Core spatial data services roadshow
Amelia Chapman

Director, Land Information and Spatial Services

Land Use Victoria, DELWP
DELWP Core Spatial Data Services Strategy

- Five-year strategic direction for how DELWP will source, aggregate, maintain and provide access to Victoria’s core spatial data
- It reconfirms our focus on being the trusted source of core spatial data services for Victoria
- Strengthened by a new focus on helping government, industry and the community to generate value from spatial data.

Visit: https://www2.delwp.vic.gov.au/maps/news
There are eight focus areas in the strategy.

1. We must efficiently source high quality and trustworthy data.
2. We must effectively manage spatial information throughout its lifecycle.
3. We will provide effortless access to our core spatial data services.
4. We will foster strong partnerships with our suppliers and core customers.
5. We will ensure our brand and value is recognised and understood by our customers and suppliers.
6. We will help to connect the right knowledge and expertise to generate public value from spatial data.
7. We will target our investment in R&D and innovation.
8. We will contribute to the development of Victoria's future workforce.
What is core spatial data?

Business-specific data
Using core spatial data as a basis, organisations generate their own specific business data to analyse events and make decisions. Some examples are shown.

Core spatial data
Authoritative base data sets depicting natural physical features of the earth’s surface and the built environment. Some examples are shown.
What *are* core spatial data services?

Core spatial data services

- Vicmap API
- Coordinated Imagery Program
- Spatial Datamart
- MapshareVic
- GPSnet™
- Vicmap Viewer
Why are core spatial data services important?

- Land use planning
- Planned burns
- Biodiversity management
- Emergency response
- Coastal management
- Transport planning
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Michelle Butler
Acting Regional Director, Grampians Forest Fire and Regions, DELWP

Opening Address
10


Robert Hoddle (1794-1881), by Agnes Grant McDonald, La Trobe Picture Collection, State Library of Victoria, H30830
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Alex Woods
Geodetic Surveyor
Office of Surveyor-General Victoria, DELWP

Upgrading Australia’s positioning datum and what it means for Victoria
Importance of a datum

Enables integration of different datasets, measure once, use multiple times
GDA2020 is now Australia’s official national datum

- Published in Commonwealth Legislation as:
  National Measurement (Recognised Value Standard of Measurement of Position) Determination 2017
- GDA2020 is Australia’s official datum, revoking GDA94
- Effective from 11 October 2017
Drivers to adopt a modernised geodetic datum for Australia:

- Plate tectonics and regional deformation
- Alignment with global satellite positioning systems - ITRF
- Significant positioning technology developments
- GDA94 failing to support increasing accuracy needs of users
- Widespread distortions in GDA94
GDA2020 specifications

- Geocentric Datum of Australia 2020
- Conventional static datum like GDA94 with rigorous uncertainty
- Just like GDA94 — based on ITRF, fixed at a specific epoch:
  \[
  \text{GDA94} = \text{ITRF1992 @ 1994.0}
  \]
  \[
  \text{GDA2020} = \text{ITRF2014 @ 2020.0}
  \]
- Horizontal shift of approx. 1.6 m NE from GDA94, slightly rotated
- Consistent vertical drop of 0.09 m from GDA94
- AUSGeoid2020
- Projections: MGA2020 (UTM), VICGRID (conformal conic)
- Australian Terrestrial Reference Frame (ATRF), initial release commencing January 2020
GDA94 to GDA2020 shift

Consistent 0.09m drop in ellipsoid height
Transformation products and tool

- **Transformation parameters**
- **Transformation grids**
  - Conformal only grid
  - Conformal + distortion grid
- GDAy downloadable software
- QGIS Plugins – NTv2 datum transformations
- Online transformation service – FME based
- Excel spreadsheets
- Proprietary software support

- **GDA2020 Fact Sheets**
- **GDA2020 Technical Manual**
- **GDA2020 Online forum**

Available from http://www.icsm.gov.au
State statutory changes

Progress of Victorian legislation changes

• Victorian Cadastral Surveys Practice Directives (July 2018)
• Surveying-related legislation
  • Surveying (Cadastral Surveys) Regulations 2015
  • Survey Co-ordination Regulations 2014
• Official datum for Victoria
• Other legislation
  • Fisheries Act 1995
  • Offshore Petroleum and Greenhouse Gas Storage Act 2010
  • Mineral Resources (Sustainable Development) (Mineral Industries) Regulations 2013
  • Geothermal Energy Resources Regulations 2016
  • Petroleum (Submerged Lands) Regulations 2004
Supporting both GDA94 and GDA2020

- DELWP GDA2020 Implementation Plan
- Survey Marks Enquiry Service (SMES)
- Vicmap Position – GPSnet
- Vicmap, Spatial Datamart
- Know your data, know your datum
- Encouraged to commence transition
- Geodesy – OSGV offering support
NPI and SBAS developments

NPI
National Positioning Infrastructure

SBAS
Space Based Augmentation System
Standard positioning service from GNSS

GNSS = Global Navigation Satellite Systems (GPS + GLONASS + Galileo + Beidou)
Reference station infrastructure for higher accuracy
AUD $64 million for:

1. Upgraded national CORS network
   - Extend AuScope network to 200 stations
   - Operate as national high-integrity network
   - Caster infrastructure upgrades to support 100,000s of users

2. Open source GNSS analytics software and products

3. Encourage open data access
   - Work with operators of GNSS networks to encourage open and free access
   - Recognise investment and ongoing operational expenses
augment (*verb*) – to make something greater by adding to it
$161M funding in SBAS to:
1. Expedite innovation
2. Support new markets; expand existing markets
3. High-integrity, free-to-air positioning in mobile coverage ‘black holes’ (which are often high risk)
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Mark Grant
Project Director, Digital Cadastre Modernisation
Land Use Victoria, DELWP

*Modernising the cadastre: the authoritative map of Victoria’s property boundaries*
Contributing to the Core Spatial Data Services Strategy

**We keep improving our core business through innovation**

1. We must efficiently source high quality and trustworthy data
2. We must effectively manage spatial information throughout its lifecycle
3. We will provide effortless access to our core spatial data services
4. We will foster strong partnerships with our suppliers and core customers
5. We will ensure our brand and value is recognised and understood by our customers and suppliers

**We catalyse innovation and increase the value generated from spatial data**

6. We will help to connect the right knowledge and expertise to generate public value from spatial data
7. We will target our investment in R&D and innovation
8. We will contribute to the development of Victoria’s future workforce
Multiple spatial layers will be more accurately displayed using back captured data.
Current boundary inaccuracy

Vicmap property boundaries

Real world boundaries
Digital cadastre modernisation

**Back Capture**
Accurate data from each paper plan is converted into a digital record (LandXML).

**Adjust**
Data from individual plans is joined and adjusted to fully align (within 50cm rural and 10cm metro).

**Automate**
Updating future data and use of newly back captured files in modern systems.

**Integrate**
The new cadastre is published in the state’s authoritative map base (Vicmap) and made available to the public.
Identified project benefits

- Increased spatial accuracy
- Increased productivity and efficiency
- Increased innovation
- Benefit of starting now
Improving business through innovation
Register your interest:
Nicola.deal@delwp.vic.gov.au
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Mr Doug Marcina
Manager, Spatial Information
Valuer-General Victoria, DELWP

Centralised valuations – a spatial approach
2016 REVALUATION

- **Residential**: 2.46m Properties, 1.42t Improved Value, 936b Land Value
- **Commercial**: 165K Properties, 190b Improved Value, 87b Land Value
- **Industrial**: 77K Properties, 76b Improved Value, 37b Land Value
- **Primary Production**: 159K Properties, 98b Improved Value, 73b Land Value
- **Non-Rateable Leviable**: 41K Properties, 65b Improved Value, 45b Land Value

**Total**
- 2.9m Properties
- 1.85t Improved Value
- 1.2t Land Value
Population 6 million

Annual revenue of $8.4b

Local Government rates - approximately $A5.1b*

State Land Tax $A1.77b - based on site value*

Fire Service levy – annual revenue of $627m*

Metropolitan improvement levy - $153m

*2015-16 budget figures
2.9 Million Properties
200+ data elements collected
Property Description
  Address
  Land and Building Area
  Title Details
  Construction and Renovation Year\Material
  Land Use
  Improvements

Values
  Site Value - Land Value
  Capital Improved Value - Land Value + Improvements
  Net Annual Value – Annual Rental

Ownership Details

Value Considerations*
Mass Appraisal

Valuation System
### Mass Appraisal

<table>
<thead>
<tr>
<th>Address</th>
<th>Water Rights</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title</td>
<td>Elevation</td>
</tr>
<tr>
<td>Land Area</td>
<td>Vegetable</td>
</tr>
<tr>
<td>Building Area</td>
<td>Improvements (pool, carport etc)</td>
</tr>
<tr>
<td>Construction Material</td>
<td>Land Use</td>
</tr>
<tr>
<td>Construction Year</td>
<td>Location Drivers (views, transport, schools)</td>
</tr>
<tr>
<td>Renovation Year</td>
<td>Encumbrances (contamination, easements, etc)</td>
</tr>
<tr>
<td>Bedrooms</td>
<td>Shape of the site</td>
</tr>
<tr>
<td>Planning</td>
<td>Urban Growth Boundary</td>
</tr>
<tr>
<td>Heritage</td>
<td>Conservation Covenant</td>
</tr>
<tr>
<td>Soil types</td>
<td>Crown Land</td>
</tr>
<tr>
<td>Arable Area</td>
<td>Imagery</td>
</tr>
</tbody>
</table>

**79 Local Government Areas**

Valuation System

Contract and Council Valuers
**Business-specific data**
Using core spatial data as a basis, organisations generate their own specific business data to analyse events and make decisions. Some examples are shown.

**Core spatial data**
Authoritative base data sets depicting natural physical features of the earth’s surface and the built environment. Some examples are shown.
Mass Appraisal - Planning

Valuation System
Mass Appraisal Rural - Soil Maps

Valuation System
Mass Appraisal

Victoria Heritage Register

Transmission Easements

Valuation System

School Zones

Train Stations \ Shopping Centres
### Mass Appraisal

#### Valuation System

- Building Area
- Floor Area
- Views
- Natural Light
- Noise
- Construction Material
- Renovation Details
- Improvements

*Source: PSMA (Geoscape)*
Mass Appraisal Analytics
Mass Appraisal Analytics

Valuation System
Mass Appraisal Analytics

Valuation System
Mass Appraisal Analytics

Valuation System
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Stephen Balharrie
Risk Analyst, Forest Fire and Regions Grampians

*The use of core spatial data services in bushfire risk analysis*
Orange lines = Fire perimeter

Red cells = Maximum spotting distance

Yellow/brown cells = Flame height
Inputs → Phoenix (Rapid Fire) → Outputs
Thank-you
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Pauline Kent
Enterprise Spatial Services Portfolio Manager

*Going Digital: How DELWP is transforming its spatial service*
Our Purpose

Connect users to spatial data through services

Users
spatial data

DELWP
spatial data
Partners

Enterprise
Core

Business


3
We will provide effortless access to our core spatial data services

5
We will ensure our brand and values are recognised and understood by our customers and suppliers

6
We will help to connect the right knowledge and expertise to generate public value from spatial data

8
We will contribute to the development of Victoria's future workforce
Our Services

- Visualise
- Search
- Desktop
- Web mapping

Support

- Services
- Data
- Map
- Connectors

Data

- Vector
- Raster
- Metadata
Our Services

Users —> [Information] —> [Cloud] —> [Database] —> DELWP

- Vector
- Raster
- Metadata
- Connectors
Our Approach

- integrated
- supported
- licenced configurable
- cloud Amazon Web Services

- siloed
- out of support
- bespoke
- infrastructure
Search & Discovery
• Spatial Datamart
  • vector only
  • metadata driven
  • Upgraded software
  • GDA2020 support
• Data.Vic for data services
• New Datashare
  • accurate search
  • raster + vector
  • eCommerce
• Spatial Datamart retired
Map Service
- architecture
- operations infrastructure
- 256 pixel tiles
- currency
- new styles
- easier integration
Web Mapping
• consolidate
• maps
• functionality
• searches
• new architecture
• reports
• mobility
• Land Channel retired
More info this afternoon

Datashare
Search & Discover

Mapshare
Web Mapping

Vicmap API
Map Service
Plenary Q&A session
Thank you

Technical workshops commence 1pm