Millenium Villages and Sustainable Communities

Executive Summary

Key findings

- The Millennium Villages initiative (and other developments) could achieve more integrated sustainable settlements if sustainability aims such as those set out in the proposed evaluation framework (minimising resource consumption; maximising environmental capital; urban design quality; quality of life, social inclusion, community participation; commercial viability) were adopted as central objectives.

- Performance targets for these sustainability aims should be set for future Millennium Villages and other developments, and their progress relative to explicit benchmarks monitored and reported.

- The Millennium Villages initiative and other developments could benefit from experimenting with organisational and delivery models other than commercial competition between developer-led consortia with volume housebuilders as their drivers.

- Availability of 'sustainability infrastructure', such as good quality public transport, and a pool of receptive residents should be high priorities in the selection of Millennium Village sites and other sustainable settlements if their success is to maximised.

- If the Millennium Village initiative is to seek uncompromisingly high achievement the fact that this will take longer and often also cost more need to be borne in mind.

- In future, sustainable community projects should experiment not only in built forms, construction techniques, layout etc. but also in different institutional solutions.

Introduction

In March 1999 the DETR commissioned action research into the Millennium Villages initiative and its contribution to sustainable development, and to stimulate debate about the creation of sustainable communities. The project had key aims to:

- support the development of sustainable communities in a wide range of contexts, including local housing and regeneration programmes in urban areas, small towns and rural areas; and

- propose a framework to facilitate the subsequent evaluation of the Millennium Villages initiative and to draw out any transferable lessons which could be fed back into their current development.

In outline, the study involved the following activities:

- refining a working definition of sustainable development as a basis for developing a coherent set of sustainable community objectives;

- devising and proposing an evaluation framework;

- assessing five places against the framework: the two Millennium Villages were used (Greenwich and Allerton Bywater), plus an 'Urban Village' (West Silvertown, London), a Housing Action Trust development (Waltham Forest, London), and the Duchy of Cornwall's Poundbury scheme (Dorset). This included interviews with key players at each place as well as national stakeholders, site visits, and in-depth interviews.

- drawing on secondary research, project implementation knowledge, and good practice from elsewhere, to combine with the evaluation framework application in forming views on the potential and measurability of the factors under review.

Creating criteria for sustainable settlements and sustainable communities

It is useful to be clear what is meant by sustainable development in order to assess how far particular communities and settlements, or approaches to creating or changing them, support sustainability. Many alternative definitions of sustainable development exist and there is no ready consensus. Nevertheless, most of the present definitions and literature concerning sustainable development focus on both the environment and human welfare, and stress that these facets need to be reconciled and integrated rather than traded off one against the other. Further key concepts that emerge are social equity, community participation, and the notion of a sustainable community as a dynamic self-maintaining system.

Taking this into account, the study proposes eight broad themes or criteria for a sustainable community. These are pragmatic choices, to encapsulate in a convenient and practical way the main features or characteristics against which settlements could be appraised. They are:

a) Resource consumption should be minimised;
b) Local environmental capital should be protected and enhanced;
c) Design quality should be high;
d) Residents should enjoy a high quality of life;
e) Equity and social inclusion should be increased;
f) Participation in governance should be as broad as possible;
g) The community should be commercially viable, i.e. not requiring public subsidies to maintain its performance on the other criteria;
h) Integration of environmental and quality of life objectives - a sustainable settlement would perform well on all the first seven themes, not some at the expense of others.

Sustainable communities need to measure performance in terms of *outcomes* - for example, whether people enjoy easy access to a range of amenities without needing to use a car - rather than *outputs* such as mixed use patterns, or inputs such as public transport provision.

Outcomes are often harder to measure, but measuring them guards against assuming that particular inputs will achieve what is wanted. Where a settlement is not yet fully implemented outcomes cannot be measured directly and outputs or inputs will often need to be used as proxies. But the actual outcome effectiveness should be tested critically whenever possible.

The full report proposes a detailed evaluation framework which covers each of the above sustainability aims. For each aim, questions are asked, indicators are suggested, an assessment method is outlined including possible data sources, and user guidance notes are provided.

Applying an evaluation framework

To maximise its effectiveness, the proposed evaluation framework would be applied at all stages of a sustainable settlement project, although this needs to be done differently at different stages. For example:

- potential and opportunities to achieve the eight aims should guide site selection: for example a site very near existing jobs, shops and schools will have more potential to reduce car dependence than one further away;

- the sustainability aims should be included in the initial objectives for all development projects to ensure that the projects are actually directed towards their achievement. The starting position for these aims should be measured before development begins to provide a baseline against which the development's effects can be assessed;

- competition briefs should be site specific but reflect the sustainability aims;

- performance benchmarks should be set in terms of the sustainability aims;

- contracts should include explicit measurable targets for the full range of sustainability criteria, with contractual sanctions to ensure their achievement;

- implementation should be phased to safeguard sustainable behaviours. For example, local amenities and public transport would need to be established before residents move in. This will often require individual agencies to work 'inefficiently' in terms of their narrow service delivery remit for the sake of the greater good. Funding and performance appraisal mechanisms should allow them to do this;

- opportunities for 'sustainable behaviour' need to be actively promoted to users and residents.

Lessons for promoting sustainability in settlements

The research showed that settlements and projects have achieved significant improvements on current developer norms on many of the criteria against which the sustainability aims can be measured. No settlement, however, has yet delivered the order of magnitude of improvement needed to demonstrate true sustainability.

The table below summarises how far each of the five test projects has addressed each sustainability aim *('scoring' before implementation requires caution; for example, the Allerton Bywater Masterplan proposals score highly, but these have yet to be delivered.)*

Methods appropriate to promote some aspects of sustainability (such as energy efficient buildings) are already well known to the development industry: Others, such as settlement-level strategies for social exclusion, are less understood. Intermediate aspects include areas such as water recycling, energy recovery and reuse, and integrated strategies to reduce the need to travel.

Some aspects of sustainability performance (for example the thermal performance of buildings) are essentially under the developer's control. However, many aspects depend on the local context: for example the availability of good amenities and/or public transport in the area around the development. One crucial aspect of context is the social acceptability of the lifestyle settlements offer. Lifestyles which in the UK might be perceived as eccentric are highly marketable in, for example, Freiburg (Germany) where behaviours that contribute toward sustainability are merely a further accentuation of existing, accepted, lifestyle habits (e.g. flat dwelling, using public transport and cycling extensively, walking to local amenities, only driving occasionally).

The Millennium Villages programme could be criticised for seeking unconventional, trend breaking results through a fairly conventional large scale top-down commercial development process. Achievement of non-commercial outcomes is therefore partly dependent on the public sector trying to impose them as conditions and restrictions and the developer extracting subsidies in return. In future, sustainable community projects should experiment in built forms, construction techniques and layout but also in different development models, such as the:

- co-ordinated redevelopment of several separate sites within a designated area, as at St. John's Urban Village in Wolverhampton. This promotes diversity and would assist the programme to reach many more areas;

- sale of plots to individual households, syndicates of households or not-for-profit agencies to develop to meet their own needs and wishes but complying with strong sustainability standards set in an overall master plan, as at Freiburg. This harnesses and supports residents' aspirations for a sustainable lifestyle directly rather than relying on the developer's judgements.

An important factor at Freiburg (and also the Peabody Trust zero emissions scheme at Beddington) is a public sector land owner allowed to accept a less than market return on the land in return for achieving higher sustainability performance.

In the UK, sustainable settlements have to swim strongly against the tide of lifestyle assumptions and habits which could be considered as anti-sustainable. Establishing sustainable communities would require less special effort if national policies were increasingly modified to be more supportive of sustainability, or if individual settlements were given more freedom to set their own policies independently of prevailing conditions. For example, national policy shifts could include ecological tax reform (i.e. increasing taxes on environmental 'bads' such as greenhouse emissions) or increasing democracy in the planning process. Examples of local policies could be to require developers to substitute for all environmental services damaged to help maximise environmental capital, or requiring residents to but energy from an in-house energy services company at its standard tariffs to help minimise resource consumption.

Summary of evaluation results for the five test places

Aim	Allerton Bywater	Greenwich	Poundbury	Waltham Forest	West Silvertown
1 Resource consumption	**Better than average (under development)**	**Mixed (under development)**	**Worse than average**	**Average**	**Mixed**
	- e.g. solar design and embodied energy. Public transport comparatively weak.	- good public transport. Embodied energy proposals could be stronger.	- uses local materials and craftsman, but highly car based	fairly conventional approach	- flagship 'crescent block', but high car impact
2 Environmental capital	**Better than average (under development)**	**Exemplary (under development)**	**Mixed**	**Mixed**	**Better than average**
	- former colliery site put to productive use	- ex gasworks transformed into new settlement	- Grade 1 agricultural land developed - new community services/amenities created	- upgrading housing estate	- disused docks developed for new neighbourhood
3 Urban design quality	**Exemplary (under development)**	**Better than average (under development)**	**Exemplary**	**Average**	**Better than average**
	- promises high quality	- innovative design intentions	- acknowledged good practice	fairly conventional approach	- quality undermined by parking and highways

4 Quality of life	Better than average (under development)	Mixed (under development)	Better than average	Better than average	Mixed
	- up-grade of existing off site services - new employment opportunities	- possible adverse impact of neighbouring development, (e.g. traffic from Sainsbury's store).	- contribution to off-site services	- good local employment and training	- new services - relatively poor training opportunities etc
5 Equity/social inclusion	Better than average (under development)	Average (under development)	Mixed	Exemplary	Mixed
	- proposed locally mixed community	- attempts to 'pepper-pot' tenures	- well-integrated social housing	- mixed tenure housing - new community facilities	- most social housing segregated
6 Participation	Better than average (under development)	Better than average (under development)	Mixed	Exemplary	Better than average
	- extensive public involvement - proposed Village Trust	- wide ranging powers for Village Trust, but - limited public participation exercise	- management company locally run, but - top-down design process	- effective participation of voluntary sector	- successful participation exercises throughout development process
7 Commercial viability	Better than average (under development)	Better than average (under development)	Better than average	Worse than average	Average
	- private funds intended to balance large public outlay	- intended to be commercially viable	- increased costs balanced by uplift in house values	- initial public funds and dowry for ongoing management	- high value housing offsets public investment in infrastructure
8 Integration	Better than average (under	Better than average (under	Better than average	Average	Worse than average

	development)	development)			

Chapter 1 Introduction

1.1 Appointment and Remit

1.1.1 On 4 March 1999, Llewelyn-Davies, CAG Consultants and GHK Economics were appointed by the DETR to carry out research into the Millennium Villages (MV) initiative and its contribution to sustainable development and the creation of sustainable communities.

1.2 Background: the Millennium Villages programme

1.2.1 The first Millennium Village development competition for the Greenwich site, was launched by the Secretary of State for the Environment, John Prescott, in July 1997. The programme is intended to set the standard for 21st Century living, and to serve as a model for the creation of new communities. This is to be done through encouraging innovation in building technologies, increasing economic and social self-sufficiency, achieving exemplar standards of functional urban design and focusing on sustainable development that addresses energy and conservation issues and building technologies.

1.2.2 The second Millennium Village is being developed at Allerton Bywater, east of Leeds, and the winning consortium was announced during June 1999. These first two Millennium Villages are to herald the beginning of a rolling programme, which is set to create between five and ten new sustainable communities throughout the UK.

1.2.3 The Millennium Villages initiative is being organised by English Partnerships. Guidance was also received from the Urban Task Force, and from the Millennium Villages Advisory Panel, which was set up last year to support English Partnerships in assessing the competition.

1.3 Study Purpose

1.3.1 The project brief states the study purpose as:
"to facilitate the subsequent evaluation of the Millennium Villages initiative and to draw out the transferable lessons which could be fed back into their development. The research would also aim to support the achievement of sustainable communities more generally in a wider range of contexts, including local housing and regeneration programmes in urban areas, small towns and rural areas."

1.3.2 It is intended that the study outcomes should both help in forming judgements on the Millennium Villages initiative to date, and provide the basis for further research, once the programme of future new Millennium Communities is under way. In principle, it should also provide guidance on the requirements for ex post evaluation once the programme has been completed.

1.4 Study Objectives

1.4.1 Essentially there are four key objectives:

1 To define an appraisal approach to evaluating the Millennium Villages initiative, based on:

adopting a working definition of key aspects of sustainable communities; and

defining performance criteria for evaluating their sustainability.

2 To test these criteria by evaluating the two Millennium Village projects, so far as possible at mid-1999, and three different but comparable projects, as development "products" and in terms of process and implementation issues. This can then be used to define a basis for evaluating the two MVs once they have been built and are fully operational; and to apply similar baseline and monitoring evaluation to other such projects;

3 To identify transferable good practice lessons for achieving sustainable communities in a wider range of contexts, drawing on the five places studied in some detail and;

4 Referring to other best practice examples from the UK and overseas. It is hoped that lessons learnt will be transferable on many different levels, from the selection and specification of future Millennium Villages, to individual projects promoting sustainable local housing and regeneration in urban areas, small towns and rural areas.

5 To suggest how to disseminate this good practice for non-Millennium Village developments as they relate to physical design and process-orientated issues such as improved policy interactions.

1.5 Scope and Approach of the Research

1.5.1 In outline, the study has involved the following activities:

- refining the "working definition" of sustainable development referred to in the brief, as a basis for coherent set of objectives for the evaluation;

- devising an evaluation Framework;

- "testing" it on five places: the two Millennium Villages plus an "Urban Village", a Housing Action Trust redevelopment, and the Duchy of Cornwall's Poundbury scheme;

- drawing on secondary research, the consultants' own first-hand experience of implementing projects, and good practice from elsewhere, to combine with the Framework application in forming views on the potential and measurability of the factors under review; and

- contributing ongoing "action research" in terms of the team's feeding into and informing judgements about how to improve the two existing Millennium Villages and how to develop the future MV programme.

1.6 Place selection and key characteristics

1.6.1 Given that one of the aims of the project was to assess the sustainability characteristics of new developments under the Millennium Villages initiative, the Greenwich and Allerton Bywater developments were self-selecting. As both of these developments are at different, but comparatively early stages of development, the additional three places were chosen to allow a balanced assessment of framework application in more fully developed areas.

1.6.2 West Silvertown was chosen on the basis of it being promoted as a model 'urban village' that provides an interesting comparison to the process, design and management intentions for Greenwich. Whilst it is an award winning scheme promoted as an example of high quality urban design, problems have also been reported, particularly in relation to crime and access to public transport for instance. Poundbury provides an interesting locational contrast, as an edge of town development that has again received mixed reviews and features heavily in the DETR's recently published 'Companion Guide to DB32' as best practice urban design. Waltham Forest HAT was selected for its well recognised approach to community participation and social inclusion. Waltham Forest was also chosen as a pilot for the DETR's new method of appraising the quality of new housing developments, Housing Quality Indicators (HQI) to build in consistency, where possible, between the two evaluation frameworks.

1.7 Methodology

1.7.1 This consisted of three stages:

- **Data collection**
  This stage consisted of a review of both primary and secondary literature relating to the sustainability agenda, the Millennium Villages initiative and the five individual test places. These sources included Master Plans, development briefs, planning applications and relevant journal, magazine and newspaper articles.

- **Initial contact with key players**
  A series of initial telephone interviews with key players at each test site were undertaken, as well as national stakeholders including representatives of DETR, English Partnerships and the Urban Villages Forum. Contact was also made with other environmental and community campaigners such as Friends of the Earth and the Council for the Protection of Rural England.

- **Site visits and in-depth interviews**
  In this stage we undertook a series of visits to each of the five test places, and in-depth interviews with a range of project participants. Interviewees included project promoters, developers, local authorities, designers and occupants, listed at the review of each test place in Appendix 1.

1.8 Report Structure

1.8.1 The report is divided into three parts:

1 The Study
This establishes the conceptual basis for the study in firstly summarising the idea of the sustainable community before going on to discuss how this has informed the structure and content of the proposed evaluation Framework (Chapter 2). This is followed by further guidance on how the framework should be used particularly emphasising the need to focus on outcomes, (Chapter 3).

2 The Framework
The evaluation framework is a distinct section to be used as a practical tool both with and apart from the main report. It contains the evaluation tables and user notes, which provide guidance on how the framework can be used to provide not only a full evaluation of a development's performance, but also as a sustainability 'checklist' (see Chapter 5 for more on this subject).

3 The lessons
The final section summarises the lessons learnt during the course of the study - in terms of:

- Application: testing the framework to refine it and determine that it is workable (Chapter 5);

- Sustainability outcomes: a critique and analysis of the project components of each of the five "test places" (Chapter 6);

- Delivery: lessons about the methods of delivery (Chapter 7); and

- Conclusions: implications for policy and projects related to the development of sustainable settlements, and recommendations as to how good practice can be disseminated.

At the end of the report there is a bibliography and an appendix that provides profiles of the five "test places".

Chapter 2 Creating sustainable settlements and sustainable communities

2.1 Introduction: The idea of a sustainable community

2.1.1 Many alternative definitions of sustainable development exist which do not provide a ready consensus. However, it is useful to be clear what is meant by a sustainable community in order to assess how far particular communities, or approaches to creating or changing communities, support sustainability. This chapter provides a selective overview of potentially relevant definitions to establish a context, and proposes more concrete objectives to form a basis for the suggested appraisal process.

2.2 Famous definitions

2.2.1 The most famous and ubiquitous two definitions of sustainable development are Brundtland's: "development that meets the needs of the present without compromising the ability of future generations to meet their own needs", (World Commission on Environment and Development, 1987); and Caring for the Earth's: "improving the quality of life within the carrying capacity of supporting ecosystems" (Caring for the Earth, 1991).

2.2.2 These two, frequently quoted together, already embody some crucial features for this project:

- Sustainable development is concerned with both the environment and with human welfare;

- These need to be reconciled and integrated rather than simply traded off one against the other;

- That it is about constraining current behaviour for the sake of future goals.

2.2.3 Two further definitions start to show how these very general principles can be applied to settlements:

- The definition adopted by the International Centre for Local Environmental Initiatives (ICLEI), which can be paraphrased as meeting the social, environmental and economic needs of all residents while maintaining the social, environmental and economic systems on which those depend (European Campaign for Sustainable Cities and Towns, 1994).

- The Aalborg Declaration, adopted at the first European Conference on Sustainable Cities and Towns which, without offering a single 'headline' definition, treats the sustainable settlement as a self-regulating interconnected social, economic, and environmental system which meets its needs and manages its impacts internally, or by fair reciprocal arrangements, and not by dumping its problems on other places.

2.2.4 These together bring out further key concepts: equity between people; participation; and - especially from the Aalborg definition - the notion of the settlement as a dynamic self-maintaining system. This definition is considered further at 2.10.1.

2.3 UK interpretations

2.3.1 These ideas were all embodied in the Local Government Management Board's Framework for Local Sustainability (1993), which was widely used as a benchmark until the new government's publication of Sustainable Communities for the 21st century (DETR 1998) and the new national sustainable development strategy, A Better Quality of Life, (DETR 1999b).

2.3.2 As well as referring to the Brundtland and Caring for the Earth definitions, these two publications between them offer four further different interpretations. Sustainable Communities gives a list of 17 "themes of a sustainable community", organised under the three broad headings of environment, society and economy. These were developed out of the 13 "themes" produced in the LGMB's indicators project, (LGMB, 1994).

2.3.3 A Better Quality of Life then offers four broad "objectives" (different from the three headings) and 14 proposed "headline indicators" (different from the 17 themes). DETR guidance on sustainability appraisal of regional planning guidance takes the four objectives as its starting point, but unpacks them into quite a different set of detailed appraisal criteria from the indicators in *A Better Quality of Life.*

2.4 Reasons for proliferation

2.4.1 The proliferation of different definitions and lists could be construed as evidence either that sustainable development is meaningless or that the Government is incoherent in approaching it. However, there are some perfectly respectable reasons for it. First, like any political idea of any depth or resonance, sustainable development is a contested concept. There are disagreements about exactly what it means, and arguments are conducted partly through competing definitions and criteria. A particularly contentious issue is whether economic activity as conventionally measured through indicators such as GDP is an indicator, or even a useful proxy for, quality of life. The debate is being played out partly through different ways of encapsulating the economic dimension of sustainability in definitions and criteria.

2.4.2 Second, different kinds of definitions and criteria are suitable for different purposes. Many local authorities which sought to apply the LGMB "13 themes" directly as policy appraisal criteria found them unsuitable for that purpose, and produced different indicators while continuing to support their philosophy. As mentioned above, the same is now happening with the DETR's own guidance on sustainability appraisal of regional planning guidance.

2.4.3 Third, for all these differences there is still a very considerable commonality between all the different indicator sets or definitions mentioned. They all mark out an idea or aspiration

which is distinct from previous concepts of environmental protection, social well-being or economic progress, but which includes aspects of all three.

2.5 Messages for this project

2.5.1 What does this mean for the current project?

- Trying to arrive at an agreed 'definition' of sustainable development is neither practicable nor necessary;

- Instead it will be more practically useful to adopt a "working definition of key aspects of sustainable communities";

- Such a working definition designed for the specific purpose of appraising putatively sustainable communities will not necessarily be the same as any of the previous definitions or lists of criteria.

2.5.2 However, it should be clear how it reflects their general aims:

- Part of the value of the project should be to clarify and refine what we mean by a sustainable settlement. Initial definitions should only, and can only, be the starting point: in applying them we will find how they need to be changed and improved.

2.6 Proposed sustainability themes

2.6.1 Reflecting all the above, this study adopted seven broad themes or criteria for a sustainable community:

1. Resource consumption should be minimised;

2. Local environmental capital should be protected and enhanced;

3. Design quality should be high;

4. Residents should enjoy a high quality of life;

5. Equity and social inclusion should be increased;

6. Participation in governance should be as broad as possible;

7. The community should be commercially viable in the sense of not requiring public subsidies to maintain its performance on the other criteria.

2.6.2 These are broad and general principles. Sections 2.7 and 2.8 below explain in more detail how they are applied.

2.7 Justification for the seven themes

2.7.1 The seven themes were chosen pragmatically. They aim to encapsulate in a convenient and practically useful way the main features or characteristics against which we wish to appraise the contribution to sustainability of Millennium Villages (MVs) and other putatively "sustainable" settlements.

2.7.2 The tests for these themes should therefore be "do they seem to capture what we want to measure" and "do they help us frame meaningful and usable appraisal questions?"

2.7.3 Later sections of this report discuss the latter question. Table 1, overleaf, is offered as "evidence" for the first question. This shows that the seven themes between them capture in a relatively concrete and operational way the main elements of three international "classic" definitions of sustainable development, and three British government definitions.

2.7.4 The final theme, commercial viability, is more tenuously connected to the definitions than any of the others, however it justifies inclusion because it is a prerequisite for lasting achievement of the other six. It would be relatively easy to create a community which performed well on all the other themes, but only by needing continuing heavy public subsidies, for example to maintain non-viable local public services. This is not a useful model in the context of low overall public spending. Appraisal should test how far a settlement can achieve better performance on the first six themes without needing extra public funding to do so.

2.7.5 This is an example of the way criteria and interpretations of sustainability need to be adapted for different purposes. At national policy level "commercial viability" would be a completely misleading and invalid criterion of sustainable development; but it is appropriate and indeed important for appraisal of projects which have to operate within a given national policy framework.

2.8 Integration not balance

2.8.1 A sustainable settlement would embody all these qualities, not compromise uneasily between partial achievement of each. It is crucial to reconcile, integrate and combine them. The planning concept of 'balance' therefore needs to be used with some caution. There will, of course, be occasions in practice where trade-offs need to be made - for example where providing a better quality of living environment requires more land or resource consumption. But the overall aim must be more ambitious: to seek to move toward integration - for example by seeking to improve one facet without damaging another, or, as Levett (1998a) argues, by improving the 'conversion rate' between one type of good and another type of bad. For example, finding ways to improve quality of life while using less resources.

2.8.2 To reflect the importance of this, an eighth aim of integration was added, with objectives and indicators concerned with the combined achievement of multiple objectives.

2.8.3 The rest of this chapter discusses two further important aspects of integration: the interconnectedness of different social, economic and environmental processes within any settlement, and the way that each settlement in turn interacts with its wider surroundings - environmental, social and economic.

Table 1: Justification for the seven proposed objectives for sustainable development

Bruntland	Caring for the Earth	ICLEI	Opportunities for Change '5 themes'	Opportunities for change '4 objectives'	Sustainable communities '17 themes'	Proposed Millennium Villages/sustainable settlements themes
Don't compromise future	within capacity of ecosystems	... without threatening viability of natural and built systems	Goods and services that use minimum environmental resources	Prudent use of natural resources	Use resources efficiently; minimise waste; limit pollution; access with less car use and environmental damage	Resource consumption
Meet needs of present			Manage and protect environment	Protection of the environment	Value and protect natural diversity	Environmental Capital
	Improve quality of life	Deliver basic environmental, social, economic services ...	Sustainable communities		Places, spaces and buildings that work well, wear well, look well; human scale settlements; local distinctiveness	Design Quality
				Social progress ...	Protect health; preventative action; satisfying work; value unpaid work; culture, leisure, recreation	Quality of life
		... to all		... which	Access to	Equity/Social

		residents		meets the needs of everyone	good food, water, housing, fuel at reasonable cost	Inclusion
					Empower all to participate in decision taking; maximise skills, knowledge	Participation
Don't compromise future		... without threatening viability of social systems	Right signals	Economic growth	Vibrant local economy; meet local needs locally	Commercial viability

2.9 The settlement as an interconnected system

2.9.1 Any settlement can be viewed as a complex interactive system, where social, economic and environmental facets bear on each other.

2.9.2 Transport provides an important illustration. People exercise choice depending (among other things) on relative costs (and cost structures) of different transport modes and land in different places. The resulting transport patterns subsequently affect the viability of different kinds of development in different places; and the resulting development patterns in turn affect transport behaviour.

2.9.3 These transport patterns in turn affect the environment - both locally (through land-take for different purposes) and globally (through energy and resource use). However, development patterns may simultaneously be influenced by environmental conditions, either directly (for example through topography constraining construction choices) or as a result of regulation to protect the environment.

2.9.4 Furthermore the patterns of land use, accessibility and transport which result from these interactions then affect the quality of life experienced by local people, and in particular the differences in access, comfort and convenience experienced by people with different levels of income and mobility.

2.10 Feedback

2.10.1 The above analysis suggests that it is not sufficient to look at any of the seven aspects in isolation, but also to consider how they interconnect. A key form of interconnection is feedback. All natural systems stabilise themselves through negative feedback-'damping': for

example a species' population expansion halted by depletion of their food source. An example in a settlement would be where rising land prices eventually halt the expansion of a particular kind of development. Negative feedback is a crucial 'systems' attribute of sustainability, since it is the mechanism for maintaining the system in a constant state (a key aspect of the Aalborg Charter's view of sustainability described earlier).

2.10.2 One of the main problems of unsustainability in settlements is the opposite of this: positive feedback or 'snowballing'. Transport offers a notorious example of this too. Consider what happens when (for whatever initial reason) some people in a city shift some of their travel from bus to car. At the margin this will result in less ticket revenue for the buses and more congestion slowing them down. This will add up to a slightly worse bus service which will - again at the margin - tip the balance of choice from bus to car for a few more journeys. This will, of course, further reduce bus revenues and increase congestion delays, encouraging more people to switch from bus to car. It is easy to see how, if unchecked, an initially small change at the margins of travel behaviour could propagate and amplify itself and cause the collapse of the bus service from the standard means of urban travel for most people to a residual last resort for those too poor, infirm or improvident to avoid it.

2.10.3 This is perhaps only a slight caricature of what has happened in most British cities since 1960. Moreover plenty of other knock-on effects have all tended to reinforce, rather than contain, the central vicious spiral. Bus services have reacted to dropping revenues and ridership by cutting services; this has made the bus a less attractive option and encouraged more journeys to swap to car. Shops, employers and leisure amenities have responded to increased car use by moving to sites which are easily accessible by car. These are generally less accessible by bus, so this has encouraged more journeys to switch. Such sites are also generally outside town centres, and the resulting loss of town centre amenities and vitality has encouraged people with the option to move to suburbs, thus further increasing car dependence and further undermining town centre vitality.

2.10.4 An important aspect of the sustainability of a settlement should therefore be how far different aspects of its functioning are linked by negative feedback loops, and how far positive feedback is avoided as shown below in Table 2.

Table 2: Positive v negative feedback		
Pressure/trend	**Positive feedback response in an unsustainable settlement**	**Negative feedback response in a sustainable settlement**
Higher car-borne personal mobility	Greater provision for cars (as in previous example)	Policies to reduce need to travel, provide non-car means
Richer people opting out of public health/education service provision	Private provision encouraged; public service deteriorates; more opt out, leaving only a	Concerted attempts to improve public provision; elimination of perverse subsidies and incentives for private provision

	'sink' service for the least well off	
Perceived increase in crime	Defensive policing, electronic surveillance, secure enclaves	Policies to tackle causes of crime and keep public realm safe
Increased demand for household living space	Suburban expansion	Densification, policies to reduce space intensity of lifestyle
Resource and waste footprint of the settlement increasing	'Predict and provide' planning of (eg) water, energy, waste	Measures to improve efficiency and reuse

2.11 What are we trying to sustain?

2.11.1 Two important points need to be kept in mind. First, negative feedback is only desirable where the status quo which it maintains is desirable. This is true of all the examples in the table. There are many undesirable attributes of cities which we do not wish to maintain, and where negative feedback is the problem not the solution. For example the notorious intractability of 'sink' estates and other islands of deprivation might be partly due to powerful feedback loops that tend to entrench disadvantage and deprivation once they have taken hold. Helping people in the most deprived areas to obtain jobs may not have any effect on the state of the areas if the beneficiaries quickly move to somewhere better to live.

2.11.2 This is an example of a more general issue: the need to stay critically aware of what it is that we are trying to 'sustain'. In broadening the concept of sustainability into the social and economic fields we can no longer simply assume, as we can with the planet's life support systems, that 'whatever is, is good' and that simply keeping the current position going indefinitely should be an unquestioned aim of policy. Negative feedback is not a desirable feature of sustainable settlements in itself - but in so far as it helps achieve desirable aims such as the 8 we have proposed.

2.12 Settlements are open systems

2.12.1 The second point is that no settlement is a closed system, but interacts with its social, economic and physical surroundings in many ways. A 'settlement' - city, town or village - exchanges resources with a wider (relatively rural) hinterland, and in current patterns of trade the hinterland for even the smallest and most remote village in the UK is world-wide. People, ideas, fashions and money flow freely between places. Indeed the term 'sustainable settlement' is rather misleading: it would be more accurate to think of 'settlements which contribute to sustainability'.

2.12.2 The consequence for appraisal is that it is not sufficient to consider performance on the 8 aims, or feedback, within a single community (such as a Millennium Village) in isolation. Each community should be considered in its context.

2.12.3 Three aspects of this are important for evaluation. First, and most obviously, evaluation must consider the effect of a settlement on the 8 themes in its surroundings as well as internally.

2.12.4 Secondly, if a Millennium Community (or other new or changed settlement) performs significantly better than the norm (which for most purposes will mean the run of UK settlements, or current developer norms) on the 8 themes, that will count as a positive, even if the result is still well adrift of any absolute standard of sustainability. For example a 20% reduction in total 'lifestyle' greenhouse gas emissions per resident would be welcome, even though it is only a small step towards the 60% average reduction the Intergovernmental Panel on Climate Change (1995) has called for, or the 88% reduction Friends of the Earth (McLaren, 1998) have argued is the fair share for the UK.

2.12.5 Thirdly, many of the pressures towards unsustainability come from outside individual settlements. Cheap energy and excellent inter-settlement road links are the result of policy and investment decisions at national level. They clearly limit the effectiveness of local measures to reduce energy consumption of transport. Consumer choice in education and health services, whereby positive feedback contributes to 'sink' schools and hospitals developing, remains a principle of policy. This can create an extra barrier to reversing decline and bringing all providers up to a basic minimum standard, one which is not present in countries such as Germany where for example, primary school catchments are strictly geographical.

2.12.6 A key question appraisal will therefore have to address is how far management within a settlement can insulate it against anti-sustainable pressures from outside it. This will become particularly sensitive in the economy, where free trade and increasing globalisation militate against measures such as municipal preference for local suppliers, even when they are not the cheapest, or imposition of ambitious environmental or social criteria not directly related to the goods or service being bought. These could help achieve multiple sustainability objectives through creating appropriate feedback signals.

Chapter 3 Focusing on Outcomes

3.1.1 This chapter explains the basis for the evaluation framework, focusing on the necessary outcomes a settlement or development should achieve in order to be considered sustainable, rather than the inputs that might be hoped to achieve them.

3.2 Outcomes focus

3.2.1 The evaluation framework uses eight themes framed in terms of outcomes: that is, what a settlement, and the decisions and actions that go into it, are designed to achieve. It is essential to distinguish outcomes from the means used to achieve them.

3.2.2 For example, the Urban Task Force's final report calls for higher density, mixed use and maximum use of brownfield sites. These means cannot be assumed to lead to the desired ends. For example:

- Higher density targets are often measured in terms of development density - plot ratio, housing units or habitable rooms per hectare. These only measure the 'land intensity' of built space. If the housing is then sparsely occupied, for example by small households in big houses, or only used for part of the year, the land and resource consumption per person may still be high. Housing density may be measured in terms which seek to correct for this, for example annual person-days of occupation per hectare: but the result may not be positively correlated with sustainability if the people then travel more to escape from the downsides of high density;

- Mixed use is of no benefit if people still travel to more distant schools, jobs, restaurants and so on. Local *availability* of a range of resources is not a reliable proxy for local use.

- Many 'brownfield' sites have more ecological and recreational value than many 'greenfield' sites, and greenfield development is not automatically or necessarily more resource- intense than brownfield.

3.2.3 This is not to deny that higher densities, diversity and reuse of land are important parts of the sustainable settlement 'toolkit'. But, as Levett (1998b) argues, the point is that they should be understood as means which will (often) help make settlements more sustainable, not icons which in themselves guarantee it.

3.2.4 It is much easier to set, monitor and enforce requirements in terms of inputs such as energy efficiency ratings of buildings, levels of provision for cars compared to bicycles, tenure patterns or levels of public service provision, than in terms of outcomes such as low actual energy consumption, low use of cars or equitable access to public services. But the inputs are only desirable so far as they help achieve the outcomes. As the examples in 3.2.2 illustrate, uncritical pursuit of input targets alone runs the risk of missing the point.

3.2.5 This was demonstrated in the 1960s approach to housing redevelopment. The overall aims - to improve living standards for the least well off, and improve and renew the built environment - were very similar to those of the current 'urban renaissance' agenda. But the means proposed by the best and most visionary thinkers of the time - comprehensive slum clearance, tower blocks, deliberate reductions of overall density, 'decanting' to the urban fringe - were very different. These means became adopted as a canon of professional and managerial orthodoxy and were frequently pursued as objectives of policy. Whether these means were in fact achieving the desired ends was not tackled to any great degree in Government or elsewhere. When reliable evidence emerged that they were not achieving desired ends much damage had already been done.

3.2.6 The corresponding professional orthodoxy of the 1990s - mixed use, mixed tenure, higher densities, functional neighbourhoods, 'brownfield' reuse - could be considered as 'right' as the 60s approach was 'wrong'. It could be argued that, if only because the 1990s approach is more modest, varied, incremental and piecemeal, it has less chance of going wrong than the bolder, comprehensive, approach of the 1960s. But the only way to make sure that means are achieving ends is to keep on testing one against the other: never to be satisfied with measuring inputs, but always to ask, critically and sceptically, how confident we can be, and what evidence there is, that they are leading to the intended outcomes.

Chapter 4 The Evaluation Framework

The following section forms the framework for evaluating sustainability. It consists of eight themes, comprising a table for evaluation containing the following:

- key questions to be asked

- indicator

- assessment method

- data to be used (and source)

- practical 'potentially supportive actions' that provide helpful guidelines to be applied at all stages of the development process (discussed further in Chapter 5).

Alongside each table are user guidance notes consisting of the basis and reasoning for the objective, the assessment approach that should be used and also proxies that may be more applicable at different stages of evaluation.

Aim 1: Minimising Resource Consumption

Basis

About 25% of the UK's greenhouse emissions are from energy use in the home, and a further 25% from transport (although this includes business and goods transport as well as personal travel to and from home.) A large proportion of water consumption is also in households, and building and maintaining housing also consumes significant amounts of energy, land and aggregates - for infrastructure as well as the housing itself. This theme is concerned with reducing all these resource impacts.

All the questions aspire to measure the amount of these environmental resource impacts actually incurred by each resident living their normal lives. Targets should be set in such terms, and development options compared using them. A sustainable settlement should achieve marked improvements compared with current average housing or standard new commercial developments. Neither

used going to and from the home, and each resident's annual share of the energy used in constructing and demolishing the buildings - that matters. Good performance on any one of these is not enough in itself. For example there is no point in achieving dramatic 'leading edge' reductions in energy consumption in the buildings themselves if these are swamped by extra energy use driving to and from an inaccessible location.

'Ecological footprint' potentially offers a means of reducing energy and the other impacts to a common measure based on the amount of land required to provide resources or assimilate wastes. The impacts identified could be footprinted, and aggregate targets set. However footprinting is not yet sufficiently well known or accepted to make this necessarily useful yet.

Proxies

Even after a settlement is occupied it may not be possible to obtain actual metered energy and water consumption figures for all residents, so sampling and extrapolation may be necessary.

scientific knowledge nor the politics of fair distribution are far enough advanced to support exact overall sustainability targets. However the best available estimates (see for example Mclaren et al 1997) suggest that the UK should be aiming for at least 50% to 90% reductions in a range of resource impacts compared to current levels if we are to play our fair role in achieving sustainability. We would therefore suggest that any new development or redevelopment/renovation of existing areas making a serious claim to show the way toward sustainability should be aiming for reductions of at least 50% on all these measures compared to the current average of UK housing.

Assessment approach
All the 'greenhouse' gas related impacts can and should be reduced to a common measure of kg of carbon dioxide equivalent. It is the aggregate of the three greenhouse impacts - energy used in the home, transport fuel

Travel surveys will probably be needed to answer the travel questions.

Before the settlement is occupied, performance will need to be estimated via proxies such as levels of energy efficiency in buildings and provision of water - efficient services, public transport, cycle facilities and good amenities accessible by more sustainable modes, and measures to reduce the availability and attractiveness of driving, such as parking restrictions, charges and inconvenient location. However these proxies must always be assessed with the question 'how much will this really alter people's behaviour?'

Aim 1: Minimising Resource Consumption

Objective and questions	Indicator	Assessment method	Data and source	Potentially supportive actions
1.1 How much greenhouse emissions does a resident produce through energy use in the home?	Kg CO_2/person year	Actual gas, electricity, heating oil (+coal?) bought x appropriate greenhouse coefficients (inc generation efficiencies) - modified for any	Fuel bills for whole development or typical homes. National figures for 'greenhouse' emissions of different fuels [DTI energy statistics]; local figures	Physical energy efficiency measures to buildings: insulation, draught-proofing, low-energy appliances, passive solar orientation and design, natural lighting/ventilation, energy efficient built forms (eg terraced/tenemental); use and generation of renewable energy (inc.

		differences in the settlement's energy supply (eg an on-site CHP plant).	for any atypical generation. OR energy efficiency ratings of buildings and conversion factors [from BRE] to fuel actually used.	biogas, biomass, solar, hydro)
1.2 How much treated water does a resident consume living in the home?	Litres/person year	Actual piped water consumption	Water meter readings	Installation of low water appliances; collection/reuse of rainwater/grey water. *Occupancy and behaviour patterns to exploit these.*
1.3 How much greenhouse emissions does a resident produce in daily travel (especially by car?)	Kg CO_2/person year	Petrol, diesel, LPG (etc) used by the residents' vehicles in daily travel. Settlement residents' share (by passenger miles) of fuel consumption of public transport providers.	Residents' vehicle mileage x National average car fuel Efficiencies (DETR) (Unless Vehicle mix will be Significantly different)	Availability of amenities locally; availability and attractiveness of public transport, cycling and walking (including the way the settlement alters these for people living in surrounding areas.)
		Any significant impacts the settlement may have on the travel patterns of non-residents, eg will people from the surrounding area come to it for shopping	Transport models to estimate mileage and modal split.	Any measures to encourage people to drive more fuel efficient cars, more slowly/carefully, and with more sharing. *Do residents actually use the local amenities and the sustainable transport options in preference to more distant ones and cars? Do they actually choose more fuel*

		or jobs; will this decrease their car use?		efficient cars and/or drive more fuel-efficiently?
1.4 How much greenhouse emissions does a resident incur in buildings/infrastructure?	Kg CO_2/person year	Embodied and demolition energy from constructing and maintaining buildings and infrastructure (including allowance for reuse, recycling) apportioned over expected lifetime.	LCA data about buildings and infrastructure x estimated life [BRE typical figures if specific data not available]	Are the buildings/infrastructure built to reduce their resource/energy use over their whole life? Minimum use of new building materials and ones with high embodied energy (steel, cement, glass), heavy materials brought long distances. Lightweight (eg timber frame) design, use of local and recycled materials (esp. aggregates). Long design life, adaptability, low maintenance. *Will buildings achieve long life?*
1.5 How much aggregate is used in the construction? How much of this is virgin?	Kg aggregate and ground material/person year	Aggregate intensity of built form; sources of aggregates		
1.6 Land take per resident	m2/person (sealed surface and total)	Off plan and occupancy data	As assessment method	Higher plot ratios, minimisation of sealed roads/terraces. *Will high occupancy levels be achieved*

Produce the benefits. Changes that do not damage the benefits can be freely allowed (for example new construction that does not interfere with distant views, or reduce the site's carrying capacity for a particular population.) Changes that substitute for benefits lost are also fine - provided all important benefits are fully substituted. For example if building housing deprives local people of a footpath to shops and a pleasant area for walking, the development should provide both an equally convenient route to equally useful shops (not necessarily the same ones!) and an equally pleasant and equally accessible area for walking. Opportunities should also always be taken to enhance or provide new benefits.

Because every site offers different benefits there can be no standard 'shopping list' (the list under 'assessment method' in the table is only a checklist of types of benefit that may be

important.) There therefore needs to be a systematic appraisal of which environmental benefits and services are provided by a site which are important and could be affected by the development. Assessment should consider first whether any such process was carried out, and how thoroughly, and then how far the development succeeded in safeguarding, substituting for or adding to these services.

Proxies

The new approach to environmental capital (CAG, 1997) developed jointly by the Countryside Agency, English Nature, English Heritage and the Environment Agency explicitly applies the 'benefits and services' philosophy outlined above and is therefore the most appropriate tool for assessing this theme. However it is not yet being widely applied. Assessment will therefore often need to rely on more traditional or specific forms of environmental assessment. In interpreting their results it is important always to ask 'what is this telling us about the benefits the environment is offering?'

Aim 2: Maximising Environmental Capital

Questions	Indicator	Assessment method	Requisite data and source	Potentially supportive actions
2.1 Has the development avoided or substituted for any loss of quantity or quality of important environmental benefits and services provided by the site?	Losses (in quantity or quality) of important environmental services provided by the site before development	Compare the environmental services provided by the site before and after development. See if any important ones have been lost or damaged, and whether they were substituted or compensated for. Should cover all the following types of benefit/service: ▪ Global ecological security (including greenhouse emissions, biodiversity) ▪ Recreation (formal and	Any environmental capital, or landscape/ biodiversity /recreation etc assessment of the site (ideally both before and after), or environmental impact assessment and/or evidence of local peoples views - eg opinion surveys, consultation responses, objections, protest petitions.	Features of the development (actual or planned) designed to preserve/ mitigate/ substitute for important environmental services. eg replacement habitats, recreation areas. Any systematic process to identify what important environmental benefits the site provided and then frame development briefs/planning agreements in terms of preserving these.

		informal)		
		• Aesthetic (eg landscape appreciation, sense of place, wildlife appreciation)		
		• Historical, cultural and educational interest		
2.2 Has the development increased or enhanced any important environmental benefits and services already provided by the site, or secure new ones?	Gains (in quantity or quality) of important environmental services provided by the site	Compare the environmental services provided by the site before and after development. See if any important new ones are being provided.		Features of the development (actual or planned) designed to secure additional important environmental services from the site.

Aim 3: Ensuring Design Quality

Basis

The design quality (in the broadest sense) of a development is immensely important to the quality of life of the people who live in or use it. Public spaces can be a direct source of pleasure in themselves, provide for enjoyable public events and activities, and discourage crime, disorder and antisocial behaviours. Semi-public spaces can support and encourage community life and cohesion at the neighbourhood level. Private space can enable people to live comfortably and undisturbed, and express their own identity and preferences. Obviously physical design, however lavish and inspired, is not enough to make a place good to live in. But this theme is concerned with ensuring that the physical layout and detail of developments promotes and enhances, rather than obstructing, a good quality of life for residents.

Assessment approach

Design quality is a notoriously elusive and subjective concept. The questions above seek to break it down into a small number of concrete questions which can be answered in a more

explicit - and therefore transparent and testable - way than simply asking 'is this good design?' Some of these are quantifiable. However it is not possible to arrive at a quantified answer to the overall question simply by aggregating scores. The numbers are only evidence in support of answers to the questions, not actual answers.

Aim 3: Ensuring Design Quality

Questions	Indicator	Assessment method	Requisite data and source	Potentially supportive actions
3.1 LOCAL IDENTITY Is this a place of character and distinction that strengthens the existing community or creates a new identifiable community neighbourhood?	Degree to which design is responsive to local context. Is it a purpose-designed scheme or an off-the-shelf solution comprising standard building types?	Attitudinal survey of existing and new/prospective residents. Design appraisal.	Attitudinal survey. Detailed design drawings. Feedback from eg. Design review panels	Use local materials, design details, craftspeople Retain historical associations Distinctive architecture (gateways, landmarks etc)
3.2 BEAUTY Are the designs considered attractive?	Popularity of the scheme as reflected in the sales take-up Perceived attractiveness of designs	Design appraisal Attitudinal survey	Detailed design drawings	Invest in quality, bespoke design
3.3 PROVISION OF OPEN SPACE Is there sufficient suitable open space to provide for all the residents' needs and wishes (including informal/'untidy' recreation)?	Quality and amount of open space provision	Application of: ▪ Hierarchy of publicly accessible open space (see Llewelyn-Davies for LPAC 1992), namely local parks and children's play facilities within 400m ▪ NPFA standards for provision of recreational facilities ▪ Quality audit	Design drawings. Survey. Quality Audit.	Provide open space to NPFA and EN standards

3.4 ACCESSIBILITY & INTEGRATION	Level of integration/connectedness	Design appraisal Possible application of Bill Hillier (UCL - 'space syntax' laboratory	Plan of development in relation to context. Space Syntax model.	Locate bus stops (etc) within walking distance of homes; safe cycle and pedestrian routes to trip generators
Do the quality, location, frequency, convenience and image of walking, cycling and public transport facilities make them attractive alternatives to the car?	Comfort and perceived attractiveness/'image' of more environmentally benign modes of travel	Survey comfort and condition of: • Buses and trains • Shelters/waiting rooms near local facilities • Safe and convenient bicycle storage Survey public perceptions of status/image of public transport	Attitudinal survey. Audit of transport facilities.	Provide high quality (clean, comfortable, smart, reliable, frequent, quick) public transport services to trip generators. Campaigns to improve image of public transport.
Is there a network of convenient and comfortable routes within the site that link with the surrounding context favouring pedestrians, cyclists, public transport and other vehicles - and in that order?	Travel time to main destinations by public transport compared to car (including getting to and from the public transport/car parking, waiting time, uncertainty/unreliability)?	Assessment of journey times based on 1991 Census data and track into future using 2001 Census etc. Or by adding up estimates of typical times to walk to stop, wait for service, sit on the bus/train, make any connections, walk from stop to destination - with allowance for uncertainty/unreliability	Bus, tram, train timetables. Journey to work info. (1991 Census for established development at ED and ward level)	Provide frequent, reliable public transport services to popular destinations

Aim 3: Ensuring Design Quality

Questions	Indicator	Assessment method	Requisite data and source	Potentially supportive actions
3.5 SECURITY AND SAFETY [Cross-reference- quality of life] Does the configuration built form help safety and feelings of security?	Well-lit interconnected routes, with 'eyes on streets'	Design appraisal Attitudinal survey: asking occupants to identify 'fear zones' on plans.	Detailed design drawings. Survey.	Well-lit interconnected routes, with 'eyes on streets'
3.6 LEGIBILITY Does the design make it easy to find your way around and make the function and ownership of spaces clear?	Legibility of urban structure, eg. existence of landmarks, vistas and focal points	Design appraisal Attitudinal survey (mental mapping and orientation)	Detailed design drawings. Survey.	Structure of built form to aid orientation and legibility including landmarks, vistas and focal points
	Clarity of ownership	Design appraisal [figure ground drawings can be used]	Detailed design drawings	
3.7 PRIVACY Do gradations of public to private space fit with the cultural and lifestyle preferences and promote local community cohesion? Are the boundaries 'legible' to users? Are private spaces free from overlooking, noise and light pollution?	Clarity of privacy gradient between public realms and perceived 'fit' with user requirements	Design appraisal Attitudinal survey	Detailed design drawings. Survey	Design language with clear, consistent cues to boundaries between public, semipublic, private, provision of semi-public neigbourhood spaces
	Levels of overlooking, sound insulation, noise and light pollution	Physical measurement	Detailed design drawings	Layout to reduce overlooking and exposure of homes to noise and light (e.g. from main roads); high levels of sound insulation
3.8 PERSONALISATION Can occupants express their personal tastes and preferences in the way they inhabit and modify	Allowance for: a) Practical personalisation eg. building extensions, adaption to	Design appraisal (Prospective) user survey	Detailed design drawings Survey	• Choice of building specifications • Selection of materials for

their environment?	internal layout; b) Image of Place eg. customised to reflect individual tastes and values			building interior/exterior • Provision of semi-private space

Aim 3: Ensuring Design Quality

Questions	Indicator	Assessment method	Requisite data and source	Potentially supportive actions
3.9 DISABLED PROVISION Are buildings accessible to, and usable by, people with disabilities?	% built to disability standards	Design appraisal (% of lifetime homes as included within Part M of proposed Building Regulations)	Detailed design drawings	Design to lifetime homes' standard
3.10 ADAPTABILITY Can buildings and open spaces accommodate shifts in user requirements arising from changes in demography, technology, affluence and lifestyle fashion with the minimum resource costs?	How flexible are buildings?	Design appraisal. Adaptability is largely determined by configuration (height, width, depth), access arrangements, internal space standards and street thresholds.	Design drawings	Design buildings to be adaptable - eg 'long life, loose fit' - ease of moving internal walls/floors, giving rooms different functions, subdividing and/or amalgamating separate units
3.11 INTERIOR SPACE Do homes have sufficient space to meet user requirements?	M2 floor area per type of dwelling	Application of Parker-Morris space standards	Indicator 5 of DETR 'Housing Quality Indicators' Parker-Morris (in DoE, DB6 'Space in the Home')	Build spaciously.
3.12 CONSTRUCTION QUALITY Freedom from defects	Zero defects at handover	Project Management assessment of defects at handover.	Project manager	Is there some recognised building industry quality management system?

Aim 4: Achieving a High Quality of Life

Basis

The planning and implementation of settlements affects quality of life in many ways above and beyond physical design issues. This theme is about how the social and economic conditions of the settlement contribute to the quality of life of its residents, and affect the quality of life of others nearby.

Assessment approach

Concerned with the difference the settlement makes to access to social and economic provision. Should start from an assessment of local ÒneedÓ (more appropriate than 'demand'?). For instance, it may be far more sustainable to invest in an ailing park, library or school in the local vicinity and strengthen linkages to these, than to build new facilities.

Aim 4: Achieving a High Quality of Life

Questions	Indicator	Assessment method	Requisite data and source	Potentially supportive actions
4.1 Are high quality public service accessible to all residents? Does the development improve access to services for other local people?	Use of local amenities by local residents (and lack of travel to distant ones) [Ease of sustainable access to amenities - is considered under objectives 1 and 2]	Assessment from plans of scale and nature of amenities against planned population. Usage surveys once amenities operational (ensuring area of residence recorded) Site plans combined with walkways, public transport provision, etc	As Assessment Method. Prior provision/demand from baseline surveys if available.	Assess needs and demands for public services from residents and other local people and ensure these are met within the development or nearby. Possible needs might include: - Work places - School(s) and nurseries - Shop selling food and groceries - Post box and phone box - Medical centre - Chemist - Playground - Leisure/sports facilities - Local meeting place/community centre *they must be high enough quality for residents to want to use them*
4.2 Does the development help reduce	Levels of reported crime	From National Crime statistics, but unlikely to be	National Crime statistics, but likely to be a poor proxy	Redistributive local economic policies to reduce poverty,

Questions	Indicator	Assessment method	Requisite data and source	Potentially supportive actions
crime and residents' fears of crime?	per capita Fear of crime	readily available at low levels of aggregation. May be able to collect some data from local police force. Suggest take an 'all crime' measure, rather than weighting for different types. By survey of households, street stops, etc.	at the level of aggregation. As Assessment Method, but check for any pre-development baselines.	unemployment and gross inequalities, eg job creation/training, LETS and other community economic initiatives. Specific anti-crime measures such as presence of park keepers, station porters

Aim 4: Achieving a High Quality of Life

Questions	Indicator	Assessment method	Requisite data and source	Potentially supportive actions
4.3 Does the settlement make secure and fulfilling work opportunities available to all who want them?	Residents unable to get suitable work. Residents made involuntarily redundant/living in fear of redundancy	Review local economic strategy documents/economic development plans. Interview development project managers and selection of economic development agencies	Local economic development plans/relevant sections of planning documents Interviews with local 'key players' - local authorities, economic development partnerships, TECs, Govt Offices, RDAs etc).	AsJob creation, training, business development programmes *to the extent that they provide for local people's needs*
4.4 Will the settlement make it easier of harder for	Ratio of jobs created by the settlement to residents in the	Analysis of existing employment patterns (for residents and those working in area)		

other people in the area to get and keep jobs?	settlement	including • Share of employment 'on development' • Employment by sector, occupation, status and location • share of jobs 'on development' taken by residents of the development From review of development plans for the development at the outset, and tracking changes in employment levels and nature. Plans to influence the 'attractiveness' of the area as an employment site		
4.5 Can everyone in the settlement get appropriate training when they need it?	Range of job training accessible [including equal opportunity issues - see AIM 5.3]	Availability of learning provision within the development - in terms of places offered. Up-take of local provision: • by development residents • by wider population Share of post-16 population involved in	Household survey Survey of local providers, to record throughput, qualifications achieved, use by residents, etc. If include schools, performance tables etc.	Training provision degree to which it is tailored to the needs of local people and made accessible to them. *Does provision reach local people who need them, and not only people who already have the capacity/come from elsewhere?.*

		'learning' - defined as being involved in further/higher education within last 6 months Qualifications achieved per post -16 capita		

Aim 5: Enabling Equity & Social Inclusion

Basis

Inequitable distribution of quality of life benefits undermines the health and cohesiveness of a settlement as well as reducing the quality of life of those less well off. This theme is concerned with how the settlement reduces inequity, social exclusion and their causes. It thus complements the previous themes. They consider what benefits the settlement offers; this one considers how they are shared out - and in particular what is done to ensure they reach the people at the bottom of the pile and that they are not excluded. It therefore concentrates attention on questions of social mix and diversity as well as promotion of equal opportunities in the development process and completed settlement.

Assessment approach

Concentrates on processes and procedures for redistribution and tackling social exclusion. The questions try to identify the specific opportunities and initiatives in the local area that respond to equity and inclusion issues now, or are planned to be introduced over time. It distinguishes between inclusion and equity in the process of developing the settlement and inclusive characteristics of the completed settlement such as provision of affordable housing. While assessment includes measurement of the presence of concrete, quantifiable schemes such as LETS, much relates to improved processes and ways of doing things that are by their nature more qualitative ie involvement of voluntary sector in management.

Proxies

Tenure mix in this context is often used as a proxy for achieving social housing will allow poorer families to live in the settlement thus promoting diversity in the population. Likewise the presence of an EO mission statement is a proxy for pursuit of an equitable approach to the development of the settlement.

Aim 5: Enabling Equity & Social Inclusion

Questions	Indicator	Assessment method	Requisite data and source	Potentially supportive actions
5.1 What opportunities/initiatives are there for the intermediate labour market, LETS etc etc in the area? How is the voluntary sector being integrated to improve equity?	Existence/planning for schemes such as ILM, LETS (including voluntarily run) on employment, skills and learning ESF, SRB or other money available for ILM/LETS	Check on existence of these and any other schemes, initiatives Check on any outcomes so far	Source: Knowledge of interviewees Data: Supporting documentation as available	Promotion of LETS schemes, community enterprises, intermediate labour market activities. Involvement of community enterprises (etc) in implementation/management of the settlement
5.2 Does the settlement have a diverse social mix, and how is this achieved?	Age, income, ethnic, household type diversity (compared to general population).	Mix of housing types and tenures, including pepper-potted 'social'/'affordable' housing	Census data Appraisal of accommodation schedule and amount and treatment of social housing	
5.3 How are equity and equal opportunities promoted in the development process and when the development is occupied?	Correlation of indices of deprivation (eg low income, unemployment, debt, crime victim, illness, poor housing) with ethnicity, gender, age, sexuality/family/marital status	Check on existence of EO and equity instruments, statements	Source: Knowledge of interviewees Data: Supporting documentation as available	Tenure options to make the settlement open to the widest range of people (eg including affordable/short term renting, shared equity, shared ownership, self build) *do they reach the people they are aimed at, and not just make it easier for people who don't need them?* Existence and implementation of EO policy framework and equity mission statement

Aim 6: Maximising Participation

Basis

The level of participation of people who live and work in the settlement is of primary importance in judging its sustainability. Participation as a term is often used loosely but can be defined closely, as in Arnstein's ÒladderÓ of participation, with rungs ascending from information provision at the lowest level to citizen's control at the top. A number of groups are legitimate stakeholders in the new development: incoming residents, existing local communities, the developers, the voluntary/community sector, interest groups with local concerns, public agencies charged with managing the process etc. The key is to achieve representativeness, as a basis for good governance and developing local democracy.

Assessment approach

There are now a broad range of useful techniques for engaging these stakeholders in participation on sustainability issues. The questions in this theme are intended to see how far appropriate participatory techniques have been used and whether the results have been fed into the development process and helped shaped the settlement. For instance, participation by way of partnership has now become a mainstream way of bringing stakeholders together in an ongoing way to manage complex process of urban development and redevelopment.

Proxies

The existence of delegated decision making, local forums, working groups, and partnerships is used as a proxy for development of objectives of local democracy and decentralised governance. It suggests a good level of community input into, and sometimes decision making powers over aspects of the development of the settlement's sustainability objectives.

Arnstein's Ladder of Public Participation

Aim 6: Maximising Participation				
Questions	Indicator	Assessment method	Requisite data and source	Potentially supportive actions
How much say do the people who live or work in and near the settlement, or are otherwise affected by it have over: 6.1 the nature of	Nature and importance of decisions where local people: - make decisions for themselves - make decisions with the developer/council	Check for existence and memberships of indicated groups, range of decisions they have contributed to, influence they	Source; Knowledge of interviewees Data: Supporting documentation as available	Establishment, and delegation of decisions, powers and budgets to institutions such as management trusts. Support for, and routine consultation of: forums, working groups, partnerships on which

the settlement (including whether there should be one at all); 6.2 how it is developed and implemented; 6.3 how it is run and managed once it exists?	- recommend to developer/council - are consulted (and listened to!) Nature of the institutions which make different kinds of decisions about the development and management of the settlement: level of stakeholder participation in them	have had. Check for whether participatory techniques have been/will be used to make significant decisions about the planning, implementation and management of the settlement.	Source; Knowledge of interviewees Data: Supporting documentation as available	local people, community and voluntary organisations are represented. *Who is actually on them; how representative; what have they actually done/influenced?* Use of participatory techniques such as *visioning, planning for real. Have their recommendations been implemented?*
How lively is the community sector?	Number, spread and active membership of community and voluntary organisations; proportion of the population involved in community bodies	Identify community organisations and their memberships	Libraries, community council, local council for voluntary service or other umbrella bodies for records of voluntary organisations	Promotion/support for community/voluntary organisations.

Aim 7: Achieving Commercial Viability

Basis

This theme is concerned with the amount of public money needed to establish the settlement and keep it running. 'Public money' needs to include all forms of grant and subsidy, and 'opportunity costs' such as lower returns on land sales or rent/rate 'holidays'.

Assessment approach

The amount of public money needed firstly to establish the settlement and subsequently to keep it running should be distinguished. Regeneration policy may justify heavy initial expense, for example on land remediation/decontamination. Higher than usual 'up front' costs may also

be justified for higher design and build quality or incorporation of sustainability infrastructure. The extra cost of running the settlement can be viewed in two ways. The first is by comparison with the cost per person of public-funded services elsewhere (e.g. does it cost more per person to provide schools, sewerage, dentistry etc in the settlement.) However if public services cost more per person in the sustainable settlement, this might be because they are better services, so it would also be interesting to compare the cost per unit of service delivery.

Proxies
It is tempting to use leverage of private funding as a proxy. But this is completely misleading. There is no virtue in spending (or attracting) more private money in itself, but only if it saves public money.

Aim 7: Achieving Commercial Viability

Questions	Indicator	Assessment method	Requisite data and source	Potentially supportive actions
7.1 How much public funding was required to make the development happen?	Public funding (per resident) required to enable the development	Review of development funding plans/project manager interviews	Development feasibility study.	Potentially supportive actions Actions to maximise private sector input/leverage *where the private money reduces the public money needed.* Action to maximise the economic self-sufficiency and closure of the settlement (eg including businesses to meet residents' needs)
7.2 Is any extra/special public funding needed to keep the settlement functioning?	Public funding additional to normal provision (eg for health and education) per resident per year, or per unit of service delivered	Compare public service budgets with norms elsewhere	Budgets attributed to the settlement; national average figures. (Local authority SSAs?)	

Aim 8: Integration

Basis

As explained in Chapter 2 a sustainable settlement is one that reconciles and combines all the previous themes rather than just trading them off against each other. This theme seeks to home in on some particularly important areas for integration. The unifying idea is to improve (as it were) the price to be paid in terms of one objective for the achievement of another.

Assessment approach

The first question is essentially about reducing the environmental resource price of comfortable living, in other words about reducing the amount of resources people need to consume in order to live comfortably. The amount people need to consume may differ from the amount they actually consume (which is covered in theme 1). Consumption below need is a measure of deprivation (= failure to provide decent quality of life); consumption above need shows some combination of luxury living, carelessness and waste. The final indicator deserves particular mention. Aim 2 (design quality) asks whether people have enough room to live comfortably. But Aim 1 is concerned to minimise the land and other resources used in housing. The apparent contradiction can be explained as follows. Sustainability is concerned with seeking the best possible ratio of comfortable living conditions to land occupied (and other resource used). There are three linked steps to achieving this, all of which we should be measuring:

- Reducing the amount of internal space people need to have to experience a given level of comfort, through the sorts of means listed at 8.1;

- Providing everyone with enough internal space to feel comfortable (which we're currently taking Parker Morris as a proxy for);

- Providing this interior space at the minimum cost in land and other resources (which is where urban design solutions become important.)

In other words comfort/land = comfort/internal space x internal space/land. We want to increase comfort and reduce land so we need to stretch these two intermediate ratios.

The second question turns this idea on its head, and looks at the quality life cost of more environmentally sustainable lifestyles - that is, how much extra money, time and effort does a household have to commit to reduce its consumption of energy, car travel or other resources? In a sustainable settlement, the sustainable options should be cheaper and easier: to the extent they are not, the settlement is relying on private altruism to achieve public policy goods.

The third question attempts to operationalise the ideal of achieving multiple benefits simultaneously. The fourth considers how far the settlement can ameliorate income inequalities by reducing the amount of privation, exclusion and disadvantage which a low income causes. The fifth is an attempt to recast the traditional concept of standard of living in more sustainable terms, so that instead of measuring attributes of material wealth it looks at how much time and energy remains after reaching these standards.

Aim 8: Integration

Questions	Indicator	Assessment method	Requisite data and source	Potentially supportive actions
8.1 Does the development enable people to live well with less resource consumption?	Energy *required* to live a pleasant life (kWh/person year)	Add up the energy a typical resident needs to use to keep warm at home, clean body and clothes, cook, read, be entertained etc [Should include all forms of energy other than renewables produced directly on the site, since consumption of any 'portable' form of energy, even off-site renewables, has an environmental opportunity cost]	Estimate energy actually needed from homes energy rating, appliance rating, lifestyle assumptions	Make buildings and appliances as energy efficient as possible.
	Motorised mobility *required* to live a pleasant life (vehicle mileage incurred per person per year)	Add up the motorised mileage a typical resident needs to do to get to day-to-day amenities	Weighted 'basket' of needs (eg 3 trips a week to school, 1.5 to food shop, 0.25 to hospital ...) Or aggregate all residents. Or (middle way) weighted average of a few selected representative	Provide amenities within easy non-car reach. Make driving less convenient than alternatives.
	Waste *unavoidably* produced in a pleasant lifestyle	Quantity of waste which people can't avoid producing in normal lifestyle and can't readily	Type of wastes for which there are practicable reuse/recycling routes; quantities of the other	Require/encourage retailers and service providers to minimise wastes. Provide convenient recycling, composting facilities.

		reuse or recycle (including organic and sewage)	wastes people can't avoid producing	
	Space *needed* to live comfortably	Volume of built space needed for comfortable life	Differences from average development 'product' (? if so this needs to be explicitly benchmarked) in needs for private space	Provide facilities that reduce the amount of space people need in their own homes for comfortable lifestyles, eg shared cars, workshops, laundries, gardens, visitor accommodation. Promote multiple use of community facilities (eg school halls, gyms, swimming pools) Make it easy for people to increase or decrease the amount of space in their homes (eg modular construction)

List of Abbreviations

BRE	Building Research Establishment
CHP	Combined Heat and Power
DETR	Department of the Environment, Transport and the Regions
DoE	Department of the Environment
DTI	Department of Trade and Industry
ED	Enumeration District
EN	English Nature
EO	Equal Opportunities
ESF	European Structural Fund
ILM	Intermediate Labour Market

LCA	Life Cycle Analysis
LETS	Local Enterprise Training Schemes
LPAC	London Planning Advisory Committee
NPFA	National Playing Fields Association
RDAs	Regional Development Agencies
SRB	Single Regeneration Budget
SSAs	Standard Spending Assessment
TECs	Training and Enterprise Council

Chapter 5 Applying the Framework

5.1 Introduction

5.1.1 Chapter 3 considered the need to focus on outcomes and concluded that a key element of this research is the importance of distinguishing the ends from the means used to achieve them.

5.1.2 However an outcome related focus presents practical difficulties for appraisal. Outcomes such as energy use can only be measured directly once a millennium community (or other sustainable settlement) is completed and occupied. It may be hard to reach reliable conclusions about whether a new community is promoting equity and quality of life until it has been functioning for some years. The appraisal framework therefore needs to be applied differently at different stages of development. The last column of the framework entitled 'potentially supportive actions' contains suggestions for 'input' and 'process' measures that may need to be used as proxies where outcomes can not be measured directly. However it is essential to remember that these are only means, and to avoid falling into the trap of promoting them as if they were ends in themselves.

5.2 Appraising at different stages of development

5.2.1 This chapter contains guidance on using the framework not only as a means of evaluation but also as a practical tool for use at each stage of a settlement's development. Seven different stages of development are considered:

1. Site selection and design;

2. Setting the objectives;

3. Preparing competition briefs;

4. Evaluating tenders and awarding contracts;

5. Benchmarking;

6. Development phasing and monitoring ongoing progress;

7. Informing the user.

5.2.2 Stage 1: Site selection

5.2.3 The evaluation framework can be used as a tool to aid site selection. As noted in the introduction, the evaluation framework contains potentially supportive actions that can be used as necessary 'proxy' questions to provide ideas of how the objectives outlined in the first column can be achieved. For example, the nature and context of each site affects the potential for sustainability gains. A South sloping site will have more opportunities for passive

solar energy; one near good public transport services will have more opportunities for reducing car use. There should be consideration of both the existing and potential ease of delivering 'sustainability infrastructure' such as Combined Heat and Power or linked housing and employment.

5.2.4 Realisation of the potential for sustainability gains will only come when people use the buildings, transport infrastructure and so on as intended, (see stage 7-informing the user). When decisions are being made about built form and resources, consideration should be made of (for example) the consequences for attractiveness to different prospective residents, and the implications for social mix and transport intensity. Integration is the key. At this stage, judgements should also be made about how realistic and deliverable the aspirations are.

5.2.5 Stage 2: Setting the objectives

5.2.6 The eight sustainability aims should be included in the objectives for all development projects to ensure that the projects are actually directed towards their achievement. The starting position on these aims should be measured before development starts to provide a baseline against which the development's effects can be assessed.

5.2.7 Stage 3: Preparing competition briefs

5.2.8 It is crucial to incorporate the aims within competition briefs and express objectives for these to be realised. Both the Allerton Bywater and Greenwich Briefs for development concentrated on physical aspects of development such as resource consumption, environmental capital and design quality with comparatively less attention to aspects such as social inclusion and community participation. The other test places embodied some sustainability aims (albeit obliquely) more significantly than others. Poundbury concentrates on design quality (as set out in Prince Charles' Vision for Britain), with less attention to resource consumption or participation. Waltham Forest HAT pays most attention to participation and social inclusion.

5.2.9 Stage 4: Benchmarking

Benchmarks provide a reference point against which objectives can be measured. The only objectives that appeared to have benchmarking data currently used in both MV briefs are energy efficiency and construction quality. The absence of suitable benchmarks undermines the ability to ensure targets are met by developers. The following four suggestions could assist in establishing effective benchmarks:

- Ensure benchmarks are explicitly tied to measurable outputs. They should not, for instance, be expressed as a requirement to be x % lower than 'the national average'. This then leads to questions (as in the Allerton Bywater winning submission) as to 'what we all come to finally agree as being the ... base data for comparison', (Aire Regeneration Partnership, 1999);

- The benchmarks could be enforced by incorporation in Lease Agreements (to be enforced by the landowner) and Section 106/Planning Conditions (to be enforced by development control);

- A review of benchmarks could be built in to ongoing development programmes to ensure that targets keep up with changing technology and contextual influences. This could be achieved by the targets being reviewed after, for example, a five year time scale to ensure that later phases of development remain up-to-date.

5.2.10 The next section considers what sustainability targets might be for each of the aims, taking each in turn:

5.2.11 Resource consumption

5.2.12 IPCC has suggested as a minimum first step a reduction of about 60% in greenhouse gases world-wide. If we add to this the 'convergence principle', i.e. working over some decades towards a roughly equal per capita share-out of greenhouse emissions over the world's population, this rises to a roughly 90% cut compared with current levels. Of course we can decide how to apportion this between different greenhouse gases, different sectors, different regions of the UK etc. Some could come from dematerialising economic production, some from developing renewable energy sources. Since it is technically harder to achieve savings through retrofit than new build, this suggests that new housing should conceivably seek to achieve more than its share of the savings. (i.e.. A greater than 90% reduction over all the greenhouse emissions in aim 1). This is technically possible: there have been numerous demonstrations of virtually zero energy houses, and most humans throughout history have managed without any car travel. Even if this is seen as unrealistically extreme, it would be hard to claim a settlement was making a serious response to this sustainability challenge with less than a 75% cut in greenhouse emissions overall - which will require 'step change' in performance on all the greenhouse criteria of theme 1.

5.2.13 Environmental capital

5.2.14 This objective should aim for no net loss of environmental benefits and services identified as important. This would require a full study of the environmental capital for every significant development, and substitution for any benefits damaged or lost. Of course, this is easiest to achieve if all new development is concentrated on land that provides few benefits or services at present. This criterion does not correspond to the greenfield/brownfield split. Some previously built land within urban areas provides many important benefits; much mediocre countryside provides very few.

5.2.15 Design Quality

5.2.16 The aim should be to achieve the best of all the separate developments together. Specifications should be set as per resource consumption. For example, the quality of open space or the % of homes built to disability standards.

5.2.17 Quality of life

5.2.18 The ideal situation would of course be that there were no external or circumstantial causes of human misery, (i.e.. everyone is safe on the streets, secure in employment, free to develop). However, suitable benchmarks could be based on the best performing areas in Britain in terms of % unemployed, amounts and seriousness of crimes committed per person per year, residents of school age achieving 5 or more GCSE A-C passes etc.

5.2.19 Equity and social inclusion

5.2.20 Current policy considers there to be much social inequity, but how much inequity is the 'optimum' or 'ideal' level is a politically loaded question. It would not generally be acceptable to suggest that total income equality was desirable - the last time anything like this was seriously on the political agenda in the late 1970s it was decisively rejected. Evidence suggests that lower levels of inequality found anywhere are better for health and cohesion.

5.2.21 Participation

5.2.22 It is too simplistic to suggest there should be total participation of everyone in everything. But there is clearly a 'subsidiarity deficit' at local level in UK at present. Local communities can't for example decide to have (and pay for) much better public services

5.2.23 Commercial viability

5.2.24 This is probably the easiest objective to benchmark at the outset as 106 Agreements etc. will include the amount of funding that will be provided by public subsidies when it will be provided and for what it should be used. What is more difficult is establishing the level of public funding that is necessary to keep the settlement functioning i.e.. for schools, libraries, health services etc.

5.2.25 Stage 5: Awarding contracts

5.2.26 When a project moves on to the negotiation of contracts and funding packages, the main appraisal question should be whether explicit measurable targets are set for the full range of sustainability criteria and, if so, with what sanctions. Targets not backed up with any contractual responsibility on particular actors for their achievement, or benchmarked against measurable outcomes and penalties for failure, should be viewed sceptically.

5.2.27 Selectors should consider which of the prospective schemes achieves the best fit between the different sustainability aims. At a very practical level, this might give rise to a discussion on the trade-offs such as minimising resource consumption whilst ensuring high quality urban design. An example of this is the possible contradiction of spacing buildings close together to minimise land consumption, maximise convenience of use intensity, whilst creating tight urban form, versus spacing buildings apart to optimise passive solar gain and reduce energy consumption.

5.2.28 Stage 6: Phasing the construction process and monitoring ongoing progress

5.2.29 The phasing of development can have wider behavioural consequences which can influence sustainability performance. For example, Vienna's City Council starts running empty trams every five minutes all day to new residential areas as soon as the first few residents move in. They take the view that if instead they waited until there was a 'viable' population to support the tram service the first arrivals would have already slipped in to car-dependent lifestyle patterns that they would then never change.

5.2.30 In contrast, at West Silvertown, the LDDC provided car-based infrastructure in advance of new public transport facilities. The majority of houses have two parking spaces and easy access onto the road network. West Silvertown is not even signposted from the nearest DLR stop at Royal Victoria and a new station adjacent to the site is not proposed for several years (i.e. once there is sufficient catchment to run it economically). Yet the likelihood is that once the station is eventually provided, people will be reluctant to change entrenched car-based travel routines and make use of the new public transport on offer.

5.2.31 Phasing to promote sustainability requires co-ordination between different agencies and an overall management framework within which each agency can behave 'inefficiently' in terms of its own remit (e.g. running frequent empty trams to half-built developments) for the sake of broader policy goals. A clear strategy should be established of how the innovations included within competition proposals will be achieved. There is no point promising to achieve a 30% target of local labour, for example, if the mechanisms are not in place to ensure delivery. For example, at West Silvertown, there were no mechanisms in place to ensure local labour was used not only in the construction process but also in schools, shops etc. Lessons could be learnt here from Greenwich who have an established agency in place known as Greenwich Local Labour in Business who could provide information and guidance of how this could be better achieved in Phase 2.

5.2.32 Stage 7: Promoting sustainable lifestyles

5.2.33 Users of the development need to be made more aware of how they can make their lifestyles more sustainable. It is important at this stage to make sustainable lifestyle patterns easier, more convenient and, if possible, cheaper. Users need to be made more aware of the sustainable options on offer which should be seen as an attractive, beneficial and viable option. The 'greener lifestyle' is often seen as the option that will require more effort with no personal benefit.

5.2.34 For example, high standards of provision for walking and cycling will only reduce car use if the amenities people want are easily accessible by non-car means. In particular, local provision of public services will only promote community cohesion to the extent that those services are (and are perceived to be) of high enough quality that people choose to use them.

Chapter 6 Lessons for promoting sustainability in settlements

6.1 Introduction

6.1.1 This chapter identifies good practice lessons for promoting sustainability in settlements. It is based on analysis of each of the five test places - concentrating in particular on the two proposed Millennium Villages, but also drawing on examples from elsewhere considered to represent sustainable communities, either in their entirety or in certain respects. The chapter aims both to promote good practice and to identify problems and approaches that are counter to sustainability objectives, with possible ways these might be overcome with reference to other UK or international projects that point the way forward. Each sustainability aim is addressed in turn.

6.2 Minimising Resource Consumption

6.2.1 References to 'sustainability' in test place development briefs and proposal documents usually allude to measures to reduce resource consumption. It is these that are conventionally considered the 'green' or 'environmental' project components (along with landscaping for biodiversity). The desired outcome, to reduce greenhouse gases, also lends itself to quantifiable measurement. To varying degrees measures to reduce resource consumption are being taken up by mainstream developers:

- energy efficiency and consumption (such as double-glazing and high performance insulation);

- using higher density forms, which minimise land take;

- suppressing car use by lowering parking standards (albeit often grudgingly) and supporting public transport;

and to a lesser extent:

- embodied energy;

- reducing water consumption (grey water recycling);

- use of environmentally benign materials.

6.2.2 The five test places illustrate the disparate levels of take-up. The more conventional Waltham Forest (confined to improved insulation) and Poundbury are at one end of the spectrum and the two Millennium Villages as intended beacons at the other (if the performance targets are actually reached). West Silvertown could be positioned between these two poles with a mixture of the extremely conventional and more innovative.

6.2.3 Energy efficiency of buildings in use

6.2.4 The crescent block in West Silvertown, intended as a model of energy efficiency, is the only component of any of the test places proven to have resulted in low fuel bills through passive solar design and high insulation specifications. Waltham Forest HAT has high standards of insulation specified to reduce fuel bills and noisy neighbour complaints, though these have yet to be measured.

6.2.5 The two Millennium Villages intend to make headway on energy efficiency and consumption matters by concentrating on passive solar design and insulation. This has not yet extended to innovative generation. Proposals to introduce solar panels, windmills and CHP to Greenwich are included within the Masterplan and subsequent Committee reports, and the design of the units facilitates their subsequent inclusion should the technologies become more viable at a later date.

6.2.6 Allerton Bywater has most advanced proposals with orientation and housing design based on solar gain. Certainly the energy consumption targets (at 15 kWh/m2/yr compared to, say, the IBA 2000 experimental houses in Berlin at 30kWh/m2/yr) are challenging. However, proposals for the Village Company to bulk buy electricity, gas and water at commercial rates resulting in 20-25% savings to residents could conceivably result in more profligate use.

6.2.7 No scheme presently proposed in the UK, however, approaches the standards for building for energy efficiency at the pioneering Nieuwland project in Amersfoort, The Netherlands (see illustration on page 53). Here REMU, the Regional Energy Distribution Company of Utrecht, have initiated the construction of a new settlement comprising approximately 500 houses, a cr che, a sports hall and nine school dwellings fitted with solar cells, or 'photovoltaic modules.' This has the capacity to generate 1 megawatt of electricity.

6.2.8 Water consumption reduction proposals

6.2.9 With the need to reduce water consumption widely accepted and relatively easy to address in design, measures to reduce water consumption could be expected to be given greater prominence, particularly in the MV projects. However, at both Greenwich and Allerton ground conditions have proven to be a huge constraining influence. The approach taken by English Partnerships to land remediation has prevented the provision of a reed bed grey water recycling and filtration system of the kind introduced in the car free development at Gorgie Goods yard project in Edinburgh, for example. The Allerton Bywater colliery site was presented to the development consortium and design team, with a compacted hardcore capping layer over the waste, making it impossible to dig out space for reedbeds. At Greenwich, the nature of the waste from the former gasworks meant that this had to be capped.

6.2.10 Allerton Bywater is the most adventurous test place in proposing water reduction measures, with systems proposed for surface rainwater to be fed into a reservoir and used to water allotments, and for homes to be fitted with a "grey water recycling kit."

6.2.11 Neither MV, however, is as imaginative as the Ecolonia project in the Netherlands, which is centred on a reed-fringed pond (see illustration on the previous page). This is heralded as the most important EU-funded low-energy housing demonstration project to date, which incorporates water reduction measures as part of a much broader set of aims. The project has been promoted by NOVEM, the Dutch Government's Trust for Energy and the Environment, and is based on a Masterplan that provides the framework for nine different architects, each given design priorities covering the following:

- use of rainwater;

- use of passive and active solar energy;

- energy saving strategies;

- reduction of water consumption;

- recyclability of building materials;

- organic architecture;

- durable materials;

- flexible ground plans;

- sound proofing;

- healthy building materials.

6.2.12 The performance of buildings in Ecolonia is subject to on-going testing, evaluation and monitoring. This is key, because it is the outcomes of these measures that matter. To illustrate this, water companies now recognise that customers do not always respond to metering in an economically rational way. Apart from the poor, most people find the charges too low to be a significant incentive, and metered customers may take entitlement to be a right because of payment and be less responsive to public interest appeals.

6.2.13 Reducing greenhouse gas emissions from daily travel

6.2.14 Current planning orthodoxy, reflected in different ways in each test place, is concerned with promoting a package of input measures in the *hope* that these will be effective in reducing vehicle emissions. Such measures include: - promotion of walking and cycling; - encouragement of public transport; - restrictions on car use and parking provision; - minimising the need to travel in arrangement and density of land uses in relation to public transport facilities.

6.2.15 However, none of the test places offers any evidence that these measures, when applied, have made a significant difference to the actual quantity of CO_2 emissions.

6.2.16 There are some ways that more environmentally benign transport is being promoted within the constraints of the current macro context. The departure from conventional highway standards in Poundbury, for example, is to be applauded in creating a pedestrian-oriented layout, now highlighted as best practice in the 'Companion Guide to DB32' (DETR, 1998a). However, parking standards remain high (negotiated down from 2.5 to 2.3 by the developer) and contrast with the 1:1 ratio in Waltham Forest (considered high in retrospect by a key HAT employee when interviewed), and 0.75 in Allerton Bywater. West Silvertown, with a parking standard of 1.5:1 but effectively 2:1 (as this standard does not take account of the shared courtyard), and highway design that makes driving the easiest option, could be judged as the test place that most encourages car use. (see 6.9 for further commentary on the impact of this).

6.2.17 Greenwich promises to have exemplary public transport facilities with the underground, LRT and bus feeder service all close at hand. Anything less than high patronage once facilities are in place would represent a failure. At present, West Silvertown is relatively poorly connected, though the DLR airport link extension will provide a station adjacent to the site. But the conventional approach to unrestricted parking and use of two-storey suburban terraced housing and land-hungry car parking in parts of the site represents a missed opportunity in a location where higher density forms would likely have been viable.

6.2.18 None of the test places has yet to demonstrate the full integration of land use and transport, or what has been described as 'Transit Oriented Development' (Calthorpe, 1993). This takes as its starting premise the need to create 'walkable' communities, with a mix of uses and highest densities focused on public transport hubs.

6.2.19 The risk with only providing public transport after the development is finished, as at West Silvertown, is that an entrenched car borne culture will undermine rail use once the station is complete. This reflects a larger issue whereby operators need to have sufficient occupant demand before services are provided (also discussed in Chapter 5). To reverse this, additional financial supports and requirements are needed, such as those planned for Kent Thames Side at Ebbsfleet where development is limited to specific quantities until such time as the necessary public transport provision is in place. At Bluewater, the developers underwrote bus operators to ensure consistency in service provision from the outset. This should be introduced at the earliest opportunity to ensure that lifestyle patterns are imprinted on the scheme from the outset.

6.2.20 As edge-of-town locations, Allerton Bywater and Poundbury offer informative comparisons on approaches to transport. Poundbury should be commended for initiatives to minimise car travel, including a walkable layout, restricted car regime, encouragement of a small neighbourhood supermarket and employment opportunities and measures to reduce the school run (see 6.5.3). However, it will be essential to monitor resident behaviour to find out whether such measures in reality influence travel behaviour and modal split. Allerton Bywater also has a compact design conducive to walking and cycling, with intended car-sharing schemes. But in both places, the edge location, small settlement size and low degree of self-sufficiency is likely to generate levels of car use and hence CO_2 output far higher than equivalent inner urban development. Alternatives to car use are limited - Poundbury is only able to sustain a small bus feeder service and in Allerton Bywater plans indicate that existing

service levels will remain unchanged, with improvements confined to possible bus priority lanes, timetable information (at stops and via an intranet) and waiting facilities.

None of the schemes analysed is proposing any particularly innovative demand reduction strategy or initiatives, such as that currently being developed by the London Borough of Westminster, where parking permits are issued free of charge to drivers of electrically powered vehicles. Other London authorities are now following Westminster's lead.

6.2.21 Greenhouse emissions from the construction of buildings

6.2.22 As mentioned in the Allerton Bywater proposal, "with a low energy home it may well be that half of the energy used in the house, over the period of the mortgage, is used before the building is even occupied" (Aire Regeneration Partnership, 1999a Vol. 2 p.108), emphasising the importance of reducing embodied energy.

6.2.23 Once again, the test places indicate contrasting levels of advancement. Waltham Forest HAT and West Silvertown are the most conventional, no account of embodied energy appears to have been taken. Poundbury has implicitly made some headway by using relatively local materials (such as Portland stone) to reflect local vernacular traditions, although it could be argued that such quarrying is environmentally harmful.

6.2.24 Both MVs seek to set new standards in addressing embodied energy. In Greenwich, the intention is to achieve a 50% reduction in embodied energy compared with the developer average. This was initially to be achieved by using timber flooring and timber-framed cladding. Later plans changed to steel and prefabricated concrete, but the developers reverted to relatively environmentally-unfriendly bricks (quarried clay).

6.2.25 Allerton Bywater proposals include using an under tenanted industrial estate to manufacture modular pre-fabricated pre-cast concrete on site. Light frames will further reduce embodied energy, whilst achieving long life, low life-cycle costs and high thermal performance. The use of recycled aggregates is also "to be considered." This is an area where the MV programme could possibly push further.

6.2.26 Land take

Table 3 illustrates the respective densities for each of the five test places. This compares each place according to habitable rooms/hectare, as this information was readily available. However, we suggest m2 of land per person is used as a more meaningful measure of the amount of people in a given area in the evaluation framework.

6.2.27 An evaluation of this 'space intensity' of living would be easier and prospective purchasers better informed if the UK adopted the continental standard of advertising properties by floor area, rather than the number of rooms.

Table 3: Comparative densities for the test places	
TEST PLACE	**DENSITY (habitable rooms per hectare)**
Greenwich MV	70
Allerton Bywater MV	45
Poundbury, Dorchester	40
West Silvertown	49
Waltham Forest HAT	105

6.2.28 Waltham Forest HAT easily exceeds the other test places, using a fairly traditional compact urban form within a grid of streets. However, the strategy agreed following community-planning exercises has been to *decrease* the density (compared with the former 1960's estate) and *increase* open space. Once again residents of the area have had to adjust to a fundamental change in living environment - from high-rise flats to low-rise houses. One resident canvassed informally during the course of this study felt the process had swung too far, expressing regret that the choice to live in flats had not been made more widely available.

6.2.29 Greenwich is set to exploit its strategic inner London location with a much higher density than both Allerton Bywater and Poundbury, which occupy less land than conventional suburbs by using terraces that relate to the traditional vernacular and built forms of each area. West Silvertown represents an unusual hybrid of medium-rise riverfront blocks and relatively low terraces behind.

6.2.30 The brownfield-greenfield debate for choice of future MV sites is also relevant. Development of greenfield land, such as Poundbury, increases the amount of virgin land take. Sustainability compared to brownfield development depends on the gains and losses of environmental services from particular sites, as well as the influence on travel patterns. Some 'brownfield' sites have more wildlife and/or recreational value than their Greenfield equivalents. Conversely, some 'brownfield' sites, such as ex-air bases and arguably the former coalmines such as Allerton Bywater, are far worse for public transport accessibility than some 'greenfield' sites such as farmland in rail corridors.

6.2.31 The benefits of pursuing the 'Compact City' model are widely acknowledged (Jenkins et al, 1996), in essence it is a "dense and socially diverse city where economic and social activities overlap and where communities are focused around neighbourhoods" (Rogers, 1997). This need not be the case and yet the opposite 'bigger equals better' attitude is to

encourage unit sizes that may exceed resident requirements. Edinburgh and Glasgow, for example, are places where high building densities are achieved with generous internal space standards and high design and construction quality - and where living in a flat in the centre is a prestigious lifestyle option that many more affluent households choose.

6.2.32 The answer lies in trying to encourage the best possible ratio of comfortable living conditions to land occupied (and other resources used). The evaluation framework suggests a methodology for achieving this (see 1.6, page 25). A comparative assessment between the test places, once initial phases have been completed, would be extremely informative.

6.3 Environmental Capital

6.3.1 The five test places provide interesting contrasts in terms of the environmental capital gained/lost as a result of development. Poundbury is controversial as the only greenfield scheme, although arguably the lost agricultural productivity is offset by a range of environmental services (from recreation to job creation). At the other end of the spectrum is Waltham Forest which, in terms of land use, replaces 'like for like', though the redevelopment is widely felt to have generated considerable improvements to the aesthetic and living environment.

6.3.2 The other three schemes are all brownfield. West Silvertown and Greenwich provide the most stark transformation from their former state (a derelict dock-side and gasworks respectively). Allerton Bywater was selected as a site both to put the disused coalfield to productive use and, more importantly, to help regenerate the existing village. The relationship between a given site and its environmental context is key to any assessment of its sustainability. Even the environmental services of the heavily polluted Greenwich Peninsula were not 'zero' prior to development if one counts: a) the on-site shoreline habitats; b) the Peninsula's place in the 'big' landscape of the river estuary; and c) the off-site services in neighbouring parts of the Borough that are available to prospective village users and occupants. It is encouraging that Greenwich MV proposals include provision for an 'eco-park', increasing biodiversity and recreational value.

6.3.3 The approach to land remediation also influences the potential environmental benefits that can be provided. In Allerton Bywater, the sustainability objectives are described as:

- *Minimise the import or export of ground material;*

- *Retain site features of potential value, such as mature vegetation;*

- *Optimise landform for solar gain, daylight and protection from exposure;*

- *Maximise soil productivity to encourage plant growth for gardens, public spaces and allotments;*

- *Retain and reuse drainage and ground water.*

(Annex 8 of the Aire regeneration Partnership proposal Report 2)

6.3.4 However, these goals have been constrained by the approach taken to remediation prior to the competition process - i.e. a finished landform with the colliery waste capped by hardcore. The capped layer and topsoil were imported (increasing embodied energy), the landform constrains solar gain and wind shelter, and the capping prevents the penetration of roots and surface water. The delivery process that predetermined this approach is clearly not helping to create a sustainable settlement (discussed in Chapter 7).

6.3.5 Greenwich MV faces similar constraints. The land is too contaminated for food cultivation but gardens raised up on podiums and roofs have been proposed which offer this potential, although their primary purpose was to assist car parking provision.

6.4 Design Quality

6.4.1 Each test place shows that urban design has an immense bearing on all the objectives - from resource consumption to quality of life and commercial viability. Although both MVs intend to set exemplary standards in representing new design thinking, Poundbury is one of the most high profile attempts nationwide to embody quality of design as its main feature. The implementation of a visionary Masterplan is well underway, arguably at the expense of a more inclusive planning process.

6.4.2 Creating local identity

6.4.3 The evolution and, ultimately, identity of Poundbury has been shaped around the desire to respect the local vernacular and use local craftsmen. Each house in the initial stages of Phase I was purpose-designed, which has inevitably been much slower, more labour intensive and thus more costly than the standardised approach of volume housebuilders. For design of the latter housing packages of Phase One the approach has been modified, with attention paid to getting the public-private interface right by creating distinctive facade arrangements, and then allowing the housebuilder to use a more standardised palette of internal layouts. This provides an instructive compromise to the recurrent dilemma of trading-off the competing demands between the economic use of standard types and the creation of a unique design response tailored to the locale.

6.4.4 Much of our Georgian/Victorian/Edwardian built heritage demonstrates that a certain standardisation of building types (in scale, preparation and appearance) and public spaces (squares, crescents, terraces etc) is no bad thing when applied with an appreciation of site context (landscape, topography etc). This appears to be the approach proposed in Allerton Bywater where twelve dwelling types are to be introduced, each selected on the basis of the solar gain opportunities of its intended position. An innovative response to solar design is thus blended with an arrangement of streets, blocks and density that relates to the traditional Yorkshire vernacular.

6.4.5 Accessibility and Integration

6.4.6 Issues related to design of streets and public transport facilities are discussed in 6.5, but in seeking to maximise integration between the site and its context, two key issues are evidenced - the approach to severance and through routes.

(i) Severance

6.4.7 The problem of severance is most keenly observed at West Silvertown, where the busy North Woolwich road runs alongside the project area and cuts off the new neighbourhood from its surroundings, turning it into a separate enclave, rather than an integrated piece of the urban fabric. This perhaps reflects a top-down approach to opening up new areas by providing highways (rather than streets) first and buildings later (in this case by LDDC, but the same is also evident on the Greenwich Peninsula). Lyngby in Copenhagen provides a good example of how this might be remedied, providing wide, direct pedestrian crossings at surface level over a busy road (see below). In West Silvertown, these will be even more acutely needed to help access the proposed new DLR station.

6.4.8 Barcelona's new seafront quarter is another example of best practice in this regard. Here the main motorway into the city centre was not built in a cutting because this would have interfered with underground water movements. Instead the ground level was built up 6m both side of it, and new blocks of housing, shops, garden squares etc. were built over the top of it to stitch the new quarter securely into the existing one the other side of the road.

(ii) Through Routes

6.4.9 The fundamental need for centres to be positioned around or alongside traffic conduits (or 'High Streets' as they used to be called) is frequently overlooked. Through routes provide passing trade and the opportunity for the creation of public transport corridors. Commercial uses rarely survive without this life source. In West Silvertown, for instance, the mixed-use centre is located on the dock-side, away from any through route, and is experiencing difficulties. Allerton Bywater's 'ecological street' also risks encountering the same problems. This "pedestrian-friendly tree-lined boulevard" (Aire Regeneration Partnership, 1999) appears insufficiently integrated into the surrounding route network to provide the activity required to support commercial uses.

6.4.10 Adaptability and Personalisation

6.4.11 This is one of the principal areas where both MVs have sought to innovate. The desire to create flexible (i.e. long life - loose fit) buildings giving prospective occupants maximum choice in design of their living environment whilst enabling future adaptation and change in use is addressed in differing ways. In Greenwich, the ambition is to develop an 'open building' system pioneered in the Netherlands in the 1960's, which comprises a steel structured frame, a unit shell and then an adaptable kit of parts that can be selected by prospective purchasers (comprising external cladding and internal partitioning).

6.4.12 In Allerton Bywater a different system is being tested, providing a shell that enables prospective owners or tenants to work with the housing developer to customise internal fittings. Additionally, every dwelling is to have a front and rear garden that enables a rear extension to be provided later if necessary and each unit is said to be capable of conversion to live-work (with potential office-space in the hallway). West Silvertown has constructed hybrid live-work units, but to date the workshops remain unoccupied - possibly as a result of the rather isolated location (see 6.4.7 on accessibility). In addition, as their retention was not included as part of the Section 106 agreement for the site, there is no mechanism to prevent them becoming wholly residential.

6.4.13 But innovation is only a means, not an end in itself. Is there perhaps too much attention being applied to 'flexibility innovation' at the expense of other sustainability objectives? Our Victorian and Edwardian heritage suggests that simply designed robust buildings close to the street using low-tech durable materials are a fail-safe way of ensuring that buildings stand the test of time, facilitate change of use and can be modified according to personal taste.

6.4.14 Privacy

6.4.15 The two main privacy-related issues are clarity of public and private realms and the ways overlooking distances are dealt with. In relation to both these issues Poundbury is to be credited in demonstrating:

- How making a clear distinction between public and private space results in no ambiguous 'space left over' (particularly by rigid adherence to a building line). Each space has a defined function and maintenance regime. By contrast, the apparent lack of clarity of public street fronts and private backs is a troubling aspect of the Allerton Bywater designs;

- That overlooking can be much more subtly dealt with than many planning standards suggest. Typically standards dictate that back-to-back houses are separated by at least 21m (derived from old bylaw standards) and fronts similarly separated by a rigid road cross-section. The result is buildings spaced apart, undermining the ability to create traditional urban patterns of streets and perimeter blocks and increasing land-take. Poundbury shows how tight mews and artful juxtapositioning of closely spaced buildings can be employed without compromising privacy.

6.4.16 Beauty

6.4.17 This most subjective of indicators is also one of the most important. The aesthetic quality of a place can profoundly influence the quality of life, boost its popularity and regeneration potential. Again, Poundbury provides the most interesting focus. It has been criticised in certain professional quarters as sentimental picturesque. However, to focus on matters of "style" alone misses the point - particularly when viewed from the wider sustainability perspective. Poundbury's essential success is the quality of public spaces and the ability of buildings to frame and animate them. This is achieved by downgrading the importance of the car in shaping layout. Certainly the rate of sales indicates popularity (especially to retirees), though this might perhaps be partly due to Royal patronage.

6.4.18 Waltham Forest HAT illuminates the possible tension between comprehensive community participation (see 6.9.1) and design integrity. In contrast, Allerton Bywater promises a confident new aesthetic (with an implied greater risk) that will hopefully not go the way of Phase I Greenwich MV, where designs perhaps resemble more conventional London Docklands.

6.4.19 Increasing Safety and Perceived Security

6.4.20 Whilst analysis of hard data relating to either actual or perceived crime levels is beyond the scope of this study, the design of each test place promotes, to some degree, passive surveillance. Buildings generally face onto the public realm with 'eyes on streets'. However, this is undermined in West Silvertown by the impact of high parking levels on the ground floor (discussed in 6.9.1). Design to promote positive social interaction and a feeling of community is taken a step further in Greenwich MV, with the 1400 dwellings clustered into five groups of about 300 homes focussed on a public place. These are further sub-divided into smaller, horseshoe-shaped "gossip groups" of 30-50 houses. A high quality public realm is also proposed. To ensure this, the Consortium have considered it necessary to deviate from adoptable local authority standards, and propose for public spaces to be maintained and controlled by a Village Trust. The same design values have been applied at Poundbury where doors open directly onto the street so people are 'in town as soon as they open their front door.' Courtyards are designed not only for parking but also as sociable spaces for conversation, washing the car, and so on. Consultees reported that this has led to two distinct local social groupings forming - front door and courtyard communities (discussed further in 6.4.15).

6.4.21 Provision of Open Space

6.4.22 The two key aspects of open space provision are:

i) Quantity and Type
In both MVs, Poundbury and to a lesser extent West Silvertown (which "borrows" its open space amenity with views over the water) an integrated network of open space types form the basis of a landscape structure. At Waltham Forest HAT, planners overestimated the number of children's play areas required and underestimated the needs of other users. This emerged from initial community concerns, later realised as over-stated. Plans are now underway to turn the play space beside the community centre into an amphitheatre.

ii) Quality
Lasting quality can only be safeguarded if places are properly looked after - requiring management and maintenance regimes to be defined at the outset of project planning. In Poundbury the flexible attitude of planners has enabled non-standard public realm specifications to still be adopted. This was not possible at Greenwich and at Allerton Bywater detailed arrangements have yet to be agreed with the local authority (though clearly components such as the communal glass houses need close attention).

6.4.23 Interior Space

6.4.24 Both MVs have comfortable internal space dimensions. When interviewed, Greenwich Borough Council has informed that Parker Morris standards are enforced throughout the Borough. In Allerton Bywater generous unit sizes are proposed (which could possibly 'sweeten' the market), with a wide (8.1m) plot width, which aids privacy and flexibility, and generous floor-ceiling heights. The latter is not the case at West Silvertown, where storey heights undermine attempts to emphasise buildings at key nodes (e.g. a Wimpey 3-storey

house equals the height of a Georgian 2-storey building). Application of the DETR housing quality indicators assessment method (DETR, 1999) showed that all Waltham Forest HAT units have been well dimensioned to meet/exceed unit size requirements.

6.4.25 Construction Quality

6.4.26 Although consistent construction quality is a fairly low sustainability priority (save for the fact that a sustainable building must, for example, be watertight and have structural integrity), the MVs are also introduced as demonstrations of efficiency in construction. At Greenwich, GMVL is incorporating clauses into all appointments with consultants and in contracts with suppliers and sub-contractors for both zero defects and targeted reductions in construction waste.

6.5 Quality of Life

6.5.1 Providing high quality accessible public services

6.5.2 In determining the components of a new sustainable settlement that aims to provide a high quality of life for its users the tendency towards introducing headline-grabbing facilities on-site (such as the Allerton Bywater 'ecological street' of community glasshouses), needs to be counter-balanced with an assessment of local need that will often favour investment in the upgrading of existing facilities off-site. At Allerton Bywater MV, for instance, maximising linkages is crucially important to ensure that existing villagers benefit from the huge amount of construction about to take place.

6.5.3 Both Allerton Bywater and Poundbury are to be commended in this respect. In both places the developer is contributing funds towards the expansion of an existing nearby school and creating high quality path and cycleway linkages.

6.5.4 It is also important that the size and type of a facility is consistent with the size and catchment of the centre within which it is to be located. The risk with introducing disproportionately large local facilities (such as the Sainsbury's superstore and DIY centre at Greenwich) is that they can impose a 'quality of life cost' on nearby residents, for example in terms of congestion and visual impact (it should be noted that the Greenwich Sainsbury's is not part of the Millennium Village and does not come under the responsibility of GMVL). Without also ensuring that the high public transport accessibility 'carrot' is provided in conjunction with the 'stick' of low car parking provision, the sustainability objective of reducing CO_2 emissions is also likely to be undermined. This is just one example of where the broader planning policy context limits the degree of sustainability that can be achieved by (part of) a single settlement.

6.5.5 Crime reduction measures

6.5.6 In addition to design responses to the issue of crime prevention (see 6.4.20), both MVs propose to introduce Village Trusts to add a further layer of management and control. The Greenwich Village Trust will have wide-ranging powers to enforce restrictive covenants aimed at moderating resident behaviour and supervise public spaces, for example via CCTV systems.

6.5.7 Employment and training opportunities

6.5.8 Proposals for Allerton Bywater MV include a firm commitment to provide 400 jobs on completion. There is an explicit intention to provide jobs close to home and a one-stop-shop is to co-ordinate employment opportunities. This is also intended at Greenwich MV via the Greenwich Local Labour and Business (GLLaB) initiative which seeks to promote the recruitment of employees (in relation to the development) from the local area. The developer is expected to pay a wages subsidy sum to assist with the payment of local labour. In terms of tangible achievements, Waltham Forest HAT has successfully exceeded targets for local employment rates from 25% to 33% by using contract clauses as well as on site skills matching through the careers service.

6.5.9 Ensuring the long term tie in of local labour, as well as variety and quality in the opportunities available is, however, more difficult to secure. Arguably inner urban developments should aim to maximise accessibility to employment opportunities (in both physical and institutional terms), which may well be elsewhere within the settlement (or in the surrounding area rather than striving to attain the holy grail of on-site "self sufficiency."

6.5.10 In Poundbury it appears that this loose concept has been implicit in the aim to attract industrial uses to the site as automatically a 'good thing' without seeking to ensure that these represent captures of new businesses to the area or that local labour is used. In the event, most businesses at Poundbury have relocated from elsewhere in Dorchester and the one hi-tech factory initially attracted has already relocated elsewhere, leaving an empty factory in its wake. Local labour has though been harnessed in the creation of Poundbury by hiring local builders and craftsmen.

6.6 Equity/Social Inclusion

6.6.1 The intention at both Greenwich and Allerton Bywater is to create socially mixed communities by including:

a) a range of different housing types and sizes; and

b) a mix of tenures 'pepper-potted' so that tenure is not discernible by built form.

6.6.2 At Greenwich, problems have been experienced in securing the latter, with the Housing Associations considering the arrangement of social housing grouped into separately identifiable blocks easier to manage. The risk of creating stigmatised 'council housing' is most starkly observed at West Silvertown. Although the Peabody Trust homes are to be well

sprinkled throughout the scheme, both the existing and proposed East London Housing Association properties are completely segregated from the rest of the development, with cul-de-sacs, fencing and walls further reinforcing this isolation.

6.6.3 The provision of facilities to help strengthen community interaction is a notable feature of Waltham Forest HAT. The HAT have contributed £2 million for the community facilities which will be managed by a specialist company O Regen. The company have provided for office space and meeting rooms within the newly built community centre on the edge of the Cathall Road estate.

6.7 Public Participation and Local Governance

6.7.1 The five test places vary considerably in relation to the level and nature of local governance and public participation. Community involvement in design, planning, construction and management ranges from information provided to existing communities, through attempts to gain legitimisation of a pre-defined plan, more meaningful involvement and control over aspects of the development by local stakeholders.

6.7.2 In Allerton Bywater, where a very extensive consultation effort has been undertaken, complaints have arisen amongst the local community of "participation fatigue" and a sense that local views are not being taken sufficiently into account in shaping the new site's Master Plan. Interviewees involved in the running of the project have reported that older people are most resistant to the proposed regeneration - they are "not signed up" - while younger people see it more positively as a way to obtain local jobs and training. Complaints relate to the proposed housing densities with a number of villagers wanting a very low-density development of around 250 houses on site as opposed to the planned 650.

6.7.3 Project participants in West Silvertown also carried out effective and extensive community involvement exercises. A central plank of this consisted of existing Barnwood Court residents choosing from four strategic options, which included: a) the retention of the high rise blocks; b) relocation elsewhere in the neighbourhood; or c) two possible options for the redevelopment of the site in its entirety. A 66% turnout was achieved for the ballot to which 70% of voting residents opted to redevelop the site to a mix of flats and houses (though this could be interpreted as just under 50% of residents voted for the option).

6.7.4 But choice brings its own problems. Waltham Forest HAT is widely credited as an exemplary case study in community participation. Yet when asked to reflect on the process, project staff suggested that almost too much choice had created huge logistical complications. This involved regular public meetings with different sections of the community to decide on the design of the scheme at every scale - from tower block demolition, to master plan layout, through to the selection of preferred housing types and eventually the choice of bathroom tiles, kitchen units and the colours of carpets and front doors. With over 90 different standard types across the scheme, the project required a huge amount of co-ordination to ensure that each individuals demands were met. As such, the HAT ran into problems over monitoring the quality of contractor performance and ensuring adequate stocks of

replacement parts - eventually requiring the services of a specialist service contractor to resolve.

6.7.5 Such intensive community involvement (rather than just *legitimisation*) in the master planning and more detailed design process from the earliest stage does clearly give future residents the chance to shape the wider as well as more immediate environment. But Waltham Forest HAT perhaps suggests that good organisation, rather than innovation *per se* is the priority.

6.7.6 Such community involvement contrasts with the approach taken in Poundbury which centred on a 'Poundbury Weekend' event. This comprised a group of invited professional, politicians and interest groups (with comparatively little local representation). Participants reported that the event did not provide a full opportunity for involvement and was more 'rubber-stamping' the presentation of a Master Plan and model developed by Leon Krier, the Duchy-appointed architect.

6.7.7 In terms of ongoing governance, Allerton Bywater is illustrative of potential dilemmas for stakeholder involvement. Each member of the village will have a share in a proposed village company (similar to the proposed Greenwich Village Trust) which will manage those areas not transferred to the local authority (i.e. open spaces maintenance), funded by an initial endowment from the developer consortium. It is too early to tell how the proposed Trust will operate, but one interviewee felt that the proposed village company is seen as "a good idea in theory" but those "who make a lot of noise are most likely to take part.". This danger can be tackled by the consortium and public sector partners seeking to involve a wide spectrum of residents in management arrangements.

6.7.8 Existing residents of Allerton Bywater are suspicious that the new development could lead to a loss of village identity. Moreover, the sustainability contradiction is that to make the project economically viable it will need to attract middle class residents, who are (a) perceived to lack a stake in the local community and (b) more likely to commute by car to nearby Leeds to work. This is despite considerable attention to developing on site managed work space, establishing village wide IT links and limiting car parking provision to discourage commuting lifestyles.

6.7.9 The lessons for public participation and local governance are mixed. Effective participation of the voluntary sector in the WFHAT example (where residents are elected onto the board at the HAT and the CBHA (Community Based Housing Association) overseen by the Peabody Trust) not only reinforces quality of place, personalisation, accessibility and connections but facilitates social inclusion through empowerment. In any case, as the WFHAT experiences illustrate it is not always easy to meet all expectations and is costly to administer. There are possible trade-offs in resource consumption; for example, WFHAT found there was a greater demand for new build and open space.

6.7.10 In Allerton Bywater there are significant issues of integration of existing and proposed new communities. Early attempts to involve the community in management functions and practical expressions of goodwill such as village landscape improvements, are helpful.

6.7.11 A key lesson is that integrating new and existing communities is complicated but approaches that meet sustainability requirements and help integration between new and existing are important. The aim should be to spread the sustainability benefits around (for example, providing intranet and internet access for all households in Allerton Bywater). This is important to establish goodwill which in turn supports social inclusion, participation and effective governance.

6.8 Commercial Viability

6.8.1 Each of the test places driven by public sector involvement have already cost government at all levels a great deal of money. In Allerton Bywater, English Partnerships has expended considerable funds to undertake remediation (£5.9m) while other funds (£0.9m) earmarked for coalfields communities have come from the EU. Leeds City Council meanwhile has provided substantial officer time over the two year lead up period.

6.8.2 Allerton Bywater illustrates the risk inherent in spending significant public funds to kick start regeneration of a declining settlement. The majority of funding is expected to be private sector (£70m is estimated), structured through a joint venture with the developer who secures a return on investment through the sale of housing and commercial space. However, the development's ability to attract private sector interest is questioned by local stakeholders. The approach being taken - of phasing development - aims to minimise commercial risk but also suggests at least the possibility that the whole development could "fall apart" if early stages don't sell. As one interviewee put it, "the trick at Allerton Bywater is for the developer to create a [new] housing market." So the project is vulnerable to the fluctuations of the wider economy and an unpredictable local demand. A key uncertainty is whether sufficient numbers of people with a decent income will want to live in an unconventional settlement separated from a major urban area in a region where there's good quality conventional property is plentiful. If not, then the risk is that the public sector players will come under pressure either to continue subsidy or jettison the innovative sustainability aims in order to be able to dispose a conventional executive estate.

6.8.3 The Duchy of Cornwall's experience in Poundbury provides an example justification for the higher cost of its commitment to quality. Private housebuilders in the area are reported to have expressed increasing interest as the 10-15% higher than usual costs have also generated an uplift in property values by a similar margin compared to other developments in the area.

6.9 Integrative Indicators

6.9.1 There is sparse evidence of an *integrated* approach to sustainability in any of the test places. Yet the inter-relatedness of the sustainability indicators is all too clear, when one considers the series of negative impacts of the extremely high parking levels at West Silvertown, for instance. This:

- weakens the take-up of public transport;

- means that much of the ground floor of buildings and their forecourts is given over to parking, which is not only unattractive, but lessens the amount of vitality or 'active frontage';

- this in turn decreases the amount of natural surveillance of the public realm, which increases the risk of antisocial behaviour going undetected.

6.10 Summary and Conclusions

With each of the projects at different and mostly preliminary stages of development a full comparative assessment is not yet possible. However, while individual settlements and projects have demonstrated significant improvements on current developer norms on many of the criteria *individually*, no settlement has yet to deliver the order of magnitude of improvement needed to show true sustainability.

This is emphasised in Table 4, which provides a crude summary of the degree to which each test place has (or is intended to) address each sustainability aim. Of course any 'scoring' of the Millennium Villages whilst they proposals have yet to be implemented is approached with some caution. Whilst Allerton Bywater Masterplan proposals taken at face value score fairly highly, it is important to note that these have yet to be delivered. Greenwich made similar claims at this stage, but some may prove harder to deliver than originally anticipated.

Table 4 Summary of evaluation results for the five test places

Aim	Allerton Bywater	Greenwich	Poundbury	Waltham Forest	West Silvertown
1 Resource consumption	Better than average (under deveopment)	Mixed (under development)	Worse than average	Average	Mixed
	- e.g. solar design and embodied energy, but poor public transport?	- good public transport, but - embodied energy proposals watered down	- local materials and craftsman, but - highly car borne	conventional approach	- flagship 'crescent block', but high car impact
2	Better than	Exemplary	Mixed	Mixed	Better than

Environmental capital	average (under development)	(under development)			average
	- former colliery site put to productive use	- ex gasworks transformed into new settlement	- Grade 1 agricultural land developed - new community services/amenities created	- upgrading housing estate	- disused docks developed for new neighbourhood
3 Urban design quality	**Exemplary (under development)**	**Better than average (under development)**	**Exemplary**	**Average**	**Better than average**
	- promises high quality	- are innovative design intentions to be replaced with developer norm?	- acknowledged good practice	conventional approach	- quality undermined by parking and highways
4 Quality of life	**Better than average (under development)**	**Mixed (under development)**	**Better than average**	**Better than average**	**Mixed**
	- up-grade of existing off site services - new employment opportunities	- possible adverse impact of neigbours (e.g. Sainsbury's?), but new services and training	- contribution to off-site services - but employment provision is relocation	- good local employment and training	- new services - but poor training opportunities etc
5 Equity/social inclusion	**Better than average (under development)**	**Average (under development)**	**Mixed**	**Exemplary**	**Mixed**
	- proposed locally mixed community	- failed attempts to 'pepper-pot' tenures?	- well-integrated social housing, but questions on equal opps. etc.	- mixed tenure housing - new community facilities	- most social housing segregated
6 Participation	**Better than average (under**	**Better than average (under**	**Mixed**	**Exemplary**	**Better than average**

	development)	development)			
	- extensive public involvement - proposed Village Trust	- wide ranging powers for Village Trust, but - limited public participation exercise	- management company locally run, but - top-down design process	- effective participation of voluntary sector	- successful participation exercises throughout development process
7 Commercial viability	Better than average (under development)	Better than average (under development)	Better than average	Worse than average	Average
	- private funds intended to balance large public outlay	- intended to be commercially viable	- increased costs balanced by uplift in house values	- initial public funds and dowry for ongoing management	- high value housing offsets public investment in infrastructure
8 Integration	Better than average (under development)	Better than average (under development)	Better than average	Average	Worse than average
	- extensive public involvement - proposed Village Trust	- wide ranging powers for Village Trust, but - limited public participation exercise	- management company locally run, but - top-down design process	- effective participation of voluntary sector	- successful participation exercises throughout development process

Chapter 7 Delivering Sustainability: Processes and Procedures

7.1 Introduction

7.1.1 The report has so far considered what sustainable development might mean for settlements and regeneration, and how developments should be evaluated. This chapter considers lessons about the process of making developments happen in a sustainable way.

7.1.2 It starts by looking at which elements of sustainable development are relatively straightforward to make happen, which depend on the setting where development is located, and differences between new-build and rehabilitation.

7.1.3 Lessons for the development process itself are then suggested: how can it be made conducive to sustainable development? The Chapter concludes with reflections on the nature of what is being asked of those who take on these projects, what they can learn from elsewhere, and the role of creativity.

7.2 Easy or difficult? - The relative ease of procuring elements of sustainable development

7.2.1 As Chapter 6 has shown, different sustainability aims received different levels of attention in the "test places". This is partly because some aspects of sustainability are easier to aim for and implement than others. This means that for future proposed developments and Millennium Communities, there is a sizeable body of knowledge and practice that can be drawn on and does not need to be reinvented. Relatively straightforward elements include the following:

Resource consumption:
- *reducing household energy use*: here, the consonance of the environmental objective with financial benefit to users means that sustainability is working "with the grain" of what developers want to do and what households are keen to hear. Thus, in Allerton Bywater, Leeds Council planners commented favourably that the target (15kWh/m2/year of greenhouse gas emissions) is much more demanding than the Government's building regulations. Further, there is a body of practice and advice (BREEAM and SAP ratings, for instance) which provides methods, benchmarks and examples; and techniques are familiar and conceptually simple: triple-glazing, high-performance insulation and passive solar design, for example.

- *reducing embodied energy* in the buildings themselves: whereas this has not been so widely taken up and rigorously evaluated, a number of interesting possibilities are being taken forward. A simple example is the proposal at Allerton Bywater to cast concrete and assemble elements on or close to site, using local and recovered material so far as possible, and reducing the need to transport finished products. In other ways schemes use lightweight timber structures from sustainably forested sources.

7.2.2 At the other end of the scale, it is not easy to demonstrate from current practice how to move towards greater equity, social inclusion, public participation and local governance *whilst managing to achieve other sustainability objectives*. Few, if any, of the schemes reviewed, or discovered in wider practice, provided convincing models of how to achieve more sustainable outcomes in terms of:

- **contributions to social inclusion:**

    - *equity/equal opportunities* (though the Greenwich GLLaB initiative and the work of Waltham Forest HAT have however made measurable progress in securing local hiring of contractors' workforces);

    - *stakeholder participation* in the development process (the exception being Waltham Forest HAT, which involved existing residents in the design and layout debates - though at a cost considered by the Audit Commission to be extremely high).

7.2.3 This is not particularly a criticism of the reviewed schemes and their promoters. Some of these objectives are simply harder to achieve, and to benchmark and monitor, than the "easy" category. This is a fact of life that any subsequent programme has to build in. What is more, many have not been set in briefs as objectives, and so it is not surprising that developers have not gone looking for what are currently extra complications and costs.

7.2.4 In between these two extremes, a sizeable group of objectives are not necessarily easy to achieve, but they offer the prospect of higher levels of sustainability performance than at present without necessarily incurring enormous difficulty or cost. In this category are:

- *Water recycling*: there is now evidence of some ambition and experience on this front, though it is not very extensive. Notably the two Millennium Villages set out proposals in terms of surface and grey water recycling, and an attempt to minimise water demand by design and education. The sustainability literature is full of advice and exhortation on grey-water recycling, reedbed filtration, ponding and so on, with reference to such schemes as Ecolonia, described in Chapter 6. Current British practice, it seems, is generally some way behind. This seems to be primarily because the achievability of these objectives is very dependent on the specific conditions of each site. For example, at Allerton Bywater, earlier decisions on how to remediate the contamination (see Chapter 6), together with the lack of a link between the River Aire and the Aire & Calder Navigation, have meant that pumping is required to achieve water circulation, meaning that one resource benefit would incur a different resource cost.

- *Energy recovery and reuse*: similarly, the widely discussed technologies such as Combined Heat & Power (CHP) are not reflected in British practice, even in the most consciously innovative of schemes. None of the "test places" have yet to attempt it (though it is planned from the outset in Greenwich); and the Edinburgh Gorgie scheme seems unlikely to realise it although it was a part of the initial concept package. This may reflect organisational issues rather than lack of ambition. CHP can be an extremely effective way of reducing overall resource drawdown, but it does require a scale of organisation and critical mass which is rarely achieved in individual British schemes. At

Allerton Bywater, it was considered, but regarded as a relatively low priority given the relative costs and benefits and the proposed development staging. Interestingly in the Vauban development in Freiburg, Germany, (in 7.3.2 below), with many institutional factors in its favour, getting CHP in place took a long and difficult negotiation, with compromises along the way. Meanwhile, by contrast CHP is unproblematic standard practice in many Scandinavian cities owing partly to the regulatory requirements, and probably also to a problem-*solving*, rather than problem-*evading* paradigm.

- *Daily travel patterns*: although "reducing the need to travel" is a national policy commitment, the communities have made few structured attempts to build it into their planning. Greenwich Millennium Village is to be served by Millennium Transit reserved-track buses direct to Jubilee Line (North Greenwich) and South Eastern Suburban (Charlton) stations; it is anyway in a part of Inner London where modal choice is already tilted towards public transport. Poundbury has carefully thought out ways of handling car movement and parking, and routes on foot and by bike, but it is not well-located to enable a significant shift to public transport. Allerton Bywater is intended to feature an "ecological street", a tough traffic calming regime, a focus on transport hubs, and a restrictive parking standard. This approach should in principle help make non-car journeys relatively easier and more likely than otherwise. However, Council planners pointed out that flexibility has been granted to the developer should the parking standard have an adverse market impact, reflecting perhaps an unspoken assumption that to achieve commercial viability, car use cannot be 'designed out' even to this extent.

7.2.5 In instances such as these cases, it may be that the slowness or inability in achieving sustainability objectives is genuinely a product of the difficulties, and the lack of current practice and examples on which to draw. But in many - probably the majority - the problem is as much the absence of the objective and its rigorous application.

7.2.6 Thus a major benefit of the use of the Framework would be to make more explicit and comprehensive which aspects of sustainability are being targeted, and how. At present, most new developments, even those conceived of as innovative, are based on a patchy and intuitively founded approach to sustainability aims and wider purposes. One of the reasons we do not know how far these objectives are achievable is that - despite all the pronouncements about sustainable settlements - nobody in the UK has really, systematically, even tried.

7.3 Local or context-dependent? - Relating sustainable development to the wider context

7.3.1 There is a clear distinction between sustainable development achievements which are largely within the gift of the developer, and those where the developer is fundamentally reliant on external factors for success.

7.3.2 This is most clearly demonstrated by comparing the test places with the German Vauban project in Freiburg. This is a municipally-led redevelopment of a former French Army site to provide homes for 5000 residents and 600 jobs. It is in a location which is intrinsically desirable for living (as witness high local land prices); it is already well served by public

transport and cycle routes, in a society where these are seen as normal parts of everyone's lifestyles.

7.3.3 It is being developed in a society where high density, flat-based lifestyles are normal and accepted - by families with small children and not just adult-only households; in a country where any jobbing small builder automatically works to a standard of quality which makes meeting demanding environmental specifications unproblematic; and in a culture where it is still the norm to use the nearest local state schools, doctors or food shop, rather that to exercise 'choice' by driving to distant alternatives.

7.3.4 A Freiburg family choosing to live in the high-density sustainability-oriented Vauban development is therefore taking on simply a more accentuated version of what is already a normal, socially acceptable pattern of life for mainstream 'respectable' people in Freiburg. This would tend to be much less the case in most of the UK, where both infrastructure/service provision trends, and lifestyle norms, are based on different aspirations and assumptions.

7.3.5 Social context, notably the existing image and acceptability of sustainable lifestyle habits, are thus a constraint on developing and disseminating "Millennium Community" concepts in Britain in a way that they are not in Germany or much of North West Europe. This is not an absolute constraint: but it makes delivery more difficult because the "sustainability" choice and thus viability much earlier and more seriously than in continental Europe.

7.3.6 This might suggest that the most promising locations for Millennium Communities in the UK would be the few places where sustainable lifestyles can already approach a Freiburg-like congruence with existing values and habits as well as infrastructure. This suggests places like:

- Stroud, Totnes, Mid-Wales - with a long history of green politics;

- Edinburgh - where people have always lived in the centre, at relatively high densities;

- "pro-sustainability" local authorities like Sutton and Leicester; or even

- parts of inner London where public transport is excellent and "eccentric" (e.g. car-free) lifestyles are construed as an expression of originality and independence rather than of failure.

7.4 New-build or regeneration? - Differences in approach

7.4.1 Greenwich is more or less isolated from any existing housing; West Silvertown adjoins and outweighs a small pre-existing municipal estate (some of which was decanted for it); Poundbury is a town extension at the outer edge; Allerton Bywater is a village extension explicitly targeted around the existing community and its requirements; and Cathall Road (Waltham Forest HAT) is a redevelopment of a fully-occupied housing estate embedded in East London. The test places thus present a range from isolation to integration:

Figure 1: The location of test places: a continuum from isolation to integration
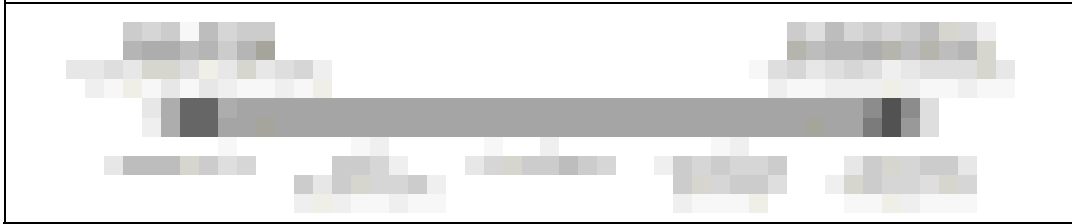
7.4.2 Cathall Road, where 6-storey deck-access slab blocks are being replaced by 2- and 3-storey houses in a traditional street and block structure, shows most clearly the difference when there is not a "clean slate". Residents' wishes about whether or not they wanted to stay affected decisions about phasing, decanting, the scale of "overspill" from the estate and - to a limited extent, what was actually built (the least satisfied were those who preferred to carry on living in a flat). Intentions of "retaining/creating a community" mean specific things, not abstractions, when there already exist residents, neighbour relationships, established associations and patterns of living.

7.4.3 This has several implications:

- the scale of involvement and hands-on management is much greater: "delivery" has to involve fieldworkers, liaison, a constant administrative load, and logistics;

- similarly, the wish and need for personalisation, following public consultation, set up an inevitable tension with contract administration which again was resource-intensive in time and attention;

- the balance of project priorities is very clearly different from the "clean slate" sites: the quantity, scale, and density of development, the provision of green space, and social inclusion issues such as a local-hiring scheme were preponderant in determining what was built, how and who for: the energy, resource-use, environmental and transport agendas were secondary and are only now emerging as part of the project debate;

- the environmental and community/empowerment aspects of sustainable development can be seen as mutually reinforcing in at least some of these instances where there is an existing community: for instance, at Allerton Bywater, creating a Village Company, encouraging an "intranet" and Internet use, and building on initiatives like Groundwork's which are already in place, are all cross-support of this kind.

7.4.4 If the Millennium Communities programme, in its widening out to tackle many sorts of location, takes on more places like Cathall Road (or St John's Village in Wolverhampton, discussed elsewhere), then these issues will be met over and over again. And similarly if the

lessons are to be applied to more than just cleared brownfield sites, the guidance needs to be capable of handling the "people" issues in particular, in terms of their implications for moving towards more sustainable settlements.

7.5 Who and how? - Project delivery and management

7.5.1 It is paradoxical that the Millennium Villages are trying to achieve unconventional, trend breaking results through a conventional development process that is competitive, developer led, top down, profit driven, with the achievement of the non-market outcomes depending on a tussle between the public sector trying to impose them as conditions and restrictions and the developer struggling to extract subsidies in return. It is predictable under this model that strains and problems emerge between project partners.

7.5.2 Experiment in built forms, construction techniques, or layout should therefore be paralleled by experiment in different institutional solutions. We should not assume that complex consortia of large organisations led by commercial development companies are the only or best vehicle.

7.5.3 The consortium/single provider approach puts too many eggs in one organisational basket, and risks the sustainability aspects of a scheme being held to ransom by the commercial realities of a site once it is in the contractual development phase. Whatever the rights and wrongs of the matter, the HTA - Countryside Properties fall out at Greenwich provides a warning about the potential strains of this model, which it would be unwise to ignore.

7.5.4 The two Millennium Villages announced so far constitute large single parcels being taken forward by volume housebuilders. It could be argued that this approach limits opportunities for fine-grained mixed-use development; reduces the number of stakeholders/developers/landowners involved, and hence the overall influence of the Millennium Village programme in changing current practices and norms; and tends to militate against innovation being fostered from the bottom up.

7.5.5 Other models - a charitable development trust, a piecemeal grouping of sites rather than a single coherent block, an implementation consortium who realise an already-defined master plan, and so on, are all conceivable. This section explores some of those choices and their implications.

7.5.6 Single site or piecemeal?

7.5.7 Our recent experience in preparing the Development Framework for the St John's Urban Village project (for English Partnerships, the Urban Villages Forum, and Wolverhampton MBC) has led us to explore the idea of a Millennium Community which uses the concept to address a more mixed bag of sites, in a very difficult urban location. In Wolverhampton the 'development site' is actually a set of separate sites within a designated area. This has some interesting features:

- it virtually guarantees diversity of architectural style, tenure and occupancy (and also provides diversity of age, which by definition is difficult within a single site being developed within a short period!);

- it potentially extends the Millennium Communities programme to many more areas. Nationally, large sites which are both available and suitable for total redevelopment are less common than run-down urban areas with a lot of smaller sites and/or buildings now ripe for replacement. In particular, large vacant sites are less common in the kinds of attractive locations where lifestyle perceptions and existing infrastructure most favour sustainable community development (touched on above), because they will already have attracted commercial developers.

7.5.8 A series of small development packages within an overall development framework might be expected to be more difficult to administer than the Greenwich/Allerton Bywater formulae. Once again, as with the other "people-present" locations, it suggests more hands-on management and co-ordination between the separate initiatives. But Waltham Forest HAT and even Allerton Bywater show that such issues need not be unmanageable - they tend to change project priorities, but they do not render them impossible.

7.5.9 Devolved implementation of a strong overall plan?

7.5.10 The Freiburg-Vauban institutional model offers a sharp alternative to the single-consortium responsible for designing, bidding, building and selling the whole package. Development at Vauban happens through the City's Council selling plots, mostly to individual households, syndicates of households, or not-for-profit agencies, for them to develop according to the master plan; there is little or no involvement by larger commercial development companies (though there would be no reason why they should be excluded from participation in such a model).

7.5.11 The potential relationship with the "Wolverhampton" suggestion above is obvious: the Vauban model copes with - indeed deliberately engenders - small sites being sold and developed piecemeal - within a master plan which lays down use-types, overall layout and orientation of building blocks, and minimum standards on some key sustainability aspects. 'Piecemealness' can be perfectly compatible with promoting the broader objectives provided - as at Vauban - but it must happen within an overall management framework with the powers and motivation to negotiate collective provision (e.g. the CHP system) and to enforce common standards.

7.5.12 Managed diversity?

7.5.13 A third approach, drawing on both, might be to deliberately sub-divide parcels into small plots. This could be described as a latter-day version of the Milton Keynes model, which created packages of 150-200 houses. Alternatively the Poundbury model consists of phases further subdivided into smaller 'sections' that include a variety of separate projects comprising housing, workshops, offices, sheltered flats, etc. Here the grain is much finer, as at Vauban, with packages of about 70 houses, for instance, being constructed by local builders. In the

case of inner-urban areas, with a mix of existing buildings, vacant plots and ownerships, the packages created would be mixed in the sense of development plus rehabilitation as well.

7.5.14 In both instances, a number of relatively small initiatives could be progressed under the umbrella of an overall area development framework or master plan, with briefing that was prescriptive enough to ensure that schemes were mutually complementary. This could have the advantages of:

- encouraging fine-grained diversity of forms, uses, and users, within a tight urban setting;

- involving a range of participants, including designers and craftsmen, which could

  - broaden the influence of the programme in changing hearts and minds; and

  - possibly generate more local involvement (helping to strengthen local identity and distinctiveness);

- creating diversity of experimental models and building types (which, on the limited evidence available to us, is more likely at the small-scale end of the institutional range than the larger); and

- testing ideas for different delivery mechanisms and institutional models within a loose overall concept of multi-institution delivery.

But as in the case of the Vauban model, this will only deliver sustainability if lodged within the right overall management framework.

7.5.15 Insulation from valuation pressures

7.5.16 A key factor at Freiburg-Vauban was the combination of potential residents' readiness to pay high prices for land, with the City Council's freedom as landowner from pressure to maximise commercial return on land sales. It must be emphasised that neither would have been sufficient on its own. High land values would not have enabled the Council's Vauban Committee to invest in sustainability infrastructure provision or set high sustainability standards for the development if, as in the UK, it had been required to maximise its commercial return. But nor would freedom from such a requirement have been enough on its own, if the market value of the land had not been enough to 'carry' some extra sustainability costs.

7.5.17 This provides a further reason why sustainable settlement projects may be more achievable in attractive places - but only if the developing agency can be insulated from pressures to maximise commercial return. Again, this points in the direction of development trusts, charitable bodies, or piecemeal arrangements where at least some of the investment decisions are insulated from such requirements.

7.5.18 In the UK, the pioneering zero emissions housing scheme being developed at Beddington by Peabody Trust was only made possible by the DETR agreeing to allow LB Sutton not to have to secure the highest possible market price for the site.

7.5.19 Whatever institutional arrangements are adopted, the lessons so far about the delivery process include:

- the need to be clear about priorities: as between wanting to encourage innovation as a means to stated outcomes,

- wanting to have a scheme that will teach relevant lessons,

- wanting to avoid a drain on the public purse, and

- wanting it to happen within a reasonably rapid timescale.

7.5.20 The scale issue

7.5.21 There is a tension between "critical mass" and "fineness of grain" - both important aspects of new developments. Critical mass is important in terms of economic and social sustainability, to generate mixed developments (varied uses, tenures, users and forms) at the level of the walkable catchment (or 'ped-shed') without forcing incompatible uses together and to make technologies such as CHP viable. Fineness of grain helps with environmental and social sustainability in making the development easy to use, pleasant to live in, and potentially less car-dependent. Yet in taking the mass-driven approach (rather than, say, sub-dividing the site into smaller plots of individual owners), fine-grained mixing is more difficult to achieve. Does the segregation of leisure facilities, shopping, housing, offices and open space represent 'zoning' on a smaller scale? These could be considered not as absolute choices, but priorities, and that so far the programme, and the EP thinking behind it, has been more skewed than it need be to the importance of mass and viability in the financial sense - thus experiments which relax these constraints ought to be part of future initiatives.

7.5.22 The timing v innovation v cost issue

There is also a trade-off between innovation, speed and cost. New developments can take longer or cost more - or both. At Greenwich, there has been demand for the project to be novel, and the Government would have liked it quicker than proved possible in practice. It should also be recognised that holistic approaches to issues like sustainable energy infrastructure require negotiating between multiple agencies, which always takes time.

7.5.23 A lesson that could be learnt be learnt from the Greenwich experience is that the creation of sustainable settlements demands holistic approaches to, for example, sustainable energy infrastructure. This requires negotiation between multiple agencies, which always takes time.

7.5.24 At Allerton Bywater, too, the wish to ensure deliverability and speed have worked against innovation, in the view of the City Council planners at least. More complex and difficult ideas like using the methane from capped-off mine shafts, or CHP, have not been nurtured by

EP in that they are (perhaps unwisely) seen as diversions from the main business of getting an effective and reasonably sustainable settlement under way, and that they do not make much difference to the site's appeal to potential homebuyers.

7.5.25 This suggests that the commitment to high sustainability performance in development, if there is to be one, must be strong and consistent; that it must be a part of the delivery phase not just the competition and planning phases; and that it will necessarily have consequences for time-scales and costs.

7.5.26 Planning framework and the weight of previous decisions

7.5.27 On difficult brownfield sites, previous decisions may constrain the ability to deliver desirable and sustainable outcomes to a surprising extent. In Allerton Bywater, the remediation procedures decided on before the new community was planned have constrained what uses can safely go where and, as we noted above, the ability to maximise sustainable handling of waste and recycled water (see Chapter 6). In contrast, as the Urban Task Force noted on its study tour to Germany, the highly-praised redevelopment at Nordhorn, near the Dutch border, deliberately called on innovation in the use of sustainable land reclamation technologies as part of an integrated urban design process.

7.5.28 Planning agreements and the monitoring of delivery

7.5.29 Section 106 planning agreements are the obvious, established and most direct way of building in commitment to sustainability in new developments. However they will only be useful if they are tightly-worded with monitoring mechanisms explicitly built in. The Greenwich agreement does not really do this - it has somewhat vague references to "reasonably demonstrating" a monitoring process, but makes little reference to quantifiable benchmarking or of performance criteria. Given how onerous and long-drawn-out the process of the consortium/L.B. Greenwich negotiations has been in that instance, we hesitate to recommend adding to the burden.

7.5.30 But this is one area where an attempt to create a corpus of good practice, perhaps drawing on the Framework proposed in this report, could provide generally-accepted ground rules and models. If government required Section 106 Agreements for any claimed 'sustainable' settlements to set explicit performance targets for (say) at least 67% of the indicators under each of our eight sustainability aims, and specify the means by which they are to be praised, and set cost penalties for non-achievement by specified dates, we would hope that negotiations would get quicker and more business-like.

7.5.31 The role of the Local Authorities

7.5.32 Test place investigation showed that local authorities have been largely external to the development process, acting as regulatory agencies not proponents or managers. As discussed above, and as shown by the German examples, this need not necessarily be the case. Within the roles required of them, the performance and attitude of local government was varied. At Silvertown, the LDDC (the then planning and development body) predetermined the road infrastructure and required standard off-the-peg highways layouts, even though L.B.

Newham, as the then consultee authority, were prepared to relax "normal" standards in order to procure something unusual and special. In Allerton Bywater's case, the view of Leeds City Council planners was that EP have not kept them as informed as they would ideally have liked, and could have taken more notice of their concerns and expertise.

7.5.33 At Poundbury, West Dorset DC have worked closely with the leading masterplanner, Leon Krier, and Alan Baxter & Associates, changing their approaches, relaxing standards, and being ready to listen and learn. The clear impression from discussion with the development teams and LA planners is that the authorities' approaches and behaviour really do matter: if they are brought in early, if they are involved in the evolving design, and if they themselves have the attitude, intellect and self-confidence, then they can be important contributors to the progress of the schemes, and to the wider acceptance of the ideas that they represent.

7.6 Creativity or best practice lessons? - the balance of learning and initiating

7.6.1 A final group of "delivery" lessons is about the creative, innovative aspects of the development process. The framework for evaluation should not become a set of hurdles that development teams must deal with. It should be a framework onto which projects can hang ideas and initiatives.

7.6.2 Those ideas and initiatives may be drawn from elsewhere - good practice exists for each of the themes, in examples all over the country. Good integrated British practice in terms of holistic sustainable communities is less easy to identify; the Allerton Bywater proposal is the most integrated so far, and the Netherlands and Germany offer some examples. Without taking items straight off the peg, planners can learn - and apply thoughtfully to their own context - from a whole toolkit of good ideas from elsewhere.

7.6.3 Alternatively ideas may be truly innovative, and the new community a test-bed for exploring their application. This research did not find much of this in British practice:

- the Greenwich "Homes for Life" concept (should it eventually take-off) seems to fall in this category, piloting as it does an attempt to think through how one might build adaptability into the space a household buys, from the outset;

- the Gorgie "car-free" homes project in Edinburgh is one of very few to actually put this much-trailed idea into British practice;

- there is very little along the lines of "free resources" (wind, wave, methane, water, etc.), or other imaginative Green initiatives: there are examples in the UK, but they tend to be the output of smaller groups like the Environment Trust (drilling for mineral water in Mile End Millennium Park; linking wind-turbines to small town regeneration in Cornwall, etc.), or to have been rejected as too difficult (as in the case of the potential for capturing methane vented from the old mine workings below Allerton Bywater).

7.6.4 Innovation per se is not, however, the point. Sustainably-oriented communities could emerge much more from wider use of good current practice, than from concentration on cutting-edge ideas. Doing well what is already known, and doing it at the right scale, and in many places, will ensure reasonable progress. That is why, although the winning scheme at Allerton Bywater was not necessarily the most innovative or imaginative, it could be defended as a perfectly justifiable decision in terms of creating and disseminating sustainable ideas in practice.

7.6.5 Nonetheless, there is undoubtedly an important role for the innovation element. These "new" ideas may be new to Britain (but not Europe), new in the housing industry (but not perhaps in office-building), or new organisationally (though quite conventional in, for example, environmental sustainability techniques).

7.6.6 This particularly applies to the nationally-funded high-profile schemes. Given the conservatism of the UK house-building and house-marketing industries are, national programmes like the Millennium Villages offer an important vehicle for testing and disseminating creative, joined-up and original ways of making places to live in.

Chapter 8 Conclusions and Recommendations

8.1 Overall conclusions

8.1.1 This study analyses the Millennium Villages initiative in the wider context of improving the way the UK currently addresses the creation of sustainable settlements and proposes an evaluation framework as a tool for aiding this process. The overall conclusion is that the important consideration now is to pilot other approaches besides the large comprehensive projects taken forward by a single consortium with a volume housebuilder as its driver.

8.1.2 Whilst there is good practice emerging on some fronts, no major development in the UK has been required to set project objectives according to the frame of reference advocated in this report, covering the eight sustainability aims, and as such the creation of sustainable settlements as we understand the term has not been fully tested.

8.1.3 If this is to be tackled, then key issues emerge regarding the promotion of sustainable settlements at various levels. Recommendations are therefore structured to cover the use of the evaluation framework, the nature of the built 'product', the Millennium Villages programme and the overall 'framework conditions' within which these are operating. The Chapter then proposes how findings might be disseminated.

8.2 Using the evaluation framework to improve delivery mechanisms

8.2.1 We do not know how far the sustainability aims are achievable because to date nobody in the UK has systematically tried - although, in the way that the Allerton Bywater proposals have been framed, it appears set to become the closest yet. The challenge is to look at ways of building the logic of the evaluation framework into the development process at each stage. Its use should be to frame debate as well as to form the basis for the selection of input specifications that are chosen explicitly to achieve measurable outcomes. The overwhelming message from this research is not that 'sustainability is too hard, let's stop trying', but rather 'we haven't yet really had a go: let's do so.'

8.2.2 Whilst tracking all the recommended indices may prove logistically daunting, key indicators should be selected, benchmarked and monitored as the project unfolds. The regulatory context and attitude of project participants is the key to achieving this. All parties involved must agree from the start that the focus should be on ways of delivering, so that everybody enters the negotiations with a problem-solving rather than problem-evading attitude.

8.3 Key components for more sustainable settlements

8.3.1 The following indicative suggestions are made as to how our analysis of existing best practice might inform project specifications:

In seeking to **minimise resource consumption:**

a) The focus on certain building specifications such as triple glazing and high-performance insulation may generate relatively small CO_2 reduction gains if car use is not curtailed. The key is to set priorities according to measurable outcome targets.

b) The answer is not to focus on single technical solutions, such as CHP, but rather to really use the MV programme as a platform for energy conservation and recycling using a range of both technologies and behaviour changes according to locational appropriateness. Technologies appropriate in some places but not others might include covering photovoltaics, water recycling, wind and geothermal resources. Behaviour changes, which likewise will vary between different locations, could include partial or total homeworking, shorter journeys using cars less, home composting or rainwater collection.

- Choose a range of locational settings that demonstrate different ways of **maximising environmental capital** - including inner urban settings that combine new build, infill and conversions. This should include consideration of different remediation techniques and how to organise these to follow, rather than dictate design solutions.

- The current focus for inventing new approaches to flexible buildings seem to have been given disproportionate weighting compared with the furtherance of other aims to **promote design quality.**

- Aims to provide **high quality accessible public services** should be premised first and foremost on an assessment of local need. The temptation to provide new flagship facilities on-site (schools, libraries etc.) needs to be counter-balanced with the need to upgrade existing facilities off-site and then making these accessible to MV users.

- More effort is needed to demonstrate how developers can be made to pepper-pot different tenures, **to create socially inclusive places.**

- Whilst different approaches to **local governance** via development trusts are to be piloted and a range of community participation exercises tested, none has been explicitly focussed on ways to take forward the seven sustainability themes. Techniques could be piloted for getting residents and other users to 'buy-in' to the concept of creating model communities of sustainability and their powers/control mechanisms tailored accordingly.

- Different **funding mechanisms** should also be tested by, for instance, setting sustainability incentives for smaller local-level initiatives.

8.4 The Millennium Villages programme

8.4.1 Our specific recommendations for the management of the Millennium Villages are

- Adopt the eight sustainability aims set out in the evaluation framework as the core objectives of the MV programme. Performance targets in terms of these aims should be set for all future MVs, and their progress relative to explicit benchmarks monitored and reported

- The Millennium Villages programme should experiment with organisational and delivery models other than commercial competition between developer-led consortia with volume housebuilders as their drivers. Models such as those set out at 7.5 above should be considered. As a first step we suggest that the Department should arrange a 'let a thousand flowers bloom' seminar bringing together a range of community, voluntary, professional. academic and commercial interests to explore possible options.

- The cardinal criterion for site selection should be the potential to achieve a viable sustainable settlement, rather than meeting criteria for funding packages or political symbolism. Availability of sustainability infrastructure (such as good public transport or good quality local public services) and a pool of potential residents likely to value the sustainability features are high priorities.

- Do not expect projects that innovate and seek to push the boundaries in terms of outcomes achieved also to be quicker, simpler and cheaper to do than ordinary ones. They are much more likely to be the opposite. To be any use, the MV programme should go uncompromisingly for high achievement, and accept that, at the pioneering stage, this will take longer and often also cost more. Having established that markedly better standards are possible at all, *then* look at how to deliver them quicker and cheaper. Starting the other way round - lowering the performance requirements to stay in budget and timetable - gives the development industry the counterproductive message that sustainable settlements are not practicable, and that ambition leads to climbdown/failure.

- Conceive the next wave of MVs as exemplifying best practice on sustainability briefing, design procurement, construction and so on - with much more open dissemination (including an on-site project office as at Poundbury, for instance).

- This implies more rigorous, hand-on management, with specialist professional advice buy-ins. We would advocate that the MV programme receives additional resources to make this possible.

8.5 Improving broader 'framework conditions'

8.5.1 The lack of infrastructure to support sustainable lifestyle initiatives within settlements and resistance to the 'image' of sustainable lifestyle choices are two examples of where sustainable settlements have to swim strongly against the current - in ways they do not in Scandinavia, Netherlands and parts of Germany.

8.5.2 Many of the suggestions in the previous chapter are like looking for shallows or backwaters where for local reasons this current is less strong. But this can at best enable a few more exceptional pilots to go a bit further. As this report has argued, settlements are open systems: nowhere is totally protected against the current.

8.5.3 How far a particular settlement can go towards sustainability on a particular issue depends on the interaction of three things:

- the strength of the anti-sustainable pressure from outside

- the degree of *closure* of the settlement with respect to the issue (i.e. how far it is able to manage itself independent of outside pressures)

- the amount of extra effort (including special resourcing) provided

8.5.4 There is an almost mathematical relationship between these. The stronger the anti-sustainable pressure, the more closure and/or special effort is needed to achieve a given level of performance. For example:

- the more car-accessible a settlement is to out of town retail parks, the more subsidy will be needed to keep local shops in it viable;

- the more expensive human employment is compared to environmental resource consumption, the more subsidy and/or local regulation will be needed to ensure a given level of waste reduction, reuse or recycling.

8.5.5 If area-based sustainable settlement projects are to be able to get closer to the levels of sustainability performance indicated earlier, without simply piling on the subsidies, there is a need for some combination of increased 'closure' and making the national 'framework conditions' more supportive of sustainability. The table overleaf offers some illustrations of the kinds of changes needed at both levels.

8.5.6 Ultimately the framework must change if we want to make *all* places more sustainable, not just create islands of better performance in a country still drifting in the wrong direction. The good news is that some of the Government's broad 'cross cutting' programmes (social inclusion 'joined-up government') are moving in the right direction - and then are mentioned in the Framework Change column. But these are still at early stages. Framework change is longer term and politically harder. So there is also a case for doing what is possible and for demonstrating what *should* become standard practice.

8.5.7 There is a striking asymmetry in current policy assumptions. Area based *carrots* are politically fashionable - such as the continuing resource emphasis into SRB and area based regeneration funding in general.

8.5.8 But area based *sticks* - such as requiring all people in a particular area to use a particular energy supplier, or to not have cars, or to pay higher local taxes to support higher employment in the public realm - are currently off the active policy agenda.

8.5.9 An analogy is to see the 'closure' suggestions constituting a place where normal rules are suspended in order to enable particular outcomes to be achieved. The only difference is that instead of suspending *public* regulations to allow the market greater freedom, we do the opposite: manage markets more actively to give precedence to a particular set of public goods.

8.5.10 A key lesson of integration is that maximising *overall* benefit may require suboptimal performance within individual agencies. We need management and appraisal processes within agencies that support this instead of obstructing it. The Best Value and Modern Local Government White paper implicitly recognises this: it now has to be made operational.

Table 5: Ideas for clarifying 'framework conditions'

Aim	Closure: allow the administration of the settlement to ...	Framework
1 Resource consumption	Require residents to buy energy from in house energy services company at its standard tariffs Subsidise and regulate public transport, and tax driving	increase energy prices; energy regulation to promote energy services approach better public transport; higher driving taxes
2 Environmental capital	Require developer to substitute for all environmental services damaged	requirement in the planning system for all development to substitute for environmental services damaged
3 Urban design quality	set its own standards for (e.g.) highways, parking, density, overlooking	national 'baseline' to increase density, reduce parking and road space.
4 Quality of life	levy local taxation to pay for higher standards of public provision cross-subsidise wherever there is a social policy case	more investment in the public realm
5 Equity/social inclusion	Reserve housing and business premises for particular types of user/occupant (including restricting	social inclusion policies more generally

	resale) on social grounds Operate redistributive (e.g. means tested) local taxes/charges	
6 Participation	Delegate statutory planning and management powers to local fora	democratise planning processes
7 Commercial viability	build local preference into public contracting	ecological tax reform (i.e. taxing 'bads' - greenhouse emissions, waste, pollution, driving - more, and 'goods' - especially employment and value adding - less.
8 Integration	Require all service providers to contribute to overall goals (even where this requires them to operate suboptimally in their own specialism)	all public services to promote broad public policy aims

8.5.11 Our 'framework' recommendations are therefore:

- Government should recognise the importance of broader policies such as green taxation shift and the Best Value approach to public service management for sustainable settlements

- Performance frameworks for public bodies need to provide for them to choose to deliver their services suboptimally or inefficiently (in terms of specific service objectives) in order to contribute to broader sustainable settlement objectives.

- Government should allow places to bid to be 'special sustainability areas' where, subject to local democratic mandate, they would have powers to *increase* public constraints/redistribution/social provisions in the kinds of ways suggested in the table.

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