

# Added value of good design

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The objectives of this paper are to review current research about the social and economic benefits associated with a well-designed built environment, to put the case for new methods that enable these sorts of benefits to be adequately captured, to speculate about what these new methods might look like, and, finally, to put forward an agenda outlining where new research is needed. Many reviews, primarily from the UK and US literature, are examined to illustrate the nature and diversity of recent, largely descriptive, research into the impact of good design on social and economic outcomes. It is argued that the likelihood of the research being taken up is limited because of the difficulty in capturing the value intangible benefits. The results from three workshops identified the types of value delivered by the built environment, the stakeholders to whom value accrues, the possibilities for new valuation methods and their implementation, and what new research is needed. Five groups of stakeholders emerged between whom value is exchanged; and six main types of value that the built environment delivers were identified: social value, cultural value, image value, economic value, use value and environmental value. Value maps, matrices and probability curves are put forward as possible approaches for exploring and capturing these varied sorts of value, while developments in brand valuation and environmental economics are identified as having potential application in the built environment. Although knowledge of the tangible and intangible benefits that arise from good design is growing, better information together with improved valuation methods and a new attitude towards evidence-based design are all needed if the built environment is to reflect the emerging understanding.

**Keywords:** added value, cultural value, design quality, design, economic value, environmental value, image value, intangibles, social value, use value, valuation methods

Il s'agit dans cet article de faire le point sur les recherches actuelles concernant les avantages sociaux et économiques associés à un milieu bâti bien conçu afin de présenter des arguments en faveur de nouvelles méthodes permettant que ces avantages soient correctement saisis; il s'agit aussi de spéculer sur l'aspect que pourraient prendre ces nouvelles méthodes et, enfin, de proposer un programme comportant de nouveaux axes de recherche. L'auteur examine un certain nombre de documents, extraits surtout de la littérature britannique et américaine, afin d'illustrer la nature et la diversité des recherches récemment menées, largement descriptives, portant sur l'impact d'une bonne conception sur les résultats sociaux et économiques. L'auteur fait valoir que la vraisemblance des recherches entreprises est limitée du fait de la difficulté de saisir les avantages intangibles en terme de valeur. Les résultats de trois ateliers ont permis de recenser les types de valeur fournie par le milieu bâti, les parties prenantes pour lesquelles la valeur s'accroît, les possibilités de nouvelles méthodes d'évaluation et leur mise en œuvre ainsi que les nouvelles recherches à mener. Cinq groupes d'intervenants se dégagent entre lesquels la valeur est échangée; six grands types de valeurs que fournit le milieu bâti ont été identifiés: valeur sociale, valeur culturelle, valeur de l'image, valeur économique, valeur d'usage et valeur environnementale. Des cartes, des matrices et des courbes de probabilité de valeur sont proposées comme méthodes possibles d'exploration et de capture de ces diverses sortes de valeurs; l'article recense également des travaux de développement dans le domaine de l'évaluation des marques et de l'économie environnementale qui pourraient trouver des applications potentielles dans le milieu bâti. Bien que l'on connaisse de mieux en mieux les avantages tangibles et intangibles qui découlent des deux conceptions, il convient également d'avoir de meilleures informations et de meilleures méthodes d'évaluation ainsi qu'une nouvelle attitude envers des conceptions basées sur l'évidence si l'on veut que le milieu bâti reflète la vision commune qui émerge.

Mots clés: valeur ajoutée, valeur culturelle, qualité de la conception, conception, valeur économique, valeur environnementale, valeur de l'image, biens intangibles, valeur sociale, valeur d'usage, méthodes d'évaluation.

## Introduction

David Pearce's report (2003) to the Construction Research and Innovation Strategy Panel brings together, in effect for the first time, a high-level, top-down view of the contribution of both the construction industry and of the built environment to the national economy. It reports on four related issues: the flows and transactions of the industry (construction activity), the building stock (the assets that comprise constructed wealth), unmarketed benefits (the well-being produced by the built environment) and unmarketed costs (such as pollution or the loss of aesthetic quality (Pearce, 2006)). Among its nine recommendations for a research agenda, it identifies the need for improving the understanding of the impact of design on the built environment – in recognition that good design can produce significant benefits and the absence of good design results in disbenefits.

An awareness of the beneficial effect of the built environment on people is a longstanding one. Florence Nightingale, writing in 1860, for example, was convinced of the recuperative benefits of sunlight and views from windows:

The very first canon of nursing . . . the first essential to the patient . . . is this: TO KEEP THE AIR HE BREATHES AS PURE AS THE EXTERNAL AIR, WITHOUT CHILLING HIM.

(Nightingale, 1860, p. 8)

. . . second only to their need of fresh air is their need of light. . . And that it is not only light but direct sunlight they want. . . People think the effect is upon the spirits only. This is by no means the case. . . light has quite as real and tangible effects upon the human body. Who has not observed the purifying effect of light, and especially of direct sunlight, upon the air of a room? . . . [The sick] should be able . . . to see out of a window from their beds, to see sky and sunlight at least.

(Nightingale, 1860, p. 48)

Similar sentiments were also expressed for educational buildings. E. R. Robson, architect to the London School Board, stressed the therapeutic value of sunlight when he wrote:

It is well known that the rays of the sun have a beneficial influence on the air of a room, tending to promote ventilation, and that they are to a young child very much what they are to a flower.

(Robson, 1874, p. 167)

Accordingly, schools of the period used tall windows to admit light, and high- and low-level opening lights to

control ventilation. Between the First and Second World Wars, there was a revival of these concerns and a renewed interest in the physiological benefits of sunlight that influenced the design not only of schools, but also of health centres and sanatoria. During the Second World War in a meeting about the rebuilding of the House of Commons held in the House of Lords, Winston Churchill made his famous observation about the relationship between the two-party parliamentary system and the design of the debating chamber when he said: 'We shape our buildings; thereafter they shape us' (Churchill, 1943).

In the second half of the 20th century, a more 'scientific' approach was taken towards the study of buildings and their impact on people, corresponding with the expansion of the universities and architecture itself becoming a university discipline. Numerous studies were carried out in the 1960s and 1970s, when 'architectural psychology' emerged as a subdiscipline with schools of architecture and elsewhere. Environment-behaviour research using psychological methods, such as those based on George Kelly's (1955) theory of personal constructs, examined people's behaviour and their responses to different designs (Canter and Lee, 1974). Human comfort was investigated by building scientists (McIntyre and Griffiths, 1974). Guidance and standards relating to quantitative issues such as comfort and ergonomics emerged from this and related research, and were endorsed by professional institutions and government. Many of the more qualitative behavioural studies, however, although published, appear to have had limited impact on design practice.

A subsequent reaction against the notion of 'architectural determinism' – the proposition of direct causal and mechanistic links between the built environment and human behaviour – led to the demise of architectural psychology with many of the lines of enquiry effectively ceasing.<sup>1</sup> Two significant UK groups did, however, continue into the 1980s and beyond. At King's College London, Alice Coleman's group, founded in 1979, focused on identifying correlations between crime or social malaise and particular features of public housing connected with anonymity, surveillance and alternative escape routes (Coleman, 1985). Coleman's hope was to design out crime, or at least to reduce it. The 'space syntax' group at University College London (UCL) focused on the topological mapping of buildings and cities as a means of modelling pedestrian behaviour, research which continues to this day and has found application in practice.

In the 1990s, UK built environment research was dominated largely by construction-related issues and a focus

on the business process of construction rather than its products and their impact. In parallel with the Latham (1994) and Egan (1998) Reports on inefficiencies in the UK construction industry, several UK research programmes and initiatives were established focusing on business process improvements, such as greater efficiency, the elimination of waste, reduced cost, on-time delivery, improved health and safety, improved collaborative working arrangements, supply chain management, and the exploitation of information and communication technologies.<sup>2</sup> Debate about the attributes of the product was conspicuous by its absence.

### Place of design

Towards the end of the 1990s, the UK design community responded to the Latham and Egan agendas with several initiatives. The Royal Institute of British Architects (RIBA) Practice Committee formed its Constructive Change group which organized a conference in 2000 called 'Design Quality – The Evidence' as well as supporting publication of the book *Designing Better Buildings* (Macmillan, 2004). The RIBA Futures Group commissioned two essays on *the value of architecture* (Worpole, 1999; Loe, 2000). The Construction Research and Innovation Strategy Panel (CRISP) convened a Design Task Group (Oliver, 2004). The Construction Industry Council (CIC) commissioned the Science Policy Research Unit at Sussex University, Brighton, to develop Design Quality Indicators<sup>3</sup> as a means to assess the product (Gann and Whyte, 2003; Gann *et al.*, 2003) – in response to the Movement for Innovation's Key Performance Indicators with their emphasis on benchmarking the construction process. Housing Quality Indicators were devised. The Royal Academy of Engineering published a paper on *The Long Term Costs of Owning and Using Buildings* (Evans *et al.*, 1998), which promoted whole-life costing and introduced the '1:5:200' ratio between initial capital cost, lifetime facilities costs and lifetime business operating costs as a reminder to clients that it was important to look at the possible improvements to staff productivity and business outputs associated with a well-designed building rather than just its initial capital cost.

Most significantly of all in the UK, a new body called the Commission for Architecture and the Built Environment (CABE), now funded jointly by the Department for Culture, Media and Sport (DCMS) and the Office of the Deputy Prime Minister (ODPM), was brought into being. One of CABE's early successes was to influence government to launch the Better Public Buildings campaign intended to bring about a step change in the quality of public buildings. The introduction to the campaign stated:

we know that good design provides a host of benefits. The best designed schools encourage children to learn. The best designed hospitals

help patients to recover their spirits and their health. Well-designed parks and town centres help to bring communities together.

(Department of Culture, Media and Sport, 2000, p. 1)

The impact of these various initiatives was substantial in reawakening interest in the impact of design on outcomes. For example, the Egan Report had made no mention of the quality of the product, but when it was updated and republished as *Accelerating Change* (Strategic Forum for Construction, 2002), the earlier omission was corrected and it now stated:

Our vision is for the UK construction industry to realise maximum value for all clients, end users and stakeholders and exceed their expectations through the consistent delivery of world class products and services. In order to achieve this the UK construction industry must:

- add value for its customers, whether occasional or experienced, large or small;
  - exploit the economic and social value of good design to improve both the functionality and enjoyment for its end users of the environments it creates (for example, hospitals where patients recover more quickly, schools and work places which are more productive and more enjoyable to work in, and housing which raises the spirits and enhances the sense of self worth).
- (Strategic Forum for Construction, 2002, p. 10)

Increasingly, then, there has been a widespread recognition not only that the construction of new buildings, the refurbishment and maintenance of existing ones, and the management of facilities and property are a vital part of the economy and need to be efficient and well managed, but also that there are benefits to be gained from the places where we live and work providing environments that promote, *inter alia*, health, productivity, neighbourliness and civic pride (Saxon, 2002). Already these messages are being delivered to private-sector clients (Davis Langdon and Everest, 2001; Spencer and Winch, 2002). For the public sector, the Office of Government Commerce's procurement pack *Achieving Excellence in Construction* (OGC, 2004) contains a whole section devoted to the delivery of design quality; while H.M. Treasury's *Green Book* (2003) emphasizes that non-monetary benefits need to be included among value-for-money assessment criteria for public building proposals. Even the National Audit Office has endorsed the positive impact of buildings on service delivery in its report *Improving Public Services through Better Construction* (National Audit Office, 2005), which notes:

Buildings that are designed well will have improved functionality and lower whole life

costs and will deliver beneficial environmental and social impacts and, more aspirationally, may inspire users, strengthen local identity and contribute to civic pride.

(National Audit Office, 2005, p. 27)

### Evidence about the benefits of good design

During the early 2000s, CABA, as the body charged with championing good design, took on the major task of collating the evidence about good design and its impact on social and economic outcomes. Its first cross-sectoral report *The Value of Good Design* stated:

Good design is not just about the aesthetic improvement of our environment, it is as much about improved quality of life, equality of opportunity and economic growth. . . . Good design does not cost more when measured across the lifetime of the building or place. . . .

(Commission for Architecture and the Built Environment, 2002a, p. 1)

CABA went on to commission literature reviews in several key sectors – offices, schools, healthcare, housing and urban design – and in some cases turned the understanding into design guidance (Commission for Architecture and the Built Environment, 2002b). A number of other reviews have also been conducted during the last few years, and the following sections provide an overview of the current state of the art in key sectors.

### Offices: use, image and exchange value

More than ten years ago, a study by DEGW & Technibank (1992) entitled *Intelligent Buildings in Europe* classified three types of buildings that responded to differing requirements:

- use value buildings: custom designed for the owner–occupier to maximize functionality and use
- exchange value buildings: developed speculatively and designed to maximize the building exchange value as a commodity to be traded
- image value buildings: designed to maximize the image value of the building sometimes at the expense of efficiency or other qualities

Of these, functionality and use value have been widely researched with an extensive literature on how spatial layout affects teamwork and collaboration, and on thermal comfort and its impact on productivity. Recent reviews include those by Oseland (1996) emphasizing air quality, and by Haynes *et al.* (2000), Heerwagen (2000), Commission for Architecture and

the Built Environment (2005b) and Clements-Croome (2005), who draws attention to the characteristics and importance of what he terms an ‘environmental feel-good factor’. It is widely accepted that productivity is affected negatively by poor indoor air quality and poor levels of thermal comfort, particularly the discomfort caused by temperatures above the normal comfort range. However, as Hertzberg *et al.* (1993) identify, the converse does not necessarily hold – improving comfort beyond a certain level does not raise productivity.

The Probe studies (Bordass *et al.*, 2001; Leaman and Bordass, 2001)<sup>4</sup> have given post-occupancy studies a renewed impetus and the Usable Buildings Trust has compiled a portfolio of feedback techniques (Bordass and Leaman, 2005a, b) for use at various stages in the project life cycle. Members of the Probe team report that among those issues that are under the control of building designers and facilities managers, the ‘killer variables’ for productivity are as follows (Leaman and Bordass, 1999):

- personal control (also referred to as adaptive opportunities by others): ability to raise or lower blinds, open and close windows, and use switches to control services
- responsiveness: speed of reaction to staff discomfort by facilities managers
- building depth: deeper buildings tend to reduce satisfaction and productivity
- workgroups: perceptions of productivity are higher in smaller and more integrated workgroups.

A worthwhile question is the extent to which designs should be optimized around their first use, particularly when new business needs emerge in today’s fast-moving economy and require ‘churn and change’. It remains an open question. More than 30 years ago, the notion that buildings be designed to for ‘long life, loose fit, low energy’ was coined, and it has reappeared periodically since then, most recently within the sustainability agenda (Cole, 2004). As Fisk (1996, p. 19) argues:

it hardly then means much to say ‘form follows function’ when ‘function’ may vary so widely during a building’s life. The function one seeks is then simply flexibility within the building shell. The idea of a design tightly optimised to first use looks inconsistent with sustainable development in a rapidly changing world. If these speculations are correct, it does not mean the end of building design appraisal, possibly the reverse. Rather than an automaton optimisation to a client brief, design becomes an assessment of the options to be left open, not the options to close.

## Education buildings

Schools figure prominently as a sector where there is widespread interest in good design. Feilden (2004) championed the need for evidence to demonstrate that ‘well-designed’ new buildings provide better academic results than ‘poorly designed’ ones, so as to help ensure that new schools offer genuine value for money through improved functionality, performance of pupils, and recruitment and retention of staff. Two major investigations have been carried out by PriceWaterhouseCoopers (2001, 2003) for the Department for Education and Skills, the first of which found that capital investment in school buildings had a positive influence on staff morale, pupil motivation and effective learning time, while the second reported that capital investment in premises (and Information Technology) had a measurable impact on learning outcomes.

More recently a group from the University of Newcastle’s Centre for Learning and Teaching has undertaken a review (Higgins *et al.*, 2005) examining the literature around the following questions:

- What makes a good school (physical) learning environment?
- What impact do (physical) school learning environments have on student behaviour, motivation, learning and achievement?
- Which components/elements of school learning environments make the most difference to pupil behaviour, motivation, learning and achievement, and why?
- What evidence exists to indicate the relative balance between the physical environment and the emotional and cognitive environments on pupil behaviour, motivation, learning and achievement?

The Introduction notes three striking features of the literature:

- ‘relative paucity of research on effective learning environments’ and that completed research ‘seems to be largely predicated on a traditional view of “chalk and talk” learning in standardised “one size fits all” institutions’
- that ‘it is the extent to which, and the ways in which, school users are engaged in the school design process that determines the success or failure of the resulting design. The message is clear. School designs cannot be imposed nor bought off-the-shelf’

- that ‘in a changing world no design solution will last forever, so the process of user involvement must be continually refreshed and iterated to support ongoing change’

The review’s conclusions about the school built environment are as follows:

- there is strong, consistent evidence for the effect of basic physical variables (air quality, temperature, noise) on learning, but that once minimal standards are attained, evidence of the effect of changing basic physical variables is less significant
- there are forceful opinions on the effects of lighting and colour, but the evidence is conflicting
- other physical characteristics affect student perceptions and behaviour, but it is difficult to draw definite, general conclusions
- the interactions of different elements are as important as the consideration of single elements

In the higher education sector, CABA’s *Design for Distinction: The Value of Good Building Design in Higher Education* (Commission for Architecture and the Built Environment, 2005a) reports on the links between building design and the recruitment, retention and performance of staff and students. Fifty articles are reviewed, and five new case studies reported.

## Healthcare buildings

The concept of designing therapeutic environments has a long history and this is one of the sectors well served by investigations into the impact of built facilities on healthcare outcomes. In 2001, National Health Service (NHS) Estates formed their Centre for Healthcare Architecture and Design, and the Better Health Buildings initiative was launched in 2002 as the Department of Health’s response to Better Public Buildings. The Achieving Excellence Design Evaluation Toolkit (AEDET) was developed, based on the Design Quality Indicator tool. *OnDesign*, the NHS healthcare design portal, includes a knowledge base about facilities and their impact. CABA formed a Healthy Hospitals programme and supported a study of *The Role of Hospital Design in the Recruitment, Retention and Performance of NHS Nurses in England* (PriceWaterhouseCoopers, 2004). The report’s appendices contain a detailed literature survey of the impact of healthcare buildings on their users, with more details available via the knowledge portal.

In the US, a major literature review was published in September 2004 by a team led by Roger Ulrich and

drawn from the Center for Health Systems and Design at Texas A&M University and the College of Architecture at Georgia Tech (Ulrich *et al.*, 2004). The authors report that they combed through scores of databases and several thousand scientific articles in order to identify more than 600 studies of how hospital design can impact on clinical outcomes. They acknowledge that hospitals are complex systems where it is difficult to isolate the impact of single factors. They go on to review studies of how the physical environment impacts on staff stress, fatigue and effectiveness in delivering care, and on patient safety and healthcare outcomes. The review covers design issues such as single-rooms versus multi-bed rooms, way-finding, noise and its effect, sunlight, exterior views, mechanical ventilation systems, and ergonomics. In their conclusions, they call for the adoption of evidence-based design as a means for creating healthcare buildings informed by the best available evidence about how the physical environment can interfere with or support activities by patients, families and staff, and how the setting should be designed to provide a caring, effective, safe, patient-centred environment.

An earlier review in the healthcare sector by Rubin *et al.* (1998) combed the medical literature for research papers on the effect of the physical environment on patient outcomes. Applying the demanding standards of proof used in medical research, they concluded that almost all the studies were methodologically flawed or limited. The 1998 review found 87 papers compared with the more than 600 found in 2004, suggesting the evidence base has grown substantially in quantity in the intervening years.

### Urban design, housing and open space

The ‘Guggenheim effect’ in Bilbao – the impact of an iconic or flagship project on inward investment and urban regeneration – has been widely discussed (e.g. Worpole, 1999). Similar examples have also been documented and reported, such as Brindley Place in Birmingham (Carmona, 2004). Comparisons with less successful examples help identification of some of the key attributes of good urban design, which include good pedestrian and vehicular access, good connectivity to neighbouring developments, a variety of public spaces and amenities, and a mixture of uses. At best, all the stakeholders gain. Investors and developers see higher returns, designers see repeat business, commercial occupiers benefit from staff recruitment and loyalty, and everyday users benefit from an improved urban environment and enhanced range of amenities. For central and local government understanding these kinds of correlations between better design and social and economic outcomes is a clear priority in order to ensure the maximum leveraging effect of public investment and greatest gains to the local

population – providing, of course, that they do not displace the very people who were originally intended to benefit from the regeneration (Mulgan, 2005).

Other than the study of Brindley Place (which was initially studied as part of an Royal Institution of Chartered Surveyors (RICS)/Department of the Environment (DoE) research project into Quality in Town and Country; Rowley, 1998) when CABE published a review of the literature on the value of urban design (Commission for Architecture and the Built Environment, 2001) only two other relevant studies were identified: a paper by Vandell and Lane (1989) and a study by the Property Council of Australia (1999).

A more recent review in New Zealand, *The Value of Urban Design: The Economic, Environmental and Social Benefits of Urban Design* by McIndoe *et al.* (2005) draws on a wide range of documentary evidence. Though it also notes that there is relatively little quantitative evidence in the field, it provides a rich summary and cites 236 sources. Evidence is examined relating to eight ‘core elements of urban design’, two of which are concerned with the processes by which urban design takes place (integrated decision-making; and user participation) and six of which are concerned with the attributes of the design (preservation of identity and local character; connectivity, permeability and ease of access; density and social connectedness; mixed-use neighbourhoods offering a variety of opportunities; adaptability of buildings and spaces to changing needs; and high quality in the public realm). A table draws attention to the social, economic and environmental aspects associated with each of the core elements.

The report’s conclusions are as follows:

- good urban design can offer significant benefits to the community; conversely, poor design can have significant adverse effects on the urban environment, society and economy
- while good urban design sometimes costs more up front, this is not necessarily the case; moreover, long-term costs can be avoided
- communities value the better quality of life that good urban design can deliver
- urban design can affect people’s ability and willingness to undertake physical exercise: good design can offer health benefits
- urban design can help make towns and cities safer and more secure
- urban design elements are interconnected: urban design is most effective when a number of elements

come together (e.g. mixed-use, density and connectivity)

The review cautions that urban design is context-specific and warns against automatically adopting successful design initiatives from overseas in the New Zealand context. It is also interesting methodologically, claiming to have categorized the evidence as conclusive, strong, suggestive or anecdotal. While noting a paucity of research, the authors suggest that a scarcity of evidence may reflect measurement difficulties rather than undervalued research results. They also note the difficulty of extracting conclusions about the impact of certain design elements because these tend to be found in combination with other features.

In terms specifically of research into housing, CABE's review of the value of housing design and layout noted the lack of empirically established quantitative relationships between outcomes and their benefits, a point which is also clearly reinforced in the New Zealand review. CABE's review (Commission for Architecture and the Built Environment, 2003, p. 22) observes:

The most striking finding in a review of the literature relating to the quality of residential design is the almost complete absence of any empirical attempts to measure the implications of high quality on costs, prices or values. Few commentators have gone beyond making a distinction between the direct benefits for built environment stakeholders and those indirect benefits that accrue in the form of 'public goods' or external-ity effects.

There is, however, quite a lot of evidence about the social impacts of housing layout, which was reviewed by Halpern (1995). His book addresses the following:

- incidence of psychiatric illness in city centre as opposed to suburban locations
- suburban neurosis in new out-of-town housing estates arising from the distance from employment and social isolation
- studies of residential satisfaction, where a large amount of the variance can be explained by attachment to the neighbourhood and the quality of relationships with neighbours
- importance of social homogeneity, which is believed to be a necessary prerequisite to high levels of supportive neighbouring behaviour
- reputation or labelling of an area that can give a self-fulfilling effect – residents of estates with poor reputations are unhappy living there
- estate layouts, where small cul-de-sacs and short, narrow streets lead to a greater sense of community compared with wider and longer roads where fewer people know their neighbours
- importance of semi-private space and facilities around which neighbouring relationships might develop

On the design of homes, Halpern draws attention to the impact of individuals' aspirations compared with their achievements as having a major effect on their judgement about the quality and acceptability of their home; even if a home appears good by some absolute external standard, if it fails to match the individual's aspirations, it will lead to disappointment and dissatisfaction. Above all, Halpern concludes there is substantial evidence to suggest that the physical environment can have real and significant effects on group and friendship formation, and on patterns of neighbourly behaviour.

If CABE's study of the value of housing design found few quantitative relationships, its review of the economic value of public open space (Commission for Architecture and the Built Environment, 2004) refers to a variety of research studies that demonstrate the economic and social impacts of open space and recreational parks. Several US studies are cited illustrating homeowners' willingness to pay to live near parks or to have views over open space. The review draws attention to the physical health benefits associated with the availability of recreation space, cites research that shows improvements in mental health from green-space activities, and notes the environmental value of biodiversity and improved air quality. Jan Gehl's work in Copenhagen is quoted to demonstrate how the provision of well-planned and well-managed open spaces, combined with traffic-reduction measures, led to a variety of benefits including a 65% increase in bicycle use over 25 years (Gehl and Gemzoe, 1996). The review's conclusions are that a high-quality public environment including well-designed and well-managed parks and open spaces create economic, social and environmental value.

CABE's follow-up research study *Does Money Grow on Trees?* (Commission for Architecture and the Built Environment, 2005c) provides a more detailed research assessment of the impact on the value of residential property arising from proximity to a park. Eight UK parks were selected and properties in three distinct relationships to them – adjacent to the park, a street/block away from the park and further away from the park – were valued by local property experts. The study sought to control for all external variables (such as shops, schools, busy roads) so as to separate out the contribution of the proximity of the park. The study found a positive relationship

between the value of residential property and overlooking or being close to a park. Quantitatively, the uplift in value was found to range from between zero and 34%. No average is given, though the table of indexed values suggests a typical uplift in value of something in the order of 5%. CABA's report refers to a number of other non-monetary benefits arising from proximity to a park, and concludes that good-quality parks and green spaces are essential components in the establishment of sustainable communities.

### Placing a value on intangible benefits

A widely acknowledged difficulty with many of the benefits associated with good design is that they are hard to measure, or intangible, and this makes it difficult for those who procure buildings to assess how much it is worth investing in design and in construction. This is a topic investigated by Rouse (2004), who describes how a number of corporate clients tried to measure architectural value to justify their investment in it. All ten case-study organizations recognized the corporate benefits from architectural investment, representing both tangible benefits of the sort that can be counted by traditional cost-benefit, but also intangible benefits that are more difficult to measure. Employee satisfaction was the most highly rated motivation; human capital is the major resource of the organizations and they seek to enhance the ability of their employees to contribute to turnover and profitability. Corporate policy in architectural investment was also very important; design champions at senior levels within the organization and corporate precedents for high-quality architecture were both in evidence. For seven of the ten organizations, procuring a building was part of a much wider corporate development process – with the goals typically of transforming how the company does business; encouraging creativity, enhancing communication, promoting team work, operating less formally, encouraging flexible working, and reducing hierarchy. Rouse argues that if the benefits of architectural quality and value can be demonstrated and quantified, then additional investment into the built environment can be released.

In a direct follow-on from Rouse's work, a study on improving the valuation of the intangible (Macmillan, 2005) was undertaken with funding from DTI's Partners in Innovation programme. The views and expertise of facilities managers, designers, surveyors and valuers were elicited through three workshops held during 2004 at PriceWaterhouseCoopers, CABA and the RICS. All three workshops were organized as structured focus groups. Before each workshop, a briefing paper, which was based on a literature search about intangibles, was circulated to delegates. Delegates' Notepads were devised setting a series of questions.

Each workshop was run along similar lines and in four sessions:

- impact of buildings on tangible and intangible outcomes
- whether well-designed buildings command a premium
- need for new methods to place value on well-designed buildings
- introducing new methods for valuing intangibles: what actions are needed, by whom and what are the barriers to adoption

Each session began with a short introduction, based partly on the findings of the literature search, and this was followed by a round-table discussion session lasting about 20–30 minutes. After each discussion, delegates were asked to respond to the questions in the Notepads – typically they were allowed 10 minutes for this. The discussions were recorded electronically and subsequently analysed in detail.

Many ideas emerged across the three workshops. First, any new building impacts on a wide range of stakeholders – each of whom will have different priorities among the outcomes they are seeking from the project. Table 1 is a high-level summary of five groups of stakeholder and the outcomes they are reported to value.

The second main area that emerged is the variety of values – some tangible, others intangible – that buildings deliver. Table 2 classifies these under six value headings, and sets the indicators that can be used to measure them.

A key suggestion from the study was the need to move away from a single-point value towards a probability curve for quantifying value, reflecting confidence levels in the accuracy with which each kind of value is assessed. Future valuation methods may offer ranges of values or a value profile, rather a single number. A matrix approach was proposed as a way of illustrating connections and dependencies between different sorts of value, although it was not developed further than this outline proposition. Through use of a weighting system, the relative importance of any single bundle of values could be adjusted according to the building type and the circumstances; not every building will be expected to achieve high value against every bundle.

Several suggestions from the workshops anticipate ideas subsequently published by Mulgan (2005) in an essay about how government needs methods to ensure both that it maximizes the impact on public

**Table 1** Stakeholders and the outcomes they value<sup>5</sup>

Category	Stakeholders	Outcomes
<b>Finance</b>	financiers, banks, PFI consortia, developers, government	return on capital, profitability, long-term value, ease of letting or selling, awards
<b>Design and construction</b>	Architects, engineers, surveyors, designers, contractors, subcontractors and suppliers	profitability, repeat business, awards, prestige
<b>Occupant organization</b>	chief executive, project directors, communications and marketing managers, general workforce, human resources managers, facilities managers, security staff, cleaners	organizational productivity and profitability, organizational vision, image and identity, corporate brand and reputation, corporate social responsibility, good working environment – staff health and well-being, recruitment and retention, absenteeism, energy and maintenance costs
<b>Public realm</b>	local authority, local community, regional and national community	regeneration and inward investment, impact on property values, pollution, local health, employment, civic pride, neighbourly behaviour, vandalism
<b>Visitors to building</b>	hospital patients, hotel guests, retail customers, students, pupils, the general public	hospital recovery rates, retail footfall, educational attainment levels

value of its capital expenditure programme and that it can compare expenditure on the built environment with other types of expenditure. Mulgan emphasizes the potential of ‘value maps’ – visual diagrams that set out in graphic form the relationships between different types of value and the flows of value they achieve. One of his examples for using such maps would be to compare the contribution to public health outcomes of public investment in the built environment versus achieving equivalent health goals through other means. Though he gives no examples of what value maps might look like, Mulgan notes that the values used in them will not be definitive and it will be necessary to be explicit about the degrees of certainty, rather than trying to combine different numbers into aggregates.

### What needs to change for new methods to be introduced?

Workshop delegates were asked how new attitudes to value could be introduced, and they identified four key changes needed:

- building owners need to get closer to operating units and to share the resulting knowledge
- evidence base about the impact of buildings on outcomes needs to be developed and broadened
- designers need to be more engaged with the delivery of outcomes
- professional institutions and government need to assist in the promotion of new approaches

Building owners were said to have much to gain by becoming smarter and developing a closer relationship

with users and their needs, including becoming more aware of the social and economic benefits that arise from well-designed premises, and more discerning in bid selection and property choice. Building managers were said to need to get closer to business units, to measure premises-related business benefits and operational returns, and to be prepared to publish data and case studies. Workshop delegates consider that by sharing this information across owner organizations, a new understanding could emerge, putting clients in a position to have higher expectations and be more demanding about what they want and what they value.

Despite the body of research into the impact of good design, delegates at the workshops said they thought much of it was anecdotal, academic, unsorted and neither robust nor replicable. They said there was no common language or shared understanding, and many variables had been studied under various guises. They also noted the difficulty of measuring outcomes arising directly from design, as distinct from many other influences. Designers at the workshops argued that at present the evidence is too diverse to provide credible value propositions or a clear foundation from which to act in a situation where investment decisions require a number of people to be persuaded.

Workshop delegates suggested that the level of commitment by designers towards improving social and economic outcomes varies widely, according to factors that include their degree of social commitment, the context, commercial imperatives and job-winning, and peer group recognition. Remuneration is decoupled from the value outcomes, and commitment is limited by the time and financial resources made available.

Among the barriers delegates identified that needed to be overcome are established norms for building costs

**Table 2** Types of value created in the built environment, and examples of metrics

Type of value created	Bundle of valued outcomes	Examples of indicators or metrics
<b>Exchange value</b>	Building as a commodity to be traded, whose commercial value is measured by the price the market is willing to pay. For the owner, this is the book value; for the developer, this is the return on capital and profitability. Also covers issues such as the ease of letting and disposability	Book value, rental, return on capital; yield
<b>Use value</b>	Contribution of the building to organizational outcomes: productivity, profitability, competitiveness and repeat business, and it arises from a working environment that is safe in use, that promotes staff health, well-being and job satisfaction, that encourages flexible working, teamwork and communication, and enhances recruitment and retention while reducing absenteeism	Measures associated with occupancy, such as satisfaction, motivation; teamwork. Measures of productivity and profitability, such as healthcare recovery rates, retail footfall, educational achievements, and occupant satisfaction
<b>Image value</b>	Contribution of the building to corporate identity, prestige, vision and reputation, demonstrating commitment to design excellence or to innovation, to openness, or as part of a brand image	Public relations opportunities, brand awareness and prestige, the 'wow' factor
<b>Social value</b>	Buildings and environments that make connections between people, creating or enhancing opportunities for positive social interaction, reinforcing social identity and civic pride, encouraging social inclusion and contributing towards improved social health, prosperity, morale, goodwill, neighbourly behaviour, safety and security, while reducing vandalism and crime	Sense of community, civic pride and neighbourly behaviour. Reduced crime and vandalism
<b>Environmental value</b>	Added value arising from a concern for intergenerational equity, the protection of biodiversity and the precautionary principle in relation to the consumption of finite resources. Principles include adaptability and/or flexibility, robustness and low maintenance, and the application of a whole-life cost approach. Immediate benefits are to local health and pollution	Environmental impact, whole life value, ecological footprint
<b>Cultural value</b>	Culture makes us what we are. This is a measure of a building's contribution to the rich tapestry of a town or city, how it relates to its location and context, and also to broader patterns of historical development and a sense of place. Cultural value may include consideration of highly intangible issues such as symbolism, inspiration and aesthetics	Press coverage – not only in the professional press, but also in the lay press. Critical opinions and reviews

and professional fees. An unwillingness was noted to invest time and money, when building for profit to an institutional standard, beyond what the general market would want and be prepared to pay. Decision-makers, especially if they are in post for a limited reign, rarely wish to increase short-term cost for long-term gain. In the commercial sector, the impact of a separation between investors and occupiers was noted; investors want buildings that appeal to wide markets, and there is little incentive to meet the intangible wants of a single occupying organization since they may not readily transfer to a second user. Political or organizational imperatives can result in cost and time pressures that work against collecting evidence and iterative research-based procedures. Commissioning client and user client are often different people even if from the same organization, and building procurement is not undertaken often enough to learn from experience. The complexity of the

relationships among the parties – investors, client, designers, contractors, end users and local authorities – requires skilled facilitation if the full expertise of the whole team is to be harnessed.

Workshop delegates identified that the industry itself needs to assimilate the existing evidence and to prepare the necessary arguments – perhaps in the form of a road-map – that will raise the awareness of clients to the potential benefits of good design and the value that can be added, and convince them to invest in its achievement. This might involve more time for strategic briefing about stakeholder objectives and generating and reviewing alternative possibilities, as well as for developing design team skill and formation, though well-timed and considered interventions were not believed necessarily to need much additional input. What delegates considered important is for the industry to engage more directly with stakeholders so as to

develop a better understanding of their various value drivers, including how design adds value to occupiers' business processes and contributes to the concerns of the wider community. Delegates said that designers need to convene the skills of related professions rather than 'going it alone', and to remain engaged with projects post-handover. Surveyors and valuers, meanwhile, need to develop a greater awareness and understanding of how buildings affect productivity and business performance, and to recognize that intangible benefits can affect the value and saleability of a property. Clear and explicit criteria are needed to differentiate the bad from the good, including measures to identify and rate intangible benefits.

Workshop delegates called on the professional institutions, particularly the RICS, to establish a cross-disciplinary research body or standing committee to identify and distil possible new approaches and methods. This should review examples from other sectors beyond property, work with investment analysts, corporate finance professionals and other experts such as those in brand valuation. Delegates argued there was a need to open the 'black box' of valuation. There is a clear potential to develop a methodology that could become a valuable tool to aid decision-makers.

Government was called upon to show a willingness to pay on a 'value-for-money' basis, to recognize the potential benefits of improved outcomes, to accept the risk for their delivery, and to work out how to share both risk and reward with the private sector. Government was also asked to encourage its own client departments to engage with research activities.

Delegates called for these ideas to be brought together in a set of broad principles and with a common language, and for the development of improved tools not only for surveyors, valuers and designers, but also for the whole industry. The potential benefits from improved means to measure and value outcomes were viewed as wide-ranging and include the following:

- more explicit consideration of the varied contributions and impacts of a building
- better articulation of the values held by stakeholders, leading to more informed negotiations among them, and a greater likelihood of meeting expectations and valued outcomes
- better assessments of appropriate levels of spending and investment
- better evaluations of alternative options, more appropriate levels of investment and improved management of buildings as assets, helping to ensure premises are well suited to the organizations that occupy them

Delegates argued that new methods have the potential to raise the level of debate about the contribution of the built environment to economic prosperity, social well-being and cultural vitality, raising public recognition of the contribution of the construction industry, enhancing its reputation and leading both to greater public trust and respect and to a more equitable level of risk and reward.

### **Learning from other sectors about the issue of 'value'**

The issue of value capture and delivery is highly topical in sectors other than the built environment, where outcomes are similarly difficult to measure. In business accounting, as the economy becomes increasingly knowledge-based, the value of a company can no longer be assessed simply by reference to its tangible assets, which may be only a fraction of its total value; the accountancy profession is searching for ways to represent the value of intangibles (Cheney, 2001; Lev, 2001). In the environment, economists are devising ways to quantify the intangible benefits that accrue from protecting greenfield sites to ensure these are balanced against the gains from possible development (Bateman *et al.*, 2003). In the arts, a recent report from Demos (Holden, 2004) explores the following question: How, in going beyond targets, can we best capture the value of culture? It identifies that cultural value may include historical, social, aesthetic and symbolic aspects, and it needs to be recognized as having intrinsic value in itself; and it makes the case that economic value alone cannot completely express the 'worth' of a cultural asset. In the public sector, the emergent notion of public value – the added value created by government and the public sector in its widest sense, and delivered through services, laws, regulations, etc. – is being keenly debated as part of a move towards public service reform. A Cabinet Office paper (Kelly *et al.*, 2002) categorizes the things citizens value into better outcomes, services and trust, and proposes that a public value perspective could generate more effective policy conclusions.

### **Conclusions and recommendations**

Buildings are far more than 'bricks and mortar', 'containers of human activities' or 'the backcloth to everyday life', to use some well-known clichés. While it is important to avoid excessive claims about the impact of the built environment of the sort that in the past led to cries of 'architectural determinism', this paper has adduced a wide range of evidence to illustrate how individual buildings and the built environment as a whole exert all kinds of influences on a variety of outcomes such as civic pride, urban regeneration,

corporate identity, health and well-being, and educational attainment. This is, of course, not a definitive list and additional social, anthropological and cultural outcomes are also evident.

In the private sector, some well-informed clients such as those studied by Rouse are – to a greater or lesser extent – aware of the potential of good design to add value, are prepared to invest to ensure that value is delivered; they have explored cost–benefit type methods for assessing value. Elsewhere, however, and particularly in the public sector where concerns about accountability can discourage the exercise of judgement and discretion, there is a greater need for evidence about the delivery of value from good design and new methods for valuing intangible benefits. In the absence of a quantification of delivered value, there is a perennial risk of building down to a cost rather than up to a value. Documented examples can be found in the schools sector where an assessment by the Audit Commission (2003) found that architectural quality was below best practice for both traditionally funded and early PFI schools, while a similar assessment of early PFI schools in Northern Ireland reported that: ‘Poor internal environments were widespread and likely to lead to impact on educational achievement’ (Northern Ireland Audit Office, 2004, p. 44). For all the rhetoric about good design, it is not always delivered in practice.

The Egan Report (1998) was a timely reminder to the construction industry of the importance of controlling construction costs, building efficiently and eliminating waste. However, *in extremis*, construction costs can be driven down to a level below which it is difficult or impossible to deliver good design. While there may be no necessary correlation between high building costs and good design, for good design depends as much on cleverness and ingenuity as it does on expensive materials and components, well-designed buildings are unlikely to be cheap. Typically, too, design fees are related directly to initial capital costs, so driving down capital costs also reduces the fee available. This is bound to have an impact on design resources and on the exercise of creativity, ingenuity and attention to detail (MacCormac, 1992).

What needs to be done? Despite the size of the evidence base underlying this paper’s literature survey, many of the reviews cited argue there is a paucity of evidence about the impact of the physical environment on social and economic outcomes, and workshop delegates concurred. An initial task in continuing sector-based research is to explore whether – despite the substantial differences in the stakeholders, their motivations and outcomes in various sectors – there are common principles and generic processes that all sectors share. To the extent that there are, sector-based studies should be prepared according to a mutually consistent framework and vocabulary so as

to facilitate cross-sector comparisons and make it possible to identify similarities and differences. However, the attempt to work within a consistent framework should not be at the expense of understanding diversity among sectors.

The ratio of ‘capital cost: lifetime-facilities cost: gross value added’ caught the imagination of many and was widely reported. The original ‘1:5:200’ figures have already been re-examined (Hughes *et al.*, 2004; Ive, 2006) and further work is under way. An equivalent benchmark for other sectors may have the potential for expressing value. In general, many occupying organizations are believed by workshop delegates to have quite low awareness of, and poor data about, their facilities management costs,<sup>6</sup> and would themselves benefit from a more sophisticated understanding of the contribution of their building to business outcomes; while sharing this information across the whole sector would add considerably to knowledge of buildings in use. Better data, metrics and benchmarks about capital, and facilities management costs and benefits would also enable purchasers of buildings to select appropriate levels of investment to deliver desired outcomes.

Given rapidly changing requirements of buildings in many sectors, there is a need to investigate the benefits and disadvantages of optimizing designs around first use, and the implications of designing for flexibility and adaptability. Such investigations will contribute to an understanding of short- and long-term value.

In terms of non-monetary values – e.g. social value, image value and cultural value – where impacts are intangible, there is almost certainly a need for the research community to collaborate with other sectors beyond the built environment. Examples include approaches used for brand valuation, methods used in environmental economics such as hedonic pricing and contingent valuation, and new approaches to the valuation of intangibles being explored by accountants and valuers.

There is a need to establish a common vocabulary for the various types of value created for different stakeholders, and a framework for understanding value exchanges between these stakeholders. Investigations are needed into the connections between public investment and private value (particularly in an urban context) to ensure investment in regeneration is used to greatest effect.

For designers, there are at least two pressing needs. First, greater awareness of the evidence that has been collated in various sectors about the value of good design should be encouraged. ‘Evidence-based design’ is already a term in widespread use in the US,<sup>7</sup> particularly in healthcare, and there are arguments in favour

of a more evidence-based design process. This is a topic that needs to be promoted not only by the research community, but also by the professional institutions and government. Second, is a need for greater awareness of the exchanges of value among stakeholders, and an ability to recognize and elicit stakeholders' values and facilitate their conscious deliberation. Of course, not all differences among stakeholders' values can be resolved, there may be winners and losers (March, 1976), but better articulation of values should lead to more informed negotiations among the parties, improved evaluations of alternative possibilities, better directed investment, and ultimately better designed buildings. If one can achieve even some of these things, the aspiration for buildings not just to meet but to exceed expectations stands some chance of being realized in practice, and, most importantly, not just in the case of a few exemplary peaks of achievement that exhibit the 'wow factor', but in the vast majority of the places where people live, work and play.

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## Endnotes

<sup>1</sup>A notable exception is the Environmental Design Research Association, which has successfully continued to run conferences every year since 1969.

<sup>2</sup>For example, the DoE’s Partners in Technology (later the DTI’s Partners in Innovation); Construction as a Manufacturing Process (EPSRC); Integration in Design and Construction (DoE/EPSRC); and Meeting Clients’ Needs through Standardisation (DoE/EPSRC). The Movement for Innovation and Construction Best Practice programme were both started independently in 1997 and came

together under the banner of Rethinking Construction before being consolidated as Constructing Excellence (CE). The Housing Forum was inaugurated to carry forward new process ideas into the housing sector. The Reading Construction Forum and the Design Build Foundation were each formed in the mid-1990s following the Latham (1994) Report, and were later consolidated as Collaborating for the Built Environment (Be). In early 2005, CE and Be merged to form Constructing Excellence in the Built Environment.

<sup>3</sup>See the *Building Research & Information* special issue on 'Design Quality', 31(5) (2003).

<sup>4</sup>See the *Building Research & Information* special issue on 'Post-occupancy Evaluation', 29(2) (2001).

<sup>5</sup>A six-way model of stakeholder value exchange is given by Saxon (2005) and was devised simultaneously but independently of that given here. In Saxon's model, the stakeholders are staff, the occupying organization, the consumer, the facilities manager, the government and the investor, and all 15 bilateral exchanges of value between the six stakeholder groups are described.

<sup>6</sup>As one delegate stated, 'buildings are typically below the business radar'.

<sup>7</sup>Ironically, evidence-based medicine is already being criticized as an over-used term! (<http://ad-libitum.blogspot.com/2005/06/resistance-to-evidence-based-medicine.html>).