

# Strategic Foresight in the Built Environment – an overview

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## **Abstract**

There has been a wide application of foresight in the financial, mining and military sectors spanning over the past 30 years. It is only recently that foresight work has been undertaken in the built environment, property construction sector.

The environmental, economic and social impact of the built environment is substantial yet it would appear that in Australia, this highly fragmented industry tends to focus its discussion and activities around the future towards innovation and environmental design. To remain competitive, innovating and sustainable in a sector that is facing unprecedented changes it will be necessary for organisations to develop an integrated foresight capacity.

This paper provides an overview of the challenges the built environment sector faces today and the driving forces of change. It then explains the different foresight activities that have been undertaken across the United Kingdom, New Zealand and Australia.

In conclusion, the paper outlines the benefits of applying foresight within organisations working across the sector.

## **What is the built environment?**

In its definition, the term “built environment” is all encompassing of the world we live in. It consists of all human-built-structures including buildings, roads, fixtures, parks, and all other improvements that form the physical character of a city.

In the United Kingdom the sector is worth £65 billion per annum, employing over 1.4 million people and comprising 186,000 small businesses, including 165,000 contracting firms (Foresight 2002).

For the 2002-2003 fiscal year the Australian property and construction industry accounted for 6.3-14% of Gross Domestic product at \$46 billion and employed over 7 percent (730 000) of the workforce. Australia’s construction industry, like the UK’s, is fragmented with more the 230 firms and 730 000 individuals in the sector (Hampson & Brandon 2004).

The built environment accounts for up to 30% of the raw materials we use, 42% of the energy and 40% of environmental air emissions (CSIRO 2001). The ACF (2005) suggests that commercial buildings are the fastest growing source of greenhouse gas pollution in Australia

## **The Year of the Built Environment**

In 2004 Australia celebrated the “Year of the Built Environment” (YBE). The objective of the (YBE) was to ‘encourage Australians to celebrate and understand how the built environment makes a difference to their quality of life and to foster a sense of community and purpose by setting directions for a positive and sustainable future’ (Built Environment 2004).

The year provided an opportunity for the community to examine the lessons of the past and to explore improvements for the future ‘through design quality, sustainable development, building codes, heritage conservation’(Built Environment 2004) and resource management.

At the YBE Victorian launch, the Hon Steve Bracks stated ‘2004 should be the time to reflect on the legacy we’ll leave our children and grandchildren’ (Committee Inquiry 2004, p. 9).

Although the YBE appears to have made little impression, it did present an opportunity to raise the ‘conversation’ and debate of the impact of the built environment on the environmental and social landscape.

## **An overview of issues facing the built environment**

Throughout February to April 2005, the author conducted a series of face-to-face investigative interviews with developers, planners, architects and engineers. A number of insights were drawn from this review:

1. Fragmentation of the built environment sector appears to be greater than other sectors such as finance/mining.
2. Discussions around the future of the built environment sector appear to focus on Futures thinking which is inclined toward 'environmental sustainable development' with minimal understanding of the social impact of the built environment. Activity is mainly focused on what can be quantitatively measured.

In addition to these interviews, literature relating to the built environment/construction sector was reviewed to identify the key variables and drivers and their impact on future decisions. A number of these issues are summarised below.

### **Changing Demographics**

Despite the changing structure of society, developers are still producing the 3-4 bedroom family home. Planners are now realising the need to review housing design with greater flexibility, 'consisting of a wide range of small, medium and large units' (Toyne 2003).

### **Information and innovation**

It is anticipated that in the future information will be shared rather than 'husbanded'. The competitive edge will not come from possession of information (such as eco tools) but how that information is shared (Foresight 2002).

Innovation will be brought in the built environment sector by other companies and other industries.

### **Sustainability**

A number of business commentators have suggested that sustainability was just a passing fad (Vandenberg 2002). Slaughter (1999, p 251) however argues that 'sustainability as a social goal will not go away; since it challenges so many aspects of existing social reality'.

### **Access to financial capital**

The past 10 years has seen the listed property trust sector become an increasingly large component of the broader Australian Stock Exchange. It is only recently the sector has started to receive increased scrutiny of its sustainable behaviour. In the UK a sustainable property appraisal process is being developed to reflect the sustainability of a property in an appraisal of its worth (Sayce, Ellison & Smith 2004).

From both the institutional and community investors' perspective, the social and environmental aspects of property are key risks that need to be managed.

### **Community pressure**

The reputation and transparency of developments are facing increased scrutiny with developers' reputations examined in the approval processes.

### **Changing customer expectations**

In the office property investment area, public and private organisations are demanding commercial properties with lower energy and water usage, improved air flow and work productivity.

Organisations that are publicly reporting on their environmental performance require the lessor to provide improvement energy and water management systems for recording data.

Institutions are developing strategies to manage the property assets of the 'sustainable methodologies'. To date, these strategies have been applied to the office sector of the Fund and take into account the following considerations: energy and water usage, occupational health & safety, waste production, air quality, building accessibility, risk management and greenhouse gas emissions (The Mays Report 2003).

### **Increased regulatory risks**

With energy usage within buildings accounting for 27% and set to increase by 48%, (The Mays Report 2003) there is an increased likelihood that compulsory energy building rating will be included across Australia. The pressure to reduce green house gases will continue to have an impact of infrastructure developments. In 2003 the CSIRO reported that the Australian built environment fell 'well short of the environment objectives expressed by both government and international agreements' (Toyne 2003).

### **Climate change**

Relative to other industry sectors, listed property trusts have been identified as poorly prepared for the impacts of climate change (AMP Capital Investors 2004).

The 2003 Carbon Disclosure Project report (Innovest 2003) concluded that:

- the financial risks and consequences of climate change are almost certain to intensify
- managing the financial risks of climate change does not necessarily impose a net cost on companies

Pressure is mounting to decrease greenhouse emissions, presenting risks and opportunities to the property development sector.

### **Resources and Waste Management**

A sharp increase in the cost of scarce resources, 'coupled with a failure to adequately consider alternatives' (Toyne 2003, p10) may result in higher than anticipated operating costs.

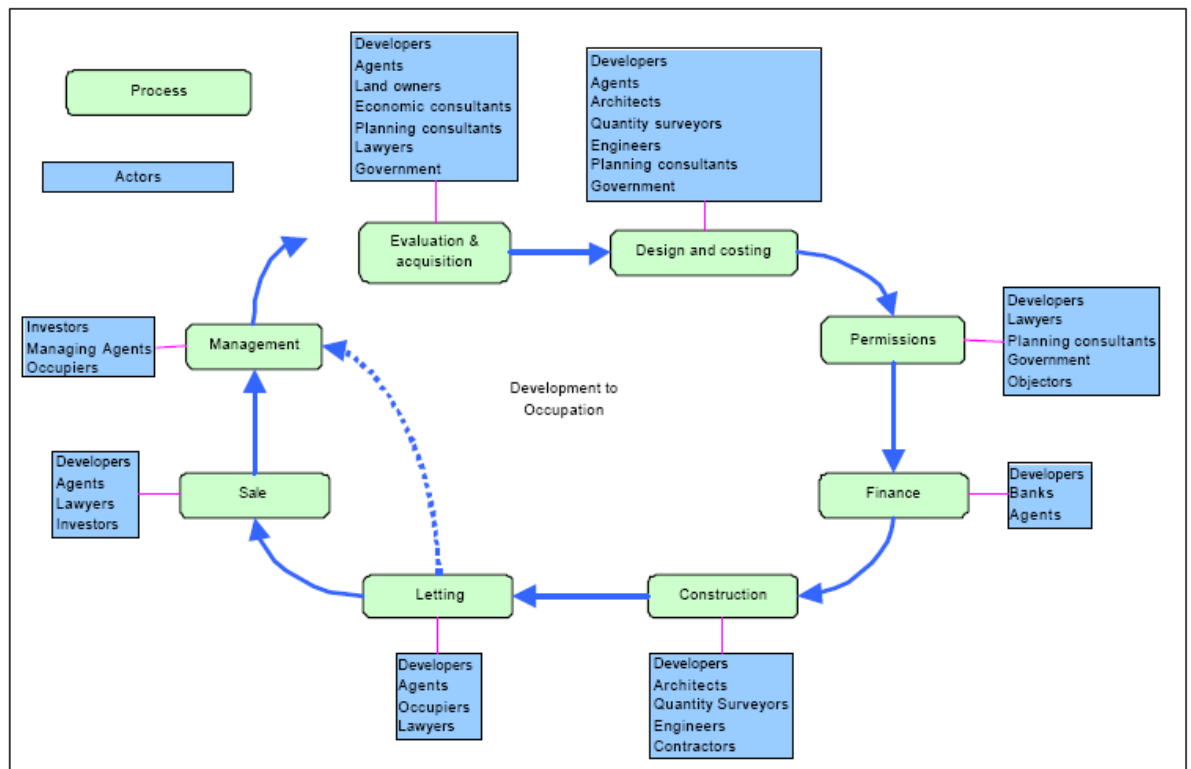
Pressure is also mounting for the sector to factor in life cycle analysis of building materials.

The risk that water and sewage costs will sharply increase has placed pressure on property managers and developers to incorporate water management systems including recycling.

### **Fragmentation and opportunity for collaboration**

The supply chain within the built environment is complex and fragmented. Figure 1 highlights the many players involved.

Figure 1 Actors in the Commercial Property Process



Source: RICS 2004, 'Sustainability and the built environment - an agenda for action', p. 5

According to the UK *Constructing the Future* report, a dynamic, profitable, innovative and competitive industry requires each of these personal to play an important role in bringing about change. Collaboration and co-operation are vital needs for a revitalised construction industry of the future (Foresight 2002).

The key to futures thinking lying in an integrated approach which 'implies significant change at every level of the industry and not merely for larger companies and enlightened thinkers' (Foresight 2002, p. 2).

### An era of change

The above issues identified provide a brief overview of the some of issues facing the built environment. According to some reports the sector is 'facing an era of rapid and unprecedented change in the next 20 years' (Foresight 2002, p. 2).

### Strategic Foresight

Foresight is a human capacity to look forward –'the vision of the mind' (Slaughter 1999).

Through careful futures scanning and the clarification of emerging situations' foresight pushes the boundaries of perception forward in at least four major ways.

- 1 By assessing the implication of present action, decision, etc
- 2 By detecting and avoiding problems before they occur
- 3 By considering the present implications of possible future events
- 4 By envisioning aspects of desired futures (Slaughter 1999, pp. 151-152).

Strategic foresight represents a mixture of foresight methods and strategic planning (Slaughter 1999).

To innovate and adapt organisations will need to be more future orientated, creative and deeper thinkers. They will also need to effectively manage change (Hines 2002).

Foresight has the potential to raise issues that may be overlooked in the conventional decision making process. By scanning the horizon and seeking opportunities and potential barriers can help formulate current strategy. It is 'necessary to pay attention to weak signals in the contextual environment which needs to be perceived and interpreted continuously for their positive or negative growth potential.' (Slaughter 1999, p.2). Organisations equipped with an 'effective foresight capability will be able to understand, and respond to, these signals' (AFI 2004). The following list details the different approaches to Strategic Foresight.

### **Futures Methodologies for Strategic Foresight**

#### **Input methods**

- Constructing near future context
- Delphi
- Environmental scanning

#### **Analytic methods**

- Cross-impact
- Forecasting and trend analysis
- Backcasting

#### **Paradigmatic Methods**

- Layered causal analysis
- Critical futures studies
- Systems thinking

#### **Iterative and Exploratory Methods**

- Scenarios
- Visioning
- Futrescan

**Source: adapted from Slaughter 1999**

### **Foresight in the built environment**

John Radcliffe, (2003) Dean of the Built Environment Facility in Dublin, suggests:

A more informed, structured and imaginative approach towards the Study of the Future is demanded of those professions concerned with the stewardship of the Built Environment and the promotion of sustainable urban development. This can most effectively be achieved by the incorporation of Futures Studies.

The Foresight Construction Associate programme report recommends that the industry anticipate and plan for change. 'Better long-term strategic thinking, future forecasting and co-ordinated planning will enable the industry to better meet future customer needs and remain competitive (Foresight 2002, p 4).

Highlighted in The Australian Council of Building Design Professionals BDP policy is the importance of foresight in the built environment. 'A well-designed built environment benefits people. If we as a nation succeed in building imaginatively not only to give shelter but to lift our spirits, then we will have fashioned an enduring future, and enhanced the present' (Blyth 2004, p. 32).

### **Examples of foresight being used in the built environment sector**

A number of industries have been applying foresight in their strategic planning process for the past 30 years (Ratcliffe 2000), yet until 1999 little work has been undertaken in the built environment (Ratcliffe 2001). 'Virtually no serious use has been made of the method in the world of property. (Perhaps even more surprising is that so few applications have been developed in the field of town planning' (Ratcliffe 2000, p. 127).

There is an emerging need to address the issues which impact upon the built environment sector and the way it contributes to society and the economy. The industry is now being asked to respond to the changes it faces. 'If the construction industry is to master [the] future, action needs to be taken now, for in construction planning terms twenty years is almost upon us' (Foresight 2002, p. 2).

Ratcliffe (2003) suggests that strategic foresight provides a useful approach in the built environment for:

- architects in the design process
- environmental and spatial planning
- innovation in construction and building materials
- risk management in property investment and property development

The futures studies and processes that have been undertaken in the built environment include:

- Environmental Scanning
- Future proofing
- Scenario building
- Visioning

### **Environmental Scanning**

The Construction Industry Research and Information Association (CIRIA), as part of a broader study into foresight and the built environment, developed an extensive 'think piece' *UK Construction 2010 Future Trends and Issues* (CIRIA 99). The paper, which identifies trends shaping the long-term future of UK construction, includes social, technical, economic, environmental and political trends; the impact of changing customer demands and; the material and resources needed to satisfy changing demands.

### **Future proofing**

As investment in the workplace is relatively long term with office fits outs lasting around 5-10 years. 'future trends must be anticipated within the limits of current knowledge' (Marmot, 2002).

With external pressures from changing demographics, legislative changes and increased regulation, Alexi Marmot from the UK, has identified the need for futures research to 'ensure new workplaces do not undergo premature obsolescence' (Marmot 2002, p.1).

Her environment scanning has identified a number of trends and opportunities for futures research. These include:

### *Demographic trends*

With an increasing percentage of the workforce growing older, it is becoming necessary to look at safety and comfort in the design of workplaces for 'Third Agers'. It is suggested that futures research in this area would link with the arts, medical sciences and construction sectors.

### *Environmental sustainability of new workplaces*

Currently, when organisations measure their CO2 emissions, only the traditional office workplace is reviewed, without taking into account the journey to and from work. Extending a research enquiry to encompass the whole 'ecological footprint' of different types of work styles (eg. working from home), could help guide organisations to select strategies to meet their future emission reduction goals.

### *Healthy workplaces.*

Commercial tenants are now placing new demands on the work environment where offices not only 'avoid sicknesses but deliver positive physical and mental outcomes. Research needs have been identified to explore the relationship between health and design (Marmot 2002).

## **Scenario Building**

Scenario building plays an important role in the built environment industry 'as they offer a methodology for understanding the whole range of possibilities that present themselves in the fields of property investment, development, management and marketing' (Radcliffe 2000, p. 2)

Scenarios can 'improve the quality of the strategic conversation in the company' (Burt & van der Heijden 2003, p. 1011). Scenario building can assist participant to 'think consistently and coherently about the future, and an improved understanding of cause-effect linkages in their areas of interest' (CIRIA 1999 CP/65 p 24).

'Good scenarios are plausible and surprising. They have the power to break old stereotypes. And, by rehearsing tomorrows future, they produce better decisions today' (Radcliffe 2001, p. 6).

*The Professionals' Choice* 2003 futures study is a series of scenarios around the possible outlook for professionals working in the built environment. It was anticipated that by developing future scenarios the study would 'stimulate debate about the way ahead and help... charter a path forward by grasping the opportunities and bypassing the pitfalls' (Foxell 2003, p.13).

Rather than provide a definitive answer the study 'posits alternative possible futures and uses them to examine the demands that society may place on the built environment professionals' (Foxell 2003, p.13). Scenarios presented in the report outlined the language of values, gaps for the profession, skills required and the scope for practitioners.

Other research conducted in the UK was a series of linked scenario exercises 'examining the future of working, shopping, leisure, transport, the home and the countryside' (Ratcliffe 2000, p.127 ). This study was commissioned by The Royal Institution of Chartered Surveyors.

## **Visioning**

The Oxford dictionary defines Vision as 'imaginative insight' (cited in Slaughter 1999, p. 334).

Visioning, a strategic foresight methodology, explores future states, options or strategies. Establishing a desirable future, visions identify resource requirements and action to achieve them, providing a useful technique of moving beyond present constraints (Slaughter 1999).

Professor Ian Lowe, previous caretaker director of Australia's Commission for the Future, summarises his vision of what the characteristics of a sustainable city would look like. 'The HEALTHIER future is one that is **H**umane, has an **E**cocentric **A**pproach and a **L**ong **T**ime **H**orizon, is **I**nformed, **E**fficient and **R**esourced' (Lowe 2002).

### *Limitations of Visioning*

The limitations of visioning is there is often a lack of 'remarkable people to stimulate lateral thinking' (Radcliffe 2001) with insufficient diversity among participants.) Radcliffe (2001) and Slaughter (1999) suggest that the role of the facilitator is crucial in developing visioning and scenario processes. 'Inexperienced people in these roles can seriously prejudice the process and the outcomes' (Radcliffe 2001, p.13).

A number of visioning activities have been undertaken in the construction arena. The main aim of all these projects was to identify research investment and activity.

### *UK Foresight*

The UK government has identified the need for a Foresight Programme. One of the aims of programme is to establish 'visions of the future and identify action properties to help the UK meet future needs' (CIRIA 1999, CP/64, p.5).

### *New Zealand Vision*

In New Zealand Strategic Portfolio Outlines (SPO's) have been developed to research investment in science and technology. A Built Environments and Construction SPO has been developed. Targeted outcomes include 'understanding the use of the built environment in order to better predict society's future home workplace and infrastructure-related needs. (Foundation for Research, Science & Technology, 1999) A 2020 Vision has been developed for the sector. The following are key components of their extensive vision:

By the year 2020 New Zealand's construction-related sector has emerged as an international leader in innovation. Key to this success has been the sector's focus on monitoring and responding to global trends and emerging influences that are shaping future demands and on understanding the changing patterns of the built environment by stakeholders...A greater degree of collaboration among designers, engineers and builders has resulted in further cost savings ...The increased interaction between all stakeholder has also improved the level of "future-proofing" of the built environment (Foundation for Research, Science & Technology, 1999, p.1).

### *Australia - Construction 2020*

The Australian Cooperative Research Centre (CRC) for Construction Innovation is a national research, development and implementation centre. The CRC has partnered with industry, government and university to focus on the needs of the property, design, construction and facility management sector (Hampson & Brandon 2004).

Throughout 2003-04 the CRC conducted, a series of workshops and questionnaires were undertaken to seek the views of industry leaders of the issues facing the Australian property development and construction industry both today, and in the future.

The Construction 2020 Vision report is said to have captured 'what the Australian industry believes are its future directions, to explore barriers to achieving this future and to identify the research required to realise the future of this industry'(Hampson & Brandon 2004, p. iii).

Those involved in completing questionnaires or participating in workshops were asked to extend their time frame to 2020. It is unclear from the report findings if this activity was undertaken in a structured, facilitated manner which could have assisted participants to question their basic assumptions and review alternative images.

From the questionnaires and workshops nine key themes were developed which were then made into nine visions. They are:

1. Environmentally sustainable construction
2. Meeting client needs
3. Improved business environment
4. Welfare and improvement of the labour force
5. Information and communication technologies for construction
6. Virtual prototyping for design, manufacture and operation off-site manufacture
7. Off-site manufacture
8. Improved process of manufacture of constructed products
9. Australian leadership in research and innovation

One of the participants at the Construction 2020 workshops critiquing the Environmentally Sustainable Construction vision, suggested the vision should offer a picture of the preferable future rather than one operating in the 'current paradigm of reduce, reuse, recycle' (Cameron 2004, p.1).

The Vision for Environmentally Sustainable Construction is:

...for industry to design, construct and maintain its buildings and infrastructure to minimise negative impacts on the natural environment - minimise waste, maximise recycling and re-use, reduce need for non-renewable resources (especially fossil fuels) and avoid pollution of land water and air – preserving environmental choices for future generations (Hampson and Brandon 2004, p.12).

Cameron's (2004, p.2) alternative vision for the future, challenges one to think deeper and explore alternatives and opportunities:

Environmentally Sustainable Construction which will eliminate the concept of waste, be built using components cycling in a closed loop of material flows, powered by renewable resources (including energy fuels) and improves the quality of land water and air – preserving environmental choices and increasing the natural capital available for future generations.

Not surprisingly the industry has focused on environmental sustainable construction. This thinking reflects what was identified in the interviews i.e. the sectors' view of sustainability currently does not represent an integrated view of sustainability. This limited view appears to be changing in Europe (RICS 2004).

The extensive process undertaken by the Construction Innovation CRC is a positive step toward developing a more forward view into Australian built environment. The workshops in themselves played an important role in brining a fragmented industry sector together.

It is hoped that the Construction Innovation CRC will extend its research framework to look at society, culture, heritage and encompass strategic foresight and critical futures studies which may help 'glimpse "beneath the surface" of social reality in order to realise the full potential of futures work' (Slaughter 1999, p.134).

## **The Potential of Foresight**

The built environment has a huge impact on the economic, environmental and social landscape.

While the current visions being presented by those participating in the built environment may lack strategic foresight they do encourage debate and robust conversations about the decisions, policies, research and actions that need to be undertaken in the present.

Organisations within the built environment who have been involved in foresight studies have found the process rewarding in terms of encouraging them to look at broader issues, identifying business opportunities and their enhancing a forward-thinking approach.

Foresight helps people to become empowered to participate in creating their future.

*"With our knowledge and a sense of responsibility for the welfare of humankind and the earth, we can create new environments that are ecological sound, aesthetically satisfying, economically rewarding, and favorable to the continued growth of civilization." —René Dubos, legendary biologist*

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