

Better designed buildings: improving the valuation of intangibles¹

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June 2005

Introduction

There has never been a better time for architects to get to grips with the issue of delivering value. There is widespread recognition at many levels and certainly among government clients, of the social and economic benefits to be gained from well-designed buildings. 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*. 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*² recognises that non-monetary benefits need to be included among value-for-money assessment criteria for public building proposals. 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 and so on – is being keenly debated as part of a move towards public service reform. A recent paper from the Cabinet Office categorises the things citizens value into better outcomes, services and trust, and proposes that a public value perspective could generate more effective policy conclusions³. One of the authors of that paper, Geoff Mulgan, recently published an essay on the contribution of the physical environment to public value⁴.

Supporting these general endorsements of the contribution of the built environment to social and economic outcomes is a growing body of evidence about the benefits of good design. At the urban level, the *Guggenheim effect* in Bilbao has been widely reported – closer to home Brindley Place in Birmingham demonstrates how design features such as good connectivity, transport links and mixed use correlate with successful social and economic outcomes leading to inward investment and sustainable regeneration⁵. David Halpern's book⁶ reviews several hundred published studies concerned with the social and behavioural consequences of urban design and housing, while housebuilders have their own rules of thumb about the impact of parking, views and tree-lined streets on marketability. Footfall and sales per square metre are used as indicators of successful design in the retail sector.

¹ This paper is based on the results of a study supported jointly by DTI under its Partners in Innovation programme and the industrial partners. Many of the findings reported here emerged during workshops held at PriceWaterhouseCoopers, CABE, and the RICS. The project was led by Eclipse Research Consultants, and the partners included CIC, CABE, RIBA, RICS, BIFM, and the Office Productivity Network.

² HM Treasury (2003) *The Green Book: Appraisal and Evaluation in Central Government*.

³ Kelly, G, Mulgan, G. and Muers, S. (2002) *Creating Public Value: an analytical framework for public service reform*, Cabinet Office.

⁴ Mulgan, G. (2005) 'Public Value: physical capital and the potential of value maps' in *Physical capital: how great places boost public value*, CABE.

⁵ Carmona, M. (2004) 'Adding value through better urban design', in Macmillan, S. 2004, *Designing Better Buildings: quality and value in the built environment*, Spon Press, London. See also CABE, 2001, *The value of urban design*, Thomas Telford, London.

⁶ Halpern, D. (1995) *Mental health and the built environment: more than bricks and mortar?* Taylor & Francis.

In offices, there is a wealth of published information about the impacts of space planning and environmental conditions on occupant satisfaction, working practices and productivity. The 1:5:200 ratio between capital costs, building-related costs and business operating costs was devised to encourage owners to focus on long term costs of ownership rather than initial capital cost, and has stimulated much research activity⁷. Past reviews include those by Oseland⁸; Heerwagen⁹; and Haynes, Matzdorf, Nunnington, Ogunmakin, Pinder and Price¹⁰ and, in May 2005, CABE published its own review¹¹. It is widely accepted that productivity is affected negatively by poor indoor air quality and poor levels of thermal comfort¹². However, as Hertzberg¹³ has identified, the converse does not necessarily hold – improving comfort does not raise productivity. Leaman and Bordass¹⁴ report that the killer variables among those which are under the control of building designers and facilities managers are:

- Personal control (also referred to as adaptive opportunities by others) - the ability to raise or lower blinds, open and close windows and use switches to control services
- Responsiveness – that is the speed of reaction to staff discomfort by facilities managers
- Building depth – deeper buildings tend to reduce satisfaction and productivity, while a depth of around 12m across the building seems about optimal
- Workgroups – perceptions of productivity are higher in smaller and more integrated workgroups.

In the education sector, the Department for Education and Skills has supported two major studies undertaken by PriceWaterhouseCoopers¹⁵ into the impact of capital investment on educational attainment as well as on staff motivation, reduced truancy and vandalism and benefits to the local community. In March 2005, CABE reported on the value of good design in the higher education sector¹⁶.

The concept of designing therapeutic healthcare environments has a long history and is one of the sectors which is relatively well-served by investigations into the impact of built facilities on healthcare outcomes. In 2001 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

⁷ The original 1998 paper was by Raymond Evans, Richard Haryott, Norman Haste and Alan Jones 'The long term costs of owning and using buildings' reprinted in S. Macmillan, editor (2004) *Designing Better Buildings*, Spon Press and a critique published by Will Hughes, Debbie Ancell, Stephen Gruneberg and Luke Hirst (2004) 'Exposing the myth of the 1:5:200 ratio relating initial cost, maintenance and staff costs of office buildings', paper to ARCOM Conference 2004.

⁸ Oseland, N. (1996) 'Productivity and the indoor environment', paper to fourth Indoor Air Quality Conference, held at Mid Career College

⁹ Heerwagen, J. (1998) 'Design, Productivity and Well-being: what are the links?' Paper presented at the American Institute of Architects Conference on Highly Effective Facilities, Cincinnati, Ohio

¹⁰ Haynes, B, Matzdorf, F, Nunnington, N, Ogunmakin, C, Pinder, J and Price, I. (2000) *Does property benefit occupiers? An evaluation of the literature*, Occupier.org report number 1, Facilities Management Graduate Centre, Sheffield Hallam University.

¹¹ CABE (2005) *The impact of office design on business performance*, CABE.

¹² Wyon, D. no date, 'Enhancing Productivity While Reducing Energy Use in Buildings'.

¹³ Herzberg, F. (1993) *Motivation to Work*, Transaction Publishers.

¹⁴ Leaman A and Bordass, B. (2000) 'Productivity in buildings: the 'killer' variables, in Clements-Croome, D. (editor) 2000, *Creating the Productive Workplace*, London: E & FN Spon.

¹⁵ PriceWaterhouseCoopers (2001) *Building Performance: an empirical assessment of the relationship between schools capital investment and pupil performance*, DFES Research Report 242, and: PriceWaterhouseCoopers (2003) *Building better performance: an empirical assessment of the learning and other impacts of schools capital investment*, DFES Research Report 407.

¹⁶ CABE (2005) *Design with distinction: the value of good building design in higher education*, CABE.

tool. *OnDesign*, the NHS healthcare design portal, includes a knowledge base about facilities and their impact. CABE 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*¹⁷. The appendices of the report 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 review¹⁸ was published in September 2004 by a team drawn from the Center for Health Systems and Design at Texas A&M University and the College of Architecture at Georgia Tech, led by Roger Ulrich, Director of the Center and well-known authority in the field. The authors report that they combed through scores of databases and several thousand scientific articles in order to identify 600-plus 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 health care buildings that are 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 and extremely detailed review in the healthcare sector by Rubin, Owens & Golden¹⁹ combed the medical literature for research papers on the effect of the physical environment on patient outcomes. The authors applied the demanding standards of proof used in medical research and concluded that almost all the studies were methodologically flawed or limited. They had found 87 relevant studies to review in detail, whereas the 2004 paper found over 600, suggesting that the evidence base has grown substantially in the intervening years.

What these studies and reviews clearly demonstrate is that, while crude *architectural determinism* – the notion that there is a direct causal link between the built environment and behaviour – was justly rejected many years ago, we are beginning to build up an evidence base about how the design of the built environment affects outcomes. With it comes the recognition that society derives huge benefits from buildings which are designed to promote beneficial outcomes such as health, well-being, educational attainment, productivity, neighbourliness and civic pride.

There is little doubt that well-designed buildings are widely appreciated – as evidenced by contented clients, repeat business, journal coverage and national or regional awards. On the other hand, public relations coverage is not the same as evaluation, media reviews are limited to highly visible buildings, and iconic buildings while valued in the short term are often less so in the long term. Place-making is less often recognised and commended. Badly designed buildings may be valued simply because they are ‘better than the old one’.

¹⁷ PricewaterhouseCoopers (2004) *The role of hospital design in the recruitment, retention and performance of NHS nurses in England*, CABE.

¹⁸ Roger Ulrich, Xiaobo Quan, Craig Zimring*, Anjali Joseph, Ruchi Choudhary, (2004) *The Role of the Physical Environment in the Hospital of the 21st Century: A Once-in-a-Lifetime Opportunity*. report, Center for Health Systems and Design, College of Architecture, Texas A&M University.

¹⁹ Rubin, H., Owens, A. J., & Golden, G. (1998). *Status report (1998): An investigation to determine whether the built environment affects patients' medical outcomes*. Martinez, CA: Center for Health Design.

Despite our emerging understanding of the benefits of good design, occupying organisations do not routinely evaluate the impact of their buildings. The culture of feedback is almost entirely missing. There are few established procedures, and few organisations keep even the most basic records about occupancy and costs. Worth to the business is not the accepted currency of valuation and the necessary metrics are not available. Nor – with few exceptions – do clients commissioning new buildings routinely attempt to determine how much they could justifiably invest to achieve a particular level of return. In a detailed study of ten client organisations that had commissioned high profile bespoke buildings, Jon Rouse²⁰ investigated how they sought to place a value on architectural design quality. Several of his case study organisations had attempted to assess costs and benefits using various approaches, not all of which were well suited to the task. Rouse went on to argue that the lack of methods to value benefits holds back investment in the built environment; and improved valuation methods that take account of outcomes could release investment into the built environment leading to better design and better outcomes.

So there remains a significant problem – that of putting a value on the benefits. We are, relatively speaking, good at measuring the costs associated with design and construction but much weaker at assessing value. There is a genuine difficulty here that many of the benefits of good design are hard to measure – in a word, they are *intangible*. And, as we know, if something cannot be measured it is likely to be under-valued or even ignored completely. It's a common experience in architecture that the desire to deliver value for money is often interpreted as cutting costs rather than raising values. We need to find ways to represent intangible benefits which enable them to be compared directly with costs, so that an informed view can be taken about an appropriate level of investment that will deliver real value for money.

Are these issues unique to the built environment?

The built environment is not unique in having difficulty putting a value on intangible benefits. In the commercial world, the sources of economic value creation during the industrial era were tangible assets such as land or plant, but with the rise of the knowledge-based economy a rapidly growing fraction of corporate wealth exists in the form of assets such as brands, patents and copyrights, as well as in the knowledge held by an organisation and by its staff. One result is that the market-to-book ratio of the top 500 companies in the US has risen from about 1:1 in 1980 to 6:1 today – for every six dollars of market value, only one appears on the balance sheet. Baruch Lev, a leading New York academic, argues²¹ that intangible assets surpass physical assets in most business enterprises, but remain absent from corporate balance sheets and therefore that the reporting of firms' performance and value is biased and deficient. He believes we need a new common language so meaningful comparisons of intangible assets can be made.

Equivalent concerns have arisen about the difficulties of capturing value in the arts. A recent Demos report²², explores the question: 'How, in going beyond targets, can we best capture the value of culture?' The report identifies that cultural value may include historical, social, aesthetic and symbolic aspects and that economic value alone cannot completely express the 'worth' of a cultural asset.

²⁰ Jon Rouse (2004) 'Measuring value or only cost: the need for new valuation methods', in *Designing Better Buildings* edited by S. Macmillan, Spon Press.

²¹ Lev, B. (2001) *Intangibles: management, measurement and reporting*, Brookings Institute.

²² Holden, J. (2004) *Capturing Cultural Value: how culture has become a tool of government policy*, Demos.

In the natural environment, increasing awareness of the importance of landscape, clean air, and biodiversity has been behind the development of new valuation methods that allow the benefits of development to be compared with the losses implied by irreversible change. Methods such as contingent valuation (for exploring the public’s willingness to pay for an environmental benefit or accept compensation for loss), hedonic pricing (to isolate the contribution which environmental quality makes to the total value of an asset) and choice experiments (asking for repeated evaluations of hypothetical scenarios to explore the effects that individual characteristics have on preferences) have been used for valuing the natural environment. Significantly, the Construction Research and Innovation Strategy Panel turned to an environmental economist – Professor David Pearce – to report on ‘The social and economic value of the built environment’²³.

A new framework for value in the built environment

The production and subsequent use of the built environment involves a large number of transactions between a wide variety of stakeholders and under a variety of headings. Box 1 summarises the main stakeholders. In any comprehensive overview of the how the industry delivers value, the transactions between all these players need to be recognised and mapped. Different maps will be needed for different sectors and different procurement routes.

Category	Stakeholders	Outcomes
Finance	Financiers, banks, PFI consortia, developers, government	Return on capital, profitability, long term value, ease of letting or selling, awards
Design and construction	Architects, engineers, surveyors, designers, contractors, sub-contractors and suppliers	Profitability, repeat business, awards, prestige
Occupant organisation	Chief Executive, Project Directors, Communications & Marketing Managers, general workforce, HR, Facilities Managers, Security staff, cleaners	Organisational productivity and profitability, organisational 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
Public realm	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
Visitors to building	Hospital patients, hotel guests, retail customers, students, pupils, the general public	Hospital recovery rates, retail footfall, educational achievements

Box 1

At workshops held at PriceWaterhouseCoopers, CABI and the RICS, designers, surveyors, valuers and facilities managers discussed the impact of design on outcomes and the need for new valuation methods to capture intangibles. There was a general agreement with Jon Rouse’ thesis that there is a need for new valuation methods in the built environment – not to replace existing ones, but as an adjunct to extend the range of factors taken into account beyond the economic to capture social and cultural values. A key suggestion at one of the workshops was the need for a matrix approach to valuation, and the framework shown in Box 2²⁴ is a first attempt to suggest what this matrix might encompass. It identifies six different

²³ Pearce, D. (2003) *The social and economic value of construction*, published by nCRISP.

²⁴ Exchange value, use value and image value were originally identified in a study of *Intelligent Buildings in Europe* by DEGW/Technibank (1992).

bundles of value that are created by a building project and offers some tentative indicators associated with each bundle.

Type of value created	Bundle of valued outcomes	Examples of indicators or metrics
Exchange value	Building as a commodity to be traded, whose commercial value is measured by the price that the market is willing to pay. For the owner this is the book value, for the developer the return on capital and profitability. Also covers issues such as ease of letting and disposability.	Book value Return on capital Rental Yield
Use value	Contribution of the building to organisational outcomes: productivity, profitability, competitiveness and repeat business, and 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 will vary sector by sector but might include recovery rates, footfall, examination results, and occupant satisfaction.	Measures associated with occupancy: such as satisfaction, motivation, and teamwork. Measures of productivity and profitability.
Image value	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
Social value	Buildings 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 and neighbourly behaviour Reduced crime and vandalism
Environmental value	The added value arising from a concern for intergenerational equity, the protection of biodiversity and the precautionary principle in relation to consumption of finite resources. The principles include adaptability and/or flexibility, robustness and low maintenance, and the application of a whole life cost approach, and the immediate benefits are to local health and pollution.	Environmental impact Whole life value
Cultural value	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. Cultural value may include consideration of highly intangible issues like symbolism, inspiration and aesthetics. Indicators of cultural value may include critical press opinion and, perhaps, the 'wow' factor.	Press coverage Critical reviews

Box 2

In addition to this matrix approach to measurement, a second key suggestion from the workshops was the need to move away from a single point value towards more of a probability curve for quantifying value, reflecting the confidence we have in the accuracy with which each kind of value is assessed. Future valuation methods may offer us ranges of

values, or a profile, rather a single number. Clearly buildings will vary in the emphasis given to each of these six types of value. Diverse kinds of value will be captured in a matrix approach but there will also be a need to look at the connections between them. This may require a mapping method and perhaps also some kind of weighting system to ensure that the relative importance of any single bundle of values can be adjusted according to the building type and the circumstances. Not every building will aspire to achieve high value against every bundle.

A third possibility is the use of value mapping as a means of capturing in graphic form the relationships between different types of value and the flows of value they achieve. This technique is already being discussed as a possible way of capturing and measuring the public value of government services.

What needs to change to introduce new methods?

Four key changes are needed:

- Owners need to get closer to operating units and to share the resulting knowledge
- The 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
- The professional institutions and government need to assist in the promotion of new approaches

Building owners have much to gain by becoming smarter. They need to develop a closer relationship with users and their needs, be 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 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. By sharing this information across owner organisations, 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 many published studies of the impact of good design, including CABE's compilations, 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 argue 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.

The commitment by designers towards improving social and economic outcomes is reported to vary 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 that will need to be overcome is that we are conditioned by established norms for building costs and professional fees. There is an unwillingness 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, there is a separation between investors and occupiers. Investors want buildings that appeal to wide markets, and there is little incentive to meet the intangible wants of a single occupying organisation since they may not readily transfer to a second user. Political or organisational 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 organisation and building procurement is not undertaken often enough to learn from experience. The complexity of the relationships among the parties – investors, client, designers, contactors, 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. But it is not merely a plea for more up-front fees – well timed and considered interventions do not necessarily need much additional input. What is 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. Designers themselves 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 recognise that intangible benefits can impact on the value and saleability of a property. They should set clear and explicit criteria to differentiate the bad from the good, and develop measures to identify and rate intangible benefits.

Workshop delegates called on the professional institutions, particularly 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 up 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 on to show a willingness to pay on a ‘value for money’ basis, to recognise the potential benefits of improved outcomes, to accept the risk for their delivery, and 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.

We need to bring these ideas together in a set of broad principles and a common language, and to develop improved tools not only for surveyors, valuers and designers but for the whole industry. The potential benefits from improved means to measure and value outcomes are wide-ranging and include:

- 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 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 organisations that occupy them.

At best, new methods will raise the level of debate about the contribution of the built environment to economic prosperity, social well-being, and cultural vitality. The contribution of the construction industry in delivering this will be increasingly recognised, enhancing the industry's reputation and leading both to greater public trust and respect, and to a more equitable level of risk and reward.

A more detailed report on the DTI project 'Better Designed Buildings: improving the valuation of intangibles' is available by email from Sebastian Macmillan, Eclipse Research Consultants <mailto:s.macmillan@btconnect.com>