



Australia and New Zealand Cadastral Systems

Questions and Answers

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Personnel

NZ Chief Executive, LINZ
Surveyor-General
Registrar General of Lands

ACT Surveyor-General

NSW Surveyor-General
Chief Surveyor
Registrar General

NT Surveyor-General
Registrar General

Qld Chief Executive, DERM
Registrar of Titles
Director of Surveys

SA Surveyor-General
Registrar General

Tas Surveyor-General
Recorder of Titles
Valuer General

Vic Surveyor-General
Registrar of Titles
Registrar General

WA Surveyor-General
Registrar of Titles
Valuer General
Inspector of Plans and Surveys

Agencies

NZ **LINZ**
Land Information New Zealand

ACT **ACTPLA**
ACT Planning and Land Authority
Survey Office

NSW **LPMA**
Land and Property Management Authority

LPI
Land and Property Information
Industry & Investment Department

NT **DLP**
Department Lands & Planning

LTO
Land Title Office, Department of Justice
Office of the Surveyor-General

Qld **DERM**
Department of Environment & Resource Management

SA **DTEI**
Department of Transport, Energy and Infrastructure

LTO
Land Titles Office

LSG
Land Services Group

Tas **DPIPWE**
Department of Primary Industries, Parks, Water and
Environment, incorporating:

LTO
Land Titles Office

TSLAB
Office of the Surveyor-General

Vic **DSE**
Department of Sustainability and Environment
Office of Surveyor-General Victoria
Land Registry

WA **Landgate**
Land Information Authority

LTO
Land Title Office
Survey Inspection Section

Commonly Used Initialisms & Jurisdictions Systems

3D	Three dimensions – used in strata titles	GIS	Geographic Information System
ACS	Association of Consulting Surveyors – a surveying software package. This was the first version of a surveying software package tailored for Australian surveying practices which later grew into two packages, one for general surveying applications (GeoSurvey) and one for cadastral adjustment applications (GeoCadastre)	GURAS	A database linked to the NSW DCDB which records street address
ACTMAP	A web mapping facility (ACT)	ILIS	Integrated Land Information System (NT)
Cadlite	A generalised DCDB available from PSMA	ITS	Integrated Titling System (NSW)
CPD	Continuing Professional Development	Landonline	(NZ)
CRM	Coordinated Reference Mark, or Coordinated Control Reference Mark	LandXML	Land Extensible Markup Language
CSD	Cadastral Survey Data (WA)	LASSI	A web package Land and Survey Spatial Information (Vic)
DB	Database	LIST	Land Information System Tasmania
DCDB	Digital Cadastral Database	LS	Licensed Surveyor
DIIMS	Document and Integrated Imaging Management System (NSW)	MGA	Map Grid Australia
DP	Deposited Plan – a plan deposited with a Department, but not lodged for registration (usually by accredited surveyors) (see <i>SP</i>)	NTGSS	NT Geodetic Survey System
DSA	Designated Survey Areas (SA)	PM	Permanent Mark
ePlan	Electronic lodgement of survey plans	PSM	Permanent Survey Mark
Eplan	Electronic lodgement of survey plans	SCDB	Spatial Cadastral Database (WA)
GeoCadastre	(see <i>ACS</i>)	SCIMS	Survey Coordination Information Management System (NSW)
GeoSurvey	(see <i>ACS</i>)	SDB	Survey Database
GESMAR	Western Australian Geodetic Survey Mark Register	SIX	Spatial Information Exchange – a web package (WA)
		SmartPlan	(WA)
		SmartRegister	(WA)
		SP	Survey Plan – a plan lodged with a Department for registration (both before and after it has been registered) (see <i>DP</i>)
		SPICAD	A mathematical cadastral database (NT)

Boards and Associations

NZ	
NZIS	New Zealand Institute of Surveyors
ICS	Institute Cadastral Surveying
CSLB	Cadastral Surveyors Licensing Board
Aust	
SSSI	Surveying & Spatial Sciences Institute
SIBA	Spatial Industry Business Association
AIMS	Australian Institute of Mine Surveyors
ACT	
SSSI (ACT)	Surveying & Spatial Sciences Institute Survey Practice Advisory Committee
NSW	
SSSI (NSW)	Surveying & Spatial Sciences Institute (NSW Division)
BOSSI	Board of Surveying and Spatial Information
NT	
SSSI (NT)	Surveying & Spatial Sciences Institute (NT Division) Surveyors Board of NT
Qld	
SSSI (Qld)	Surveying & Spatial Sciences Institute (Qld Division) Surveyors Board of Qld
SA	
SSSI (SA)	Surveying & Spatial Sciences Institute (SA Division) Surveyors Board of SA Survey Advisory Committee
Tas	
SSSI (Tas)	Surveying & Spatial Sciences Institute (Tas Division)
TLSAB	Tasmanian Land Surveyors Accreditation Board
Vic	
SSSI (Vic)	Surveying & Spatial Sciences Institute (Vic Division)
ISV	Institution of Surveyors, Victoria
SRBV	Surveyors Registration Board of Vic
WA	
	Land Surveyors Licensing Board of WA

Acts

NZ	Cadastral Survey Act 2002 Land Transfer Act 1952
ACT	Surveyors Act 2007
NSW	Surveying and Spatial Information Act 2002 Aboriginal Land Claims Act
NT	Licensed Surveyors Act Aboriginal Land Rights Act Native Title Act
Qld	
SA	Survey Act 1992 Real Property Act 1886
Tas	Surveyors Act 2002 Land Titles Act 1980
Vic	Surveying Act 2004 Subdivision Act 1988 Transfer of Land Act 1958
WA	Licensed Surveyors Act 1909 Transfer of Land Act 1893

Jurisdictions

NZ	New Zealand
ACT	Australian Capital Territory
NSW	New South Wales
NT	Northern Territory
Qld	Queensland
SA	South Australia
Tas	Tasmania
Vic	Victoria
WA	Western Australia

Governance

G1 Is there a statutory officer with overall responsibility (explicit or implicit in legislation) for the spatial integrity of the cadastre (eg Surveyor-General)?

- NZ** Yes – Surveyor-General
- ACT** Yes – Surveyor-General
- NSW** Yes – Surveyor-General sets the survey standards and the Registrar General examines the plans
- NT** Yes – the Surveyor-General is responsible for spatial aspects of cadastre
- Qld** Yes – Chief Executive, DERM
- SA** Yes – Surveyor-General
- Tas** Yes – Surveyor-General has statutory responsibility for the spatial cadastre through responsibility for registration and practice of land surveyors, maintenance of standards and correction of errors, and for plans and surveys made over Crown land for administrative and transactional purposes

As Director Spatial Information the Surveyor-General also has line responsibility for the spatial cadastral database

- Vic** Yes – Surveyor-General has statutory responsibility for setting surveying standards and monitoring surveying matters that affect the spatial aspects of the cadastre

Also responsible for approving survey plans of Crown land and related administrative functions

- WA** Yes, Surveyor-General (Chief Executive)

G2 Is G1 officer required to be, or have been, a qualified/licensed cadastral surveyor?

- NZ** Yes – must have been licensed or equivalent in NZ or any other similar jurisdiction
- ACT** Yes – licensed or eligible to be licensed
- NSW** No
- NT** Yes – must be registered as a licensed surveyor in the NT
- Qld** No
- SA** Yes
- Tas** Yes
- Vic** Yes – Surveyor-General is required to be a licensed surveyor
- WA** No

G3 Is there a statutory officer with responsibility (explicit or implicit in legislation) for operational management of the cadastre, if so, who is it?

- NZ** Yes – Chief Executive of LINZ
- ACT** Yes – Surveyor-General
- NSW** Yes – Surveyor-General and Registrar General
- NT** Yes – Surveyor-General
- Qld** Yes – Chief Executive, DERM
- SA** Yes – Surveyor-General
- Tas** Yes – Surveyor-General for the spatial cadastre
- Vic** Yes – the Surveyor-General is responsible for the cadastral surveying component
- WA** Yes – Surveyor-General (Chief Executive), Registrar of Titles and Valuer General

G4 *If different, what is the accountability relationship between the G1 and G3 officers?*

NZ	The Surveyor-General is an employee and therefore has performance responsibility to the Chief Executive of LINZ. The Surveyor-General has statutory function to audit the exercise of the Chief Executive functions relating to processing of cadastral survey data
ACT	N/A
NSW	N/A
NT	Surveyor-General and Registrar General are government employees and therefore have performance responsibility to superiors
Qld	N/A
SA	N/A
Tas	N/A
Vic	N/A
WA	N/A

G5 *Is the G3 officer required to be or have been a qualified/licensed cadastral surveyor?*

NZ	No
ACT	N/A
NSW	No
NT	Surveyor-General must be registered as licensed surveyor
Qld	No
SA	Yes – Surveyor-General
Tas	Yes – Surveyor-General
Vic	Yes – the Surveyor-General is required to be a licensed surveyor
WA	No

Standard Setting

SS1 Who is responsible for Cadastral Survey Standards?

NZ	Surveyor-General
ACT	Surveyor-General
NSW	Surveyor-General through the Surveying Act 2002
NT	Surveyors Board of the NT
Qld	Chief Executive, DERM.
SA	Minister for Infrastructure through legislation administered by the Surveyor-General, the Surveyor-General has the authority under the Act to issue Practice Directions
Tas	Surveyor-General
Vic	Surveyor-General
WA	Surveyor-General, Registrar of Titles and Land Surveyors Licensing Board

SS2 If the SS1 officer is not the Surveyor-General or equivalent, – what role does the Surveyor-General or equivalent have? (eg chair of Board that sets standards, etc)?

NZ	N/A
ACT	N/A
NSW	President of the Board of Surveying and Spatial Information (BOSSI)
NT	Surveyor-General is Chair
Qld	Director of Surveys holds a delegation from the Chief Executive to approve standards
SA	Although the Minister for Infrastructure has responsibility for the standards, the legislation is administered by the Surveyor-General who has the authority under the Act to issue Practice Directions
Tas	N/A
Vic	Most cadastral surveys require geodetic connection and Surveyor-General obligated to provide geodetic infrastructure.
WA	N/A

SS3 What other parties have a statutory input to setting cadastral survey standards?

NZ	Statutory requirement to consult bodies representing surveyors (New Zealand Institute of Surveyors, Institute of Cadastral Surveying), Surveyors Licensing Board, managers of tenure systems eg Registrar General of Lands. Other stakeholders including LINZ Customer Services group are also consulted.
ACT	Survey Practice Advisory Committee (Statutory)
NSW	The Land and Property Management Authority and Industry & Investment Department (for mining interests)
NT	Nil – however in practice consultation and consensus through an industry working group is the norm
Qld	None – but Chief Executive, DERM may consult with Surveyors Board of Qld etc.
SA	Survey Advisory Committee established under the Survey Act 1992
Tas	Standards require agreement of Surveying & Spatial Sciences Institute (SSSI), registering authorities and Secretary of relevant State Agencies
Vic	Possibly Registrar of Titles through Subdivision Act and Transfer of Land Act, and also Minister for Local Government through Local Government Act
WA	Inspector of Plans & Surveys and persons appointed under Section 18 of the Licensed Surveyors Act

SS4 *Are there any non-cadastral issues that have to be taken into account when setting standards?*

- NZ** Use of cadastral survey data for purposes other than cadastral surveys
- ACT** Maintenance and consistency with DCDB
- NSW** Measurement standards, Instrument calibration, use of GNSS equipment, use and format of Surveying Information in GIS
- NT** Yes – environmental issues such as clearing Calibration of EDM/GNSS Geodetic connections
- Qld** Use of cadastral survey data for other surveying and mapping infrastructure
- SA** ICSM Standards and Specifications for Control Surveys (SP1)
- Tas** Cadastral surveys require coordination which obligates the Surveyor-General to ensure that the geodetic network is capable of supporting the coordination undertaken
- Vic** ICSM Standards and Specifications for Control Surveys (SP1)
- WA** Geodetic issues in certain circumstances

Licensing/Registration

LR1 *Are surveyors undertaking/certifying cadastral surveys required to be registered/licensed?*

NZ	Yes – licensed by the Cadastral Surveyors Licensing Board
ACT	Yes
NSW	Yes
NT	Yes
Qld	Yes – must be registered with a cadastral endorsement with the Surveyors Board of Qld.
SA	Yes – licensed
Tas	Yes
Vic	Yes – must be licensed to certify a cadastral survey but can undertake a cadastral survey without a licence when supervised by a licensed surveyor
WA	Yes

LR2 *Is there more than one class of registration?*

NZ	No
ACT	No
NSW	Yes – cadastral and/or mining registration
NT	No – only cadastral
Qld	Yes – general registration for surveyors. Cadastral endorsement is required to undertake cadastral surveys, and consulting endorsement required to carry on a business providing cadastral surveying services. Endorsements also available for engineering and mining surveying.
SA	Yes – cadastral licensing, general registration for non-cadastral areas
Tas	No – one class for cadastral surveys (voluntary general registration and registration in other specific fields of surveying is available)
Vic	Yes – full licence and a restricted licence.
WA	No

LR3 *What body is responsible for licensing/registering cadastral surveyors? (Hereafter called the Board)*

NZ	Cadastral Surveyors Licensing Board
ACT	Not a body – the Chief Surveyor of the ACT. There is not a separate registration system in the ACT and surveyors wanting ACT registration do so via the NSW Board of Surveying and Spatial Information (BOSSI). ACT provides examiners in these cases.
NSW	Board of Surveying and Spatial Information
NT	Surveyors Board of NT
Qld	Surveyors Board of Qld
SA	Surveyors Board of SA which is a subcommittee of the Institution of Surveyors Australia (ISA)
Tas	The Institution of Surveyors Australia (ISA) administers the post-graduate training and examination of candidates through its sub-committee, the Tasmanian Land Surveyors Accreditation Board (TLSAB). Once accreditation is achieved, the Surveyor-General administers mandatory, ongoing registration on receipt of evidence of competency.
Vic	Surveyors Registration Board of Vic
WA	Land Surveyors Licensing Board of WA

LR4 *Does the LR3 Board conduct its own examinations?*

- NZ** No – it has accredited the cadastral component of the NZ Institute of Surveyors membership examinations
- ACT** No – examinations via government employees
- NSW** Yes
- NT** Yes
- Qld** Yes – it has established competency frameworks and is in the process of accrediting entities for assessing competency.
- SA** Yes
- Tas** Yes
- Vic** Yes
- WA** Yes

LR5 *Is a licence for a defined period of time?*

- NZ** Yes – up to 3 years in legislation but annual renewal by Board policy
- ACT** Yes – annual renewal
- NSW** Yes – annual renewal
- NT** Yes – annual renewal
- Qld** Yes – annual renewal
- SA** Yes – annual renewal
- Tas** Yes – annual renewal for registration, initial accreditation is a one-off event
- Vic** Yes – annual renewal
- WA** No – but an annual practicing certificate required

LR6 *Are there special requirements for re-licensing (other than paying fees)?*

- NZ** Generally no – however Cadastral Surveyors Licensing Board may choose not to renew a licence if they believe there is a competency issue as a result of complaints or notice of significant failures.
- ACT** Yes – Continuing Professional Development
- NSW** Yes – Continuing Professional Development
- NT** No
- Qld** Yes – applicant must provide evidence of competency, by way of a declaration. A random sample of 10% of applicants must also provide additional evidence.
- SA** No – unless imposed by the Court as an outcome of a Disciplinary Hearing
- Tas** No
- Vic** Yes – applicant must meet continual training and development requirements
- WA** Yes – practicing certificates are annual and based on Continuing Professional Development

LR7 *What is the role of the Surveyor-General on the LR3 Board (if any)?*

NZ	Ex-officio member, but can not be the Chair
ACT	Chairs the Survey Practice Advisory Committee
NSW	President
NT	Chair
Qld	One member must be a surveyor employed by the Department – there is no Surveyor-General in Queensland
SA	Invited member, but can not Chair
Tas	Nil, but the Surveyor-General is responsible for annual registration of surveyors
Vic	Chair
WA	Ex-officio member

LR8 *What is the make-up of LR3 Board members?*

NZ	6 members – 5 appointed by the Minister, plus the Surveyor-General. The 5 appointments comprise: <ul style="list-style-type: none"> • 2 persons (1 of who must be or have been a licensed cadastral surveyor) both of whom have been nominated by a body or bodies representing licensed cadastral surveyors; • 2 persons who are or have been licensed cadastral surveyors and who have not been nominated by a body representing licensed cadastral surveyors; • 1 person who is not and never has been a licensed cadastral surveyor and who is not employed in and does not represent the surveying profession
ACT	There is no Board, but there is a Survey Practice Advisory Committee which is established under the Surveyors Act however it has no role in the establishment or discipline of registered surveyors. 7 members – a Chief Surveyor, Registrar General (or representative), Public Servant, Surveying & Spatial Sciences Institute (ACT) representative.
NSW	12 members – Surveyor-General, 1 Land and Property Management Authority representative, 3 nominated by Surveying & Spatial Sciences Institute (NSW), 1 university representative, 1 nominated by the Australian Institute of Mine Surveyors, 1 community representative nominated by Department of Fair Trading, 1 statutory mining representative and 3 from spatial industry
NT	5 members – Surveyor-General, plus 4 licensed surveyors. The Minister appoints 2 from private nominations and 2 from 3 licensed surveyors nominated by the Surveying & Spatial Sciences Institute (NT).
Qld	8 members – 6 surveyors (3 cadastral surveyors, 1 surveyor directly involved in teaching surveying, 1 cadastral surveyor employed in DERM, 1 other surveyor) and 2 others who represent the interests of the community generally
SA	7 members – President Surveying & Spatial Sciences Institute (SA), Surveyor-General, 1 academic member, 4 Members elected by members of the Institution of Surveyors
Tas	TLSAB has 5 members – appointed by Institute of Surveyors Australia (Tas). Currently a Chair and four members covering public, private and academic survey sectors
Vic	8 members appointed by the Minister – the Surveyor-General, 1 public sector employee licensed surveyor, 2 licensed surveyors from professional body, a tertiary academic who teaches cadastral surveying, 3 community members including administration lawyer, a property development rep and a general community representative
WA	6 members – appointed under Section 4 of the Licensed Surveyors Act 1909 WA

LR9 *Does the Surveyor-General participate in disciplinary hearings?*

- NZ** No – Surveyor-General may bring a complaint to the Board but may not act as a member of the Board in hearing that complaint.
- ACT** Yes
- NSW** Yes – as part of a Disciplinary Committee
- NT** Yes/No – The Surveyor-General may bring a complaint to the board but may not act as a member of the Board in hearing that complaint. Surveyor-General is not barred from participating if the complaint is external.
- Qld** No (there is no SG), but the departmental representative on the Board may participate in the lower two levels of discipline. Three levels of discipline are provided. At the lowest level, there is opportunity for a discussion between the Board and the registered person, at which agreement can be reached about actions to be taken. At the second level, following an investigation by an independent investigator, the matter can be heard by a Professional Conduct Review Panel consisting of some or all Board members. At the highest level, matters are referred to the Queensland Civil and Administrative Tribunal (QCAT).
- SA** No – Surveyor-General is often the one making the complaint. Board manages investigations with the assistance of the Crown Solicitor, Court hears disciplinary charges
- Tas** No – Surveyor-General may advise and counsel surveyors found to be producing sub-standard surveys and instigate complaints against surveyors if found necessary. The complaint is to the Director of Consumer Affairs or may proceed as a prosecution to the Courts.
- Vic** Optional
- WA** Yes

LR10 *Is the Board independent of the department responsible for the cadastral system?*

- NZ** Yes
- ACT** Advisory only
- NSW** Yes – the Board is independent but housed within Land and Property Management Authority and uses some of the services.
- NT** Yes
- Qld** Yes
- SA** Yes
- Tas** Yes
- Vic** Yes – the Board is independent although the department funds Secretariat overheads
- WA** Yes

LR11 *What are the sources of Board funding?*

- NZ** License Fees only
- ACT** Remuneration of private member's time
- NSW** From surveyor registration and candidate examination fees
- NT** Registration fees and NT Government funding
- Qld** License Fees and funds from DERM to assist the Board in its public interest responsibility
- SA** Annual license fees plus a levy on every plan certified by a licensed surveyor and lodged in the Lands Titles Office
- Tas** Candidate fees, supplemented by DPIPWE through annual surveyor registration fees
- Vic** Departmental funding, fees associated with Professional Training Agreements and from annual licensed surveyor registration fees, proceeds from disciplinary hearings
- WA** Annual grant support from LANDGATE. Practicing Certificate Renewals Proceeds from disciplinary actions

LR12 *Are the competency standards limited to cadastral survey?*

NZ	Yes – also include legal matters relating to subdivision such as local body consent, etc
ACT	Yes
NSW	No – cadastral and mining surveys
NT	No
Qld	No
SA	No
Tas	Yes – although there is potential through the Surveyors Act 2002 for standards to be set for any survey made for a statutory purpose.
Vic	Yes
WA	No

LR13 *If no to L12, what are they?*

NZ	N/A
ACT	N/A
NSW	Cadastral and mining surveys
NT	Includes engineering and geodetic surveying.
Qld	Board has endorsements for engineering, mining (two categories), consulting. A corporation may be registered as a surveyor.
SA	General registration available in other surveying specialities
Tas	N/A
Vic	N/A
WA	General procedures of surveying. Knowledge of theory. Practical applications. Knowledge, allowance and adjustment of error

LR14 *Does the Board have a formal relationship with Professional Organisations representing surveyors?*

NZ	Only insofar as 2 Board members are nominated by a body/bodies representing licensed cadastral surveyors
ACT	Advisory Committee representatives Surveying & Spatial Sciences Institute (SSSI)
NSW	No formal relationship but a co-operative approach to many matters
NT	Only insofar as 2 Board members are selected from Surveying & Spatial Sciences Institute (NT) nominations
Qld	No
SA	Is a subcommittee of the Institution of Surveyors SA Div Inc
Tas	Yes, as a sub-committee of Institute of Surveyors Australia (Tas).
Vic	Yes, the Act requires 2 licensed surveyors on the Board nominated by the professional body that represents the majority of licensed surveyors in Vic.
WA	Yes – by way of Board membership

LR15 *Does the Board have a formal relationship with Universities?*

NZ	No
ACT	N/A (there is no Board)
NSW	Yes – has an academic member on the Board
NT	No
Qld	No
SA	Yes – has an academic member on the Board
Tas	Yes – the Board accredits the University of Tasmania to provide the undergraduate degree required for candidacy.
Vic	Yes – an academic member on the Board and the Board accredits the two universities that provide the degrees required for candidacy
WA	Yes – has an academic member on the Board

Discipline

D1 Who may bring a complaint before the Board?

NZ	Anyone – including Surveyor-General
ACT	Anyone – to Chief Surveyor as there is not a Board
NSW	Anyone
NT	Anyone
Qld	Anyone
SA	Anyone
Tas	Anyone – complaints are made to the Director of Consumer Affairs
Vic	Anyone
WA	Anyone – including the Board

D2 Can the Board apply fines?

NZ	No– but it can recover cost of a hearing (typically \$2,500) and rectification costs
ACT	No – the Chief Surveyor can suspend but not fine
NSW	Yes
NT	No – only recover rectification costs
Qld	Yes – the Board can apply fines and recover costs of and incidental to the investigation/proceeding
SA	No
Tas	Not the Board – the Director can impose financial penalties and impose limits on practice Yes – Director can impose financial penalties and impose limits on practice
Vic	Yes
WA	No

D3 How many complaints per year on average in recent years?

NZ	Approximately 2
ACT	Approximately 1 (two in past three years)
NSW	6
NT	Less than 1
Qld	Approximately 6
SA	2-3 – the majority of these are resolved through conciliation. Serious complaints may result in formal disciplinary action
Tas	Approximately 2
Vic	7
WA	2

D4 What proportion of complaints are upheld?

NZ	About 80% that proceed to a hearing
ACT	Very few
NSW	About 80%
NT	50%
Qld	The Board seeks to address complaints by communicating with the surveyor and the complainant. 1-2 complaints per year require formal appointment of an investigator, and a proportion of these progress to a formal hearing with a finding against the surveyor (about one every year).
SA	All complaints referred to Court have been upheld, one is currently before the court, first for over 7 years. Approximately 7 between 1992 and 2000, all upheld.
Tas	Unknown
Vic	80% that proceed to a hearing
WA	Some parts of all complaints were upheld

D5 Who prosecutes the complaint?

NZ	Most have been brought and prosecuted by the Surveyor-General but private individuals can prosecute their own complaints
ACT	Surveyor-General via the ACT Civil and Administrative Tribunal
NSW	The Board investigates a complaint then sets a penalty. Appeals will be heard by the Administrative Disputes Tribunal
NT	Surveyor-General
Qld	The Board appoints an independent investigator. The Board prosecutes complaints that can be heard by a Civil and Administrative Tribunal, or by a Professional Conduct Review Panel of Board members
SA	The Board must investigate all complaints raised by the Surveyor-General; and may investigate complaints brought by individuals and if necessary prosecutes through the courts
Tas	Director of Consumer Affairs
Vic	Most have been brought and prosecuted by the Surveyor-General but private individuals can prosecute their own complaints
WA	The Land Surveyors Licensing Board of WA (barrister and solicitor on behalf of the Board in the form of the State Administrative Tribunal). Complaint cannot go direct to the State Administrative Tribunal

D6 Are legal counsel usually involved in the hearings?

NZ	Generally not – but some respondents have engaged legal counsel. The Board has a legal advisor attend the hearings
ACT	Optional – no recent history
NSW	Not usually as there are no hearings
NT	Not usually – but can
Qld	The registrant may be accompanied by a lawyer at either a Professional Conduct Review Panel hearing or a QCAT hearing.
SA	Yes – held in District Court before a Judge
Tas	No
Vic	The legal practitioner on the Board chairs the panel. Legal counsel rarely accompanies either the complainant or the defendant.
WA	Yes

Professional Bodies

PB1 Are there any professional bodies representing cadastral surveyors in the jurisdiction?

NZ	Yes – NZ Institute of Surveyors, Institute of Cadastral Surveying
ACT	Yes – Surveying & Spatial Sciences Institute (ACT)
NSW	Yes – Surveying & Spatial Sciences Institute (NSW) and Australian Institute of Mining Surveyors
NT	Yes – Surveying & Spatial Sciences Institute (NT)
Qld	Yes – Surveying & Spatial Sciences Institute (Qld)
SA	Yes – Surveying & Spatial Sciences Institute (SA)
Tas	Yes – Surveying & Spatial Sciences Institute (Tas) and Institute of Surveyors Australia (Tas)
Vic	Yes – Surveying & Spatial Sciences Institute (Vic) and Institution of Surveyors, Victoria
WA	Yes

PB2 Is membership of a professional body compulsory for a cadastral surveyor?

NZ	No
ACT	No
NSW	No
NT	No
Qld	No
SA	No
Tas	No
Vic	No
WA	No

PB3 Do the professional institutes have a formal statutory role in the management of the cadastre?

NZ	No – except the right to be consulted when the Surveyor-General is setting standards
ACT	No
NSW	No – but they do have a subcommittee on Survey Standards and Legislation to advise members accordingly.
NT	No
Qld	No – but in practice Surveying & Spatial Sciences Institute is consulted when DERM is setting standards.
SA	Yes – through their membership of the Survey Advisory Committee
Tas	No direct role – but have input into cadastral surveyor accreditation, and to the development of survey standards.
Vic	No statutory role - but the profession is consulted in the management of the cadastre
WA	Yes – through membership of the Board

Audit

A1 *Who audits the work of cadastral surveyors?*

NZ	Surveyor-General statutory function (undertaken by LINZ Business and Regulatory Assurance Group on behalf of Surveyor-General)
ACT	Survey Office
NSW	Land and Property Information for cadastral surveys and Industry & Investment Department for mining surveys
NT	Office of the Surveyor-General
Qld	DERM (through plan examination)
SA	Surveyor-General field audits, Registrar General office audits
Tas	Office of the Surveyor-General and routine office examinations are also undertaken by Land Titles Office
Vic	Office of Surveyor-General Vic
WA	Survey Inspection Section

A2 *Are all surveyors field audited within a certain period?*

NZ	No
ACT	Yes – through a targeted program every 1-5 years
NSW	No – there is no set criteria for this however there is a program of random field survey audits. 20% of surveyors audited for Continuing Professional Development compliance
NT	Yes – does not include Units Plans
Qld	No – the Department does not have an audit process that is separate from plan examination, however, 1 in 15 plans that are lodged by accredited surveyors are given a detailed office check, to complement the minimal checking that is done before registration.
SA	Yes – field audit of surveyors at least once every 2 – 3 years
Tas	Yes – through a targeted program every 1-5 years
Vic	Yes – through a targeted program every 1-3 years
WA	No – a sample are field audited every year

A3 *How many years maximum between field audits?*

NZ	N/A
ACT	5 years
NSW	N/A
NT	Base on 10% of plans lodged
Qld	Annually at least one plan by each accredited surveyor must be given a full examination.
SA	Usually 2-3 years could be more if surveyor lodges small numbers of easy surveys
Tas	5 years
Vic	3 years
WA	N/A

A4 *How are surveyors selected for audit?*

NZ	Targeting of firms based on various risk factors – e.g. number of surveys, validation concerns
ACT	Every survey examined, field audit random or based on survey concerns
NSW	Random and targeted – approximately 120 field audits per year. 20% = approximately 200 for Continuing Professional Development Audit.
NT	Random, unless suspicions dictate
Qld	Random, although DERM does have an 'accreditation system' in place for surveyors who can demonstrate high standards (and so only 1 in 15 of their plans are examined in full)
SA	Priority to re-audit those whose last audit was assessed as unsatisfactory
Tas	Based on previous performance and newly accredited surveyors
Vic	Random and targeted
WA	Random and targeted

A5 *How are surveys selected for audit?*

NZ	Mostly targeted as a result of survey validation concerns or other risk factors
ACT	Every survey examined, field audit random or based on survey concerns
NSW	Random and targeted – approximately 120 field audits per year
NT	Random, unless other suspicions dictate
Qld	Random or numerical (every 'nth' one)
SA	From problems identified during plan examination or time from previous audit
Tas	Random selection from surveys lodged with Land Titles Office
Vic	Through the surveyor, size of survey, location of survey and referral from Land Registry (Titles Office)
WA	Random and targeted

A6 *How are the audits conducted?*

NZ	A review of surveyor quality processes to complement field audits
ACT	Desktop examination and field audit
NSW	By registered surveyors from the Department of Lands and Industry & Investment Department
NT	A review of surveyor quality processes to complement field audits
Qld	Detailed Desktop examination of 1 in 15 plans and partial field audit of 1 in 10 plans
SA	Field resurvey and analysis by licensed surveyor, review by Investigating Surveyor, consultation with surveyor, review by sub-committee of the Surveyors Board
Tas	Senior surveyors of the Office of the Surveyor-General undertake field audit and office check. Surveyors are advised of outcomes, given the opportunity to respond, and a final audit classification determined.
Vic	Desktop and field audit by Office of Surveyor-General's licensed surveyor
WA	Inspecting Surveyors complete a field check

- A7** *Do you have a system which results in a lower level of quality checking for plans prepared by surveyors with a record of producing good quality plans? If so, how does it apply?*
- NZ** Yes – a formal risk-based acceptance process is currently used to better target the validation resource to the dataset risk profile. This profile is predicated on the dataset complexity profile and the surveyor profile. The latter being an assessment from past performance including requisitions, Surveyor-General reviews and audits.
- The 'risk' assessment in this process is the compliance risk (ie the likelihood of it being wrong) - rather than the inherent or gross risk of the consequences to the cadastre if it is wrong
- ACT** Not officially – however some surveyors, or surveys in known problem areas, are given more careful scrutiny
- NSW** No
- NT** Yes – in so far as plans lodged by accredited examiner firms only have a cursory examination applied. These firms receive benefits of accelerated approval and no examination fees. Accreditation is reviewed through cursory examination prior to approval and random audit post approval.
- Qld** Yes – surveyors with a consistently good record in relation to plans (low error rates) are accredited. 85% of plans endorsed by accredited surveyors are given a lower level of checking. Endorsed plans are submitted to the department before lodgement, so they can be checked and recorded in departmental systems, thereby reducing delays at lodgement.
- SA** No – treated the same for office all examination. Field audits are often targeted to problems arising out of the office examination process or on surveyors who have a history of poor field audits in the past
- Tas** No – The Land Titles Office examination program does not distinguish between surveyors, although government surveys are not fully examined and some surveyors' work may require greater scrutiny due to frequent errors or poor documentation. The frequency of the Office of the Surveyor-General audits for any particular surveyor is determined by past performance.
- Vic** No – each plan is afforded the same level of checking regardless of the surveyor or his or her record of previous work.
- WA** No – audits are performed on all lodged plans.

Volumes (as at 2008)

V1 *How many surveys (including unit/strata survey plans) are lodged per annum?*

- NZ** Approximately 14000
07/08 15000 (including 1040 flat and unit plans)
08/09 12000 estimated (including 780 flat and unit plans)
- ACT** 246 Average pa (116 deposited plans plus 130 Unit plans)
(average of past 3 years)
- NSW** During 2008;
Deposited Plans = 12654
Strata Plans = 1587
Total = 14241
- NT** Approximately 220 pa (170 Crown/Freehold + 50 Unit/Strata title subdivisions)
- Qld** Approximately 10000 to 11,000 pa. (2007-08 - 11,105)
In addition about two thirds of this number of identification plans are also submitted each year. These are generally not examined or registered but are available to the public.
- SA** Between 5500 and 6000
- Tas** 2008 calendar year
1,723 'registered' plans (ie creating new title boundaries).
In addition approximately 300 re-mark plans of existing boundaries were lodged.
- Vic** Approximately 9600 survey-based dealings (Registered pa by Land Victoria)
8800 subdivisions of freehold land
600 application surveys (also of freehold land) and
200 Crown surveys.
- WA** 4043 (Financial Yr 06-07)
Freehold Deposited Plans = 2648
Crown Deposited Plans = 407
Strata & Survey Strata Plans = 2274
Interest Only Plans = 644

V2 *How many new titles are issued per annum*

NZ	53,500
ACT	1,500 – 3,000
NSW	2008: Lots = 30,438, Strata Lots = 14,769 and Total Lots = 45,207
NT	1,500
Qld	Approximately 55,000
SA	Approximately 22,000 new titles created and 12,000 new allotments
Tas	Approximately 4,000 from survey and 1,000 strata titles.
Vic	56,400 (5 year average)
WA	Approximately 28,500 (20,000 Freehold/8,500 Crown)

Responsibility for Survey Quality

SQ1 Can a licensed cadastral surveyor certify work carried out by another person?

NZ	Yes
ACT	Yes – if under direct supervision
NSW	Yes – if under supervision
NT	Yes – if he or she oversees and directs the survey work to ensure the survey is carried out in accordance with the survey practice directions.
Qld	Yes – but the person must be registered with the Board, but not necessarily with a cadastral endorsement
SA	Yes – if survey is carried out under their supervision
Tas	Yes
Vic	Yes
WA	Yes

SQ2 Is there any restriction of the persons who carry out this work (eg field work)?

NZ	No
ACT	No
NSW	No
NT	No
Qld	Yes – the person carrying out a cadastral survey under the supervision of a cadastral surveyor must be a registered surveyor, surveying graduate or surveying associate
SA	No – must be under the supervision of a licensed surveyor
Tas	No
Vic	Yes – must be authorised/supervised by the licensed surveyor
WA	Yes – must be an Articled Cadet Surveyor

SQ3 What level of direction/supervision/control/oversight is required?

NZ	The work must be under the surveyor's 'direction' – this does not require the surveyor to be physically present to personally supervise field work
ACT	The surveyor shall attend personally on the ground during the making for the survey, and exercise such immediate oversight and direction of the work, as will ensure that the survey is carried out in accordance with the Survey Directions
NSW	Immediate or general supervision depending on the qualification and experience of the person carrying out the work
NT	At licensed surveyor discretion – there is no requirement to disclose supervised staff – the licensed surveyor takes full responsibility.
Qld	The work must be under the surveyor's 'direction' – this does not require the surveyor to be physically present to personally supervise field work. The Board has recently approved a guideline on supervision.
SA	For a graduate – adequate supervision, usually in field at the start but transitioning to office based as the graduate's competence grows. For a non-graduate, both field and office supervision expected.
Tas	Sufficient to ensure all the requirements of the Surveyors Act 2002 (including Survey Directions) and any other relevant standards are met.
Vic	To satisfaction and/or direction of licensed surveyor
WA	Depends on competency

SQ4 *Who initiates the correction of errors in cadastral surveys?*

NZ	Surveyor-General
ACT	Survey office, Registrar General or other surveyor
NSW	The Land and Property Management Authority usually issues a requisition. Errors are often detected by users of surveying information, usually State & Local Government agencies and other surveyors.
NT	In the first instance the Surveyor-General; the Surveyors Board may also direct remedial action.
Qld	Chief Executive or Registrar of Titles (DERM) may ask the responsible cadastral surveyor to correct errors.
SA	Could be the Surveyor-General, Registrar General or surveyor
Tas	Surveyor-General (Although the Surveyors Act 2002 encourages surveyors to resolve differences regarding their surveys prior to involving the Surveyor-General)
Vic	A number of bodies - Surveyor-General, Land Titles Office, other surveyors
WA	Inspecting Surveyors

SQ5 *Who is responsible for the correction of errors found in the work of currently practising surveyors?*

NZ	The surveyor responsible for the error
ACT	The surveyor responsible for the error
NSW	The surveyor responsible for the error
NT	The surveyor responsible for the error
Qld	The surveyor responsible for the error
SA	The surveyor responsible for the error
Tas	The surveyor responsible for the error
Vic	The surveyor responsible for the error
WA	The surveyor responsible for the error

SQ6 *Is there a limitations period for this responsibility, (except, the case of being no longer licensed, death or incapacity)?*

NZ	No
ACT	No
NSW	No
NT	No – responsibility would seem to cease under the Licensed Surveyors Act when the surveyor is removed from the register – untested
Qld	No
SA	No
Tas	No
Vic	No
WA	No

SQ7 *Does the surveyor's employer/survey firm have an accountability?*

NZ	Not under the Cadastral Survey Act – surveyors and employers may have contractual obligations
ACT	No
NSW	Not under the Surveying Act 2002
NT	Not under the Licensed Surveyors Act – however in practice the firm employing the surveyor has always supported corrective action even when the surveyor is no longer employed
Qld	Yes – if the firm is a corporation registered with the Board as a surveyor, with endorsement as a consulting surveyor, and the firm has signed the plan as the surveyor
SA	Implied – if the surveyor has left the firm, the expectation is that the firm will make the correction
Tas	Not through the Surveyors Act 2002, but perhaps as a result of business contract or tort
Vic	Officially no, but morally/practically yes
WA	Officially no, but morally/practically yes

SQ8 *Are cadastral surveyors legally responsible for correcting consequential errors to titles?*

NZ	Debatable
ACT	Debatable
NSW	No – registered surveyors are responsible for correcting any errors they make in their plans – the Land Titles Office will then correct a title if required.
NT	No – licensed surveyor is responsible for correcting errors on plans. Land Registry is responsible for correcting Titles, if appropriate
Qld	No
SA	No – Land Title Office will amend the title at no cost
Tas	No
Vic	No – licensed surveyor is responsible for correcting errors on plans. Land Registry is responsible for correcting Titles, if appropriate
WA	No – licensed surveyor is responsible for correcting errors on plans. Commissioner of Titles is responsible for correcting Titles, if appropriate

SQ9 *Where surveys are corrected that affect titles, are the title records always corrected to match?*

NZ	Only if the owners agree
ACT	Generally yes
NSW	Yes – the survey plan is the title diagram; therefore it will always be corrected
NT	Yes – titles have no title diagram but do reference the survey plan so a correction to the plan effectively corrects the spatial aspects of the title. Registrar General has power to correct the register for such things as area amendments
Qld	Generally yes – the Registrar of Titles has the statutory power to correct registers
SA	Yes
Tas	No – process is through the Land Titles Act 1980, which requires the cooperation of the owners; thus correction of title does not always occur
Vic	No – requires owners consent and positive action by them
WA	Yes

SQ10 *Who is responsible for the correction of errors found in the work of surveyors who are no longer practising?*

- NZ** No one formally although the Crown may pick it up – the Surveyor-General has the power to engage a surveyor to correct the error at the Crown's cost.
- ACT** Government
- NSW** The Surveying Act 2002 has provision for the Surveyor-General to appoint another registered surveyor to correct errors. The plan is then corrected and the corrected plan is available to all users
- NT** Unknown, but a civil claim would seem a logical outcome – pragmatically, government would correct the survey and title, then determine if restitution should be pursued
- Qld** There is no legislated responsibility, but in practical terms it is the State
- SA** Often the firm takes responsibility, government may in some cases, Surveyor-General has the legislative authority but rarely used. When we do not have sufficient information plan/title not corrected but a note added to the title to the effect that a survey is required to resolve anomalies
- Tas** Not specified, but undertaken by the Surveyor-General
- Vic** Not specified – usually the practising licensed surveyors in conjunction with the Crown agency
- WA** Inspecting surveyors and private licensed surveyors

SQ11 *How many surveys requiring a new plan to correct errors are required per annum?*

- NZ** Less than 10
- ACT** Rare
- NSW** Rare – depends on the errors found in plans
- NT** Rare
- Qld** Rare
- SA** Rare
- Tas** About 5
- Vic** Rare
- WA** Rare

Disputes

Dp1 Does any statutory officer (eg, Surveyor-General or equivalent) have the power to consider appeals to resolve disputed or conflicting surveys?

- NZ** No – these may need to be resolved in the courts if the parties cannot agree
- ACT** No – courts to decide
- NSW** Yes – the Registrar General (or his appointee) can make a Boundary Determination to resolve a dispute
- NT** Not with respect to surveys although the opinion of the Surveyor-General on these matters often concludes such disputes. Appeals Tribunal is available for determining appeals on a surveyor's competence
- Qld** Yes – the Chief Executive or the Registrar of Titles (DERM) may take reasonable action to resolve the matter
- SA** No – but may provide advice Surveyor-General has authority to resurvey areas of 'cadastral confusion' but will not use to resolve boundary disputes
- Tas** Yes – Surveyor-General
- Vic** Yes – Surveyor-General
- WA** No

Dp2 Does any statutory officer (eg, Surveyor-General or equivalent) have a responsibility to adjudicate on land status?

- NZ** No – previously the Surveyor-General had this duty/power but it was removed in 2002
- ACT** No – would be asked to give opinion but not statutory authority
- NSW** No – however the opinion of the Surveyor-General on these matters often concludes such disputes
- NT** No – however the opinion of the Surveyor-General on these matters often concludes such disputes
- Qld** No
- SA** No – but may provide advice Surveyor-General has authority to resurvey areas of 'cadastral confusion' but will not use to resolve boundary disputes
- Tas** No – Surveyor-General gives opinion on Crown land status, but this is not a statutory responsibility. Recorder of Titles has statutory powers to determine disputed/erroneous/ unclear status of alienated land
- Vic** Yes – Surveyor-General
- WA** No

Dp3 Are boundary definition errors covered by the government guarantee of title?

- NZ** No – no claim against the Crown has not ever been upheld on these grounds
- ACT** Not tested
- NSW** No – the guarantee on title does not extend to survey measurement or to areas – the surveyor is responsible for all content of the survey
- NT** Unknown – pragmatically, government would correct the survey and title, then determine if restitution should be pursued
- Qld** No
- SA** No
- Tas** No
- Vic** No
- WA** No

Integrated Cadastre

IC1 Is there an integrated cadastre as a repository for all land tenure surveys (e.g. Crown)

NZ	Yes
ACT	Yes
NSW	No – the Integrated Titling System only holds records for land held under the Real Property Act. The Digital Cadastral Data Base only holds records of current land titles. There are many interests in land that are not integrated into a single cadastral system. i.e. mining, aquaculture, easements, licences, telecommunication sites, survey information etc.
NT	Yes – Integrated Land Information System (ILIS)
Qld	Yes
SA	Yes
Tas	No – there is no one spatial index or database for all cadastral surveys. Some surveys are not held or indexed in any database
Vic	No – but progressing towards an integrated cadastre
WA	Yes – Spatial Cadastral Database (SCDB)

IC2 If no to IC1, what other systems exist?

NZ	N/A
ACT	N/A
NSW	N/A
NT	N/A
Qld	N/A
SA	N/A
Tas	There are several spatial or tabular databases indexing and/or delivering Crown and title surveys. Some are publicly available through the Land Information System Tasmania (LIST) web mapping service, some are internal to the Agency.
Vic	Individual/multiple databases within a range of organisations
WA	N/A

IC3 Is there a single registry for all cadastral datasets and title records?

NZ	Yes – administered by Chief Executive Officer of LINZ
ACT	Yes – different databases linked for government access
NSW	No – the three main datasets are the Digital Cadastral Database (DCDB), a plans register and the Torrens Title register
NT	Yes – Integrated Land Information System (ILIS) provides access to land titles (Freehold and Crown) and spatial Digital Cadastral Database (DCDB)
Qld	No
SA	No – Separate but linked registers, all administered in the Land Services Group
Tas	No
Vic	No
WA	Yes – SmartPlan/SmartRegister

IC4 *If no to IC3, what relationships ensure the compatibility of the separate systems?*

NZ	N/A
ACT	N/A
NSW	The three systems are related and rely on each other
NT	N/A
Qld	All registers are managed by DERM who are working towards full integration
SA	Linked through a number of common indices, eg plan/parcel number, valuation number, certificate of title number, Crown lease number etc
Tas	Management of all survey records and datasets and of the Crown estate falls within the responsibilities of the Information and Land Services Division. Actions affecting land status require the responsible party to consult the appropriate information
Vic	The licensing of surveyors, and to a limited extent, Agency relationships; universal adoption of GDA94/MGA94
WA	Both systems are linked and managed by Landgate

IC5 *Are land title records linked to the cadastre?*

NZ	Generally yes – new records always, some old record are not linked
ACT	Yes
NSW	No – only some of the Torrens Title Interests
NT	Yes – by unique parcel identifier (not Lot on Plan)
Qld	Yes – by unique parcel identifier (Lot on Plan)
SA	Yes – through plan/parcel and CT reference
Tas	Yes – title references are held as a parcel attribute.
Vic	Yes
WA	Yes

Tenures

T1 What separate tenure systems are impacted by cadastral surveys?

- NZ** 1 Land transfer (private freehold land)
 2 Maori Land tenure (Maori freehold land)
 3 Crown land (land held by the Crown outside the Land Title system)
- ACT** 1 All ACT land is leasehold – generally 99 year (effectively Torrens freehold)
 2 Crown land surveys infrequent (occasionally for roads etc.)
- NSW** Torrens Title, Crown Estate, Old System Mining, leases from government agencies
- NT** Lands Title Office register of freehold titles (includes Aboriginal Freehold) and Crown leases.
- Qld** 1 Land transfer (private freehold and leasehold land)
 2 Indigenous freehold land tenure (not native title)
 3 Unallocated State land
- SA** Crown, Old System and Freehold land
- Tas** Crown and titled land, with some land remaining at general law having surveyed boundaries.
 Some Crown parcels also require survey.
- Vic** Crown and Freehold
- WA** Freehold and Crown

T2 What system(s) of land transfer title is used?

- NZ** Torrens Title system of registration
- ACT** Torrens Title – lease transfer
- NSW** Torrens Title
- NT** Torrens Title
- Qld** Torrens Title
- SA** Real Property Act (Torrens) for freehold land, Crown Lands Act for Crown, Registration of Deeds Act for Old system
- Tas** Torrens Titles and remnant general law (deeds)
- Vic** Torrens Title System and general law (deeds)
- WA** Torrens Title

T3 Are there remnant parcels of land from prior systems and what are they?

- NZ** Torrens land 'limited as to parcels' and remnant Deeds system lands
- ACT** No
- NSW** There are still remnants of Old System title, plus many forms of Crown Land.
- NT** No – NT does not recognise adverse possession of land
- Qld** There may be remnants of 'old system' land, but none are known
- SA** Some 'old system' land pre-Torrens Title still exists, may be limited to boundaries or ownership
- Tas** There are remnant general law parcels.
- Vic** Yes – General Law Deeds
- WA** Yes – Deeds land not under Transfer of Land Act 1893

T4 *Can remnant systems remain after survey?*

NZ	Yes – ownership issues are unresolved and therefore land considered not part of survey.
ACT	N/A
NSW	Generally No
NT	No
Qld	No
SA	Yes – if they require ownership issues to be resolved
Tas	Yes – the aim is to convert balances to titles under the Land Titles Act 1980 at every opportunity, but this does not always occur.
Vic	Generally no
WA	No

T5 *Who is responsible for the administration of the Land Transfer and remnant registration systems?*

NZ	Registrar General of Land within LINZ under the Land Transfer Act 1952
ACT	Registrar General – different portfolio. Chief Surveyor in Planning, Registrar General in Attorney Generals
NSW	The Land and Property Management Authority plus the relevant government agency – eg National Parks, Industry & Investment Department, Road Traffic Authority, Licences for Crown Land
NT	Registrar General, at Land Titles Office
Qld	Registrar of Titles
SA	Registrar-General
Tas	Recorder of Titles
Vic	Registrar of Titles
WA	Registrar of Titles

T6 *What system of Native/Maori Land title is used?*

NZ	Registration of Maori Freehold title and ownership succession within the Maori Land Court and registration of title in the Land Transfer register
ACT	N/A – several unresolved Native Title Claims
NSW	Torrens Title for land claimed under the NSW Aboriginal Land Claims Act. Federal system for Native Titles in NSW
NT	Aboriginal Freehold – under the Aboriginal Land Rights (NT) Act and Native Title Rights – under the national Native Title Act
Qld	Native title is not a land tenure – there is State land rights legislation that leads to indigenous groups being granted inalienable freehold in certain circumstances.
SA	Native Title not registered in Land Administration System
Tas	Aboriginal lands registered under Land Titles Act 1980
Vic	Native Title is not registered in the Land Administration System
WA	N/A

T7 ***What body is responsible for the registration of Native/Maori Land?***

NZ	Maori Land Court and Registrar General Land
ACT	N/A
NSW	The Department of Lands issues titles for Aboriginal Land Claims
NT	National Native Title Tribunal – however these rights are not as yet adequately reflected in Intergrated Land Information System (ILIS) at this stage.
Qld	Successful native title claims are registered in a register maintained by the National Native Title Tribunal – an independent Commonwealth Government agency. The register is not related to the cadastre. Land granted to aborigines and Torres Strait islanders under state legislation is recorded in the land registry.
SA	National Native Title Tribunal
Tas	N/A
Vic	National Native Title Tribunal
WA	N/A

T8 ***What system of Crown Land registration is used?***

NZ	Crown Land may be held in Land Title titles registered under the Land Title Act, by gazette notice or lease registered in the Land Title system or held by the Crown with no registration.
ACT	Crown land in ACT is not under title – areas are defined for custodianship such as reserves, roads etc
NSW	Crown Land is being progressively identified to enable the general description of the land. It does not have the same indefeasibility of title as it has limitations regarding the definition of it's extent.
NT	Lands Title Office register Crown leases. Also separate database of all Crown Land available in Integrated Land Information System (ILIS)
Qld	All land other than roads and watercourses is recorded in the land registry. Roads and watercourses can be recorded if they are given a description.
SA	Crown Lands Act
Tas	There is no registration system as such. A repository is available for administrative plans. The purpose of the plan is generally enabled by an action under an Act.
Vic	Ad-hoc Crown Records systems in Central Plan Office (Surveyor-General) and Torrens System (Crown leases and restricted Crown Grants)
WA	Torrens Title System

3D Parcels

3D1 *Are 3D parcels catered for in the cadastre?*

NZ	Yes
ACT	Yes – upper and lower level of stratum title held in DCDB as attributes
NSW	Yes – as stratum subdivisions at ground level
NT	Yes – in Units (Strata) Plans and volumetric freehold plans
Qld	Yes
SA	Yes
Tas	Yes – paper-based strata plans
Vic	Yes – noted as multi-level subdivisions in DCDB
WA	Yes

3D2 *Are 3D parcels managed as image data?*

NZ	Yes
ACT	No
NSW	No
NT	Yes
Qld	Yes
SA	Yes
Tas	Yes – as scans of strata plans
Vic	Yes – as scans of hard copy multi level plans
WA	Yes

3D3 *Are 3D parcels able to be managed as digital spatial objects within survey datasets data?*

NZ	No – only as images
ACT	No
NSW	No
NT	No
Qld	No – only as images
SA	No
Tas	No – Strata units managed by planimetric shape and vertical level or height description
Vic	No – only as images of the hard-copy paper plan format
WA	Yes

3D4 *Are 3D parcels able to be managed as digital spatial objects within the integrated cadastre?*

NZ	No – only as images
ACT	No
NSW	Yes, they can be
NT	No
Qld	No – only as images (show footprint only)
SA	No – only as image, approximate building footprint shown in DCDB
Tas	No
Vic	No
WA	Yes

3D5 *Is any automated validation of 3D parcels possible to ensure no overlaps?*

NZ	No
ACT	No
NSW	Yes, but this is not possible in the current data held in the DCDB
NT	No
Qld	No
SA	No
Tas	No
Vic	No
WA	No

3D6 *Are there any constraints on the geometric shapes of 3D parcels?*

NZ	No – if bounded by physical structures and depicted on plan images. If not on structures, then the boundaries must be planes bounded by right lines, arcs or irregular natural boundaries
ACT	No– if bounded by physical structures and depicted on plan images. If not on structures, then the boundaries must be planes bounded by right lines, arcs or irregular natural boundaries
NSW	No – provided an unambiguous description is possible
NT	No
Qld	The surfaces of volumetric parcels can be any shape that can be described mathematically. There is no restriction on the shape of building format parcels that are bounded by the structural elements (floors, walls and ceiling) of the building.
SA	No – provided an unambiguous description is possible
Tas	No – provided an unambiguous description is possible
Vic	No
WA	No

3D7 *Are strata parcels (eg tunnels, bridges, corridors) managed spatially?*

NZ	Yes – but not well managed. The overlap with other parcels is depicted
ACT	Not really – simply shown as overlapping parcel
NSW	Partially – only managed at ground level at present.
NT	No
Qld	Yes – a 3D volumetric parcel can be created.
SA	Sometimes – if have Australia Height Datum information
Tas	No
Vic	Yes – within a hard-copy plan format, but not in a digital sense
WA	Yes

Public Rights (eg access)

R-P1 *Are public rights over land recorded in the spatial cadastral database?*

- NZ** Yes and No – reserves may be labelled as such but walkways and marginal strips may only be found by referring to supporting plans and titles
- ACT** Generally Yes –reserves walk ways and easements however not all
- NSW** No – only those for which a title has issued
- NT** Only in so far as public roads, reserves and the like are shown
- Qld** Public land is recorded in the land registry. Where a public access easement exists over private land (freehold or leasehold) and the easement is surveyed, it is recorded in the spatial cadastral database
- SA** Partially – surveyed roads and reserves record is not complete as a number of roads in the outback have no spatial definition
- Tas** Yes – but the record is incomplete.
- Vic** Partially – roads/reserves etc
- WA** Yes

R-P2 *Are all parcels subject to public rights defined by survey?*

- NZ** No – exceptions are marginal strips which are explicitly not required to be surveyed
- ACT** No – areas such as roads within Territory land not surveyed. Division boundaries and holding leases not surveyed.
- NSW** Generally No – many are defined/described by a notice the Government Gazette requiring no survey.
- NT** No – for example many public roads through pastoral properties are not formally surveyed.
- Qld** No
- SA** Partially – the majority would be, but in some instances land can still be subdivided without survey.
- Tas** No – many rights are based on administrative plans that are created from spatial data other than cadastral survey
- Vic** No
- WA** No

Secondary Rights

R-S1 Are secondary spatial rights (easements and covenants) recorded in the spatial cadastral database?

NZ	New and historic secondary right parcels captured by recent surveys are in the database. Other secondary interest parcels may only be found from supporting plans
ACT	Generally Yes, but not always
NSW	Only the large public Infrastructure easements are shown in the Digital Cadastral Database (DCDB)
NT	No – easements are captured in the SPICAD Development database (numeric cadastre) but have not been transferred to the Digital Cadastral Database because of incomplete coverage. Some Mining and Administrative Leases are shown
Qld	Yes
SA	No – but are shown on survey plans and title diagrams
Tas	Yes – but not comprehensively. The spatial cadastral database is linked directly to the title which describes the easements and covenants.
Vic	In some circumstances easements are shown but not in all cases. Covenants are not recorded
WA	Yes – new easements recorded since 2000. Major infrastructure corridors being captured.

R-S2 Where secondary rights are managed spatially, are overlaps and topology constraints managed?

NZ	Yes
ACT	Yes
NSW	Yes
NT	Yes
Qld	Manually
SA	N/A
Tas	Yes
Vic	No
WA	Yes

Building-Based Parcels (flats, units)

BP1 *Are building based parcels recorded in the spatial cadastral database?*

- NZ** No – reference must be made to supporting graphical plans
- ACT** Yes – Unit subdivisions (non-stratum)
No – Stratum
- NSW** No – only referenced to base parcel
- NT** No – only referenced to the parent parcel
- Qld** No – reference must be made to supporting graphical plans
- SA** Yes approximate shape of building extracted from plans and recorded in digital form in the Property (Valuation) Cadastre
- Tas** Yes – as part of a strata plan
- Vic** Yes – at ground level only. For levels above ground, detail is provided by graphical means on hard-copy plans
- WA** No – only referenced to base parcel, no building footprints

BP2 *Are there plans to make building based parcels visible in the cadastre?*

- NZ** Not yet
- ACT** Not currently for stratum
- NSW** No – but there should be
- NT** No
- Qld** Not yet
- SA** Do show building outlines etc
- Tas** They are, but only in plan view
- Vic** Preliminary investigations are being made with respect to showing layers of Crown land in 3D and this may be exported to the freehold system.
- WA** No

Survey Control and Geodetic Datum

SC1 *Is the national (or State) survey control system and/or geodetic system integrated with the survey cadastre?*

NZ	Yes
ACT	Yes
NSW	Yes – 80% of all new Surveys use the established survey control network
NT	Yes – Coordinates can be shown on Survey Plans and all cadastral surveys are coordinated through SPICAD Development database
Qld	Yes
SA	Yes
Tas	Yes
Vic	Yes
WA	Yes

SC2 *Who sets the standards for the control systems?*

NZ	Surveyor-General
ACT	Chief Surveyor, Survey Office
NSW	Surveyor-General
NT	Office of the Surveyor-General using ICSM standards
Qld	Chief Executive, DERM
SA	Surveyor-General but accepts national ICSM standard
Tas	Surveyor-General
Vic	Surveyor-General, but specifies ICSM SP1
WA	Landgate (utilising National Standards)

SC3 *Is geodetic data integrated with the cadastral database?*

NZ	Yes
ACT	Yes
NSW	Yes
NT	Yes – most areas have GDA94 coordinates. All cadastral surveys are coordinated in the SPICAD Development database
Qld	Minimal (see SC1)
SA	Yes - Coordinates and related details of all survey marks placed in the State is stored in the Survey Database. The Digital Cadastral Database provides a graphical index to show spatially the position of the mark.
Tas	No – they form two separate data bases. However, both are spatially accessible through Land Information System Tasmania (LIST) web mapping service
Vic	In part
WA	Separate database with linkage

SC4 *Are geodetic marks generally required to be connected to the cadastre?*

- NZ** Yes – for most geodetic marks (except highest order control)
- ACT** Yes
- NSW** Yes – at least 2 Permanent Marks for every survey
- NT** Yes
- Qld** Only where practical
- SA** **Yes** - If surveys in Designated Survey Areas (DSAs), all cadastral marks are also geodetic. Outside Designated Survey Areas usually connected to if adjacent to land surveyed
- Tas** Yes
- Vic** No – but the converse applies ie cadastral surveys are to be connected to the local geodetic control.
- WA** Yes

SC5 *What proportion of new surveys are oriented in terms of geodetic datum?*

- NZ** Approximately 98%
- ACT** 100%
- NSW** About 80% of new surveys are oriented to the geodetic datum
- NT** 75%
- Qld** Cadastral surveys are required to be connected to permanent marks, but a significant proportion of these marks are not coordinated
- SA** Approximately 20% of total cadastre, but probably 95% of current surveys lodged
- Tas** All cadastral surveys made since 1/1/05. Prior to that, it was on a sporadic basis. In total, very approximately 4% of all surveys held by the Information and Land Services Division
- Vic** It is estimated that 50% of modern surveys are connected to the geodetic datum
- WA** 30-40%

Parcel Geometry & Topology

PG1 Are there constraints on the lines that can be used to define cadastral parcels?

NZ	Yes – only right lines and circular arcs for non-natural boundaries
ACT	Not stated – right lines and circular arcs used
NSW	No constraints – there must be no overlaps of titles
NT	No new curved boundaries are allowed. Irregular boundaries can be digitised polylines
Qld	No
SA	No – mainly right lines but do use curvilinear lines extracted from topographic data to show High Water Mark and Closure Lines of river boundaries
Tas	Right lines only
Vic	No
WA	No

PG2 Is parcel topology actively managed to avoid gaps and overlaps in the cadastre?

NZ	Yes
ACT	Yes
NSW	Yes – there are no gaps or overlaps allowed due to strict topology rules in the DCDB
NT	Yes
Qld	Yes
SA	Yes
Tas	Yes
Vic	Yes
WA	Yes

PG3 Are there any voids in the digital spatial cadastre (eg roads, rivers, lakes, etc)?

NZ	No
ACT	No
NSW	Yes – there are many, however, they are still held as features within the DCDB
NT	Yes – roads, rivers, lakes
Qld	No
SA	Yes – roads
Tas	Yes – unidentified parcels of Crown land
Vic	Yes – roads, railways, reservoirs etc currently a back capture project)
WA	Yes – roads (as a back capture project)

Local Authorities

LA1 Do Local Authorities have responsibility for or input into the Digital Cadastral Database record (other than planning approval)?

NZ	Yes
ACT	N/A
NSW	No
NT	No
Qld	No
SA	Yes
Tas	Yes
Vic	Yes
WA	Yes

LA2 If so, what is their responsibility and input?

NZ	They provide street address data
ACT	N/A
NSW	They provide street address data
NT	N/A
Qld	They provide street address data but it is not included in the DCDC
SA	They provide street address data, but it is not included in the Digital Cadastral Database
Tas	Some local councils contribute to maintenance of the spatial cadastre. All councils are responsible for the sealing of plans that form the basis for subdivision of the cadastre and the naming of streets within proclaimed towns
Vic	Within Geographic Names context; Certification of documents that create cadastral records; parcel location and size (geographical) and street address
WA	They provide street address data

Coordinates

C1 Is the integrated cadastre a legal coordinated cadastre?

NZ	No
ACT	No
NSW	No
NT	No – not at this stage
Qld	No
SA	No
Tas	No
Vic	No – it is neither a legal coordinated cadastre nor spatially accurate cadastre
WA	No

C2 If not, how is spatial integrity maintained?

NZ	By connection to existing marks in the database and provision of vector relationships to new marks and boundary points. Least squares adjustment of new and affected boundary points after survey approval.
ACT	The majority of the cadastre is designed on accurate and dense control network. The survey marks are placed based on the coordinated design. Older areas are being adjusted to fit more accurate control.
NSW	Spatial integrity is maintained by having all plans connected to the coordination network. Plus all Lots must close. The misclosure limit is 15mm + 100 ppm.
NT	By connection with adjacent cadastre and/or geodetic infrastructure
Qld	New surveys are entered into the DCDB, and are generally distorted to fit the existing framework.
SA	Through connection to previously placed reference marks, many of which have coordinates
Tas	All surveys are coordinated on the Map Grid of Australia (MGA). All surveys are entered to the spatial cadastral database within Information and Land Services Division or by the relevant council.
Vic	Partially by geographic position from geodetic connection and partially by relationships to adjoining parcels that exist within the map base
WA	Raw observations and Least Square adjusted

C3 Are surveyors required to provide coordinates in terms of an official datum?

NZ	No
ACT	Yes – however it is a local datum based on AGD spheroid
NSW	Yes – Surveyors must state the coordinates, accuracy and origin of all permanent marks found or placed
NT	No – but often do where long boundaries are fixed by coordinates and intermediate lines are calculated
Qld	No
SA	No – but if place new reference marks, Permanent Survey Marks (PSMs) in a Designated Survey Areas (DSA) are required to provide adequate measurement to enable the PSMs to be coordinated by the Surveyor-General.
Tas	Yes
Vic	In most circumstances
WA	No

C4 *If not, what do they provide to maintain spatial relationships?*

NZ	Connections to existing marks in the database and provision of vector relationships to new marks and boundary points
ACT	N/A
NSW	N/A
NT	By connection with adjacent cadastre and/or geodetic infrastructure
Qld	Connections to existing marks in the database and provision of vector relationships to new marks and boundary points
SA	Connections to previous surveys through the best available physical evidence
Tas	N/A
Vic	Legal abuttals
WA	Connections from the Geodetic control Network and then connections into the cadastre

Boundary Marks

BM1 Are boundary points demarcated, and how?

- NZ** Yes – types of boundary markers are prescribed in the Surveyor-General Rules.
- ACT** Yes – generally with pegs of prescribed dimension
- NSW** Yes – usually by wooden pegs. If not a peg, the details must be stated
- NT** Yes – survey marks. Pegs can be wooden, plastic, 600mm steel star irons or concrete posts
- Qld** Yes – types of boundary markers are prescribed in *DERM Cadastral Survey Requirements*
- SA** Yes – there is an expectation that newly created boundaries marked with survey pegs these are not always defined on a certified survey as in some instances can subdivide one block into two on a data plan
- Tas** Yes – The Surveyors Regulations 2003 prescribe the types of marks to be used
- Vic** Yes – by pegs or other marks as authorised by the Surveyor-General
- WA** Yes – by standard survey marks

BM2 If boundary points are not marked, how are they referenced for future re-instatement?

- NZ** Proposed Rules will require witness marks and vector relationships when boundary points are not marked
- ACT** If a boundary mark is not placed a reference mark must be placed
- NSW** The Regulation requires that if a boundary mark is not placed a reference mark must be placed
- NT** Reference marks are also placed – iron spikes, drill holes, brass plaque in concrete (a Coordinated Control Reference Mark or CRM), star iron to refusal
- Qld** Sufficient reference marks must be placed to enable re-instatement.
- SA** Referenced from Permanent Survey Marks (PSMs) and other reference marks placed on a certified survey. No referencing on data divisions
- Tas** Line marks and sufficient additional referencing is required
- Vic** By reference to permanent marks, primary cadastral marks and/or other reference marks/survey monuments
- WA** The Regulation requires that if a boundary mark is not placed a reference mark must be placed

BM3 Is a survey required to be lodged whenever a boundary point is marked/pegged?

- NZ** Yes – In terms of the Rules
- ACT** No – not for idents/peg-outs (optional but rarely done)
- NSW** No – only on plans if redefinition, consolidation or subdivision surveys. Peg-outs and Idents are performed for the client and not plan is lodged.
- NT** No – only subdivisions and consolidations
- Qld** Connection to reference marks, permanent survey marks, or other cadastral corners
- SA** only if required by legislation, eg land division, outer boundary survey for a community plan or subdivision. Not if an ‘identification survey’ for fencing etc
- Tas** Yes – it is mandated by the Survey Directions.
- Vic** Yes
- WA** Yes

BM4 *If yes to BM3, is this requirement generally complied with where a subdivision is not involved?*

NZ	Compliance is low
ACT	N/A
NSW	N/A
NT	N/A
Qld	Yes
SA	Legislation only requires new boundaries to be pegged. In other cases client requirements dictate if pegs placed or not
Tas	There are no authoritative figures, but compliance appears to be reasonable.
Vic	Unable to be precise about this but the compliance would be greater than 50%
WA	Yes

Reference Marks

RM1 Are reference marks required on every survey to support reinstatement of boundaries?

NZ	Yes
ACT	Yes
NSW	Yes – the Surveying Regulation requires reference marks for all surveys
NT	Yes
Qld	Yes
SA	Yes
Tas	Yes
Vic	Yes
WA	Yes

RM2 How many?

NZ	3
ACT	2 minimum and not less than 200 metres apart
NSW	Generally two per parcel
NT	Usually 2 at major corners
Qld	Sufficient to facilitate future reinstatement; at least 2 must be permanent marks.
SA	In Designated Survey Areas minimum of 3 coordinated survey marks, outside Designated Survey Areas, a minimum of 2 permanent survey marks must be placed or connected to.
Tas	3
Vic	Varies depending on the size of the survey – lot numbers
WA	Minimum of 3 control marks

RM3 How far from boundary?

NZ	125 metres urban, 250 metres rural
ACT	25 metres
NSW	Must be less than 30 meters from a corner
NT	Within 20 metres
Qld	Practical
SA	In a safe location, less than 3m if new mark required to be placed
Tas	Preferably within 10 metres of the corner being referenced
Vic	Not stipulated
WA	Minimum of 100 metres (metro), minimum of 250 metres (rural)

RM4 Are measurement to boundary required on survey?

NZ	Yes
ACT	Yes
NSW	Yes
NT	Yes
Qld	Yes
SA	All reference marks must be connected to a boundary
Tas	Yes
Vic	Yes
WA	Yes

RM5 *Are reference marks shown in cadastral database?*

NZ	Yes
ACT	Yes – coordinated marks only
NSW	No – but they can be.
NT	No
Qld	No
SA	Yes – Permanent Survey Marks (PSMs) in Survey Data Base (SDB)
Tas	No – only on the survey notes of the particular survey
Vic	In image form only, not in digital form
WA	Control points are shown

RM6 *Are reference marks required in the spatial cadastral database?*

NZ	Yes
ACT	Yes – Coordinated Control Reference Marks (CRMs) but not all reference marks
NSW	Not at this stage – the cadastral model caters for them, but not populated at present. 2 of the Permanent Marks (PMs) are shown.
NT	No – geodetic quality control marks are stored in NT Geodetic Survey System (NTGSS)
Qld	No although they are shown on survey plans
SA	Yes each Permanent Survey Marks (PSMs) mark is uniquely numbered and stored in the Survey Database (SDB)
Tas	No
Vic	No – specific cadastral and geodetic marks are stored in Vic Survey Marks Enquiry Service (SMES) database
WA	No

RM7 *If yes to RM6, how are they provided?*

NZ	Provided as part of the submitting surveyor's dataset
ACT	As part of the cadastral survey
NSW	N/A
NT	N/A
Qld	No although they are shown on survey plans
SA	New Permanent Survey Marks (PSMs) reference marks are added to the Survey Database at the time of plan examination in the Lands Titles Office. If in a Designated Survey Areas, geodetic coordinates determined later and stored in Survey Database. If outside, scaled coordinates determined for mark to enable it to be correctly referenced in the Digital Cadastral Database (DCDB).
Tas	N/A
Vic	N/A
WA	Fieldbook (digital file or conventionally captured)

RM8 *If no to RM6, how can they be located?*

NZ	N/A
ACT	N/A
NSW	Shown on survey plans
NT	Via survey plan or the NT Geodetic Survey System (NTGSS)
Qld	Shown on survey plans
SA	N/A
Tas	Shown on survey plans
Vic	From survey documentation lodged with Land Victoria (Titles Office or OSGV)
WA	Located in GESMAR (Geodetic Survey Mark Register) Database or Field Books

Field Data

FD1 *Is raw field data required to be submitted?*

NZ	No – but must be available to the Surveyor-General upon request.
ACT	No – but must be available to the Surveyor-General upon request
NSW	No
NT	Yes
Qld	No
SA	No
Tas	No
Vic	No – but must be available to the Surveyor-General upon request
WA	Yes

FD2 *If yes, in what form?*

NZ	N/A
ACT	N/A
NSW	N/A
NT	Field notes in digital or analogue format
Qld	N/A
SA	N/A
Tas	N/A
Vic	N/A
WA	Digital and analogue

Reduced Observation Data

RO1 *Is reduced observation data required to be submitted to the cadastre?*

NZ	Yes
ACT	No
NSW	All distances are horizontal ground distances usually using an MGA orientation.
NT	Yes – if observed and recorded in Field Book. Survey plans show final reduced or adjusted dimensions
Qld	No
SA	No – only as it is shown on the survey plan
Tas	Not to the spatial cadastral database. Only boundaries are entered to the spatial cadastral database. It is required in the form of paper-based survey notes.
Vic	Yes – Office compiled abstracts of field records and surveyor's reports to be submitted with survey plans for cadastral examination.
WA	Yes

RO2 *If not, is it available for audit purposes or to later surveyors?*

NZ	N/A
ACT	No
NSW	No
NT	N/A
Qld	N/A
SA	Yes – for audit only if called for
Tas	Yes – via paper-based survey notes
Vic	N/A
WA	N/A

Accuracy Standards (as at 2008)

AS1 *Positional accuracy (metres) in relation to reference marks, CBD, Residential, Peri-urban, Rural, Remote*

NZ CBD: 0.030
 Res: 0.030
 Per: 0.060
 Rur: 0.130
 Rem: 0.130 (or more by dispensation)

ACT Distance Accuracy < 6 mm + 30 ppm at 95%
 Angular Misclose < 20 second + 10√n.
 Misclosure < 15 mm + 100 ppm

NSW Distance Accuracy < 10 mm + 15 ppm at 67%
 Angular Misclose < 20 second + 10√n
 Misclosure < 15 mm + 100 ppm.

NT Error Circle
 CBD: 1 0.015
 Res: 10 0.015
 Per: 100 0.022
 Rur: 1000 0.075
 Rem: 10,000 0.750

Qld Queensland does not have positional accuracy as a classification. However, all surveyed lines (including connections to reference marks) must have a vector accuracy of 10 millimeters + 50 ppm.

SA CBD: 0.02
 Res: 0.05
 Per: 0.15
 Rur: 0.15
 Rem: 0.15 (more by request)

Tas 0.025 or 1:10,000 (whichever is greater) applies to all surveyed vectors

Vic N/A – no positional accuracy standard - have misclose vector standards based on topography.

WA In WA examples of individual results for the propagation of circular errors for the lowest order surveys are as follows

CBD: 0.011
 Res: 0.011
 Per: 0.031
 Rur: 0.080
 Rem: 0.700

AS2 Measurement accuracy (metres in length & metres in transverse direction) over 1m, 10m, 100m, 1,000m, 10,000m

NZ	1m:	0.020 & 0.020		
	10m:	0.021 & 0.021		
	100m:	0.030 & 0.030		
	1,000m:	0.120 & 0.120		
	10,000m:	1.020 & 1.020		
ACT	1m:	0.006		
	10m:	0.006		
	100m:	0.009		
	1,000m:	0.036		
	10,000m:	0.306		
NSW	1m:	0.010		
	10m:	0.010		
	100m:	0.0115		
	1,000m:	0.025		
	10,000m:	0.160		
NT	Misclose	50"/Angle	Min	Max
	1m:	0.000	0.010	0.010
	10m:	0.002	0.011	0.013
	100m:	0.024	0.020	0.038
	1,000m:	0.2	0.110	0.296
	10,000m:	2.420	1.010	2.867

Qld	1m:	0.007 & 0.007	
	10m:	0.007 & 0.007	
	100m:	0.011 & 0.011	
	1,000m:	0.042 & 0.042	
	10,000m:	0.360 & 0.360	

The above values are for an individual observation by a surveyor.

- SA** (a) on surveys in the Adelaide City Core District: 0.02 metres plus one part in 15 000
 (b) on surveys in Commercial and Adelaide City Frame and Residential Districts: 0.02 metres plus 1 part in 10 000
 (c) on urban surveys: 0.03 metres plus one part in 10 000
 (d) on rural surveys: 0.10 metres plus one part in 5 000

Tas 0.025 or 1:10,000 (whichever is greater) applies to all surveyed vectors

Vic	1m:	0.000 & 0.001	
	10m:	0.001 & 0.006	
	100m:	0.010 & 0.025	
	1,000m:	0.025 & 0.025	
	10,000m:	0.025 & 0.025	

WA The linear misclosure in a survey should not exceed the following

For Urban Surveys

0.02m or 1:12000 of the perimeter, whichever is the greater provided that if the surround includes existing surveys and if the new work is proven then a misclosure of up to 1:6000 may be accepted

For Rural surveys

0.04m or 1:6000 of the perimeter whichever is the greater provided that if the surround includes existing surveys and if the new work is proven then a misclosure of up to 1:4000 may be accepted, or greater in the case of surveys before 1910

Survey Plans

SP1 ***When a title survey is completed, is the survey data required to be submitted***

NZ	Yes
ACT	Yes – prior to survey
NSW	Not all data is submitted – only a plan summarising the measurements is submitted
NT	Yes
Qld	No data other than what is shown on the plan (dimensions of boundaries of subject land and other reinstated or surveyed lines), supplemented by 'field records' which these days are generally a report or other material supporting the survey (field observations are not submitted)
SA	Yes - Survey plan provides data from which a title diagram is created. Electronic data not provided by surveyor but determined in-house as part of the plan examination process
Tas	Yes – in the form of paper-based survey notes
Vic	Yes – in the form of paper-based documents, hard copy or pdf
WA	Yes

SP2 ***If not, is this data available for audit or to later surveyors?***

NZ	N/A
ACT	N/A
NSW	No
NT	N/A
Qld	No
SA	N/A
Tas	N/A
Vic	N/A
WA	N/A

Digital Lodgement

DL1 Can survey data/ boundary data be digitally submitted?

NZ	Yes – it is mandatory to do so.
ACT	Yes – design digitally and survey plan as .pdf
NSW	Yes – in the form of images i.e. plan image. Soon E-Plan lodgement.
NT	No
Qld	No – but is under development
SA	Yes
Tas	Only very limited survey data relating to forestry rights.
Vic	Yes – but as imaged data in pdf format
WA	Yes

DL2 Is this in the form of images only, structured data only or a combination of images and structured data?

NZ	A combination of structured data (required); plan images (generated from structured data) and other document images provided by surveyor
ACT	Survey plans as images only although surveyors are obliged to supply coordinates of subdivision
NSW	Images only
NT	N/A
Qld	Image only at present
SA	Image only
Tas	Combination of structured and image data
Vic	Imaged data
WA	Combination

GPS

GPS1 Are GPS determinations of boundary dimensions accepted into the cadastre?

NZ	Yes
ACT	Yes
NSW	Yes
NT	Yes – with prior approval of the Surveyor-General.
Qld	Yes
SA	Yes
Tas	Yes
Vic	Yes
WA	Yes

GPS2 What proportion of cadastral surveys use GPS?

NZ	10-15% (mainly outside urban areas - rural only upwards of 25%)
ACT	Very few
NSW	Approximately 10% – most rural surveys use GPS in some form.
NT	Approximately 20%
Qld	Unknown
SA	Unknown but would expect most rural surveys to be done with GPS
Tas	Undetermined. Currently a low base, but appears to be increasing.
Vic	Approximately 10%
WA	10-20%

GPS3 Is GPS data required to be presented in a different form from conventional data?

NZ	No
ACT	No
NSW	Yes – lines that are measured by GPS must be noted on the plan.
NT	Raw and processed data is required to be lodged. Reduced ground level data is shown on survey plans
Qld	No
SA	No
Tas	No
Vic	Yes – field records of Surveyors Report to depict/note GPS data
WA	No

GPS4 *Are there any constraints or special requirements for GPS survey technology?*

NZ	No
ACT	No
NSW	The Surveying Regulation 2006 has special requirements. Must connect from established Permanent Marks to verify system was operating correctly
NT	Survey Practice Directions must be adhered to and can normally be satisfied by ambiguity resolved independent redundant solutions
Qld	No – surveyors are expected to be satisfied that the measurement technique they are using meets the accuracy specifications
SA	No
Tas	No – surveyors are required to ensure that the survey method is appropriate to produce the outcomes prescribed.
Vic	No – compliance with the relevant legislation is as applicable to GPS surveys as 'conventional surveys. Under legislation, it is the responsibility of surveyors to prove legal traceability if required by the courts to do so
WA	No – up to the surveyor's professionalism

Other New Survey Technology

O1 Are Survey Rules/Regulations enabling for any future new technology?

NZ	Yes – provided that technology can meet the integrity needs of the cadastre
ACT	No – not specifically excluded
NSW	Yes – generally the regulations stipulates an outcome from a survey, not how it is performed
NT	Yes – potentially, any technology can be applied if accuracy and closure limits can be proved
Qld	Yes – provided that technology can meet the integrity needs of the cadastre
SA	Yes – regulations are technology agnostic
Tas	Yes – in terms of field survey the Survey Directions are technology independent
Vic	Yes
WA	Yes

O2 Are there any constraints or special requirements for non-traditional survey technology?

NZ	No
ACT	Yes – Would need to maintain accuracy of cadastre
NSW	Yes – Accuracy standards using GPS data were difficult to obtain so the standard was slackened. Must use Map Grid Australia and established network.
NT	No
Qld	No
SA	Yes – must meet the accuracy requirements set by the Surveyor-General
Tas	Non mandated
Vic	No
WA	Yes

Surveyor-Software

(computation, validation, dataset preparation)

Sw1 *Do survey firms use private sector software or government provided software?*

- NZ** Both – most survey firms have private sector supplied software but Landonline also provides tools for survey data capture and validation
- ACT** Private
- NSW** Private sector
- NT** Private – government cadastral coordination contracts must use Association of Consulting Surveyors surveying software package.(ACS) or GeoCadastre software
- Qld** Private sector
- SA** Both
- Tas** Private sector
- Vic** Private
- WA** Both

Sw2 *Are most surveyor software packages integrated with software for other surveyor activities (subdivision design, engineering set out, etc)?*

- NZ** Yes for private sector software
No for Landonline capture software, except insofar as LandXML extracts are available from the cadastre.
- ACT** Yes
- NSW** Yes
- NT** Yes
- Qld** Generally Yes
- SA** Yes
- Tas** Yes
- Vic** Yes
- WA** Yes

Survey Records (paper/images)

SR1 *Are existing survey records available for searching?*

NZ	Yes
ACT	Yes
NSW	Yes
NT	Yes
Qld	Yes
SA	Yes
Tas	Yes
Vic	Yes
WA	Yes

SR2 *In what form are they available?*

NZ	All prior survey plans are available as digital images at a surveyor's desktop if they hold a Landonline license. Supplementary information is available in hard copy upon request.
ACT	Digital image
NSW	Digital Images or database reports
NT	Field book and original survey plan – original survey plans are imaged and available online free through Integrated Land Information System (ILIS) or NT Atlas.
Qld	Digital images
SA	TIFF Images available on-line
Tas	Many are available via the Land Information System Tasmania (LIST) as images while a substantial portion remains limited to paper-based access over the counter or by mail
Vic	Paper, scanned images most are on-line
WA	.PDF

Integrated Cadastre (DCDB) (Digital Cadastral Database)

IC-D1 What roles does the DCDB (integrated spatial cadastral data) play?

NZ	Index to survey data, spatial view of parcels, electoral boundary determination, survey validation by surveyors and LINZ (survey accurate digital cadastral areas)
ACT	Base for mapping and public notification of development, street addressing, spatial view of parcels, electoral boundary determination, survey validation, management of leases and licences
NSW	The Digital Cadastral Database (DCDB) provides an index of cadastral data of current Torrens Titles, Crown land, some Easements, Old System Land, Crown Departmental plans, land valuations and property boundaries. Also an array of Administrative Layers to name a few.
NT	Fundamental basis for spatial land administration in the NT
Qld	Spatial representation of property boundaries and related property descriptions – contains lot on plan description, areas, tenure, road and street names, local govt names etc.
SA	Spatial index, mapping tool
Tas	The spatial cadastral database primarily forms a spatial index that links to survey plans, title and valuation information. It also forms the basis for many administrative plans and spatial layers. It provides a spatial base for local government GIS
Vic	Parcels index and base for other data sets, spatial view of parcels
WA	Cadastral framework for the State

IC-D2 Are a proportion of DCDB coordinates survey accurate (sufficient to assist in boundary survey and validation)?

NZ	Yes
ACT	Yes
NSW	A small percentage of new plans are held with survey accurate coordinates
NT	No – survey accurate cadastral coordinates are still maintained 'off line' in the SPICAD development data base
Qld	No – those that are accurate are not managed in a way that would assure their continued accuracy (i.e. not held on the surveyed coordinates)
SA	Yes tend to be large subdivisions in Designated Survey Areas but unlikely to be of sufficient rigor for survey validation at this stage
Tas	Yes – the spatial cadastral database is not used for boundary validation other than as an approximate identifier).
Vic	Yes – but legislation does not permit these to be used for boundary survey or validation
WA	Yes

IC-D3 *What proportion of survey parcels have survey accurate coordinates?*

NZ	Approximately 70%
ACT	Approximately 95%
NSW	Approximately 3%
NT	Nil in the DCDB – 75% in the developmental SPICAD database
Qld	Low
SA	Approximately 19% of parcels have surveyed bearings and distances captured that can, be coordinated as they are in Designated Survey Areas
Tas	Approximately 5%. – the availability of survey accurate coordinated boundary data was severely limited until the introduction of mandatory coordination of cadastral surveys in 2005
Vic	Approximately 5%
WA	93%

IC-D4 *Are boundary coordinates updated as more accurate information becomes available?*

NZ	Yes
ACT	No – surveys and DCDB must agree within tolerances
NSW	Yes – there is an active program of upgrading the DCDB to improve accuracy
NT	Only in areas where maintaining existing associativity is not critical, new data however is always input to the SPICAD development database
Qld	Yes
SA	Yes – if clients require improved spatial accuracy and there is adequate control or quality imagery available
Tas	Yes
Vic	Yes – within the metadata, but this is not automatically included in the DCDB
WA	Yes

IC-D5 *If no to IC-D4, what is the constraint to improving coordinate accuracy?*

NZ	N/A
ACT	Requires a new survey to improve coordinates
NSW	N/A
NT	Refer to answer for IC-D4
Qld	Nil as part of the DCDB update process. Separately, there are DCDB upgrade projects carried out, often in cooperation with local governments
SA	N/A
Tas	N/A
Vic	N/A
WA	N/A

IC-D6 *If yes to IC-D4, are the historical coordinates retained?*

NZ	Yes
ACT	N/A
NSW	Everything is now retained
NT	Yes
Qld	The DCDB records point movements, so it would be possible to determine the previous DCDB coordinates of any cadastral corner
SA	Yes
Tas	Yes
Vic	N/A
WA	No

IC-D7 *Is the DCDB available directly online to the public?*

NZ	Not from LINZ – only to Landonline license holders. Some 3rd party on-line provision of LINZ data.
ACT	Yes – via web mapping facility (ACTMAP) as view only
NSW	Yes
NT	Yes – to view a digital data license agreement is required for vector data
Qld	Yes – via a download facility (for which there is a charge)
SA	Yes in a ‘view only’ form
Tas	Yes – as an image through Land Information System Tasmania (LIST), with a limited query capability.
Vic	Yes – the Land and Survey Spatial Information web package (LASSI)
WA	Yes

IC-D8 *Is the DCDB made available through wholesalers?*

NZ	Yes
ACT	Can be purchased from Government, also via PSMA
NSW	Yes
NT	Yes – only through PSMA
Qld	Yes
SA	Yes – only through PSMA
Tas	Yes – only through PSMA
Vic	Yes – via PSMA
WA	Yes – only through PSMA

IC-D9 Can the supply of DCDB data be tailored for different customer needs?

NZ	Not by LINZ – bulk supply of whole country only
ACT	Yes – at cost of supply
NSW	Yes
NT	Yes
Qld	Yes
SA	Yes – but we do not supply only maintain
Tas	Yes
Vic	Yes – through web tools available in Land and Survey Spatial Information (LASSI)
WA	Yes

IC-D10 Are incremental updates available?

NZ	No – only monthly supply of all data
ACT	Yes – currently to one client only
NSW	Yes
NT	Yes – to local councils, PSMA, NT Native Title Tribunal (NNTT)
Qld	Yes
SA	No
Tas	Yes
Vic	Yes – through web tools available in Land and Survey Spatial Information (LASSI)
WA	Yes

Cadastral – Title Links

TL1 Are parcels digitally linked to titles?

NZ	Yes
ACT	Yes – Block number digitally linked to title. Web DCDB mapping provides title number but not on-line title
NSW	Yes by the unique parcel identifiers
NT	Yes – unique parcel identifiers used
Qld	Yes
SA	Yes – linked through unique identifiers
Tas	Yes – the title reference is held as a parcel attribute.
Vic	No
WA	Yes

TL2 If yes - what proportion of parcels have a reliable link?

NZ	75% (historic) 100% of new titles created since 2000
ACT	Close to 100%
NSW	All parcels have identifiers
NT	All current parcels and those back to the mid 1970's
Qld	Virtually all, through the use of a lot on plan description for parcels
SA	99.90%
Tas	99%
Vic	N/A
WA	All

TL3 Are parcels digitally linked to the survey that defined/created them?

NZ	Historical links are not robust. Links since 2000 are good
ACT	Parcels have deposited plan numbers as attributes.
NSW	No – deposited plan image is in the Document and Integrated Imaging Management System (DIIMS), title is in Integrated Titling System (ITS) and spatial display is in DCDB. No automated link between data sets.
NT	Yes – survey plan reference is part of the title information
Qld	Yes
SA	Not directly, but can be obtained via database linkages in most cases
Tas	Only some'– The survey reference is held as a parcel attribute, being coincident with the title volume. Search through a chain of scanned and paper-based surveys may be required to completely define the boundaries of a title.
Vic	No
WA	Most

Cadastral Observations Database

OD1 Are boundary dimensions held in a measurement database?

NZ	Yes – for 70% of historical parcels and all new parcels since 2000
ACT	DCDB has grid distances however ground difference not much different as datum is local. Surveyed distances not held in database
NSW	Yes – they have been collected since 2004 but are not available to the public.
NT	Not in the DCDB but are in the SPICAD development database
Qld	Initiatives to do this are underway
SA	Yes – captured from plans lodged as part of the survey examination process since 1980's
Tas	No
Vic	No
WA	Yes

OD2 Are historical boundary dimensions retained along with the latest/current dimensions?

NZ	Yes
ACT	DCDB history maintained. Not survey distances
NSW	Since 2004 they have been retained.
NT	Not in the DCDB but are in the SPICAD development Database
Qld	N/A
SA	Complete paper plan record with digital boundary data stored since about 1980
Tas	N/A
Vic	Yes – within paper/image records
WA	No

OD3 Are traverse observations/connections to reference marks held in a measurement database?

NZ	Yes – a minority of historical observations captured for survey conversion plus all new traverse observations necessary to define boundaries in terms of the survey network and validate surveys
ACT	No
NSW	Yes – only partial connections
NT	Not in the DCDB but are in the SPICAD development Database
Qld	No
SA	Only as they relate to the creation and update of the geodetic network
Tas	No
Vic	Only as they relate to the creation and update of the geodetic network
WA	Yes

OD4 *Are dimensions/observations available for download into surveyors software?*

NZ	Yes
ACT	DCDB is available with control network. Connections not available
NSW	No
NT	Not from the DCDB but can be exported from the SPICAD development database
Qld	No
SA	No
Tas	No
Vic	Not by digital download - available for manual entry from paper/image records
WA	Yes

OD5 *What is the format?*

NZ	LandXML
ACT	Oracle spatial, various GIS and CAD
NSW	N/A
NT	ACS or XML
Qld	N/A
SA	N/A
Tas	N/A
Vic	N/A
WA	Cadastral Survey Data (CSD) and an in-house file format called NORM files

OD6 *How may observations be selected for download?*

NZ	Individual observation, all observations from a specified survey, all observations in a specified area
ACT	N/A
NSW	N/A
NT	Potentially unlimited but size is a practical limitation
Qld	N/A
SA	N/A
Tas	N/A
Vic	N/A
WA	unlimited

OD7 *Are observed lines visible in the DCDB?*

NZ	Yes
ACT	N/A
NSW	Yes – where available
NT	No
Qld	N/A
SA	No
Tas	N/A
Vic	No
WA	Yes

Cadastral Marks Database

MD1 Is data about cadastral marks held in the cadastral database?

NZ	Yes – a minority of historical marks captured for survey conversion plus all new survey marks on surveys since 2000-2002 (Landonline rollout)
ACT	Yes – for control (which is quite dense). Not minor recovery marks such as Galvanised Iron Pipe (GIPs).
NSW	No – the Cadastral Model caters for all survey marks. Very few populated. SCIMS has mark type of 'CR' for cadastral Reference Marks. There are 1326 recorded at present with accurate positions.
NT	No
Qld	Some
SA	Yes – in the survey database
Tas	No
Vic	No – in the survey marks database SMES
WA	No

MD2 Is data about Geodetic marks held in the cadastral database?

NZ	Yes – all geodetic marks
ACT	Yes
NSW	No – they are in Survey Control Information Management System (SCIMS)
NT	Yes – as part of the control data in the SPICAD development database as well as in the NT Geodetic Survey System (NTGSS) database
Qld	No – there is a separate Survey Control Database.
SA	Yes – in the survey Database
Tas	No
Vic	No – in the survey marks database SMES
WA	Yes

MD3 Are survey marks available for download into surveyors software?

NZ	Yes – all Landonline survey mark data for Landonline spatial customers. Geodetic control mark data is also available to the public on the Internet.
ACT	Yes
NSW	Yes – in many formats. CSV, ASCII, Geolab, HAVOC, ArcMap, many others
NT	No
Qld	Yes
SA	Yes – as CSV file
Tas	N/A
Vic	No
WA	Yes

MD4 Are survey marks visible in the DCDB?

NZ	Yes
ACT	Yes
NSW	Yes
NT	No
Qld	Yes – a survey control map can be produced with the cadastral data as a background.
SA	Yes
Tas	N/A
Vic	Yes
WA	Yes

Street Addresses

SA1 *Are street addresses part of the integrated cadastre?*

- NZ** No – but are recorded in the cadastral database for other purposes.
- ACT** Yes – included in Digital Cadastral Database
- NSW** Yes as the DCDB is linked to the Geocoded Urban and Rural Addressing System (GURAS) which in turn holds all the Street Address information
- NT** Yes
- Qld** No
- SA** Partly – they are stored as an attribute to the road centreline, but the process is not integrated at this stage
- Tas** Indirectly – in that the cadastral database is linked to the property database which holds address as a property attribute.
- Vic** Yes
- WA** Yes

SA2 *Is the SG responsible for addressing and addressing standards?*

- NZ** Yes – but under the Local Govt Act for electoral or other purposes. It is not part of the Surveyor-General Cadastral responsibility
- ACT** Yes – included in Digital Cadastral Database (DCBD)
- NSW** Yes – Surveyor-General is responsible for some of the address components such as suburb names through (GNB) and can object to Road names, however, a significant responsibility is held by Local Government who is responsible for street numbers and the naming of roads. Addressing Standards are being established via national collaborations.
- NT** Yes
- Qld** No – responsibility rests with local government.
- SA** No – but has to be notified of street names
- Tas** Yes – in conjunction with local government in proclaimed towns.
- Vic** No
- WA** No

SA3 *Are street addresses managed in the DCDB?*

- NZ** Yes – for electoral and other purposes
- ACT** Yes
- NSW** These are managed in a separate database that is linked to the DCDB, called GURAS
- NT** No – they are managed in ILIS and linked by unique parcel ID to DCDB
- Qld** No – separate database
- SA** DCDB connects to street address, street name from the topographic data base, address from the valuation file
- Tas** No – street address is accessed from property database which holds address as a property attribute.
- Vic** Yes – by linkage from a separate database
- WA** Yes

SA4 *Do all street addresses have a defined spatial location?*

NZ	Yes
ACT	Yes
NSW	Yes
NT	Yes
Qld	Lot on plan
SA	Yes – for urban, rural capture nearing completion
Tas	Yes (99%)
Vic	Yes
WA	Yes

SA5 *What point does the address correspond to (eg in the correct parcel, location of dwelling, location of letterbox)?*

NZ	In the correct parcel
ACT	Usually centre front of block
NSW	The point for service delivery/entry for rural properties (Rural Street Addressing), the centroid of the parcel for non-rural areas
NT	Generally centroid of parcel
Qld	Lot on plan
SA	In urban the centroid, rural property access point
Tas	Property centroid in urban areas or rural address access point in rural areas.
Vic	8m from, and square to, the midpoint of the parcel's frontage
WA	In the correct Parcel

SA6 *Do street address spatial locations meet the expectations of emergency services?*

NZ	Not really
ACT	Yes
NSW	Yes – but in many cases Department of Housing ‘Super Lots’ cause many problems as many houses/structures are located on the single super lot.
NT	Yes – although they would probably prefer driveway access or dwelling
Qld	Unknown
SA	In most cases for urban, still building rural address data base
Tas	Yes
Vic	Yes –in most cases
WA	Yes – Metro, Rural 80%

SA7 *Can parcels be searched for by street address?*

NZ	Yes
ACT	Yes
NSW	Yes
NT	Yes
Qld	Yes
SA	Yes
Tas	Yes
Vic	Yes
WA	Yes

SA8 *Is it a reliable search key?*

NZ	Generally Yes
ACT	Yes
NSW	Yes
NT	Yes
Qld	Generally Yes
SA	In most cases where an address exists
Tas	Yes
Vic	Yes
WA	Yes

SA9 *Can titles be searched for by street address*

NZ	Yes
ACT	Yes – internally not for public
NSW	Yes
NT	Yes
Qld	Yes
SA	Yes – In most cases where an address exists
Tas	Yes
Vic	No – not through the Digital Cadastral Database but through databases available to authorised departmental staff
WA	Yes

SA10 *Is it a reliable search key?*

NZ	Yes – for all post 2000 titles. Is OK but often returns no result due to weakness of parcel – title link for historical titles.
ACT	Yes
NSW	Yes
NT	Yes
Qld	Generally Yes
SA	In most cases Yes
Tas	Yes
Vic	Yes
WA	Yes

Cost of Data (as at 2008)

CD1 *Is survey data provided at the cost of dissemination?*

NZ	Yes
ACT	Digital Cadastral Database data is at cost of transfer although revenue is not covering cost at present
NSW	Survey data is provided in the form of hardcopy of plans at the cost of delivery
NT	Yes – with respect to hard copy plans provided at cost of delivery. No with respect to digital survey plans available free via ILIS or NT Atlas web search
Qld	Only by survey plans, as either paper copy or scanned image. Cost is \$12.25 per plan
SA	No
Tas	No
Vic	No – costs for on-line delivery is \$0.55 per sheet for hard copy (including GST)
WA	Yes

CD2 *If not, is there a charge for the data itself?*

NZ	No
ACT	No
NSW	No
NT	No
Qld	NA
SA	Yes – regulated fee
Tas	Yes – highly variable.
Vic	No
WA	N/A

CD3 *Is spatial cadastral data provided in bulk?*

NZ	Yes
ACT	Yes or in part – on demand
NSW	Yes – Digital Cadastral Database data can be supplied in bulk – survey plans as requested.
NT	Yes
Qld	Yes
SA	Yes
Tas	Yes
Vic	Yes – survey information to Association of Consulting Surveyors Victoria (ACSV). Other spatial data through Vicmap can be provided by licence
WA	Yes

CD4 *What is the cost of one supply of the entire jurisdictional cadastre?*

NZ	\$270
ACT	\$2,800 initially with much reduced maintenance. No cost to Government
NSW	Only available as the Digital Cadastral Database – \$11,000
NT	\$0.05 per parcel for basic cadastre and parcel identifier – approximately \$ 3,000
Qld	\$2,180 one-off or \$6,543 yearly agreement with monthly updates
SA	Varies depending on data layers required and contractual arrangements
Tas	\$22,000 for a commercial purpose. Most access is negotiated through service level agreements
Vic	No cost for Survey information. For digital data in Vicmap, \$2,000 per licence to a single user and \$80,000 for a corporate user
WA	1,133,357 polygons @ \$0.03 per polygon; plus a service fee of \$119 per hour (ex-GST); plus licence fee \$199 (ex-GST); plus GST

CD5 *Is bulk data able to be on-sold by wholesalers without constraint or revenue sharing?*

NZ	Yes
ACT	Almost all via PSMA although there is one client who pays royalties.
NSW	No – the licence agreement does not allow for this.
NT	At this stage only through PSMA but would consider other Value Added Resellers (VARs) arrangements if requested.
Qld	Can be on-sold under license
SA	Only on seller is PSMA
Tas	No
Vic	For survey information (SI) there is no restriction for on-selling but as survey information is free, no market exists. For other spatial data, sale is in accordance with the terms of the licence.
WA	New initiative currently being investigated

CD6 *What is the cost of a copy of a survey plan?*

NZ	\$8 (manual) \$3 (electronic via LandOnline)
ACT	\$11 image, \$18 hardcopy
NSW	\$12.50 over the counter, \$10.50 via the internet
NT	Free on line. \$15 over the counter hard copy
Qld	\$12.25
SA	\$7.25
Tas	\$10 per survey for Crown surveys and \$20 per survey for title surveys. However, an area search of survey plans and notes is available for \$30.
Vic	\$6.45 for the whole plan or \$0.55 per sheet (statutory fee)
WA	\$19.00 Survey Plan and Strata Plan – online

CD7 *What is the cost of a copy of a title?*

NZ	\$8 (manual), \$3 (electronic via LandOnline)
ACT	\$15
NSW	\$12.50 over the counter, \$10.50 via the internet
NT	\$15
Qld	\$12.25
SA	\$16.85
Tas	\$20 for the folio and plan.
Vic	The cost varies depending on the method of the purchase and the capacity of the purchaser to provide the Volume/Folio number. On-line: \$14.30 plus \$6.08 if a search for the Volume/Folio is required. Over the counter: \$15.00 plus \$7.70 if a search for the Volume/Folio is required. Costs are inclusive of GST. Brokers may charge a totally different fee.
WA	\$19.00 – inline

CD8 *What is the cost of an extract of digital cadastral data (eg, marks, observations, parcels)?*

NZ	Free
ACT	Cost related to the volume of data and type of data
NSW	Fabric data only from the Digital Cadastral Database. Other information only from plans or from Survey Coordination Information Management System (SCIMS)
NT	Free
Qld	Example: in a defined geographic area, up to 5,000 parcels – \$250.70
SA	\$2.60 for a list of survey plans connected to the mark and \$2.60 for coordinate details of the mark per PSM
Tas	N/A
Vic	Only applicable to marks and no costs are levied. Cadastral survey information is not available in digital form.
WA	service fee of \$124 per hour; plus \$0.03 per polygon

CD9 *What is the cost of a licence to access the cadastral database online?*

NZ	\$1,000
ACT	Not currently available
NSW	DCDB is available online through SIX for free.
NT	Free
Qld	Database not available online.
SA	Not Available to extract but can view for free
Tas	Not available
Vic	\$2,000/\$80,000 for individual/corporate licences
WA	N/A

CD10 *Are there copyright issues affecting the supply of cadastral survey data?*

- NZ** No – LINZ is required to supply this data. Also there is no data charge for LINZ so market competition only relates to the form/convenience of supply – not the data itself.
- ACT** No – digital data has Intellectual Property restrictions
- NSW** Yes – the Surveyors won
- NT** No
- Qld** Generally No
- SA** No
- Tas** Usually supplied under an agreement which specifies the use the data can be put to and the limits on on-selling.
- Vic** As per individual licences and/or by acknowledgement of the source within any paper/presentation
- WA** No

Lodgement Fees (as at 2008)

LC1 Do lodgement cost fully cover the cost of survey processing and system maintenance?

NZ	Yes (over time)
ACT	In theory Yes, but probably No in practice
NSW	This is the aim of the pricing policy
NT	No
Qld	No – lodgement fees from survey plans do not cover the cost of survey processing
SA	Not if you take into account the cost of the full process – they may cover Land Title Office costs
Tas	Surveys that change or create boundaries carry a lodgement fee. Remark surveys are lodged free of charge. There are no separate figures for the survey component of Land Titles Office operations. The Land Titles Office generates income in excess of operating costs.
Vic	Yes – fees as at 1 July 2008 set in accordance with government full cost-recovery policy
WA	No

LC2 If not, where does the extra funding come from?

NZ	Any shortfall in a particular year is made up from over-recovery in previous or subsequent years
ACT	Unknown – possible via development approval process (no local government)
NSW	If required extra funding would come from dealing lodgement
NT	Government
Qld	General revenue
SA	Budget allocation
Tas	N/A
Vic	N/A
WA	Document lodgement

LC3 Do lodgement fees exceed the cost of survey processing and system maintenance?

NZ	No (over time)
ACT	No
NSW	Yes – that is how a return to government is provided by Land and Property Information
NT	No
Qld	No – for survey plans, Yes for all titles lodgement fees
SA	Not if include the full cost of maintenance of the cadastre.
Tas	Possibly
Vic	No
WA	No

LC4 *If so, what is the additional funding used for (eg consolidated accounts for general government spending)?*

NZ	Any excess in a particular year is used up by under-recovery in previous or subsequent years
ACT	N/A
NSW	N/A – consolidated revenue
NT	N/A
Qld	General government spending
SA	All revenue goes into State consolidated accounts
Tas	The Land Titles Office funding is set as part of the Agency budget. Income generated generally flows directly back to consolidated revenue, and is significantly impacted by the level of economic activity in the state.
Vic	N/A
WA	N/A

LC5 *Typical lodgement fees?
Small urban subdivision (2 lots under 1000 sqm each)?*

NZ	\$340 (\$216 base + \$42/lot + \$40 deposit)
ACT	\$352 per deposited plan
NSW	\$1,230 + \$123 per Lot
NT	\$280
Qld	Approximately \$370 (includes lodgement fee, survey deposit, new titles fee)
SA	\$1,073
Tas	\$606
Vic	\$567; plus \$111 per Owners (Body) Corporation plus \$278 if plan is supported by a survey. Lot size is not relevant
WA	\$329

LC6 *Typical lodgement fees?
Large urban subdivision (100 lots under 1000 sqm each)?*

NZ	\$4,456
ACT	\$352 per deposited plan
NSW	\$13,200
NT	\$4,200
Qld	Approximately \$6,800
SA	\$935.50 (examination for Outer boundary survey) plus \$7883.50 for examination of subdivision and issue of new titles
Tas	\$5,555
Vic	For 100 lots = \$13,000 assuming no Owners Corp and no staging. For each stage the fees are calculated such \$567, plus \$124 per lot >2 lots, plus \$111 per Owners (Body) Corporation, plus \$278 if plan is supported by a survey. Lot size is not relevant
WA	\$6,013

LC7 **Typical lodgement fees?**
Intensive rural subdivision (3 lots under 100 ha each)

NZ	\$382
ACT	\$352 per deposited plan
NSW	\$1230 + \$123 per Lot
NT	\$320
Qld	Approximately \$440
SA	\$1,190.50
Tas	\$656.50
Vic	for 3 lots without Owners Corporation = \$969 (\$567, plus \$124 per lot >2 lots, plus \$111 per Owners (Body) Corporation, plus \$278 if plan is supported by a survey. Lot size is not relevant)
WA	\$387

LC8 **Typical lodgement fees?**
Extensive rural subdivision (3 lots under 10,000 ha each)?

NZ	\$382
ACT	\$352 per deposited plan
NSW	\$1230 + \$123 per Lot
NT	\$320
Qld	Approximately \$440
SA	\$1,190.50
Tas	\$656.50
Vic	for 3 lots without Owners Corporation = \$969 (\$567, plus \$124 per lot >2 lots, plus \$111 per Owners (Body) Corporation, plus \$278 if plan is supported by a survey. Lot size is not relevant)
WA	\$387

LC9 **Typical lodgement fees?**
Unit/Flat development (50 units)?

NZ	\$1101 (\$61 base + \$20/unit + \$40 deposit)
ACT	\$90 however approximately \$10K for Unit plan approval
NSW	\$1230 + \$123 per lot
NT	\$1,700
Qld	Approximately \$4,500
SA	\$935.50 (examination for Outer Boundary survey) plus \$3876.00 for examination of community plan plus issue of new titles
Tas	\$3,030
Vic	For 50 lots = \$6,789 (\$567, plus \$124 per lot >2 lots, plus \$111 per Owners (Body) Corporation in excess of one, plus \$278 if plan is supported by a survey. Lot size is not relevant)
WA	\$3,113

Auditing and Quality Assurance

QA1 *Is there a quality check on every plan before it is registered? (If no, indicate what proportion are quality checked.)*

- NZ** Yes
- ACT** Yes for deposited plans, 100% of deposited plans checked and
No for Unit Plans, 5-10% of unit plans fully checked
- NSW** Yes
- NT** Yes
Departmental 'cursory' desktop examination of all Crown/Freehold subdivisions lodged by privately Accredited Examining Surveyor or full desktop examination of plans lodged by non-Accredited firms
- Qld** Yes. For Non Endorsed Plans
 - 100% of Non-Endorsed plans are fully checked
 - 7% of Endorsed plans are fully checked
 - 93% of Endorsed Plans have a basic check.
 - (Endorsed Plans have been checked by an accredited surveyor)
- SA** Yes
Each plan fully checked in Office for:
 - mathematical closure,
 - Registrar General requirements
 - Surveyor-General requirements and
 - survey definition
- Tas** Generally all 'registered' plans bar those prepared by survey staff in the Office of the Surveyor-General or other government agencies are fully examined by Land Titles Office examiners. In 2008, 92% were fully examined and the balance partially examined. Re-mark plans are not examined.
- Vic** Yes
all plans are examined prior to registration.
The plan is always fully examined, however only a cursory examination of the other survey documents is performed for subdivisions of freehold land and Crown surveys performed by surveyors on the Register of Contract Survey Firms.
- WA** Yes

QA2 *Does the quality check involve a complete check of the plan, or only selected items? (If selected items, how has the list of items been determined?)*

- NZ** Selected Items
 Since the implementation of Landonline, LINZ's validation processes include both automated and manual analysis against predetermined business rules (designed to ensure compliance with the Cadastral Survey Rules. As many rules as practical were automated. Manual check list items cover the aspects more difficult to automate. Now that it is mandatory to lodge datasets electronically, and given that the Landonline design provides surveyors with pre-lodgement validation tools including automated checks, more emphasis is to be placed on the auto business rules in the LINZ validation process.
- ACT** Deposited plans are checked against a check list which surveyors are also expected to use. Unit plans are checked for correct addressing and numbering, dimensions shown and plan quality adequate. Less detail than Deposited Plans.
- NSW** The quality check is for all items on the plan except for close and area. No field notes are supplied. Boundary definition is checked. After registration of the plan, the survey geometry of all new parcels surveyed is entered into the Digital Cadastral Database by bearing and distance entry. That process ensures a complete check of all geometry.
- NT** Selected Items
 Cursory examination by senior technical staff involves a fairly comprehensive 50 point checklist of likely 'fatal' errors that could defeat or seriously compromise title issue. Surveyors are required to lodge closes and area calculation so no manual calculations are done by examiners, just inspection of the lodged documents and check that these accord with the plan.
- Qld** Checks are made of those items identified as being critical for the purpose of either the issuing of title or maintaining the integrity of the cadastre. A complete check is made of these critical items for Non Endorsed Plans and for 7% of Endorsed Plans. A basic check is used for the remaining 93% of Endorsed Plans.
- SA** Yes – see above
- Tas** Examination is for all items affecting title boundary and entitlements. Only a limited range of survey-related items are checked to facilitate the title check.
- Vic** The quality check involves a complete check of the plan. For subdivisions of freehold land, a check list of 14 items that forms part of the Examining Draftsman's Report is used.
- WA** Performing full legal audits of all Freehold, Crown and Strata Plans and certifying them as, In Order for Dealings (this is the final plan status prior to the customer lodging applications for certificates of title with the Registration of Interests Section)
 Legal Audit of Plans include
- Confirm all dimensions – Plan/FB/CSD/SCDB
 - New Lots created compared to former tenure
 - Ownership details (single or multiple)
 - Compliance with Acts & Regulations
 - Interests & Notifications (created & carried forward)
 - Identifying In Order For Dealings conditions

QA3 *In addition to the routine quality checking of plans, do you conduct a more detailed check (or audit) of some plans? If so, what proportion of plans.*

- NZ** Yes
Audits of surveyor's processes. Refer to 'Audit Process for Cadastral Surveys – Office and Field Audit Approach'
- ACT** Yes
Random checks of 5-10% of unit plans checked in greater detail
- NSW** Yes
Further desk audit are made however approximately 3 2 % (approximately 150 deposited plan) of plans are audited in the field.
- NT** Yes
The performance measure is for a random 10% of plans to be audited, spread across all surveyors lodging surveys.
- Qld** Yes – 7% of endorsed plans receive a full examination (which may be after registration)
- SA** Yes – about 50 out of about 3500 plans redefining boundaries audited in the field per year
- Tas** Yes
A selection from all plans lodged/registered are audited by the Office of the Surveyor-General on the basis of one per year for poorly performing and newly registered surveyors. Otherwise, all surveyors are audited at least once every 5 years. 29 surveys were audited in 2008 = 1.4% of all surveys lodged/registered
- Vic** Yes - About 150 or 1.5% of survey based dealings subject to a field audit
- WA** Yes
Inspecting Surveyors are frequently required to carry out an office audit (either full or partial) of a survey. This involves determining whether the surveyor has achieved a correct definition of the boundaries of the land the subject of the plan of survey.

QA4 *Are any checks carried out in the field? If so, indicate what proportion of surveys are checked in the field, and the nature of the checks.*

- NZ** Yes
2 surveys for each firms audited (12 firms/year) Refer to ‘Audit Process for Cadastral Surveys - Office & Field Audit Approach’ and ‘Field Audit Report Template’
- ACT** Yes
Approximately 25% of deposited plans are field checked (often only briefly)
5-10% Unit plans check however it is recognised that this may be insufficient
- NSW** Yes
Field audit varies from a full resurvey to an inspection. If the inspection reveals problems further detailed investigation is carried out.
- The majority of field audits involve measurement from survey control to the survey plus reference mark checks.
- NT** Yes
An audit is a full independent desktop examination including taking out closes, checking field book entries, redefinition and field check by a senior licensed surveyors, if practical. Field check can include marking, reference mark verification (found/gone), re-measurement and re-definition of representative sample.
- Qld** Yes
Our performance measure is for a random 10% of all plans to be field checked.
However, due to lack of surveying resources, this performance measure is not achieved across the state.
The nature of the check is a basic check of marking, encroachments and measurements.
- SA** Yes
Usually full check on measurement, marking, physical evidence and definition, on larger surveys may just be a portion of the survey
- Tas** Yes
All audits include a field check. The audits cover all statutory requirements for surveys.
- Vic** Yes
150 or 1.5% survey-based dealings audited pa.
The audit process consists of a full field and office audit by a SGV Licensed Surveyor and a full examination of the plan by a LRS Examining Draftsman. The findings of both components are combined and forwarded to the surveyor under audit for his or her attention.
- WA** Yes but No stats supplied
Field inspections enable the field record to be compared with the actual field environment.
Inspection of the marking determines:
- Whether the regulations have been adhered to,
 - Whether all exceptions to the regulations have been recorded in the field notes, and
 - The overall standard of the marking for the public, including clarity of lot numbering on pegs/posts and witnessing of the marks (eg. stakes and flagging).
- Field measurements enable two standards of accuracy to be determined:
- accuracy of re-establishment, or how well the survey fits in to the existing cadastre, and
 - plan accuracy, or how well the marks fit with the dimensions on the plan of survey.
- Both of these measures include a component of comparison between the measuring devices of the surveyor and of the inspector. Early Issue of Title subdivisions are a special case where the accuracy of the survey is compared with the accuracy specifications in the guidelines by means of a coordinate check.
- Standards of quality are expressed as:
- HIGH (or ACCURATE)
 - REASONABLE,
 - SATISFACTORY,
 - ACCEPTABLE,
 - UNACCEPTABLE (or POOR)

QA5 *How many full time equivalent people (FTE's) are involved in quality checking of plans (including pre and post registration, field and office)?*

- NZ** Customer Services
 FTEs - processing survey datasets and integration into the cadastre
 - 30 valuers including recent trainees who have graduated)
 - 11 trainees (October 08 intake)
 - 9 approvers
 - 5 survey advisors
 - 5 Network adjustment (post approval)
 - 2 performance managers
- Note this excludes National Office Business Analysts and customer service staff who assist surveyors resolve issues and fatal rule failures that prevent lodging
- Regulatory
 1.8 FTE for post approval audits
- ACT** 1.5 FTE
- NSW** No one is employed full time on audits however it is estimated that with the administrative follow up each audit takes at least 1 day for 1 person for both Survey Plans and Deposited Plans. Therefore 2 FTE's
- NT** Desktop examination for Crown/Freehold and Unit plans is 4 FTE technical staff in Darwin and about ¼ of a Licensed Surveyors time in the Alice Springs office. Audits are done by a senior licensed surveyor when available
- Qld** 33.7 FTE
 However the majority of staff are also involved in other surveying activities across the State including indigenous land surveys in Cape York.
- SA** About 34 staff in the Registrar-General's Office do pre registration checks 6 staff from the Office of the Surveyor-General do field audits, and provide advice to survey examination staff, surveyors, the public etc.
- Tas** 6 FTE (5 Land Titles Office examiners + approximately 1 FTE Office of the Surveyor-General involving an audit surveyor and program manager)
- Vic** 2.1 FTE's are involved in the auditing of survey-based dealings.
- WA** 57 FTE's are involved in the total audit process comprising:-
 - 51 staff undertaking lodgement, spatial maintenance, plan audit, control networks and
 - 6 staff with the task of survey inspection.

QA6 *Are there any other systems or measures which assist with quality control of plans? (e.g. referrals to the Surveyors Board; software validation)*

- NZ** Yes
Historically the Surveyor-General has published guidelines which include an element of 'best practice'. In the future, this role of defining will increasingly be taken up by the Institute

Complaints of professional misconduct may be laid with the Licensing Board.

A lesser sanction is to report a 'significant failure'. The Board considers this carefully at the time of annual license renewal.

A surveyor may also be required to correct an error on a survey at their expense even if the error does not meet the threshold of significant failure or professional misconduct.
- ACT** Surveyors are encouraged to discuss difficulties with our office as they arise. This is common.
- NSW** Yes – all audit survey statistics and unprofessional conduct is reported to BOSSI
- NT** Yes
All surveys are entered into the survey accurate data base (SPICAD) and are therefore mathematically checked for internal consistency and fit with abutting cadastre. This check is often post approval
- Qld** Yes
The department regularly provides the Surveyors Board with surveyors performance statistics and as result, the Surveyors Board often review the competency or otherwise of surveyors based on the statistics.
A process was introduced in 2008 using the LandXML SIP tool to automatically examine aspects of plans. This tool, which is a precursor to electronic lodgement, provides a routine check of all closes as well as checking other items on the plan.
- SA** Yes – all audit surveys reviewed by a committee of the Surveyors Board which provides advice to the Board and Surveyor-General on appropriate actions to be taken. Surveyors have also been provided with internal plan examination check lists and a copy of the software used for mathematical validation in the LTO (PCPLANS)
- Tas** Yes
Surveyors with ongoing poor records may be referred to the Director for Consumer Affairs and Fair Trading for disciplinary action.
- Vic** Yes - Surveyor-General Practice Directives, Surveyors Board unprofessional conduct complaints
- WA** Yes – all requisition statistics and some inspecting surveyor reports are referred to Land Surveyors Licensing Board

QA7 *What other risk mitigation measures are in place regarding the quality of plans? (e.g. publication of error statistics, offences)*

- NZ** The most common errors resulting in requisition are published.
<http://www.landonline.govt.nz/esurvey/best-practice/risk-based-acceptance/top10-requisitions.asp>
- Surveyors being audited are provided with an overall report of their requisitions to date to help them focus on areas to be improved.
- A fee for re-lodgement following requisition has been introduced to reflect the additional processing cost faced by the department.
- The Licensing Board publishes a Bulletin describing issues resulting in disciplinary action.
- Errors in 1st lodgement (the 1st certification as to correctness) have been referred to the Board. Therefore 'lodge and hope' is not a safe strategy for surveyors who wish to rely on the department to tell them what is wrong rather than confirming correctness themselves
- ACT** Common problems identified in 6 monthly Continuing Professional Development seminars
- NSW** Continual communication, education and briefings with surveying industry to ensure compliance to surveying standards and results of audits. Workshops and seminars to raise/maintain knowledge base. Amendment of Real Property Act to ensure surveyors are responsible of all errors on survey plan.
- NT** Surveyors receive regular advice as to their examination and audit performances as Accredited Examiners. Occasional circulars discuss prevalent errors detected in the audit program.
- Qld** No other risk mitigation measures. Action can be taken by referral to the Board if surveyors do not attend to corrections on plans.
- SA** Twice yearly redefinition seminars where problem definitions are discussed, provision of statistical information to surveyors on their requisition rates
- Tas** Surveyors receive regular advice as to their examination and audit performances and where they stand in relation to the average of the profession. Occasional circulars discuss prevalent errors detected in the audit program.
- Vic** Surveyors receive audit reports. Surveyors Board publishes discipline hearing outcomes in industry newsletters and on Board website
- WA** LSLB advise surveyors on their requisitions, and deal with any matters referred by IPS. Landgate provide regular education via Notices to Surveyors, updated into practice manuals, and presentations at CPD seminars.