



Contemporary Web Cadastre

Presentation to: The 14th South East Asia Survey Congress 2017

16th August 2017

Peter Barratt
myCadaastre Pty. Ltd



Prof. Don Grant AM, RFD

Chairman, Adviser NSW Surveyor General (retired), Consultant

- A thought leader and Land Administration Advisor at senior and Ministerial level.
- Focus on institutional reengineering, strategic planning and cadastral reform



Peter Barratt

Solution Architect Land Surveyor → IT focused

- Broad industry experience having worked in ICT & Project Management, Solution and Technical Architecture, Team Leadership and Domain Specialist roles



Freddie Sia

Senior Developer IT focused → Lands Domain

- A computer scientist that has specialised in spatial data processing for over 30 years.
- Broad international and industry experience having worked in fifteen countries.



Dr. Roger Merritt

Adjustment Specialist Land Surveyor → IT focused

- A powerhouse of knowledge when it comes to complex algorithmic development and finding innovative solutions to mind-bending cadastral problems.



Phill Dance

Business Manager Land Registry domain focus

- specialised in modernising land information systems and providing the highest availability solutions possible, via Web services on secure, private cloud technology.


About Us

- Collectively, over one hundred and fifty years of knowledge in the Registry, Lands and Cadastral Custodian domains
- We have worked widely and internationally
- We undertook the ePlan mapping of LandXML and internal business case for NSW
- We have been involved at different levels in the design and renewal of several large scale Cadastral Processing Systems
- We understand the domain and we care about this problem space

We are seeing clear drivers of change towards a Cadastre that is ...

- Accessible → freedom of access, ubiquitous, democratised
- Collaborative → created and maintained by multiple parties
- Sustainable → economically viable, with support of community
- Adaptive → well designed to be resilient with change
- Efficient and Effective → automate where possible, simplify where not
- Fit for purpose → performs the processes required for stage of evolution

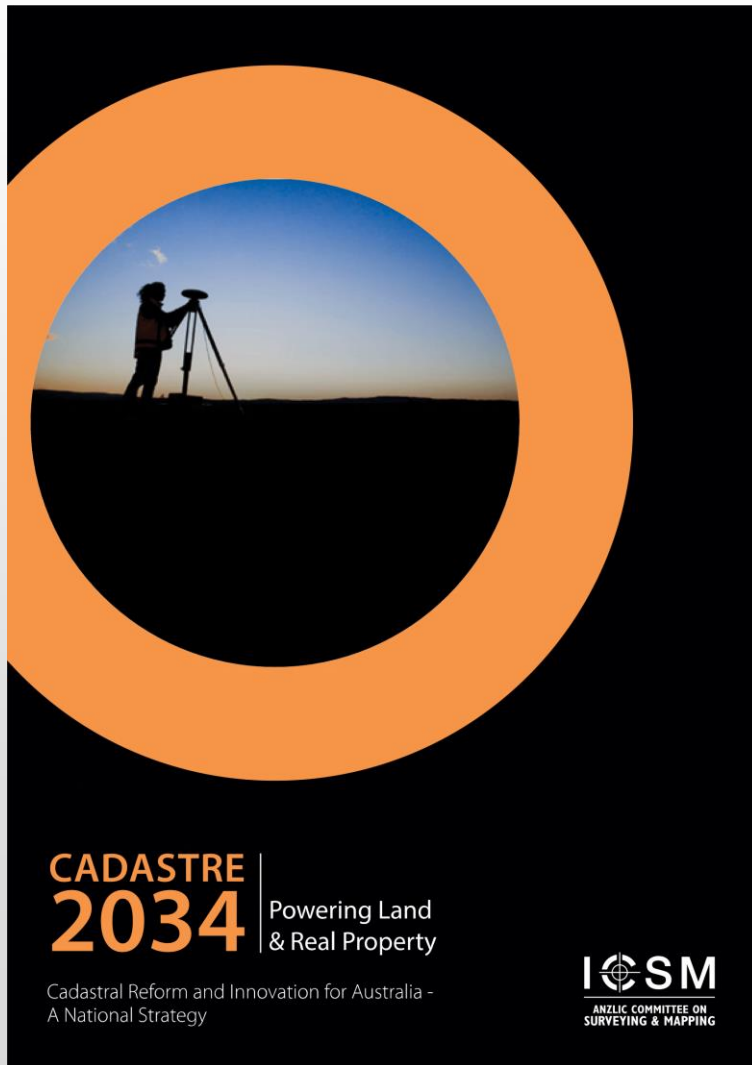
Timeline ...

- 
- 1960's Introduction of computer graphics capabilities ('sketchpad' Ivan Sutherland MIT)
 - the beginnings of the possibility of digital mapping
 - standard survey reduction and adjustment program development
 - 1970's The era of digital cartography and mapping begins ...
 - mini computers, photogrammetric and mapping systems
 - 1980's Back capture and digitisation, attribution, query and the beginning of GIS...
 - desktop computing, launch of the Free Software Movement (Richard Stallman)
 - 1990's Cadastral mapping systems built on (typically) file based GIS systems
 - www, html, uri, http (Tim Berners-Lee) → W3C, founding principles for "open-ness"
 - 2000's Cadastral systems built/migrated to spatial databases but now **requiring only a subset** of the improved GIS capabilities, Google maps and industry wide growth of web mapping
 - a growing eco-system of geospatial open source projects and supporting technologies: mapServer, geoServer, GDAL, proj4, JTS, open-layers, etc
 - github (2008), open source projects (OSS), OSGeo (2005), growth of web mapping,
 - standards, JSON, XML, GML and in particular LandXML
 - 2010 - Government acceptance of OSS as a mature s/w base
 - the beginnings of Open Data, Open Government, Open Access

where next ??

Cadastral 2034

<http://www.icsm.gov.au/cadastral/Cadastral2034.pdf>



A Vision for Cadastral 2034

“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.”

In future, citizens will know what can be done on land (rights), what cannot be done (restrictions) and what must be done (responsibilities).

Cadastral 2034 has five goals, to achieve a system that:

- is fundamental to land and property ownership and is sustainably managed;
- is truly accessible, easily visualised, and readily understood and used;
- is fully integrated with broader legal and social interests of land;
- provides a digital representation of the real world that is survey accurate, 3- dimensional and dynamic; and
- is a federated cadastral system based on common standards.

The ePlan Initiative: improve/automate processing: LandXML

An ongoing process to enable Australian jurisdictions to facilitate the Electronic Lodgement and Transfer of Survey Data

- ePlan Protocol documents finalised and ratified by the ICSM in November 2010
- Four States QLD, NSW, VIC, SA have published their jurisdictional schemas
- Various levels of implementation progress are currently in play by the different States

<http://www.icsm.gov.au/ePlan/>

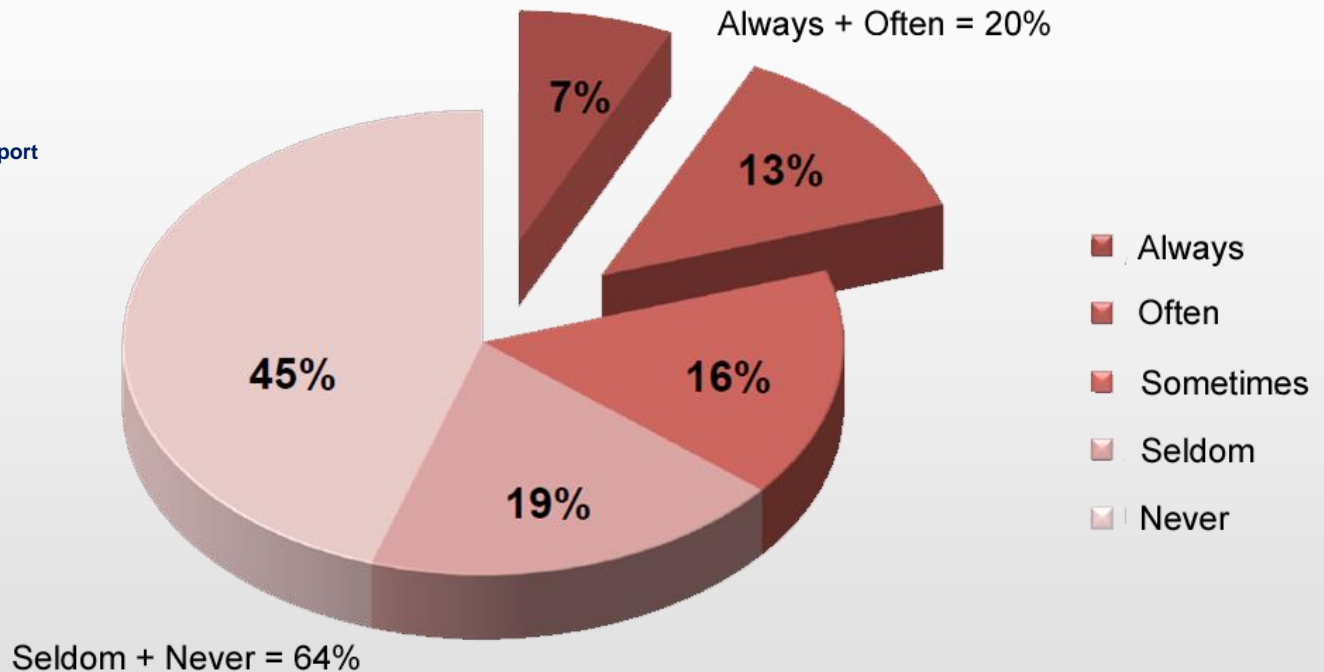
- Surveyors can complete online cadastral infrastructure searches of jurisdictional databases and receive standard LandXML survey data downloads
- Create a cadastral survey (data) plan using proprietary vendor applications that is suitable for lodgement with the relevant jurisdictional authorities
- Have ePlan data visualised, validated and approved by the relevant jurisdictional authorities as a spatially and legally valid instrument for land title registration

The Software Dilemma

Pareto's principle

Source:

TheStandish Group - CHAOS Report



- Vendor software usually contains non-essential functionality (for cadastral operations)
- Purchase and pay maintenance on 100%, actual use ... 20%
- Typically requires investment in Professional Services for a solution or configuration

The Open Source Dilemma



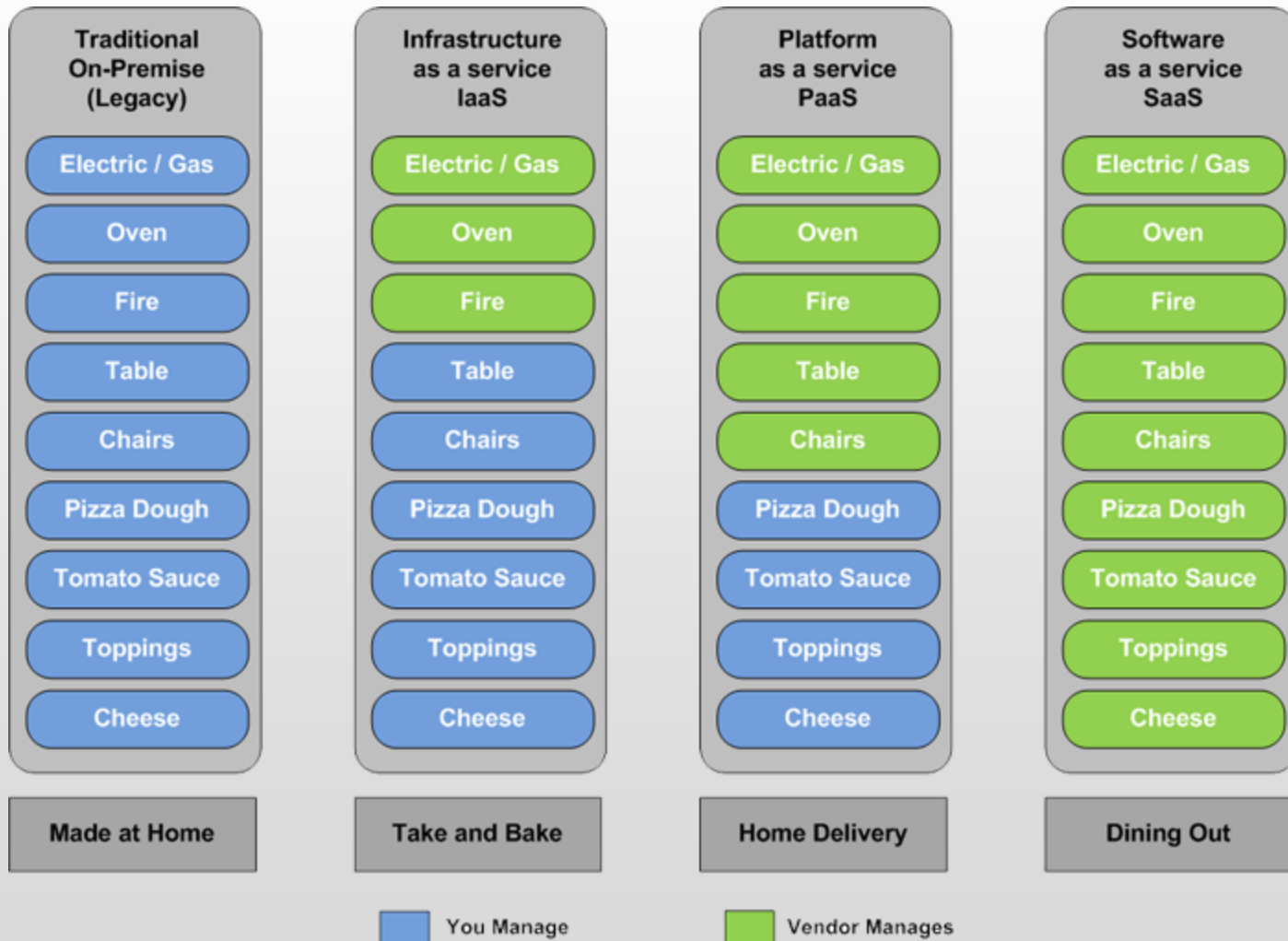
- One almighty jigsaw of components and a changing landscape
- Lack of resources and/or time to undertake the R&D to identify usable elements
- Often placed in the “*too hard*” basket
- There is always a cost somewhere
- Key business functionality is **usually missing** !

The Platform Dilemma

- **Traditional (on-premise) / behind the firewall**
the current state for many organisations, in-house hardware, system admin, mixed software environment
- **Infrastructure as a Service (IaaS)**
is a form of cloud computing that provides self-provisioned virtualised computing resources over the Internet e.g. Amazon VPC, Rackspace
- **Platform as a Service (PaaS)**
provides an environment for the consumer to load, configure and run their own or acquired s/w applications in a pre-configured environment using programming languages libraries, services and tools supported by the provider e.g. MS Azure, IBM BlueMix
- **Software as a Service (SaaS)**
cloud based applications that are accessed via the internet and whose data is stored/saved in the cloud. Sometimes called web-based, on-demand or hosted software, Usually provided as a subscription service hosted on a SaaS provider's servers e.g. Office365, Salesforce, Xero



Pizza as a Service (the Executive version)



Core Capabilities

- **Capture**
the ability to capture parcel and/or strata information accurately and efficiently directly from the plan document or via a structured data input (e.g. LandXML)
- **Update**
to add the captured new plan parcels or strata unit data to the authoritative digital cadastral fabric
- **Upgrade**
to incrementally improve the spatial accuracy of the cadastral fabric
- **QA and Edit**
the ability to identify and rectify topological and dimensional error in the cadastral fabric
- **Conflate**
harmonising two cadastres to provide accurate re-alignment of the cadastral fabric and associated layers
- **Collaboration**
to provide a platform that enables parties to work together - collaboratively and seamlessly

Custodian Challenges

Cost of Ownership

Spatial Accuracy

How to leverage ePlan Data?

Cost of using ePlan to create fabric

Consistency with ubiquitous high resolution imagery

Timely Cadastre by acquiring and managing full lifecycle ePlan Data

Poor system performance

Business Agility

Risk mitigation

- ✓ OSS can offer cost reductions
- ✓ Fast upgrade processes
- ✓ Automated ePlan ingestion
- ✓ Automated parcel fabric creation
- ✓ Simple “Ortho” adjustment
- ✓ Process pipeline for versioning of “proposed” plans
- ✓ Low friction services / database access
- ✓ Improve ability to focus on delivery services
- ✓ Simplified processes

Decision Time

- Is there a need and a market ?
- Do we have sufficient core competency ?
- What are our current code and knowledge assets ?
- How much re-engineering and new engineering effort are we prepared to do ?
- What is our target architecture and deployment environment ?
- What are the core technologies that we would target ?
- Where are the processing boundaries ?
- Approach

Basic R&D and early prototyping

Creation of reusable pattern frameworks for web-services, micro-services and scaffolding for client applications

Creation of data-centre (VPC) and build/deployment pipelines

Creation of test cases

and then **JUST A LOT OF HARD WORK !!**

Cloud Storage

- *Maintenance Cadastre*
- *Working Cadastre*
- *LandXML Plans*
- *Delivery Cadastre*



LandXML documents

- *non proprietary*
- *well supported*
- *easy to understand*



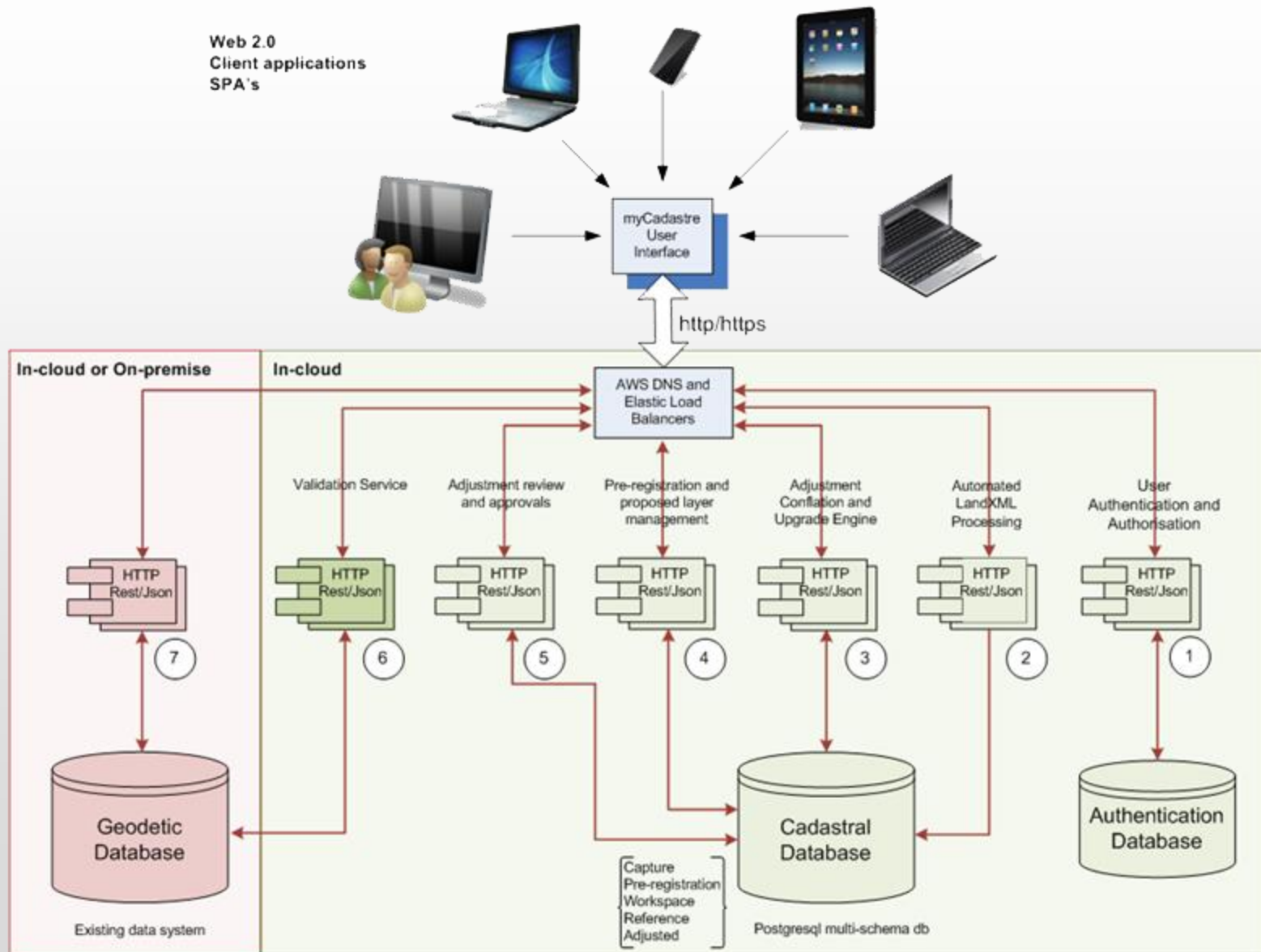
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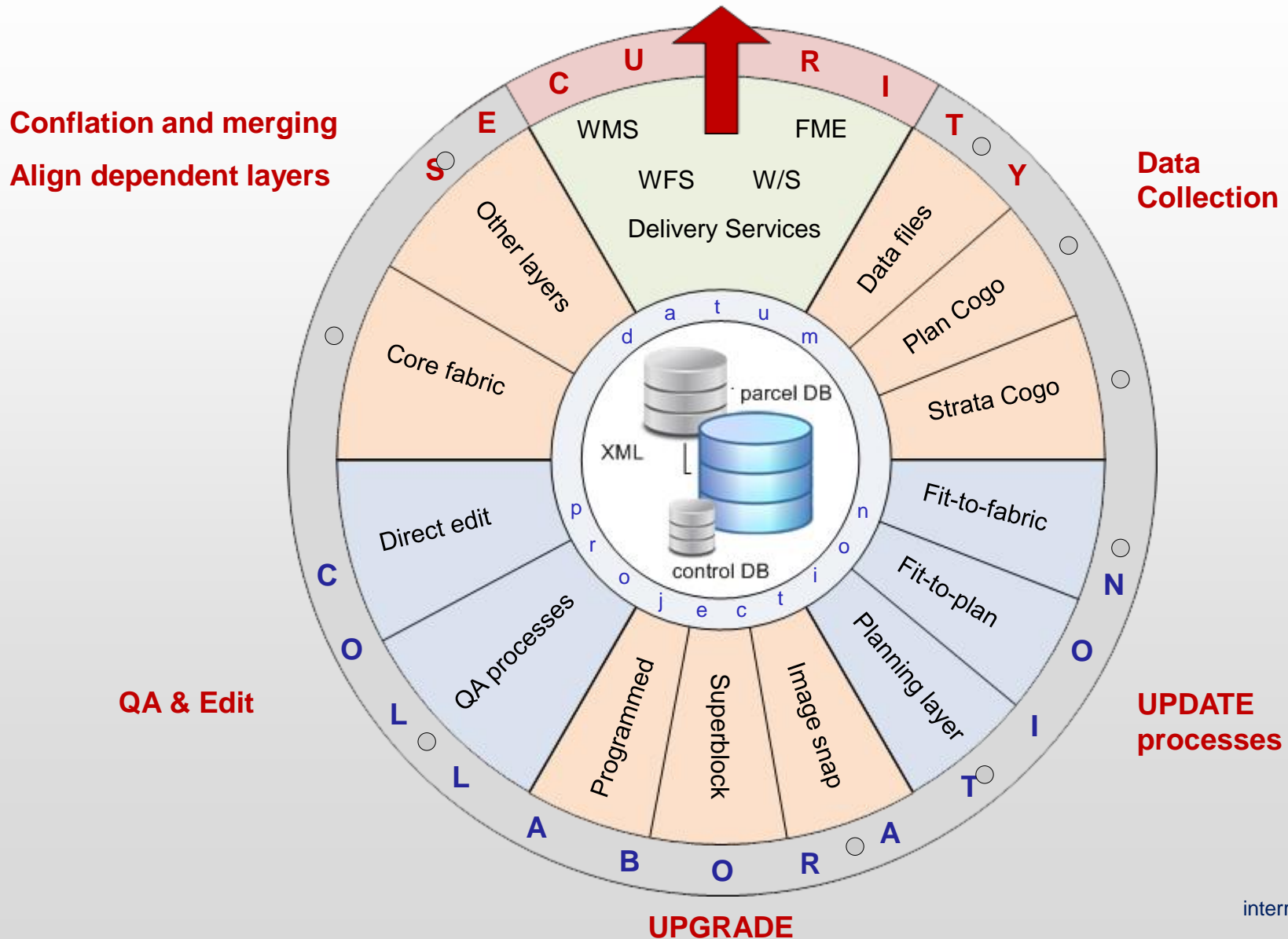
- *Plan capture*
- *Validation*
- *Search, View, Update*
- *Cadastral maintenance*
 - *update (fit-to-fabric)*
 - *upgrade*
 - *layer/asset alignment*
 - *conflation*
 - *datum transformation*

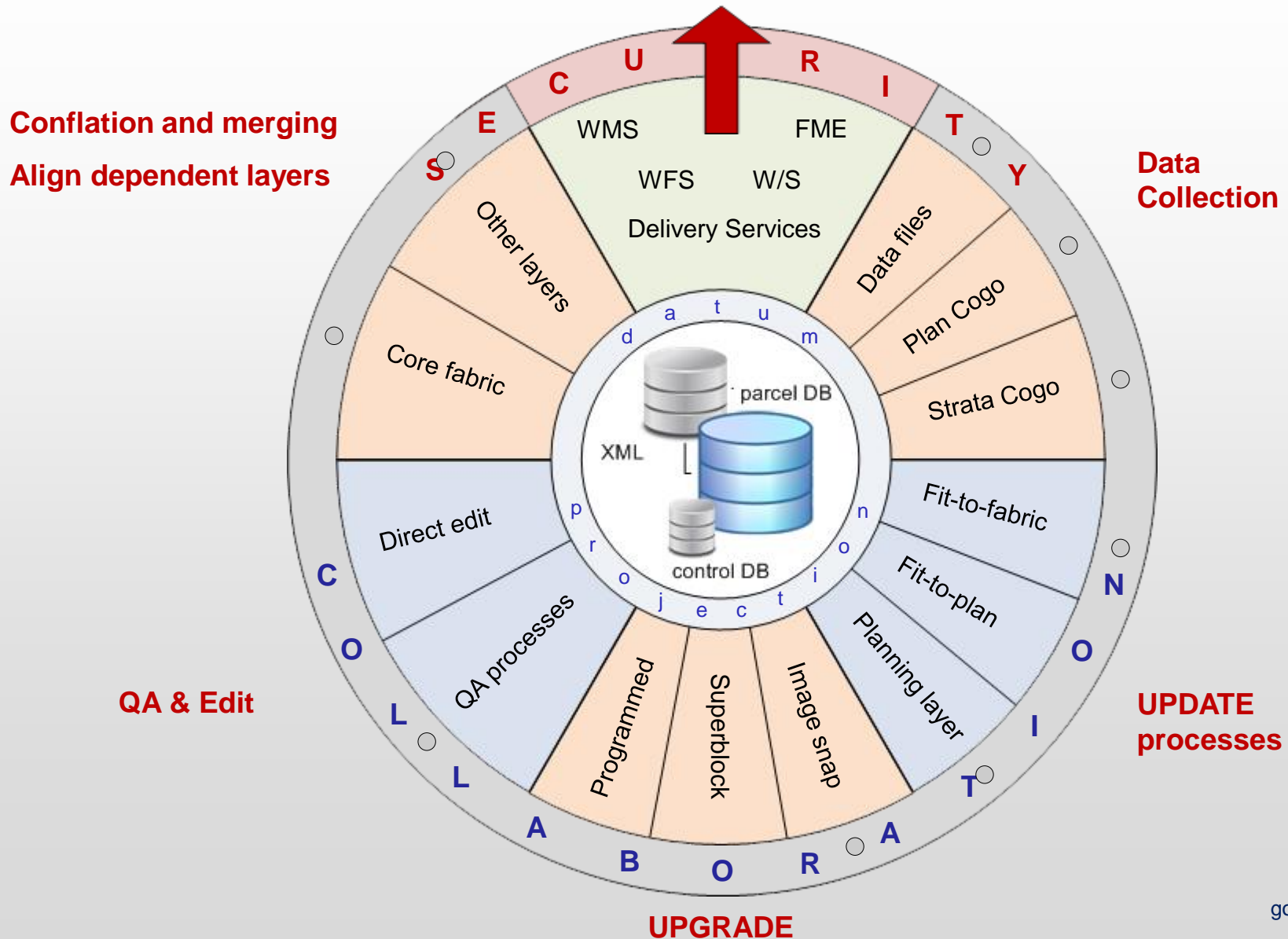


Users

- *access via browser*
- *desktops, tablets, mobile*
- *database storage with easy access*







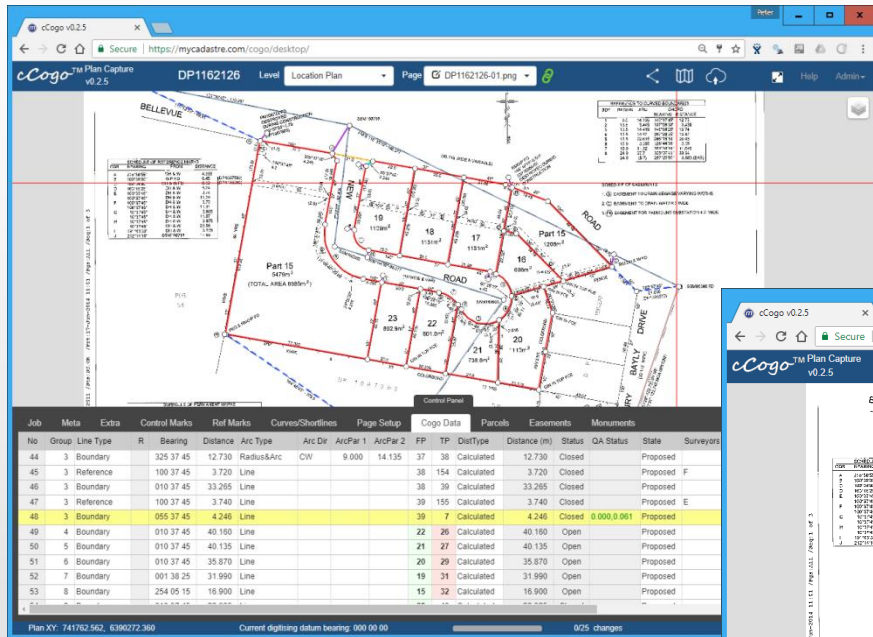
LandXML

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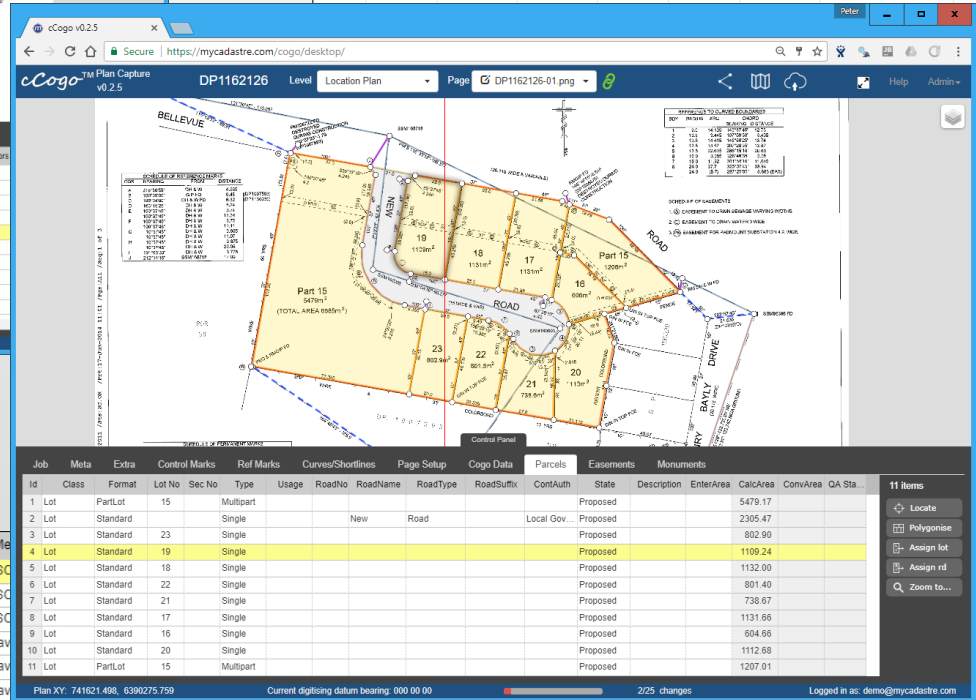
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cCogo – Survey Plan Capture

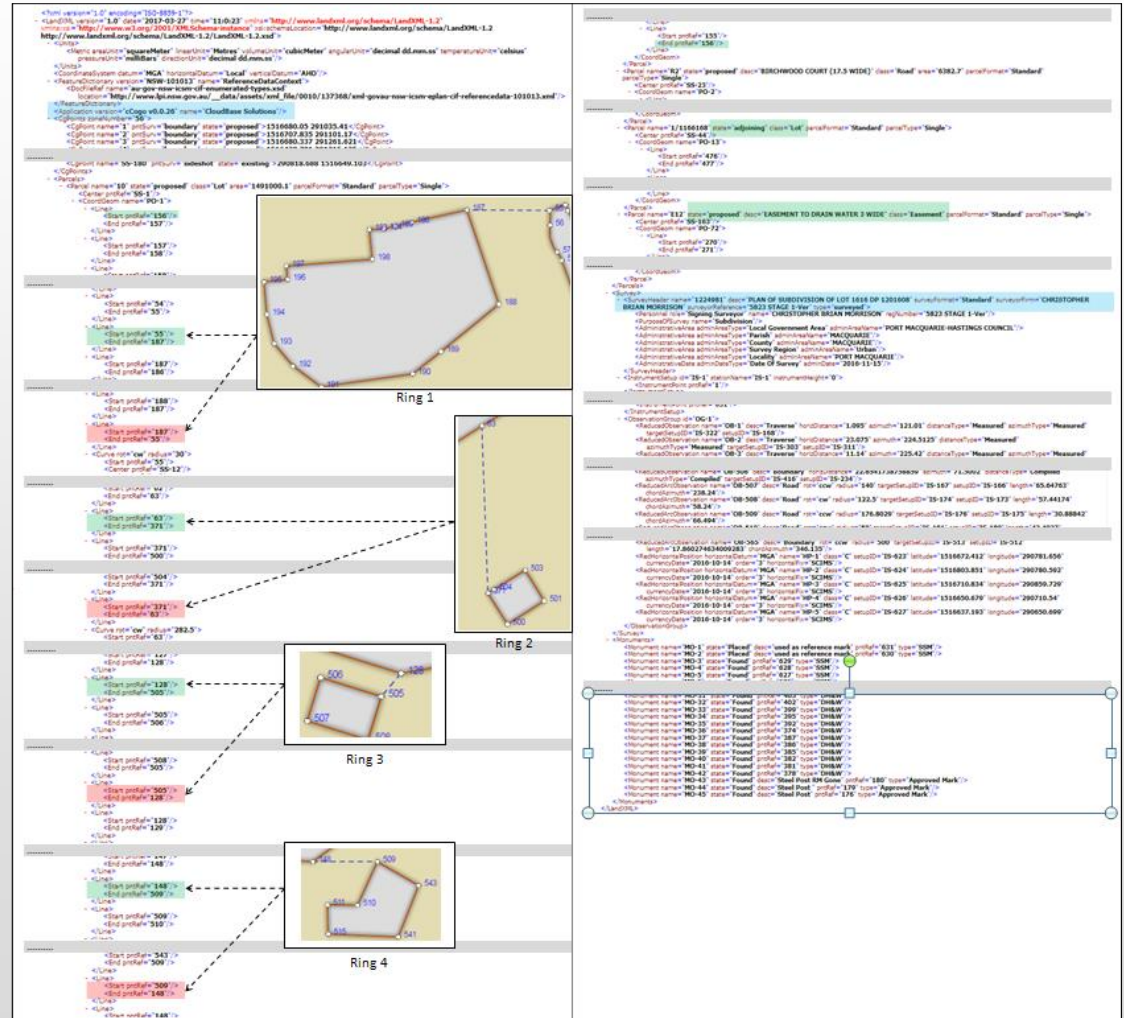


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1	3	145 50 25	13.740	13.500	14.415			✓	+
1	4	207 20 35	13.870	13.500	14.570			✓	+
1	5	286 15 10	20.060	13.500	22.615			✓	+
1	6	328 46 35	3.050	16.000	3.055			✓	+
1	7	301 58 10	11.645	16.000	11.920			✓	+
1	8	325 37 45	33.940	24.000	37.700			✓	+
1	8a	287 25 55	5.685	24.000	5.700			✓	+



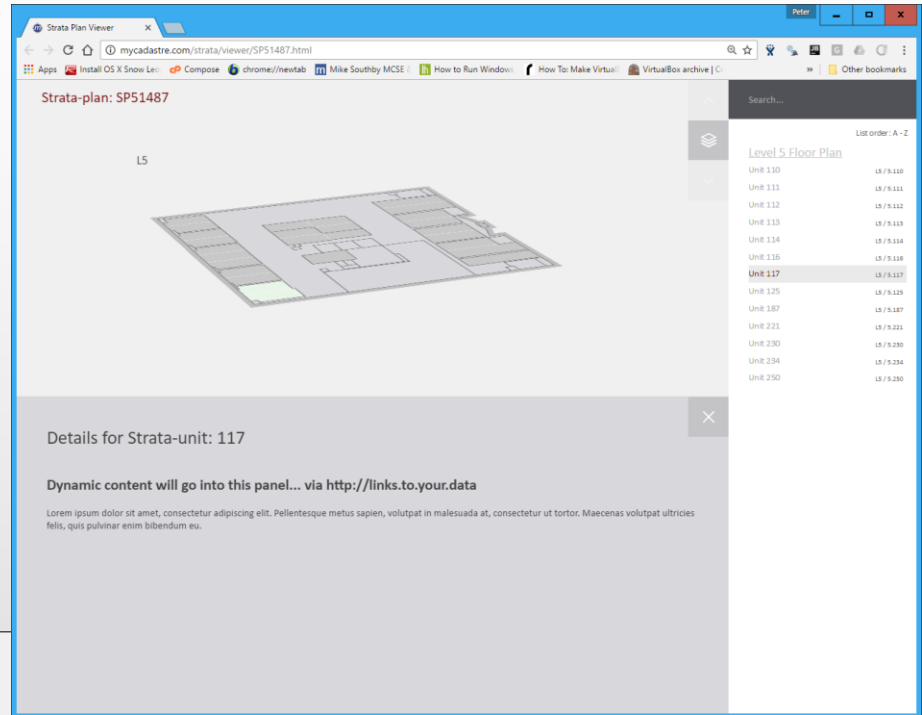
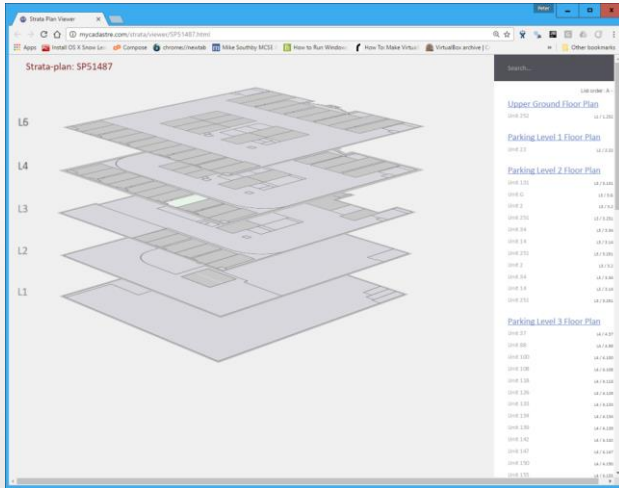
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1	SSM	141516	741487.289	6390325.360	55	C	3	Trav
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Page	Curve Id	Bearing	Distance	Radius	Arc Length	Angle	QA Status	Used	Copy
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1	2	107 56 30	3.435	13.500	3.445			✓	+
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1	5	286 15 10	20.060	13.500	22.615			✓	+
1	6	328 46 35	3.050	16.000	3.055			✓	+
1	7	301 58 10	11.645	16.000	11.920			✓	+
1	8	325 37 45	33.940	24.000	37.700			✓	+
1	8a	287 25 55	5.685	24.000	5.700			✓	+

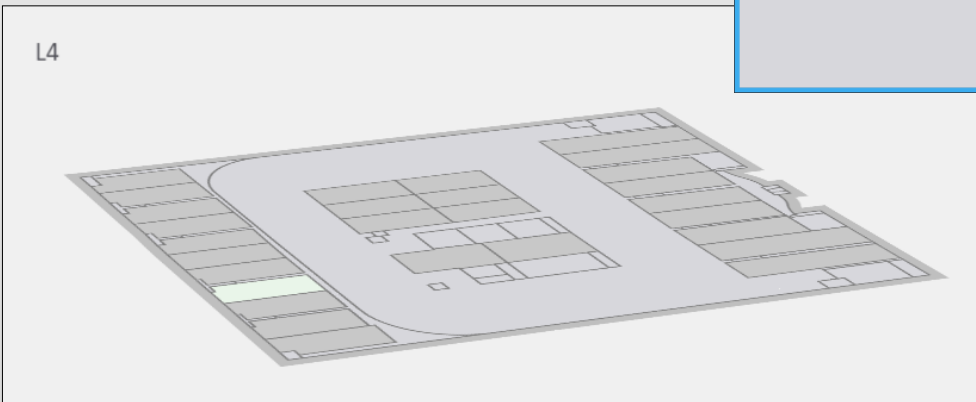




QA and Perspectives

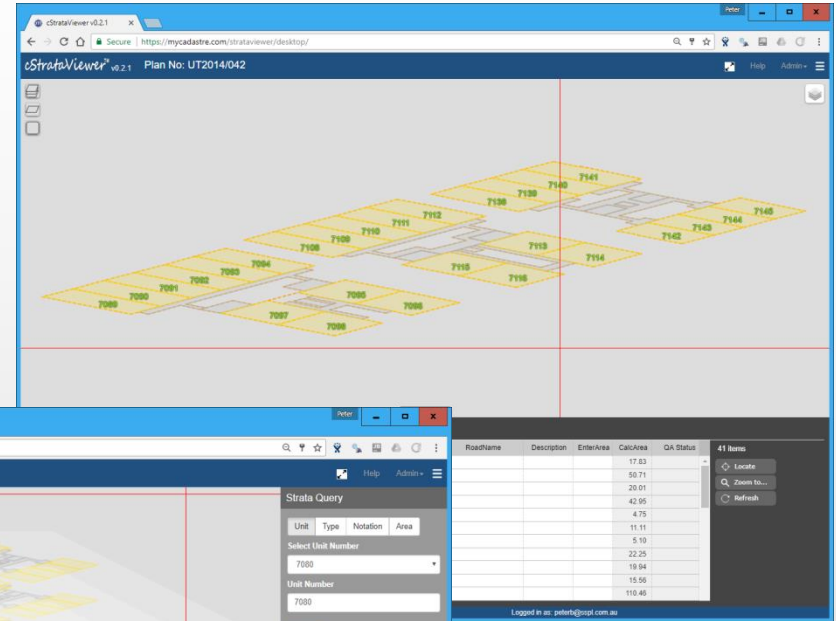
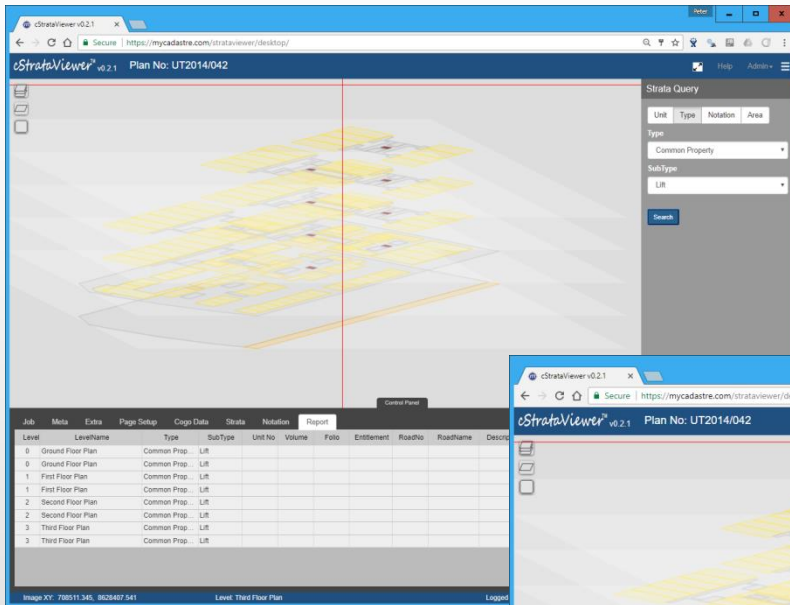


Parking Level 2 Floor Plan



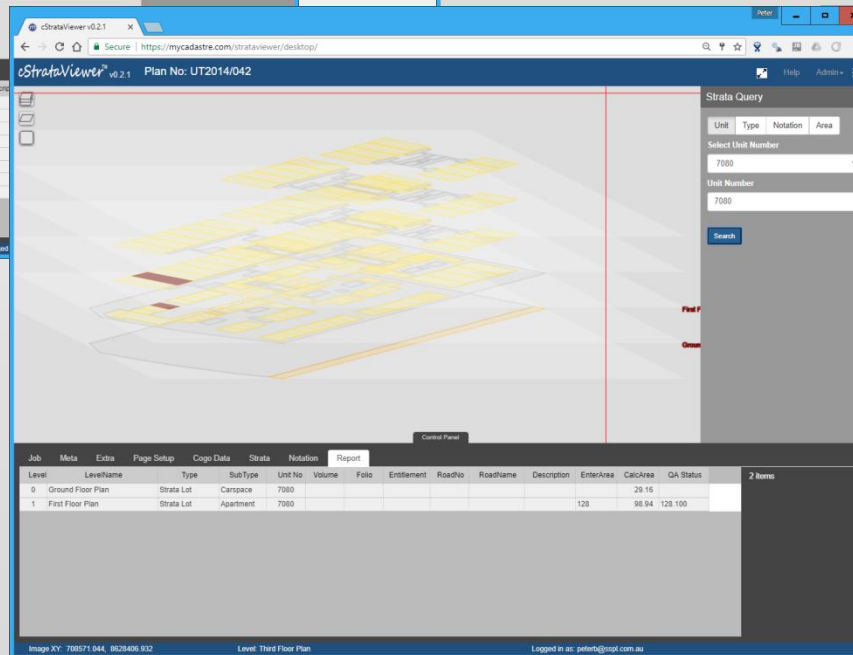
Lightweight Html/CSS version

QA and Perspectives

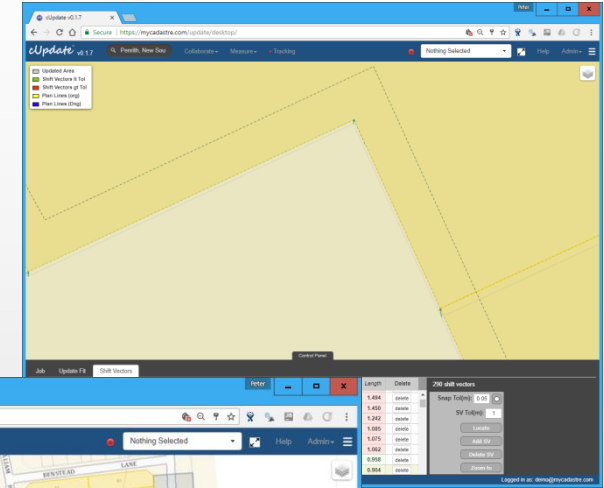
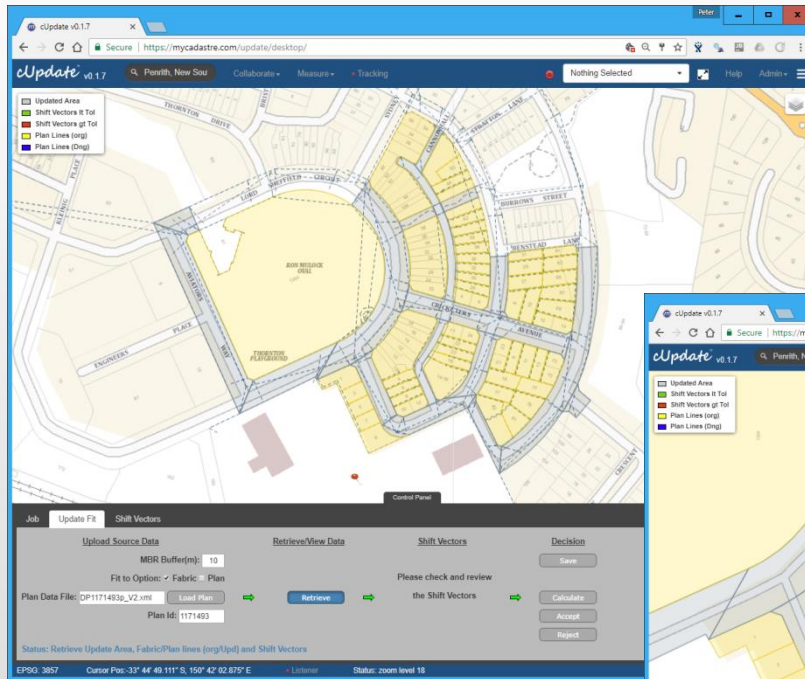


Perspective view queries can identify common elements eg. lifts, stairs, balconies etc.

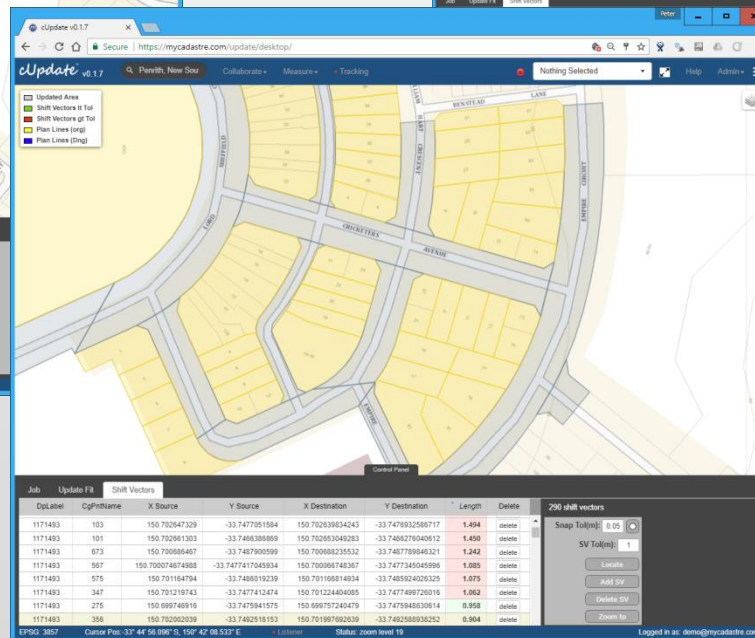
Use perspective to check attribution – unit numbers, areas etc



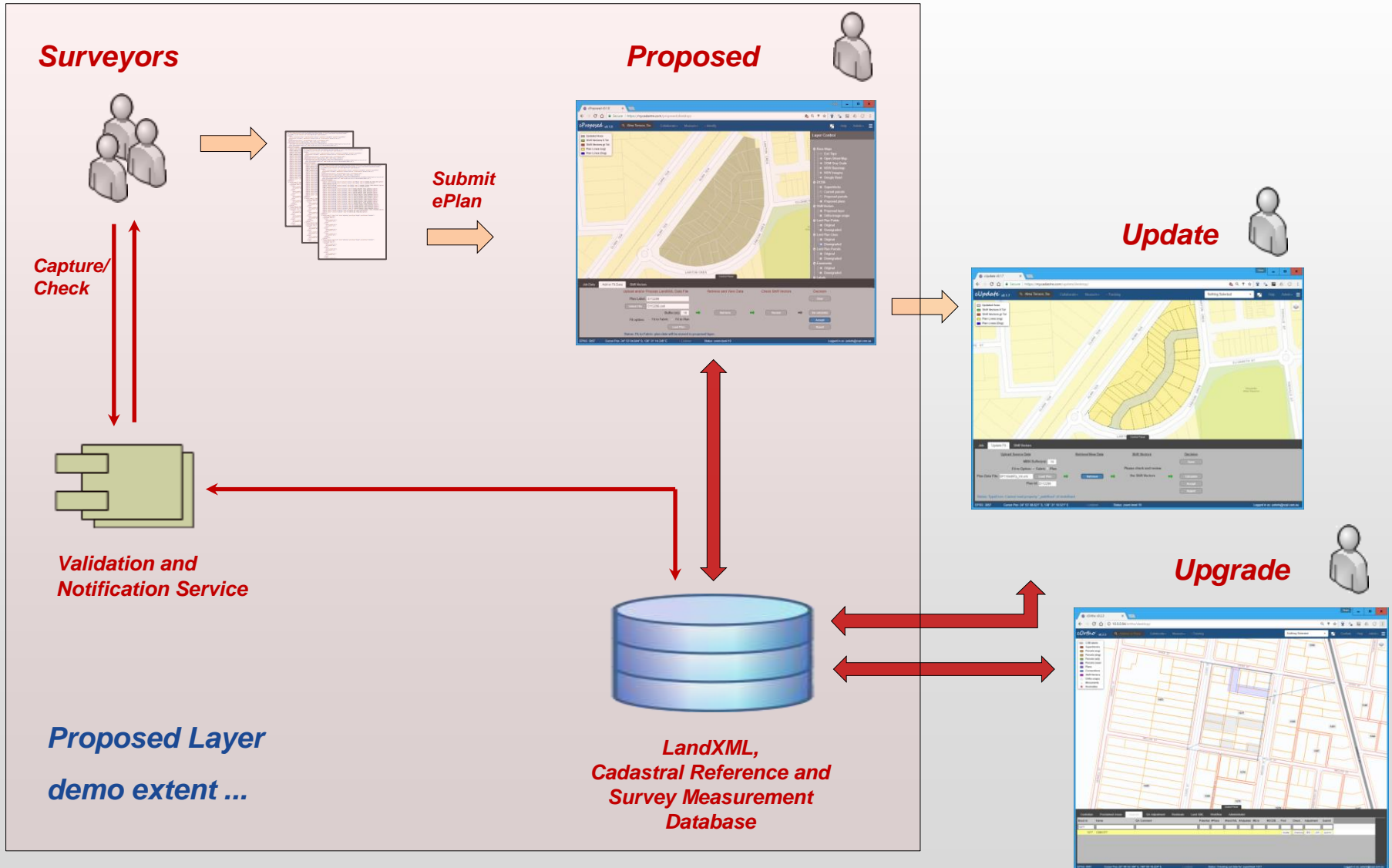
Update – Fit to Fabric



1. LandXML loaded
2. Shift-vectors generated
3. Adjustment performed
4. Shift-vectors examined
5. Re-adjust if necessary
6. Job done!



Planning Layer Workflow



The screenshot shows the myCadastral.com web application interface. The browser address bar displays the URL <https://mycadastral.com/proposed/desktop/>. The application title is "cProposed v0.1.8". The main map area shows a residential street layout with labels for "BYLONG VALLEY WAY", "CROWN ST", "ILFORD RD", "ANGUS AVE", "DAVIES RD", "DAVIES WHITE CRES", "JACQUES ST", "RODGERS ST", and "DANBAR ST". A legend on the left side of the map lists the following layers: "Updated Area" (white), "Shift Vectors It Tol" (green), "Shift Vectors gt Tol" (red), "Plan Lines (org)" (yellow), and "Plan Lines (Dng)" (blue). A dialog box titled "Load available Jobs" is open in the center of the screen, displaying the message: "No jobs found. You will need to upload some LandXML first." with an "Ok" button. The bottom of the interface features a "Control Panel" with tabs for "Job Data", "Add or Fit Data", and "Shift Vectors". The "Job Data" tab is active, showing a table with columns: "Job No", "Plan Label", "Version", "Description", "Status", "Comment", "Last Updated By", "Last Updated", "Created", "Find", and "Update". The table is currently empty. A "Refresh Data" button is located to the right of the table. The bottom status bar displays "EPSG: 3857", "Cursor Pos: waiting...", "Listener", "Status: connected", and "Logged in as: peterb@sspl.com.au".

Load available Jobs

No jobs found.
You will need to upload some LandXML first.

Ok

Control Panel

Job Data Add or Fit Data Shift Vectors Refresh Data

Job No	Plan Label	Version	Description	Status	Comment	Last Updated By	Last Updated	Created	Find	Update
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EPSG: 3857 Cursor Pos: waiting... Listener Status: connected Logged in as: peterb@sspl.com.au

The screenshot displays the myCadastral.com web application interface. The top section shows a browser window with the URL <https://mycadastral.com/proposed/desktop/>. Below the browser window is the application header with the logo "cProposed v0.1.8" and navigation links: "Alma Terrace, Sei", "Collaborate", "Measure", "Identify", "Help", and "Admin".

The main map area shows a residential street layout with yellow land parcels and green areas. A legend in the top-left corner identifies the map features:

- Updated Area (yellow outline)
- Shift Vectors It Tol (green outline)
- Shift Vectors gt Tol (red outline)
- Plan Lines (org) (yellow fill)
- Plan Lines (Dng) (blue fill)

The map includes labels for streets: CLARK TER, ALMA TER, LAWTON CRES, ELIZABETH ST, and TODVILLE ST. A green area is labeled "Woodlife West Reserve".

Below the map is a "Control Panel" with three tabs: "Job Data", "Add or Fit Data", and "Shift Vectors". The "Add or Fit Data" tab is active, showing a workflow for uploading and processing LandXML data. The workflow includes:

- Upload and/or Process LandXML Data File:** Includes a "Plan Label:" input field, a "Select File..." button, a "Buffer (m):" input field set to 10, a "Fit option:" section with radio buttons for "Fit to Fabric" and "Fit to Plan", and a "Load Plan" button.
- Retrieve and View Data:** Includes a "Retrieve" button.
- Check Shift Vectors:** Includes a "Review" button.
- Decision:** Includes buttons for "Clear", "Re-calculate", "Accept", and "Reject".

The bottom status bar displays the following information:

- EPSG: 3857
- Cursor Pos: -34° 53' 04.559" S, 138° 31' 13.602" E
- Listener
- Status: zoom level 19
- Logged in as: peterb@spil.com.au

The screenshot shows the myCadastral.com web application interface. The browser address bar displays <https://mycadastral.com/proposed/desktop/>. The application title is "cProposed v0.1.8". The user is logged in as "Peter".

An "Open" file dialog is open, showing the file explorer view. The path is `Data_01 (D:) > MyCadastral > Demo-landXML > sa`. The file list shows the following files:

Name	Date modified	Type
D95023.xml	19/06/2017 8:18 PM	XML File
D112296.xml	19/06/2017 9:34 PM	XML File
D112296-extra.xml	23/07/2017 11:58 ...	XML File
D112641.xml	21/06/2017 7:06 PM	XML File

The "File name" field contains "D112296.xml" and the "File type" is set to "All Files". The "Open" button is visible.

The background map shows a residential area with streets including Sweeney Ter, Elizabeth St, Henderson Ave, Ryan Ave, Lawton Cres, Agnes St, and Clark Ter. The map is overlaid with a yellow grid representing the proposed layer.

The bottom panel contains the "Control Panel" with the following sections:

- Job Data**: Add or Fit Data, Shift Vectors
- Upload and/or Process LandXML Data File**: Plan Label: ; Select File: D112296.xml; Buffer (m): 10; Fit option: ☐ Fit to Fabric ☒ Fit to Plan; Load Plan
- Retrieve and View Data**: Retrieve
- Check Shift Vectors**: Review
- Decision**: Clear, Re-calculate, Accept, Reject

Status: Load Plan and Calculate Fit

EPSG: 3857 Cursor Pos: -34° 53' 02.365" S, 138° 31' 11.197" E Listener Status: zoom level 18 Logged in as: peterb@sspl.com.au

The screenshot displays the myCadastr.com web application interface. The browser window shows the URL <https://mycadastr.com/proposed/desktop/>. The application title is "cProposed v0.1.8". The main map area shows a residential area with streets labeled: CLARK TER, ALMA TER, LAWTON CRES, and TODVILLE ST. A large yellow polygon represents a proposed area. A legend in the top-left corner identifies the map elements: Updated Area (yellow), Shift Vectors lt Tol (green), Shift Vectors gt Tol (red), Plan Lines (org) (yellow), and Plan Lines (Dng) (blue). The bottom control panel has tabs for "Job Data", "Add or Fit Data", and "Shift Vectors". The "Add or Fit Data" tab is active, showing a workflow for uploading and processing LandXML data. The workflow includes fields for "Plan Label" (D112296), "Select File..." (D112296.xml), "Buffer (m):" (10), and "Fit option:" (Fit to Fabric, Fit to Plan). The "Retrieve" button is highlighted. The "Decision" section has buttons for "Clear", "Re-calculate", "Accept", and "Reject". The status bar at the bottom shows "EPSG: 3857", "Cursor Pos: -34° 53' 04.757\" S, 138° 31' 14.577\" E", "Listener", "Status: zoom level 19", and "Logged in as: peterb@spil.com.au".

Updated Area
Shift Vectors lt Tol
Shift Vectors gt Tol
Plan Lines (org)
Plan Lines (Dng)

CLARK TER
ALMA TER
LAWTON CRES
TODVILLE ST
ELIZABETH ST
Woodville West Reserve

Control Panel

Job Data | Add or Fit Data | Shift Vectors

Upload and/or Process LandXML Data File

Plan Label: D112296
Select File... D112296.xml
Buffer (m): 10
Fit option: ☐ Fit to Fabric ☐ Fit to Plan
Load Plan

Retrieve and View Data

Retrieve

Check Shift Vectors

Review

Decision

Clear
Re-calculate
Accept
Reject

Status: Load Plan and Calculate Fit

EPSG: 3857 | Cursor Pos: -34° 53' 04.757" S, 138° 31' 14.577" E | Listener | Status: zoom level 19 | Logged in as: peterb@spil.com.au

cProposed v0.1.8

Secure | <https://mycadastral.com/proposed/desktop/>

cProposed v0.1.8 | | Collaborate | Measure | Identify | Help | Admin

Legend:

- Updated Area
- Shift Vectors It Tol
- Shift Vectors gt Tol
- Plan Lines (org)
- Plan Lines (Dng)

Layer Control

- Base Maps
 - Esri Topo
 - Open Street Map
 - OSM Gray Scale
 - NSW Basemap
 - NSW Imagery
 - Google Road
- DCDB
 - Superblocks
 - Current parcels
 - Proposed parcels
 - Proposed plans
- Shift Vectors
 - Proposed layer
 - Ortho-image snaps
- Lxml Plan Points
 - Original
 - Downgraded
- Lxml Plan Lines
 - Original
 - Downgraded
- Lxml Plan Parcels
 - Original
 - Downgraded
- Easements
 - Original
 - Downgraded
- Labels

Control Panel

Job Data | **Add or Fit Data** | Shift Vectors

Upload and/or Process LandXML Data File | Retrieve and View Data | Check Shift Vectors | Decision

Plan Label:

Select File...

Buffer (m): → → →

Fit option: ☐ Fit to Fabric ☐ Fit to Plan

Decision:

Status: Retrieve update area, fabric/plan lines (org/upd) and shift-vectors

EPSG: 3857 | Cursor Pos: -34° 53' 04.749" S, 138° 31' 19.733" E | Listener | Status: zoom level 19 | Logged in as: peterb@sspl.com.au

cProposed v0.1.8

Secure | <https://mycadastral.com/proposed/desktop/>

cProposed v0.1.8 | Alma Terrace, Se | Collaborate | Measure | Identify | Help | Admin

Updated Area
Shift Vectors It Tol
Shift Vectors gt Tol
Plan Lines (org)
Plan Lines (Dng)

Layer Control

- Base Maps
 - Esri Topo
 - Open Street Map
 - OSM Grey Scale
 - NSW Basemap
 - NSW Imagery
 - Google Road
- DCDB
 - Superblocks
 - Current parcels
 - Proposed parcels
 - Proposed plans
- Shift Vectors
 - Proposed layer
 - Ortho-image snaps
- Lxml Plan Points
 - Original
 - Downgraded
- Lxml Plan Lines
 - Original
 - Downgraded
- Lxml Plan Parcels
 - Original
 - Downgraded
- Easements
 - Original
 - Downgraded
- Labels

Control Panel

Job Data | Add or Fit Data | Shift Vectors

Plan Label	CgPnt Name	X Source	Y Source	X Destination	Y Destination	Length	Delete
D112296	29	138.52049027	-34.88596653	138.520480060577	-34.8859630845768	1.007	delete
D112296	20	138.52090559	-34.88556525	138.520907565943	-34.885567877151	0.958	delete
D112296	33	138.52021853	-34.8860307499999	138.520208958557	-34.8860310226434	0.874	delete
D112296	41	138.51964888	-34.8859242299999	138.519639421511	-34.8859250543063	0.868	delete
D112296	16	138.52095328	-34.88526079	138.520946022433	-34.8852588537532	0.696	delete
D112296	31	138.52034397	-34.8860108299999	138.520339868038	-34.8860084096921	0.461	delete
D112296	3	138.51964175	-34.88585287	138.519625112096	-34.8858500025139	1.551	delete
D112296	8	138.52069925	-34.8847029199999	138.520690316313	-34.8846973071887	1.026	delete

14 shift vectors

Snap Tol(m): 0.5

SV Tol(m): 1

Locate

Add SV

Delete SV

Zoom to

EPSG: 3857 | Cursor Pos:-34° 53' 08.553" S, 138° 31' 11.977" E | Listener | Status: zoom level 21 | Logged in as: peterb@spil.com.au

The screenshot displays the myCadastr.com web application interface for the 'Proposed Layer Creation' process. The browser window shows the URL <https://mycadastr.com/proposed/desktop/>. The application title is 'cProposed v0.1.8'.

Map View: The central map area shows a yellow-shaded polygon representing the 'Updated Area'. A legend in the top-left corner identifies the layers: 'Updated Area' (yellow), 'Shift Vectors lt Tol' (green), 'Shift Vectors gt Tol' (red), 'Plan Lines (org)' (yellow), and 'Plan Lines (Dng)' (blue). A 'Control Panel' tab is visible at the bottom of the map area.

Layer Control Panel: Located on the right side, it lists various map layers categorized under 'Base Maps', 'DCDB', 'Shift Vectors', 'Lxml Plan Points', 'Lxml Plan Lines', 'Lxml Plan Parcels', 'Easements', and 'Labels'. The 'Proposed layer' under 'Shift Vectors' is currently checked.

Control Panel (Bottom): This panel contains several tabs: 'Job Data', 'Add or Fit Data', and 'Shift Vectors'. The 'Add or Fit Data' tab is active, showing the following workflow:

- Upload and/or Process LandXML Data File:** Includes a 'Plan Label' field (D112296), a 'Select File...' button, and a 'Buffer (m): 10' input field.
- Retrieve and View Data:** Includes a 'Retrieve' button.
- Check Shift Vectors:** Includes a 'Review' button.
- Decision:** Includes buttons for 'Clear', 'Re-calculate', 'Accept', and 'Reject'.

Additional controls include a 'Fit option' (Fit to Fabric / Fit to Plan) and a 'Load Plan' button. The status bar at the bottom indicates the status: 'Retrieve update area, fabric/plan lines (org/upd) and shift-vectors'.

Footer: The bottom of the interface shows the EPSG: 3857 projection, cursor coordinates (34° 53' 09.842" S, 138° 31' 10.140" E), a listener status, zoom level 21, and the user is logged in as 'peterb@sspl.com.au'.

The screenshot displays the myCadastral.com web application interface for creating a proposed layer. The browser window shows the URL <https://mycadastral.com/proposed/desktop/>. The application title is "cProposed v0.1.8".

Map Interface:

- Legend:** Located in the top-left corner, it includes:
 - Updated Area (light green)
 - Shift Vectors lt Tol (dark green)
 - Shift Vectors gt Tol (red)
 - Plan Lines (org) (yellow)
 - Plan Lines (Dng) (blue)
- Map:** A central map showing a street layout with labels for CLARK TER, ALMA TER, LAWTON CRES, and ELIZABETH. A central area is highlighted in light green, indicating the "Updated Area".
- Layer Control:** A panel on the right side of the map, titled "Layer Control", listing various map layers and their status (Original or Downgraded).
 - Base Maps:** Esri Topo, Open Street Map, OSM Grey Scale, NSW Basemap, NSW Imagery, Google Road.
 - DCDB:** Superblocks, Current parcels, Proposed parcels, Proposed plans.
 - Shift Vectors:** Proposed layer, Ortho-image snaps.
 - Lxml Plan Points:** Original, Downgraded.
 - Lxml Plan Lines:** Original, Downgraded.
 - Lxml Plan Parcels:** Original, Downgraded.
 - Easements:** Original, Downgraded.
 - Labels:**

Control Panel:

The Control Panel at the bottom contains several sections:

- Job Data:** Includes tabs for "Add or Fit Data" and "Shift Vectors".
- Upload and/or Process LandXML Data File:** Includes a "Plan Label" field (D112296), a "Select File..." button, and a "Buffer (m): 10" input field.
- Retrieve and View Data:** Includes a "Retrieve" button.
- Check Shift Vectors:** Includes a "Review" button.
- Decision:** Includes buttons for "Clear", "Re-calculate", "Accept", and "Reject".

Status: A message at the bottom of the Control Panel states: "Status: Fit-to-Fabric: plan data will be moved to proposed layer."

Footer: The bottom of the application shows the EPSG: 3857 projection, cursor coordinates (34° 53' 04.844" S, 138° 31' 14.336" E), a "Listener" status, zoom level 19, and the user is logged in as "peterb@sspl.com.au".

The screenshot displays the myCadastr.com cProposed v0.1.8 web application. The interface includes a browser window with the URL <https://mycadastr.com/proposed/desktop/>. The main map area shows an aerial view of a residential development with proposed land parcels outlined in blue. A legend in the top-left corner identifies the map elements: Updated Area (grey), Shift Vectors It Tol (green), Shift Vectors gt Tol (red), Plan Lines (org) (yellow), and Plan Lines (Dng) (blue). The control panel at the bottom is divided into four sections: Job Data, Add or Fit Data, Shift Vectors, and Decision. The Job Data section contains fields for Plan Label (1184497) and a file selection button. The Add or Fit Data section has a Buffer (m) field set to 10 and a Fit option (Fit to Fabric, Fit to Plan). The Shift Vectors section includes a Retrieve button. The Decision section has buttons for Clear, Re-calculate, Accept, and Reject. The status bar at the bottom indicates the EPSG: 3857 projection, cursor coordinates, and the user is logged in as peterb@sspl.com.au.

Legend:

- Updated Area
- Shift Vectors It Tol
- Shift Vectors gt Tol
- Plan Lines (org)
- Plan Lines (Dng)

Control Panel:

Job Data | Add or Fit Data | Shift Vectors

Upload and/or Process LandXML Data File

Plan Label: 1184497

Select File... DP1184497p_V4.xml

Buffer (m): 10

Fit option: ☐ Fit to Fabric ☐ Fit to Plan

Retrieve

Check Shift Vectors

Review

Decision

Clear

Re-calculate

Accept

Reject

Status: Fit-to-Fabric: plan data will be moved to proposed layer.

EPSG: 3857 | Cursor Pos: -33° 44' 40.038" S, 150° 41' 54.764" E | Listener | Status: zoom level 18 | Logged in as: peterb@sspl.com.au

The screenshot displays the myCadastr.com web application interface for the 'Proposed Layer Creation' process. The browser window shows the URL <https://mycadastr.com/proposed/desktop/>. The application version is cProposed v0.1.8.

Map View: The main map area shows an aerial view of a residential area with various land parcels. A legend in the top-left corner identifies the following layers:

- Updated Area (Grey outline)
- Shift Vectors lt Tol (Green outline)
- Shift Vectors gt Tol (Red outline)
- Plan Lines (org) (Yellow outline)
- Plan Lines (Dng) (Blue outline)

Layer Control: The right-hand panel lists the following layers:

- Base Maps
 - Esri Topo
 - Open Street Map
 - OSM Grey Scale
 - NSW Basemap
 - NSW Imagery
 - Google Road
- DCDB
 - Superblocks
 - Current parcels
 - Proposed parcels
 - Proposed plans
- Shift Vectors
 - Proposed layer
 - Ortho-image snaps
- Lxml Plan Points
 - Original
 - Downgraded
- Lxml Plan Lines
 - Original
 - Downgraded
- Lxml Plan Parcels
 - Original
 - Downgraded
- Easements
 - Original
 - Downgraded
- Labels

Control Panel: The bottom section contains the following elements:

- Tabs:** Job Data, Add or Fit Data (active), Shift Vectors.
- Workflow Steps:**
 - Upload and/or Process LandXML Data File:** Includes a text field for Plan Label (1171491), a file selection button (DP1171491p_V2.xml), a Buffer (m) field (10), and a Fit option (Fit to Fabric, Fit to Plan). A Load Plan button is also present.
 - Retrieve and View Data:** Includes a Retrieve button.
 - Check Shift Vectors:** Includes a Review button.
 - Decision:** Includes buttons for Clear, Re-calculate, Accept, and Reject.
- Status:** Retrieve update area, fabric/plan lines (org/upd) and shift-vectors
- Footer:** EPSG: 3857, Cursor Pos:-33° 44' 41.821" S, 150° 42' 01.388" E, Listener, Status: zoom level 17, Logged in as: peterb@spil.com.au

myCadastrre.com v0.1.8

Secure | <https://mycadastrre.com/proposed/desktop/>

Alma Terrace, Sei | Collaborate | Measure | Identify | Help | Admin

Legend:

- Updated Area
- Shift Vectors It Tol
- Shift Vectors gt Tol
- Plan Lines (org)
- Plan Lines (Dng)

Layer Control:

- Base Maps
 - Esri Topo
 - Open Street Map
 - OSM Grey Scale
 - NSW Basemap
 - NSW Imagery
 - Google Road
- DCDB
 - Superblocks
 - Current parcels
 - Proposed parcels
 - Proposed plans
- Shift Vectors
 - Proposed layer
 - Ortho-image snaps
- Lxml Plan Points
 - Original
 - Downgraded
- Lxml Plan Lines
 - Original
 - Downgraded
- Lxml Plan Parcels
 - Original
 - Downgraded
- Easements
 - Original
 - Downgraded
- Labels

Control Panel:

Job Data | Add or Fit Data | Shift Vectors

Upload and/or Process LandXML Data File | Retrieve and View Data | Check Shift Vectors | Decision

Plan Label: 1171491

Select File: DP1171491p_V2.xml

Buffer (m): 10

Fit option: ☐ Fit to Fabric ☐ Fit to Plan

Load Plan

Status: Retrieve update area, fabric/plan lines (org/upd) and shift-vectors

EPSG: 3857 | Cursor Pos: 33° 44' 17.090° S, 150° 42' 05.791° E | Listener | Status: zoom level 15 | Logged in as: peterb@sspl.com.au

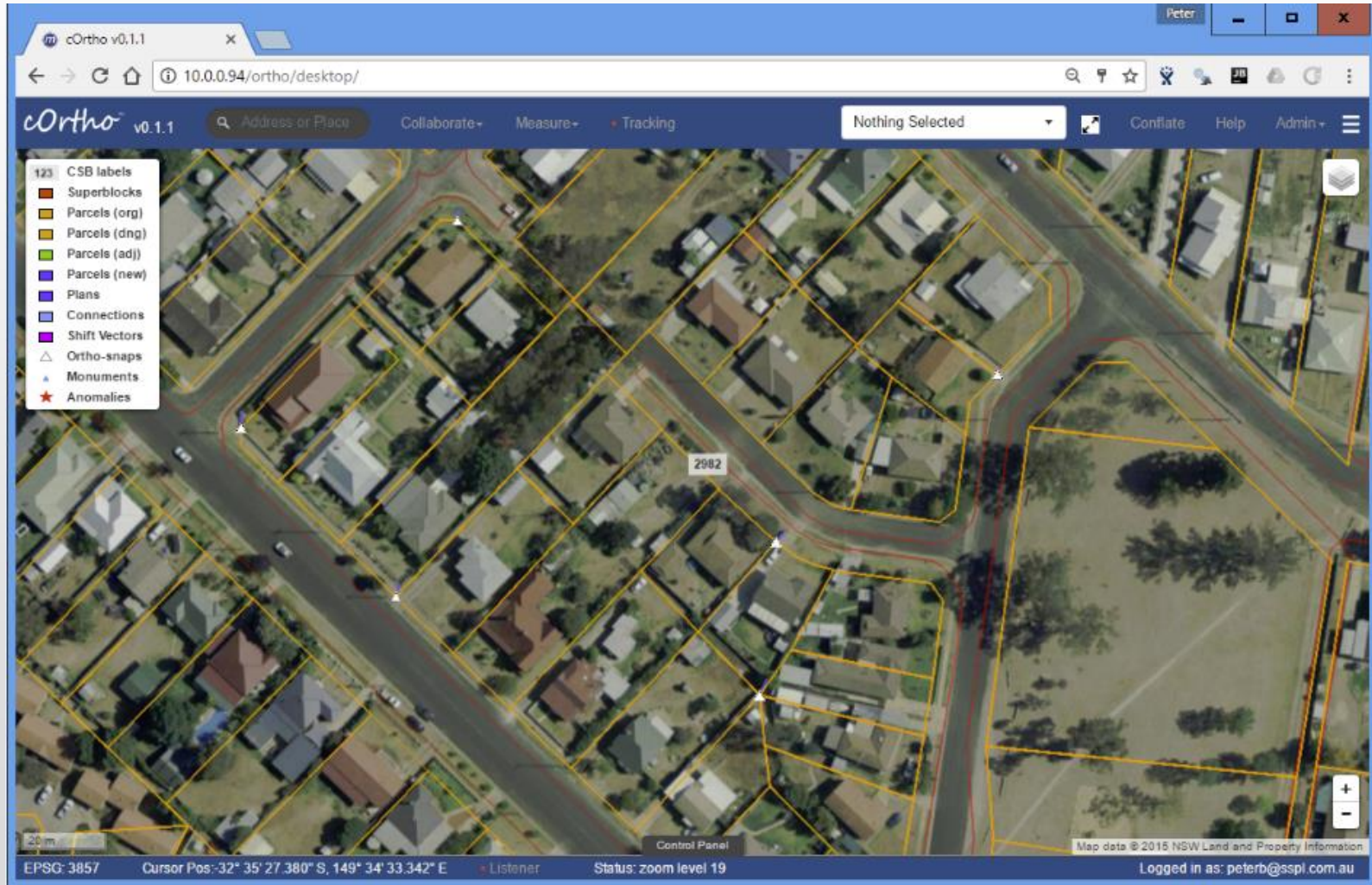
Ortho Upgrade



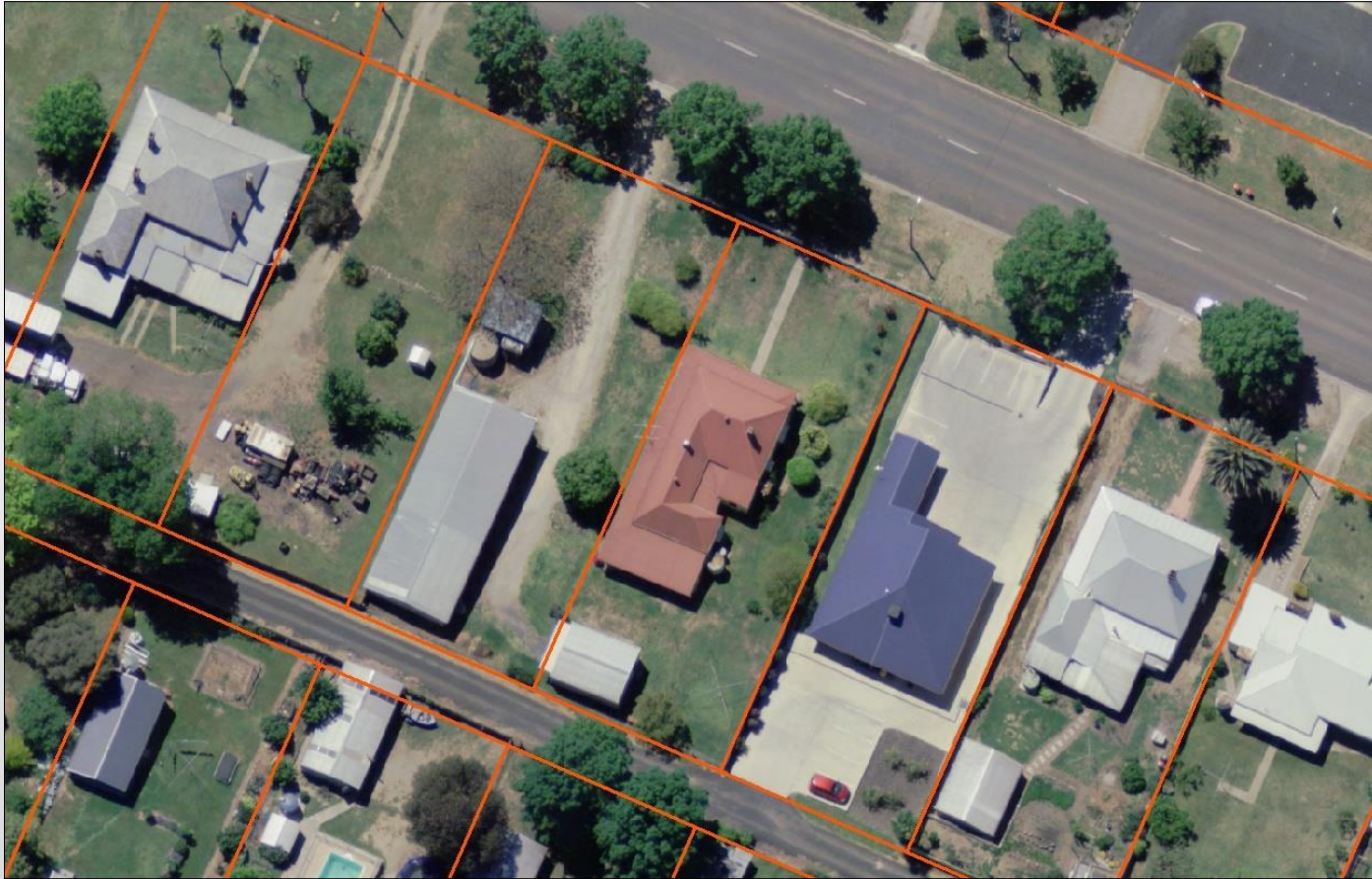
Common situation



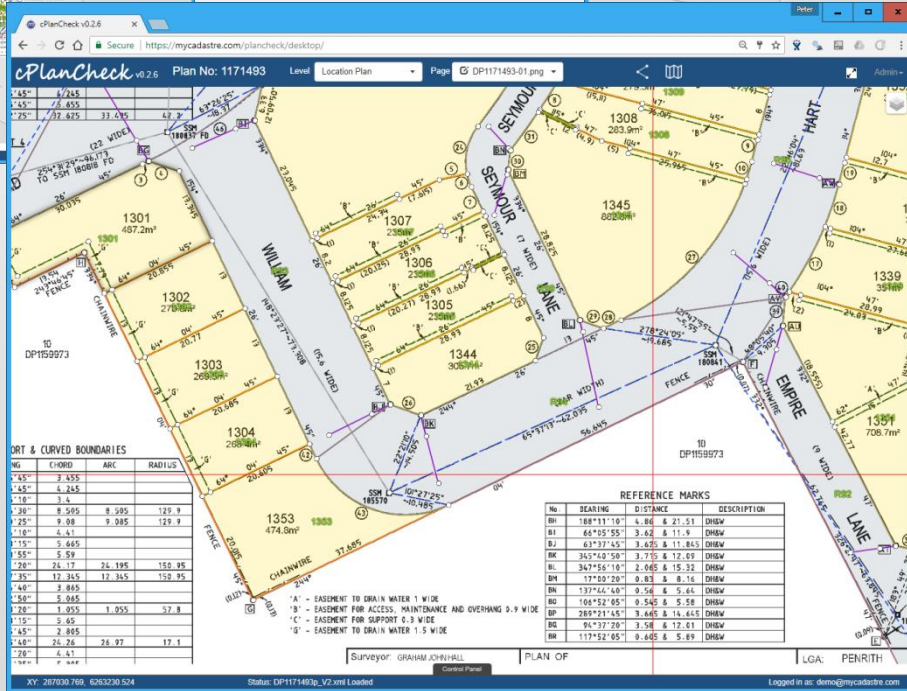
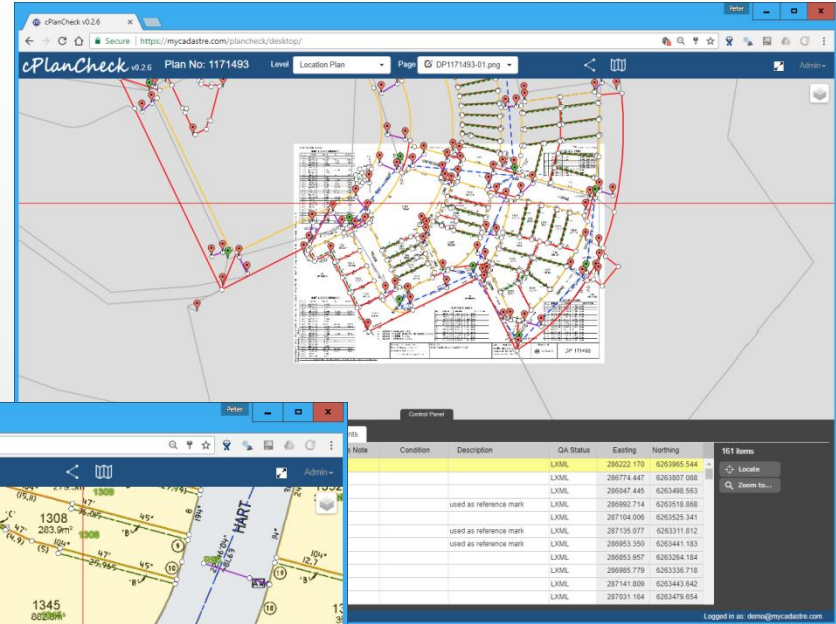
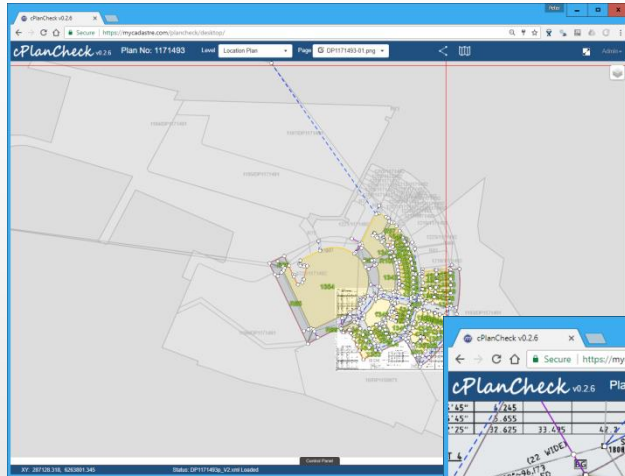
Ortho Upgrade...



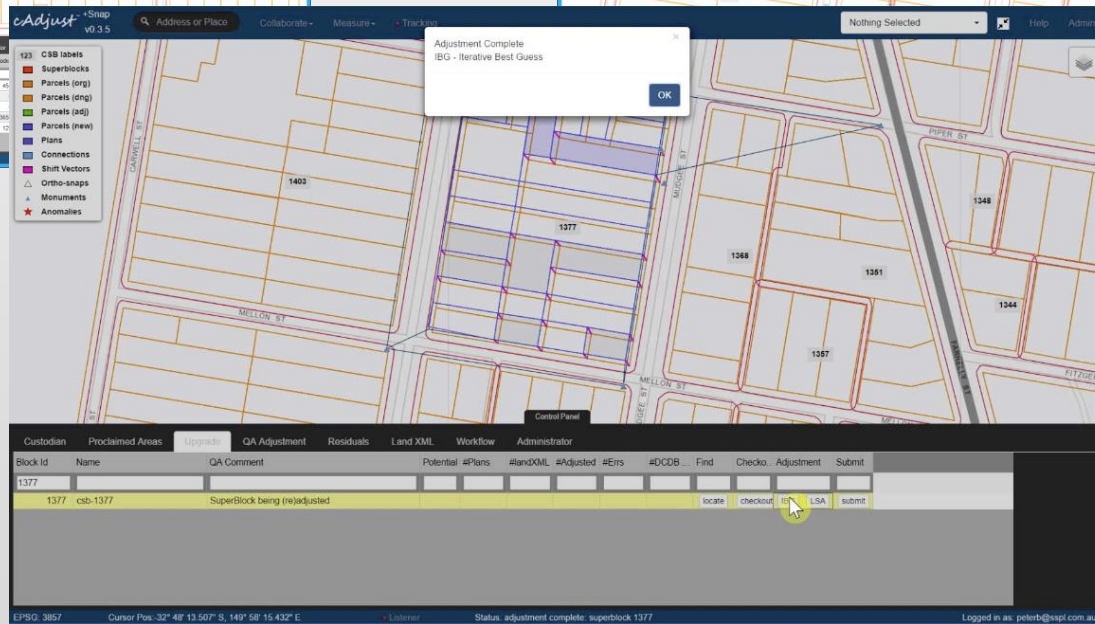
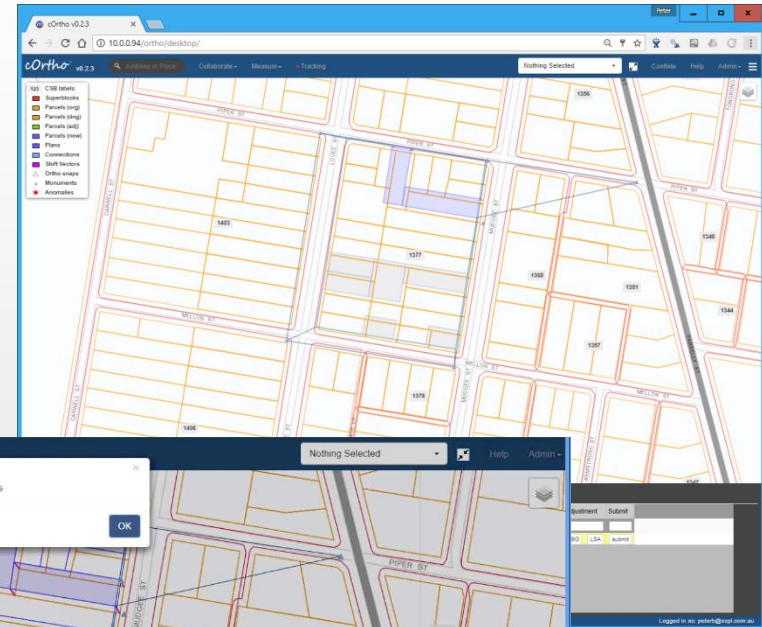
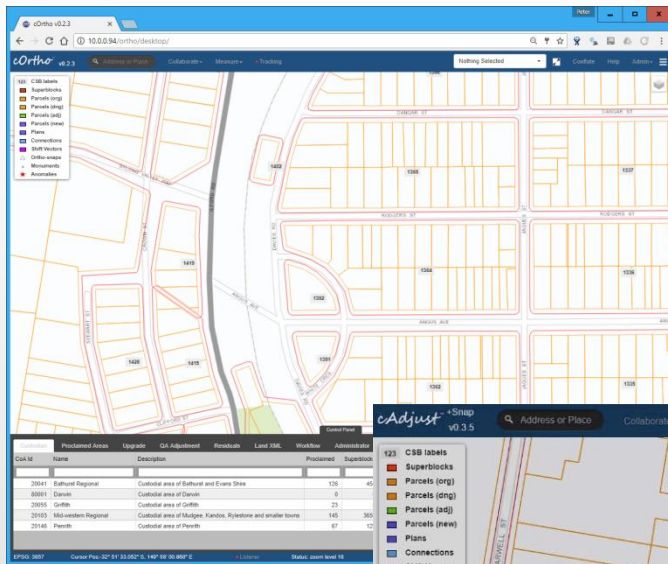
Adjusted



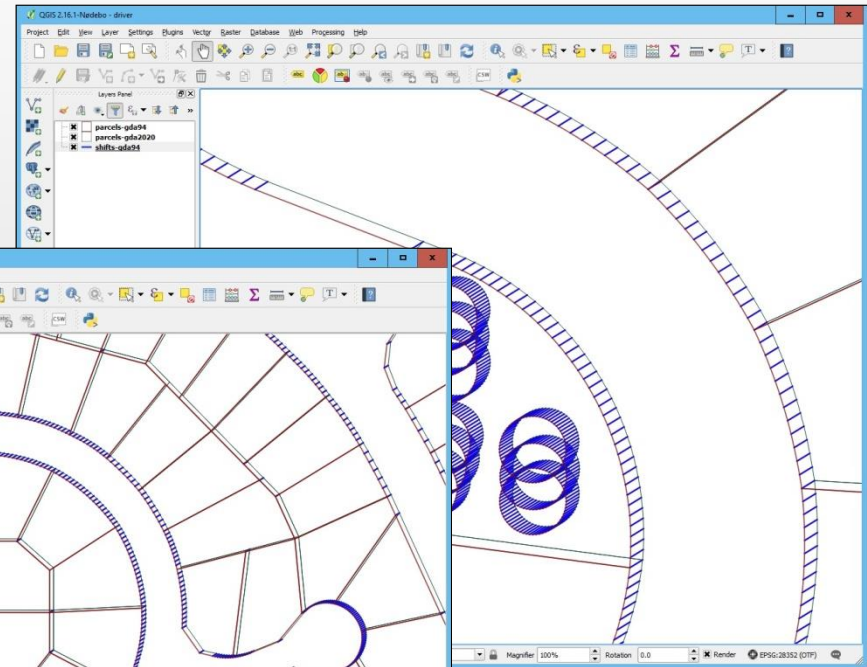
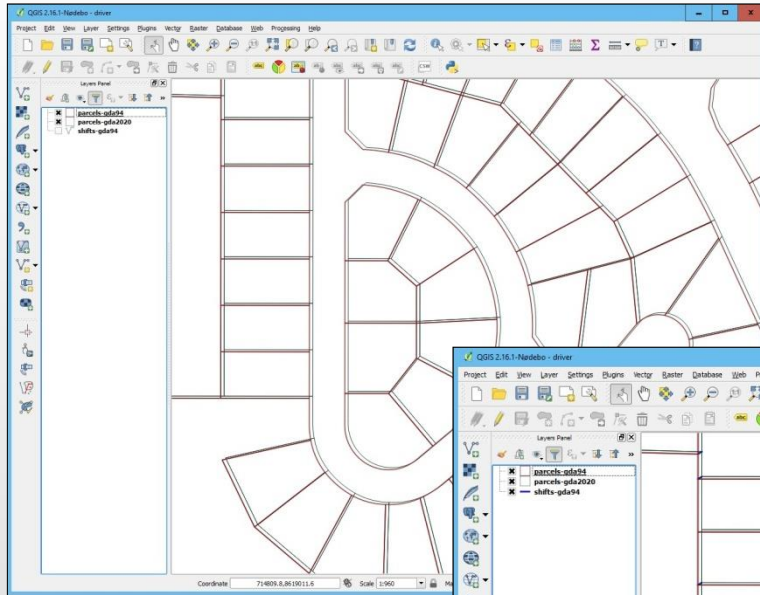
Plan Checking



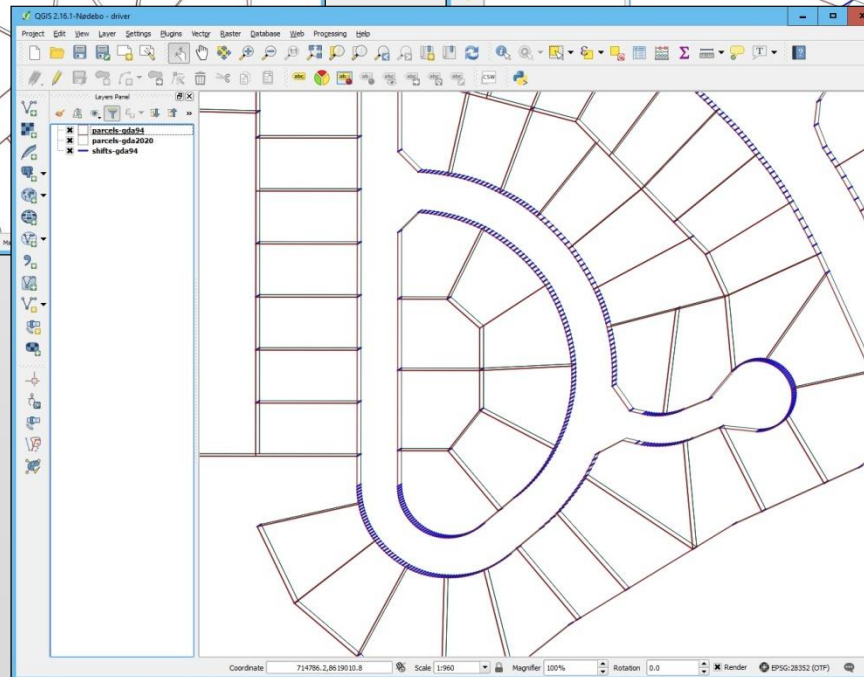
LandXML import/upgrade



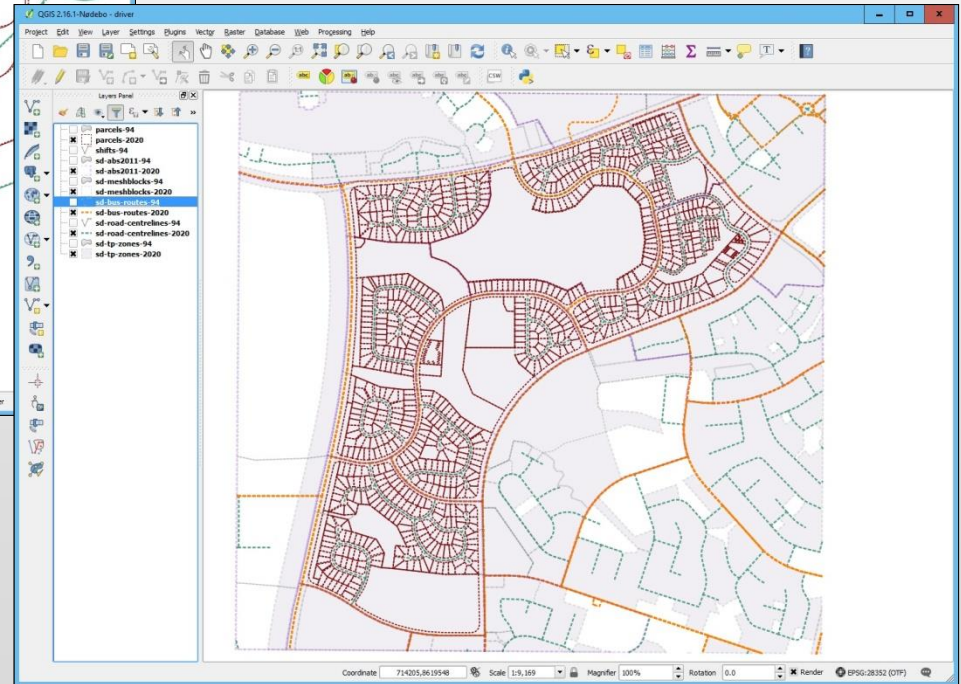
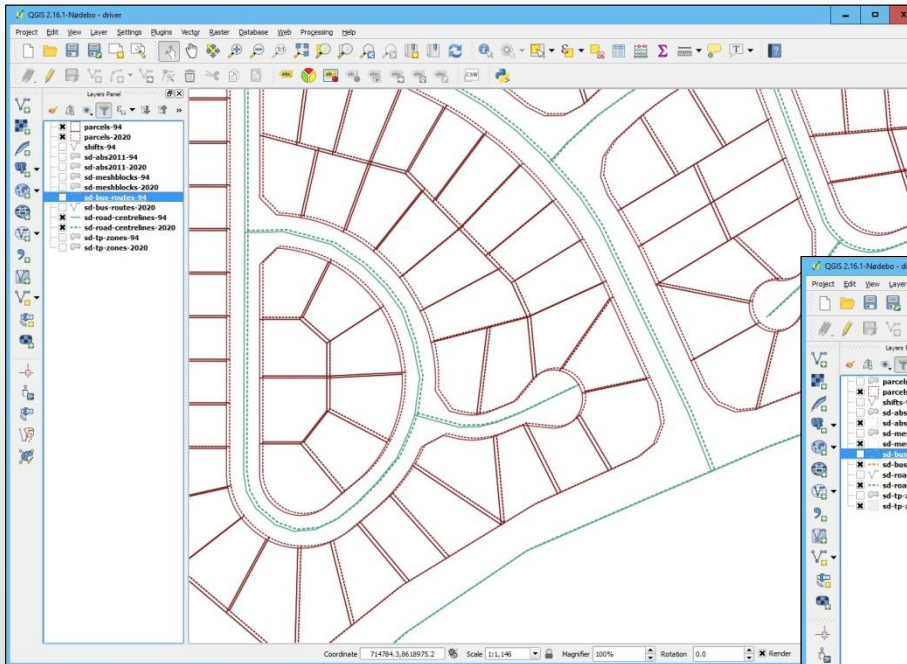
Conflation – harmonise two cadastral datasets



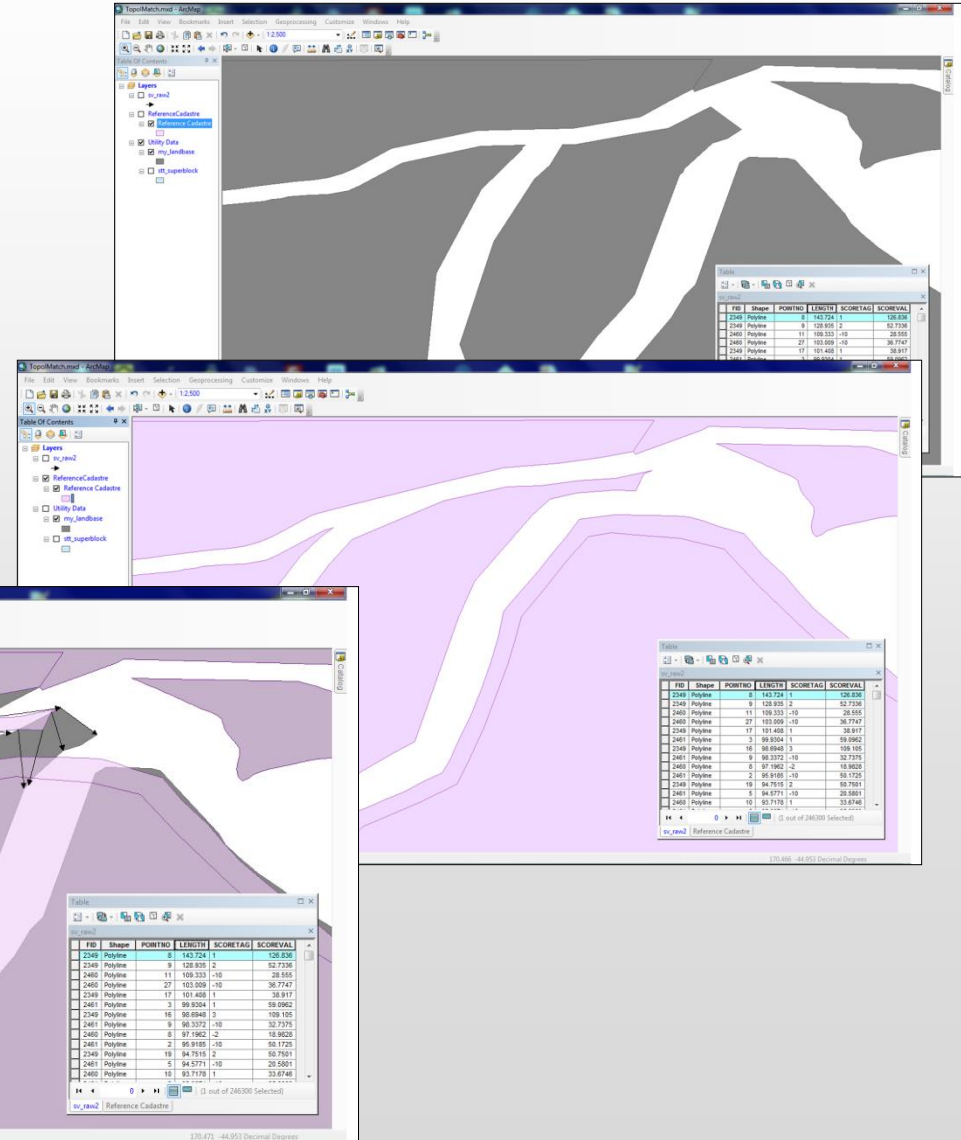
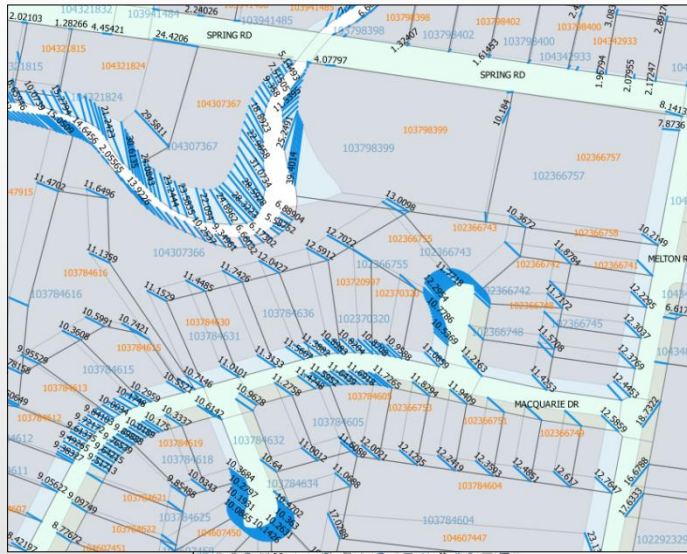
Case Study:
Suburb of Driver



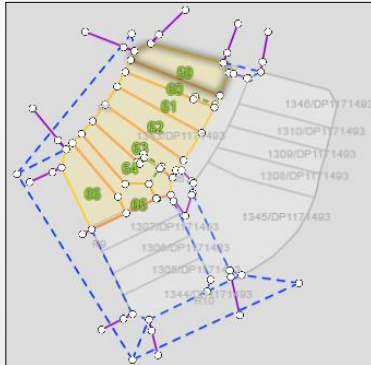
Conflation – process spatially dependent layers



Complex topology matching



LandXML PlanViewer



LandXML PlanViewer displays a detailed XML file (LandXML 1.2) describing a land parcel and its associated data. The XML content is shown in a structured, color-coded format, with key elements highlighted in green boxes and arrows pointing to the corresponding map features.

Proposed parcel

Adjacent parcel

Proposed easement

Existing easement

The XML file includes the following key elements:

- Header:**
 - xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
 - xmlns:landxml="http://www.landxml.org/schema/LandXML-1.2"
 - xmlns:landxml="http://www.landxml.org/schema/LandXML-1.2"
- Parcel:**
 - Parcel name: "Proposed parcel"
 - Parcel type: "Proposed"
 - Parcel area: "279.51"
 - Parcel perimeter: "Standard"
 - Parcel type: "Single"
- Adjacent parcel:**
 - Parcel name: "Adjacent parcel"
 - Parcel type: "Adjacent"
 - Parcel area: "279.51"
 - Parcel perimeter: "Standard"
 - Parcel type: "Single"
- Proposed easement:**
 - Parcel name: "Proposed easement"
 - Parcel type: "Proposed"
 - Parcel area: "279.51"
 - Parcel perimeter: "Standard"
 - Parcel type: "Single"
- Existing easement:**
 - Parcel name: "Existing easement"
 - Parcel type: "Existing"
 - Parcel area: "279.51"
 - Parcel perimeter: "Standard"
 - Parcel type: "Single"
- Survey:**
 - Survey name: "Survey"
 - Survey type: "Survey"
 - Survey area: "279.51"
 - Survey perimeter: "Standard"
 - Survey type: "Single"
- Boundary:**
 - Boundary name: "Boundary"
 - Boundary type: "Boundary"
 - Boundary area: "279.51"
 - Boundary perimeter: "Standard"
 - Boundary type: "Single"
- Survey:**
 - Survey name: "Survey"
 - Survey type: "Survey"
 - Survey area: "279.51"
 - Survey perimeter: "Standard"
 - Survey type: "Single"

Innovation

The new ideas that become truly influential are a combination of previously proven ideas that in their totality turn into something special.

The genius of innovation is almost never a revolutionary new idea. Most often, innovation is combining a series of previously unrelated items into something that by nature of their combination becomes new and remarkable.

Adam Harrell (Nebo)

In reality → 10% inspiration and 90% perspiration !

Peter Barratt (myCadastre)

Cadastral Processing in the Cloud or behind the Firewall



Done...

thank you

谢谢

terimah kasih

ありがとうございます

salamat po

ขอบคุณครับ