

# **Innovation in Land Management, What Makes It Happen?**

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**Key words:** innovation, practitioners, change, land information, land management.

## **SUMMARY**

Land management and innovation, somehow this seems a contradiction in terms. However within this work field increasingly there are examples of how innovations are not only changing the face of this industry but initiating change in other industries. What is it about land management practitioners and their business that drives these changes?

This paper will review the changes in such areas as land information, the delivery of land management services through government, geospatial services and new uses of measurement technologies such as GPS and explore the relationships between innovation and the land management industry. It will identify some of the drivers for change and suggest how this has worked in creating innovation. Characteristics of successful innovation will be explored especially where this has happened in older lifestyle organisations. There is great benefit in the changes happening in the industry and there is the potential for others to learn about these innovations and apply variations of these in their own organisations.

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**(Disclaimer:** The views in this article are my own and are presented for the purpose of academic and professional Research and do not necessarily reflect the policy or views of the Department of Sustainability and Environment in this area.)

## **1. INTRODUCTION**

Land management in one form or other has been an activity undertaken by humankind over most of its history. In some ways it has evolved greatly and has always been subject to change as humankind evolved and changed. However for hundreds of years it has stabilised into forms that in many developed countries have stood the test of time. In these countries they are seen as one area that can be relied on as being a constant underlying building block of the local economy. This can often lead to resistance to change and yet there are many drivers pushing for innovation.

This paper reviews the changes in such areas as land information, the delivery of land management services through government, geospatial services and new uses of measurement technologies such as GPS and explores the relationships between innovation and the land management industry. It identifies some of the drivers for change and suggests how these have worked in creating innovation. Characteristics of successful innovation will be explored across a range of organisations that together are components of the larger land management system. The benefits of innovation for land management and associated professionals are explored and suggestions made on how to encourage further developments.

### **1.1 What is driving the demand for continued change and innovation?**

Increasingly events around us remind us that we are living in a global village where the actions of our neighbours have an impact on our home patch. Actions undertaken in the economic and natural environments by countries can often have long lasting impacts on many other countries across the world. For example the clearing of large tracts of forest may ultimately change climates half a world away. These common issues or potential problems have led to the development of agreements between countries to tackle cross boundary issues such as the Kyoto Protocol in the environmental arena that aims to reduce greenhouse gas emissions. The International Federation of Surveyors (FIG) has participated in a number of initiatives in cooperation with international bodies such as the United Nations (UN) and various countries to review and discuss issues of challenge for the future and propose common ways forward. These have included the Bogor Declaration from the United Nations Interregional Meeting of Experts on the Cadastre, 1996; the Bathurst Declaration on Land Administration for Sustainable Development, 1999; the Nairobi Statement on Spatial information for Sustainable Development, 2001; the Marrakech Statement on Urban-Rural Inter-relationship, 2003 and the Aguascalientes Statement on Development of Land Information Policies in the Americas held in 2004. All this adds to the impetus for change in land management.

There is a need to develop ideas together because the world around us is changing at an ever-increasing speed. 'A globalised economy is creating both more hazards and more opportunities for everyone, forcing firms (*and industries and professions*) to make dramatic improvements not only to compete and prosper but also to merely survive.'(Kotter, 1996). Kotter identified that globalisation is in itself driven by 'a broad and powerful set of forces' associated with technological change, international economic integration, maturing of domestic markets in more developed countries and also the fall of communist and socialist regimes that have increased the number of countries linked to the capitalist system. No industry or business can escape the influence of these forces. (Newnham, 2004)

An important element to consider when responding to the drivers for change and innovation, is the principle of sustainability and the responsibility of incorporating the needs of wider community. Land management professionals overviewing what is happening across their realm of operations will be witnessing the clashes occurring between approaching their work from a purely profit focus with the increasing pressures to share resources more equitably across society and consider the need to sustain resources for future generations. As the FIG President expressed in the opening speech for the 2004 FIG Working Week, 'the changed political, economic, demographic and technological conditions demand new approaches. They present new questions and new challenges, require new approaches, answers and solutions, in short: they demand innovation!'(Magel, 2004) Further to this is the increased speed of change and the need to respond now.

He further referred to the work of Roland Berger a global strategist who identified seven decisive factors for economic growth and the development of affluence. These being:

1. natural resources
2. human resources (human labour)
3. technical progress
4. capital
5. knowledge (including the marketing of this knowledge)
6. the political regulatory framework (eg. a social market economy as against a planned economy), and,
7. scale of values and performance paradigms.

The speed of structural change in State, society and economy was found to be decisive for growth, employment and affluence. Structural change was best stimulated by innovation. Berger's view was that three factors: technical progress, capital and knowledge determined the future for national development and would determine the division of the world in the industrial/knowledge era into poor and rich. (Berger, 2004). FIG members with interests in furthering technical and scientific innovations within the wider land management profession and across member countries were identified as potential agents of innovation and change. (Magel, 2004)

Boundaries between countries, states within countries, between industries and professions are fading in the sense that so many activities cross over. Global Navigation Satellite Systems

(GNSS) such as Global Positioning System (GPS) adoption is an apt example of how technology can be used regardless of boundary or continent. At the outset, this type of technical innovation was viewed by some land practitioners as a threat to their livelihood and professional standing. The reason for this perceived threat? Complexities relating to the economic impact of purchasing new equipment, initiating new methodologies, standards, training staff and the client's expectations.

However as the system has matured and the economic benefits are readily understood, surveyors have embraced the use of GPS related technologies. Productivity for data collection has increased with appropriate emphasis on data quality and improved analysis. Many early adopters in this area have created a more diverse client base and transitioned into providing additional specialist services.

Improvements in data collection equipment have enabled surveyors to supervise field personnel with little experience, allowing resources to be allocated to higher yield activities such as data interpretation, analysis and presentation. This places the surveyor in a more comfortable and traditional role of efficient project management.

Poorer and less developed countries have also benefited from using GPS. Locals with minimal training use relatively inexpensive GPS technology for various tasks such as disaster or environmental mapping. Community decisions are made with suitable information with more regard to appropriate land use management and a sense of local ownership. Not surprisingly, these types of users have a different view of change management as the whole process is new and exciting without the legacies of entrenched ways of operating that can be both a positive and negative for more developed countries.

Innovation as outlined above can be present in many different forms and varies according to the context in which it is applied. It is not necessarily related to technology implementations however that is one dimension that has had significant impact in the land management area over the last decades. It can include many other changes such as variations to legislation, organisational arrangement, policy directions and quality requirements. This leads to a key question - what is meant by innovation?

## **1.2 What is Innovation?**

Innovation as a word has different meanings to different people, the Concise Oxford Dictionary's definition for innovate is to bring in novelties and make changes. The Victorian Government Innovation Statement issued in 2002 defines it as follows; 'at its broadest, innovation means finding new or better ways to do things, creating new products or services, applying new technologies to solve existing problems, or using existing products and technologies to meet new needs.' (Victorian Government, 2002, p8). Innovation in response to a changing world has taken on a great significance in modern societies. The Statement identifies that 'worldwide, innovation is recognised as the single most important ingredient in a successful modern economy, delivering high rates of return on investment and driving economic growth, high quality jobs and high standards of living.'

### **1.3 Why is innovation in land management important?**

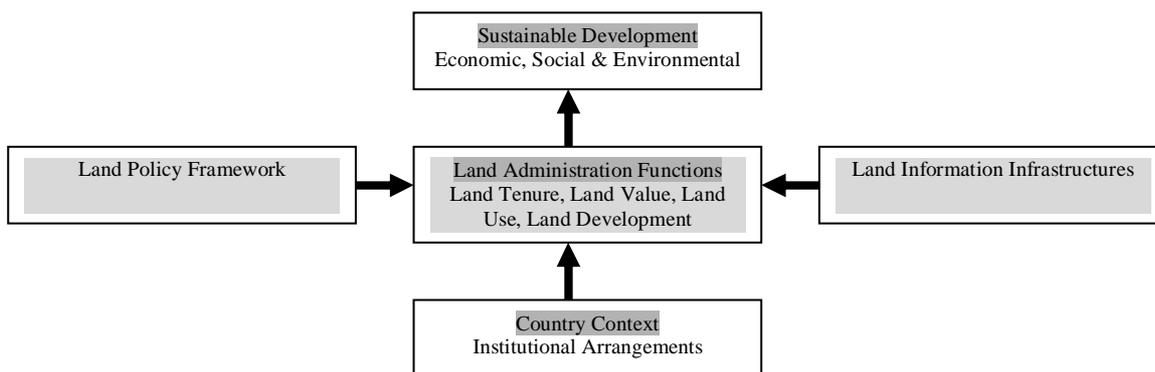
One of the basic underlying needs for societies in both the developed and developing countries is land information and organisation of land – this is a building block for larger economic development. Reforms in these areas provide larger flow on effects in economies. Land management provides access to basic building blocks for a society. De Soto has raised the awareness throughout the World of the role of widespread, secured and tradable property rights in combating poverty. (De Soto, 2000). He identified that registered property is the fundamental resource for capital formation, not only as collateral for mortgages. It has far wider impacts, such as providing people with recognised addresses for suppliers of public services to arrange billing and so facilitating investments in water supply and other basic services. In addition people and businesses must be enabled to act in the property market. Innovation and or change in this area has the potential for a significant impact on stimulating economic growth.

The value of innovation in these areas could be significant for example in Victoria the property market in Victoria in 2004 was estimated to be worth around \$770 billion (Aust) (Tulloch, 2005). This is about 2.5 times Victoria's Gross State Product. Even a small improvement might release millions of dollars of additional value for the state.

### **1.4 The Land Management Paradigm framework as a model for reviewing innovation**

Understanding the varying influences on Land Management and how the integration of these leads to what is observed at the local level, helps describe the impact of innovation. These influences have been described at the highest generic level by Stig Enemark (2004) as the Land Management Paradigm, as illustrated below in Figure 1. This has been developed so that it can apply across countries and regions throughout the world and the factors allow consideration of all the applicable influences on Land Management. The three components; Land Policies, Land Information Infrastructures, and Land Administration Functions, in support of Sustainable Development have as an additional input the country context.

The mix of these factors create great variability in the on the ground conditions in any country. Given this innovations undertaken in any country will vary depending on the local conditions. This provides great opportunity for the sharing of information between countries so allowing the adoption of useful practices that might in the context of the adopting country spark innovation. I have used this as a framework for the case study analysis of innovation and change to show how the innovation fits into the larger land management system.



**Figure 1:** The Land Management Paradigm (Enemark, 2004)

### 1.5 Land Policy Framework

Using the Land Management Paradigm to classify the case studies, innovation applying to Land Policy is illustrated by policy directions set by the Victorian Government. It has set overall policy to build innovation into its operations, including its role in the development of Land Policy Frameworks. At another level of government, the Department that largely administers and develops Land Policy for Victoria also has an identified organisational policy to foster and develop innovation and change.

Earlier in this paper the Victorian Government Innovation Statement (2002) is illustrated. The Statement gives a policy direction for the whole state that ‘is about making sure we use ideas, technology and knowledge to give all Victorians a higher standard of living, more satisfying and rewarding jobs and a better environment in which to live, work and raise their families.’ The text in the box below outlines the intention to cover innovation across all aspects of Victorian’s lives, the economy, the community and the environment. To support this the Victorian Government has a long-term investment program in innovative projects and the development of an innovative and creative economy to assist Victoria successfully operating in a highly competitive and rapidly changing global marketplace..

#### HOW INNOVATION BENEFITS VICTORIA

Innovation benefits the **ECONOMY** by driving economic growth, attracting global investment and keeping and attracting skilled and talented people.

Innovation benefits the **COMMUNITY** by driving advances in medical treatment and health care and delivering better transport and communication.

Innovation benefits the **ENVIRONMENT** by creating new ways to conserve, manage, protect and efficiently use our natural resources.

(Source: Victorian Government, 2002).

It is explicitly stated that ‘an innovative state requires an innovative government.’ To this end Victoria has aimed to be a global leader in using new technologies and systems to deliver government services online. It has made many advances towards this goal. It is also working to an eGovernment Strategy, ‘Putting People at the Centre’, that will substantially improve support and services to citizens and look to innovation to find new opportunities for ongoing reform.

A strategy for changing behaviour towards innovation at the organisation level is demonstrated by the Department of Sustainability and Environment (DSE). This is the key agency for land management for Victoria with functions including land valuations, surveying, state planning frameworks, spatial data infrastructure, land registration and the management of the large percentage of land (approximately one third) that is kept for public purposes such as parks, water management and environment reserves. As an organisation it is part of the larger state government and delivers outputs in line with whole of government policies such as the Innovation Statement. It also has organisational values that guide staff in undertaking their work. These are commitment, collaboration, accountability, **innovation and flexibility**. (Source: [www.dse.vic.gov.au](http://www.dse.vic.gov.au))

Within these two highlighted values a description is given on how staff will behave when they use them:

- **Innovation** – we will influence and advance industry and the wider community by adopting innovative solutions and leading best practice in the sustainable use of Victoria's resources.
- **Flexibility** – we are responsive, adapting to change with ease.

DSE has a stated commitment to innovation and flexibility. As with any organisational directions the intent does not necessarily lead to the desired outcome, however setting the direction clearly encourages staff to adopt these behaviours in carrying out their work. Internal staff recognition programs that reward innovation as one of the categories of achievement reinforces these as values.

## 1.7 Land Administration Functions

Land Administration Functions in the Land Management Paradigm contain the functions of land tenure, land value, land use and land development. Innovation here is demonstrated in the following case study on the Land Exchange Project in Victoria, Australia.

### Cast Study - Innovative Government – The Land Titles Project and Land Exchange

The on-line delivery of Land Titles information in Victoria has required the mammoth task of converting 4 million paper titles to electronic format and the commissioning of a new electronic business operating system, the Victorian Online Titles System (VOTS).

It has resulted in immediate online access to all titles and allows for immediate ‘over the counter’ registration, which used to take up to 21 days.

By converting over 150 years of Victorian paper records to electronic format, on-line searching of land titles is now available from anywhere in the world.

The successful implementation of the Victorian Online Titles System has also provided the platform for the establishment of a Land Exchange.

The Land Exchange will be a first for Australia, providing business and the community with a single point of online access to integrated state and local government land information and transactions.

Designed to operate as a comprehensive online market place, where parties can exchange land-related information and perform transactions via the Internet in a safe and regulated environment, the Land Exchange will enable people to:

- Buy and sell land electronically;
- Lodge and register planning applications online; and
- Ascertain the status of Crown (*Government*) land.

(Source: Victorian Government, 2002, p.75).

Stakeholders in the project including the Property Council of Australia, the Real Estate Institute of Victoria and the Municipal Association of Victoria, identified that the Land Exchange would position Victoria's property industry ahead of any other state in Australia. Reducing the time taken for property transactions and so associated costs. It was considered it had the potential to give the Victorian economy a significant boost given that the property market has an estimated annual turnover of \$28 billion and is critical in creating wealth and helping Victoria grow.

The Land Exchange is an interesting example of what could be called a second generation innovation. The first step was the development of the Victorian Online Titles System that became fully operation in 2001. While this was largely a technological innovation there was significant administration changes associated with this that included bringing hundreds of people, and a whole associated land registration industry, from a paper based to a computer based working environment. The principles behind this change have been outlined in an earlier paper ‘Managing Change Successfully In Land Management Organisations’ (Newnham, 2004).

Once innovation occurs, it enlarges people’s minds to the possibilities of the new systems or approaches and this often sparks additional innovation building on the first. The benefits have been recognised with the Victorian Office of the Chief Information Officer selecting the Land Exchange as one of the projects to be used to build a case study portfolio, to demonstrate successful Information Communication Technology (ICT) implementations that have delivered significant benefits to the public and private sectors.

## 1.8 Land Information Infrastructures

Land Information Infrastructures are the areas most affected by continued development in information technologies. There is a continued development and interchange between this area and other technologies. This has led to the ability of integration across previously separate professional disciplines and scientific areas of research.

Spatial information development has been an area that promises much in terms of innovation for land management. There have been many notable developments already with such things as integration of mapping and real time tracking for emergency management; global positioning system (GPS) capability available through continually smaller units and eventually readily accessible through mobile telephones and precision agriculture using GPS combined with other technologies. Two case studies are used to illustrate innovation in this area, the Australian Government Positioning Strategy and one of the associated technological applications - precision agriculture, and the development of the Cooperative Research Centre for the Spatial Industry.

### Case Study - Australian Government Positioning Strategy

Satellite navigation and positioning provided by global navigation satellite systems (GNSS) is becoming integral to a wide range of sectors in the Australian economy, and is also becoming increasingly important for personal use. Examples of applications include maritime and aviation navigation, timing, commerce, agriculture, mining, water catchment and environmental management, tracking of trucks and freight consignments, in-car navigation systems and recreational uses such as fishing and bushwalking.

The Australian Government has identified a need for coordination of GNSS implementation in Australia to obtain the best and most efficient use from this technology. The Australian Global Navigation Satellite System Coordination Committee was established in May 2000 to consider and develop mechanisms to coordinate all land, sea and air aspects of GNSS; promote the safe and effective utilisation and development of GNSS in Australia; and coordinate national security issues, the application of augmentation systems, and the national use of GNSS in other relevant applications. It developed a national strategic policy on GNSS.

The policy, 'Positioning for the Future' has a vision of Australia as a world leader in the multimodal application of satellite navigation. It sets a framework to allow opportunities for the continued uptake of satellite navigation and positioning technology by Australian business and the broader community. The policy is built on eight strategic principles: national coverage; safety; efficiency; economic and social benefits; industry development; flexibility of policy and strategy; standards; environmental benefits, and; national security.

(Positioning For The Future, Australia's Satellite Navigation Strategic Policy, 2002, Dept of Transport and Regional Services)

Setting a national policy encourages innovation and the application of new technologies for purposes such as enhancing transport efficiency, improving national accessibility of services, industry development, public safety, and other economic, environmental and social outcomes. The explosion of innovation and new applications for this technology also has its challenges. There are not always regulated markets for delivery of services or adequate mechanisms to control use of new applications of technology so government has an important role in establishing the ground rules.

### **Example of Positioning Innovation in Operation - Precision agriculture**

Precision agriculture (PA) varies management operations to take account of the fine (sub-paddock) scale spatial and temporal variability in crop yields. Crop yields can vary greatly over short (metre) distances and between seasons due to reasons including soil characteristics; weeds, pests and diseases; variable application of production inputs such as fertiliser and land degradation such as water logging and salinity:

Farmers had long known that yields vary within paddocks, but only recently have had a way to measure variations and to develop treatments. It has been the introduction of global positioning system (GPS), geographic information system (GIS), variable (application) rate technology (VRT) and digital information technology into farm management that has made PA a practical reality.

This allows farmers to be precise in varying inputs of fertiliser, lime and pesticides, and varying sowing rates that can reduce costs, increase yields and product quality, improve management of the land and produce environmental benefits

(Source. [www.brs.gov.au](http://www.brs.gov.au))

The uptake of precision agriculture techniques has been assisted by the Bureau of Rural Sciences that monitors PA developments in Australia and overseas, and identifies and sets priorities for current and emerging issues for government policy consideration. Work included facilitating GIS experts and leading precision farming practitioners from government, industry and the farming community to share their experiences and identify ways in which information and GIS can be used to make Australian farming more sustainable. (East and Dempsey, 1998a). Investigation is ongoing into other ways for the use of this technology such as applying precision management principles to local, catchment and regional planning. ([www.brs.gov.au](http://www.brs.gov.au) and East and Dempsey 1998a)

### **Case Study - Cooperative Research Centre for the Spatial Industry**

The Cooperative Research Centre program initiative run by the Australian Commonwealth Government aims to 'change the research culture' of Australia. Government funds are matched by industry support in a collaborative program that strengthens links between industry, research organisations and educational institutions. The CRC for the Spatial Industry (SI) formed in July 2003 brings together \$78 million (Aust) in cash and in-kind from its partners to identify the question of our future spatial information needs— who needs SI, in what form,

and when—and to seek innovative solutions to meet these needs. The CRCSI will challenge the existing assumptions and practices of information management. It will use the collective wisdom of the broad base of participants to accelerate the growth of industry, generate intellectual property (IP), seek efficiency gains for government, and better position the research and education programs of universities and other institutions. The mission of the CRC-SI is to develop the concept of a *Virtual Australia*, uniting research and commercial innovation in spatial information.

The CRCSI will undertake research to include the innovative use and application of emerging technologies, as well as the development of new technologies. It will undertake world class research leading to new applications of spatial information and enabling technologies which will be used to generate new wealth for the partners of the CRCSI.

The program includes:

#### Integrated Positioning and Mapping Systems

Research undertaken to facilitate the development of a low-cost, real-time GPS-based positioning system capable of providing accurate location in any environment to support a range of surveying and mapping applications.

#### Metric Imagery as a Spatial Information Source

Research and develop automated processes for feature recognition, extraction, 3D reconstruction, modelling and mapping from space-borne, airborne and terrestrial imaging sensors and laser scanning systems. To develop, through collaborative research with industry, new technologies, methodologies and systems to provide leading edge spatial information tools for application and commercial exploitation by Australian industry.

#### Spatial Information System Design & Spatial Data Infrastructures

The achievement of an overall project in providing a 'Virtual Australia' depends on having effective Spatial Data Infrastructure (SDI) and Spatial Information System designs to support efficient access, retrieval and delivery of spatial information to locations where it is needed from locations where it is stored.

#### Earth Observation for Natural Resource Management

Development of new applications, software and spatial data products from remotely sensed data to more efficiently monitor the environment and to provide basic information to assist resource management.

#### Modelling and Visualisation for Spatial Decision Support

Development of knowledge and understanding on how to apply information obtained from a 'Virtual Australia' depends upon an ability to analyse, and apply modelling, visualization and collaboration.

#### Demonstrators

A demonstrator program brings together key groups in a cooperative relationship to complete demonstrator projects in a short period (about 18 months), typically using existing information and technologies in innovative ways.

#### Education and Training

Provision of educational and training opportunities to people who are or may be employed by industries using SI.

(Source: [www.crcsi.com.au](http://www.crcsi.com.au))

Innovation often occurs when crossovers occur between particular subject areas that were previously thought of as separate activities with little or no overlap. For example, GPS and agriculture combined with other technologies leading to the creation of precision agriculture. The Cooperative Research Centre for the Spatial Industry will bring together a range of commercial industries, research agencies and government, each with a role to play in innovation in the spatial industry, specifically tasked with creating opportunity for innovation. The strands of the activity of the Centre will lead to the creation of a SI innovation community. The activities such as ongoing education and training, investment in a targeted research program and a demonstration program that is targeted to developing prototype projects, will provide a results oriented environment. Other ventures of this kind that were not geared to produce practical outputs in the past may not have generated the desired level of innovation.

## **1.9 Making innovation happen**

There are many drivers towards innovation and change as illustrated in part in the case studies and the earlier sections of this paper. It is clear that our world is becoming relatively smaller and economically and environmentally the interdependence creates a need to consider the larger implications of our activities.

Planning and creating the right environment for change and development can assist in using the drivers to promote needed innovation and change. This can be achieved in many ways. Some of the case studies identify that policy setting at a country, state and even local organisation level can have a role. Adaptability and flexibility at the local level are more likely to result in success.

The ideas in this paper are a starting point for further discussion and debate on these issues. There are many things that can be done by an organisation such as FIG in supporting and promoting change in conjunction with individuals and other organisations. The paper outlines some of the activities already undertaken in shaping future policy and direction for land management and creating an impetus for change. There is also scope for activities to be undertaken such as:

- creating a community of interest for professionals interested in innovation,
- develop skills in change management,
- expanding professional educational to include innovation as a subject area,
- encourage professionals to consider how they are or can be change agents in land management, or,
- undertaking further exploration of the role of individuals as land management entrepreneurs.

## **1.10 New Beginnings**

This is a paper about new beginnings and shaping the future. In the end innovation interests us all as it determines how well we approach the future – the various components are

summarised below in terms of Victoria however it could be adapted to include the name of any state or organisation. -

‘Innovation is all about building Victoria’s Future. We need to develop a civic culture that promotes the creative discussion of possible futures, around the sharing of a belief in the value of doing things better. The innovator’s credo is that it is possible to imagine something different and better. The innovative idea is what remains when all else is forgotten.’  
Dr Terry Cutler, Principal – Cutler and Company. (Victorian Government, 2002, p15)

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## GLOSSARY

CRC	Cooperative Research Centre
CRCSI	Cooperative Research Centre for the Spatial industry
Crown Land	State owned land.
DSE	Department of Sustainability and Environment
FIG	International Federation of Surveyors
GNSS	Global Navigation Satellite Systems
GPS	Global Positioning System
GIS	Geographic Information System.
IT	Information Technology
LIS	Land Information System
LV	Land Victoria
PA	Precision Agriculture
SDI	Spatial Data Infrastructure
SI	Spatial Industry
UN	United Nations
VRT	Variable (application) rate technology
3D	Three Dimensional

## BIBLIOGRAPHY

- Berger, R. (2004): *as cited in* Magel, H., 2004, ‘**Where there is Noble Competition, there is Victory.**’ *Opening Speech for the FIG Working Week, May 2004 in Athens, Greece.*
- De Soto, H, 2000, ‘**The Mystery of Capital.**’, Bantram Press, London.
- Dept of Transport and Regional Services, 2002, ‘**Positioning For The Future, Australia's Satellite Navigation Strategic Policy.**’ Canberra, Australia.
- East, T.J. and Dempsey, S.M.,1998a, ‘**Geographic Information Systems at farm and local scales, Proceedings of a workshop, Agriculture, Fisheries and Forestry - Australia, Canberra, 28–29 August 1997.** Bureau of Rural Sciences, Canberra.

- Enemark, S., 2004, '**Building Land Information Policies.**' *UN, FIG, PC IDEA Inter-regional Special Forum on the The Building of Land Information Policies in the Americas. Aguascalientes, Mexico 26-27 October 2004.*
- FIG/UN, 1999. **The Bathurst Declaration on Land Administration for Sustainable Development.** International Federation of Surveyors in co-operation with The United Nations. Bathurst, Australia, 1999.
- FIG/UN DESA/PC IDEA, 2004. **Aguascalientes Statement** *UN, FIG, PC IDEA Inter-regional Special Forum on the The Building of Land Information Policies in the Americas. Aguascalientes, Mexico 26-27 October 2004.*
- Institute of Public Administration Australia, Victorian Division, 1999, '**From Policy to Implementation – Making the Big Idea Happen.**' *Conference of the Institute of Public Administration Australia, Victorian Division, 28 July, 1999.*
- Kotter, J.P, 1996, '**Leading Change.**', Harvard Business School Press, Boston, Massachusetts.
- Kotter, J.P, and Cohen, D.S., 2002, '**The Heart of Change.**', Harvard Business School Press, Boston, Massachusetts.
- Magel, H., 2004, '**Where there is Noble Competition, there is Victory.**' *Opening Speech for the FIG Working Week, May 2004 in Athens, Greece.*
- Newnham, L., 2004, '**Managing Change Successfully In Land Management Organisations.**' *Paper presented at the FIG Working Week, May 2004 in Athens, Greece.*
- Tulloch, J., 2005, '**New Era for land surveying.**' Article in *Landlinks – Land Victoria Staff Newsletter, DSE Victoria, February 2005, p.2.*
- Victorian Government, 2002, '**Victorian Government Innovation Statement – 'Victorians. Bright Ideas. Brilliant Future.'**' Victorian Government, Melbourne, Australia.

## WEB SITE REFERENCE LIST

[www.brs.gov.au](http://www.brs.gov.au)  
[www.crcsi.com.au](http://www.crcsi.com.au)  
[www.dse.vic.gov.au](http://www.dse.vic.gov.au)

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