The value of good design

How buildings and spaces create economic and social value

cabe

The value of good design: public perception

In a MORI poll commissioned by CABE in the summer of 2002, an overwhelming 81% of people said they are 'interested in how the built environment looks and feels', with over a third saying they are 'very interested' and another third wanting more of a say in the design of buildings and spaces. 85% of people agreed with the statement 'better quality buildings and public spaces improve the quality of people's lives' and thought that the quality of the built environment made a difference to the way they felt.

The figures on the right summarise some of the findings of the survey. They show that the majority of people consider well designed buildings and spaces as positive influences on the quality of daily life, professional productivity, educational attainment, physical well-being, levels of crime and house values.

People work more productively in well designed offices
Agree 77%
Disagree 7%

Well designed schools improve children's education
Agree 70%
Disagree 17%

The design of hospitals makes no difference to how fast patients recover
Agree 29%
Disagree 52%

How streets look and feel makes no real difference to crime
Agree 22%
Disagree 66%

Well designed houses will increase in value quicker than average
Agree 72%
Disagree 9%

Source: MORI/CABE, 2002

Introduction

This short document has a very simple aim. It draws together key research from the UK and abroad to show that investment in good design generates economic and social value. Collectively the studies provide evidence of the value of design in the areas of:

- **Healthcare**
- **Educational environments**
- **Housing**
- **Civic pride and cultural activity**
- **Business**
- **Crime prevention**

All of the examples listed prove that design matters because our lives are connected through our common built environment. Across all sectors and building types the message is the same – when we invest in the built environment, we must consider the impact of design throughout the lifetime of the buildings, on the places in which they are located and on all stakeholders involved. The vast majority of a building's costs and benefits can be expressed in terms of the impact upon its occupiers, users and passers by.

- A well designed hospital will help patients get better more quickly
- A well designed school will improve the educational achievement of its pupils
- A well designed department store will have a direct impact on stock turnover
- A well designed neighbourhood will benefit from lower crime and higher house values

We cannot afford **not** to invest in good design. 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. If we want to be a successful and sustainable society we have to overcome our ignorance about the importance of design and depart from our culturally-ingrained notion that a poor quality environment is the norm and all we can expect from British builders, developers, planners and politicians.

Over the next five years, we are going to experience the largest public investment programme in new buildings for a generation. Get it right and we will have a legacy of civic buildings to match or even surpass the Victorian age. Get it wrong and we will have dysfunctional, under-utilised and unloved buildings in every part of the country. The stakes are high but we will succeed provided we abide by three key principles:

- Good design does not cost more when measured across the lifetime of the building or place
- Good design flows from the employment of skilled and multi-disciplinary teams
- The starting point of good design is client commitment

CABE is here to help. We are working in partnership with organisations in all sectors, the major built environment industries, and project teams throughout the country to ensure that the lessons set out in this publication are disseminated widely. Across the board we are determined to make the case for investment in good design ever more compelling, knowing that we will all benefit as a result. CABE, with its partners is aiming to address this. Most of all, we want to add to this evidence. If you have spent time and effort measuring the impact of design investment, please let us know.

Sir Stuart Lipton, Chairman, CABE

A. The value of design in healthcare

A1. A study by Sheffield University for NHS Estates compared patient outcomes in a newly refurbished orthopaedic unit at Poole hospital with those in a 1960s conventional ward. The study found that patients treated on the refurbished ward required less analgesic medication than those on the older ward. Patients not undergoing operations were discharged significantly more quickly from the newer ward – after 6.4 days compared with 8.1 days.

A2. The Sheffield study also compared psychiatric patients treated at Mill View Hospital, a purpose-built unit in Hove, with those at two older wards at Freshfield Mental Health Unit within Brighton Medical Hospital, located in a former Victorian workhouse. The length of stay was again lower on the new unit. Patients treated entirely in the new building had an average reduction of 14% in their length of stay – 36.5 days compared with 42.4 days. In the same new unit at Mill View Hospital 79% of the patients were judged by staff to have made good progress (compared to 60% in the old unit), and the level of verbal outbursts and threatening behaviour was reduced by 24% and 42% respectively.

A3. A King's Fund document published in 2002 highlighted the example of Newham Hospital in south east London, where levels of staff morale increased by 56% following the redesign of the hospital. When asked if they felt valued, 78% of staff said 'yes' after the redesign compared to 22% three years previously.

A4. Research by the National Institute for Health and the National Institute on Ageing in the US showed that certain design features in Special Care Units and Assisted Living Treatment Residences for people with Alzheimer's disease and related dementias made people calmer whilst certain others generated more agitated behaviour. For example, unobtrusive and secure exits reduced paranoid delusions, and increased bedroom privacy and better through routes in common areas reduced both verbal and physical agitation and aggression. The study concluded that the benefits of these design features on health and quality of life are independent of the quality of other care characteristics.

A5. A study in a suburban Pennsylvania hospital examined the records of patients recovering from cholecystectomy. It compared patients whose rooms had windows overlooking natural landscapes with patients who looked out onto a brick wall, and found that the patients with open views:

- had shorter post-operative stays – 7.9 days compared with 8.7 days
- had fewer negative evaluation comments from nurses
- took fewer strong and moderate analgesic doses
- had lower rates of minor post-surgical complications

A6. A study carried out by the University of Nottingham which compared three healthcare environments before and after they were redesigned found clear benefits to patient health and associated improvements in the efficiency of medical resourcing due to good design. The schemes included a cardiology ward with improved lighting, better external views and clustering of beds in smaller groups; a waiting area with enhanced artificial lighting, better seating and interior design; and a coronary day-care unit with better beds and patient facilities, larger windows and a visitors area. The new ward was perceived by patients and staff as more pleasant, relaxing and welcoming. It resulted in lower pulse rates and blood pressure readings amongst patients, shorter post-operative stays – 8 days down from 11 days – and lower prescribed drug intakes.

1 Courtyard of Pulross Centre, Brixton *Penoyre & Prasad*
2 Interior corridor and staircase ACAD Centre, Central Middlesex Hospital *Avanti Architects*
3 GP Surgery, Croydon *AHMM Architects*
4 GP Surgery, Hammersmith, *Guy Greenfield Architects*
5 Courtyard ACAD Centre, Central Middlesex Hospital *Avanti Architects*
6 Public art in Chelsea and Westminster Hospital, London

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1 Kingswood Day School, Bath *Feilden Clegg Bradley*
2 Hayes School, Kent *PCKO*
3 Martial Rose Library, Winchester *Feilden Clegg Bradley*
4 Great Notley Primary School, Braintree, Essex *AHMM*
5 Jubilee Campus, University of Nottingham *Michael Hopkins & Partners*
6 Greenwich Millennium School, London *Edward Cullinan Architects*

B. The value of design in educational environments

B1. A study carried out in 2000 by PricewaterhouseCoopers for the Department for Education and Skills examined the relationship between capital investment in schools and pupil performance. It found that capital investment in school buildings had the strongest influence on staff morale, pupil motivation and effective learning time. The study highlighted one school where the design of playgrounds and the school hall had enabled a reduction of lunchtime assistants from 8 to 5, with the saved resources switched to direct educational expenditure.

B2. A study carried out at Georgetown University in Washington DC showed that after controlling other variables, such as a student's economic status, students' standardised achievement scores rose by 5.5% as a school's physical environment improved from one design category to the next, eg from 'poor' to 'fair' to 'excellent'. If a school improved its condition from 'poor' to 'excellent' an average increase of 10.9% could be expected.

B3. A French study of two new school building projects in Marseille and Paris, found that educational environments designed to integrate information and communication technology were more conducive to learning. After the completion of the Marseille project the repeat rate among sixth grade students was only 2.5%, compared to the national rate of 9.8%, the rate of progression from sixth to tenth grade was 71.5% compared to the national norm of 64.5%, and incidents of vandalism declined despite the large size of campus. After the completion of the Paris project the baccalauréat success rate was 84%, compared to the national average of 78%, the rate of progression from tenth grade to baccalauréat was 73% compared to the national average of only 57% and the number of enrolment applications from private school pupils has steeply risen – 17.4% of the students aged 15–16 now come from these schools.

B4. A series of American studies on the relationship between pupil performance, achievement, behaviour and the built environment found that scores for the Comprehensive Test of Basic Skills (CTBS) amongst students aged 16–17 in well designed high schools in North Dakota were between 1 and 11% higher than those in poorly designed high school buildings.

B5. A study of Academic Proficiency test results in small, rural high schools in Virginia, USA indicated a positive relationship between building condition and student achievement. Results were generally higher in school buildings with better structural and aesthetic qualities. Combined results on test scores were 5% higher for students in better designed schools.

B6. A related study which used the same methodology to look at large, urban high schools in Virginia found a greater range of differences between students' test scores in poorly designed and well designed buildings than those in the rural high schools in the Virginia and North Dakota high schools study above, with some of the differences as great as 17%.

B7. A separate study carried out in California analysed the test score results of over 21,000 student records from three school districts in the US. Controlling for other variables, it found that students with the most natural day lighting in their classrooms progressed 20% faster on maths tests and 26% on reading tests in one year than those with the least natural light.

B8. Research carried out at the School Design and Planning Laboratory, University of Georgia, found that elementary schools with more than 100 square feet of building space per student tend to have significantly higher science, social studies and overall Iowa Test of Basic Skills (ITBS) scores than schools with under 100 square feet per student. A separate study by the same university found evidence of improved child behaviour in schools with over 100 square feet per child. The impact of additional space on behavioural patterns was most noticeable on children with special learning needs.

B9. A doctoral dissertation from the University of Georgia found that junior high school pupils based in newly renovated school facilities showed more positive attitudes toward school than pupils based in older buildings and that students in classrooms with the most daylight had 7–18% higher scores than those with the least daylight.

C. The value of design in housing

C1. A study for the Royal Institution of Chartered Surveyors carried out in 1997 estimated that more money – as much as £2 billion per year – is spent on treating illnesses arising from poor housing conditions than is spent by local authorities on their own housing stock. National annual estimates of the increased costs associated with the 7.6% of public sector homes considered unfit for habitation are £3 billion due to poor health, £1.8 billion due to increased crime and £120 million for the cost of fire services. Although not definitive figures, they show the extent of the problem.

C2. In a recent MORI poll commissioned by CABE in the summer of 2002, nearly three quarters of those interviewed (72%) said that they believe well designed houses will increase in value quicker than average with less than one in ten (9%) disagreeing with this statement. When asked to list two or three things which they considered important in the design of new houses over half the respondents (59%) said security against crime was a key factor; 56% said that new homes should be built to last; 45% said they should be designed to be safe from accidents and fires; 41% mentioned ease of maintenance; and 35% thought that energy efficiency was important.

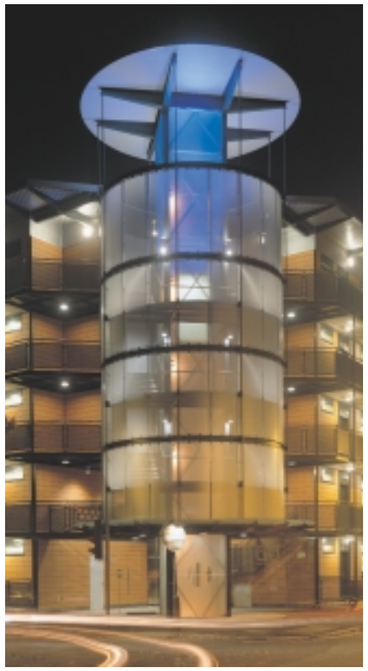
C3. Extensive international research by the University of California in the 1970s and 1980s using post-occupancy surveys discovered that not only did the overall impression of the exterior of a house and its surrounding dwellings have an impact on how people felt about their homes but also in many cases those residents' personal sense of worth.

C4. An Urban Land Institute study of over 10,000 housing transactions in four pairs of housing developments in the United States revealed an average sales premium of $20,000 or 11%, on schemes upholding basic urban design principles similar to those set out in recent UK planning guidance Better Places to Live.

C5. The University of Bristol carried out a survey of 600 households on a large suburban housing estate with little or no distinctive design quality. The researchers found that these residents exhibited more difficulties in selling and experienced more negative equity than those living on more distinctively designed developments.

C6. The Popular Housing Forum used over 800 interviews and discussion groups across the UK to explore public attitudes to the appearance and site layout of new housing. Appearance of the neighbourhood was considered a more important factor than the design of the home itself.

C7. An exploratory study carried out by international property consultants FPD Savills in 2002 indicated that volume house builders who had invested in higher quality design in residential schemes could expect to yield a residual value per hectare of up to 15% more than conventionally designed schemes.



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1 Murray Grove, London *Cartwright Pickard for Peabody Trust*
2 Bishops Mead, Chelmsford, Essex *Reeves Bailey for Bryant Homes Eastern*
3 Slateford Green, Edinburgh *Hackland & Dore for Canmore Housing Association*
4 Iroko Housing Coin Street, London *Howarth Tompkins for Coin Street Community Builders*
5 The Point, Bristol *Feilden Clegg Bradley for Crosby Homes*
6 Chronos Housing, Whitechapel, London *Proctor Matthews for Copthorne Homes*

1 Bus stop, Edinburgh *Reiach & Hall*
2 Brindley Place, Birmingham *Terry Farrell/ John Chatwin*
3 Millennium Bridge, London *Foster & Partners*
4 Millennium Bridge, Gateshead *Wilkinson Eyre*
5 Peace Gardens, Sheffield *Sheffield City Council/ Sheffield One*
6 South Promenade, Bridlington *Bauman Lyons*

D. The value of urban design in promoting civic pride and cultural activity

D1. Research published by CABE and the Office of the Deputy Prime Minister (ODPM) in 2001 analysed three pairs of selected commercial developments in Birmingham, Nottingham and Manchester – each pair of developments having one better designed than the other – to test the value of investment in high quality urban design. The research found that the better designed schemes provided a range of economic, social and environmental benefits including higher rental levels, lower maintenance costs, enhanced regeneration and increased public support for the development.

D2. Since 1965 Jan Gehl of the University of Copenhagen has conducted research on the contribution of public spaces to civic life in Copenhagen. The research has consistently shown that wherever public spaces of good quality are provided an increase in public life also takes place. As a result, despite the climatic differences, the level of public outdoor activity on a summer's day in Copenhagen equals that of Rome. The amount of car traffic in the city has remained unchanged for the last 25 years while bicycle use has increased by 65%.

D3. By contrast, a European survey of people's attitude towards town centres found that by far the highest incidence of disliking town centres was recorded in surveys of British towns. The distinguishing factors were the lack of car-free spaces to sit and relax, the low desire to participate in social activities and an unstimulating visual environment in the form of shop displays, public activity and street furniture.

D4. Within two years of the Tate Gallery opening in St Ives, people whose main reason for visiting St Ives was to visit the Gallery contributed £16 million per annum to the local economy. On a smaller scale, within the first few months of the opening of the New Art Gallery in Walsall, the local Boots store reported a daily sales increase of £4,000 and planned to open stores in the area on Sundays to capitalise on the impact of the gallery.

D5. A study by the University of San Francisco in 1999 which looked at case studies across the United States has reported that the preservation and improvement of open land for public use creates a net increase in municipal tax revenues by increasing land values in the surrounding neighbourhood.

D6. Upon the completion of the award-winning Rose Center for Earth and Space at the American Museum of Natural History in New York, the museum reported a 58% increase in visitors and a 200% increase in membership applications. The contemporary nature of the new extension means that a 131 year-old museum is now regarded as one of the most dynamic museums in the city.

D7. In 2000 the new Peckham Library, designed by Will Alsop, won the Stirling prize for the best designed building by a UK architect. Usage figures for the first six months of the new library compared to the two closed libraries it replaced show that annual visits increased from 171,000 to 450,000 and book loans rose from 80,000 to approximately 340,000. Latest figures show that there were over 565,500 annual visits made from April 2001 until March 2002.

D8. Finally, another award-winning project. After the completion of a new educational campus for the Spencer Institute in Kadina, South Australia, library usage has increased by about 30%, enrolments for courses have increased dramatically and the Institute has been awarded the title 'National Training Provider of the Year.'

E. The value of design for business

E1. According to international architect Norman Foster when considering the average costs of a building over a 25 year period, the physical envelope of the building comprises only 5.5% of the total cost whereby the costs of occupying the building represent 86% of the total cost. His experience highlights that a small investment in design quality can quickly make a significant impact on this much larger percentage.

E2. A survey undertaken for the University of Nottingham of ten major companies that had invested in high quality bespoke corporate buildings in the UK, including British Airways, Boots and Capital One, found that 'employee satisfaction' and 'functional quality' were the highest rated drivers for investment.

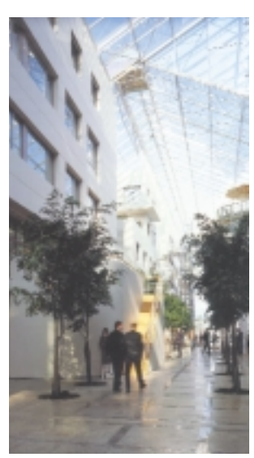
E3. Following the award-winning design for an arts and craft studio in Des Moines, Iowa, the company which occupies it has enjoyed a 20% increase in output and a reduction in the time required for handling and transporting products. The savings have been used to enhance employee benefits and for recruitment and retention programmes.

E4. A study carried out in Chicago in the early 1980s used a method known as hedonic price estimation to measure the impact of 'good' architecture on rental rates for commercial offices. Using the receipt of architectural awards as the relevant measure of 'good' architecture it found that the rewarded buildings commanded a significant rental premium that could not be explained by other factors. A similar study was undertaken a decade later using over a hundred high grade office buildings across the United States. Again, the research again found a positive correlation between design quality and market rents.

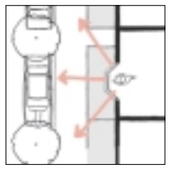
E5. The leading writer on office design, architect Frank Duffy, cites the case of Anderson Worldwide whose design investment in their new Chicago office achieved a reduction of 30% in the space that would have been used by conventional layout designs. The overall savings on rent and occupancy levels paid for the initial capital outlay within four years.

E6. In 1999 the Property Council of Australia established a scorecard for measuring the financial performance of commercial urban developments. By looking at 16 developments in detail they found evidence of a 'design dividend' which can be measured in financial terms.

1 Boots Offices, Nottingham *DEGW*
2 Egg Offices, Pride Park, Derby *DEGW*
3 Entrance BT Headquarters, Stockley Park, West London *Fosters and Partners*
4 Kajima Offices, Tokyo *Kajima Construction*
5 SAS Headquarters, Stockholm *Niels Torp*
6 Interior BT Headquarters, Stockley Park, West London *Fosters and Partners*



F. The value of design in crime prevention



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1 Terraced street in Jesmond, Newcastle. The diagram shows how bay windows and front doors which open on to the street provide increased surveillance for pedestrians and cars and houses

2 Diagram and close up of house in Rolls Crescent, Manchester demonstrate surveillance views

3 Ladbroke Grove Environmental Focus Area, West London *Tibbalds Monro* Well designed street lighting in public areas can prevent criminal activity

4 Crown Street Regeneration Project, The Gorbals, Glasgow *CZWG Architects*. Well designed open space in this housing development in The Gorbals, Glasgow provides a safe semi-private area for residents

F1. A study published in Urban Design International looked at the spatial distribution of crime reports provided by the police in three towns with a wide range of social classes, spatial patterns and housing types, found that:

- property crimes tended to cluster in locally segregated areas, particularly in cul-de-sacs, footpaths and rear dead-end alleys
- positive features that made spaces safer included integrated through roads with front entrances on both sides, more passers-by on the street, more visible neighbours on the streets, good visual relations to the public realm rather than seclusion, more linear integrated spaces and visual continuity between spaces

F2. Adopting good design qualities in low-rise housing can lead to lower crime rates. Research in Northampton indicated that to reduce crime, the front windows of houses should face each other across the street to create a system of mutual surveillance.

F3. A comprehensive redesign programme of a 1970s housing estate in Edinburgh which included fundamental changes in the estate layout as well as individual units, reduced housebreaking by 65% and vandalism incidents by 59% with the total number of incidents being lowered overall.

F4. The Crime Prevention Services Unit in Peel, Ontario, Canada has recorded examples of redevelopments in the city that have adopted ‘Crime Prevention Through Environmental Design’ (CPTED) principles. In 1992 CPTED principles were adopted in the redesign of a residential area including the removal of negative environmental cues and an increase in site visibility. After completion there was a drop in vandalism and loitering and a 90% drop in the number of break-ins in the area sustained over several years.

F5. A study of 27 housing estates in West Yorkshire designed according to ‘Secured by Design’ (SBD) principles, reported that crime rates had dropped by between 54% and 67% since the redesign. Burglary rates were 50% less than those on other West Yorkshire estates and there were 42% fewer vehicle crimes. The average cost of the extra design measures was £440 per new dwelling, compared to estimated average burglary losses of £1,670 per dwelling.

F6. A research project in Kitchener, Canada compared the before-and-after effects of turning a large under-developed plot of land in a crime-ridden neighbourhood into a community garden. As a result, crime incidents in the surrounding buildings dropped by 30% immediately, and by 49% and 56% in the two subsequent years.

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Further information

Value of good design: relevant websites and links

General

CABE
www.cabe.org.uk

ODPM
www.odpm.gov.uk

DCMS
www.culture.gov.uk

The Prime Minister's Better Public Building Award 2002
www.betterpublicbuildings.gov.uk

A. Health

NHS Estates – The Department of Health's property agency
www.nhsestates.gov.uk

Architects for Health
www.architectsforhealth.com

Medical Architecture Research Unit (MARU)
www.sbu.ac.uk/maru

The Nuffield Trust
www.nuffieldtrust.org.uk

B. Education

DfES Schools Building & Design Unit
www.teachernet.gov.uk/schoolbuildings

School Works
www.school-works.org

The Education Design Group
www.educationdesign.co.uk

OECD – Programme on Educational Building (PEB)
www.oecd.org/els/education/facilities

C. Housing

Building for Life
www.buildingforlife.org

House Builders Federation
www.hbf.co.uk

Design for Homes
www.designforhomes.org

New Homes Marketing Board
www.new-homes.co.uk

The Housing Forum
www.thehousingforum.org.uk

Joseph Rowntree Foundation
www.jrf.org.uk

D. Urban Design/Civic Pride

The Urban Design Alliance
www.udal.org.uk

The Urban Design Group
www.udg.org.uk

Streets of shame
www.streetsofshame.org.uk

E. Commercial/Housing

Urban Land Institute
www.uli.org

F. Crime

Home Office
www.homeoffice.gov.uk

Secured by Design
www.securedbydesign.com

Relevant publications available through the CABE website

The value impact of housing design and layout
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Improving standards of design in the procurement of public buildings (with OGC)
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Design: DUFFY

Bartlett School of Planning
University College London
22 Gordon Street
London
WC1H OQB

T 020 7387 7500
F 020 7380 7502
www.bartlett.ucl.ac.uk/planning

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Commission for Architecture
& the Built Environment

The Tower Building
11 York Road
London
SE1 7NX

T 020 7960 2400
F 020 7960 2444
E enquiries@cabe.org.uk
W www.cabe.org.uk