Land Management in Australia
Case Study with emphasis on the State of Victoria

John PARKER and Leonie NEWNHAM, Australia

This paper draws to a large degree on a paper published in 2003 titled "Cadastral Systems within Australia" by Kate Dalrymple, Ian Williamson and Jude Wallace.

Key Words: Land Administration, Land Tenure, Spatial Data, Government Structures.

1. INTRODUCTION

Australia is a federation and operates separate cadastral systems in each state and territory. These have played a significant role in shaping Australia's development. Initially they provided registration of ownership for land settlement. Then, by providing security for land transfers, they assisted establishment of a successful and complex land market. The cadastral systems have recently evolved into comprehensive instruments for assisting economic, environmental and social decision making. This is shown in broadening land tenure arrangements, recognition of traditional Aboriginal land rights, and use of new technologies to integrate cadastral information as a foundation of spatial information systems. Future objectives involve further development of computer technology and applications to enhance the operability and efficiency of land registration and transfer and support the wider roles that cadastral information plays in spatial data infrastructures.

The Australian State Government land management systems provide a suitable environment for the land market and a sound base for freehold and public land management generally doing this by –

- Providing security of tenure (achieved by registering interests in and, in many cases, guaranteeing title to land);
- Registering the size, extent and spatial relationships of land parcels through survey;
- Developing land policy;
- Controlling land use and development through planning schemes;
- Managing and administering the Crown (or public) estate;
- Providing an impartial and equitable base for property valuation to serve the fiscal requirements of rates and land tax; and
- Providing public access to land administration information including tenure, survey, mapping, valuation and other related data.

The paper by Stig Enemark titled "Building Land Information Policies" to be presented at this Special Forum provides an excellent overview of the systems associated with land management, in particular his Figure 6, provides an illustration of "A Global Land Management Perspective".

2. GEOGRAPHY

Australia is the largest island continent in the world, with a total area of over 7,600,000 sq km, lying south of the Equator between the Indian and South Pacific Oceans. The population is approximately 20 million, with a growth rate of about 1%. The majority of the population (85%) resides in urban areas along the east and south-eastern coastline and fertile plains.

Much of the interior of the country is flat, barren and sparsely populated. The highest point, Mt Kosciusko reaching 2,229m, is part of an extensive mountain range running north south along the eastern seaboard. Australia lays claim to the third largest marine jurisdiction in the world, has a coastline extending more than 36,700km and has administrative responsibility for seven external territories.

Australia was inhabited for over 40,000 years by indigenous peoples prior to British colonisation in 1788. However their previous occupation was disregarded as rapid establishment and settlement of colonies took place. The colony of New South Wales was established on first settlement with further colonies or separated territories forming around the country to make 8 jurisdictions in total. In 1901 Australia became an independent member of the British Commonwealth as a Federation of States.

3. INSTITUTIONAL ARRANGEMENTS

Australia's system of government is based on the liberal democratic tradition, which includes religious tolerance and freedom of speech and association. Its institutions and practices reflect British and North American models but are uniquely Australian. Australia has a written constitution that defines the responsibilities of the federal government. (DFAT 2004)

Australia operates under the Westminster system of the separation of powers. The legislature or parliament makes the laws; the executive put the laws into operation; and the judiciary or courts interprets the laws. The powers and functions of each of these 'arms' are separate and carried out separately. No single arm is able to exercise complete authority and each is dependent on the other. This prevents powers from being concentrated in one arm of government. The independence of each helps keep the others from exceeding their power, thus ensuring the rule of law and protecting individual rights. (DIMMI 2004)

The Federal or Commonwealth Government is based on a bicameral Federal Parliament headed by an elected Prime Minister. The Federal Government has powers over defence, foreign affairs, trade and commerce, taxation, customs and excise duties, pensions, immigration and postal services. Other powers are the responsibility of state and territory governments, such as health, education, state transport networks, town and rural planning and land administration (cadastral system and land registration). State governments usually tend to develop the policy, whilst much of the implementation at the local level occurs through local government.

Victoria is the smallest in area of the mainland States: at 227,420km it accounts for only 3 % of the country's area although its population of 4.8 million people makes it Australia's second most populous State (see Table 1).

Table 1: Comparison of Victoria as part of Australia according to key characteristics. (ABS 1999)

	Area Km^2	**Population**	**Roads Km**	**Dwellings ***	**Land Parcels**	**Properties**	**Local Govts**
Victoria (% of total)	227,420 3%	4.8M 25%	155,079 19%	1.75M 25%	2.4M	2.3M	78
Australia	7,692,030	19M	802,600	6.95M	11M	-	728**

* Housing (separate houses, flats, apartments, etc)
**National Office of Local Government

Local government is the third tier of government in an Australian federal system. The role local government plays in this system differs from that in many other parts of the world in that Australian local governments tend to have limited constitutional powers. Functions include general public services, health and welfare, planning and land use, property services, recreational services and roads.

There are 79 local governing bodies in Victoria, playing a major role in the Victorian economy.

Within a national momentum to privatise government activities and agencies, land administration has tended to remain a government responsibility. There are four main arguments for retaining government control over the functions of cadastral surveying and land registration. These are: systematic and accurate records of boundary definition and ownership of land are of general public interest; government guarantee of indefeasibility of title (but not boundaries) to private land; the need for systematic and accurate recording for land taxation purposes as a source of important state revenue; and, government needs to protect and administer Crown and other public land to ensure against encroachment (Dale, 1976).

4. LAND POLICY

Australia's land policies were established very early in the settlement of Australia and now are largely integrated with land use policies. The original land policies determined what lands should be reserved for public use, e.g. foreshore and stream reserves, and what lands should be released for alienation having regard to topography, fertility, etc.

Land policies are largely developed at state government level through planning policies and implemented by local government. Planning policies are statements about how decisions will

be made. State planning policies are concerned with issues such as urban consideration and neighbourhood character, while local planning policies are concerned with issues of regional or local significance.

Planning in this context refers to the decisions that change the environment and affect everyday life. These decisions might be about new public transport, the size of a new shopping centre, the location of parks, a bike path or a new road.

However there are trends where the Federal Government is taking a lead role in dealing with issues that cross state boundaries, particularly where environmental sustainability is an issue.

5. LAND INFORMATION

5.1 Topographic Mapping

Following the second world war an accelerated topographic mapping program was put in place as a joint initiative between the Federal Government (including the defence forces) and the State Governments. To ensure coverage across Australia, the Federal Government mapped the country at the smaller scales of 1:250,000 and 1:100,000. States undertook to produce larger scale mapping, where it was required at 1:25,000 and 1:50,000.

Australia is now covered by digital data sets collected at various scales, which have regard to the density of information and data.

5.2 Cadastral Mapping

The present day cadastre is now digitised throughout the country with all jurisdictions having completed the digitisation process for all land parcels. A seamless cadastral database, called 'Cadastral Lite' integrated from each of the jurisdictional data sets and coordinated on the national reference datum, is available from the Public Sector Mapping Agency Ltd. The Australian cadastre covers approximately 10.2 million parcels including freehold, state owned land, strata titles and a very small number of native title parcels.

The complexity and data richness of the systems, coupled with centralised land registries in each jurisdiction, provided major impetus for computerisation of land titles. Computerisation of all land data encourages integration of cadastral mapping to facilitate wider land management and environmental planning. Commonly one government agency is delegated the responsibility for maintaining an up-to-date cadastral map of all land parcels, while registration, land use management, and land taxation remain that of the custodians.

The Victorian dataset series with the initial data capture project for digitisation completed in 1990, as is common to most jurisdictions, contains data primarily representing land parcels and properties and is used extensively in Geographic Information Systems (GIS) by the public and private sectors. The content includes parcel polygons, proposed parcels (future development), parcel identifiers, municipal council reference numbers, road centre-lines, road

easements and Crown and freehold land differentiation. Each of the data features is date stamped and uniquely identified.

Private land surveyors and many government agencies continually input cadastral detail validating and improving content. Both the computerised land register and Digital Cadastral Data Base (DCDB) in each state or territory are updated daily. Updates are available as whole file replacement or incremental files (changes only) with maintenance ongoing daily and incremental updates available fortnightly. Services to view and print cadastral information in most states are available via the Internet for a fee or available for purchasing through licensing agreements. Digital cadastral maps are available free of charge via the Internet with some limitations to information availability.

5.3 The Role of Spatial Data Infrastructures

Increasingly business needs and technological developments demonstrate the value of spatial information in processes of economic, environmental and social decision-making (Williamson et al, 1998). In response to the demand for interaction of spatial data from both the public and private sectors, most states of Australia have established state land information units which oversee the collection and maintenance of spatial data as part of the jurisdiction's Spatial Data Infrastructure (SDI). Responsibilities are usually in the same government department as surveying and mapping, which is pertinent to their successful development.

The key fundamental layer underpinning the SDI model is the parcel based cadastral layer, supported by the geodetic network layer. In most cases the cadastral layer provides the most distinctive, legally defined and unambiguous occupation and use of land on which to base a land information system. Data is linked to standard parcel identifiers in the cadastral layer thereby correlating information from each of the data sets through indexing to other parcel identifiers used by valuation, local government or utilities organisations, amongst others. Increasingly the focus in each state is on the development of core spatial data sets that provide the basic infrastructure to support the use of spatial information across a broad range of areas.

At the state level, DCDB and components of the SDI increasingly support electronic conveyancing activities, online delivery of vendor statements certificates, Crown land, town, rural and urban planning and provide databases for activities in various authorities and public sector agencies, such as emergency response, homeland security and environmental risk assessment mapping.

6. LAND ADMINISTRATION FUNCTIONS

As a Federation of States, Australia maintains centralized land administration offices in each jurisdiction. There is no prescribed organizational structure common to all states; land administration is a state government responsibility performed under a range of government departments such as Environment, Planning, Lands or Land Administration. Embedded in these departments are the state's digital cadastral map, land registry and titles office, Crown lands management office, Surveyors Board, and business units for land information and

resources. Combinations of these services can be found in each state, integrated through sharing agreements. Today this is assisted by the computerisation of spatial and non-spatial information.

6.1 Land Tenure and Cadastral Systems

6.1.1 Current Cadastral Systems

The cadastral systems in Australia are historically based on registering transactions with land generated by a land market. The second role of the cadastral system is to support the registration of land for legal ownership, registering the rights, restrictions and responsibilities pertaining to land through precise surveying methods. Although cadastral systems vary across the nation, the integrity of each system is consistent allowing the core spatial data set in spatial data infrastructures to play a fundamental role in broader land administration activities. Computerisation of spatial and textual data establishes the cadastre as an integral tool in many areas. These include facilitating:

- in a legal capacity, the registration of ownership of land;
- in a fiscal capacity, valuation of land sales and taxation; and
- more widely, in multipurpose functions in land management and planning for local government, emergency response, Australian Bureau of Statistics data capture, environmental risk assessment, and business planning.

Cadastral systems are basically created by surveying land parcels in the field and recording the corresponding land ownership titles in the land registry. There is generally a 1:1 relationship between these two main units, that is each land parcel is related to one land ownership entry in a folio in the land register.

Components of Australian Cadastral systems:

- Textual component – the land register identifies real property parcels, which includes all land parcels concentrating on those held privately in freehold ownership and identifies owners' rights, restrictions, and responsibilities, ownership, easements and mortgages.
- Spatial component - cadastral maps show all land parcels graphically corresponding to the registered title with plan numbers and unique identifiers in a fully computerised system. Cadastral maps consist of fixed and general boundaries, about 90% and 10% respectively:
  - Fixed boundaries are those with legally surveyed measurements used to precisely identify most parcel boundaries determined by cadastral surveys such as a subdivision.
  - General boundaries (graphical) are not survey accurate and are based on natural or artificial physical features, such as high water mark, or walls and buildings as found on building or strata subdivisions.
- Crown lands management has management and administrative responsibility for state owned lands. Details of Crown lands, including land parcels leased or licensed to the public, parks and reserves, government land and excess land, are kept less formally than land registry records.

Additional legal, valuation, local government, utilities and planning activities are involved in land administration, and are heavily reliant on the fundamentals of the cadastral system. In particular collection of local government rates, land tax and stamp duty (payable on transfer, mortgage and lease of land) relies on land parcels and are major revenue raisers for the state and territory economies.

Land titles and registry offices in each jurisdiction are comprised of very large and complex organisations. They store vast amounts of paper records and now computerise almost all dealings. For example the Land Registry in Victoria has about 2.5 million land titles, 3.8 million parcels, 0.43 million plans of survey (including plans of field notes) and 14 million live supporting documents

6.1.2 Land Registration

The Torrens system is a system of title registration where the law guarantees that the person shown on the title displayed in a public register is the registered proprietor. The folio of the register is conclusive evidence that the person named in the folio, as the proprietor of an interest in the land is the legal owner of that interest. Interests in land can only be created, varied or changed by registration (with some exceptions). If there is an error on the register, the government may compensate for any loss incurred by the error. These standards are summarised as three fundamental principles of the Torrens system; namely the Mirror Principle, Curtain Principle and Insurance Principle. The Mirror Principle ensures that the register reflects legal interests in the land. The Curtain Principle means that once a registration occurs unregistered interests affecting the land are not enforceable against the registered owner. It is not necessary to look behind the title to investigate previous interests. The Insurance Principle means that the information on the register is guaranteed by the State. The Torrens system as conceived had four qualities: speed; simplicity; cheapness; and suitability to the needs of the community. It is remarkably successful despite the complexities of common law and the cadastral survey system.

There are three components in a Torrens title. The parcel section identifies the parcel boundary, giving it a unique identifier and describing the metes and bounds (usually graphically by reference to a plan of survey). The proprietorship section identifies the owner, and the encumbrance section identifies any other interests in the parcel such as a mortgage, an easement or a restriction as to use. In the paper based system, the registered proprietor holds a duplicate of the title held by the land registry. The paper certificates are being phased out as the administrations convert to computer based systems and electronic conveyancing. In Victoria new digital titles are now being produced. Unlike the original certificates of title, the parcel section, which often included a sketch of the parcel, is not included, it is instead available as a separate document.

Acts of Parliament support the cadastral system within each jurisdiction. The legislation controlling the Torrens system is usually called a Real Property Act or Land Transfer Act. The effect of registration in key areas, such as easements, leases and adverse possession (Park and Williamson, 1999), varies among the jurisdictions. In some states registration is required; in others these interests are made paramount and affect land even if not registered. Over

about the last forty years or so all states introduced building subdivision legislation to allow real property to be subdivided vertically as well as horizontally thereby permitting individual ownership of apartments. An enormous impetus to the development of medium to high density housing resulted. The legislation continues to evolve to reflect social needs and building techniques. Strata, cluster, community and retirement village titles are variations on the theme.

Other legislation provides legal infrastructure to the land market including legislation supporting the sale and mortgage of land, environmental protection, planning and local government services supporting the occupation and development of land.

6.1.3 Cadastral Surveying

Australia has over two centuries of expertise in cadastral surveys of parcel boundaries. Historically cadastral surveying was not part of the statewide cadastral mapping process. Surveys of individual land parcel boundaries are carried out to a high mathematical precision and until recently were only connected into neighbouring land parcels. Some states permit cadastral plans to be submitted to the Land Registry in digital form to facilitate updating of the digital cadastral mapping system. Acts and Regulations regulate standard cadastral procedures in each jurisdiction.

Professional land surveyors, licensed or registered undertake cadastral surveying. Applicable Acts and Regulations specify the duties and responsibilities of registered cadastral land surveyors, establish a Board of Surveyors and set qualifications for registration. Processes such as surveying related to land transfers and subdivision currently can only be performed by a licensed/registered surveyor.

6.1.4 Land Transfer Process

The land transfer process as part of the land market is moving towards being completely on line. In Victoria in 2004, the whole sale process from initial vendor certificates, through financial settlement to registration of the transfer is being trailed as an online process before being fully released for general use.

The land market operates almost totally within the private sector with the only exceptions being the operation of the Land Registry Offices and the oversight of cadastral surveys by a Board of Surveyors or an equivalent body in each state. The major players in the land market are land owners, land developers and planners, land surveyors, conveyancers (lawyers and others), real estate agents and financial institutions. Where a subdivision takes place prior to transfer of ownership, those involved in addition to the above, include local government in planning and engineering and service authorities (water, sewerage, gas, electricity, telecommunications, drainage, etc.).

6.2 Land Value Systems

The land market determines the key component of Australia's land value system. Australia has a prosperous Western-style capitalist economy supported by a well educated population, expansive natural resources, a strong financial sector and good infrastructure. With this standard of living Australians place a high value on home ownership with about 70% of families owning their own freestanding house or apartment.

Most of the population living in detached houses have a land area of about 500 to 1,000 square metres. On average, Australians sell their homes and buy or build new ones about every ten years. An increasing percentage of the population live in medium density housing (about 15%). These are often individually owned building subdivision apartments, in multistorey buildings or small adjoined or stand-alone clustered dwellings sharing a reserved area of common property.

Government incentives to invest in real property for first homebuyers and lending policies of financial institutions are making home loans (mortgages) more affordable. Most real property is purchased by borrowing money from a bank (up to about 80% to 90% of the purchase price can be borrowed) in exchange for a mortgage. Interest rates are currently about 6.5% per annum with loans repayable usually over a maximum period of 30 years. The price of land, especially in the larger cities, has accelerated reflecting a healthy competitive market and tax advantages available for residential landowners and investors.

A key data set is a standardised set of valuations for the purposes of municipal rating and for state land tax assessments. To ensure integrity and uniformity of the valuation data sets government has established and maintains an expert group governed by legislation.

Valuations are professional compilations of sale prices of comparable properties, estimates of the capital worth of the land and buildings, without chattels, furniture or moveable business assets. Land tax is assessed on a percentage of the value of the total land holdings of a person or company on an aggregated basis and payable annually; the tax is high. Land taxes are charged on residential land over a particular value and on commercial and industrial land. Productive agricultural land is exempted. (Wallace et al, 2004)

6.3 Land Use Control and Land Development Systems

The planning scheme controls land use and development within a municipality. It contains State and local planning policies, zones and overlays and other provisions that affect how land can be used and developed. The planning scheme will indicate if a planning permit is required to change the use of the land, or to construct a building or make other changes to the land. Every municipality has its own planning scheme.

The council of local government must take into account both the State and local planning policies when making a planning decision. It makes most of the planning decisions that affect its municipality. For example, it decides whether or not to grant a planning permit for a new use or development, and what permit conditions are appropriate.

Today in Victoria, all municipalities are covered by land use planning controls, which are prepared and administered by State and local government authorities. Legislation governs such controls through the Planning and Environment Act 1987. Those who do not obey the laws about the land and development can be prosecuted.

At the State level, the Government's strategic land-use planning is based on a sound analysis of issues and trends that can be monitored and reviewed regularly, with an integration of the transport, environmental and social aspects of development.

Such strategies are reflective of the broader community and are therefore based on extensive community consultation and debate. The State Government's approach relies on creative and effective partnerships with local government, local communities, business, industry and other organisations and interest groups.

7. PROFESSIONAL STANDARDS

7.1 Public Service

Virtually all government public service organisations and many private sector organisations within Australia have conduct principles for their employees. These overarching principles have a flow down affect on all activities and cause a de facto standard to be set. For example in Victoria the governments conduct principles include:

- impartiality
- integrity
- accountability, and
- responsive service.

7.2 Registration of Surveyors

Under the Torrens System of title registration, the state guarantees entries in folios of the land register. While relationships between land on the ground and information in surveys and maps used in registration processes are not guaranteed, the integrity of the system depends on consistent application of the highest standards of surveying to ensure land is reliably identified. Surveyors therefore act on behalf of the client and as 'an agent of the state' to ensure the integrity of the land tenure system (Ristevski and Williamson, 2001). Surveyors Acts and Regulations established licensing and registration of cadastral surveyors to ensure the maintenance of standards, and to ensure surveyors acting on behalf of the state are fit and proper and equipped with the appropriate knowledge and skills to perform cadastral surveys. Under the Reciprocating Surveyors' Board of Australia and New Zealand, persons registered by a Board in any state or New Zealand, can apply for registration in any other of these jurisdictions under a reciprocity agreement.

7.3 Professional Institutions

The regulation of surveyors was recognised as early as 1837 with the licensing of government land surveyors (Ristevski and Williamson, 2001). Only 7 years later the private sector entered the profession playing a minor role. By the 1880's a representative body for professional surveyors primarily interested in cadastral issues was institutionalised and the first Institute of Surveyors division originated. Over the decades a representative body was formed in all states and territories, servicing 3,800 existing members, with a national representation by the Institute of Surveyors Australia, now incorporated into the Spatial Sciences Institute.

At a national level, surveying and mapping coordination and cooperation is provided by the Inter-governmental Committee on Surveying and Mapping (ICSM) represented by Australia's Commonwealth, State, Territory and Defence surveying and mapping agencies. The Reciprocating Surveyors' Boards of Australia and New Zealand control cadastral surveys across jurisdictions and the Australia New Zealand Land Information Council (ANZLIC), established in 1986, coordinates land and geographic information. The Australian Spatial Data Infrastructure initiative arose from this Council, which involves the responsibility of leading the development of spatial information management. Additional government agencies at a Commonwealth level assist with policy and spatial data management (Geosciences Australia) and at the technical level through the Public Sector Mapping Agency.

Internationally, the International Federation of Surveyors (FIG) (www.fig.net) has available in excess of 30 publications to assist the professional, which include:

- Constituting Professional Associations
- Statement of Ethical Principles and Model Code of Professional Conduct
- Business Matters for Professionals

8. ASSESSMENT AND IDENTIFICATION OF PROBLEMS AND BARRIERS

8.1 Institutional Barriers

One of the most difficult challenges to achieve positive results for the country, a State, or even a community has been to create an understanding of the relevance and importance of geographic information to the economic development, environmental and social infrastructure of the country, State or community. By the integration of data/information through common mechanisms, decision making is significantly enhanced. Between 60-80% of all information held by government can be classified as geographic information.

Within Victoria during the 1980's there was recognition at a political level of the importance of having many of the land related functions together in the same organisation.

8.1.1 The Creation of Land Victoria (Newnham & Others. 2001)

Land Victoria, the agency within Victoria with primary responsibility for land administration matters, was created in 1996 bringing together many of the State's core land administration functions into the one agency for the first time. These functions included geospatial information, mapping, survey, valuation, Crown (or unalienated) land management and freehold title creation and registration. At that time it operated within the then Department of Natural Resources and Environment's land management framework aimed at protecting identified environmental and social values of public and private land.

Historically these component functions were delivered separately with key roles undertaken by institutions and associated professions that saw themselves as 'keepers of the faith' guarding what they saw as the integrity of their operations with vigor. This meant the creation of a number of purpose-built infrastructures resulting in isolated business 'silos' where information and knowledge was jealously guarded, not easily integrated or combined, and not readily shared (Mooney and Grant, 1997).

The three functions which remained located outside the then Department of Natural Resources and Environment were responsibility for the land use planning framework (Planning and Heritage Division, Department of Infrastructure), land as a basis of taxation (State Revenue Office, Department of Treasury and Finance), and land as the basis of rating (78 local Councils).

In a recent government departmental restructure, Land Victoria has been moved into a Department of Sustainability and Environment with all the land use planning functions of government. This aims to create sustainability in both the natural and built environments.

Developing an Integrated Land Administration Vision for Victoria

Land Victoria when created in 1996 had a clear mandate and a unique opportunity to undertake the necessary reforms to deliver wide ranging business efficiencies and improve customer service. Consequently, Land Victoria commenced a comprehensive reform program designed to lead to three major areas of benefit –

- Reduced costs to Government through re-engineering of business processes;
- Reduced transaction costs for business and consumers through re-engineering of business processes and streamlining of legislation; and
- Increased competitiveness of the State and industry growth due to more efficient use and availability of land information.

A major business review found that Land Victoria could help 'maximise the value created from land' by leading, facilitating, negotiating or doing, depending on the ability of the market to deliver a function and the nature of the value it creates.

In the mid 1980s, the land information industry was dominated by Government and the private sector was characterised by numerous small firms undertaking little research and

development and little or no capital investment. Today, however, a growing number of firms employ upwards of 30 people, with more than 1,500 now employed in the industry as a whole, research and development is a significant part of their operations, and many are exporting their expertise overseas. There has also been a growth in the number of educational opportunities available at tertiary level. These trends are expected to continue.

The review also found that by far the most economic value (approximately A$400 million per year, or approximately US$300 million) would come from a coordinated statewide improvement in the affordability, accessibility and integration of geospatial information.

Land Victoria determined that a key driver with which to achieve this reform would be through pursuing the Government's vision for electronic service delivery. As a result, Land Victoria became a key sponsor of online delivery initiatives within the State.

8.2 Current Issues for Consideration

Different issues affect each of the jurisdictions depending on the stage of spatial information development and particularly cadastral development. However issues of survey accuracy, seamless cadastres and online data activities are uniformly experienced.

Electronic, online conveyancing and registration services, such as digital lodgement of subdivision plans and transfer of title are posing technical, social and economic challenges. Concerns and risks are involved in issues of data compatibility, privacy, identity, fraud and pricing. Online land transfers aim to take away the necessity of 'over-the-counter' dealings, reducing time and cost. In the paper based systems, the copy of title is the key to access to the registration process; this is not the case in the electronic environment

Public land management is another area that is coming under increasing pressure due to completing uses. On the one hand there is a desire to retain the public land in its natural state particularly from the environmental lobby, and on the other, is to open up the land for greater public enjoyment and in some cases to use the public land for commercial purposes.

9. CONCLUSION

The modern land administration paradigm is about protecting reserved Crown land, allocating rights over Crown land, regulating the freehold land market, and providing access to information and service delivery. Today, 'land administration' refers to the role of government in securing land ownership for the community, providing access to public land, protecting identified values and public open space, and establishing information systems based on where land is, what it is used for, and its value (be it in dollar terms through the freehold market or community values through public land).

Due to the inherent wealth of Australia, relatively expensive and complex cadastral systems were allowed to evolve in the individual jurisdictions. These systems work well and underpin a secure land transfer system supporting an active land market. Furthermore, although Australian cadastral systems were not designed as part of a wider land administration system,

they now form its foundation and are becoming increasingly important within the wider spatial information environment.

Victoria was an early adopter of the benefits of technology in improving its land administration systems and functions. In the mid-1980s Landata was created to deliver land information electronically. However, in retrospect, the technology then available could not deliver the Government's ambitions. In addition, the organisational arrangements remained fragmented and worked against improved integration of service delivery.

Land Victoria's creation and its evolution from 1996 to the present day illustrates how 'the relationship between humankind and land in almost every society is dynamic […and] varies for almost every situation' (Ting and Williamson, 1999). Other parts of Australia and its near neighbour New Zealand are now adopting this more complex form of organisation for government land administration. This indicates that network oriented organisations may be the best form of organisation to meet the demands of international drivers for change and the increasingly complex economic and societal needs for land administration systems in developed countries.(Newnham & Others. 2001)

10. ACKNOWLEDGMENT AND QUALIFICATION

It should be noted this paper is supported by a computerised presentation that includes illustrations of government structures and examples of land administration in Victoria

The views and information expressed in this paper are those of the authors and of the authors of the referenced papers, and do not necessarily reflect the views of the individual jurisdictions. Readers should acknowledge that this paper includes an overview of Australian cadastral systems and as a result does not identify all the differences in law, regulation and practice in the different jurisdictions.

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BIOGRAPHICAL NOTES

John Parker is an international land administration consultant specialising in quality management, professional practice and management and geographical names.
He was Surveyor General of Victoria, Australia for nine years and had spent nineteen years in private practice in a multi disciplinary firm.

Currently he is actively involved in the International Federation of Surveyors and was chair of FIG Commission 1 (Professional Standards and Practice). Membership of professional associations includes the Institution of Surveyors Australia and Spatial Sciences Institute. Papers have been presented and published at a range of events, including international forums, on a wide range of subjects.

Leonie Newnham is a manager within the public sector currently working for the Victorian State Government Department of Sustainability and Environment. In recent years she has been specializing in business development, project management and associated organization change in land management organisations.

Leonie chairs a Working Group for the International Federation of Surveyors FIG Commission 1 (Professional Standards and Practice). Membership of professional associations includes the Institution of Surveyors Australia, Institute of Public Administration Australia and Spatial Sciences Institute. She has published and presented papers at a range of forums, including international conferences, on a wide range of subjects.

CONTACTS

Professor John Parker
PO Box 110
Brunswick East
Victoria 3057
AUSTRALIA
Tel. + 61 (0) 408 364 159
Fax + 613 9381 1378
Email: park106@attglobal.net

Ms Leonie Newnham
PO Box 500
East Melbourne
Victoria 3002
AUSTRALIA
Tel. + 61 (0) 417 551 633
Fax + 613 9637 8651
Email: leonie.newnham@dse.vic.gov.au