluative embeddedness

Chapter 5 pointed to four issues that limited the extent to which GI evaluation influenced design and construction decisions in terms of general strategic practice of GI evaluation and regarding the enactment of that practice or 'praxis'. Barriers for strategic GI evaluative practice included:

(i) the narrow way practitioners define GI impacted how GI was treated during evaluation; and

(ii) the lack of recognition by dominant practitioners of GI as living systems with agency, that can carry wider evaluative intentions than simply anthropogenic functions.

The barriers for GI evaluative praxis included:

(iii) a lack of assigned responsibility over GI, necessary to enable reflexive responses; and

(iv) the narrow definition of 'inclusion' that resulted in exclusion of local groups from formal GI evaluative praxis.

These four barriers are discussed further below, contrasting the empirical findings wider literature on these issues.

6.3.1.1 GI as an established concept

The term GI is reported to have first emerged in political and academic circles in the late 1990s (Mell, 2017), as a conceptual way to capture humanity's interaction with landscape, encapsulating core principles, including providing:

- Multi-functional ecosystem services[30] (Hansen and Pauleit, 2014; Elmqvist et al., 2010);
- Multi-scalar connectivity (Jerome, 2017; Bélisle, 2005);

[30] Ecosystem services refer to services that ecosystems (such as forests, wetlands, mountains, grassland, river and stream ecosystems) contribute to humans and wider flora and fauna. Ecosystem services include: *Provisioning* services (e.g. production of food, timber, fibres, water); *Regulatory* services (e.g. climate, soil, water quality, waste water treatment); *Supporting* services (e.g. provision of habitats and maintaining genetic biodiversity); and *Cultural* services (contribution to recreation, economy, amenity and wellbeing) (Elmqvist et al., 2010; Hansen and Pauleit, 2014).

- Social inclusion (Agyeman and Evans, 2004; Curran and Hamilton, 2012); and
- A long-term strategic approach (Sinnett et al, 2016; Pauleit et al., 2011).

In a review of how the concept of GI has evolved over the last twenty years, Mell (2017) describes three phases. In the first 'exploratory' phase in early millennium, proponents advocated for GI to capture certain common principles. During the second 'expansion' phase between 2005 and 2010, where an increasing range of actors adopted the term in policy and practise. The third, most recent, phase 'consolidates' actors' understanding of GI, where a 'common consensus' about the benefits of adopting a GI approach in landscape management and urban development exists. The findings from this empirical review do not suggest that a shared understanding (Maitlis and Sonenshein, 2010) of GI had been reached among the different practitioners interviewed, or that the definition of GI principles have been sufficiently defined to be fully operationalised by practitioners (de Groot et al., 2010). This finding accords with Meerow and Newell (2017) who similarly found that, whilst practitioners recognised individual GI functions, such as flood amelioration, they were less likely to have a more multi-faceted understanding (Elmqvist et al., 2010; Hansen and Pauleit, 2014). The narrow interpretation by developers and dominant practitioners, constrained the degree of reflexivity to evaluative information about GI, making GI seem less important in contrast with more pressing (mimetic, iterative and practical- evaluative) intentions:

> "*In truth trees are so insignificant they are often an afterthought...The biggest financial problem is not mitigating [for the loss of] the trees. It's the wrong trees affecting the site footprint. If that means a loss of units that's going to hit the purse strings."* (Interview 14, arboriculture assessor)

In the context of the narrow GI conceptualisation and a lack of tools to evaluate GI more broadly, it is understandable that GI intentions were often compromised in preference for more established concepts of cost control, highways and time management. The implication of this discussion is that more work needs to be done to operationalise the definition of long term, inclusive, multi-functional and multi-scale GI evaluative intentions within masterplan *praxis*, especially during the construction and in-use stages.

6.3.1.2 GI as an agent and subject of evaluation

The episodes studied in this research showed GI was being evaluated principally in terms of anthropocentric intentions. As a result, the additional functions and services that ecological systems provide, along with their own right to exist as living organisms, were devalued or even ignored. For example, in all episodes, except episode 5 (Estate 2), it was accepted that most trees interior to the sites would be 'sacrificed' to make room for the development. In episode 5, the architect successfully designed a residential block around two mature trees, opening up the block to create 'glimpses' of green. The architect understood it took at least 40 years for trees to reach maturity. Even then, the architect described the trees, not in terms of their own intrinsic value, but in terms of the emotional and visual amenity trees provide people (Interview 12, Architect, Estate 2). Another interviewee argued that the concept of GI was itself framed against ecological agency:

> "G*reen infrastructure is more for people…. You can't make a wildlife site multi-use... you know the usual parlance. 'We'll put a road through the heathland. It won't matter if the badgers get run over. That's hard luck you know'.*" (Interview 23, local ecologist).

Human ecologist Dr Robert Fish (University of Kent) suggested that the term 'green infrastructure' was adopted to give the 'soft' profession of landscape architecture greater status in how it was considered by policy makers, planners, designers and developers (UK Valuing Nature Network Conference, June 2016). The problem with equating 'green' infrastructure to 'grey' hard infrastructure is that ecological systems risk being treated in the same manner – as an object for human use first and foremost, and not as an entity or system that has agency and functions which are intrinsically valuable in their own right (Bang and Marin, 2015; Gschwandtner, 2013; Mcshane, 2007; Orr 2004; Callicott, 1985). This highlights a problematic tension between the anthropocentric, neoliberal views that underpin terminology such as green *infrastructure*, ecological *services* and natural *capital*, and an eco-centric view of ecological systems, of which human needs and intentions are but one part (Lent, 2017; Steffen et al., 2015).

Within the field of urban design, there are a number of advocates from academia and practice, such as Jacobs (1961), Carmona (2014) and Gehl (2010), who call for urban design or 'place shaping' to start by understanding people's needs and experiences. These writers and practitioners have a strong social intentionality in their work, as depicted in Gehl's '*Cities for People*' (**Figure 6-4**). There is a growing body of research that argues that urban 'Life' (top picture in Figure 6-4) should refer to *all* living things as part of the urban design context, an urban ecology of which humans are one part of an interconnected 'life support system' (Sassen and Dotan, 2011; Gandy, 2006; Pauleit et al., 2011; Pincetl, 2010; Bryant, 2006; Orr, 2004) .

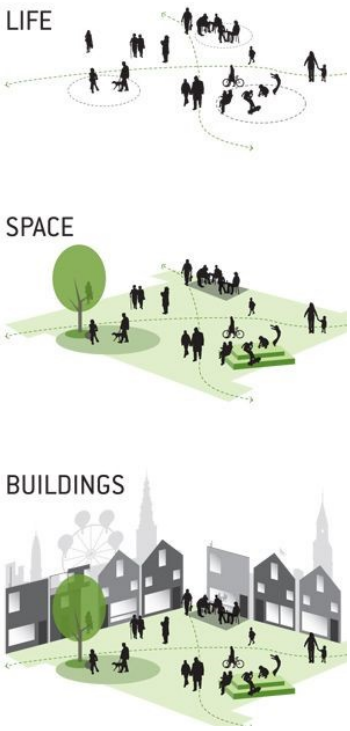


Figure 6-4 Design with people first (Gehl, 2010)

Thus, the top picture could be reinterpreted to include living flora and fauna, and ecological habitats, including rivers and forests, as the foundational basis upon which present and future human communities will develop, as far as possible in close harmony (**Figure 6-5**). And if GI elements are not found present in and around a site, then a central intention should be to restore or introduce such elements to support a sustainable future.

Figure 6-5 'Life' revised to design places for all life (adapted from Gehl, 2010)

The proposition of evaluating GI as a foundational and integral part of urban systems and their design seems far removed from the practice observed in most of these episodes. The episodes

point to a highly constrained and risk-averse mimetic, iterative and practical-evaluative cultures, particularly in relation to the evaluation of relatively 'new' GI, such as soft SuDS, green roofs and bio-geographically linked landscape design. The episodes also highlighted the conflicted and imbalanced negotiation between GI and other anthropocentric intentions, an imbalance that is echoed throughout construction and development literature where GI intentions are frequently compromised (Yigitcanlar and Teriman, 2015; Pincetl, 2010).

6.3.1.3 Weak GI evaluative responsibility

The two challenges of 'front-loaded' evaluation and weak long-term responsibility over GI, reduced the sense of *evaluative* responsibility and increased the risk of compromise or even failure to respond to earlier recommendations. As a result, 'static' and 'regressive' evaluative transitions were more commonly observed in the episodes studied here.

The separation between design and construction practices (Yigitcanlar and Teriman, 2015) and associated practitioners, was one of factors that appeared to weaken actors' intentions and therefore sense of responsibility to embed GI evaluation in the delivery stage of neighbourhood masterplans. Much of the GI evaluative practices were enacted early in the design stage or 'front-loaded' as one interviewee called it (Interview 34, developer, Estate 2). This was encouraged by the external rules and norms which tend to prioritize the early GI evaluation as a part of the planning process. In comparison, other more internal intentions (notably regarding finance, time and hard infrastructure) were evaluated and prioritised throughout the masterplan process. The lack of responsibility to check the delivery of earlier GI evaluative recommendations served to undermine reflexive responses in construction practice. As an urban designer commented during a public seminar:

> "*It's something that I call the 'mystery of the missing trees', cause you go out on site with your plan and [the trees] have all gone because no one really thought about where all the utility runs were going to be*" Amy Burbidge (Urban Design Group seminar, 22 November 2017)

This lack of evaluative attention in the latter stages of a masterplan was demonstrated in six of the thirteen episodes, including: the failure to plant the agreed number of trees in (episode 5, Estate 2; episode 7, Infill 1; and episode 12, RUE 2); the failure to construct functional soft SuDS (episode 6, Infill 1); the failure to establish a living green roof in Infill 2 (episode 9); and the failure promote bio-geographic connectivity (episode 8, Infill 2 site; episode 10, RUE 1; episode 13, RUE 2). Even where a post-construction appraisal had been applied (episode 4, Estate 2), there were limited opportunities for the evaluative findings (relating to GI) to influence later design and construction practices in proceeding masterplan phases. The main reason for this lack of reflexivity was because the developer had not conducted the evaluation with an intention to make design improvements but rather to build local dialogue and relationships for the duration of a lengthy masterplan process. The findings were therefore not communicated with the next phase design teams who might have been able to learn from and respond to the information.

Another factor that reduced the sense of responsibility over GI evaluation was a lack of intention to ensure the long-term management and maintenance of GI once a site was in-use. Neither developers nor local authorities interviewed for this research displayed strong intentions regarding on-going GI management and maintenance, where responsibility '*is widely shared and no one is truly in charge'* (Pincetl, 2010, p53). This problem has been recognized elsewhere (Landscape Institute, 2014; Princes Foundation for the Built Environment, 2010; Bordass,

2000). The Princes Foundation, the Land Trust and Landscape Institute, amongst others, have sought to address this responsibility gap through clarifying how GI services can add to real estate and land values (de Groot et al., 2010; Tiesdell and Adams, 2011), as well as by encouraging developers to adopt longer term investment models (Landscape Institute, 2014; Princes Foundation for the Built Environment, 2010).

6.3.1.4 Exclusive GI evaluation and delivery

Regulatory, normative and mimetic evaluative practices and wider masterplan processes do not generally support a more inclusive and equitable distribution of environmental benefits from GI functions (Fredericks, 2014; Mercado-Alonso et al., 2017). Formal GI evaluative praxes (e.g. LVIA, flood risk assessment, arboriculture surveys, ecology surveys and microclimate surveys), in the episodes studied here, did not evaluate the distributive impact of proposed GI provisions for different demographic groups of people. Nor was it an established practice to engage with local actors (e.g. residents, local businesses, societies and community groups) when undertaking these technical surveys. In the interviews the local actors indicated an in-depth knowledge and interest concerning those issues (e.g. regarding visual amenity or ecological connectivity). Evaluators would focus on consulting those institutions they were required to engage as part of the planning process, (e.g. Natural England, Environment Agency and local authorities). Engaging local actors was principally done through broad public events, such as workshops and exhibitions, and by dumping large quantities of planning documentation online for dedicated individuals to try and wade through and make sense of. The participatory site visits described in Estate 1 and 2 were examples where designers sought to create opportunities for more open dialogue. But whilst local interviewees indicated their passion and

know-how about different aspects of GI, it was unclear whether they felt it was appropriate to raise different GI issues at general events and how.

Developers and their contracted facilitators talked about wanting to avoid consultation overload and conflict but where the praxes of obtaining and communicating evaluative information were closed and tightly controlled (Weick et al., 2005), they contributed to 'information asymmetries' (Vlaar et al., 2006). Asymmetric evaluative control was imposed in the closed praxis of tree, ecology, landscape visual impact, microclimate, and overshadowing surveys, and in the cost management assessments enacted at all the sites. It was also enacted by the developers in episode 4 (Estate 2), when they decided not to communicate the courtyard landscape design recommendations to design teams after the post-construction evaluation. These asymmetries had consequences regarding power relationships, reducing the levels of local trust and engagement, and missed opportunities to enhance masterplans regarding their treatment of GI. These examples indicated a continued risk that local engagement activities are applied more to legitimise developers' planning application processes than about gaining an in-depth understanding of local knowledge, highlighting potential design concerns or about reaching more equitable planning outcomes (Fox-Rogers and Murphy, 2014).

6.3.2 Barriers to embedding BC as a normative evaluative framework

Chapter 5 pointed to similarities in the dynamics of formal evaluative practices as they transitioned in the masterplan process. There were also similarities in how GI evaluation was enacted between those sites that applied BC and those that did not. The three sites that did not apply BC (Estate 2, Infill 2 and RUE 2) undertook many of the same types of formal (technical)

evaluative processes and consultations as the sites which applied BC (Estate 1, Infill 1 and RUE 1). In part, this is because planning and regulatory institutions expected those evaluations to be conducted but also because the developers, being large organisations, likely preferred a consistent system of project and information management (Timmermans and Epstein, 2010; Lounsbury, 2008).

Whilst it remains problematic to definitively state the degree to which BC affected the evaluative practice, the analysis of interviews and documents suggests that BC did not clearly influence the developers to adopt or alter evaluative practices (at least in terms of the evaluation of GI and detailed design and construction responses). As such BC lacked transformative impact, i.e. it did not appear to change either evaluative practices or the decision making that took place in response to those practices (Timmermans and Epstein, 2010). BC, and indeed all sustainable neighbourhood standards, suggest that a development site can be evaluated deterministically, where the BC certification score for site designs acts as a 'proxy' for the sustainability performance of a site (Schweber, 2014, p,24). This is problematic for four reasons:

(i) the dominant mimetic culture and iterative/practical evaluative nature of construction practice meant that longer term (projective) intentions contained in BC were deprioritised (in all but two episodes);

(ii) masterplanned sites and the practitioners involved are dynamic and subject to changes across design, construction and in-use stages, such as to site layout when underground utilities have been incorrectly mapped and only discovered once construction is underway (as in episode 12, RUE 2);

(iii) the core sustainability principle of holism or integration is weakened by the vast array of evaluative intentions than can come into conflict with each other (in all episodes); and

(iv) the problem of legitimacy, regarding who it is that determines the 'success' of a site, how BC technically defines a sustainable community, contrasted with how different practitioners may perceive and experience the process and outcomes.

These four issues are discussed in turn.

6.3.2.1 Locked-in evaluative cultures

Estate 1 and Infill 1 underwent a regressive transition in terms of the relationship between the masterplan and BC, one that shifted from a more 'punctual fit' during outline design (i.e. BC requirements ran in parallel with many of the practices the developers were doing anyway) to being 'bolted on' as an afterthought, during detailed design and construction stages (Schweber and Haroglu, 2014). This lack of evaluative responsibility to deliver BC, accords with Schweber's (2014) concern that voluntary standards lack strong rules to coerce compliance. As an evaluative framework that is external to the masterplan process, BC requires external and internal drivers to incentivise developers to apply the standard in a more embedded way. These drivers were lacking at the detailed design and construction stages for Estate 1 and Infill 1. In RUE 1, BC was required by the planning authority as part of the planning process, along with a funded POE to validate implementation, incentivising the developer to apply BC, at least 'punctually' if not in a more embedded way (Schweber and Haroglu, 2014). Even when the coercive rules and normative guidance were present, the influence of rules and norms on detailed designs and construction were limited by the lack of resources in the regulators or consultants to monitor and check if a developer had fallen short on earlier commitments

(Interview 41, Parish Councillor). There was also a lack of active buy-in from the three co-developers in RUE 2, and importantly their contractors and subcontractors, to ensure compliance (Interview 41 Parish Councillor, Interview 38, BC assessor). It is arguable that practitioners' evaluative habits or mimetic culture are 'locked-in' to certain ways of doing things (Schweber, 2013, p.142; Heeres et al., 2015). Thus, it may be more fundamental to address habitual practice when seeking to further embed evaluative practices than expecting change through a voluntary normative standard, such as BC, or the adoption of hard rules, where regulators may lack resources to properly enforce them. But that raises the question, how can mimetics be influenced or changed?

6.3.2.2 Transitions in evaluative responsibility

According to BRE and others, bringing evaluative practice up-front or 'early' in the masterplan visioning / design process helps to better integrate evaluative intentions (BRE, 2014; Heeres et al., 2015; UK Urban Task Force, 2005). The three sites that applied BC in this research (Estate 1, Infill 1 and RUE 1), showed that the 'degree of fit' (Schweber and Haroglu, 2014) or the embeddedness of BC changed dynamically during the masterplan process. In Estate 1 and Infill 1, when the applicant (developer) was seeking planning permission during the outline design stage, and the design team (who had recommended the developer to undertake BC) played a more dominant role, there were references to BC throughout the planning application documents. This included references in the Design and Access Statements and an apparent prioritisation of those issues the applicant was seeking BC credits for. Here, BC appeared to play a 'normative legitimising' role (Schweber, 2014, p,24), helping the developer to assure the planning authority of 'best practice'. Once outline planning permission had been achieved, in the detailed design and construction stages, the developer took greater role in commissioning

and responding to evaluative practices. At this point, there was a switch back to familiar mimetic behaviours, combined with iterative and practical evaluative agency, driving the negotiation of different evaluative priorities. Thus, in the detailed design and construction stage documents there was little to no reference to BC, and the interviewed developers openly recognised BC was mainly referenced in relation to the early design / pre-planning consent stage. This suggests that, like several of the GI episodes, BC was subject to a 'regressive' evaluative transition, where the influence the standard played over design and construction practices declined over time.

None of the masterplan sites were finished in terms of their construction during the course of this study so it was not possible to offer an 'ex post' account of sustainability performance for any of the sites or for any single issue. However, even if the sites had been completed it is questionable whether an objective statement of masterplan sustainability performance could be presented. This is in part because performance is dependent on who judges it, and at what stage performance can be clarified, since a neighbourhood is differentially experienced and viewed by different practitioners, as was the case in most of the interviews. Nor is it possible to definitively state that any neighbourhood site is ever entirely 'finished' as places are shaped through use, as well as by design and construction practices (Carmona, 2014). As such it is problematic for a BC assessor to form a conclusive judgement of performance in terms of outcomes. BC can only really refer to the expected *procedures* and desired transitory (snap-shot) outcomes (Timmermans and Epstein, 2010).

6.3.2.3 Evaluative complexity

BC offers a multi-issue formal framework for evaluating sustainable communities, as defined by a global 'evidence-based' consensus of what is leading sustainable development practice

regarding those issues (BRE Interview, 2016). The problem for BC (and potentially for masterplans in general), is that it implies that some form of utopian 'optimal' set of decisions is achievable. Most of the interviewees in the research appeared to recognise there could be no single harmonious masterplan solution, one that would address all issues and make everyone happy. They recognised and accepted that there would always be conflicting 'institutional logics' (Lounsbury, 2008) resulting in winners and losers in the masterplan process. BC, in seeking to formalise how masterplans are evaluated, has chosen to ignore the key evaluative practices where social, economic and environmental intentions are negotiated, notably financial evaluation. This narrowing of intentional focus in BC, means the standard does not adequately address 'the reality' of masterplan practice (Vlaar et al., 2006, p1627).

As Bordass (2000) points out, developers tend to see construction products as ends in themselves, rather than as a means to wider (sustainability) ends. 'Wider' evaluative intentions, such as social inclusion and ecological diversity, tend to be longer term and not deliver clear benefits that a developer can directly benefit from. The benefits of rebalancing evaluative intentions may be unclear for participants (Vlaar et al., 2006). As Abidin and Pasquire (2007) indicate, clients might be more interested in prioritising environmental and social intentions if there were 'real incentives' to do so.

There does seem to be a need for a clearer framework, such as BC, to guide and reframe the process of consolidation between different evaluative intentions, i.e. making the negotiation of different priorities more transparent or 'visible' (Schweber, 2014). A key aspect of making negotiation more visible is about encouraging those practitioners that dominate evaluative negotiation to explicitly (and publicly) recognise the potential distributive effects of certain design outcomes. This means evaluating the consequences of particular choices (Heeres et al.,

2015), accounting for those who have no voice or at least a weaker voice in the masterplan process (defined as 'marginalised social groups' in BC), whilst also working within the limits of ecosystem functioning (Raworth, 2017; Yigitancanlar and Teriman, 2015).

6.3.2.4 Global expert versus local contextual evaluative intentions?

The literature review (Chapter 2) identified a fundamental tension within BC between trying to impose control over those evaluative intentions, which BRE as an 'expert' institution has deemed important to sustainable community, versus promoting participatory dialogue between different masterplan practitioners and allowing each to play a part in evaluating and defining the intentions of what a sustainable community could be. As Eversole comments, in a review of community engagement:

> "*Participation as typically understood and practiced retains a legacy of a top-down view of social change: it invites 'communities' into development processes and development decision-making*" (Eversole, 2012, p.38)

BC aims to be both a generalised standard, but also prescribes which local issues are a 'global' priority (Schweber, 2014; Timmermans and Epstein, 2010), and as such seems to fit Eversole's (2012) top-down definition of participation. Whilst BC specifies that greater community engagement improves community sustainability, it also details who could be involved and specifies the issues where actors (at a minimum) should be involved. It does not outline much about the process of engagement itself, as a negotiated or deliberative process, one which could contribute to establishing the process *itself* and identifying thematic priorities as the dialogue develops (Beauvais and Baechtiger, 2016; Forester, 2013; Hemmati, 2002).

In all six sites, the urban practitioners and policy makers continued to adopt traditional (mimetic, iterative and practical evaluative) modes of evidence gathering for specific technical issues, such as viability and cost appraisal, LVIA and arboriculture tree surveys, to support 'rational' expert decision making. These closed-door formal evaluative praxes did not appear to increase the trust in the wider public about such processes, but instead provoked protests about the loss of trees or allocation of affordable homes. Did local actors feel their concerns are listened and responded to? Did they feel that they had a genuine part to play in negotiating some of the difficult compromises that had to be made as a masterplan is developed? The capability of local actors to engage and consideration of the distributive impacts of decision-making are poorly addressed in BC (Fox-Rogers and Murphy, 2014; Holland, 2014). There was a lack of engagement around key strategic masterplan intentions, such as regarding site location, finance, or allocation of affordable homes in all the study sites. BC requires applicants to try to engage with '*hard to reach groups*' in the GO 01 Governance issue (BRE 2011). In at least two of the sites (Estate 1 and RUE 1) local actors did not engage in the development dialogue because they felt the decisions *they* were most concerned with had already been taken. Therefore, it cannot be assumed that all relevant actors will even want to engage if a process is too controlled (Rydin and Pennington, 2000).

Is a masterplan development done *to* a community, *for* a community, or *with* a community? Is participation simply a means for the developer to attain planning permission and achieve their short-term real estate intentions? (Bernstein et al., 2016; Eversole, 2012; Fox-Rogers and Murphy, 2014). Conversely, should the will of local actors and the public always be assumed to be 'right' without question or criticism (Mumby, 1997)? Asking BC to address this question of top-down control verses a more open participatory approach maybe something of a false dichotomy. Instead, perhaps, a compromise is required, where local actors and masterplan

practitioners can all be understood as practitioners (as with SaP). These practitioners, through a clear deliberative process, can then agree who takes a lead in decision making at different stages, how decisions will be taken, including the degree of accountability to which they should be held, and a clear commitment to account for who (and what) will benefit (and lose) from the decisions that are taken.

6.4 Recommendations to improve evaluative embeddedness

The following section outlines ways in which GI can be more embedded within evaluated practices in the masterplan process, before considering more general recommendations to enhance how BC is applied by applicants.

6.4.1 Enhancing GI evaluative embeddedness

Outlining the barriers to embedding GI evaluative practice also helps identify where improvements could be made. Four recommendations emerge regarding improving GI evaluation in general but also how BC could address it in future. This relates to:

(i) operationalising the multi-functional, multi-scale inclusive principles that are described in literature;

(ii) examining how to evaluate impacts to GI for their own sake, not just in terms of their impacts to human intentions;

(iii) assigning clear responsibility to evaluate GI at each stage of the masterplan; and

(iv) further embedding of the distributional impacts of GI proposals.

These four recommendations are discussed further below.

6.4.1.1 Clarifying GI evaluative intentions

A central challenge regarding the evaluative treatment of GI is how to operationalise GI evaluation during construction, when short term priorities come to the fore. This points to a general need to clarify how GI is defined, its intentions and how it should be measured, as well as to indicate who should take responsibility for enacting and responding to that evaluative practice, particularly during construction.

In terms of further embedding the concept of GI in the BC standard, the issue 'SE11 – Green Infrastructure' comes at **Step 2** in the standard, after other strategic plans have been established. One option would be to adopt a new **Step 1** issue on GI or consider revising the **LE 01 Ecology** issue, to establish a clear and broad definition of the concept, principles and intentions, and require applicants to create a GI strategy that will apply those principles during the design, construction and in-use stages. This approach would require a common definition of the term 'green infrastructure'. For example, Natural England Guidance states that:

> *'Green infrastructure is a network of multi-functional green [and blue[31]] space, both new and existing, both rural and urban, which supports the natural and ecological processes and is integral to the health and quality of life of sustainable communities'.* (Natural England, 2009, p7)

[31] 'Blue' infrastructure is added to the definition of Green Infrastructure as Natural England and others recognise that GI includes water-based infrastructure, such as river and coastal habitats (Natural England 2009, p7; Taylor, 2012).

BC should then clarify the core principles and intentions of GI that designers and developers should interpret and plan for: multi-functionality, integration, connectivity, inclusion, and long-term responsibility (Mell, 2017; Hansen and Pauleit, 2014; Elmqvist et al., 2010; Jerome, 2017; Bélisle, 2005; Agyeman and Evans, 2004; Curran and Hamilton, 2012). In terms of embedding the concept of integration, Table 4.1 in Appendix 4 indicates a range of other issues in BC where the definition and inter-connections to GI could be clarified. For example, **LE 05 – Landscape** could include a reference to bio-geographic connectivity (Gasanov et al., 2016; Kupfer, 2012; Kent, 2007; Howard and Mitchell, 1980), so landscape design focuses not just on promoting national 'native' species, but considers *local* ecological connections. In addition, separate issues emerged from the case studies that were not covered in the episodes but were of relevance to a more integrated conceptual approach to GI evaluation in BC. This includes a more explicit promotion of the productive and economic role of GI, such as referring to food production through community gardening and allotments in **SE 01 – Economic needs, LE 05 - Landscape** and **SE 17 – Training and Skills**.

6.4.1.2 Recognising the agency of GI

The Natural England (2011) definition of GI refers to it as a networked system that has both bio-centric and anthropocentric intentions. This dual set of intentions, aligns with definitions elsewhere in literature (Meerow and Newell, 2017; European Commission, 2013; Benedict and McMahon, 2002). In comparison, in BC issue **SE 11 – Green Infrastructure** is explicitly anthropocentric in intention, focusing on the *inclusive* access to green spaces *for people*. The issue does not even talk about promoting good 'quality' GI, in broad terms. BC is therefore narrow in its focus regarding the specific evaluation of GI. This specificity benefits standard users by providing precise and measurable objectives but, as discussed in 6.3.1, misses the

multi-functional, inter-active, and autonomous qualities of blue and green infrastructure that are described by policy makers and literature. BRE should redefine the definition of GI in BC, as suggested in 6.4.1, to encapsulate the non-anthropocentric functions and principles of GI, and include an *explicit* intention of broadening developer and construction contractor mind-sets and mimetic habits about GI evaluation, through education and training.

More research is required to consider whether and how GI interactions can be better reflected in specific formal evaluative practices. For example, broadening the focus of landscape appraisal may offer an opportunity to account for the multi-scalar aspects of GI functions (de Groot et al., 2010). This could also include further research into evaluating the different functions of GI (e.g. absorption, insulating, cooling, and shading) with regards to the praxis of noise, flood, energy, microclimate and overshadowing modelling. Similarly, transport impact assessment could incorporate the potential mitigating role of GI with regards to air, water, noise and soil quality. Research is also required regarding how technical evaluations can better reflect the impacts of a development *towards* GI functioning.

6.4.1.3 Assigning responsibility

To better operationalise the evaluation of GI during construction stages, there is a need to clarify who takes responsibility for ensuring that evaluative practice is enacted and responded to. BRE could include a requirement in BC that the developer assigns, as a part of a wider GI strategy, clear responsibility over the evaluation and management of GI during construction and in-use stages. This should include attaching sufficient resources (ecological, human, technical, financial and time) to maintain GI evaluation and responses, with monitoring a key part of that responsibility. It should not be assumed that the residents will necessarily adopt long term responsibility over GI management (as currently proposed in BC issue **GO 04 – Community**

management of facilities), as community actors may not have the interest, skills or resources to do so. Instead, the decision regarding long term management and how that would function should be taken as part of a deliberative process with local actors (Eversole, 2012). In addition, BC could encourage applicants to be more open when negotiating priorities, such as through introducing a negative score for issues that are compromised by prioritisation elsewhere. For example, intentions to integrate hard infrastructure (e.g. utilities, car parking) that undermine ecological intentions (e.g. habitat provision and GI connectivity) could result in a loss of credits in BC issue **LE 01 – Ecology Strategy**.

6.4.1.4 Inclusive GI evaluation

The episodes examined in this research outlined a rich knowledge base amongst local actors about different aspects of GI and this knowledge could have been tapped into at an early visioning stage of the masterplan. The local actors shared knowledge about: landscape views and trees of local amenity and cultural value; sites of importance for ecological connectivity and diversity; GI impacted by overshadowing; and knowledge of local flood history. The case studies present missed opportunities to use that knowledge to inform and enhance plans. The evaluative consultants and developers need to proactively engage with local actors, explaining the range of issues that will be evaluated and creating a range of opportunities for local actors to share their priorities, concerns and insights. This occurred in Infill 2 when the landscape architect informally sought out local knowledge and feedback, but in that instance the architect did not formally record the outcomes of that engagement and so that feedback was not retained. A second aspect of inclusivity related to the equity of distributional impacts of GI proposals (Mels, 2016; Holland, 2014; Department for Transport, 2015), where the episodes did not

consistently evaluate who benefitted and who lost from particular landscape design decisions and other GI-related decisions.

The principle of inclusive GI in BC therefore needs to be more clearly defined, in terms of the enactment of evaluative practice, requiring an explicit evaluation of the distribution of benefits obtained by different groups to avoid information asymmetries (Vlaar et al., 2006). BC could make amendments to specific issues to reflect these principles of deliberation and inclusive distribution, such as requiring inclusive visual amenity or 'landscape justice' (Mercado-Alonso et al., 2017; Mels, 2016) within LVIAs and an assessment of distributional impact of landscape design and layout in BC issues **SE 11 – Green infrastructure** and **LE 5 – Landscape**. It could also address these principles more generically in **GO 01 – Consultation plan** and **GO 02 – consultation and engagement.**

6.4.2 Enhancing the embeddedness of BC

Turning to the broader implications of the research for BC, the discussion points to four broad recommendations that would contribute to enhancing the evaluative embeddedness of BC:

(i) re-orientating mimetic habits towards sustainability intentions;

(ii) making evaluative transitions more transparent;

(iii) improving integration through clarifying evaluative intentions; and

(iv) enabling deliberative and distributed dialogue.

6.4.2.1 Transforming evaluative cultures

Schweber and Haroglu (2014, p316) suggested that BRE standards could have greater impact in transforming practice by adopting a stronger focus on '*a more capacity building*

approach…developing sustainability skills and expertise across the sector' rather than through promoting a normative technocratic tool. This recommendation recognises that transformation of practice is probably more likely when individuals and institutions mimetically internalise new ways of thinking and acting through applied learning, '*learning through doing'* (Whitmarsh et al., 2011; Bobek et al, 2009). More research and resources are needed to build up a more mimetically embedded approach to evaluation, one that encourages practitioners to adopt a greater level of projective agency in masterplan construction and post-construction stages. One possibility is that BRE could look work collaboratively with organisations also involved in this area, such as BSIRA (Way and Bordings, 2014), Green Building Council, the Construction Industry Research and Information Association (CIRIA), the Construction Industry Council (CIC), RIBA (RIBA and Hay et al, 2017) and Town and Country Planning Association (TCPA). Such a collaboration could consolidate learning and training that explicitly aims to increase evaluative responsibility towards sustainability intentions. This would include identifying and promoting tools that combine a better balance of iterative, practical evaluative and projective thinking, and so create more opportunities to prioritise social and environment intentions in negotiation with financial short termism and hard infrastructure prioritisation.

6.4.2.2 Transparent transitions

Recognising the limitations of what BC can offer in a complex and dynamic masterplan context, greater attention could be paid to making the evaluative transitions more transparent between design, construction and in-use stages. This is necessary to smooth out the front-loaded nature of evaluation, particularly for non-economic intentions, including GI. As Jallow et al. (2011) recommend, BC should encourage developers to establish a clear knowledge management process or reporting framework that seeks to track and validate key evaluative intentions across

the different masterplan stages. This would need to include post-construction evaluation, with sufficient resources and responsibility attached to ensure there is capacity and commitment to respond to the findings of those validation checks. This could be established in BC through creating a new mandatory governance issue in the standard, or through introducing an additional mandatory requirement in **GO 01 – Governance** on 'reporting delivery'.

6.4.2.3 Improving integration through clarifying intentions

Several interviewees recognised that BC *could* play a role as a formal normative guidance that supports more transparent evaluative negotiation processes. It could do this through making clear: the baseline evaluative intentions or requirements; the interaction of different intentions; and the distributive impact of potential outcomes (i.e. who and what benefits from different evaluative responses) (Vlaar et al., 2006). Whilst it is impossible for BC to expect developers to give a 'complete' account of the consequences of all evaluative negotiations in a masterplan process (Chenhall et al., 2013; Bowker and Star, 2000), there are two specific gaps that BC could practically address to enhance the visibility and hopefully better prioritisation of social and environmental intentions. The first relates to how BC defines and appraises GI, and the second, is the need to reframe financial evaluative negotiation.

First, in relation to GI, BC needs to make the connections between GI and other issues more explicit, including through a more consistent approach to cross-referencing throughout the standard. Although there are some direct references to **SE 11- GI** in a few other issues (e.g. **LE 01 – Ecology**) with credits awarded for action in those areas, there are also several issues with less clear indirect links, where GI is referred to but no credits assigned. These issues with indirect references could make the links to GI more visible by linking them to credits. *If* BRE accepts the broader definition of GI described by regulators and literature, then those definitions

and connections could be clarified in specific BC issues, as outlined in **Table 4.1 in Appendix 4**. In addition, rather than simply having mandatory and optional issues, BC could require the clear identification of negative consequences of not selecting to evaluate certain issues, through adopting a negative to positive performance scale for example, rather than the current positive performance scale. This would make the negative compromises more transparent and encourage clearer justification for ignoring issues, rather than simply opting out of issues not deemed 'viable' for a site.

Second, in chapter 2, it emerged that all BC issues either directly or indirectly referred to some aim or action with financial implications (see **Appendix 1, Table 1.5**). All the episodes examined in this study also highlighted how dominant financial evaluative practices are in the negotiation of differing evaluative intentions that press against developers. As such, it would appear to be a fundamental addition to BC to establish a new issue to address this strategic evaluative intention aimed at a more projective mediation between conflicting intentions (Jarzabkowski, 2010; Bell, 2005). There is a growing body of research and tools that aim to quantify sustainability intentions as a part of economic or financial evaluations, such as Sustainable Value Management (Abidin and Pasquire, 2007), natural capital accounting (Nicholas, 2016; Chee, 2004) and Social Return on Investment (SRoI) for the contribution to people's wellbeing (Banke-Thomas et al., 2015), as well as more integrated tools (combining qualitative and semi-quantitative data), such as triple bottom line reporting (GRI, 2000) and multi-criteria analyses (Garmendia and Gamboa, 2012). As mentioned in Chapter 5, other neighbourhood sustainability standards, such as Green Star Communities have adopted financial reporting requirements as part of their evaluative framework. Green Star Communities offers credits for applicants when they evaluate 'Return on Investment' and 'Affordability' but perhaps it does not require integration of social and environmental intentions into those

appraisals. GRI (2000) used a global multi-stakeholder dialogue to develop a more integrated framework for triple bottom line reporting for 'G4 Construction and Real Estate Sector Disclosure' (2000). A more integrated form of financial disclosure could encourage companies to make the negotiation of different intentions more visible. It would be valuable to undertake further research to examine how the Green Star standard and GRI reporting practices have been applied by practitioners, in terms of the degree to which they are thought to impact the prioritisation of different evaluative intentions.

6.4.2.4 Enabling deliberative and distributional dialogue

The masterplans in these case studies predominantly prioritised short term and familiar (practical-evaluative and mimetic evaluative) intentions (e.g. finance and highways infrastructure). A more balanced or integrated account of other sustainability intentions would require an alternative mode of collaborative response to rebalance those evaluative practices that currently dominate design and construction decision-making. As one interviewee indicated, the complexity of masterplans requires an intensely collaborative design process:

> "*The key skill in masterplanning is seeing through all the thousands of different things that people want and finding a path that suits as many of them as possible. So, the creativity is in listening and finding a path because you're never going to do everything. You can't do it by yourself. You can't just draw a masterplan and hope for the best. It has to be the result of an integrated…it is very much an integrated process*." (Interview 12, Architect, Estate 2)

Perhaps BC can only continue to promote principles of stakeholder engagement, if it more openly acknowledges that different sites and actor groups are likely to require different

approaches, depending on the culture, demographics, history and expectations of people in the neighbourhood, external institutions and 'internal' project delivery actors. It could do more to encourage developers to empower local ownership of evaluative practices. This would include encouraging applicants to provide local actors with training and learning opportunities to develop skills and knowledge about the development process, so they are better equipped to engage and also be more realistic about the boundaries of that engagement (Hemmati, 2002; Rydin and Pennington, 2000). More fundamentally, it needs to encourage an earlier deliberative dialogue, regarding the negotiation of different intentions, to improve the visibility of the distributional impacts of different outcomes and allow sufficient space for mutual dialogue, exchange, learning, engagement and response (Holland, 2014; Beauvais and Baechtiger, 2016).

6.5 Summary

Three broad implications emerge from this discussion. First, evaluation as a strategic practice is not automatically embedded into other strategic practices. The relationship between evaluation, other practices and practitioners is dynamic and shaped by interactions between a range of internal and external thematic drivers (external drivers, responsibility, negotiation and reflexivity). Second, based on the empirical analysis and literature, there is a need to build shared understanding and mimetic skills regarding GI definition, evaluation and response. This includes, finding practical approaches to combine the more projective mode of agency with the iterative and practical evaluative agency commonly adopted during masterplan construction, and operationalising a more long-term, multi-functional, multi-scale, and inclusive approach to evaluate GI. Third, to encourage a more integrated and inclusive evaluative approach in masterplan processes, BC needs to better reflect the dynamic and transactional nature of

evaluation. This includes incorporating new requirements for integrated evaluation and reflexive responsibility at each stage of the masterplan process, especially construction, with the aim of promoting a more transparent, deliberative evaluative negotiation, and with an explicit intention to improve the distributive impacts of dominant evaluative intentions, particularly regarding finance.

Each case study and episode discussed in this study has specific contextual characteristics. The findings are based on the examination of GI as one evaluative issue, and a group of discrete evaluative episodes proffered by interviewees, from six larger masterplan processes. The abductive approach recognises that it is impossible to obtain a complete picture of events, or indeed represent the perspective of every actor involved, regarding those events. The events have also been interpreted based on the researcher's understanding of the data (interview, documentation and observations), using the SaP framework to identify the thematic drivers and types of transition. Therefore, all the inferences discussed in this section need to be read with an awareness of these analytical choices and potential for participant and observer bias. Further research and practitioner feedback would therefore be beneficial to consider the wider applicability of the findings.

Chapter 7: Conclusion

7.1 Overview

The empirical study of Green Infrastructure (GI) evaluation in thirteen episodes across six English masterplanned sites demonstrated transitional evaluative dynamics, in terms of who enacts and responds to evaluative information, and how and why evaluation is enacted in different ways at different stages of the process. The study has shown that even where certain evaluative intentions have been formalised, evaluated and responded to (e.g. as recommendations in planning documentation), it was common to see later revisions and surprise discoveries (e.g. unmapped underground utilities) that required a change in response, away from the recommended course of action.

The study contributes to the body of research about Strategy as Practice (SaP) regarding the relationship between evaluation and other strategic practices. It indicates that 'evaluative embeddedness', or the degree to which evaluative practice influences other practices, is not a linear relationship between evaluative praxis and response. Evaluative embeddedness is dependent on a combination of internal and external thematic drivers that dynamically enable and constrain how practitioners structure, apply and respond to evaluative information at different points in time.

The study adds to knowledge about GI, highlighting that the concept of multi-functional, multi-scalar, long-term and inclusive GI is not established among all masterplan practitioners. The narrow definitions of GI by rules, norms and mimetic practice limits how dominant actors (e.g. developers and contractors) evaluate and promote wider potential benefits to a neighbourhood.

Other, more familiar, evaluative intentions tend to take priority (e.g. saving costs and time, integrating highways and underground utilities) as a result. More work is therefore required to better operationalise a multi-faceted approach to GI in masterplan processes, particularly during the construction stage.

The study contributes to research regarding standardised evaluative frameworks, such as BC. It points to the limits of BC in a dynamic and collaborative masterplan process, where BC appeared to serve a legitimising rather than transformative function in the three sites that applied it. If BC intends to encourage practitioners to re-balance masterplan responses towards social and environmental intentions, it needs to directly tackle the dominant practitioners, evaluative practices (cost control / value engineering) and the stage of evaluation (detailed design and construction) where those intentions are deprioritised.

Looking at the process in a metaphorical way, one of the architect interviewees likened the masterplan process to an orchestra. In this metaphor, a composer (or architect) seeks to outline the composition (masterplan), and the developer (conductor) brings together the different sections of the orchestra (or internal actor groups, such as contractors, clients, residents, and evaluators) to produce an interpretation of the musical score. They aim to make a harmonious sound that both the orchestra and the audience (or external actors, such as neighbouring residents, businesses, regulators, statutory bodies) can hopefully enjoy. Throughout the performance, the conductor guides each section of the orchestra, their timing, when to come to the fore and when to take a backseat.

Applying the metaphor to the findings from this empirical study suggests how a composition is interpreted changes at different points during its enactment. It was common for the design team and regulators to dominate during the creative composition stage (masterplan design) and for

the developer to be more dominant during the performance (construction). This change in dominance affects how the musical score (masterplan) is read, interpreted and responded to. Thus, the role of certain sections of the orchestra (e.g. landscape architects) can be greatly affected depending on the conductor, where some instruments such as the wind instruments and drums (community facilitators and tree surveyors) have a reduced role, and popular and familiar favourites such as the violins and cellos (financial accountants and highways engineers) dominate a performance. Each composer and conductor need to be persuaded of and understand the wider benefits of other instruments coming to the fore, to produce a more balanced or harmonious sound. They also need to be aware of the problems or discord that would later occur if a synthesis is not encouraged. The other musicians also need to accept and understand how to create a sound space (design and construction practice) that allows other instruments to take a stronger role. It is this challenge of persuasion that is perhaps the most difficult but crucial one for BRE, when considering the future shape of BC and any additional activities they undertake to promote more sustainable neighbourhood developments.

The following section reviews the research findings, considers the conceptual and more practical implications of those findings, as well as offers some reflection on the potential limitations of the research and consideration of further research needs.

7.2 Implications for Strategy as Practice

The study has benefitted from the application of the SaP as a conceptual framework, as well as identified some findings regarding strategic evaluative practice that may be relevance to the wider body of knowledge about SaP.

7.2.1 Contribution *of* Strategy as Practice

This study combined Strategy as Practice (SaP) as a conceptual framework with a deductive / abductive analysis of GI evaluative practice in six case studies. The SaP framework provided analytical structure (using Whittington's (2006) constructs of practice, praxis and practitioner) to chronologically map out and analyse the case study interviews and documentation. SaP made two clear contributions to the study.

First, the SaP framework supports an analysis of strategic practices that function across *different scales*, linking macro-scale 'extra-organisational' rules (e.g. Environmental regulations) to meso-scale organisational practices (e.g. environmental impact assessment) and micro-scale praxis (e.g. tree surveys). The case review considered evaluative practice across these scales which seem somewhat abstract and fuzzy in the 'real world' (Flyvbjerg, 2001). SaP helps to clarify some distinction between the scales, and the role that intrinsic and extrinsic practitioners play in shaping strategic relationships across those scales (Whittington, 2006; Suddaby et al, 2013). SaP explicitly disaggregates the micro-scale evaluative praxes and the meso-scale (organisational) practices, as understood from the perspectives of different practitioners (in this study: design teams, developers, local authority officers, residents, consultants); and situates practice and praxis within the context of much broader, macro-scale, *external* regulations, norms and mimetics (Lounsbury, 2008). This classification was useful in seeking to clarify the drivers underpinning a particular strategic practice, in this case GI evaluative practice.

Second, SaP offers a relatively simple framework to map out strategic practices in a highly collaborative multi-actor and *inter-organisational* context (Hoon, 2007), as is the case with masterplan processes. The SaP framework (Practitioner, Practice, Praxis) helps to chronologically map out changing relationships over time, especially when applying

Whittington's multi-dimensional approach (2006). This includes clarifying changes in influence or control by different practitioners over practices. This analysis, combined with the deductive/abductive coding of interview data, supported the clarification of the thematic drivers (external drivers, responsibility, negotiation and reflexivity) that appear to constrain and enable the relationship between evaluation and other practices. It also helped identify the different types of evaluative transition that can occur (Flyvbjerg, 2001).

7.2.2 Contribution *to* Strategy as Practice

This case review makes a small contribution to the body of knowledge about strategic evaluative practice, by focusing on the role of *formal* evaluative practices within an *inter-organisational* strategic collaborative process (masterplans) (Egels-Zandén and Rosén, 2015). The empirical study of evaluation in practice examined the assumption of *embeddedness* of evaluative practice within other strategic practices, in this instance masterplan design, construction and in-use.

Based on the findings, evaluative practice cannot be assumed to be an 'embedded' part of organisational processes. It suggests that there is not a linear relationship between evaluation and evaluative response. Evaluative practices are transactional and dynamic in nature, where evaluation can both influence and be influenced by the different practitioners involved and by the other practices that the evaluative practice is seeking to address. Instead the review indicates that evaluative embeddedness, or the use of evaluative practices by practitioners to influence and change other practices, is enabled and constrained by four broad inter and extra-organisational drivers:

(i) External drivers

A range of external or 'extra-organisational' drivers (Whittington, 2006), the coercive rules, normative guidance and mimetic cultures (Lounsbury, 2008; DiMaggio and Powell, 1983) that establish intrinsic or extrinsic expectations regarding how practitioners use evaluative information. These drivers establish formal and informal expectations regarding how an evaluative practice is structured, enacted and responded to.

(ii) Evaluative responsibility

Evaluative responsibility relates to the intentionality, mode of agency (iterative, practical evaluative and projective) (Battilana and D'Aunno, 2009; Gluch and Bosch-Sijtsema, 2016; Bresnen et al., 2005) and the degree of control that different practitioners adopt when enacting evaluative practices. Responsibility is shaped in part by the external drivers that place external expectations and limits on how practitioners consider an evaluative intention. It is also affected by the negotiated prioritisation of different evaluative intentions, as demonstrated by the commitment of resources (time, staff, finance) assigned to enact a particular intention.

(iii) Evaluative negotiation

Strategic processes, such as masterplans, involve multiple evaluative intentions which different practitioners or actor groups need to negotiate in order to make decisions (Sharma and Kearins, 2011; Vlaar et al., 2006). Evaluative negotiation requires a collaborative process of integration, organising, and prioritising to bring together those different intentions into a coherent plan (Filzmoser et al., 2016; Holland, 2014). It also requires consideration of the distributive impact (for different actor groups and different intentions) of a certain negotiated outcome, to weigh

up the winners and losers and whether additional or alternative prioritisation needs to occur (Holland, 2014; Beauvais and Baechtiger, 2016).

(iv) Evaluative reflexivity

Evaluative reflexivity, in terms of learning, interpreting and responding to evaluative information, is affected by the other three drivers. For example, if an evaluative intention is deprioritised during negotiation with other intentions, then there is a greater likelihood of a static (unresponsive) or regressive dynamic in how practitioners respond to that intention. Furthermore, changes in the dominant practitioner, affects the personal and organisational interpretation of evaluative information, altering the degree of responsibility, prioritisation and responsiveness adopted with regards to different evaluative intentions.

7.3 Implications for evaluative practice

This study outlined three types of evaluative transition at different stages of the masterplan. The most common type of evaluative transition displayed was a 'static' or 'regressive' evaluative transition between masterplan outline design and detailed design / construction stages. As a result, the evaluative recommendations that emerged regarding different GI intentions (e.g. street trees, vegetative drainage filters, green roofs, or ecological and landscape connectivity) were deprioritised in favour of more familiar memetic 'practical evaluative' intentions, such as the delivery of cost savings or integration of hard infrastructure.

A common theme running through the recommendations emerging from this study is the need to clarify how sustainability intentions (including GI) can be made more visible in masterplan

decision making processes, through evaluative practices (Schweber, 2014; Vlaar et al., 2006; Bowker and Star, 2000). Increasing visibility, includes defining evaluative intentions more formally (Jarzabkowski, 2010) – outlining areas of complementarity and potential conflict between intentions (e.g. ecological connectivity, social inclusion, cost minimisation and hard infrastructure) and clarifying how responsibility (including resources) will be assigned to carry out and respond to evaluative practices for the duration of the project and beyond. This will help to make the negotiation of different evaluative intentions more transparent, including highlighting the potential distributional impacts of particular prioritisations for different people (Department for Transport, 2015; Holland, 2014).

This study contributes to the body of knowledge about the enactment GI evaluative practice and the application of BC as a neighbourhood sustainability standard. These contributions are summarised below.

7.3.1 Green Infrastructure evaluation in masterplan processes

The case review highlights that the definition of GI was not an established concept across all the masterplan practitioners studied here, unlike recent reports (e.g. Mell, 2017). There was a tendency, particularly amongst those actors that dominated construction practices (in these episodes, particularly the developer and their contractors), to focus on discrete benefits of GI, such as flood relief and not the multiple breadth and agency of green and blue natural systems, that requires a long-term strategic approach within design, construction and in-use. The implication from the research is that more needs to be done to clarify this definition of GI and

operationalise this broader understanding within the practitioners involved in detailed design, construction and in-use stages of masterplan processes.

Table 7-1 Barriers and recommendations to embed GI in neighbourhood masterplans

Barriers to embedded evaluation	Policy and practice recommendations
1. **Conceptual**: GI is not an established evaluative concept, in relation to key principles of long term multi-functionality, multi-scalar connectivity, and inclusive GI provision.	1. **Clarifying GI evaluative intentions:** The definition of the broad intentions, principles and potential measures for GI evaluation need to be better defined and formally integrated into BC.
2. **Agency:** The agency of GI systems is often not considered in formal masterplan evaluations e.g. energy, overshadowing, microclimate, noise, transport surveys did not consider the impact to and by GI.	2. **Recognising GI agency**: Further research is required to improve evaluative praxis, to better account for impacts *to* and *by* GI in different aspects of masterplan processes (e.g. energy, noise, overshadowing, micro-climate and transport surveys).
3. **Weak responsibility:** There is a lack of commitment to track evaluative recommendations about GI, especially during construction and in-use masterplan stages.	3. **Assigning responsibility:** Masterplans should seek to produce a GI strategy that specifies how, when, by who and with what resources, evaluative recommendations will be enacted, monitored and responded to.
4. **Exclusion:** The weak conceptualisation of 'inclusive' GI means that the distributive impact of proposals and knowledge of local actors are not considered in formal evaluative praxis.	4. **Inclusive GI evaluation:** Encouraging the evaluation of distributional impacts of decisions relating to GI, as well as a more deliberative process engaging local actors in formal evaluative praxis (e.g. ecology, landscape, tree, over-shadowing surveys) and encouraged in BC.

Table 7-1 summarises the barriers and recommendations to further embed GI evaluative practice in masterplan processes, arising from the case analysis and discussion (chapters 5 and 6). Specifically, targeted (on and off-site) training and applied learning is needed to deepen knowledge and reflexive responses relating to GI within masterplan processes, particularly focusing on non-specialist practitioners, including construction contractors.

7.3.2 The role of BC in masterplan processes

Regarding the application of the neighbourhood sustainability standard BC, the study indicated that BC did not have a clear transformative impact in terms of the evaluative practices relating to GI, when comparing those sites that applied BC with similar sites that did not. Although broadly positive about BC, interviewees indicated they felt BC had played a minimal role in shaping evaluative practices. The formal evaluative practices, praxis and responses applied across all six sites were broadly similar regardless of the presence of BC, further supporting the view that BC did not play a strong role in influencing the formal evaluative practices, at least in respect to GI evaluation. Instead, BC seemed to play more of a legitimising function for developers (Schweber, 2013), where it was 'bolted on' to support planning application process, and then barely alluded to in the detailed design and construction states, once planning consent was granted.

Various barriers and ways to promote a more embedded approach to BC in masterplan processes were analysed and discussed in chapter 5 and 6, these are summarised in Table 7-2. The findings point to the limits of BC, in the dynamic inter-organisational context of a masterplan, where evaluative intentions and their prioritisation can shift over time, as the dominant practitioners involved change. BC intentionally avoids addressing the practice of financial evaluation, the most consistently dominant practice in all the empirical episodes. Intentions that were narrowly defined and poorly accounted for in financial evaluation, in this instance GI, were inevitably deprioritised. If BC is to encourage practitioners to re-balance masterplan responses towards social and environmental intentions, it needs to directly address the dominant practitioners (developers and contractors), evaluative practices (cost control /

procurement / value engineering) and the stage of evaluation (detailed design and construction) when that deprioritisation occurs.

Table 7-2 Barriers and recommendations to embed BC in neighbourhood masterplans

Barriers to embedded evaluation	Policy and practice recommendations
1. **Evaluative lock in:** There is a lack of coercive rules, normative guidance and mimetic habits that promote a more projective mode of evaluative responsibility during construction and in-use masterplan stages	1. **Transforming evaluative cultures:** BRE should work collaboratively across construction and real estate sectors to develop a more projective culture of evaluative responsibility, including through training programmes
2. **Inconsistent transitions**: Changes in practitioners, the mode of agency adopted and the interpretation of external drivers mean that the relationship between evaluative practice and other practices is subject to change.	2. **Transparent transitions**: Smooth out the front-loaded evaluation of non-economic intentions, including GI. BC could establish monitoring requirements in detailed design, construction and in-use stages, to validate the credits being sought.
3. **Evaluative complexity**: BC does not integrate dominant evaluative practices that drive evaluative negotiation, decision-making and actions, particularly regarding financial evaluative practice.	3. **Improving integration**: BC needs to further integrate GI (and other issues) in the manual and make financial evaluative negotiation more transparent through a new issue or credit on finance (e.g. triple bottom line reporting).
4. **Global verses local intentionality**: BC struggles with promoting globally defined technical sustainability intentions whilst at the same time seeking to encourage local community ownership of the process.	4. **Enabling deliberative and distributional dialogue***:* Local actors need to be understood as active practitioners in masterplan processes, requiring training and support to help them make an effective contribution to evaluative negotiation and responses.

BC should encourage greater responsibility and prioritisation of social and environmental intentions at all masterplan stages, as well as make evaluative negotiation more visible, through supporting an open deliberative dialogue about the procedures, prioritisation and distributive impact of negotiated responses. BRE could make a further contribution to operationalising key evaluative concepts, such as GI and sustainable value management, supporting applied learning through training and skills development programmes (Schweber and Haroglu, 2014; Bell and Morse, 2013).

It is clear from this study that a voluntary normative standard can only go so far in incentivising mimetic change (Schweber, 2014). Even if BC were required through regulation, there are other external factors, such as decreased public sector capacity (Innes and Tetlow, 2015; Carmona, 2011; UK Urban Task Force, 2005), that would limit evaluative impact. In the likelihood of continued public sector cut backs, additional sector-wide attention may therefore be required, involving not only BC but a range of associations working collaboratively to increase construction and real estate sector intentionality to reframe the current dominant mimetic and short-term evaluative cultures in masterplan processes towards more sustainable neighbourhood outcomes.

7.4 Reflections on the conceptual framework and method

The conceptual framework and methods applied in this study has exposed certain broad and specific reflections. These reflections are discussed further below.

7.4.1 Broad learnings

Three broad learnings have emerged from the process of undertaking this research. First learning, is that by selecting SaP as the conceptual framework and a mixed method qualitative case review, it is impossible to avoid a degree of bias and abstraction. All questions and responses are constructed abstractions of events and that in turn, will shape what is asked and the answers (Popova, 2016). There is a need therefore to recognise the underlying assumptions, and the inherent bias in the questions that are posed and the constructs being used to frame those questions. It is also about recognising the limits of what is being examined. The biases in this research relate to the empirical choices made, including the use of SaP, the selection of the

six masterplanned sites, using GI as a thematic lens, as well as combining semi-structured interviews and documentation as the major data sources and deduction/abduction to analyse that data.

The second learning is that it is reasonable, if not necessary, in empirical research to allow space for the reflexive evolution in the applied research approach, as issues and questions emerge and are refined (Fletcher, 2017; Forester, 2013). An example of the reflexive learning that took place in this research was an early shift from early thinking that the role of evaluation in promoting sustainable neighbourhood masterplans was an almost straight forward technical question. It quickly became clear that the management and implementation of such 'technical' standards are predominantly social phenomena and as such social science became a more central conceptual and methodological basis.

The third learning is that this study has been quite critical of the evaluative practices that took place at the six sites. It has been clear from all the interviews with the developers, urban designers, landscape architects, arboriculture surveyors, ecologists, engineers, employers agents, site managers, local authority planning and regeneration officers, residents, neighbouring residents and other national and local organisations, that there is a wide range of individuals and organisations who have worked extremely hard to produce a development that responds to a multitude of evaluative intentions in a highly complex, sometimes discordant, collaborative setting. It may be an obvious point, but it is important to recognise that it is far easier to criticise masterplan process and its associated practices than it is to deliver a project in practice.

7.4.2 Specific reflections regarding the method of data collection

The aim of the case study review was to look at the embeddedness of green infrastructure evaluation in neighbourhood masterplan processes and whether this varied depending on whether a standardised evaluative framework (BC) was applied. The objectives were to better understand how green infrastructure is variously defined, evaluated, and how it was understood to relate to masterplan decision making, regarding design, construction and in-use practices. These objectives have been broadly met, however it would be prudent to indicate caution before suggesting that the findings generally apply to masterplans beyond the case studies reviewed here.

By using data from interviews from a limited group of individuals from different types of 'actor-groups' (Whittington, 2006), it is unrealistic to expect to obtain a full picture of what took place. The interviewees were speaking retrospectively about their experiences, so specific timeframes and exact details of events and who was involved may not always have been easy to recollect. Such problems were partly addressed by obtaining a range of perspectives (as they were put forward in interview) of what took place. The accounts of different interviewees were compared with each other, and this information was set alongside the grey literature that was publically available for each masterplan, representing a moment in time where decisions had been sufficiently fixed to be able to communicate them publically. There is also the potential for bias within planning application documents, where there may be a tendency to communicate the positive messages of the proposals (to gain planning consent). Combining multi-actor interviews and analysis of content in documented evidence of events helped to address some of the problems with bias in both the interviews and documentation. Nevertheless, it is clear care should be taken before attributing the empirical findings of this study with more generalizable

lessons for masterplan processes. Therefore, further research would need to be undertaken to test out how far the findings resonate more widely.

The following discussion considers further the more specific aspects of SaP, participant and observer bias that may limit the findings that emerged from the research.

7.4.2.1 Limitations of SaP

SaP requires certain thematic and temporal decisions to narrow the analytical focus to a manageable level. In this research, the narrowing of focus on GI evaluation and to a limited number of time-bound episodes, meant that other evaluative practices were not directly scrutinised in the same detail. Nevertheless, other evaluative practices were referred to during the interviews and documentation analysis, where they interacted with the GI practice and praxes. This helped to give an indication of the mediation or negotiation processes between those evaluative practices (Jarzabkowski, 2010; Bowker and Star, 2000).

It was also necessary to supplement SaP, using deductive/abductive inference during the coding of the qualitative interview data. The critical-realist abductive approach (Fletcher, 2017) helped to focus the analysis more on the 'how' and 'why' questions, regarding the drivers that appeared to influence how evaluative practices and praxes were conducted and understood, and to consider how those drivers affected the relationship between different evaluative practices and with other strategic practices.

7.4.2.2 Participant bias

Those individuals being interviewed may have been subject to participant bias, where they present either what they think their organisation would like them to present or what they think

the interviewer is interested in. For example, one developer interviewed did not mention BC once during the interview until they were explicitly asked about it, despite being informed that BC was part of the research focus in the interview information sheet and at the outset of the interview. However, during a public meeting involving BRE, immediately after the interview, the interviewee was very positive and described how valuable BC was. This variance in individual accounts highlighted the importance of seeking multiple perspectives.

Another participant problem occurred when interviewees did not wish to share information about more potentially dubious practice. For example, one interviewee described how they had arrived on site to see 'protected' trees being damaged by contractors, albeit supposedly unintentionally. They did not wish their client to get into trouble by disclosing this information but at the same time they did want to share that such activities can occur once construction is underway. A separate interviewee also commented on the lack of proper care taken around trees, where they had witnessed sub-contractors cutting the bolls around tree trunks, damaging and potentially killing the trees. Again, the interviewee was reluctant to give specific details and chose to speak more in general terms, referring to this as 'fairly common practice'.

7.4.2.3 Observer bias and influence

When conducting interviews and outreach to potential interviewees, sometimes by merely asking a question the researcher can affect the objects and subjects being observed. There was at least one occasion where asking a question resulted in a tangible change to the events. A construction site manager was asked about the status of a green roof they had installed on site and whether it was possible to view the roof. The manager emailed the following day with photos of the roof, indicating, that because of the question, he had discovered that the roof had not been installed properly. A tenant from a neighbouring building onsite had already

mentioned that the roof looked ‘dead’ but the manager had thought it was simply because it was winter. The question had given them an extra motivation to pay more attention to an object than they might have done otherwise.

As interviewer (and researcher in general), it is useful to recognise that various bias and personal interests are also likely. Although this is impossible to avoid it is worthwhile to recognise how personal circumstances, career and experiences are likely to influence the research approach adopted. In addition to the researcher’s personal history and background is an awareness of the support and influence of the PhD supervisors, tutors, and assessors, as well as other staff and researchers at the University and other colleagues outside the university who are involved in similar work, who have directly or indirectly helped shape thoughts, analysis and writing.

Another potential risk of observer bias relates the fact that the BRE were industry sponsors of the EPSRC CASE studentship research examining their own standard. Importantly, it was not BRE who proposed a focus on BC but the researcher’s own personal interest in the standard. This interest arose more through professional exposure to the scheme whilst working for a charity that had campaigned about how to make new neighbourhood developments more ‘liveable’ for residents. The PhD was an opportunity to look further into this question of neighbourhood quality, how it was evaluated and delivered at a neighbourhood-scale. There were opportunities for the BRE supervisor to comment on the research at three or four project meetings that took place each year. This intermittent dialogue benefitted the research in that the research is informed by BRE’s response and experience but there were not any clear instances where the BRE supervisor asked for any of the findings to be changed. The project meetings were more about sharing with BRE the direction the research was taking and ensuring they had

a chance to comment and respond to any of the findings that were emerging. What BRE were perhaps most interested in was how to practically respond to any of the findings in the future roll-out of the BC standard. So, if there was any bias, it was in their interest to draw out practical recommendations to improve the standard. There is a commitment to produce a more industry facing report of the findings and ultimately it will be up to BRE to decide what they would like to do in response to the findings that have emerged.

7.5 Scope for further research

Four potential areas of further research have emerged from this study, they include: testing the findings with a wider construction sector audience; incorporation of GI in formal masterplan evaluative practices; encouraging greater transparency in financial evaluations; and changing the mimetic culture regarding evaluation to increase a sense of evaluative responsibility during construction phases. These ideas are further considered below.

7.5.1 Wider sector resonance

The early research plan was to conduct wider consultation with construction, planning and real estate sectors to examine the general relevance of the findings. It was not possible to arrange a consultative activity in parallel with writing up the thesis, however there is still a possibility of a follow-up activity, supported by BRE. This could take the form of a workshop and / or industry survey to provide an opportunity to test out the findings and consider whether there are opportunities for BRE to address some of the findings, including through making targeted refinements to the BC technical manual and procedures.

7.5.2 Operationalising GI evaluation

There is a need to consider how formal evaluations can better reflect the impacts of a development *towards GI functioning* as well as how GI can *impact other masterplan intentions*. More research is therefore required to consider whether and how specific formal evaluative practices can incorporate GI, especially during the construction stage of a masterplan. For example, broadening the focus of LVIA may offer an opportunity to better account for the multi-functional, multi-scalar, inclusive and temporal aspects of GI. In addition, *local* and regional interactions of different GI with regards to flood, transport, energy, noise, microclimate and overshadowing models (reflecting the absorption, insulating, cooling, and shading roles of GI), as well as better incorporating GI in value management.

7.5.3 Evaluative transparency – opening-up financial evaluation

If BRE wants to facilitate greater transparency about the negotiation between evaluative intentions they need to better understand the barriers and opportunities for developers and their contractors to report financial prioritisation practices (Warren, 2016; Abidin and Pasquire, 2007). There is a research gap in the area of neighbourhood planning and financial evaluation, in terms of the influence on masterplan processes of other sustainability standards that have explicitly sought to address these more economic intentions, such as Green Star Communities and the GRI Construction and Real Estate sector triple bottom line reporting framework (GRI, 2014).

7.5.4 Promoting mimetic change

Potentially, the most challenging agenda coming out of the study is how and whether BRE can play a role in promoting greater skills and shared sense-making (Weick et al., 2005) to further

embed evaluative responsibility during the construction and in-use stages of masterplan delivery, particularly in relation to GI. A key opportunity could be to work collaboratively with construction associations and companies to promote a more balanced combination of projective, practical-evaluative and iterative perspectives when evaluating GI, one that also embeds consideration of the longer-term impacts arising from routine behaviours.

7.6 Summary

This study of evaluative practices in neighbourhood masterplan processes highlights a dynamic and interactive relationship between four broad 'evaluative drivers' that affect the relationship between evaluative practices and other strategic practices: external drivers, evaluative responsibility, negotiation and reflexivity. It demonstrates how changes in the practitioner that dominates the masterplan process at any one time affects how these drivers influence the relationship between evaluation with design, construction and in-use practices. Of the thirteen episodes of GI evaluation studied, eleven episodes displayed a 'static' or 'regressive' evaluative transition between masterplan outline design and detailed design / construction stages, where the GI issue in question was deprioritised in favour of more familiar 'practical evaluative' intentions i.e. making cost savings or integrating hard infrastructure such as highways and utilities. The findings point to certain barriers that prevent a more projective (forward looking) response to GI evaluation. This includes a lack of evaluative responsibility, by dominant practitioners, to address certain GI issues during masterplan construction and once the site is in-use. The study also identifies certain problems in BC that prevent the standard from taking a more transformative role, including the need to directly address dominant evaluative practices (e.g. financial appraisal) and masterplan stages (detailed design, construction and in-use

practices) where habitual practices and short–term modes of agency result in GI being de-prioritised. BRE needs to further integrate GI (and other issues) in the BC standard and make financial evaluative negotiation more transparent, such as through introducing a new evaluative issue or credit on financial reporting. Perhaps a more fundamental challenge for BRE is the need to look beyond the BC standard and focus on developing training and learning resources that will equip practitioners with memetic and practical tools to better embed GI evaluative intentions in masterplan processes.

The study points to some conceptual and methodological learnings that have emerged in the application of SaP and deductive / abductive coding of interview data. This includes the benefits of applying SaP to support mapping out dynamic inter-and intra-organisational processes, as well as the finding that practitioners and practices can shift in dominance over time from being internal to a process to peripheral or even external, depending on who is dominating the process at any one time. Limitations of the research include a recognition of the potential risks of participant and observer bias that occur in interview and from adopting an episodic and thematic (GI) lens, which may restrict the wider applicability of the research.

Future research needs include the need for research into enhancing the mimetic practice of GI evaluation, including improving the consideration of bio-geographical connectivity and the distributive impacts of landscape for different social groups. The evaluative transitions from masterplan design to construction to in-use also requires further analysis. This includes examining the cultures that prevent greater transparency in financial evaluative negotiation, and to consider the impact that tools such as triple-bottom-line reporting can have on those practices.

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Appendix 1

Table 1.1 Sustainability intentions attributed to key urban design attributes (updated from Callway et al 2016)

Social intentions	Urban Design features or approaches *	Example refs
Safety: Creating safe and vibrant places enabling social interaction and freedoms	• Character and enclosure • Natural surveillance • Compact and diverse communities • Good quality, well maintained public realm and infrastructure • Inclusive and participative design process • Assigned and resourced stewardship • Risk management strategies and modelling	Carmona et al 2002; Mehta 2014; Gehl and Svarre 2013; Davies et al 2004; Cozens et al 2002; Scottish Executive 2006; Ward Thompson et al, 2012; Woolcock and Steele 2008; Lynch 1981; Boyko and Cooper 2011; Dalziel and Cortale 2012; Godschalk 2003, p141; Mileti 1999
Belonging and equity: promoting social and cultural relevance, inclusion, identity interaction, independent voice / autonomy, affordability and prosperity	• Contextual assessment • Character • Compact and diverse communities • Adaptable, 'long-life' and 'loose-fit' design • Good quality, well maintained public realm and infrastructure • Inclusive and participative design and engagement • Assigned and resourced stewardship • Provision of training/learning/employment opportunities	Mulliner et al 2013; Mehta 2014; Adams and Tiesdell 2013; Young Foundation 2010; Lynch 1981; Chawla 2002; Carmona et al 2002; Woolcock and Steele 2008; Mehta 2014; Burton and Mitchell 2006; Jacobs 1961; Carmona et al 2010; Dempsey 2010; Mould 2014; Tonkiss 2013, Boyko and Cooper 2011, Hamiduddin 2015; RICS/CBRE 2014; Social Integration Commission, 2014
Accessibility: inclusive access to public transport and amenities, walkability and bikability	• Accessibility and legibility • Compact and diverse communities • Character • Inclusive and participative design and engagement	Bentley 1985; Boyko and Cooper 2011; CABE 2002; Carmona 2014; CIHT 2010; Dempsey et al 2010; Ewing et al 2014; Gehl 2010; Gehl, 2006; Lynch 1981; Jacobs 1993; Wall and Waterman, 2009; Woolcock, and Steele 2008
Health: Enhanced physical and mental wellbeing, enjoyment and quality of life	• Character • Accessibility and legibility, permeability, connectivity and integrated transport systems • Compact and diverse communities • Internal and external environmental features / microclimate • Inclusive and 'participative' design process • Good quality, well maintained public realm and infrastructure • Landscaping for multi-functional green /blue infrastructure • Provision of training/learning/employment opportunities	Alcock et al. 2013; Anderson 2015; Bell et al 2014; Bird 2002; Barton 2005; Birkbeck and Kruczkowski 2015; Barton et al 2009; Carmona 2014; CABE / Design Council 2015; Coote 2002; Ewing et al 2014; HCA 2014; Fuller et al 2007; Gehl and Svarre 2013; Macmillan 2003; Miller, 2005; Mehta 2014; Mould 2014; Lynch 1981; Münzel et al 2014; Landscape Institute, 2013; Natural England 2014; Gill 2008; Royal Society for Public Health 2015; Sallis et al 2005; Tzoulas et al., 2007; Ulrich 1984; Ward Thompson et al 2012; Wright and Aronne 2012; Wilding 2001; White et al 2013
Environmental intentions	**Design features and approaches**	**Example refs**

Multiple functionality: productive, supportive, regulatory, amenity ecosystem services	• Contextual assessment • Landscaping for multi-functional green /blue infrastructure • Inclusive and participatory design and engagement • Assigned and resourced stewardship	Mell 2017; Sinnett et al 2016; Landscape Institute 2009; Callway 2013; Kellert 2005; Ulrich 1984; Jenks and Dempsey 2007; European Commission 2012; Madureira and Andersen, 2014
Ecology and biodiversity: Protecting and enhancing wildlife and habitats	• Contextual assessment • Landscaping for multi-functional green /blue infrastructure • Inclusive and participatory design and engagement • Assigned and resourced stewardship • Buildability • Compact and diverse communities	Boyko and Cooper 2011; Mell 2017; McHarg 1992; Princes Foundation for the Built Environment 2010; Shwartz et al 2014; Pickett and Cadenasso 2008; Sinnett et al 2016; Scottish Executive 2006
Reducing pollution and over use: promoting sustainable use and management of resources (e.g. air, noise, light, soil, water, energy, materials (timber, metals, aggregates, glass, plastics) and wastes)	• Good quality, well maintained public realm and infrastructure • Landscaping for multi-functional green/blue infrastructure • Buildability • Inclusive and participatory design and engagement • Integrated networks (transport, infrastructure, utilities) • Compact and diverse communities • Resilience and/or risk management strategy	Mell 2017; Sinnett et al 2016; Callway 2013; Adams and Tiesdell 2013; Whitmarsh et al 2012; Boyko and Cooper 2011; Dempsey et al 2008; Godschalk 2003, Kennedy et al 2005; Girardet, 2008
Climate adaptation: promote resilience to increasingly variable climate dynamics	• Landscaping for multi-functional green/blue infrastructure • Adaptive, long life and loose fit design • Inclusive and participatory design and engagement • Risk management strategies	Mell 2017; Sinnett et al 2016; Landscape Institute 2009; Callway 2013; Walton et al 2008; Whitmarsh et al 2012; Godschalk 2003; Hofmann et al 2011
Climate mitigation: Minimizing Green House Gas emissions	• Landscaping for multi-functional green/blue infrastructure • Low/zero/negative carbon energy design • Compact and diverse communities • Inclusive and participatory design and engagement • Assigned and resourced stewardship • Integrated networks	Sinnett et al 2016; Callway 2013; Dempsey et al 2010; Hart 2015; Whitmarsh 2011; Miskin 2010; Boyko and Cooper 2011
Efficient land-use: promoting compact layout	• Contextual assessment • Compact and diverse communities • Landscaping with green/blue infrastructure • Inclusive and participatory design and engagement • Integrated networks	Adams and Tiesdell 2013 (p22); Hart 2015; Dempsey et al, 2010; Landscape Institute 2014; Boyko and Cooper, 2011
Economic intentions	**Design features and approaches**	**Example refs**
Brand value: reputation, marketability and customer responsiveness	• Good quality, well maintained public realm and infrastructure • Landscaping with green/blue infrastructure • Participatory and inclusive design and engagement • Assigned and resourced stewardship • Character	Scottish Executive 2006; Carmona et al 2002; Ewing et al 2014; RICS / CBRE 2014; Landscape Institute 2014; Bordass, 2000

Land and property values: higher returns on investment through enhance rental return and capital value	• Contextual assessment • Character • Good quality, well maintained public realm and infrastructure • Landscaping for multifunctional green/blue infrastructure • Participatory and inclusive design and engagement • Assigned and resourced stewardship • Accessibility and legibility • Compact and diverse communities	Mell et al. 2016; Scottish Executive 2006; Princes Foundation 2007; Carmona et al 2002; Ewing et al 2014; RICS / CBRE 2014; Landscape Institute 2014
Human resource benefits: productivity, wellbeing, retention, employment creation	• Good quality, well maintained public realm and infrastructure • Landscaping for multifunctional green/blue infrastructure • Accessibility and legibility • Compact and diverse communities • Internal and external environmental features / microclimate • Character • Inclusive and participatory design and engagement	Mazza et al 2011; Scottish Executive 2006; Ewing et al 2014; PricewaterhouseCoopers, 2000; Higgins et al 2005; Earthman 2004; Carmona et al 2002; Carmona et al 2010
Local economic support, wider regeneration and investment: attracting visitors, new businesses, raising investor and grant holder confidence, making a site more competitive.	• Character • Contextual assessment • Good quality, well maintained public realm and infrastructure • Accessibility and legibility • Compact and diverse communities • Landscaping with Green/blue infrastructure • Participatory and inclusive design and engagement	Carmona 2014; Adams and Tiesdell 2013; Living Streets 2006; Scottish Executive 2006; Bell 2005; Carmona et al 2002; Prince's Foundation 2007; Ward and Lewis 2002
Multi-functional green infrastructure: productive, regulatory, supportive and amenity services	• Good quality, well maintained public realm and infrastructure • Landscaping with green/blue infrastructure • Contextual assessment • Participatory and inclusive design and engagement • Assigned and resourced stewardship	Madureira and Andersen, 2014; Landscape Institute, 2009; DG Environment, 2012; Hansen and Pauleit, 2014; Meerow and Newell, 2017; Sinnett, et al, 2016; Landscape Institute, 2014; Callway, R., 2013; Cinderby, S. and Sue Bagwell, S., 2015
Cost effective lifecycle: Operational savings in planning, construction, management and running costs	• Adaptable, 'long-life' and 'loose-fit' design • Buildability • Upfront investment in public realm and infrastructure • Participatory and inclusive design and engagement • Risk management strategy	Macmillan 2003; Langston 2014; Landscape Institute 2014; Tiesdell and Adams 2011; Godschalk 2003; Kennedy et al 2010; Girardet 2008
Public sector savings: Reduced costs and efficiency gains, supporting wider regeneration and 'life-giving' infrastructure	• Diversity and compact communities • Good quality, well maintained public realm and infrastructure • Landscaping with green/blue infrastructure • Participatory and inclusive design and engagement • Risk management strategy	Adams and Tiesdell, 2013; Coote, A. (ed), 2002; Godschalk, D. R., 2003

Technical (form/function) intentions	Design features and approaches	Example Refs
Structural quality and resilience: material performance, stability	• Adaptive, 'long-life', 'loose-fit' design • Buildability • Assigned and resourced stewardship • Risk management • Evaluative feedback	Allan et al., 2013; Adams and Tiesdell 2013; Langston 2014; Macmillan 2003; RIBA 2015; Scottish Executive 2006; van der Voordt and van Wegen 2005; Wall and Waterman, 2010
System integration: linking soft and hard infrastructure, amenities and services with the built environment	• Contextual assessment • Network connectivity • Adaptive, flexible, 'loose-fit' design	Farrells, 2014, Boyko and Cooper 2011, Hart 2015, Gandi 2014, Maduriera and Andresen 2013; Woltjer et al., 2015
Innovative solutions: inventive problem solving processes and interventions	• Creative design • Evaluative feedback • Inclusive and participatory design	RIBA 2015, van de Voordt and van Wegen 2005, Risom 2014, Leach et al., 2015, Prince's Foundation, 2007
Spatial efficiency: compactness in context	• Compact design • Contextual assessment • Proximity • Network connectivity • Accessibility	HCA 2014, OECD 2012, Dempsey et al 2010, DETR 2000, Boyko and Cooper 2011, Grant, 2006, Berlund and Weber 2014, Burton et al 2003, Hart 2015, Ward and Lewis 2002, Prince's Foundation 2007

***Definitions of urban design attributes**

- **Accessibility:** compact design, mix of land use, legibility, permeability, affordability, 'way-finding', integrated transport and permeability, bikeability and walkability, transparency, enclosure
- **Adaptable, long-life, loose fit design**: flexible, resilient, robust, inclusive and user-focused technologies
- **Assessment feedback**: ex-ante baseline assessment, monitoring and ex-post, post-construction review
- **Buildability**: Sustainable and 'closed loop' resource use at building and neighbourhood scale
- **Character:** distinctiveness, identity, 'imageability', legibility, scale, landmarks, history, human scale
- **Contextual assessment:** existing natural assets (landscape, green infrastructure, microclimate), geography, geology, planning and policy context, built environment and public realm (scale, typology, character, legibility, safety, visual / physical connections), cultural and historical assets, local economy, demographics
- **Creative design:** openness, learning-in-action, risk-taking, clear vision, flexibility (e.g. tactical design, meanwhile spaces, 'pop ups', pilots)
- **Compact and diverse communities:** mixed-use and typology, multi-tenure neighbourhoods, qualitative and quantitative features (e.g. proximity to public realm, affordable residences, work spaces, green space, transport and other amenities), internal and external layout (transparency, spaciousness, active frontage, privacy and semi-private space, noise), individual and cultural perceptions
- **Enclosure**: clearly defined public / private areas, 'defensible' semi-private spaces, edges
- **Internal and external environmental features / microclimate**: lighting (natural/artificial), sound, temperature (heat and moisture), air / soil/ water quality, wind, smell
- **Legibility**: ease of 'way finding' or orientation, clear edges, uncluttered space, enclosure
- **Landscaping for green/blue infrastructure:** road-side and river verges, parks, allotments, cemeteries, living walls / roofs, street trees, private / public gardens, wildlife corridors and habitats, SuDS
- **Natural surveillance:** overlooked spaces, 'eyes on streets', compact design, human scale

- **Network connectivity:** opportunities to enhance public transport integration, walkability and bikeability, access to utilities, infrastructure, nodes, connectivity to destinations, car parking options
- **Proximity**: contiguity (agglomeration), compact, poly-centric urban form
- **Transparency**: linking exterior and interior spaces, access to daylight

Table 1.2 References to sustainable urban design attributes in BC 'mandatory' issues

BC themes and issues		Environ-mental design attributes	Social design attributes	Economic design attributes	Technical design attributes	Overall score
	Total possible score	**31**	**32**	**43**	**17**	**123**
Governance	GO 01 Consultation plan	24 (77%)	24 (75%)	40 (93%)	11.5 (68%)	**100 (81%)**
	GO 02 Consultation and engagement	8 (24%)	5 (16%)	9 (21%)	5.5 (32%)	**27 (22%)**
Social and Economic	SE 01 Economic impact	4 (13%)	11 (34%)	19 (44%)	4 (24%)	**38 (31%)**
	SE 02 Demographic needs and assessment	20 (63%)	15 (47%)	24.5 (62%)	5.5 (32%)	**67 (54%)**
	SE 03 Flood assessment	11 (35%)	9 (28%)	9.5 (22%)	3.5 (21%)	**33 (27%)**
	SE 04 Noise pollution	7 (23%)	4 (13%)	17 (40%)	3.5 (21%)	**32 (26%)**
Resource efficiency	RE 01 Energy strategy	10.5 (34%)	3 (9%)	9 (21%)	4.5 (26%)	**27 (22%)**
	RE 02 Existing buildings and infrastructure	18 (58%)	12 (38%)	24 (56%)	6.5 (38%)	**61 (49%)**
	RE 03 Water strategy	12.5 (40%)	8 (25%)	14.5 (34%)	5.5 (32%)	**41 (33%)**
Land and ecology	LE 01 Ecology strategy	17 (55%)	6 (19%)	17 (40%)	4 (24%)	**44 (36%)**
	LE 02 Land use	14 (45%)	8 (25%)	9 (21%)	3.5 (21%)	**34 (28%)**
Transport	TM 01 Travel assessment	17.5 (56%)	10 (31%)	12 (30%)	7.5 (44%)	**47 (38%)**
	Total average score	**14 (44%)**	**10 (30%)**	**17 (40%)**	**5 (32%)**	**46 (37%)**

Highlighted % boxes indicate high proportion of references

Table 1.3 References to sustainable urban design in LEED ND 'prerequisite' issues

		Environ-mental design attributes	Social design attributes	Economic design attributes	Technical design attributes	Overall
LEED ND themes and issues	**Total possible score**	**31**	**32**	**43**	**17**	**123**
Smart location and linkage	Smart location	8.5 (27%)	9.5 (30%)	12.5 (29%)	5 (29%)	**36 (29%)**
	Imperilled species and ecol. communities	14.5 (47%)	6 (19%)	10 (23%)	4 (24%)	**35 (28%)**
	Wetland and water body conservation	7.9 (29%)	4 (13%)	8 (19%)	0.5 (3%)	**22 (17%)**
	Agricultural land conservation	7.5 (24%)	4 (13%)	6 (14%)	2 (13%)	**20 (16%)**
	Flood plain avoidance	5.7 (23%)	1.5 (5%)	7.5 (17%)	1 (6%)	**17 (14%)**
Neighbourhood pattern and design	Walkable Streets	6.5 (21%)	13 (41%)	12.5 (29%)	5 (29%)	**37 (30%)**
	Compact development	4 (13%)	1 (3%)	4.5 (10%)	1.5 (9%)	**11 (9%)**
	Connected and open Community	4.5 (15%)	4 (13%)	5.5 (13%)	2 (12%)	**16 (13%)**
Green Infrastructure and buildings	Certified green buildings	2 (6%)	3 (8%)	5.5 (13%)	1.5 (9%)	**12 (9%)**
	Minimum building energy performance	2 (6%)	0.5 (2%)	1 (2%)	0.5 (3%)	**4 (3%)**
	Indoor water use reduction	2 (6%)	0.5 (2%)	0	0.5 (3%)	**3 (2%)**
	Construction activity pollution prevention	9.5 (31%)	2 (6%)	9 (21%)	2 (12%)	**23 (18%)**
	Average score	**6.4 (21%)**	**4 (13%)**	**6.8 (16%)**	**2.1 (13%)**	**19 (16%)**

Table 1.4 References to different types of formal evaluation in BREEAM Communities

Level	Types	Examples	Ref Y/N	References in BC technical manual
Direct evaluation (on-site)	Observational review (visual impact evaluation)	Design / issue-specific audits / surveys / site tours	Y	SE 03 - Flood risk evaluation, LE 01 – Ecology Strategy (Ecological Impact Evaluation), TM 02 – Safe and appealing streets (Context appraisal), SE 04 - Noise Pollution (noise impact evaluation)
		Surveying human behaviour	Y	TM 01 - Transport
	Interactive review	Residents - onsite surveys / interviews / questionnaires	Y	GO 01 - Governance, GO 02 - Consultation and Engagement, GO 03 - Design Review, GO 04 - Community management of facilities, SE 02 - Demographic needs and priorities, SE 03 - Flood Risk Evaluation, SE 06 - Delivery of services, facilities and amenities, SE 07 - Public realm, SE 11 - Green infrastructure, SE 12 - Local parking, SE 14 - Local Vernacular, SE 17 - Training and skills, RE 02 - Existing buildings and infrastructure, LE 01 - Ecology strategy, LE 05 - Landscape, TM 05 - Cycling facilities; TM 06 - Public transport facilities
		Team and individual immersion / ethnography	N	-
	Prototyping/ trials	'Tactical urbanism', action research (e.g. pop ups, meanwhile spaces)	N	-
Indirect evaluation (off-site)	Participative/ consultative evaluation	Design review panels	Y	GO 03 - Design Review
		Design workshops	Y	GO 02 - Consultation plan, LE 05 - Landscape
	Remote research	Visual evaluation (e.g. photos, drawings, 3D printed models, amps and plans)	Y	BREEAM Assessor evidential requirements (p144-145)
		Written reports, statistics	Y	Mandatory issues, plus 'BREEAM assessor evidential requirements' (p144-145)
	Virtual modelling	Simulation (e.g. BIM, microclimate models, energy models, gaming)	Y	RE 01 - Energy strategy, SE 02 - Housing provision (financial), SE 08 – Microclimate, SE 13 - Flood Risk Management (drainage)
Generic principles	**Design standards**	Benchmark standards (e.g. BREEAM Communities, One Planet Communities)	Y	Full manual, plus 'RE 04 - Sustainable Buildings' applying BREEAM buildings benchmark
		Local / national / European standards and regulations	Y	SE 15 - Inclusive design: Public Sector Equality Duty and other aspects of the Equality Act 2010 and the Non-residential access standard, BS8300; SE 11 - Green Infrastructure: Accessible Natural Greenspace Standard (Natural England) and green space access, Disability Discrimination Act 1995; RE 01 - Emissions Strategy: European Directive 2001/42/EC (the Strategic Environmental Evaluation or SEA Directive), Baseline energy demand evaluation method
		Labelling schemes	Y	BREEAM Assessor evidential requirements, p144-145: Forestry Stewardship Council and Energy Performance Certificates
	Design codes	Street, neighbourhood and public space designs	Y	TM 02 - Safe and appealing streets: TfL Manual for streets, 2007
		Architectural / building codes	Y	RE 04 - Sustainable Buildings: Code for Sustainable Homes; SE 05 - Housing provision: Minimum space standards; SE 15 Inclusive design: Lifetime Homes standard
		Ecological and Landscape codes	Y	LE 03 - Water pollution: Pollution Prevention Guide 3; SE 11-Green Infrastructure: Natural England's Green Flag Award and Play England's play quality assurance standard

Table 1.5 References in BREEAM Communities to four sustainability intentions: social inclusion, ecosystem services, financial viability, infrastructural integration

BREEAM Communities *Themes and issues*	**Social inclusion**		**Ecosystems services**		**Financial viability**		**Infrastructure integration**	
Governance (GO)	Direct ref	Indirect ref	Direct ref	Indirect ref	Direct ref	Indirect ref	Direct ref	Indirect ref
Consultation plan (GO 01)	Y		Y			Y	Y	
Consultation and engagement (GO 02)	Y			Y		Y		Y
Design review (GO 03)	Y			Y		Y	Y	
Community management of facilities (GO 04)	Y			Y	Y		-	-
Socio-economic (SE)								
Economic impact (SE 01)		Y	-	-		Y	Y	
Demographic needs and priorities (SE 02)	Y			Y	Y		Y	
Flood risk assessment (SE 03)		Y	Y			Y	Y	
Noise pollution (SE 04)		Y		Y		Y		Y
Housing provision (SE 05)	Y			Y	Y			Y
Delivery of services, facilities and amenities (SE 06)	Y			Y	Y		Y	
Public Realm (SE07	Y		Y			Y		
Microclimate (SE 08)		Y	Y			Y	Y	
Utilities (SE 09)	-	-	-	-		Y	Y	
Adapting to climate change (SE 10)		Y	Y			Y	Y	
Green infrastructure (SE 11)	Y		Y		Y		Y	
Local parking (SE 12)		Y		Y		Y	Y	
Flood risk management (SE 13)	-	-	Y			Y		Y
Local vernacular (SE 14)	Y		Y			Y		Y
Inclusive design (SE 15)	Y			Y		Y	Y	
Light pollution (SE 16)		Y		Y		Y	-	-
Training and skills (SE 17)	Y			Y?		Y		Y
Resources and energy (RE)								
Energy strategy (RE 01)	-	-		Y		Y	Y	
Existing buildings and infrastructure (RE 02)		Y		Y?		Y	Y	
Water strategy (RE 03)			Y			Y		Y
Sustainable buildings (RE 04)		Y		Y		Y	Y	
Low impact materials (RE 05)	-	-		Y		Y	-	-
Resource efficiency (RE 06)	-	-		Y		Y	Y	
Transport carbon emissions (RE 07)		Y		Y	Y			Y
Transport management (TM)								
Transport assessment (TM 01)		Y		Y	Y		Y	
Safe and appealing streets (TM 02)		Y		Y		Y	Y	
Cycling network (TM 03)		Y	-	-		Y		Y
Access to public transport (TM 04)	Y		-	-		Y		Y
Cycling facilities (TM 05)	Y		-	-	Y		-	-
Public transport facilities (TM 06)	Y			Y		Y		Y
Land and ecology (LE)								
Ecology strategy (LE 01)		Y	Y		Y			Y
Land use (LE 02)	-	-	Y			Y		Y
Water pollution (LE 03)	-	-	Y			Y		Y
Enhancement of ecological value (LE 04)	Y		Y			Y		Y
Landscape (LE 05)	Y		Y			Y		Y
Rainwater harvesting (LE 06)	-	-	Y			Y	-	-
Innovation (INN)								
Innovation (INN 01)		Y		Y	Y			Y
Total references (% proportion of total 41 issues)	17 (41%)	15 (37%)	15 (37%)	18 (43%)	10 (24%)	31 (76%)	18 (43%)	17 (41%)
Proportion references overall	**79%**		81%		100%		84%	

Search terms used for direct (D) and indirect (I) references in BREEAM Communities

Social inclusion:

- Direct: inclusion, access, user needs, social integration, disability, special needs, age, gender, ethnicity, economic group, universal design, local skills / training, consultation, interaction, engagement, participation
- Indirect: segregation, isolation, marginal, wellbeing, security, safety

Ecosystem services (servicing, regulating, productive, cultural):

- Direct: green infrastructure, microclimate, SuDS, ecology, biodiversity, natural buffer, passive treatment, landscape
- Indirect: pollution, environmental damage, contamination, open space, weather

Financial viability:

- Direct: cost, revenue, fund, finance, fee, bill, compensate / tion
- Indirect: implement, refurbish, construct, install, maintenance/maintain, manage/ment, measures, treatment, creation, enhancement, procedures, mitigation, facilities, risk, value, feasible / feasibility

Infrastructural integration

- Direct: cross-references to separate infrastructural issues (e.g. highways, utilities and green infrastructure) (within and beyond site), integrate/ion/ing, link/ing/ed,
- Indirect: limited reference to other infrastructural issues or reference to wider area / off-site / nearby infrastructural impact (e.g. Cycling Network (TM 03) only considers other transport infrastructure not green infrastructure)

? = the reference unclear as it is general not specific (e.g. the issue refers to 'infrastructure' and not specifically *'Green'* infrastructure).

Appendix 2

Table 2.1 Initial variables for case study analysis

	Variable	Types of questions
Background	**1. Context**	• What are the cultural, historical, political, economic, physical and demographic similarities and differences between the case studies?
	2. Type of development	• What forms of neighbourhood developments are being compared? (e.g. new build or retrofitting, greenfield or brownfield sites, inner city and suburbs, small to larger scale).
Practitioners	**3. Actors**	• Which actors are involved in GI evaluative practice and praxis (enactment of practice) • How were different actors identified? • What is the form of their engagement? (leading, collaborative, participating, observing, unengaged, rebelling)
	4. The 3 C's of evaluative fit	**Capability** • What are the practitioners' past experience of GI evaluation, masterplan processes, and of other actors • What resources do evaluators have at their disposal (financial, time, human and technical)? • What status does the evaluator have i.e. level of seniority within an internal or external organisation? **Commitment** • What are key intentions for GI evaluation and how are they defined? 1. Internal aims of design team (e.g. CSR, design options, client / developer requirements) 2. External aims e.g. local / national regulatory requirements, community requirements, other stakeholders • What are the perspectives of different actors regarding GI evaluation? **Coordination** • What is the quality of lines of communication and liaison between client, developer, GI evaluators, as well as the BC standard assessor • Who interprets the evaluation findings, who receives them and how (e.g. technical reports)?
Practice and praxis	**5. Metrics**	• What are the key metrics applied within evaluative praxis? • How are these metrics identified and prioritised? • How does GI evaluation take account of metrics relating to social inclusion, ecosystem services, financial viability, infrastructural integration?
	6. Methods	• What methods (and mode) of evaluative praxis are applied? e.g. site visits, observational studies, interviews, meetings, workshops, desk-based activities
	7. Timing	• When does GI evaluative praxis occur in the masterplan process? • How does different timing impact the use of evaluative findings?
	8. Outcomes	• How are GI evaluation recommendations reflected in masterplan outcomes (decisions, documents etc.)? Is there perceived to be a clear link? • Which issues are ignored, produce conflict or agreement between actors relating to GI and its evaluation? • (Post occupancy) Has the final development introduced GI as intended in the original masterplan design and evaluation recommendations. If not, why not?
	9. Presence of BREEAM Communities	• Does the presence of BC certification process affect GI evaluative practice, in terms of the objectives? methods and outcomes, as compared to sites without BC?

Table 2.2 Wider learning activities

Activities within the University of Reading	• School of Real Estate and Management, participant in urban design masters modules; • School of Built Environment, participant in theory workshops and presentation of research at the school's summer conferences 2015 – 2017; • School of Architecture, rapporteur at the 2017 conference and production of 'Urban Design Room' background paper; • Graduate school research development courses (Literature reviews, critical writing, project management, poster design).
External public speaking, training and other contributions	• A BC assessor three-day training course and exam (Dec 2014); • Assistant editor for the summer edition of Urban Design Journal (Feb-April 2015); • Training for Landscape Visual Impact Appraisal, Landscape Institute (May 2016); • Facilitator and note taker at Academy of Urbanism Annual Congress (June 2016); • Presentation and poster at the Valuing Nature Network conference (July 2016); • Presentation at RICS COBRA (Sept 2016); • Poster at BRE student conference (Dec 2016); • Presentation at JTP urban design practice (Jan 2017); • Presentation at ARCOM (Sept 2017).
Other events attended	• Rethinking the Urban Landscape; • Urban Design London seminars – Reviewing public realm; Masterplanning; • BRE Cities Convention; • James Corner lecture, Landscape Institute; • TCPA Green infrastructure conference.

Table 2.3 DRAFT Interview Protocol – trial period

Masterplan processes and evaluation

Aim: to learn about an evaluators' broad perceptions of masterplans and evaluation practice and praxis

Question	Aim
Q.1 What techniques / approaches do you use to evaluate this site which related / referred to green infrastructure? Such as landscape and visual impact assessment, ecology survey, flood risk, microclimate modelling, building energy modelling (living roof and wall insulation and shading impacts), community consultations, design review, quantity survey, viability assessment	To clarify the role of the interviewee
Q.2 What are / were the main objectives of the evaluations? How were these identified? What were the boundaries / limits of the evaluation?	To extract a range of perspectives regarding the purpose of evaluations
Q.3 There are a range of activities used to different factors in a masterplan process. How important were the following four issues, regarding information sought from the evaluations (on a scale from 5 = 'high priority' to 1 = 'not a priority' (4 = somewhat a priority, 3 = neutral, 2 = low priority)?	To examine integration of objectives and provide a comparative response with other actors

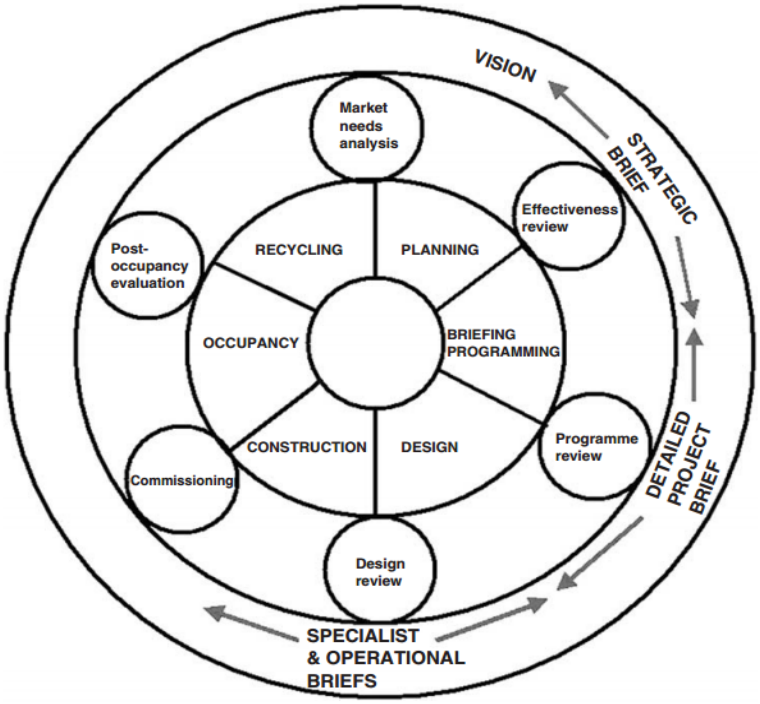
	Objectives			
Evaluative activity	**Ecosystem services**	**Social inclusion**	**Financial viability**	**Infrastructure integration**
Design review				
Quantity survey (landscape)				
Viability assessment				
Landscape and visual impact assessment				
Land-use survey (e.g. contaminated land)				
Flood risk appraisal				
Ecology surveys				
EIA				
Public realm				
Transport / highways surveys				
Building modelling (e.g. microclimate, energy use)				
Resident consultations (e.g. exhibitions, pop ups, workshops, online surveys)				
(internal) team meetings				
Client meetings				
Stakeholder meetings (authorities, regulators, local charities, businesses)				
Desk-based research (plans, reports)				

Informal conversations				
Site walkabout				
Other activities (please detail)				

Q.4 Can you rank the effectiveness of the following activities (see Table below), answer where relevant) in evaluating the quality of Green Infrastructure on the site, where 5 = highly effective and 1 = highly ineffective	To clarify actor perspectives about evaluative efficacy. Providing a comparative overview of rankings
Q.5 Why did you say some activities were 'effective' and others 'ineffective' or problematic?	To explain /unpack sense making regarding quality and evaluative processes
Q.6 What challenges arose in conducting the evaluations?	Revealing internal and external challenges for evaluators

Evaluative activity	**Effectiveness score**
Design review	
Quantity survey (landscape)	
Viability assessment	
Landscape and visual impact assessment	
Land-use survey (e.g. contaminated land)	
Flood risk appraisal	
Ecology surveys	
EIA	
Public realm surveys	
Transport / highways surveys	
Building modelling (e.g. microclimate, energy use)	
Resident consultations: exhibitions, pop ups, workshops, online surveys	
Client meetings	
Team meetings	
Stakeholder meetings (authorities, regulators, local charities, businesses)	
Desk-based research (reviewing existing plans, reports, policies)	
Other (please detail)	

Q.7 How would you describe a typical neighbourhood masterplan process? Where do evaluative processes fit into that?	Clarify different actor's sense making of the process, whether there is such a thing as a 'typical' process
Q.8 This picture (Marmot et al 2005 p41, from Prieser and Schramm 2005) offers simplified view of the phases of masterplans (inner circle), evaluation (middle circle) and document outputs (outer circle). Where would the GI evaluative activities take place on the circle? If it is significantly different at this site, how would you draw the process? (Ref to Greengage (CIRIA 2016) lack of monitoring outcomes and remedial measures)	Clarify the interviewee's sense making of GI evaluation process in contrast with literature

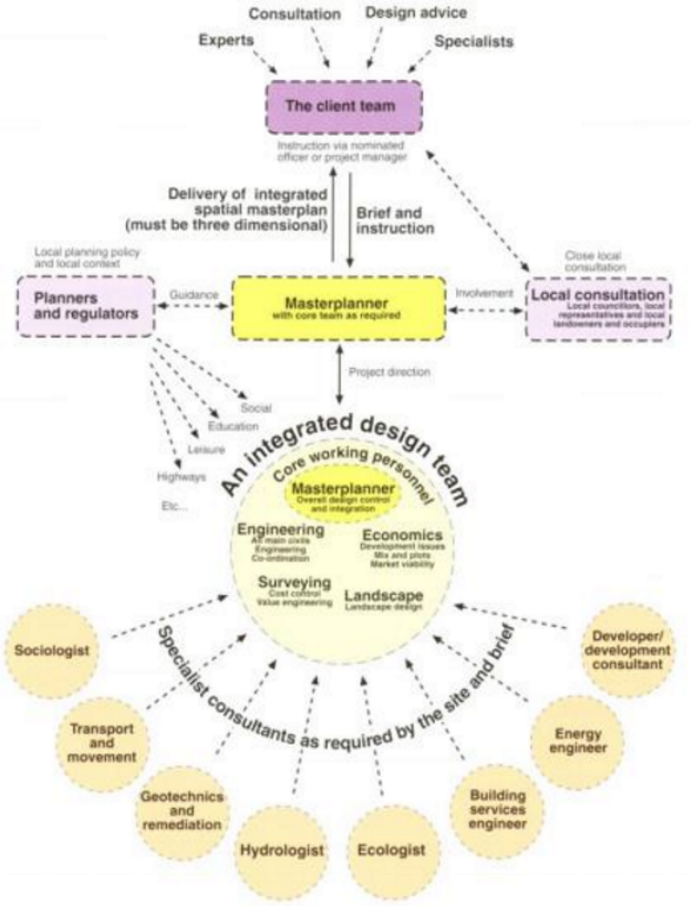


Actors

Aim: clarifying perspectives of actors' roles, leadership styles, modes of engagement

Question	Aim
Q.9 Which actors are / were involved in the evaluation of this site?	Clarify perspectives of different actor roles and forms of evaluative engagement

Q.10 Viewing this picture (UK Urban Task Force 2005, citing Andrew Wright Associates), would you say this is an accurate representation of the groups involved in neighbourhood-scale masterplans? Where would you place the key actors involved in green infrastructure evaluation for this site?	Contrasting empirical experience with academic ideas of actor roles.



Question	Aim
Q.11 Which actors / organisations were involved in evaluations relating to GI? Over what period of time?	Clarify views of actor roles and timing in masterplan process
Q.12 Which of the following actors were involved in evaluations relating to GI? Please rank their engagement on a scale of 1 to 7, where (1 = leading role and 7 = rebellion, 0= unknown role):	Comparative scale to contrast different actor views of engagement

Scale of engagement	Description
0 = Unknown role	Unaware a group was involved
1 = Leading role	Highly engaged 'central decision-maker'
2 = Owning role	Regular consultation and asked opinion regarding decisions about evaluation (inc. method and outcomes), highly active with regular two-way exchange

3 = Contributing role	Regular opportunities to comment and receive feedback from intermediary (not high-level decision-maker), active with intermittent two-way exchange
4 = Endorsing role	Regular information with some limited opportunities to comment, i.e. limited two-way exchange
5 = Following / observing	Intermittent information provided and read, one-way, information flow
6 = No engagement	Ignore / avoid the process
7 = Rebellion	Actively seeking to disrupt / prevent the process

Actors	**Examples**
Evaluators (in-house or sub-contractors)	Ecologist
	Landscape and visual assessor
	Quantity surveyor
	Flood risk assessor
	Transport surveyor
	Community consultant
	Engineer
	Other (detail)
In-house (to masterplan process)	Masterplan design team (architect, landscape architect)
	Client (public / private / housing association)
	Developer / constructor
	Consultants (e.g. planners, engineers, risk assurance, other please detail)
	Other (detail)
External	Regulators (local authorities, national bodies e.g. English Heritage, Environment Agency)
	Local businesses
	Local residents
	Community groups (e.g. wildlife groups, civic groups, faith groups, schools)
	Wider public
	Other (detail)

Question	**Aim**
Q.13 Were any particular or unexpected issues relating to green infrastructure raised by any of these actors during the masterplan process? If yes, who raised them, what broad issues were raised, how were they raised?	Clarify perceived priorities, challenges, in the process of evaluation engagement and negotiation

Outcomes

Aim: Understanding the perceived evaluation outputs, decision impact, design impact of evaluation

Question	**Aim**
Q.14 Who were (are) evaluation findings reported to? How?	Clarify lines of accountability (positions of leadership) and mode of communication
Q.15 How did the evaluation/s contribute to any specific masterplan outcomes or decisions relating to green infrastructure on or around the site? Can you give any examples?	Clarify views of evaluative impact and how GI is integrated amongst other objectives

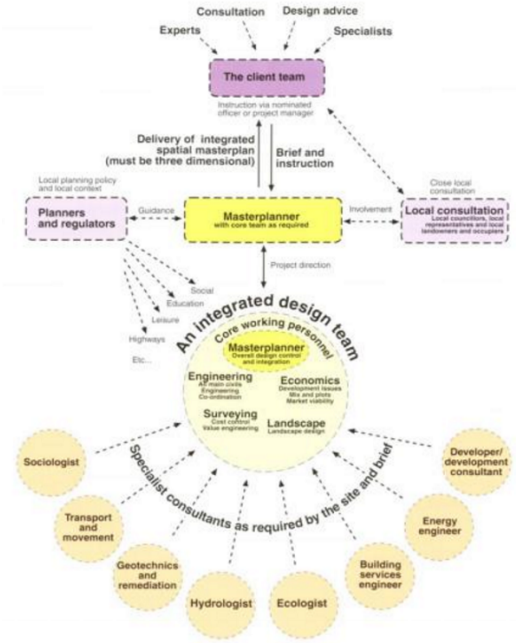
Q.16 How did BREEAM Communities (IF APPPLIED) contribute to any specific masterplan outcomes or decisions relating to green infrastructure on or around the site? Can you give any examples?	Clarify views of evaluative impact of BC and how GI is integrated amongst other objectives
Q.17 (Post Occupancy) Are any phases of the plan completed? If yes, has the green infrastructure on site (or completed phase) been designed and used as recommended by the evaluation/s? If not, how is it different and why?	Clarify views of evaluative impact and how GI is integrated amongst other objectives
Q.18 (Post occupancy) Has there been any unforeseen problems relating to (existing or new) green infrastructure on the site?	Clarify views of how GI is integrated amongst other objectives
Q.19 Will / have you conducted any post occupancy appraisal of the development phases? How?	Clarify capacity and perspectives on Post Occupancy review
Q.20 How would you evaluate the GI in these pictures	Sense-making

Table 2.4 REVISED Interview Protocol

Context and actors

Aim: Sense of personal history and role

Question	Aim
Q.1 What was your general role and when you got involved? Prior experience of MP?	To clarify perceived role
Q.2 Who did you report to (internal and external)? How? Had you worked together before?	To clarify lines of responsibility and continuity
Q.3 Who did you employ? (consultants, size of team)	To clarify lines of responsibility
Q.4. Viewing this picture (UK Urban Task Force 1999, citing Andrew Wright Associates), would you say this is an accurate representation of the groups involved in neighbourhood-scale masterplans? Where would you place the key actors involved in green infrastructure evaluation for this site?	Contrasting empirical experience with academic ideas of actor roles.

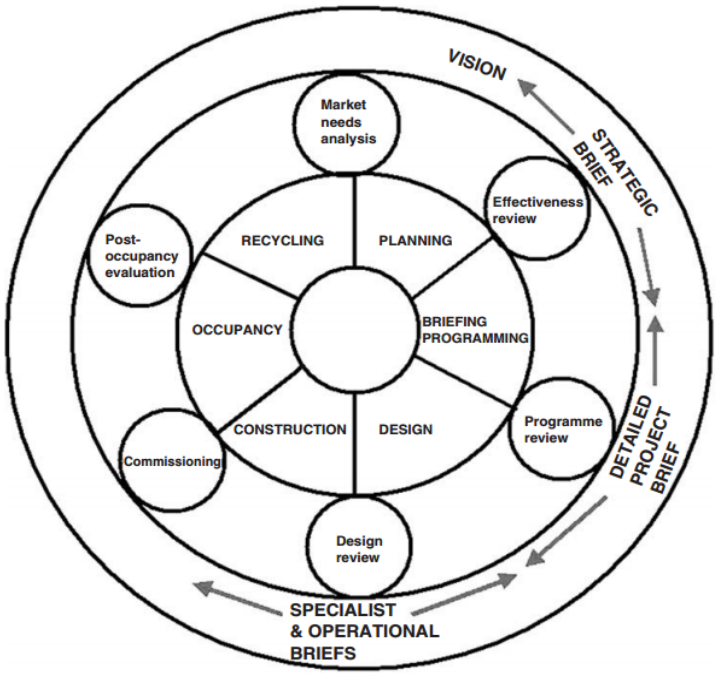


Masterplans and evaluative practice

Aim: to learn about an evaluators' broad perceptions of masterplan processes and evaluation practice and praxis

Q.5 How would you describe a typical neighbourhood masterplan process? Where do evaluative processes fit into that?	Clarify different actor's sense making of the

	process, whether there is such a thing as a 'typical' process
Q.6 This picture (Marmot et al 2005 p41, from Prieser and Schramm 2005) offers simplified view of the phases of masterplans (inner circle), evaluation (middle circle) and document outputs (outer circle). Where would the GI evaluative activities take place on the circle? If it is significantly different at this site, how would you draw the process? Where would you place BREEAM Communities?	Clarify the interviewee's sense-making of GI evaluation process in contrast with literature



Question	**Aim**
Q.7 Broadly, what techniques / approaches do you use to evaluate GREEN INFRASTRUCTURE on this site, such as landscape and visual impact assessment, ecology survey, flood risk, microclimate modelling, building energy modelling (living roof and wall insulation and shading impacts), community consultations, design review, quantity survey, viability assessment, desk-based work	To clarify enactment activities and tools
Q.8 Following chart; Clarify objectives, who involved, when activities took place and how – on site, desk based…	To examine integration of objectives and provide a comparative response with other actors
Q.10 Did the evaluation/s contribute to any specific masterplan outcomes or decisions relating to green infrastructure on or around the site? Can you give any examples?	Clarify views of evaluative impact and how GI is integrated amongst other objectives

Q.11 How did BREEAM Communities (IF APPPLIED) contribute to any specific masterplan outcomes or decisions relating to green infrastructure on or around the site? Can you give any examples?	Clarify views of evaluative impact of BC and how GI is integrated amongst other objectives
Q.12 (Post Occupancy) Are any phases of the plan completed? Will / have you conducted any post occupancy appraisal of the development phases? How? If yes, has the green infrastructure on site (or completed phase) been designed and used as recommended by the evaluation/s? If not, how is it different and why?	Clarify views of evaluative impact and how GI is integrated amongst other objectives

Appendix 3

Table 3.1 Estate 1: References to GI in formal evaluative practices and links to BC

Evaluative practice	Master plan and Phase 1	Phase 2	Links to BREEAM Communities
Quantity survey (buildings, landscape)	N/A	N/A	New issue required in BC (e.g. triple-bottom line project reporting / sustainable value management)?
Financial viability and value management	N/A	N/A	
Socio-economic assessment	Y	N/A	
Equality Impact Survey (Equalities Act 2010)	Y	N/A	
Utilities assessment	Y	N/A	No ref to street-based GI in 'SE 09 Utilities'
Transport / highways and parking assessment	Y	N	No ref to role of GI in mitigating transport impacts, in 'TM 01 Transport assessment'
Land survey (e.g. topography, contamination)	Y	Y	
Townscape / Landscape visual impact assessment (LVIA, in EIA)	Y	Y	No ref to timing of survey during design phase, in 'LE 05 Landscape'
Heritage survey (in EIA)	Y	N/A	
Archaeological survey (in EIA)	Y	N/A	
Flood risk, surface and drainage assessments	Y	Y	
EIA (scoping, appraisal, mitigation) soil, noise, air, water	P	P	GI buffering functions (soil, water, noise, air, visual) not linked to street design in 'TM02 Safe and Appealing Streets'
Ecology survey (in EIA, protected species mainly (e.g. bats, slow worms; alien invasive species)	Y	Y	No ref to *inclusive visual amenity* of green infrastructure in 'SE 11 GI' and 'LE 05'
Arboriculture (tree) survey	Y	Y	Arboriculture survey not linked to ecological objectives in 'LE 01 Ecology Strategy'
Microclimate modelling (wind, shading, temp)	N	N	No ref to the BRE Guidelines on daylight assessment in 'SE 08 Microclimate' or to impact on GI of overshadowing
Daylight, sunlight and shading (in EIA)	Y	Y	
Light strategy and assessment	P	P	
Energy use modelling	Y	N	No link to role of GI in cooling and insulating buildings in 'RE 01 Energy Strategy'
Waste assessment and strategy	Y	N/A	No ref to replanting viable trees or vegetation in 'RE 02 Existing Buildings and infrastructure'
Design review (in Design and Access statement)	Y	N/A	
Design and access statement	Y	Y	
Design and Client team meetings	Y	Y	
Resident and local actor consultations (workshops, exhibitions, walkabouts)	Y	Y	Refers to community engagement for SE 11 GI and LE 04 Landscape
Statutory consultees	Y	Y	
Other codes		Y	BREEAM New Buildings

P = partial reference for certain issues; Y = GI referred to; N = no reference; N/A = not available

Table 3.2 Estate 2: References to GI in formal evaluative practices and links to BC

Evaluative practice	Master plan	Phase 1	Phase 2	Phase 3.1	Notes
Quantity survey (buildings, landscape)	N/A	N/A	N/A	N/A	Not publically available
Viability assessment (finance, affordable homes)	P	N/A	N/A	N/A	Bidding criteria for masterplan made reference to GI management and maintenance
Socio-economic assessment (Local economy, market needs, demographics)	N/A	N/A	N/A	N/A	
Equality Impact Survey	N/A	-	-	-	Conducted 2007 and 2008, not available online, but predates Equalities Act (2010) so focused on *economic* wellbeing
Mental health impact assessment	Y	-	-	-	
Utilities assessment			Y		Landscaping plan considered telecom utilities
Transport / highways and parking assessment	Y	Y	Y	Y	PERS audit refers to 'Quality of environment' parameter includes soft landscaping as a factor
Land survey (e.g. topography, contamination, remediation strategy)	Y	Y	Y	Y	
Townscape / Landscape Visual Impact Assessment	Y	Y	Y	Y	Local residents were not consulted during LVIA and green roofs not considered
Heritage survey (in EIA statement)	Y	Y	Y	N/A	
Archaeological survey (in EIA statement)	Y	N/A	Y	N/A	
Flood risk and drainage assessments	Y	Y	Y	?	Refers to GI role in retention and reduction of water runoff
EIA/statement (Scoping, appraisal, mitigation) soil, noise, air, water and ecology	P	P	P	P	No ref to GI regarding noise modelling or mitigation, or mitigation of air pollution
Ecology survey (protected species e.g. bats; alien invasive species)	Y	Y	Y	Y	No ref to microclimate impact on ecology
Arboriculture (tree) survey	Y	Y	Y	Y	No ref to microclimate impact on trees
Microclimate (wind, shading and temp)	Y	Y	Y	Y	Unusually this site was funded to undertake modelling including GI role (see below)
Daylight, sunlight and shading (in EIA statement)	P	P	P	N	Modelling did not include trees but referred to a potential impact of large trees
Climate adaptation assessment and strategy	Y	Y	-	-	
Energy use modelling	N	N	N	N	Models do not consider the cooling impact of proposed green roofs
Waste assessment and strategy	N/A	N/A	N/A	N/A	Plans refer to composting of occupant waste
Design review (in Design and Access statement)	N/A	N/A	N/A	N/A	Design reviews were referred to in interviews but no reference found in documentation
Design and access statement (Accessibility, inclusion)	Y	Y	Y	Y	
Design and Client team meetings	Y	Y	Y	Y	
Resident and local actor consultations (workshops, exhibitions, walk abouts)	Y	Y	Y	Y	
Statutory consultees	Y	Y	Y	Y	
Other codes	Y	Y			CfSH 4, BREEAM New Construction, Lifetime homes, Building for Life 20, Secured by Design

P = partial reference; Y = GI referred to; N/A = not available

Table 3.3 Infill 1: References to GI in formal evaluative practices and links to BC

Evaluative practice	Master plan and Phase 1	Links to BREEAM Communities, 2008 version *(links to 2012 in italics and brackets)*
Quantity survey (buildings, landscape)	Y	No reference to triple-bottom line project reporting / sustainable value management in BC 2008 (*or 2012*)
Financial viability and value management	Y	
Socio-economic assessment	N/A	
Equality Impact Survey (Equalities Act 2010)	N/A	No ref in BC 2008 *(or 2012)*
Utilities assessment	Y	No ref to utilities in BC 2008 (*no ref to street-based GI in 'SE 09 Utilities' BC 2012*)
Transport / highways and parking assessment	P	No ref to role of GI in mitigating transport impacts, in TRA1 – TRA5 (*or in 'TM 01 Transport assessment'*)
Land survey (e.g. topography, contamination)	Y	
Townscape / Landscape visual impact assessment (LVIA)	Y	No ref to timing of survey during design phase, in PS4 Landscape (LE 05)
Heritage survey	Y	
Archaeological survey	Y	
Flood risk, surface and drainage assessments	Y	No ref to *ground level* SuDS in BREEAM 2008 *(included in SE 13 in 2012 but not as an Step 1 issue)*
EIA (scoping, appraisal, mitigation) soil, noise, air, water	N/A	GI buffering functions (noise, soil, water, air, visual) not linked to street design in TRA 1 – TRA5 (*TM02 Safe and Appealing Streets' considers shade from trees)*
Ecology survey (protected species mainly e.g. bats; alien invasive species)	Y	No ref to *inclusive visual amenity* of green infrastructure in PS6 Green space *(SE 11)* and PS4 Landscape *(LE 05)*
Arboriculture (tree) survey	Y	Arboriculture survey not linked to ecological objectives in ECO 1 Ecology Strategy *(LE 01)*
Microclimate modelling (wind, temp)	N/A	CE 4 Heat Island – refers to shading/cooling role of GI
Daylight, sunlight and shading (in CfSH)	Y	No ref in 2008 BC *(No ref to the BRE Guidelines on daylight assessment in 'SE 08 Microclimate' or to impact on GI of overshadowing)*
Light strategy and assessment	P	
Energy use modelling	N	No link to role of GI in cooling and insulating buildings in CE 5 Energy Efficiency *(RE 01 Energy Strategy)*
Waste assessment and strategy	N	No ref to replanting viable trees or vegetation in RES 4 Resource efficiency *(RE 02 - Existing Buildings and infrastructure)*
Design review (in Design and Access Statement)	Y	
Design and Access Statement	Y	
Design and Client team meetings	Y	
Resident and local actor consultations (workshops, exhibitions)	N	Unclear if community engagement required in PS6 Green space and PS4 Landscape *(It is required for (SE 11 and LE 05 in 2012 version)*
Statutory consultees	Y	
Other codes	Y	Secure by Design, CfSH, BREEAM New Construction

P = partial reference for certain issues; Y = GI referred to; N = no reference; N/A = Not available

Table 3.3 Infill 2: References to GI in formal evaluative practices and links to BC

Evaluative practice	Master plan	Phase 1	Notes
Quantity survey (buildings, landscape)	Y	Y	BC makes no reference to insurance of buildings located close to trees, in terms of NHBC guidance
Viability assessment (finance, affordable homes)	N/A	N/A	Not available
Socio-economic assessment (Local economy, market needs, demographics)	N/A	N/A	
Equality Impact Survey (Equalities Act 2010)	N/A	N/A	Not conducted
Utilities assessment	Y	Y	Part of Geo-environmental land survey
Transport / highways and parking assessment	Y	Y	PERS audit applied and refers to GI in promoting attractive walking environment and encouraging access to the park
Land survey (e.g. topography, contamination, remediation strategy)	Y	Y	Examined location of proposed soft landscaping and under-ground land contamination
Townscape / Landscape visual impact assessment	Y	Y	
Heritage survey	Y	Y	
Archaeological survey	Y	Y	
Flood risk and drainage assessments	Y	Y	
EIA/statement, soil, noise, air, water and ecology	N/A	N/A	Not applied, only scoping report
Ecology survey (protected species e.g. bats, slow worms; alien invasive species)	Y	Y	
Arboriculture (tree) survey	Y	Y	
Microclimate (wind, shading and temp)	N/A	N/A	Wind analysis was not applied as buildings were below the 10 story threshold.
Daylight, sunlight and shading	Y	Y	
Energy use modelling	Y	N/A	Some consideration of trees shading provision of light if PV used. Also potential GI contribution to biomass fuel, if used.
Waste assessment and strategy	N	N	No direct consideration to transplanting (re-use) of tree or other existing GI.
Design review (in Design and Access statement)	N/A	N/A	No details available
Design and access statement (Accessibility, inclusion)	Y	Y	
Design and Client team meetings	Y	Y	
Resident and local actor consultations (workshops, exhibitions, walk abouts)	Y	Y	
Statutory consultees	Y	Y	GLA did not refer to specific GI policies (e.g. ALGG SPD) in planning conditions. EH proposes to green wall during site survey
Other codes	Y	Y	Code for Sustainable Homes (level 4), Lifetime homes, BREEAM Refurbishment were applied

P = partial reference for certain issues; Y = GI referred to; N = no reference; N/A = Not available

Table 3.5 RUE 1: References to GI in formal evaluative practices and links to BC

Evaluative practice	Master plan	Phase 1	Phase 2	Notes
Quantity survey (buildings, landscape)	N/A	N/A	N/A	Not available
Viability assessment (finance, affordable homes)	P	P	P	
Socio-economic assessment (Local economy, market needs, demographics)	N	Y	N	
Equality Impact Survey (Equalities Act 2010)	-	-	-	Not conducted
Utilities assessment	Y	Y	Y	Considers impact of roots to utilities and ***vice versa*** if maintenance required
Transport / highways and parking assessment	N	N	N	No consideration of buffer role of GI as a mitigating measure for increase in traffic (2012)
Land survey (e.g. topography, contamination, remediation strategy)	Y	Y	Y	
Townscape / Landscape visual impact assessment	Y	Y	Y	Desk and field survey Dec 2012 and Sept 2012, did use feedback from public consultation events
Archaeology and heritage survey (in EIA statement)	Y	Y	Y	Desk-based (2012), looks at soils and geology, identifies ancient and semi-natural ancient woodland
Flood risk and drainage assessments	Y	Y	Y	Assessment refers to potential role of SuDS (p.30)
EIA/statement (Scoping, appraisal, mitigation) soil, noise, air, water and ecology	P	Y	Y	The air quality survey considered ecologically sensitive receptors (in accordance with Habitat regulation 1994), monitor ref to revegetating earthworks and exposed areas (p20, Oct 2012)
Ecology survey (protected species e.g. bats, slow worms; alien invasive species)	Y	Y	Y	
Arboriculture (tree) survey	Y	Y	Y	
Microclimate (wind, shading and temp)	-	-	-	Not conducted
Daylight, sunlight and shading (in EIA statement)	N/A	N/A	N/A	
Energy use modelling	N	N	N	No reference to potential functions of GI (insulation, cooling of green walls and roofs)
Waste assessment and strategy	P	-	-	Refers to 80% recycling objective. Refers to soils and timber waster but not to relocation (transplanting) of trees or other vegetation
Design review (in Design and Access statement)	N/A	N/A	N/A	Not available
Design and access statement (Accessibility, inclusion)	Y	Y	Y	
Design and Client team meetings	Y	Y	Y	Interviews
Resident and local actor consultations (workshops, exhibitions, walk abouts)	Y	Y	Y	2012 workshop referred to landscape and views
Statutory consultees	Y	Y	Y	Design code
Other codes	Y	Y		Code for Sustainable Homes (Ecology survey), BREEAM New Construction (water consumption)

P = partial documentation; Y = Reference to GI; N = No reference to GI; NA = Not available

Table 3.6 RUE 2: References to GI in formal evaluative practices and links to BC

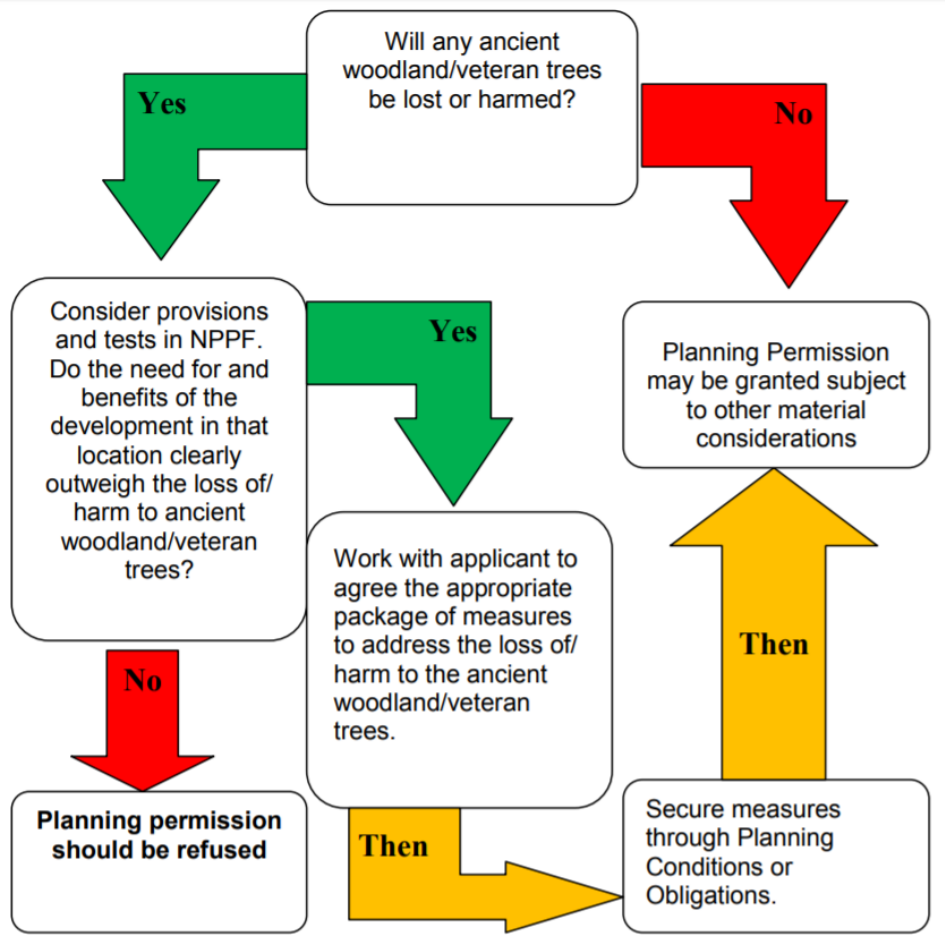
	Masterplan	Parcel 1	Parcel 2	Notes
Quantity survey (buildings, landscape)	N/A	N/A	N/A	Study not public
Viability assessment (finance, affordable homes)	P	N/A	N/A	Study referred to but not public
Socio-economic assessment (Local economy, market needs, demographics)	Y	-	-	Considered possibility of visitor centre for South Downs National Park plus links to woodland parks
Equality Impact Survey (Equalities Act 2010)	N/A	N/A	N/A	
Utilities assessment				
Transport / highways and parking assessment	Y	N	Y	
Land survey (e.g. topography, contamination, remediation strategy)	Y	Y	Y	
Landscape visual impact assessment	Y	-	-	
Heritage survey	Y	-	-	
Archaeological survey	Y	Y	Y	
Flood risk and drainage assessments	Y	N	Y	No reference to GI SUDS on parcel 1
EIA (Scoping, appraisal, mitigation) soil, noise, air, water and ecology	P	-	P	GI not considered as a buffer for mitigating noise or air quality impact
Ecology survey (protected species e.g. bats, slow worms; alien invasive species)	Y	Y	Y	
Arboriculture (tree) survey	Y	Y	Y	
Microclimate (wind, shading and temp)	N/A	N/A	N/A	Not conducted
Daylight, sunlight and shading	N/A	N/A	N/A	Not conducted
Energy use modelling	N	N	N	
Waste assessment and strategy	N/A	N	N	Refers to construction 'spoil' rather than waste. No ref to GI
Design review (in Design and Access statement)	Y	Y	N/A	
Design and access statement (Accessibility, inclusion)	Y	Y	Y	
Design and Client team meetings	Y	Y	Y	
Resident and local actor consultations (workshops, exhibitions, walk abouts)	Y	Y	Y	
Statutory consultees	Y	Y	Y	
Other codes	Y	Y	Y	Bioregional 'One Planet Community' indicators

P = partial documentation; Y = Reference to GI; N = No reference to GI; NA = Not available

Table 3.7 Phase 1 Courtyard assessment's design recommendations
(adapted from the Open Space Review, 2015)

Stage	Recommendations
Masterplan	• Courtyard orientation, access to sunlight and proportion of width to surrounding heights should be key considerations at earliest planning stage. • Where possible, the width of the courtyard should aim to be equal to the height of the tallest buildings and ideally a minimum of 18m wide. • A variation of form, either in plan or section, accommodates more diverse uses.
Detailed design	• Security measures should be passive, not aggressive. Privacy and natural surveillance should be carefully balanced, allowing self-regulation of space. • Provide seating and benches, particularly in sunny spots and edges and make boundaries permeable where possible. Garden fences need not be full height. • Secured by design can be counterproductive when considered in isolation. The objective of courtyards should be to encourage, not discourage their use.
Design and management	• Children need to be catered for and allowed to use courtyards. Complaints from residents should indicate a design fault, not a fault with children. • Noise dissipates more naturally in large courtyards but smaller courtyards needs to cushion sound through soft materials, levels etc. • Small play areas may not need equipment, but need visual connection to family homes. • Elderly people need to be catered for and allowed to use courtyards. Often it is their only accessible social space. Raised beds provide an accessible social activity. • Courtyards with varying levels need to be fully accessible. Seating should be provided, paying attention to edges and sunny spots. A courtyard is like an outdoor 'room'.
All stages	• People who feel at home make a space their own. • Too much design and too much management both prevent user ownership. • Some parts of spaces should be intentionally left 'unfinished' for people to take over. • Things like planters, walls and edges provide excellent opportunities. • Signs of inhabitation are signs of a successful place.

Table 3.8 Flow chart for development in or around Ancient Woodland



Source: Forestry Commission / Natural England Standing Advice (2014, p9)

Appendix 4

Table 4.1 BC and GI gap analysis

Issue	Case sites	Legislation and guidance	Potential link to BC issues
Transparent cost appraisal and validation	All	Global Reporting Initiative (GRI) G4 Construction and Real Estate Sector Disclosure https://www.globalreporting.org/resourcelibrary/GRI-G4-Construction-and-Real-Estate-Sector-Disclosures.pdf Supplementary guidance https://www.globalreporting.org/resourcelibrary/G3-1-English-Construction-and-Real-Estate-Sector-Supplement-Summary-Document.pdf Gold Star Communities includes issues **Econ 3 – Return on Investment** and **Econ 5 - Affordability**	**Introduce new 'GO' - Governance reporting** issue to require project sustainability reporting (see examples left)**.** The reporting requirement could also include post-construction validation of evaluative commitments.
GI definition and integration	E2, I1, I2, R1	Natural England GI Guidance NE 176 (2009): http://publications.naturalengland.org.uk/publication/35033 DEFRA/DCLG guide: Benefits of GI (2010) NPPF ch.11, paras 117 - 118 regarding ecological networks and determining planning applications (but no explicit reference to promoting multifunctional GI in developments)	**LE 01 – Ecology Strategy** could be renamed 'GI strategy' and include a clear definition of multi-functional and multi-scalar green and blue infrastructure. This would create a coherent framework for specific issues (e.g. ecology, landscaping, transport, flooding etc.). clarifying links to GI across the rest of BC.
Inclusive visual amenity	E1, I2	The concept of inclusive visual amenity is included in EIA Guidance (2016) https://www.cieem.net/data/files/Publications/EcIA_Guidelines_Terrestrial_Freshwater_and_Coastal_Jan_2016.pdf	**SE 11 - GI** could reward promotion of inclusive access to the *visual amenity* of green spaces. **LE 05 - Landscape** could refer to the principle of *inclusive visual amenity*, support the involvement of local actors in the LVIA, as well as promote the *early* undertaking of LVIA to better inform designs
Microclimate and overshadowing of GI	E1, E2, R1	BRE Guidelines on Daylight, Sunlight and Shading (2011) Microclimate analysis does not refer to impact of overshadowing on GI	**SE 08 – Microclimate** should refer to the BRE's own guidelines on daylight, sunlight and shading, as well as promote appraisal of impact to GI.
SuDS ownership at river basin scale	I1, R1	'Flood Water Management Act 2010 section 3' regarding sustainable surface water drainage https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/82428/suds-consult-annexf-ia-111220.pdf NPPF states that sites over 1 hectare in areas of flood risk should conduct a flood risk assessment. https://www.gov.uk/guidance/flood-risk-assessment-for-planning-applications	**SE 03 – Flood Risk Assessment** should promote involvement of local actors during appraisal **GO 04 - Community Management** should only encourage community ownership of SuDS if the community fully involved in the decision to take on management, has the capacity to do so and is aware of the cost implications involved

		Flood Risk Regulations (2009) requires assessment of flood risk EU Water Framework Directive (2000): calls for management and protection of water quality 'based on natural formation of river basins' through a catchment-based system of River Basin Management Plans. Enacted into UK law in 2003 http://www.legislation.gov.uk/uksi/2003/3242/pdfs/uksi_20033242_en.pdf Non-statutory Technical Guidance to SuDS (DEFRA 2015) https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/415773/sustainable-drainage-technical-standards.pdf BRE Digest 365 Soakaway design (2016) Garvin, S. Digest 365 describes the processes for design, construction, management and monitoring of soakaways, how to calculate rainfall values and soil infiltration rates. https://www.brebookshop.com/details.jsp?id=327592 CIRIA SuDs Manual (2015), guidance (C68=97) Building regulation Part H – Drainage and Water Disposal – ensure proper disposal to promote human and environmental health Planning policy Statement 25: Development and Flood Risk Responding to climate change	**SE 13 - Flood risk management** should require verification of SuDS operation in-use and also refer to the relevant regulations and guidance (see left)
Trees verses infrastructure and cost	E2, I1, I2, R2	Poor mimetic link to tree relocation in normative guidance; BS8545:2014 part 10 (tree planting); BS 5837: 2012 (design demolition and construction); NHBC guidelines regarding building near trees (NHBC 2011). Lack of assigned responsibility to monitor trees during construction and operation Pedestrian Environment Review System (PERS) which is used to audit the 'walkability' of a location, was applied in four of the sites (E1, I1, I2, and R1). This approach is not referred to in BC. PERS covers 11 themes, including a 'Quality of Environment' theme, which includes an indicator on the quality of soft landscaping	**LE01 - Ecology strategy** should refer to protection of SINCs, including Ancient Woodland. To include exchange of findings of arboriculture survey and ecology appraisal to avoid conflict **TM 01 – Transport assessment** should support the role of trees (and other GI) to mitigate transport impacts. Could also refer to PERS audit. **TM 02 - Safe and Appealing Streets**' should support the buffering role of trees (and other GI) in ameliorating noise, soil, water, air quality and visual pollution, using landscape design along pedestrian routes. Could also refer to PERS. **SE 09 – Utilities** should support the mediation between street-based GI (trees, vegetation, SuDS) and underground utilities;

			RE 02 - Existing Buildings and infrastructure should promote replanting of viable trees and other vegetation if their removal is unavoidable. To refer to tree guidance (See left)
Ecological connectivity and ownership	I2, R2	Lack of assigned responsibility to monitor ecology during construction and operation. Lack of protection of SINC sites.	**LE 01 – Ecology Strategy** needs a clear requirement (e.g. credit) assigning monitoring responsibility, during and post construction. Consider ecological connectivity at this stage instead of **LE 04**
Green roof multi-functional benefit and ownership	I2	CIRIA Building Greener. Guidance on the use of green roofs, green walls and complementary features on buildings (2007) Buglife Creating Green Roofs for invertebrates: Best practice guide (2012) https://www.buglife.org.uk/sites/default/files/Creating%20Green%20Roofs%20for%20Invertebrates_Best%20practice%20guidance.pdf	**SE 11 – GI and / or SE 13 – Flood Risk Management** should refer to guidance (see left)
Ancient woodland	R1	Forestry commission and Natural England Ancient Woodland Standing Advice https://www.forestry.gov.uk/pdf/AncientWoodsSA_v7FINALPUBLISHED14Apr3.pdf/%24file/AncientWoodsSA_v7FINALPUBLISHED14Apr3.pdf Ancient Woodland Assessment Guide https://www.forestry.gov.uk/pdf/150330AWAssessmentGuide2.pdf/$FILE/150330AWAssessmentGuide2.pdf General ancient woodland web page https://www.forestry.gov.uk/forestry/infd-9hbjk4	**LE 01 – Ecology Strategy** should promote the protection of Ancient Woodland and other 'irreplaceable' or sensitive habitats, including those listed as SINCs, and to refer to key guidance from Natural England and Forestry Commission supporting their protection