

## Education Department Research Programme

## A Literature Review of the Social, Economic and Environmental Impact of Architecture and Design

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The Scottish Executive commissioned this study in the light of the Policy on Architecture for Scotland to provide better public access to the results of research on the social, economic and environmental impact of architecture and design and to better inform clients and designers, with a view to improving quality of life. The review focuses on the end-user, those individuals for whose use buildings and places are ultimately designed. It draws on evidence from the last ten years, from the UK, mainland Europe, Canada and New Zealand.

### Main Findings

- Visionary buildings, high-quality design and aesthetic appeal increase land and property values, create jobs, attract, motivate, inspire and retain staff and users and enhance student motivation and performance.
- Natural views, green space, trees and water features provide significant social, economic and environmental impact. They increase property values; enhance worker satisfaction; and have a positive effect on user health and well-being. Environmentally, impacts include cooler air temperature, produce oxygen, reduce airborne pollution and can help reduce overall energy use.
- Use of sustainable design features including energy saving techniques, reduces energy use and costs.
- Internal space allocation significantly impacts on effectiveness, efficiency, comfort and satisfaction in all sectors. A variety of space affording different environments is beneficial in most sectors.
- User comfort increases productivity, satisfaction and well-being, contributed to by good-quality lighting, including natural lighting, air-quality, temperature and acoustics.
- Areas with character, particularly if these involve historic restoration, can rejuvenate areas and give them a unique sense of identity.
- Public realm, which is felt to be accessible and safe, increases use and provides for social interaction.
- Mixed-use development helps regeneration by increasing an area's vibrancy, attracting businesses and residents and creating jobs. It also reduces harmful environmental impact from car emissions where car use is low.
- Accessible, well-connected spaces attract business investment and increase use. Low-traffic environments increase social use and give rise to health benefits from increased pedestrian use.
- Enhanced local pride, identity, ownership and use and reduced crime arises from involvement of users and stakeholders in the design of both buildings and places.

## Introduction

The United Kingdom is in the midst of its biggest building boom post World War II. Scotland has experienced a 30% rise in the turnover of the construction industry from £8.4m in 1998 to £10.9m by 2003<sup>1</sup>; the largest ever investment in school buildings with 300 schools being built or refurbished by 2008-09<sup>2</sup>; 27 hospital project proposals, with a total value of £983m, in the last five years<sup>3</sup>; and 119,000 new residential dwellings equivalent to 5% of households being built between 2000 and 2004,<sup>4</sup> with a 9% increase between 2003 and 2004 alone<sup>5</sup>.

This transformation, much of it in the public sector, is spearheaded by the increasing belief of policy makers in the difference that good architecture and design can make to the lives and aspirations of individuals and communities. Much evidence exists on the social, economic or cultural impact of architecture and design, but there is little consistent research. These findings draw on a synthesis of empirical and case-study evidence.

## Impact

This section identifies the key causal factors and the range of impacts arising.

### Vision

Visionary buildings, with character or a 'wow' factor create jobs; are important in business location decisions; help recruit and retain staff and increase land or property prices in surrounding areas.

### Historic Restoration

Restoration of historic buildings or sites can engage local communities and encourages community interaction, which contributes to community cohesion and revived civic pride.

### Building Design

Buildings with aesthetic appeal and a high-quality of design, embracing exterior views, fresh air, sunlight, spaciousness, tailor-made design and layout which encourages interaction, use of colour and visual art:

- Increase property and land values; affect business location decisions; increase rental income and property marketability.
- Help staff recruitment; provide inspiration and stimulation; heighten staff morale and satisfaction; improve effectiveness; reduce absenteeism; aid staff retention.
- Enhance pupil and student motivation; reduce absenteeism and improve academic performance.
- Contribute to improved patient recovery rates in hospitals.
- Can provide less harmful environments for people to live, work and learn in by reducing exposure to harmful pollutants.

### Context

Buildings with natural views or near to green spaces, trees and water features:

- increase rental value of commercial and retail property and enhance worker satisfaction and retention, particularly where contiguous to high quality mixed-use public space.
- have a positive effect on health and well-being of staff and residents.
- increase residential property prices particularly where the green spaces include parks and playgrounds.

Homes overlooking each other, with good sight from kitchens and living rooms to outdoor areas where children can play, provide an increased perception of safety for residents. Housing near busy roads is felt to be safer from crime but clearly not from road traffic.

### Sustainability

Sustainable design features can reduce energy use and costs, in construction and ongoing operation. These include intelligent lighting; insulation; low temperature and automatically adjusting heating and glare systems and low emissivity glass.

Socially, careful use of building materials has health benefits by reducing exposure to harmful materials. Energy-saving techniques can reduce the number of households experiencing fuel poverty. Effective sound insulation can lessen noise problems in high-density accommodation.

1 Office for National Statistics, Annual Business Inquiry, [www.scotland.gov.uk](http://www.scotland.gov.uk)

2 Scottish Executive Spending Proposals 2003-2006

3 [www.show.scot.nhs.uk/pfcu](http://www.show.scot.nhs.uk/pfcu)

4 Scotland's Census Results Online, 6.3.06

5 [www.scotland.gov.uk/topics/statistics](http://www.scotland.gov.uk/topics/statistics), HSG/2005/05, Table 6: New dwellings completed: 1995 to 30 June 2005

## **Allocation and use of space**

Internal space allocation and use has a significant impact on effectiveness, efficiency, comfort and satisfaction of users in all sectors. In most cases, a variety of space affording different environments is beneficial.

In education, cramped classrooms reduce pupil motivation and performance. Quiet study spaces increase motivation and performance. Common areas foster social interaction. Linking space can reduce staffing costs.

In hospitals, patients appear to be happier in private recovery rooms although multi-bed rooms can reduce feelings of isolation.

In work environments, open-plan offices improve communication but can also be distracting. Creative/flexible spaces can encourage creativity and inspiration. Greater space per employee reduces illness.

## **User comfort**

Good quality and natural lighting, air quality, temperature and acoustics are important in all sectors for productivity, satisfaction, health and well-being.

## **Navigation**

Provision of external views from within helps people orientate themselves in buildings. In hospitals, creating natural progression from public to treatment rooms supported by clear way-finding, reduces disorientation.

## **Character**

Character, particularly if it involves restoration of historic sites, can rejuvenate an area and give it a unique sense of identity. Characterful areas are more valued by potential house-buyers. Standardised buildings and those that do not fit into their surroundings are less valued. However, increased property prices due to regeneration can cause the displacement of local communities.

## **Gated Communities**

Gated communities are more likely to lack community cohesion; make people outside feel excluded and increase travel times and congestion for those who have to travel round them. Estates can also make people who live on them feel socially excluded due to physical separation from the rest of society. Non-gated communities have greater street vitality and compact, lower-density developments encourage greater community cohesion, due in part to lower car dependence.

## **Public Realm**

Safe, comfortable, accessible public realm attracts residents and encourages greater use, which can lead to greater social cohesion. Lack of public space reduces these opportunities. Economically, quality public realm raises property prices and increases retail spend. Key causal factors include pedestrianisation and provision of street-furniture. Safety measures and perceptions of increased safety help increase use, particularly effective lighting, CCTV and designing public spaces to have natural surveillance.

## **Mixed-use development**

Economically, mixed-use environments create jobs for local communities and increase workforce productivity by providing nearby leisure and retail opportunities. Socially, more opportunity is afforded for people to form relationships and increased personal time arises from reduced travel to work time. However while mixed-use may create socially diverse communities, this does not necessarily lead to social inclusiveness. Personal safety is felt to be greater in mixed-use public spaces. Health benefits accrue as greater exercise is taken when more people walk to work, retail and leisure facilities. Harmful car emissions are reduced in mixed-use environments but increased in greenfield locations.

## **Green space and trees**

Socially, green space, provides opportunities for social interaction and community activities, which foster community cohesion. Health benefits accrue from opportunities for 'green' exercise, which helps reduce stress and enhances individual well-being.

Economically, proximity to green space increases residential property prices while lack of green space reduces them. Rental income for offices with green spaces is increased but negative health and environmental impacts arise if the offices are out-of-town, due to increased car use.

The environmental benefits of green space and trees are extensive. Trees and shrubs help cool the air temperature in heavily trafficked streets; are good interceptors of solar reflection and radiation from buildings and streets; improve air quality by reducing airborne particulate and gaseous pollutants and produce oxygen. They can reduce overall energy use in buildings and CO<sup>2</sup> emissions. Trees provide carbon-storage capacity and lower the level of water run-off into drains, reducing flood problems.

## **Ease of movement**

Accessible, well-connected spaces have economic impact from being a major factor in business location decisions;

help attract and retain staff and increase the economic value of land where buildings are located near to transportation networks. Socially, low traffic streets afford a greater sense of neighbourhood as people use the streets more and move on less quickly. From a health perspective, well-designed streets that restrain vehicle speeds can reduce traffic accidents while provision of transport alternatives to cars, such as cycle networks and walkways increase exercise. Well-connected and visible areas have reduced crime due to the existence of natural surveillance. Environmentally, good public transport systems, provision of cycle ways and walkways decrease car use and consequent pollution.

## Involvement

Involving users and stakeholders in the design process helps foster pride, local identity and ownership, and increases future use. These factors contribute to community cohesion and reduced crime, particularly vandalism.

## Conclusions

Well-designed buildings and places clearly attract investment and create jobs. They motivate and enhance the productivity and performance of users. Socially, architecture and design can help us feel good about who we are and where we live; it can foster social interaction and contribute to increased social cohesion. Health benefits include less illness, faster patient recovery, reduced stress and greater overall health and well-being. Sustainable design, mixed-use development, green space and trees and well-connected public realm with effective public transport, have significant environmental benefits.

If you wish further copies of this Research Findings or have any enquiries about this project, please contact:

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The research findings is accompanied by a web only full report.

This document (and other Architectural Policy Unit Research Findings and Reports) may be viewed on the Scottish Executive web site <http://www.scotland.gov.uk> and also at <http://www.scottisharchitecture.com/education-research.html>

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