Repositioning Queensland’s Cadastre for a Spatial Future

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A cadastral system that enables people to readily and confidently identify the location and extent of all rights, restrictions and responsibilities related to land and real property.

**Cadastre 2034**

**CADASTRAL SYSTEM**

- Digital representation of land parcels (digital cadastre)
- Survey marks and other physical evidence of boundaries
- Instruments defining land
- Registered Surveyors
- Information delivery and access
- Records of surveys including plans
- Standards for definition and surveying of land

**Land Registration System**

**Land Planning System**

**Land Valuation System**

**Positional Framework**
The enduring principles that guide the pathway towards Cadastre 2034 are:

• Certainty in the spatial extent of ownership.
• Uniquely defined land (and/or property) that is common to all registers – ownership, valuation, land use.
• Integrity and security of the parcel boundary system.
• Strong relationship between regulators and the industry.
• Appropriate regulatory standards.
3dQld - Vision

Ensuring that the quality of spatial information that is readily available to decision makers provides them with confidence and certainty about opportunities and investments.

3D visualisation of spatial information that supports a wide range of activities … providing greater certainty and clarity to businesses and government.
3dQld – key characteristics

• Emphasis is a spatially accurate 3d digital model of the cadastre, capable of being fully integrated with digital models of the physical and administrative landscapes
• Recognises a range of measures are required to achieve this
• Recognises that the vision can be achieved only through collaboration of government and industry.
3dQld - Short Term Actions

The key short term actions to deliver the 3dQLD vision are:

*Enhance the existing surveying standards* to ensure that all new tenure surveys are aligned to the national datum, to maximise the 'value add' of digital 3D cadastral survey data.

*Develop incentives for industry* to invest in activities that will accelerate the rectification of cadastral parcel plan alignment with a national datum and the realisation of 3dQLD.

*Facilitate and promote the digital collection and lodgement of authoritative cadastral and mining survey data.*

*Continue to build the coverage of CORS infrastructure* over regional areas of the state.
Enabling regulations

- Cadastre 2034 and 3dQld both recognise the role of appropriate regulations in improving the cadastral system.

- Appropriate regulations:
  - impose sufficient (but no more) requirements to ensure regulatory objectives
  - enable the use of new technologies
  - facilitate innovation

- Key reforms proposed
  - Use of GNSS for cadastral surveys
  - Large scale development surveys
  - ePlan
GNSS for Cadastral Surveys

Standard – 5 high level principles

Guidelines – guidance on achieving the standard
  – surveyor can use another way (if better)

Draws on SP1 v2

Designed to enable use of GNSS to achieve existing accuracy specifications (expressed in vector accuracy)
5 Principles for using GNSS for cadastral surveys

1  **GNSS measurement quality**
GNSS surveys must be designed to ensure that all possible sources of error are minimised to a level expected for the GNSS technique used
Guidelines
- minimising site dependent effects
- observation time
- detecting outliers
- minimising non-GNSS effects

2  **GNSS measurement quality for cadastral surveys**
The survey uncertainties achieved from GNSS measurements must ensure that any possible outliers are detected and removed and that the relative uncertainty between adjacent cadastral survey marks does not exceed the vector accuracies specified in section 3.4.2 *Measurement accuracy*
Guidelines
- testing quality
- specific GNSS measurement techniques
5 Principles for using GNSS for cadastral surveys

3 Measurement traceability
GNSS measurements must conform to legal traceability requirements in line with the SMI Act and the National Measurement Act 1960
Guidelines
- connecting to datum

4 Coordinates, heights, bearings and distances
GNSS surveys must use and manage coordinates, heights, bearings and distances in a manner suitable for cadastral purposes
Guidelines
- terrain distances
- local projections and scale factors

5 Survey records
GNSS surveys must allow lodgement and storage in the register of sufficient information to enable the survey to be correctly and unambiguously interpreted.
Guidelines – data processing and archiving
Large scale land development surveys

Methodology trialled in pilots:

- robust and accurate coordinate framework for development
- gives repeatable location wrt Datum, including corner location within cadastral tolerances
- reduces need for repeated marking throughout the development cycle
- coordinated surround survey provides consistency in DCDB update
Large scale land development surveys

Proposed standard

- Applies when:
  - \( \geq 20 \text{ lots} \)
  - Development based on coordinate framework
  - Approved use of this standard

- Specification
  - Coordinate framework established, connected to Datum, design approved
  - Coordinate framework used for design & construction, & for boundaries
  - Surround survey, with coordinates related to framework, SU < 15mm
  - Coordinates for all lot corners deposited
  - No requirement to mark corners before lodgement, provided:
    - plan shows connections to State control survey that provide basis for coords
    - notation on plan “in accordance with CSR 3.22, corners have not been marked”
    - marks placed before development stage certified as ‘on maintenance’
    - independent validation of the location of each corner mark placed
Large scale land development surveys

Future
- More widespread application in new developments, as techniques mature
- Legal implications – not a coordinated cadastre but …
- Can this be applied in existing developed areas?
Standards for ePlans

- Cadastral Infrastructure File submitted
- Information for title creation
- Information for survey record

Earl 2 Plan standard
- Certification
- Survey Record

Visualisation

CIF Archive
CISP
SCDB
DCDB
The paper plan is the legal instrument for lodgement
Require sufficient information for titling and the general user

<table>
<thead>
<tr>
<th>Standard</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certification by surveyor</td>
<td>Form 14, not Form 13; Form 19 not Form 18</td>
</tr>
<tr>
<td>Identification surveys</td>
<td>Form 14, not Form 13</td>
</tr>
<tr>
<td>Dimensions and Tabulations</td>
<td>Standard applies, except boundary dimensions may be tabulated</td>
</tr>
<tr>
<td>Survey mark information</td>
<td>Only marks at corners of subject land, no reference mark or PM information, no external reinstatement</td>
</tr>
<tr>
<td>Corner information</td>
<td>Only marks at corners of subject land, and occupation at or near these corners.</td>
</tr>
<tr>
<td>Bearings &amp; Centre Lines</td>
<td>No depiction of connections to distant points or road centre lines; no ranged only and reads bearings; no measurement only.</td>
</tr>
<tr>
<td>Traverses</td>
<td>Not depicted, unless necessary for depiction of subject land (e.g. distance across internal road at boundary intersection; connection of building to a corner on BFP)</td>
</tr>
</tbody>
</table>
# EARL 2 Plans

<table>
<thead>
<tr>
<th>Standard</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coordinates of cadastral corners</td>
<td>Not shown, except for <em>Profit a prendre</em></td>
</tr>
<tr>
<td>Long line easements</td>
<td>coordinates not shown for PMs, boundary marks and reference marks</td>
</tr>
<tr>
<td>Surveying water boundaries</td>
<td>Points table not depicted</td>
</tr>
<tr>
<td>Compiling water boundaries</td>
<td>Original traverse and origin of offsets not depicted</td>
</tr>
<tr>
<td>Reporting requirements for water boundaries</td>
<td>Report not depicted</td>
</tr>
<tr>
<td>Meridian</td>
<td>Depicted, but method not described</td>
</tr>
<tr>
<td>Datum</td>
<td>Datum not depicted</td>
</tr>
<tr>
<td>Surveys of land in remote areas</td>
<td>Source of original information not described</td>
</tr>
<tr>
<td><em>Profit a prendre</em></td>
<td>For <em>Reduced survey standard</em>, show dimensions, area, corner marks, connections to parent lot, corner coordinates if corners not marked</td>
</tr>
</tbody>
</table>
EARL 2 plan certificates

Form 14 - Certificate for cadastral plans & corresponding cadastral information files

I, Russell John Priebbenow hereby certify that the land comprised in this plan was surveyed by me personally and that the plan and digital file are accurate, that the said survey was performed in accordance with the Survey and Mapping Infrastructure Act 2003 and Surveyors Act 2003 and associated Regulations and Standards and that the said survey was completed on 20 September 2014.

Digital file – the CIF for this plan, containing this certificate, submitted to the department
Department – the department administering the SMI Act
Plan – the hard copy plan bearing this certificate
Accurate – includes consistency between submitted CIF and lodged plan

Note: Submission of CIF through allocated log-in = certification of CIF
EARL 3 Plans

The CIF is the legal instrument for lodgement

A range of visualisation types will be able to be created from the ‘registered CIF’
Summary

Cadastre 2034 and 3dQld both paint a picture for the longer term future of the cadastral system.

The regulatory environment plays a small but important role in achieving the vision set out by those strategies.

Thank you