Issue 144, July 9 , 2004

How Long Is the "Long Term"?

Long term mathematical simulation of water erosion around bridge structures

Q: What do Asset Management decisions have in common with the protection of critical infrastructure and sustainable development?

A: They are all concerned with the 'Long Term' – but what do we mean by this and just how long is the long term?

In this issue we explore the notion of time in economic sustainability and its relevance to asset management decisions (and to the growing interest in public participation in AM decisions)

And we also look at the current interest in "Critical Infrastructure' and what might be the AM reaction.

Contents

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Strategic Asset Management

"At the heart of sustainable development are some assumptions about how long a development is expected to be sustainable. Over what period are we considering the issue?"

Time in the context of TBL/QBL

Professor Peter Brandon, heads the Research Institute of the Built and Human Environment, University of Salford, UK. These excerpts are taken from two addresses that he has given recently: a CRC Construction Innovation workshop in Adelaide June 2004 and a Nov 2003 CIB Conference on Smart and Sustainable Cities in Brisbane. He is the co-author of "Evaluating Sustainable Development in the Built Environment", Blackwells, London, due out early 2005.

2004 is the "Year of the Built Environment"

As Asset Management is all about the choice, use and long term sustainment of this built environment, it is appropriate that we celebrate our role in this year with these extracts from the work of Peter Brandon on some of the issues of the interface between the built environment , the natural environment, society and culture—in other words the TBL/QBL.

How Long is the Long Term?

"One answer might be 'for ever', another might be 'over a human lifetime' and another might be 'until something comes along which is better or changes the reason for trying to sustain the development."

Irrelevant because Sustainable Development is a "Process, a Way ot Thinking"?

"Underlying all the assessments and evaluations of sustainable development must be some consideration of the time period over which we are making the assessment. Some might argue that as sustainable development is thought to be a process then it is not necessary to pay too much attention to this matter. It is part of getting all the stakeholders to think in a certain way about the future to avoid leaving future generations in a worse position than we have today. It is therefore as much about culture and the creation of a learning environment as it is about calculation and prediction."

Regardless, in the end a decision has to be made on the time period—all other decisions depend on it

"However true this might be, at some stage, decisions have to made about what to build, how to build and how to use the built environment. Finance houses, clients, local authorities and all the other participants in the process who have some power, or require accountability in the process, will want to know over what time period these assessments have been made. Every decision is made within the context of an assumed time period. It influences the choice of material, the speed at which development occurs, the response to market forces, the design and layout and a whole host of other factors which make up the complexity of the built environment. Whilst our horizons might be the long-term future we have to make decisions in the here and now"

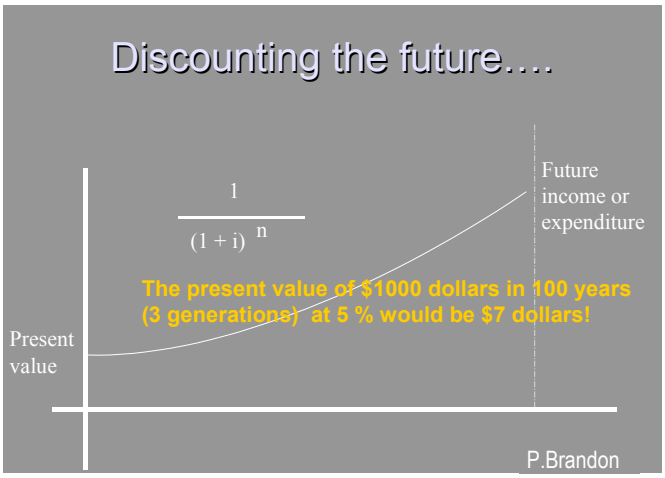
Discounting the Future

"What is our idea of cleverness?" asks Brandon. " In economics, the two main methods of assessment are the payback period—the quicker you get your money back the better—and discounted cash flow - future costs and benefits can be discounted back to today, we can discount the future"

I would add that, so well is this idea now accepted, that it seems sheer madness to think to do anything else. Yet how can we say that we are giving equal weight to future sustainability and present desires whilst we clearly discount the future?

Once we step outside the economic paradigm and look at sustainability, society and culture, it really makes very little sense to say that the importance to us of future Sustainability and future societies is a function of today's interest rates.

Why should the future , in general, mean more to us when today's market rates are low, and less when they are high? Surely the accident of today's market rates are irrelevant to these non-economic decisions? And yet that is what we do—by default—if we fail to find a better way to measure the value of the future.



Present value: Generation table

Years	2%	5%	10%
25	.609	.295	.092
50	.571	.087	.009
75	.226	.025	.001

< 10%

P.Brandon

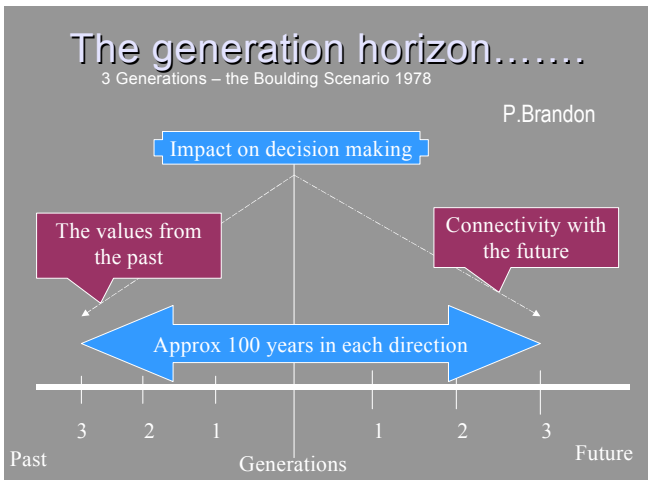
Discounting Society

Extending Brandon's arguments, even within the economic dimension, there is today an almost general use of the capital assets model for determining the discount rate that sets discount rates high according to perceived risks to a business.

25 years ago, public sector economists carefully considered the discount rate appropriate to Society. It was called the "social time discount rate'. It recognised that businesses, whose aim is to make a profit, will have a shorter time horizon than society in general, who are looking to the future of their children and grandchildren.

Discounting the Past

Triple bottom line (TBL) looks to economics, society, and the environment. By contrast, the NZ approach to explicit Quadruple Bottom Line (QBL) acknowledges that the past (our history and our culture) has an important part to play in today's decision -making. In conversation with Peter Brandon at the CRC Construction Innovation Meeting in Adelaide, he told me that Boulding's 3 generation approach oppposite was what most attracted him as the way forward.



How Long is the 'Long Term' – And who decides?

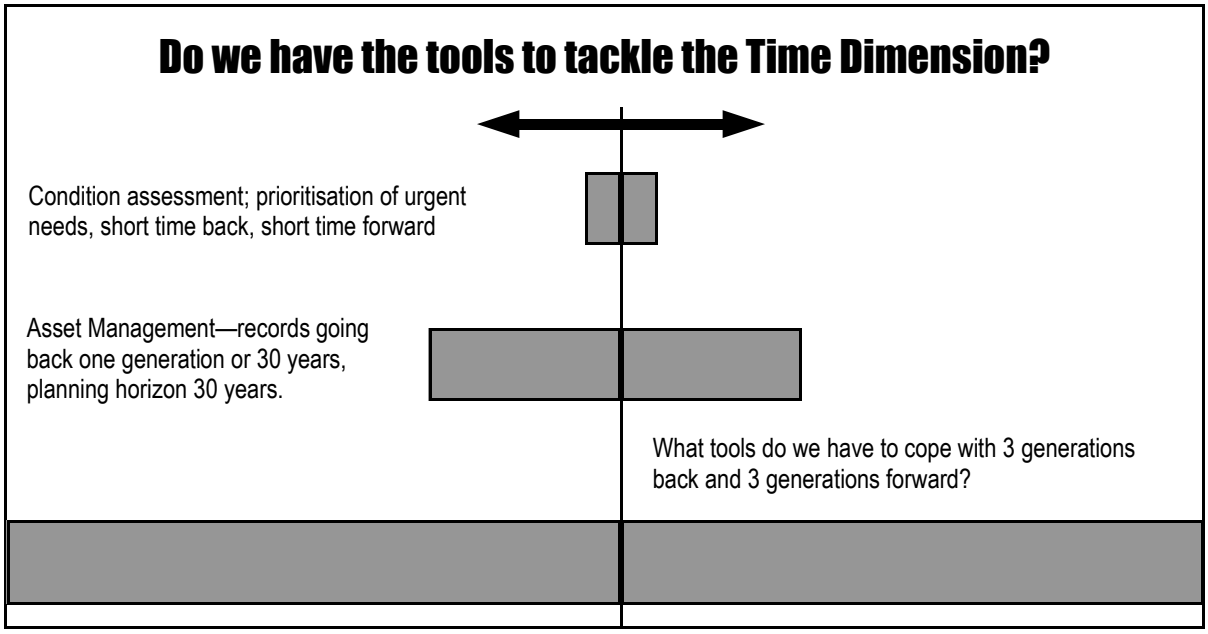
- **Political** support for a development in an area might be limited to the time of a term of office of an elected politician or a party
- **Finance** houses may view the development over the time required to get a pay back on their investment
- **Retail** clients may view the development over the number of y ears they believe they have left before the market moves on elsewhere or the market has grown to the point where they need a new store or a major extension.
- A group of **citizens** may be interested in the development over their lifetime or the lifetime of their children.
- **Planners** may see the development within the lifetime of their 'master plan' or other such strategic document.
- **Developers** may view the development from the financial point of view but also what is happening in adjacent sites, regions, and even other countries and therefore a response to market conditions (in the markets in which work) over the time it takes to create the development.
- **Experts** in demography will be interested in the changing age patterns around the development over a specified period related to, perhaps, government horizons.
- **Lawyers** might at one level be interested in the development for the time it takes to sign off a contract, and/or at another level the length of time new legal business will exist and at another level the implications of changes in the law over a much longer time period.
- **Valuation surveyors** may be interested in the time taken to create an increase in property and land values.

P.Brandon, CIB Conference on Smart and Sustainable Cities, Brisbane, Nov 2003

There are many views, if the aim is to create harmony of view, how do we do it?

- **Whose view should take priority** in the case of a dispute?
- **Is it the person on the organization** who has the longest time interest in the development?
- **Should it be the financiers**, who take the major financial risk, which are considered to be pre-eminent in the decision-making process? If they are not then will the finance become available to undertake any development?
- **Should market forces be challenged** as, in time, the markets will adjust to the new situation that faces them. However the time-lag may be too great to avoid irreparable destruction to the environment and is this acceptable?
- **Is the aim** of sustainable development to avoid negative influences on what is believed to be a better way of living?
- **Are our techniques for evaluation sufficiently sensitive** to the way society views sustainable development?
- **Is it easier to identify potential critical failure points** in the quest for sustainable development rather than, or as well as, critical success factors?

P.Brandon, CIB Conference on Smart and Sustainable Cities, Brisbane, Nov 2003



The Problems … as Peter Brandon sees them

<u>To start off with</u>…

- **There is no common structure language or vocabulary that allows the multitude of players to unite together**
- **There is no common set of values upon which the basis of sustainable communities can be built**

And what is more, there is little current debate about this.

<u>What is needed now is</u> ….

- **A Philosophy** - sharing a set of values Consumer or conservation society?
- **A common structure and classification system**
- **Assessment and measurement tools** Over what time period do we measure the impact of our decisions?
- **Management framework for intervention** Who manages and over what timescales?
- **Protocols for decision making** How does the decision making process consider the future?

<u>And the messages for Asset Managers?</u> Practitioners: Be aware of different time dimensions when consulting the community; do a sensitivity analysis on the outcomes if you don't discount the future with respect, at least, to society and environmental benefits. **Policy Analysts:** Reconsider the appropriateness of the capital assets model for determining discount rates for economic aspects of community benefits. Ask yourselves whether we should not *apply a premium* to the future.

What is Critical Infrastructure?

"Critical infrastructure is defined as those physical facilities and those information technologies and communication networks which would, if destroyed, degraded or rendered unavailable for an extended period, impact on the social or economic well-being of the nation or affect Australia's ability to conduct national defence and ensure national security.

Critical infrastructure extends across many sectors of the economy, including banking and finance, transport and distribution, energy, utilities, health, food supply, manufacturing and communications, as well as key government services and national icons."

From the Government information website: http://www.cript.gov.au/

This raises an important question:

What Infrastructure isn't Critical?

And to whom?

What is the role of the Government?

Despite claims that it is interested in more than simply criminal activity (a.ka. terrorism) the content of the website, the tasks undertaken and the role for owners and operators (below) suggest otherwise.

> "Critical infrastructure can be damaged or destroyed by computer hackers, criminal activity, malicious damage, accidents and natural disasters. Our critical infrastructure has to be protected against all of these threats."
>
> From the Government information website: http://www.cript.gov.au/

The government's role (as indicated in the background papers on the above site) is seen as a facilitating, liasing, coordinating, leadership role in the medium to long term. (Immediate disaster management is already provided for.) The one thing that it does undertake to do is to establish a national database of critical infrastructure (but see story on the back page)

Role of Owners and Operators of Critical Infrastructure

Owners and operators of critical infrastructure have responsibility to:

- provide adequate security of their assets,
- actively undertake the planning process in accordance with Risk Management Standard, AS/NZS 4360:1999,
- conduct a review of the risk management plan on an annual basis,
- participate in any exercises to test plans conducted by government authorities, and
- report any incidents or suspicious activity to State or Territory police.

What's Missing?

If we are really serious about protecting critical infrastructure
What about the damage that occurs not through act of terrorism but through

- Neglect,
- Insufficient funding,
- Natural ageing not attended to,
- Functional change not anticipated and prepared for,
- Poor training and servicing,
- Lack of skilled and experienced resources
- Poor maintenance practices
- Inappropriate asset choice
- Lack of good information

The Auckland CBD blackout, the Sydney Water Scare, the Longford Gas Explosion, an increasing run of electricity shortages and rail disasters: these were not the result of criminal or malicious damage, nor were they accidents that could not have been prevented and they weren't natural disasters
- they were the results of poor management and under funding of maintenance

And the messages for Asset Managers?

Ask yourselves: What has the highest probability for you? Failure through neglect and insufficient funding, etc., or being the target of a terrorist attack?

When you notice groups that are eagerly promoting the spending of large sums on 'preventative measures', ask yourselves 'What's in it for them?" Is this really where you want your meagre resources allocated?

If not, then there are a couple of things that you can do, even though you are not in the political decision making chair.

(1) **Capitalise on the heightened awareness** of the importance of infrastructure by using this opportunity to bring to notice the *important* deficiencies in maintenance/renewal etc that may impact on service delivery—however, overplaying your hand at this stage can backfire, so choose the deficiencies that you can well document and explain in layman's language.
(2) Make sure that you know your infrastructure really well so that when suggestions are made for spending money on knee-jerk reactions, you are ready with reasoned arguments for better resource allocation.

How safe is your database?
A story

Earlier this year (Feb 14, The Buzz) ABC's Radio National broadcast an interesting interview with an American post graduate student whose research work caused major security concerns, so much so that Richard Clarke, former White House cyberterrorism chief, declared that it should be burnt!

What did the student do to create such antagonism at security levels?

Critical Infrastructure Database

His thesis was on critical infrastructure in the United States, with a focus on information infrastructure. As part of his work in analysing the infrastructure and its vulnerabilities as preparation for determining a set of tools to deal with the vulnerabilities, the student put together an integrated database. The dataset consisted of a large collection of geo-spatial data on where the fibre optic lines were in the country, both long-haul lines that connect cities up, the metropolitan area networks within cities, switching centres and data warehouses that house and direct traffic on the network. The data carried on theses lines included a wide variety of critical sectors in the US economy and global economy including financial transactions, military command and control, emergency response, telephone calls, government communications. "Pretty much everything runs over fibre except for satellite transmissions" he said.

He worked quietly away at his research for a number of years – and by the way all of the data in his database was gathered from the public domain! – until the Washington Post wrote an article about his work, and then things started to get a little heated. Top security people then spoke with his university and wanted to know what security precautions were being taken with the database. The University asked government agencies what security precautions would be taken within their domain and then tried to replicate as best as they could within the university.

Safeguarding the Database.

This is what they did: The graduate explained "The computers that the data is housed on are not connected to any network and are in a secure room behind cipher locks. We have a vault that we take the removeable hard drives to and put them in there for storage.. and things along those lines."

Integration

What I found interesting about this story is that as long as the data was available in a distributed form, on individual websites all over the country, there was no great hue and cry. Admittedly the student started his research in 1996, which pre-dated Sep 11.

However, the general lesson remains – integrated databases are more valuable because they allow us to do things that distributed databases don't. In the student's case it made it possible to analyse national vulnerabilities. But the very act of integration introduces the biggest vulnerability of all!