

# Assessing Values Created By the Built Environment: A Methodological and Analytical Review

A Report to the Commission for Architecture and the Built Environment (CABE)

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January 27<sup>th</sup> 2006



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## **Executive Summary**

There is currently a great deal of interest from within the urban design and policy communities in the idea that good design has social and economic benefits to the wider society. The belief is that people derive psychological benefits from looking at such developments and from living or spending leisure time around them. At the same time, the austere funding climates in the public, private and non-profit sectors mean that any investment in the built environment by these sectors requires justification – there must be benefits to the investors now and in the future. These factors make a review of ways for valuing investment in good design extremely timely. This report considers three main approaches: Multi-Criteria Analysis (MCA); Environmental Economics; and Impacts Literature. Whether a meta-tool can unite the three different main approaches remains unclear. What is clear however is the need, through the report, seminars and subsequent work, to make different communities aware of each other. Visual tools can be helpful in making these connections easier to grasp although it is inter-disciplinary debate and practical trials that will be key to making progress in thinking about value. If a meta-framework is to emerge, it is necessary for the three approaches to be more inter-connected and for more cross-disciplinary working – hopefully a blending of different methods rather than one approach just taking over. Communication should not just be restricted to these groups too – other disciplines must be invited to the table in the hope of sparking further insight (environmental and community psychology for example). Whether a meta-tool emerges or not, such communication must surely bode well for encouraging better design.

## I. Introduction

Britain, like most countries, continues to see exciting new built structures that delight, appall and amaze those who encounter them. Examples include the new Selfridges in Birmingham (the 'blue bubble wrap' building), Gateshead's Sage Centre and Angel of the North, the Oracle retail and leisure complex built around the River Kennett in central Reading and the Millenium Bridge in London. Other buildings continue to attract loathing. Portsmouth's Tricorn Centre has often topped lists of loathed buildings although that city can now boast the impressive new 170m tall Spinnaker Tower.

Interest has grown in the idea that well designed buildings might deliver wider social and economic benefits especially within Government. The Office of Government Commerce's procurement pack *Achieving Excellence in Construction* contains a whole section devoted to the delivery of design quality, and the Treasury's *Green Book* recognises that non-monetary benefits need to be included among value-for-money assessment criteria for public building proposals. In March 2005, the National Audit Office endorsed the positive impact of buildings on service delivery in its report *Improving Public Services through better construction*.

Opportunities for high standard design in public buildings should be growing. The UK has seen very low levels of public capital investment in recent decades by comparison with other countries, during a period when *per capita* income has caught up with and in some cases overtaken others (the rate of investment has risen rapidly but remains well below OECD norms). The result is an evident imbalance between private affluence and public poverty (and in some cases squalor), that is likely to persist for some time (Mulgan 2005). Of course the interest in the wider social value that good design can bring is not limited solely to the public sector – the issues discussed here are also applicable to the private sector.

Putting a market value on a building is straightforward, as is calculating the price of other aspects of the built environment. It is the wider effects on the population that are still in need of greater understanding and public discussion. There should hopefully be a ready audience for such a framework. The Urban Task Force, led by the architect Lord Rogers of Riverside, recently reconvened and included increased attention to the design of buildings and public spaces amongst its calls. Specifically, it argued for placing design champions at strategic board level in public regeneration and development bodies and reinforcing this in the way Government funds and tasks the activity of such bodies. The Task Force also recommended a strengthening of design advice to ministers, mayors, local authority leaders and cabinets (UTF 2005).

In both the public and private sectors a concern with the financial bottom line when thinking about buying/constructing a building mean that there are always likely to be concerns expressed when some within an organisation want a building that is of noticeably higher design quality – or simply on a bigger scale. If buildings are internally better designed there needs to be evidence (to satisfy the accountants and/or shareholders) that there is a corresponding effect on workforce productivity, patient recovery rates, pupil performance etc. Such evidence is now starting to emerge (see Eclipse 2005). With building exteriors and other forms of urban development, such as bridges, there may also be wider social, economic and environmental benefits (or dis-benefits) yet these are less understood and, therefore, harder to justify. The valuation task is made more complex still when it becomes democratised – that is when the general public, who have to live with the built environment, are seen as having a right to decide what is and isn't valuable and, therefore, which developments should and shouldn't proceed. This report aims to help in making all of these deliberations more comprehensible and easier.

The report has three core sections. The first of these, Section Two, attempts to cast light on the meaning of value, public value and the urban environment. Section Three looks at what existing literature (principally design, economics, organisational performance and impact studies), has to offer in terms of placing values upon such developments and for assisting dialogue, negotiation and decision-making by the key stakeholders in a proposed new urban development. Finally, Section Four considers whether the best practice methods can sit together within some sort of meta-framework. It asks whether the possibility exists of subsequently developing a new practical (and perhaps very visual) 'value mapping' toolkit that would achieve this.

## **2. Value, Public Value and the Urban Environment**

### *2.1 Value*

Economics textbooks offer a useful, if somewhat dry, insight into the notion of value. They highlight the importance of scarcity to value. So, although people have certain needs, these are likely to diminish the more frequently they experience them – beyond a certain point the experience will even become a negative one. Prices will thus be low if goods and services (including aspects of the built environment) are in abundance and can sometimes be high simply because the opposite is the case (i.e. some luxury goods). Consumers need to strike a balance between enjoyment and over-indulgence – the market price will tend to represent this trade-off point. Producers need to tailor their supply in line with market needs – although they will forever make efforts (through advertising) to make people want more of some existing goods or services or to offer something that is new and exciting.

Just as what we value will vary in accordance with our needs and its availability so too will the things we value change over our lifetimes and between generations. Although people often share common perceptions of beauty, value is nonetheless a social construct and, as such, does not reside in any good or service indefinitely. In other words, nothing is valuable forever. Investment decisions by companies (and, for that matter, governments) have then to find a balance between something known to be valuable today and the considerable uncertainty about what future demand will be.

The economists' definition of value as representing a consumer's willingness to pay for something (based on their estimation of the net benefits in relation to the cost) is applicable to all goods and services whether traded in the market or not. Thus, we are typically willing to pay for something like access to sunset even though no direct market exists for sunset – indeed, we should be able to discern this value by comparing the prices of west-facing houses with other similar houses.

## 2.2 The Urban Environment

As Figure 1 indicates, there are numerous aspects of the urban built environment. It can be defined as place, buildings, public space (loosely, the space between buildings) and landscaped elements of the natural environment. The valuation task ahead of us is of course much harder than simply identifying key aspects of the urban built environment. The value we will place upon this environment will depend not so much on any one element but upon the relationship of these elements to each other – the whole realm of urban design.

**Figure 1: Elements of the Built Environment**

<b>Building Elements</b>	<b>Infrastructure</b>	<b>Landscape</b>	<b>Buildings and Spaces</b>
Artwork	Bridges	Advertising	Colleges
Balconies/projections	Bus stops/shelters	Bollards	Community uses
Building lighting	Canals	Boundary	Factories
Canopies	CCTV polls and cameras	walls/fences/railings	Gardens
Colonnades	Gutters/drainage	Festive decorations	Homes
Corners	Harbours	Fountains/water features	Hospitals
Decoration	Parking bays/meters/car parks	Lawns and verges	Industrial uses
Entrances/exists	Public toilets	Paving	Kiosks
Flags and banners	Railways	Planters/hanging baskets	Law Courts
Floodlighting	Roads and cycle lanes	Planting beds and areas	Leisure
Monuments/landmarks	Servicing bays/turning heads	Plazas	uses(active/passive)
Shop fronts	Street lighting	Public art	Offices
Signage	Telecommunications equipment	Road surfaces	Parks
Skyline/roofscape	Telegraph polls	Shelters/band stands	Performance Venues
Structure	Telematics	Signage	Play grounds
Walls	Telephone/post boxes	Squares	Police Stations
Windows	Traffic lights/road signage	Steps	Prisons
	Tram/bus lanes	Street Furniture	Restaurants and Eateries
	Underground services	Traffic calming	Retail Parks
	Utilities boxes	Trees	Schools
	Waste and recycling bins		Shopping Malls
			Shops
			Sports facilities
			Sports Stadia
			Tourism
			Transport Terminals
			Universities
			Workplaces

(Source: adapted from Living Places, Caring for Quality, (ODPM, 2004).

## 2.3 Public Value and Design

There has been a considerable interest amongst many key figures in Westminster, Whitehall and the think-tank world in the notion of ‘public value’ a term coined by Harvard University’s Mark Moore (Moore 1997). The key aspect of public value is that it is the public who determine what is valuable – rather than professional economists advising government. Kelly et al. (2002) note that the things which citizens value, and demand from governments most are services, outcomes and trust. The key to unlocking public value then is all about public servants developing new

ways of doing their job that will allow them to improve services improve outcomes and increase trust between service users and providers. So how do the public show what they value? For one of the authors (Mulgan 2005) it is citizens' preferences, expressed through a variety of means and refracted through the decisions of elected politicians. For something to be of value, citizens - either individually or collectively, must be willing to give something up in return for it. Such sacrifices may be through the conventional channel of taxation but can also involve giving time – for example, serving as a part-time special police officer. The idea of opportunity cost is therefore central to public value.

It is not difficult to make potential connections between public value and the built environment. If the public have been involved in the development of public buildings or spaces and have access to those spaces, it should augur well for increased receptiveness to the public services subsequently offered from those same premises. In terms of *outcomes* links can include the effects of good design of schools and hospitals buildings on positive welfare outcomes. The availability of safe green spaces with areas for tranquility and/or exercise should also contribute to health outcomes. There is also a considerable evidence base on designing out crime. *Trust* refers here to the relationship between state and citizens – something that should improve if the two sides regularly discuss the shape of the urban environment. Trust can also be an outcome in itself (in the sense that the design and management of public spaces is likely to have an impact on overall levels of interpersonal trust). In terms of how the public can value all of this it may well be that peoples' attendance at meetings to discuss design (or their involvement in environmental management/repair) is deemed a good way of displaying the value they place upon it. This is particularly relevant to poor areas that are unable, in strict economic terms, to value the environment.

#### *2.4 The Opportunities for 'Valuation' in the Urban Design Process*

Before we can start considering methods by which the urban built environment can be valued we need to be clear about the process through which this environment emerges and the key stakeholders that are, or might be involved. The obvious first key stakeholder is the *Client*. Unless a building is speculatively built by a private developer, there will be a client. This might be a business, a local public authority, a local regeneration company or, conceivably, a partnership of these. The client will appoint a *Consultant Team* of design and construction experts (see Table 1) to advise them on their land and make recommendations about what is feasible in technical and political (planning) terms. So already there would be numerous professionals ready to state what they think is valuable about a building – in monetary and/or 'good design' terms. Consultation events with the public can vary from the cosmetic to active workshop-type events

that, if organized and facilitated well, can be extremely productive in identifying and designing out problems and securing consensus. All of these groups will need methods for valuing what they want to get from some change to the built environment and then, collectively, the different organisations and groups, will need some method for negotiation and decision-making – preferably one that is not greatly protracted. If the Client then decides to proceed with a planning application, the Consultant Team will then prepare this in yet more consultation with the local authority (mainly planning and highways, but sometimes other departments), and other stakeholders (urban regeneration companies, regional development agencies, local landowners, bus operators, local businesses, residents).

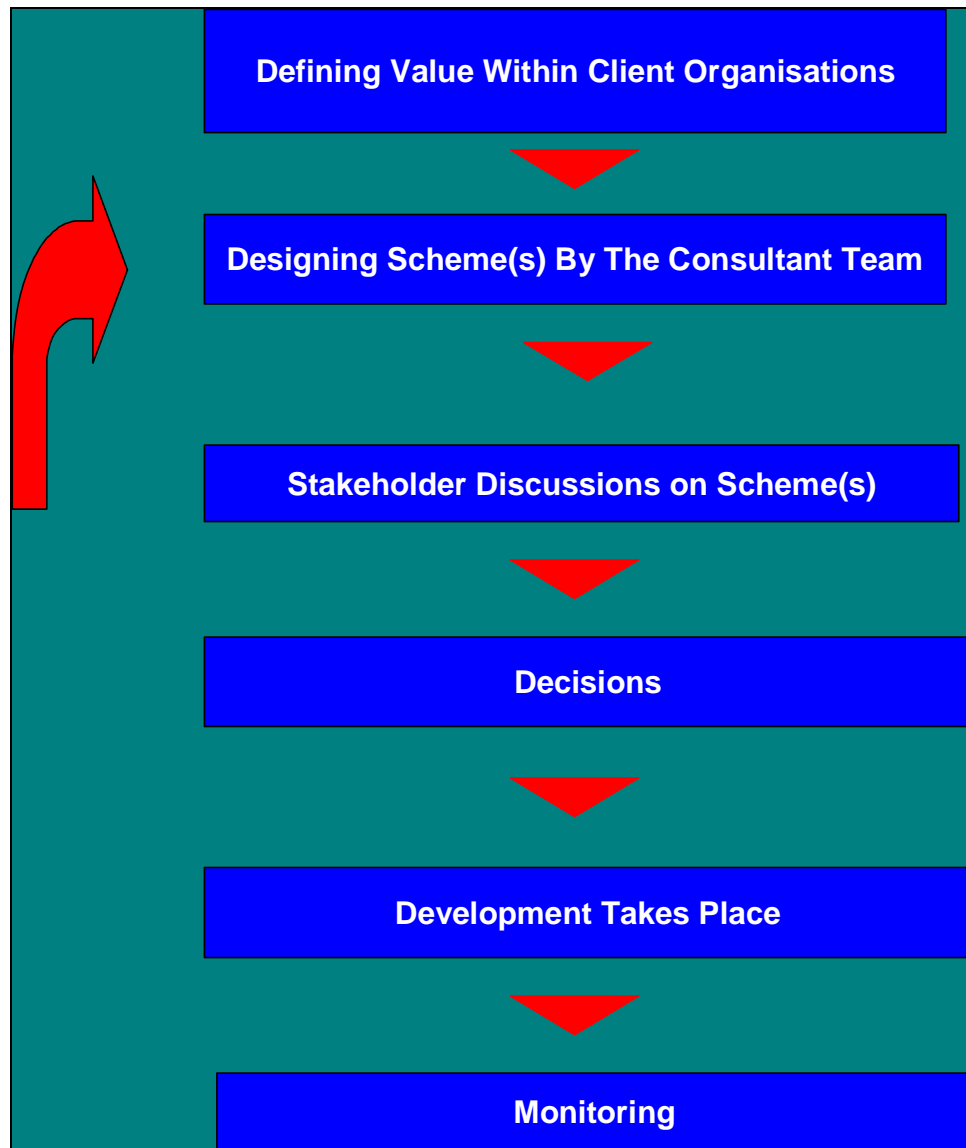
**Table 1: Key Stakeholders in the Development of the Built Environment**

<b>Category</b>	<b>Stakeholder</b>
Finance	Financiers, banks, PFI consortia, developers, government
Design and construction	Architects, engineers, sub-/contractors, Quantity Surveyor, an Urban Designer, an Environmental / Planning Consultant, a Highways/Transportation Engineer; a Civil engineer; a PR Consultant and a Socio-economic advisor sub-contractors and suppliers.
Occupant organisation	Chief Executive, Project Directors, Communications and Marketing Managers, General Workforce, HR, Facilities Manager, Security staff, Cleaners.
Public Realm	Local Authority; Local Community; Regional and National Community.
Visitors to Building	Hospital patients, hotel guests, retail customers, students, pupils, the general public.

(Adapted from Eclipse 2005).

The public may of course value things that professional designers, architects and engineers regard with horror. This may be a matter of aesthetics or may even extend to the more robust design/architecture/engineering principles such as usability, durability, adaptability, sustainability, inclusion, safety etc. It may well be that there is an economic case for educating people in the principles of good design since, if the built environment isn't fashioned according to good design principles, it could well see costs outweighing any values placed upon it by the public and so be uneconomical to build. It may well also be that what people state they want and what economic evidence shows they value are both at odds with evidence that shows how the urban environment may be delivering benefits of which they are unaware. So impact/evidence-based approaches also need to be employed as they have the potential to show people costs and benefits of which they may be unaware.

Figure 2: Opportunities for Valuation of the Built Environment



(source: authors 2005)

### **3. Approaches for Valuing the Built Environment**

#### *3.1 Introduction*

The literature review covered a handful of broad approaches to assessing environmental value. These were: Design; Environmental Economics; Impacts and Indicators; Organisational Performance; and Property Market. About ten other approaches were reviewed yet proved not to be as fruitful as we had initially envisaged. Nonetheless, eighteen different approaches have emerged from the initial review. Between them these eighteen approaches offer ten different types of contribution that we can look into more closely with a view to achieving a better understanding of how we might value and discuss the external values created by the built environment.

The reviews looked at approaches' conceptual clarity, their ability to inform decision-making; their display of data and perspective, their accessibility to diverse audiences and their methodological rigour. The tables outline the more technical aspects and the rest of the account deals with the approaches' strengths and weaknesses in more detail. The approaches range from direct monetary valuations of the value people place upon environmental goods through to studies that conceive of how the built environment can have numerous different social and environmental impacts.

#### *3.2 Valuing the Quality of Existing Places*

Several approaches consider the quality of existing places – most notable amongst them being *Placecheck*, *Local Environmental Quality Survey (LEQS)* and *Landscape Area Characterisation*. The latter is used specifically to assess and categorise historic aspects of areas and landscapes – its relevance to proposed urban developments is likely to lie in informing all stakeholders of the site's significance. All of the methods offer something in terms of ways for thinking about the built environment. If a community (or group of interested people) establishes what an area needs before a development is proposed this will put those same people in a good position to then judge what they are likely to value in any proposed development. The Area Characterisation's historical focus is particularly interesting in that it offers to help in uncovering the (often) hidden history of a place – a history that, once people become aware of it, may alter their valuations of the site.

Like almost all methods reviewed the approaches vary in cost depending upon the extent and rigour with which they are pursued. As a valuation tool the methods have limitations. In order to make decisions about allocating financial resources to different concerns we really need methods that can gauge how much value people attach to different measures. Without this it

becomes impossible to say if the monetary cost of certain measures will yield value of an equal or greater amount – thereby making an investment worthwhile. Only the Placecheck method offers any real framework for stakeholder dialogue – and even this is somewhat unstructured (certainly when compared to the methods discussed subsequently).

None of the approaches actually seem to get to grips with the question of good design though – looking instead at history or amenity. Given the inevitable interest in good design, one possible approach is to simply design a key list of what good design (there are numerous good design guides) is and then ask people to judge – perhaps as part of a national survey (such as a bolt-on to the LEQS). The tool that probably best addresses (non-monetary) value is the Place Consultation Tool currently being piloted by CABA which gauges the views of members of the public and of professionals running a space on nine issues (that the individuals have weighted beforehand). The nine are a mix of issues about design and about the use and compared against the group management of the space. They are: access; activities on offer; how it serves different needs; maintenance; performance; materials used; shelter and seasonality; role of the space in the community; how the space makes individuals feel. A score is then given by participants for each area of public space – so that, after the scores have been weighted, individual values can be compared with the groups.

**Table 2: The Methodology of ‘Place Approaches’**

<u>Approach and Subject</u>	<u>Object(s)</u>	<u>Measurement</u>	<u>Analysis</u>	<u>Use in Valuation</u>
<p><b>Placecheck</b></p> <p>Looks at urban spaces / areas. Potentially city-wide.</p>	<p><u>People:</u> helps identify key people, funds and processes needed for considering how to improve a place.</p> <p><u>Place:</u> helps identify what aspects of the place can be improved – greener, safety, spaces, connectedness etc.</p> <p>100 aspects considered in all.</p>	<p><u>Opinions:</u> gathered in workshop or survey (or, possibly, by observing the place).</p> <p><u>Easy:</u> designed for use by lay people.</p> <p><u>Recording:</u> Maps; Plans; Diagrams; Notes; Sketches; Video; photographs; audio tape.</p>	<p><u>Low Comparability:</u> although it is possible to develop each question into scales.</p> <p><u>Presentation:</u> in a variety of ways: Maps; Plans; Diagrams; Notes; Sketches; Video; photographs; audio tape.</p>	<p>It’s looking at lots of different things (that may well be valuable and, therefore, in need of valuation).</p> <p>But it’s not about attaching values or about ranking desired outcomes.</p>
<p><b>Local Environmental Quality Survey</b></p> <p>Looks at urban spaces / areas. Potentially city-wide.</p>	<p><u>Core characteristics</u> such as: cleanliness; environmental Crime and Fear of Crime; Street Furniture; Landscaping.</p> <p>Doesn’t look specifically at buildings.</p> <p>10 core characteristics and 31 across these.</p>	<p><u>Opinion:</u> of the surveyor who completes a nominal scale of ‘poor’ through to ‘good’ (there are also response scales within each category).</p> <p><u>National</u> year-long survey by trained staff to help authorities better manage their local environmental services.</p>	<p><u>Quantitative:</u> various analyses may be conducted (by professional statisticians) on the aggregations of data to assess change over time.</p> <p><u>Presentation:</u> overall service standards (and detailed variations therein) have been presented in graphic form, in four broad colour-</p>	<p>It’s looking at lots of different things (that may well be valuable and, therefore, in need of valuation).</p> <p>But it’s not about attaching values or about ranking desired outcomes.</p>

			quality coded categories	
<p><b>Landscape Area Characterisation</b></p> <p>Attributes and areas are not prescribed, but could include aspects of the natural and built environment that have been shaped by human activity in the past (for example, the lines of roads and streets).</p>	<p>The methods work by classifying landscape. Broad types of landscape character could (there is no definitive list) include communications and industrial land (although most landscape types tend to be rural).</p>	<p><u>Categorisation:</u> landscape or townscape is identified and described (by professional assessors).</p> <p>Also likely to involve archaeological work.</p> <p><u>Subjective:</u> often subjective method. Like a lot of heritage issues in an urban situation, this would be potentially controversial.</p> <p><u>National:</u> aim is to be national in coverage. Two-thirds of country have already been the subject of landscape characterisations.</p> <p><u>Visual Material:</u> maps; aerial photos.</p>	<p><u>Judgement:</u> Objectives are agreed based on the initial assessment.</p> <p><u>Presentation:</u> written description of the classifications. Sometimes accompanied by other forms such as illustrative maps or time-depth matrices.</p>	<p>It's looking at lots of different things (that may well be valuable and, therefore, in need of valuation).</p> <p>But it's not about attaching values or about ranking desired outcome</p> <p>It is unique in that it is looking at things that are often simply not visible to most lay valuations of a place. Not least archaeological sites.</p>
<p><b>Place Consultation Tool</b></p> <p>Urban spaces</p>	<p>Resident and professional space managers views on a space</p>	<p>Nine classes of views. access; activities on offer; how it serves different needs; maintenance; performance; materials used; shelter and seasonality; role of the space in the community; how the space makes individuals feel</p>	<p>Simple calculation of participant ratings.</p>	<p>Transparent easy-to-use tool for encouraging dialogue.</p> <p>Doesn't address value in the sense of allowing cost benefit analyses of different options.</p>

### 3.3 Discussing Non-Monetary Values of Building Design

The Design Quality Indicators (DQI) and the *Value in Design* (VALID) approaches are interesting in that they are both able to get stakeholders, both professional and amateur, around a table to talk about the design quality of the built environment – both before and after construction. The two approaches are both examples of the most common technique used to compare both unvalued costs and benefits – namely, weighting and scoring (sometimes called multi-criteria analysis (MCA)). The basic MCA approach involves assigning weights to criteria, and then scoring options in terms of how well they perform against those weighted criteria.

With DQI, for example, there are three main headings for valuing a design (usually a building). These are: Functionality (usefulness); Build quality (building fabric) and Impact (sense of place). Within these are ten other headings. Initial weightings of 1-3 are set for lots of different indicators within the ten headings. Then a design is rated using a Likert scale (agree strongly through to disagree strongly). These marks are then weighted using the initial weighting to give an overall DQI – for each individual and collectively. Individuals can see where they are getting

or not getting what they want and the Co-ordinator can then assess what the group as a whole needs.

VALID is largely the same although the user interface on the software is different. VALID is designed to divide up stakeholders in providers and customers. It then offers breakdowns of the scores for individuals, these two groups and overall. Measurements for all four of these are in terms of a ratio (judgements to targets). Judgements are what the stakeholder thinks the situation is and the target is what they want it to be. Interestingly, there are also various methods for weighting according to the stakeholders' importance – thereby helping lessen, if not removing, the worry that stakeholders are all treated equally when, in fact, their ability to resource their differing claims may vary wildly (i.e. between a poor representative from a community group and someone from a large construction company).

Although external impact is a relatively minor consideration in these approaches it is clear that they could be merged with the place quality methods referred to earlier and other approaches, addressed ahead, that address socio-economic impacts that businesses have.

Table 3: The Methodology of 'Multi-Criteria' Approaches to Design

Approach and Subject	Object(s)	Measurement	Analysis	Use in Valuation
<p><b>Design Quality Indicators</b></p> <p>design quality of buildings</p>	<p>Construction project under three main headings of: Functionality; Build quality; impact. Under each of these headings, there are two further levels.</p>	<p>Building is rated according to the dimensions set out in the questionnaire. The scale is 1 (strongly disagree) to 6 (strongly agree) and 7 N/A or don't know.</p> <p>range of data, some already collected, analysed and aggregated (such as heating data), others generated simply from direct reflection on building characteristics (such as extent to which it 'raises your spirits').</p> <p>Focuses mainly on building quality, less on the impact of a building on its locality (although some questions address these aspects).</p>	<p>data collection and 'analysis' is mostly simultaneous, stakeholder concerns are inbuilt and reflected in the mechanism through weighting, It is possible to arrive an overall DQI score which is the sum of the relative weights of each DQI section multiplied by the relative weight of that section.</p> <p>Visuals: most commonly used is a disaggregated 'spider diagrams' that show the performance of the sections and subsections. A more aggregated doughnut diagram can display the score of each section of impact, function, building quality.</p>	<p>It can be used by a wide variety of people from brief setting through to post-completion evaluation.</p> <p>Allows for a transparent discussion.</p> <p>Comparisons can be made as to relative importance of each dimension.</p> <p>Any comparison between buildings or over time will need the same stakeholders.</p>
<p><b>Value in Design (VALID)</b></p> <p>design quality of buildings</p>	<p>Allows stakeholder groups to identify and set targets for values connected with a project.</p> <p>Stakeholder groups identify which values are important to them, up to a total of around 10 items. e.g. 'building creates a sense of place' or 'additional cost imposed'.</p> <p>The values entered by each stakeholder can be given a weighting according to their relevance to the project.</p>	<p>Each benefit, sacrifice or resource is measured on a scale of 1-10. Benefits and sacrifices are measured subjectively. Resources can be measured objectively, and each unit on the 1-10 scale represents a numerical amount in real life.</p> <p>Stakeholder groups could include the building users, local authorities, designers, members of the local community and the building contractor. Data can be collected in a single workshop.</p>	<p>Allows analysis of how well the project has achieved those targets.</p> <p>VALID has produced an Excel spreadsheet allowing calculation.</p> <p>Data entered into the pro-forma excel spreadsheet is periodically used to (instantly) calculate a 'value ratio' for each stakeholder and for the project as a whole. Analysis is likely to be done by the project facilitator.</p> <p>Value ratios are displayed as a number on the Excel spreadsheet. Individual measurements and targets are displayed graphically on linear bars.</p>	<p>Intended to involve stakeholders in the assessment of value delivery throughout a project.</p> <p>The values can be compared over time by keeping records at different stages of the project. The process allows for participants entering data at specific stages on major projects. The same values are measured by members of the same stakeholder group, and can be compared. However, as the stakeholder groups define the values to be measured, they can only be compared with others if different stakeholder groups define the same values.</p>

### 3.4 Using Stated Preference Techniques to Gauge Value

Stated preference approaches were always going to be of considerable interest here. They deal with hypothetical environmental futures and, as such, seem well suited to addressing proposed changes to the built environment. The two approaches that are of most direct relevance are of the 'stated preference' variety. These approaches (*Contingent Valuation* and *Choice Modelling*) gauge peoples' views about what they would be willing to pay for something – whether they actually use it or not. They differ in that one asks directly about willingness to pay for something and the other attempts to tease it out by exploring peoples' preferences for various different environmental variables (including cost).

The approaches are also interesting in that the proposed changes are depicted visually - in the case of a proposed building this means the basic design versus several more elaborate ones. So, although the evaluations are conducted by professional economists, the data collection can be comprehensible and enjoyable. The techniques also, crucially, discuss valuations in money terms – asking whether the value we claim to have for some environmental change (or preservation of the status quo – such as preservation of an old building) exceeds the costs of that change. Whilst stated preferences are worth understanding they are not without their problems.

One key issue is that, in everyday life, people are rarely asked to perform such difficult cognitive tasks. Instead they have the opportunity to engage in repeated transactions over time, they have opportunities to explore in some detail the markets for substitutes and complements and have the opportunity to acquire substantial information. Stated willingness to pay is not a reflection of preferences they held previously but is instead constructed in the interview procedure. It entails picking one good cause and asking people about it – regardless of the fact that they may have given it no thought previously. If they were then asked about various other good causes (paying for kids' operations etc.) they might decide they would rather allocate their hypothetical money there. With the choice modelling scenario if a respondent has too many of the choice cards/images given out as part of the valuation exercises it may simply be too much of a confusing task.

There are also a series of equity issues not least of which is the fact that the poor are seen as having no value for things – those unable to afford some environmental good are treated as having zero value for it. From an economic viewpoint this is perfectly valid. Certainly, the richer will benefit more - they simply have more resources with which they can value something. Environmental economists counter by saying that it is not their remit to rectify social

inequalities but to deal with economic realities<sup>1</sup>. Environmental economists agree that the key thing from an environmental justice viewpoint is that the poor are not affected negatively by the wishes of the rich. Specifically, poor areas should not have more unsightly buildings than richer areas and, where they might be affected; they should receive compensation from those gaining value benefits from the building being there. Willingness to accept compensation is methodologically problematic but, since it is not constrained by income, is something that the poor can state when asked.

Whilst choice modelling allows us to isolate values for individual aspects of an environment it can also show things that people simply don't really have preferences for – this may be revealed statistically through various repeat exercises that establish what is and isn't important or simply by people saying they don't care when doing the exercise. In this case things like the type of materials proposed for a building might well be left to the experts. The Choice approach is also useful because it can discern between whether it is the buildings or the activities that take place around them that people like (for example, the bookstalls, street performers and outdoor cafes on London's South Bank) rather than the building and design aspects. If these activities turn out to be highly valued it has useful implications for designers and building/space managers. It should even be possible to assess how our knowledge of what goes on inside a building affects our valuations of it - for example how peoples' views on gambling affect their enjoyment of a casino's design.

There is a dilemma that affects both contingent and choice modelling approaches – namely, that when we say what we would value we can have no way of knowing how other people will actually use it. Admittedly, contingent and choice methods might allow us to discern that people value some places more if they have few visitors (a small space near a church, say) and value others because of the 'urban buzz' factor. But, once a building is built we cannot know whether everyone will then visit and be disappointed because too many people are there – or because the reverse is the case. Hopefully, the transfer of data from existing visit studies (see ahead) can help here.

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<sup>1</sup> If people are required to make judgements as jurors in a court of law there may well be a good case for designing new methods of taking on board peoples' judgements about the physical environment they live in.

Table 4: Stated Preference Techniques

Approach and Subject	Object(s)	Measurement	Analysis	Use in Valuation
<p><b>Contingent Valuation</b></p> <p>Willingness to pay for a proposed change to an environmental good (usually a specific site) or service.</p>	<p>Willingness to pay, when given a hypothetical future scenario, to preserve an environmental site or to secure a desired change.</p> <p>Main way of estimating non-use. This can include:</p> <p><i>altruistic use</i> – knowing someone else might like it</p> <p><i>option use</i> – having the opportunity to do something if you want</p> <p><i>bequest use</i> – leaving something for the future.</p> <p><i>existence use</i> – satisfaction that things exist even if you don't enjoy them personally.</p> <p>Presumably we can also include sentimental value – where we no longer use a building but it is important to our memories.</p>	<p><u>Monetary values.</u></p> <p>Data is collected from households – a randomly selected sample (350-500) of the relevant population.</p> <p><u>Methods</u> most common is discrete/dichotomous choice which asks: would you pay the following to get a certain change – yes or no. Participants are randomly assigned different values.</p> <p>Data is collected by mail, phone or in person</p> <p>Usually takes at least several months.</p> <p>if visuals are too flash it can see people attributing value to that rather than the subject.</p> <p>computer altered pictures – can do in standard computer programmes.</p> <p>various checks are in place to stop lying.</p> <p>sometimes several people may do the same CV survey over a few months – see if values change.</p>	<p>Using statistical (i.e. sample-based) techniques.</p> <p>Researchers estimate the average value for an individual or household. This is then extrapolated to the relevant wider population.</p> <p>Analysis includes regression (for open-ended data) and Logit models (for yes-no responses).</p> <p>When applying contingent valuation, the researcher usually explains the WTP in terms of several variables, like income and age.</p> <p>Median WTP is more robust to outliers and of more interest to policy makers worried about political support. For the purposes of cost benefit analysis however it is mean/average WTP which is most appropriate.</p>	<p>Most widely accepted method in environmental economics for dealing with total economic value – both use and non-use.</p> <p>Crucially for us it deals with the hypothetical – we are talking of proposed buildings so it is important.</p> <p>For a value mapping exercise could use simple bar charts on willingness to pay versus costs.</p> <p>the use of a robust methodology should allow for comparisons between designs and over time.</p>
<p><b>Choice Modelling</b></p> <p>Willingness to pay for different elements of a proposed change to an environmental good (usually a specific site) or service.</p>	<p>peoples' willingness to pay for different aspects of an environmental good</p>	<p>respondent given a number of commodity descriptions or situations on a set of cards, that differ according to the attributes described, and survey respondents.</p> <p>then asked to rank and rate the desirability of each card. The inclusion of price as one of the attributes allows for the derivation of implicit prices for each of the other attributes.</p> <p>Avoids the direct valuation problems seen with the CV method.</p> <p>Randomly selected sample of the relevant population.</p> <p>Lengthy to pilot.</p> <p>pictures – good for visuals.</p> <p>Non-deliberative.</p>	<p>sophisticated logit modelling needed for choice modelling – the capacity to do this is included in most econometric software.</p> <p>Researchers can extrapolate from the average values for a service (for each individual/household) to the wider population – thereby arriving at the total benefits from the site.</p> <p>The data can highlight variations between respondents in terms of socio-economic differences and attitudinal differences.</p>	<p>Very suitable for the valuation of environmental goods, since these goods are pre-eminently goods with a multidimensional character.</p> <p>Different sites can be compared in terms of how they 'score' when the multi-dimensional equation is applied to them.</p>

### 3.5 Using Revealed Preference Techniques to Gauge Value

Revealed Preferences have the obvious problem here in that they are about existing developments. However, the possibilities of one day using Value Transfer methods that seek to use existing studies to inform proposed developments (see next sub-section) means that revealed preference work warrants consideration. The two main approaches are *Hedonic Pricing and the Travel Cost Method*. The Hedonic Pricing Method aims to determine the relationship between the attributes of a good and its price. It has as its basic proposition the notion that any good has a range of characteristics, each with its own implicit or 'shadow' price. The final price of that good is the sum of the shadow prices of all its attributes, and thus reflects the consumer's valuation of the marginal differences between attributes. Applied to property, it involves the use of econometric analysis of (recent) relevant databases to disentangle the various attributes of a building or a development from the other factors making up their market price. It has been used to examine the impact on market prices of the location of buildings in relation to amenities, public transport, schools and health facilities; proximity to landscape features; presence of architectural features and internal/external design characteristics; or any attribute of a building or development that might be of value to consumers.

The approach is not unproblematic. It does of course rely on there being a well-functioning, data-rich property market. In the UK, this has restricted the use of hedonic methods mostly to the study of the value of different attributes of housing, whereas in the US it has limited its use to commercial property. Also, if transaction costs (searching, buying and moving) in property markets are sufficiently high, they may negate the benefits of moving. Besides its reliance on the quality of property market data, the main difficulty with this approach is that it requires all other variables that could explain price differences to be isolated and quantified. Recent studies on the impact of large public transport projects on property prices show how difficult this can be. There are other potential weaknesses too. As it concentrates on property prices, the hedonic approach ignores values that are not or cannot be incorporated into the market price of a building and therefore considers only values that are relevant to consumers of property and for which they are prepared to pay. Thus, it ignores those with non-use values for a particular piece of the built environment and it ignores visitors – their values would need to be picked up by other methods. The zoning of the built environment also affects who is able to buy property that overlooks or is near to different elements of the built environment. For example, in many business parks and business districts the architecture and spaces do tend to be 'consumed' just by other businesses – simply because such areas often have few residential premises. To enjoy such design others really would have to make special visits. The same is true for a Greenfield University campus or a wonderfully designed suburban train station.

The basic premise of the *Travel Cost Method* is that the time and travel cost expenses that people incur to visit a site represent their valuation of that site. This approach makes it possible to construct a willingness to pay curve for some aspect of the built environment. There are not many obvious flaws in the approach although TCM does seem to be a snap-shot – some places that people visit may be declining in popularity whereas the reverse will true of other sites. This is a problem if the costs of an environmental change are a calculable one-off and yet the benefits may well extend into the future. Some sort of trend data is needed. There is an obvious distributional issue here that the TCM can't help in addressing – namely that some buildings and places that prove highly popular with visitors actually depress local house prices (because residents dislike the noise and problems that accompany large crowds).

**Table 5: Revealed Preference Techniques**

<u>Approach and Subject</u>	<u>Object(s)</u>	<u>Measurement</u>	<u>Analysis</u>	<u>Use in Valuation</u>
<p><b>Hedonic Pricing</b></p> <p>recent housing/property market data to gauge the effects of certain environmental characteristics on house/property prices.</p>	<p>measuring marginal willingness to pay curves.</p> <p>estimation of the demand curve for the non-market good by observing behaviour in the market for a related good. Uses a non-market good (e.g. proximity to open space) that is implicitly traded.</p>	<p>the exercise should be very cheap if data are readily available.</p> <p>In addition to collection data on sale prices of properties within a given area, the researcher also collects details on the characteristics of each property.</p> <p>data is usually for the previous year and usually for an urban property market.</p>	<p>Uses regressions and differentiation techniques</p> <p>Geographical Information Systems (GISs) are commonly used.</p>	<p>should be amenable to mapping.</p> <p>Need to develop metrics for design – metrics that touch upon good design (whilst recognising that judgements on the more aesthetic elements will be beyond the reach of hedonic models).</p> <p>data could indicate change in the popularity of a development over time.</p>
<p><b>Travel Cost Method</b></p> <p>Data on willingness of the public to pay for visiting sites. Because travel and time costs increase with distance it becomes possible to gauge the number of visits at different prices (i.e. willingness to pay for additional visits at different prices). There may also be entrance fees at the sites.</p>	<p>sites used for recreational purposes.</p> <p>The approach can be used to assess the costs and benefits of possible changes to a site and/or access costs to it.</p> <p>The Random Utility Method (RUM) is the most sophisticated and common TCM approach. It is particularly suited to dealing with specific quality changes of sites and where numerous substitute sites exist.</p>	<p>With RUM individuals are asked about all possible sites they have selected in the past year, their quality characteristics and the travel costs to each site.</p> <p>Data is typically collected for the 12 months prior to the time of collection – which can be collection over this period or collection that asks people about their 'visiting' behaviour over this period. usually collected from visitors at the site.</p> <p>n.b. some people may regard travel time as a benefit and not an opportunity cost.</p> <p>Typically collected through surveys – on-site, telephone or mail surveys. For simpler models there may be data</p>	<p>Regression is the most common form of analysis.</p> <p>RUMs use logit models.</p> <p>demographic variables such as age and income – these should make it possible to isolate how different groups' visiting behaviour varies.</p> <p>With RUM the researcher can then estimate a statistical model about when trips will be made, which sites are selected and how changes in site quality affect value. If we can know what is desirable we can</p>	<p>As with hedonics we need some (design – related) site quality metrics that are quantifiable (such as presence of seating, availability of rubbish bins, amount of green-space). Put another way, how would the RUM models that look at beach use need to change to be applied to use of urban space.</p>

		<p>available from various environmental/governmental agencies.</p> <p>don't count by-passers – they are in the area (possibly benefiting from the space) but are not there because of the space.</p> <p>Non-use values are omitted – these are the values of a site to people that don't use it. These can be very substantial where a site is unique.</p>	<p>know how to improve sites for the better.</p>	
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### 3.6 The Value Transfer Approach

*Value Transfer* uses data from pre-existing revealed or stated preference studies and could potentially help inform deliberations on proposed building development. Due to limited time and resources when environmental decisions have to be made decision-makers try to transfer economic estimates from previous studies (often termed study sites) of similar changes at other locations. The first need is to ask whether the existing and proposed sites are similar in type and quality and whether there is a similar availability of alternative sites between the existing and proposed developments. It is also important to ask whether the demographics are similar between the area where the existing study was conducted and the area to be valued. If not, are data available to make adjustments? It is perhaps not surprising to note that there are considerable concerns about the method's accuracy.

One potential problem would be where a proposed project were so alike another project in the same country that it didn't replicate the study site in terms of value – but got considerably less because it wasn't novel (perhaps attracting all those living nearer to the new site than the old site). The immediate practical problem with the Value Transfer approach is that there is nothing to transfer – in contrast to the environmental economics field there are not existing databases of revealed or stated preference studies.

Table 6: Value Transfer Methods

Approach and Subject	Object(s)	Measurement	Analysis	Use in Valuation
<p><b>Value Transfer</b></p> <p>transfer economic estimates from previous studies of similar changes in environmental quality to value the environmental change at the site being assessed.</p>	Willingness to pay for environmental goods.	because a development will be new, the researcher will need to estimate how many people will use it. This might be accomplished by a survey of visitors, asking whether they would use the new development and how many times they would use it.	<p><u>Unit Transfer</u> the simplest form is to borrow the estimated average (mean) willingness to pay for some study good and apply it to a policy good context. this approach is termed mean/average value transfer or unadjusted unit value transfer.</p> <p><u>Function Transfer</u> Benefit function statistically relates peoples' willingness to pay to characteristics of the ecosystem, the people whose values were elicited and, sometimes, availability of substitute sites.</p> <p>analysis is not complicated, lengthy or expensive.</p> <p>Geographical Information System (GIS) often gets used</p>	<p>may be particularly useful in policy contexts where rough or crude economic estimates may be sufficient to make a judgement.</p> <p>The method can be used as a screening technique to determine if a more detailed, original valuation study should be conducted.</p> <p>most reliable when the original site and the study site are very similar and when the original valuation study was carefully conducted and used sound valuation techniques.</p> <p>"value transfer is an approach to economic valuation that has some degree of inherent uncertainty and evidence concerning its accuracy is inconclusive" (EFTEC 2005).</p>

### 3.7 Quality of Life Approaches

The Quality of Life approaches discusses a wide spectrum of life although the connections between these and the built environment are not apparent in the approaches themselves. Many of the indicators are of no real relevance to built environment discussions (fish stocks and pensioner poverty for example). Admittedly, well designed homes can save pensioners fuel bills but that is more a question of the internal design rather than the external benefits that concern us here. Even if the connections to the urban environment were made it would still probably offer nothing more than the Placecheck approach. The visual idea of using traffic lights to indicate progress is however an interesting one for possible value mapping – pretty much everyone understands the significance of traffic lights.

The Quality of Life Capital is the most strategic of the three variant approaches – albeit one whose rural pre-occupations are fairly visible. It is all about identifying and maintaining benefits for an area – it is much less concerned with damage to an aspect of the environment than it is to the loss of benefits that were provided by that aspect. The approach stipulates that any change that reduces or damages the benefit is offset by some other change that increases or

improves the same benefit to at least the same degree – a useful concept that might inform Section 106 agreements<sup>2</sup>. In some cases the recommendation will be that the development doesn't proceed at all. The method is very much a broad-brush style rather than a fixed checklist. It is also very much about protection rather than any creative process for use in shaping a future development.

**Table 7: Quality of Life Methods**

<u>Approach and Subject</u>	<u>Object(s)</u>	<u>Measurement</u>	<u>Use in Valuation</u>
Quality of Life (Sustainable Development Indicators)	"sustainable development" in the UK – in the widest sense of social, economic and environmental	20 'framework indicators, and 48 supporting indicators. Uses existing data for the last year.  <u>Environmental Framework Indicators</u> 1. Greenhouse gas emissions 13. Resource use 18. Waste 20. Bird populations 27. Fish stocks 28. Ecological impacts of air pollution 30. River quality: Biological, Chemical  <u>Socio-Economic Framework</u> 32. Economic output 37. Active community participation 38. Crime: Vehicles & burglary, Robbery 40. Employment 41. Workless households 43. Childhood poverty 45. Pensioner poverty 47. Education 49. Health inequality 55. Mobility: Walking/cycling, Public transport 59. Social justice 60. Environmental equality 68. Wellbeing	no overall assessment methodology that aggregates these indicators into a single index to make them comparable or tradeable.  Some of the welfare aspects could be relevant in terms of hospitals effects on recovery or schools' effects on learning.  three categories indicating progress or not. green, amber, red. white = insufficient or no comparable data.
Audit Commission Local Quality of Life Indicators	Ideas for measuring sustainable development and quality of life in local communities.	<u>People and place</u> Several issues around cohesion, community and political participation. Would need to think how new spaces could facilitate this – lot of evidence on. <u>Community safety</u> Safety of areas – defensible space (see Streets). Value might be measured by absence of litter, graffiti – although a tiny minority may always wish to annoy the wishes of the rest. <u>Culture and leisure</u> increased facilities for leisure – particularly the young <u>Economic well-being</u> not relevant here <u>Education and life-long learning</u> educational attendance and attainment – evidence from ethnographic study <u>Environment</u> land reclaimed would be good <u>Health and social well-being</u> tenuous <u>Housing</u> tenuous <u>Transport and access</u> friendliness to pedestrians and cyclists <u>Other indicators</u> Percentage of people surveyed who feel that	Useful in suggesting indicators.

<sup>2</sup> Compensation by developers to local authorities for pressures on the local environment.

		their local area is a place where people from different backgrounds get on well together.	
Quality of Life Capital	<p>The benefits that affect the quality of life, at any scale ranging from a development site to a whole planning district or region.</p> <p>Actual dimensions used will depend on what is being evaluated.</p> <p><u>Environmental</u></p> <ul style="list-style-type: none"> <li>• Distinctiveness</li> <li>• Quality</li> <li>• Rarity</li> <li>• Representativeness</li> <li>• Setting/context</li> <li>• Historical continuity</li> <li>• Recorded history</li> <li>• Accessibility</li> <li>• Popularity</li> </ul> <p><u>Social</u></p> <ul style="list-style-type: none"> <li>• Trust</li> <li>• Norms</li> <li>• Reciprocity</li> <li>• Networks and connections</li> <li>• Health, shelter, subsistence</li> <li>• Livelihoods</li> </ul> <p><u>Economic</u></p>	<p>Collected over a range of areas, from a single development site to a planning district or region. Usually requires trained facilitation or use by professionals.</p> <p>Feature is selected. Then the benefits and dis-benefits are noted – both now and for the future. The scale and importance are noted. The trend of the benefits and/or disbenefits is noted – with a particular view to whether they are sustainable.</p> <p>Looks whether there are substitutes that might fill in for whatever is giving the benefits at present.</p>	<p>Has been shown to be particularly useful at the local scale and for engaging public participation.</p> <p>Aims to identify priorities for guiding land-use planning and management decisions.</p> <p>To involve the public in decision-making, by making potential trade-offs of benefits more transparent.</p> <p>very broad-brush rather than fixed universal method</p> <p>Very much about protection rather than any creative process for use in shaping a future development.</p>

### 3.8 Arts Impacts<sup>3</sup> and the Value of the Built Environment

Traditionally the arts sector has relied primarily on aesthetic rationales and arguments emphasising their intrinsic and ‘civilising’ values. David Throsby (2000) defines cultural value as consisting of: aesthetic value; spiritual value; social value (sense of identity and space); historical value, symbolic value and authenticity value (its genuineness). Similarly, Kelly and Kelly (2000) stress the need to value and support art which is difficult and new and for which there is no market. Delgado (2001 in Reeves 2002) notes too that issues such as cultural preservation and cultural diversity must also be factored into discussions about what is valuable. This has clear implications for the built environment – we should, so the argument goes, support the avant-garde because it may become popular and, if it doesn’t, it will anyway still add to the stock of cultural diversity.

Environmental economists, including David Pearce, in work on preserving heritage buildings have recently taken issue with those who would see cultural values as somehow exempt from the formal valuation applied to other goods. The economists in question (see EFTEC 2005) concede that, a building that almost no-one values may have great value to a few experts who are aware of its cutting-edge technology or its historical significance. EFTEC argue that without the ability

<sup>3</sup> There is no table for this approach as the literature is very diverse and its value here lies in the questions it throws up rather than any methodological insights.

to compare costs and benefits we are powerless to make any resource decisions. In reality we do put implicit or explicit prices on all assets – even human life. They offer some hope for the aesthete - suggesting there may be a need to educate the wider public about the case for reconsidering their initial values (which creates the further problem of how much should be spent on such education).

What about the value of the life changing effects an arts project may have. Landry et al. (1993) described these as effects that have a “continuing influence upon, and directly touch, peoples’ lives”. These effects may not be apparent at the point of consumption (the admission price might be repaid many times over). So a valuation based on market value or willingness to pay might be misleading. Of course, measuring the effect of a building on a person is fraught with difficulty. The effects on one individual could be far more significant than any number of visitor pounds – it may be that seeing an impressive piece of architecture has swayed many talented people into the field of architecture and urban design. Alternatively, it may instead be that attraction to these professions is caused by bad design.

The arts impacts literature also discusses how an areas’ image and, as a result of this, its economic fortunes can be changed if it can boast some great artistic works. Although we are avoiding discussion of economic impacts here, this particular issue is relevant in that urban environments can often be converted to images such as posters and postcards. These images can also then be used in tourism and advertising (see Kelly and Kelly 2000). So there is an additional source of value that conventional environmental economics doesn’t appear to mention.

### 3.9 Environmental and Ecological Impacts and the Value of the Built Environment

There are two main ecological approaches that focus upon impacts over a wider geographic reach - *Ecological Footprints* and *Ecological Rucksacks*. With the Footprints approach we can find the biologically productive area that is required to maintain the flows of much of what we consume and compare what we use with the area on the planet that is biologically productive. Urbanised economies are of course more likely, by definition, to need to import resources to meet their needs. It is perhaps unsurprising then that various towns and cities have developed detailed accounts for their ecological impacts and demands. Cities and developments that can discourage car use without hampering movement are clearly a key factor in footprint reduction - in industrial countries, fossil fuel use accounts for about half of the footprint. The *Ecological Rucksack* is a similar tool that shows that anything we use has invisible environmental impacts in production and subsequent disposal – albeit one that extends well beyond the local place and, even, the local city and country. The Rucksack approach uses the idea of a consumed product's true weight – the weight of biosphere that is disturbed to make a good or service. Showing the true environmental impact of what we consume. Neither approach is applied at the level of buildings. With footprints the impact is by person (not by weight) so it is not entirely clear how the consumption of materials used for a building would be related to people.

The last approach is Environmental Impact Assessment (EIA). EIA provides evidence and analysis of environmental impacts of activities from conception to decision making. An EIA must include a detailed risk assessment and provide alternative solutions or options. It may cover any engineering or industrial project, legislative proposal, policy programme or operational procedure with environmental implications. It is more about being reactive rather than any creative process for deciding what the valuable features of a new building might be. Neither EIA nor the other two approaches is specifically concerned with measuring the costs of the impacts – which are different again, of course, from the value of these costs (society's willingness to pay to rectify the damage or to accept compensation for its occurrence).

**Table 8: Environmental and Ecological Impacts**

Approach and Subject	Object(s)	Measurement	Analysis	Use in Valuation
<p><b>Environmental Impact Assessment</b></p> <p>Areas believed to be of environmental value</p>	<p>A wide range of environmental factors and the impact of proposals upon the environment. The measurement will vary due to the nature of the proposal, the environment which it is likely to affect, and the information available. While a study of the proposed location is required, original scientific research is not normally required.</p>	<p>During the policy development process or before physical development is undertaken. Geographical scale dependent upon proposals. done by Scientists and Environmental consultants</p>	<p>varies</p>	<p>Environmental data and impact can of course be quantified into monetary terms.</p> <p>Environmental analysis may indicate ways which the project can be modified to avoid possible adverse effects and enable the planning process to run more smoothly (In line with this developers are now required to consider alternative approaches to the proposed development that they have considered).</p>
<p><b>Ecological Footprints</b></p> <p>Environmental data.</p>	<p>Ecologically productive space per capita. Measures the amount of nature's resources an individual, a community, or a country consumes in a given year. Consumption data is translated into the amount of biologically productive land and water area required to produce the resources consumed and to assimilate the wastes generated using prevailing technology.</p>	<p>Calculates how much productive land and sea is needed to feed us and provide all the energy, water and materials we use in our everyday lives. It also calculates the emissions generated from the oil, coal and gas we burn at ever-increasing rates, and it determines how much land is required to absorb our waste. Usually based on data from a single year – the last year. Collected within a city or country but the data's implications are then assessed in terms of their impact on global stocks of bio-productive space. <u>Expert advice:</u> Data from United Nations agencies and the Intergovernmental Panel on Climate Change.</p>	<p>Resource uses are translated into global acres by dividing the total amount consumed in each category by its ecological productivity (or yield). In the case of carbon dioxide (CO<sub>2</sub>) emissions, the total is divided by the assimilation capacity of forests. This data can be converted into the biologically productive area that is required to maintain these flows. This area for total human demand can be compared with nature's supply of ecological services, since it is also possible to assess the area on the planet that is biologically productive.</p>	<p>Footprint accounts make no distinction between land uses that are sustainable and those that are not. It's thus all about land use. But, if activities in one year lead to an increase in desertification, for example, then the bio-productive supply will decrease in subsequent years.</p> <p>Simplicity of the term means that, if methods remain the same, the method can be repeated over time. Not clear how doing this for a building would mean anything though – the impact is largely a once and for all one.</p>
<p><b>Ecological Rucksacks</b></p> <p>Environmental data.</p>	<p>the amount (in kilograms) of material taken from natural locations in order to make a product – so the material used in the good, the material used in making the machinery that produced it and the material used in making the transport that moved the good (and in final disposal – hopefully in a biodegradable/recyclable fashion). For a</p>	<p>Measured in weight in kilograms. Potentially global – wherever goods draw their inputs from and wherever There are data dumps that outline the rucksacks for most common goods.</p>	<p>The ecological rucksacks of goods are easily calculated. All materials used in the production of goods are listed by weight and multiplied by rucksack factors, and then summed to include all materials. The rucksack factor is the amount (in kilograms) of materials moved to obtain 1 kilogram of</p>	<p>Doesn't attempt to make valuations of environmental impacts (particularly whether all negative environmental impacts are: a) paid for; b) acceptable in terms of their effects on people and wildlife/natural environment.</p> <p>It is a good conceptual tool for measuring (though</p>

	toothbrush the rucksack is 1.5kg, for a mobile phone it is 75kg and for a personal computer it is a monstrous 1,500kg.		the resource. For example, one kilogram of steel carries an ecological rucksack of 21 kilograms.  Assuming a stable methodology is used, it would be quite possible to compare the rucksacks of different buildings (perhaps with some weighting to take into account building scale/cost).	<i>not valuing</i> the movement of environmental material.  Concept ought to help inform a visual display of resources.
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### 3.10 Social Return on Investment

*Social Return on Investment* focuses upon measuring social outputs and valuing social outcomes (in relation to costs and what would have occurred anyway). ‘Social’ is used, in both approaches, to cover social, environmental and economic aspects. As we are concerned with buildings/places rather than the organisations located in these developments, these tools are not particularly appropriate – in the sense that too much of the key issues relate to issues such as workplace relations etc. Nonetheless, the holistic approach and concern with a return on an outlay (which is at the heart of the concept of value) means the SROI approach, in particular, has some mileage here. The focus on creating a causal theory relating to the organisation and its impacts is important here. Certainly the material reviewed in this report should go a considerable way to informing a causal theory of how the built environment creates wider social returns on the investment made in them.

**Table 9: Social Return on Investment**

Approach and Subject	Object(s)	Measurement	Analysis	Use in Valuation
<p><b>Social Return on Investment</b></p> <p>Social, environmental impacts.</p>	<p>Monetary value of desired social impacts in relation to the expenditure spent to get these impacts.</p>	<p>Causal theory is important – moves from inputs to activities and outputs to (desired) outcomes. n.b. danger of missing out undesirable outcomes?</p> <p>Will vary according to the complexity of the model used.</p> <p>5 years is a standard time horizon to project return on investment. Each future year is discounted to allow for the change in the value of money over time (discounted at 3.5%).</p> <p>Will vary according to the complexity of the model used.</p> <p>usually staff from the organisations themselves or from NGOs that do research and consultancy in this field.</p>	<p>4 main elements needed to measure social value creation: inputs (resources); outputs (activity completed); outcomes (direct and indirect change as a result of the activity completed) and impacts (change adjusted for the 'policy off' (a.k.a. counterfactual/deadweight) scenario).</p> <p>indirect effects can include money saved – e.g. something that makes someone healthier is likely to save the taxpayer.</p> <p>SROI for a project is expressed as a ratio – i.e. an SROI of 10 to 1 would mean that for every pound invested, ten pounds of value was created for society. This is a good headline, comprehensible indicator.</p>	<p>this process also makes it possible to apportion who gets the value.</p> <p>visuals are limited to arrow diagrams and SROI tables.</p>

### 3.11 Property Market

There are many approaches under the *Property Valuation* banner, broadly divided into traditional and advanced methods. All are methods of assessing the market value of real property. The approach is very much one for expert property valuers. These will use rental data of comparable properties and a survey of the property, as well as conditions of lease, covenants etc. to derive a value.

**Table 10: Methods of Market-Based Property Valuation**

TRADITIONAL	
Approach	Nature
Investment Method (Income Capitalisation Method)	all depend directly on assessing comparative rental flows.
The Profits Method	
Development Method (The Residual Method)	Assessing the value of developable land
The Contractor's Cost or Replacement Cost Method	cost of constructing replacement
The Multiple Regression Method	assess what elements of the property are contributing what proportion of its value.
The Stepwise Regression Method.	
ADVANCED	
Approach	Nature
Artificial Neural Networks (Anns)	The advanced methods still take into account income flows, but they tend to try and take into account the changes to this flow over time, or to model more accurately various variables (such as geographic variations).
Hedonic Price Models	
Spatial Analysis Method	
Fuzzy Logic	
Autoregressive Integrated Moving Averages (Arimas).	

Some make the valuable characteristics of a property explicit – including through use of the sorts of hedonic approaches mentioned earlier. One approach that has openly attempted to talk about ‘good design’ is the *Design Dividend* approach. This has sought to show a statistical relationship between good urban office design (as defined by professional judges) and financial returns to property investors. However, this property-based approach has been very much about those who invest in the building reaping benefits from the building’s good design – not really about the wider value that might accrue to the local community or wider society.

The *Triple Bottom Line Property Appraisal* approach, still in its infancy, is a more concerted attempt (than *Design Dividend*) to gauge the effects on building worth (not value – the exchange price) of sustainability criteria. Writers within this school have also sought to develop social indicators that might affect investor returns – these indicators range from aspects that staff will like such as access to local green space, proximity to town centre through to community access to the building, heritage preservation, compliance with the local vernacular etc. This community-mindedness is still all about investors capturing the benefits of their investment – not about values accruing to the wider locality. This is a subtle point – investors would, in effect, be paying to give value to the community free of charge (thereby presumably thinking they are deriving some sort of concomitant value in the process – most probably good p.r.). However, we could only know that developers/building occupiers were recapturing this value (and therefore that the arrangement might be sustainable) if we knew what value the public placed on the design ‘gift’ and the extent to which this value translates to support for the developer/building occupier.

## 4. Conclusions

### 4.1 *The Literature Reviews*

The review has shown that a handful of methods already exist that do or could help discuss the value of an existing or proposed addition/alteration to the built environment. There are multi-criteria analysis (MCA) approaches that allow different stakeholders to prioritise what they want from a (good) design and to then discuss and negotiate amongst themselves about how the development should proceed. This method is accessible, transparent and can generate decisions that lead to developments. It can reasonably be said to be the dominant method for value discussions around the built environment and is used to engage both professionals and interested members of the general public. At present however the method is more focused upon building design quality than valuations of the wider social and economic benefits. Also, the method isn't related to different stakeholders' willingness and ability to pay for what they want. That is, it's not about genuine valuations out there in the real world. We can see who benefits in terms of public or private sector, people or business but not in terms of genuine monetary value. Several measures ought to make it more possible to retain rather than reject the approach. These include greater attention to place rather than just buildings; greater weighting according to genuine financial power and greater attention paid to ensuring that the general public have a say in proportion to their numbers and willingness to pay.

The Environmental Economics field has several approaches for valuing peoples' willingness to pay for the improvement/protection of the natural (non-built) environment yet these techniques have not been applied in an urban context. The two main techniques centre upon estimating what people would pay or, using existing data, what they have paid for such improvement/protection. If a proposed development is very similar to one for which data exists and for which a valuation has been undertaken, it can be possible to estimate values for the proposed development. All of these economic approaches have inherent weaknesses although they are the most rigorous in terms of strict valuation. Again, the approaches must not be rejected but embraced by those eager for a well designed built environment. The approach needs to start being applied to the built environment. Only when this occurs can those interested in the built environment get a real sense of what the approaches has to offer. Both the built environment profession and environmental economists must take up this gauntlet – at present there is something analogous to CP Snows' famous 'Two Cultures' divide between scientists and artists. This might, conceivably, extend to a new type of University degree or to CABI having an environmental economics team.

The final main block of work reviewed were approaches that focus upon impacts. These approaches include the arts impacts literature that includes discussion of how people can be moved or brought closer together by great (or awful) works. Also considered are the environmental impacts and ecological footprints/rucksacks. None of these discuss value in the sense of assessing how much we are willing to pay for something but they do make it possible to work out the costs and benefits of activities. The environmental and environmental economics approaches were the ones to take the future into account the most – the former by its concern with sustainability and the latter by its discussion of discount rates.

#### *4.2 Where To From Here?*

Visual diagrams that set out in graphic form the sorts of values outlined here may well be able to help in structuring discussion during and after building projects – with greater method and discussion being needed for the bigger projects. There is a need for such tools to be explicit about the degrees of certainty around different numbers (either through a star rating - one to five stars depending on the solidity of estimates, or visually through font sizes and darkness). Revisiting and revising value maps could provide a focus for communities to become more sophisticated in their understanding of their environments and ways in which they might improve them. Such diagrams could:

- Combine quantitative and qualitative data
- Reflect timescales for value
- Incorporate private and public benefits
- Reflect the hardness or softness of valuations (i.e. how quantifiable is it)
- Facilitate decision-making around important changes to the built environment
- Find the best way to maximize value in the public and private spheres
- Establish to whom costs and benefits accrue and how.

There are two key and mutually inclusive stages to generate these value maps. The first is to engage leading exponents of the approaches discussed here and to engage those with an interest in the issue of valuing the built environment. These then need to meet and discuss just exactly how they might learn from each other, how they might visualise their valuation needs and the how they might integrate the different issues raised here. Given that it is possible to discuss all of these issues here it should also mean it is possible to depict them graphically. The second key way is to review the work of the leading exponents in the field of information graphics – who, curiously given the importance of what they do, seem to operate away from the glare of academic publicity. The thinkers whose work was consulted include Edward Tufte and Robert

Horn in the US and of Bob Spence at Imperial College in London. From these works we assembled a check-list of infographics principles – included in the appendices. Also reviewed were several websites that offered versions of value maps and an excellent website dedicated to information visualisation called Information Aesthetics (<http://infosthetics.com>). Numerous pointers about visualisation of information were gleaned from the various literature mentioned and are noted below but it was not until the maps and visualisations were consulted that the words in the manuals became meaningful. At the time of writing the project team are now preparing to engage key decision-makers and experts in these value mapping exercises.

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## **Appendix I: The Project Team**

### Young Foundation

The project has been overseen by Dr Geoff Mulgan CBE, Young Foundation Director. Geoff became director of the Young Foundation in September 2004. Between 1997 and 2004 he had various roles in government including director of the Government's Strategy Unit and head of policy in the Prime Minister's office. Before that he was the founder and director of the think-tank Demos, described by the Economist as the UK's most influential think-tank; chief adviser to Gordon Brown MP; a consultant and lecturer in telecommunications; and an investment executive. He began his career in local government in London. He has been a reporter for BBC TV and radio and a columnist for national newspapers including the Guardian and Independent. Geoff is a World Economic Forum Global Leader of Tomorrow, and was ranked in 2004 as one of the UK's 100 leading public intellectuals. He has lectured in over 30 countries. He is a visiting professor at LSE and UCL, and a senior fellow at the Australia New Zealand School of Government. His most recent book is *Connexity* (Harvard Business Press and Jonathon Cape, 1998). Previous books include: *Saturday Night or Sunday Morning* (Comedia, 1987); *Communication and Control: Networks and the New Economies of Communication* (Blackwells, 1991); *Politics in an Anti-political Age* (Polity, 1994); *Life After Politics* (Harper Collins, 1997). He has two books forthcoming in 2005/6: *Good and Bad Power*; and *The Art of Public Strategy*.

The report-writing and day-to-day project co-ordination was led by Dr. Gareth Potts, a Young Foundation Research Associate. In addition to his PhD (economic geography) he holds a Masters degree in Civic Design and a first degree in Social Policy and Administration. After his PhD (on universities' roles in regional economic development) he worked on the ESRC-funded Cities Programme where his work included a book chapter on the links between economic competitiveness and the social fabric (social capital, social cohesion and social inclusion). After this he worked at the New Economics Foundation where his work included co-authoring two reports for the Inner City 100 project and two reports for central Government on enterprise in deprived areas. Between that post and his present job he worked for Marsh Farm Community Development Trust, Luton as a capacity building manager. He is author of a review article for the journal *Economics and Philosophy* on the work of Professor John O'Neill, Director of Lancaster University's Institute for Environment, Philosophy and Public Policy. He has also reviewed the book 'Environmental Ethics and the Global Economy' for the *Journal of Applied Philosophy*. He has contributed numerous articles to the regeneration press ranging from professional football clubs' community schemes to resident research in disadvantaged areas. He currently serves on the Research Advisory Board of the Urban Forum.

James Audsley is currently a Research Assistant on the Young Foundation's Transforming Neighbourhoods project. He has a BA in Geography from Oxford University and worked as an intern on the Transforming Neighbourhoods project over the summer. His interests focus on regeneration, city design and community issues. He is currently developing his research dissertation on the redevelopment of the World Trade Center for publication. Previously he has interned with TfL's Policy and Strategy team, as an MP's assistant and in George Wimpey's Land and Development team (City Region). He is currently working on development of the team's neighbourhood wiki, researching across the project and has been providing intellectual and practical input to the CUBE project.

*The Bartlett School of Planning, UCL*

The Bartlett team has been led by Professor Matthew Carmona, who has successfully undertaken a range of research projects for CUBE. Matthew Heads up the Bartlett School of Planning and has published extensively around issues of urban design, public space and its management, design policy and control, design value, and the measurement of design quality. Currently, Matthew serves on the 'Urban Design Skills Working Group', and is a member of the Royal Town Planning Institute's General Assembly. He is on the editorial board of 'Urban Design Quarterly', is European Associate Editor for the 'Journal of Urban Design', and is series editor for the 'Design in the Built Environment' book series from Ashgate. In 2002 Matthew worked with Norman Foster & Associates to win the West Kowloon Cultural District International Master-planning competition. He has undertaken a wide range of research projects from funders that include: DETR, CUBE, RTPI, ESRC, ODPM, the Housing Corporation, and the Audit Commission.

Claudio de Magalhaes is a senior lecturer in planning and urban regeneration, with a background in architecture and town planning. Prior to moving to the UK in the early 1990s, he worked for 12 years a senior planner in local and regional government in Brazil, acquiring considerable experience in urban governance and in the management of urban investment programmes for urban and regional development. As an academic, his interests are in urban planning and the governance of the built environment, property development processes and urban regeneration policy. He has conducted research for ESRC, RICS, CUBE, local authorities and UK Government Departments and published on property markets and globalisation, capacity building for urban governance, and the relationship between urban governance, the built environment and property markets. His more recent research focuses on the relationship

between urban governance and increasingly globalised property markets, design and the management of public spaces.

Louie Sieh is an Architect and Senior Research Fellow at the Bartlett School of Planning. She trained as an architect at Cambridge University and the Architectural Association in London. She has practised as a built environment consultant, primarily as a master-planner and urban designer. Louie joined the Bartlett in 2002 where she worked in the area of performance management in the public sector through which she contributed to the ODPM Working Group for a national planning quality indicator. Her research interests span strategic management in the public sector, the creation of value in urban public space, and the relationship between built environment production, consumption and its governance. She is currently completing a PhD entitled "*Public Space Governance – Questions of Value in the Urban Public Realm*". Louie is on the editorial board of "Transactions", a journal of the Centre for Education in the Built Environment (CEBE).

#### Work Commissioned

Guidance around the environmental economics field was commissioned from Dr Susana Mourato, a Lecturer in Environmental Economics at Imperial College London's Department of Environmental Science and Technology. Susana is an economist (MSc Economics, New University of Lisbon; PhD Economics, University College London), specialising in environmental economics and an expert in the application of non-market valuation techniques to the measurement of environmental, social and cultural change. Her recent research has focused on testing and developing choice modelling techniques: her work in this area has been published in various international journals. She has worked on more than 40 research projects and consultancies for research councils, governments, industry, charities and international organisations.

At both stages of the project we have involved a practising designer involved. In this particular individuals' case, he also has the capacity to develop new software tools using these methods. The person who has agreed to work with us, Chris Sharpe (BArch, DipArch, Mackintosh School of Architecture, Glasgow), is founding partner of Sharpe and Pelipenko, an urban design software company that recently created the street design program 'Streetscape' and continues to develop urban design and planning tools. He has worked as an urban designer at Alan Baxter and Associates and Bernard Engle Architects and Planners in London. He has had experience of residential-led and retail-led mixed-use master-planning, movement engineering, conservation, characterization and community planning exercises.

**Appendix 2: Attendees at Seminars**Attendees at February 14<sup>th</sup> Event

<u>Name</u>	<u>Institution/Organisation</u>
1. Alain Chiaradia	Space Syntax
2. Andrew Bowles	Sheppard Robson
3. Annabel Jackson	Annabel Jackson Associates Evaluators
4. Benjamin Davies	Central London Partnership
5. Bridget Rosewell	Economic Advisor to the Mayor of London
6. Graeme Evans	Director, Cities Institute, London Met. University
7. Kirsteen Mackay	Springett Mackay Architecture
8. Louise Horner	The Work Foundation
9. Max Nathan	Centre for Cities, Institute for Public Policy Research
10. Melissa Mean	Demos, Head of Cities Programme
11. Sarah Ichioka	LSE
12. Sebastian Macmillan	Eclipse Research Consultants
13. Paul Hildreth	Urban Policy Directorate, ODPM

Attendees at February 28<sup>th</sup> Event

<u>Name</u>	<u>Institution/Organisation</u>
1. Austin Williams	RIBA Enterprises
2. Blake, Neil	Experian Consultants
3. Daniel Fitzpatrick	Renaissi
4. Jo Hammond	Central London Partnership
5. Kate Clark	Heritage Lottery Fund
6. Lara Dose	National Network for the Arts in Health
7. Lee Pugalis	Regeneration Advisor, One North East RDA
8. Lisa Sanfilippo	New Economics Foundation
9. Mark Kleinman rep	Urban Policy Unit
10. Richard Biggs	Construction Industry Council
11. Robert Booth	Editor, Building Design
12. Ross Ingham	Senior Consultant, GVA Grimley LLP
13. Sophia de Sousa	The Glass House
14. Tom Franklin	Living Streets