A Sustainable Cadastre for New Zealand

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• Accurate positioning for everyone
  – Few cm accuracy in most locations
• Online access to spatial data for everyone
  – Delivered to mobile devices
• Spatially accurate data in most populated areas
  – Dynamic coordinates (regularly updated)?
• Diverse spatial and tenure datasets integrated
  – Integration happens behind the scenes (smart services)
• Increased expectation of 3D visualisation

Expected changes
**Current cadastre**

- Cadastre based on marks
  - Legal coordinate cadastre has limitations in NZ
  - Earth deformation
  - Coordinates must change
- But can we do better?
- What do landowners want?
  - Intelligent boundaries?
  - Augmented reality?

**Survey / Spatial Convergence**

- Surveying
- Mapping / Spatial

<table>
<thead>
<tr>
<th>Year</th>
<th>Cost per Feature</th>
<th>Positional Error</th>
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<tbody>
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<td>1840</td>
<td></td>
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<td>2020</td>
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2D vs 3D

- Complex 3D rights
- Shown as 2D on survey plans
- Unintelligent images
- Spatial cadastre shown as 2D
- Users expect 3D

2D plans & spatial cadastre
Sensing the environment

- Wireless sensor networks
  - Spatial positioning chips
  - RFID chips
  - Wireless communications
- Cost effective
- Sense change in physical environment
- Data streams of enormous value
- Potential to assist boundary location

Augmented reality
- Google Goggles
Augmented Reality Cadastre?

- Is this what surveyors will want?
- Is this what landowners will want?
- What is possible in 10-20 years?
Surveyor user – definition 2

Lot 1 DP 310674
785 m

Road

Upload position
Upload geo-referenced photo
Peg VII SO 12345
undisturbed

Surveyor user – definition 3

Lot 1 DP 310674
785 m

Surveyor Id confirmed
Data saved
Position Validated
Boundary Adjusted
Survey Accurate
Landowner view

Sewer Invert 53.64m 1.27 below GL

Easement A DP 5123 (in gross) Foul Sewer Wellington City Council

Coordinated Cadastre?

Can we make this work?

- Technical issue - earth deformation
- Boundary movements complex
- Improving models
- More reliable in the future?
Coordinates and earth deformation

Draft vision statement

A cadastre that enables **people** to **readily** and confidently identify the spatial extent of **all** rights, restrictions and responsibilities related to land

Three important "stretch" words
- **people** (not just surveyors);
- **readily** (finding boundaries is not easy now);
- **all** (currently only focus on a subset of RRRs)