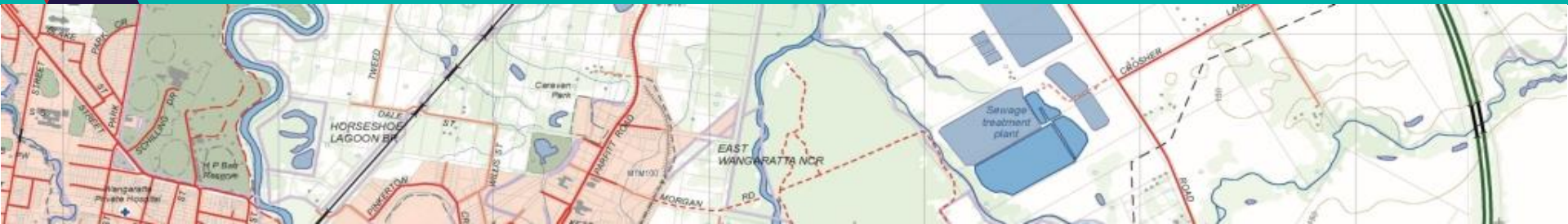


Core spatial data services roadshow



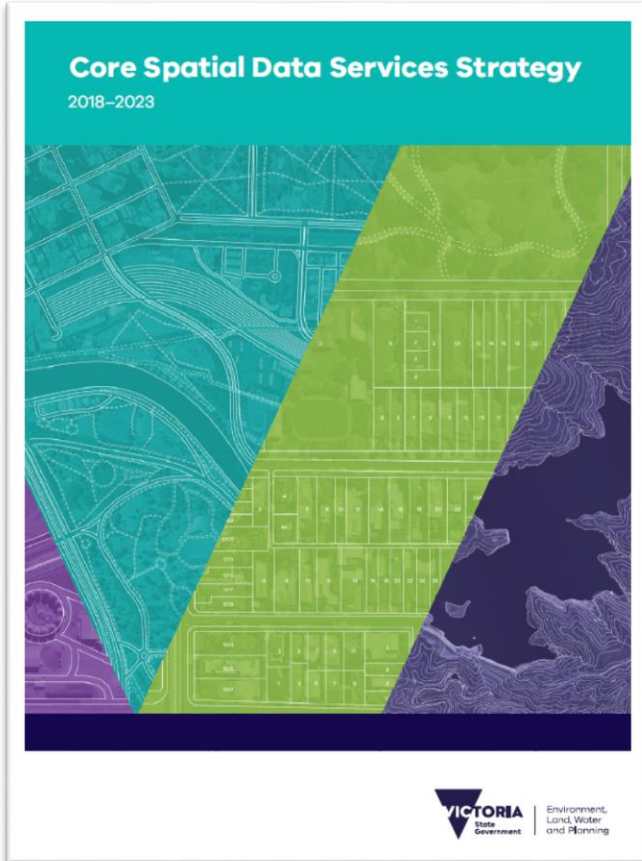
Environment,
Land, Water
and Planning



Craig Sandy

Surveyor-General Victoria

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.

There are eight focus areas in the strategy

GOALS

We keep improving our core business through innovation

We catalyse innovation and increase the value generated from spatial data

FOCUS AREAS



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

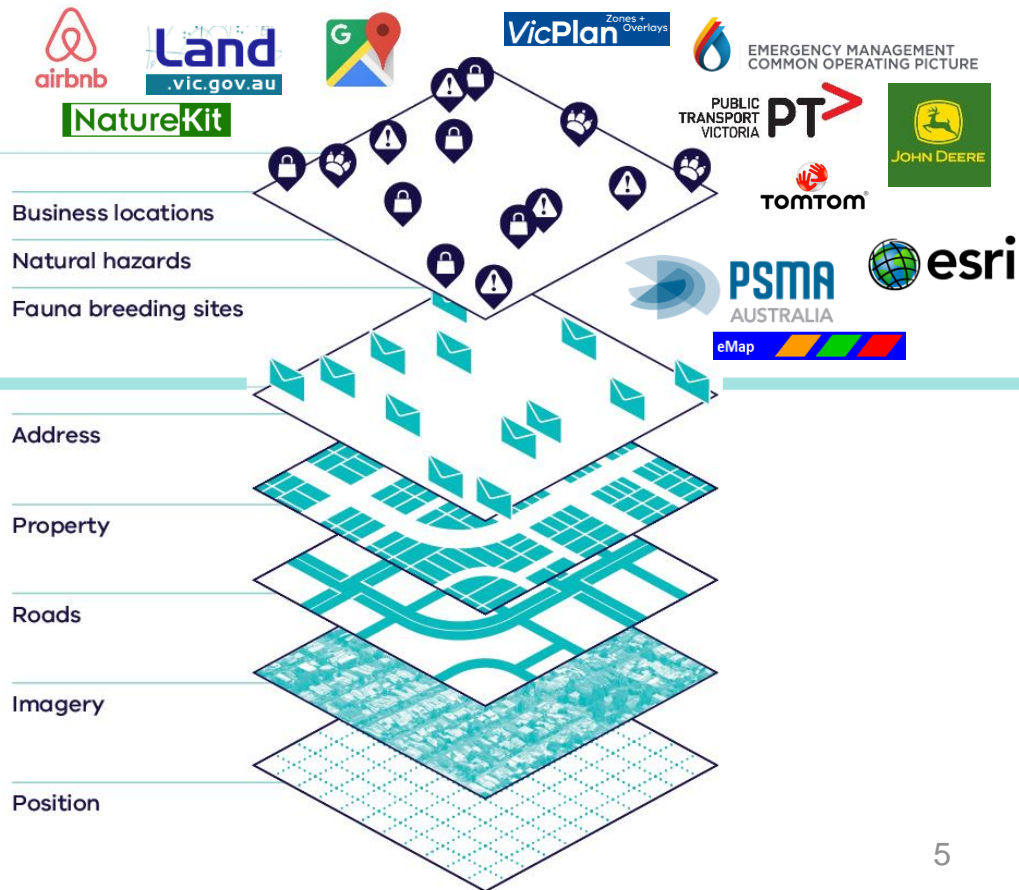
What is core spatial data?

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.

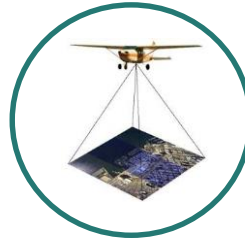


What *are* core spatial data services?

Core spatial data services



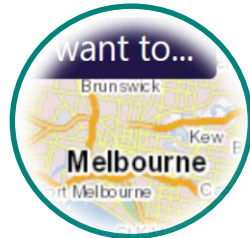
Vicmap API



**Coordinated Imagery
Program**



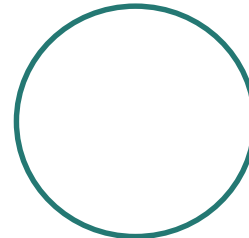
Spatial Datamart



MapshareVic

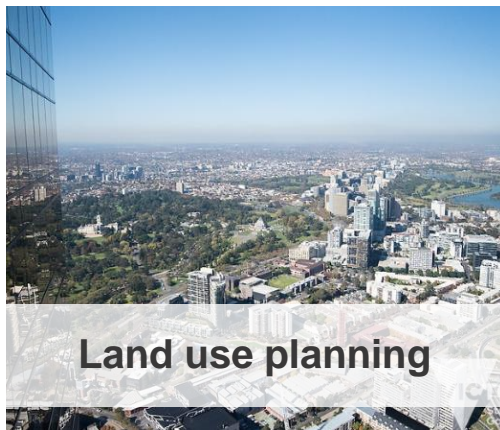


GPSnet™



Vicmap Viewer

Why are core spatial data services important?



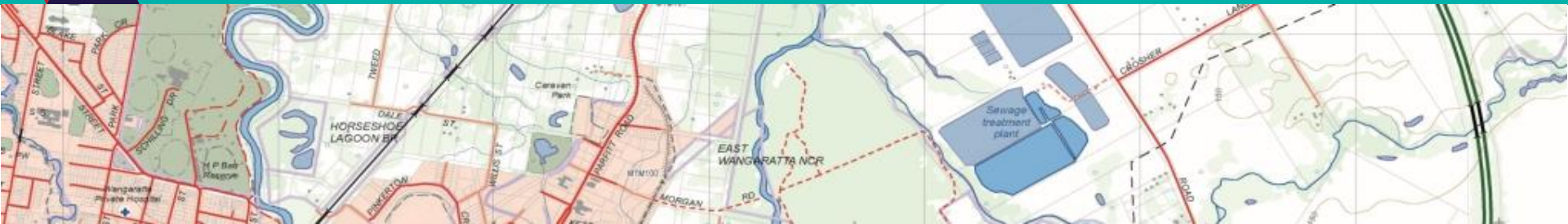
www.sli.do: Event code E093

Twitter - @DELWP_Vic

Social media - #DELWP_CSDS



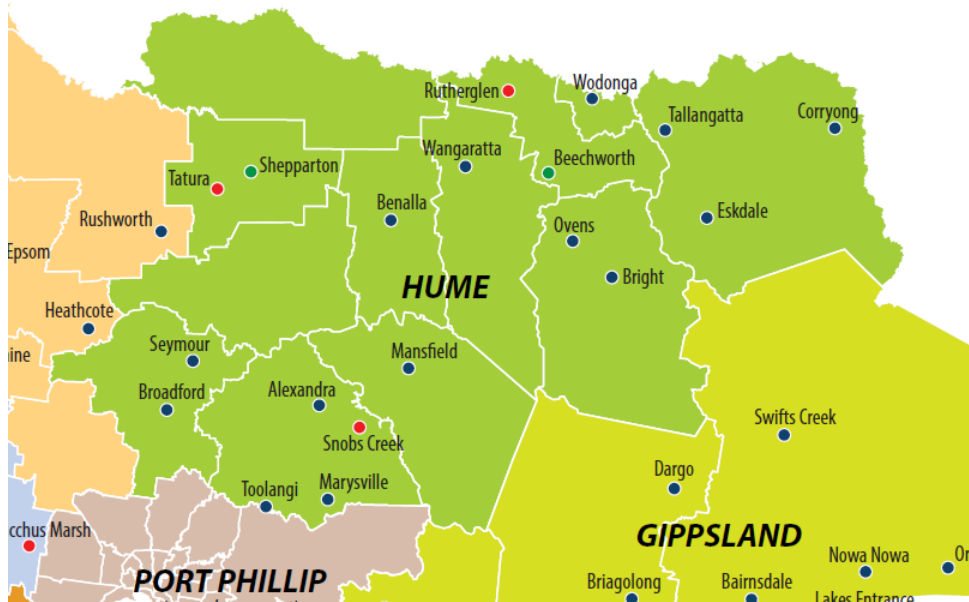
Environment,
Land, Water
and Planning



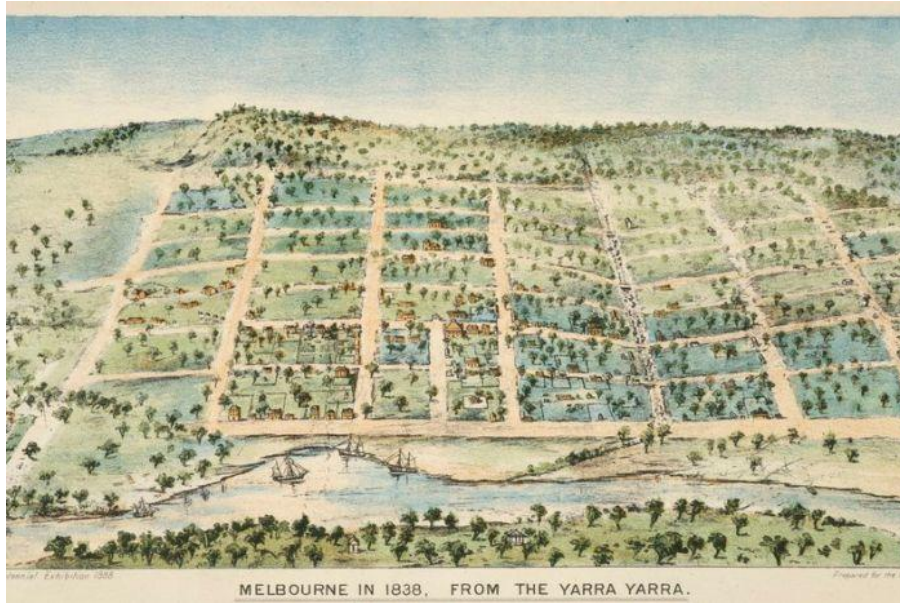
James Stewart
Regional Manager Land and Built Environment
DELWP Hume Region

Opening Address

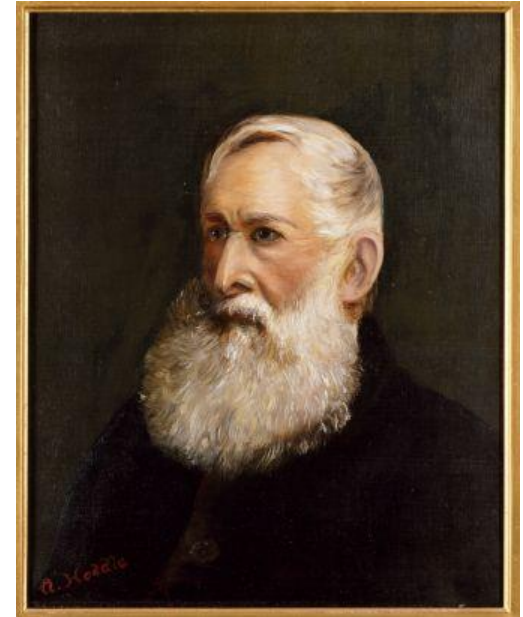
DELWP Hume Region



- 13 locations with approx. 2000 staff across region
- 1.66 million hectares of public land (river valleys, forests and high country)
- End-to-end management of forests, fire and other emergencies
- Environmental management including biodiversity and catchment protection



Source: <http://www.abc.net.au/news/2018-05-04/melbourne-grid-designed-by-robert-hoddle/9712556>



Robert Hoddle (1794-1881), by Agnes Grant McDonald, La Trobe Picture Collection, State Library of Victoria, H30830



Corryong



Jamieson



Shepparton



Lake Hume



Bright



Mansfield

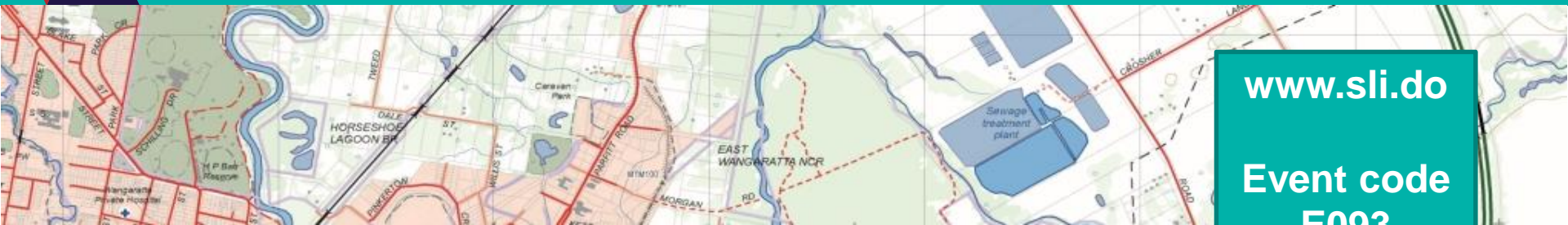
www.sli.do - event code E093

Twitter - @DELWP_Vic

Social media - #DELWP_CSDS



Environment,
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and Planning



www.sli.do

Event code
E093

Alex Woods

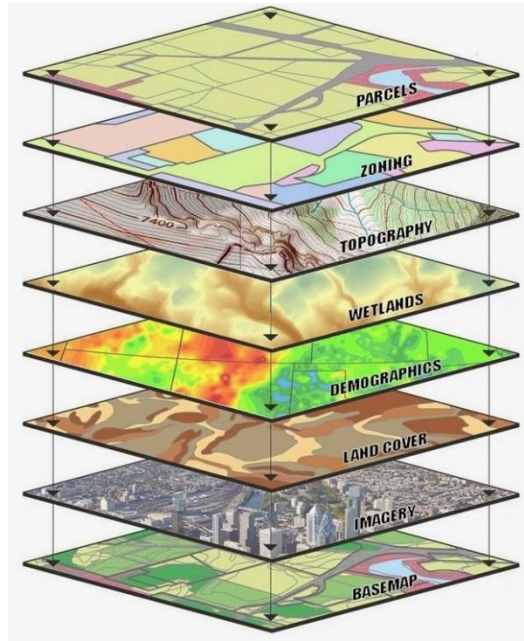
Geodetic Surveyor

Office of Surveyor-General Victoria

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

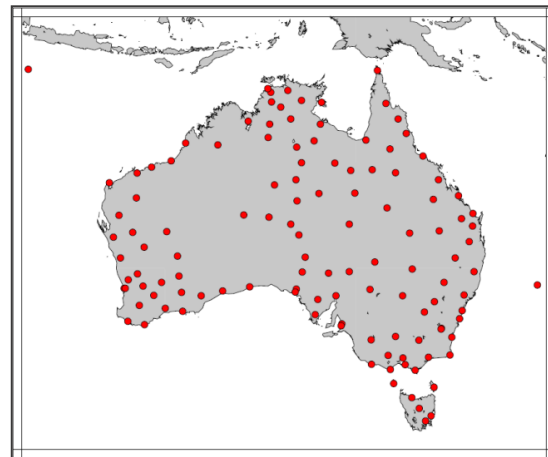
- Published in Commonwealth Legislation as:
National Measurement (Recognised Value Standard of Measurement of Position)
Determination 2017
- GDA2020 is Australia's official datum, revoking GDA94
- Effective from 11 October 2017



National Measurement (Recognized-Value Standard of Measurement of Position) Determination 2017

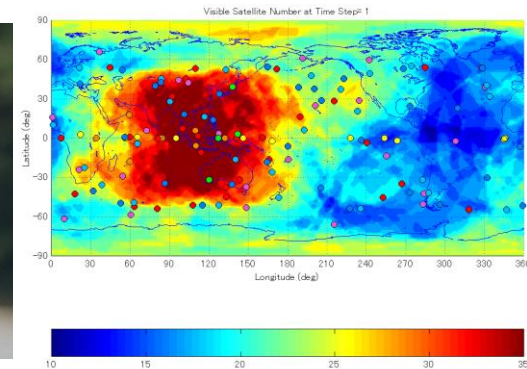
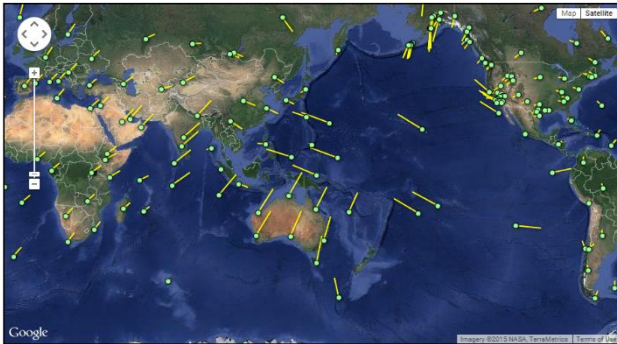
I, Dr R. Bruce Warrington, Chief Metrologist, National Measurement Institute, make the following determination.

Dated 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



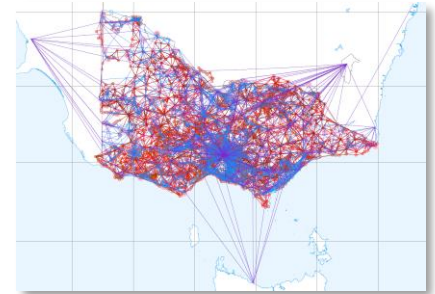
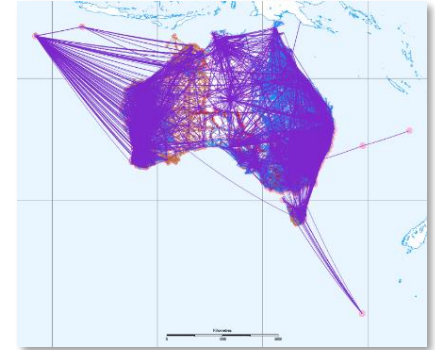
GDA2020 specifications

- Geocentric Datum of Australia 2020
- Conventional static datum like GDA94 with rigorous uncertainty
- Just like GDA94 — based on ITRF, fixed at a specific epoch:

GDA94 = ITRF1992 @ 1994.0

GDA2020 = ITRF2014 @ 2020.0

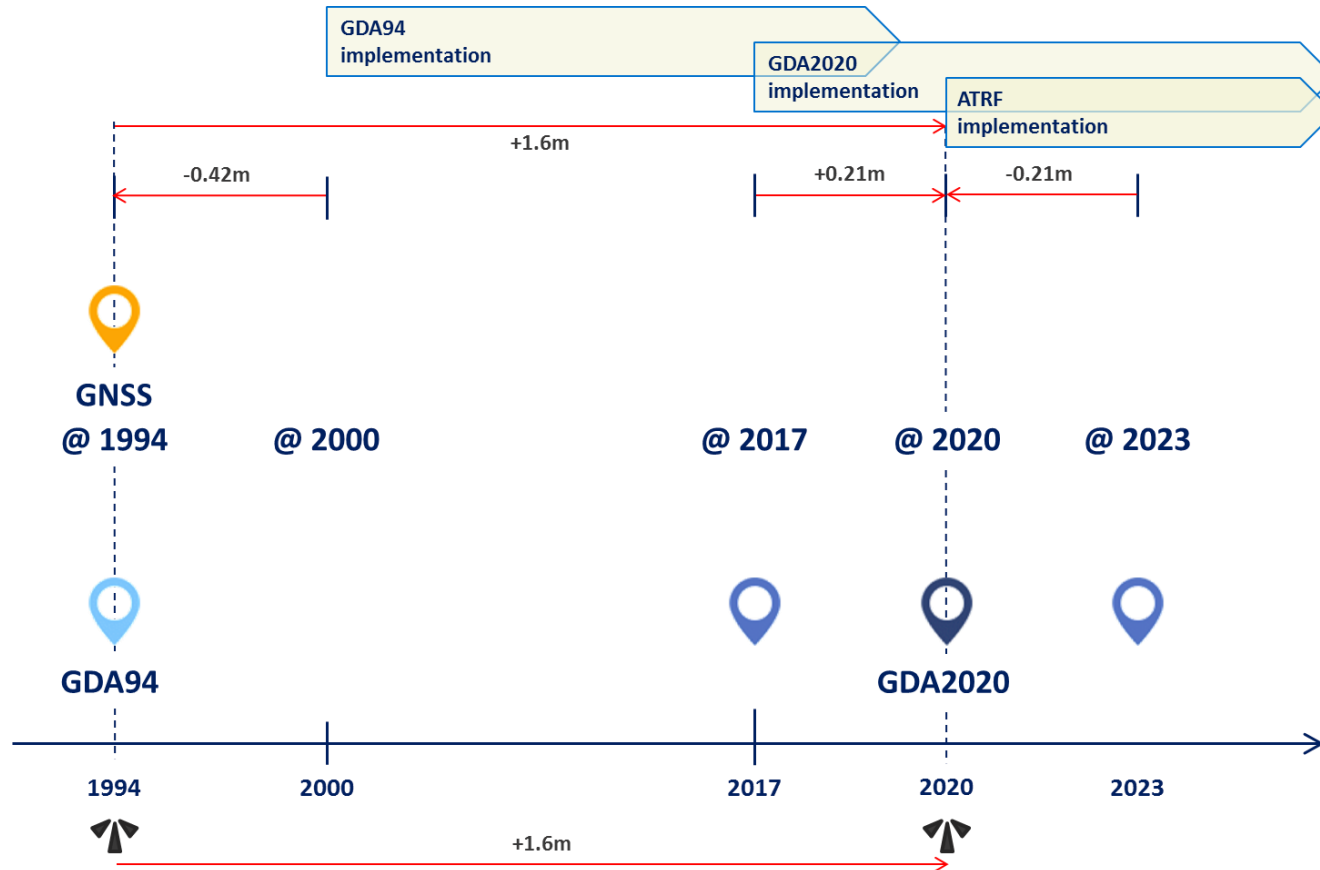
- Horizontal shift of approx. **1.6 m NE** from GDA94, slightly rotated
- Consistent vertical drop of **0.09 m** from GDA94
- AUSGeoid2020
- Projections: **MGA2020** (UTM), **VICGRID** (conformal conic)
- Australian Terrestrial Reference Frame (ATRF), initial release commencing January 2020



GDA94 to GDA2020 shift



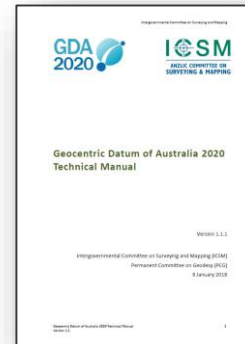
GDA94 - GDA2020 – ATRF implementation



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>



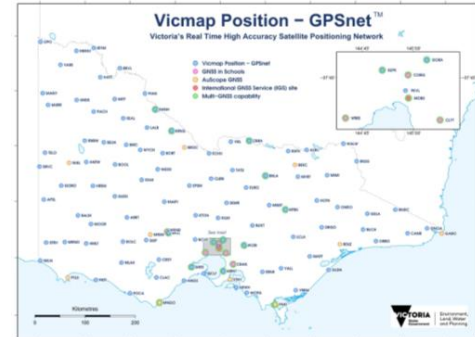
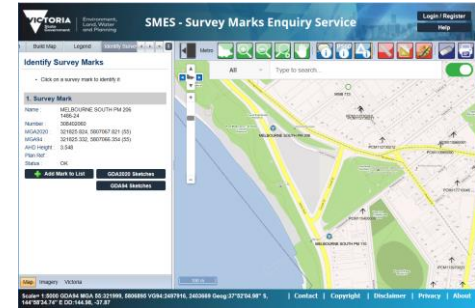
Progress of Victorian legislation changes

- **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

National Positioning Infrastructure

SBAS

Space Based Augmentation System

Standard positioning service from GNSS



**USA
GPS**



**Russia
GLONASS**



**EU
Galileo**



**China
Beidou**



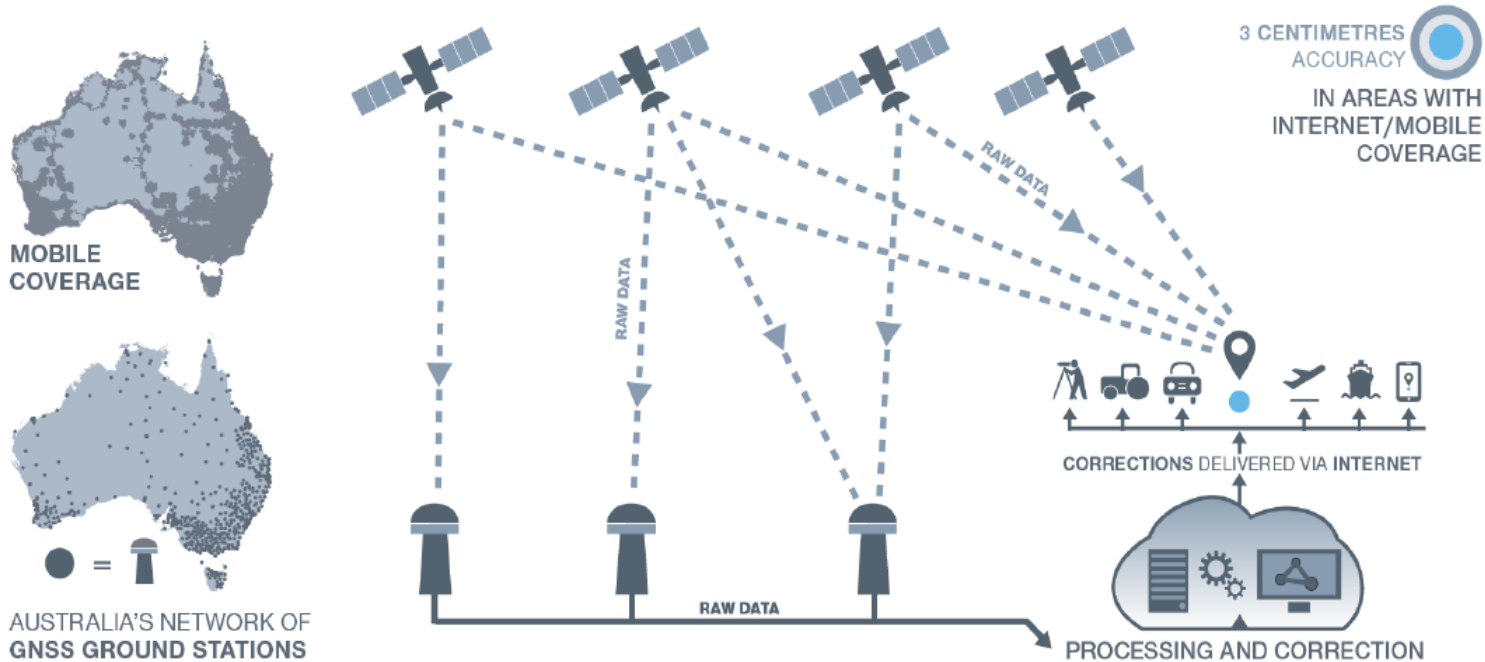
DIFFERENT APPLICATIONS DEMAND DIFFERENT LEVELS OF ACCURACY



**STANDARD SATELLITE
POSITIONING**

GNSS = Global Navigation Satellite Systems (GPS + GLONASS + Galileo + Beidou)

Reference station infrastructure for higher accuracy



2018 budget announcement - NPI

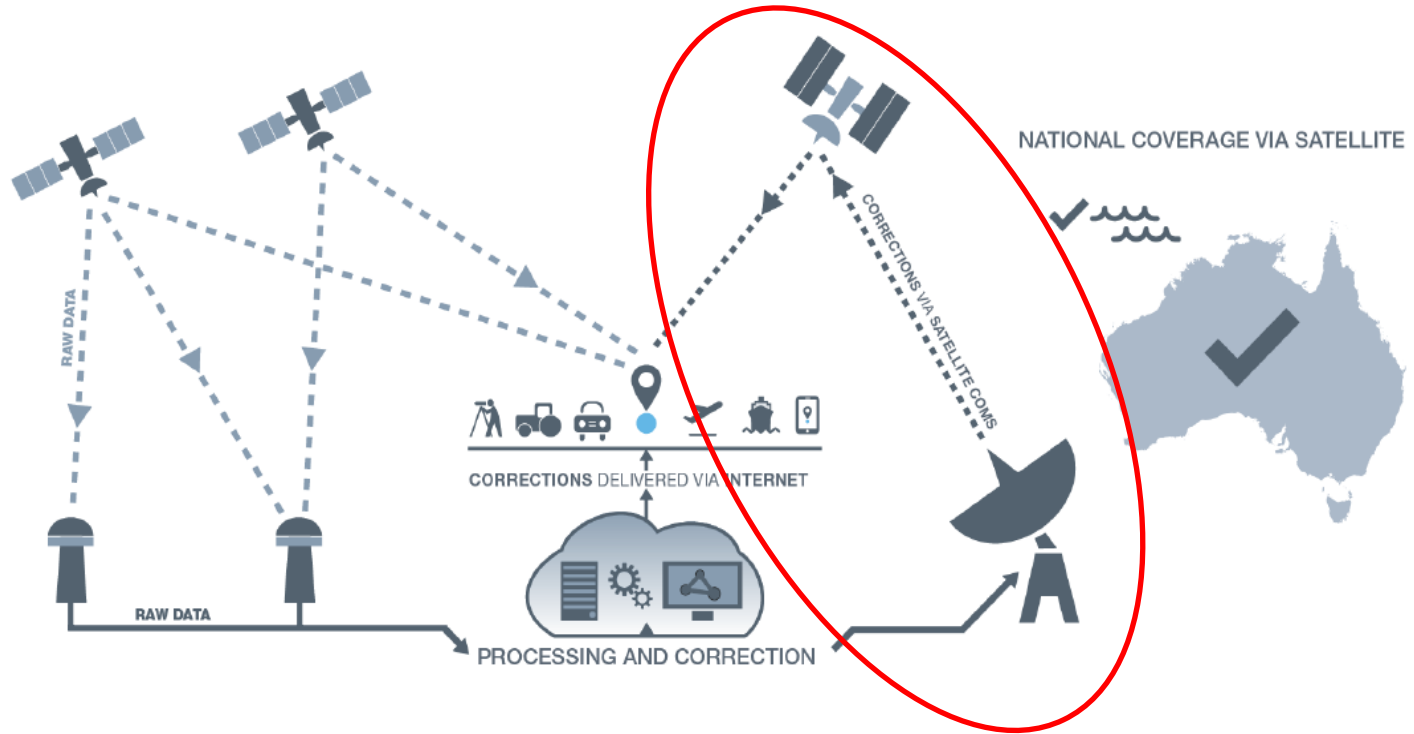


AUSTRALIA'S NETWORK OF
GNSS GROUND STATIONS

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**

Space Based Augmentation System (SBAS)

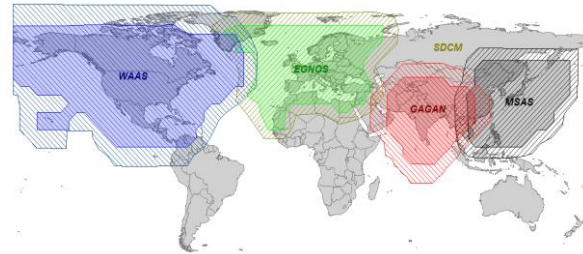


augment (*verb*) – to make something greater by adding to it

2018 budget announcement - SBAS

\$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)



www.sli.do - event code E093

Twitter - @DELWP_Vic

Social media - #DELWP_CSDS



Environment,
Land, Water
and Planning



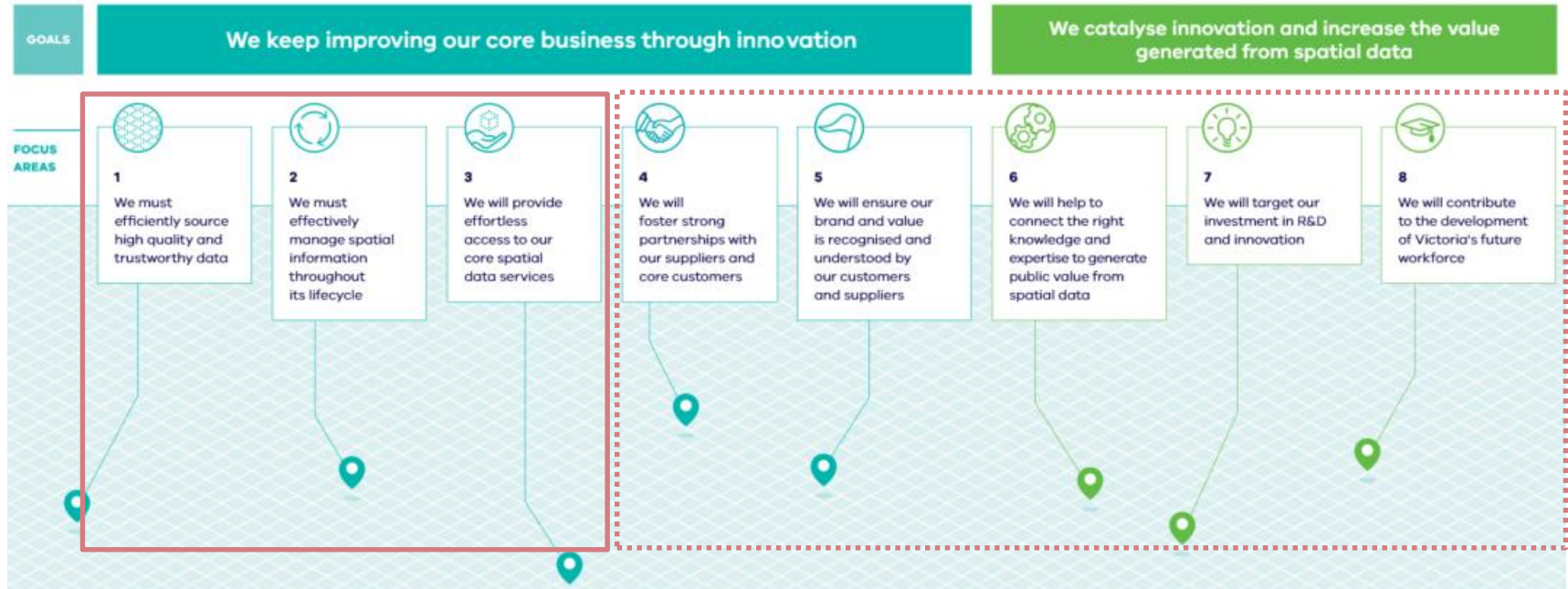
www.sli.do

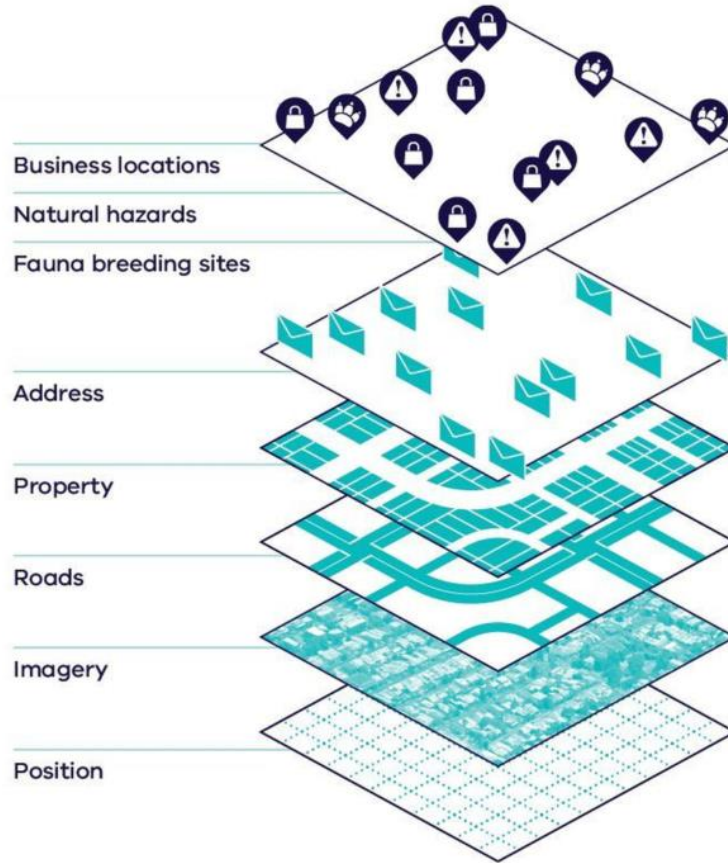
Event code
E093

Mark Grant
Project Director
Digital Cadastre Modernisation

*Modernising the authoritative map of Victoria's property boundaries
(cadastre)*

Contributing to the Core Spatial Data Services Strategy





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)



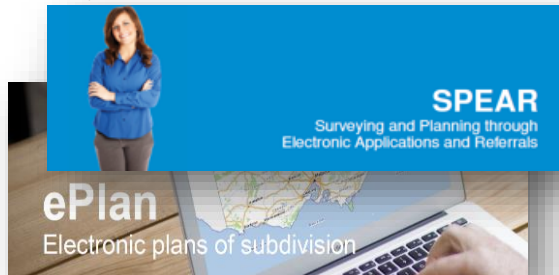
Adjust

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

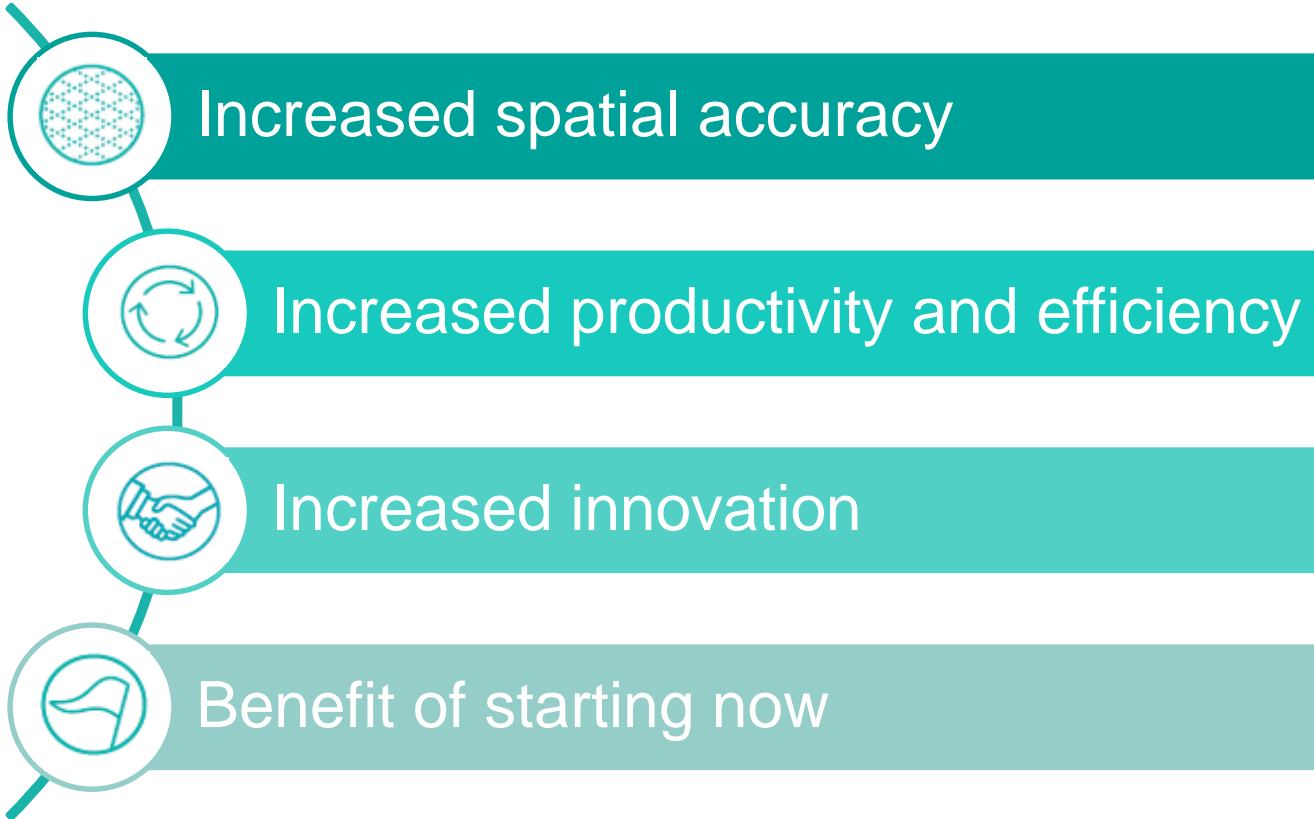


Integrate

The new cadastre is published in the state's authoritative map base (Vicmap) and made available to the public



Identified project benefits



Improving core business through innovation



Keep updated on our project



<https://youtu.be/KNqtuy8MbwE>

For updates contact: Nicola.deal@delwp.vic.gov.au

www.sli.do - event code E093

Twitter - @DELWP_Vic

Social media - #DELWP_CSDS



Environment,
Land, Water
and Planning

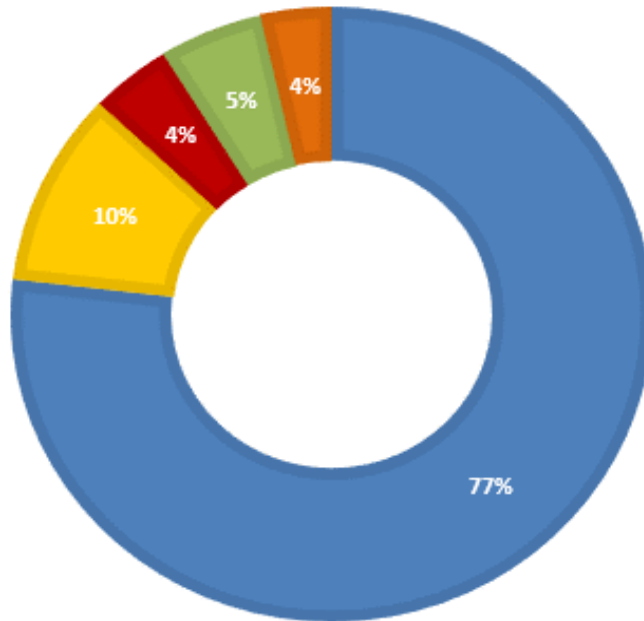


Valuation Data Manager - Valuer-General Victoria

40

2016 REVALUATION

■ Residential ■ Commercial ■ Industrial ■ Rural ■ Non Rateable Leviable



Total

2.9m Properties
1.85t Improved Value
1.2t Land Value



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

Population 6.385 million

State area 237,590 sq km

Annual revenue of \$9b

Local Government rates -
approximately \$A5.08*

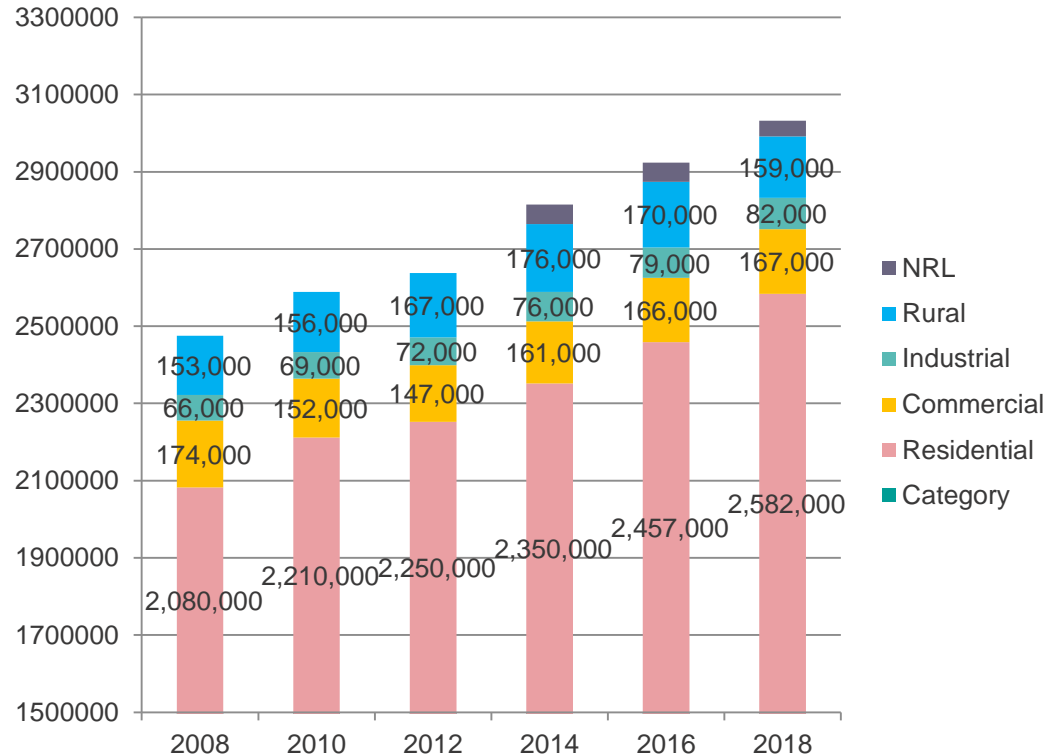
State Land Tax \$A3.1b -
based on site value*

Fire Service levy – annual
revenue of \$642m*

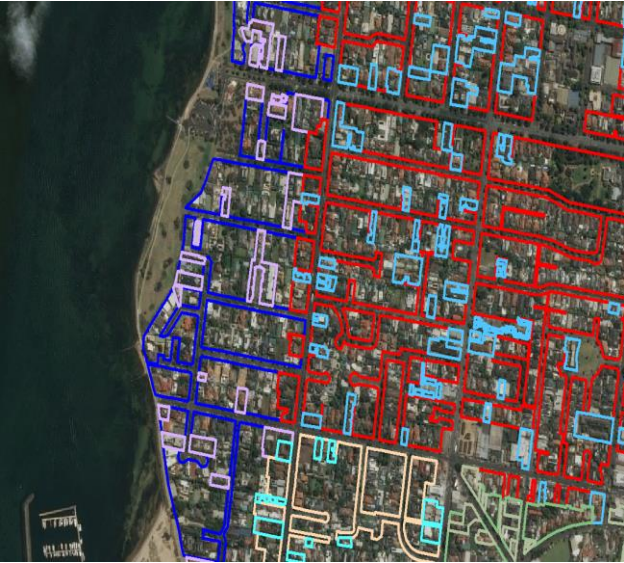
Metropolitan improvement
levy - \$176m

*2018/19 budget figures

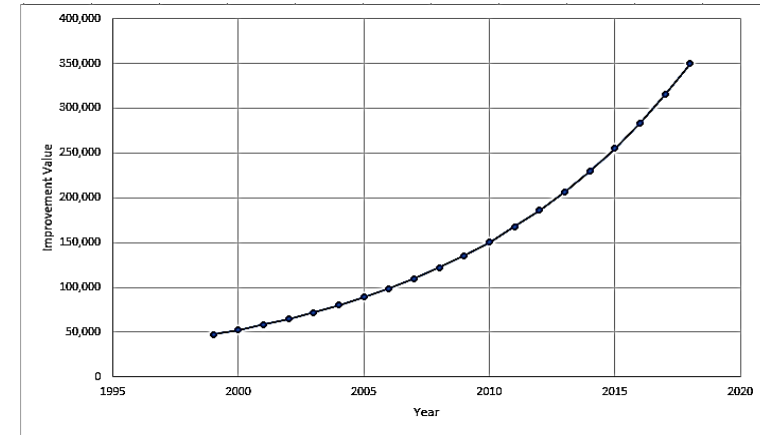
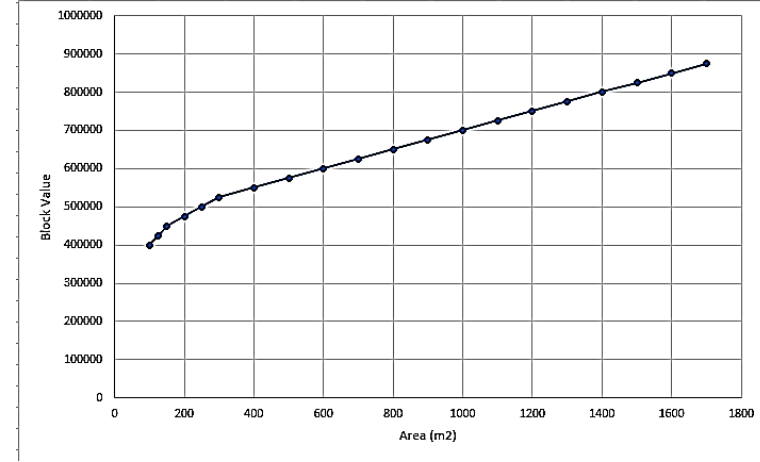
Assessment Numbers

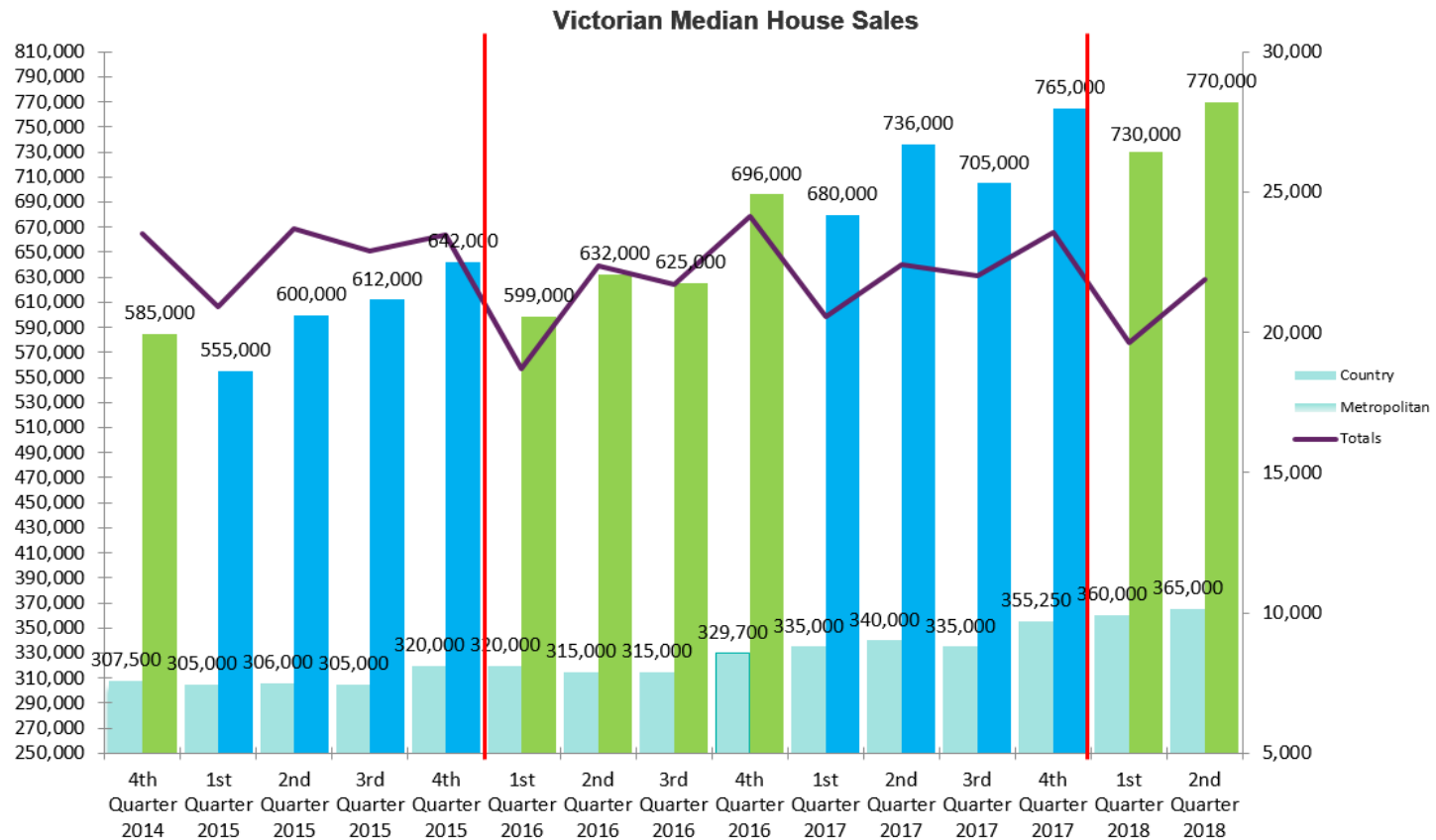


Mass Appraisal



Valuation System





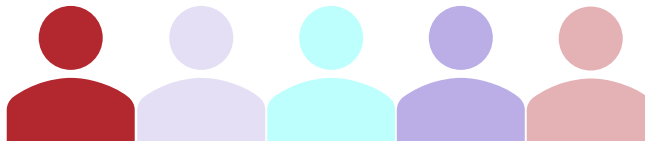
Address	Water Rights
Title	Elevation
Land Area	Vegetation
Building Area	Improvements (pool, carport etc)
Construction Material	Land Use
Construction Year	Location Drivers (views, transport, schools)
Renovation Year	Encumbrances (contamination, easements, etc)
Bedrooms	Shape of the site
Planning	Urban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

79 Local Government Areas



Valuation System

Contract and Council Valuers



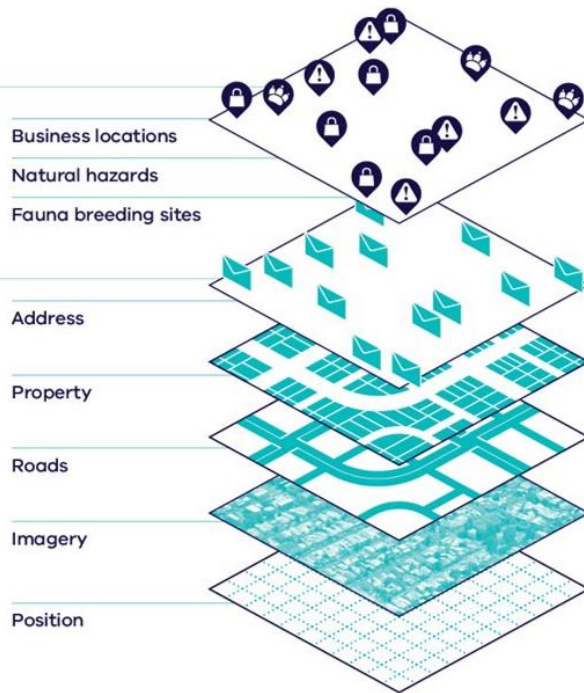
Mass Appraisal - Base Property

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.



Valuation System



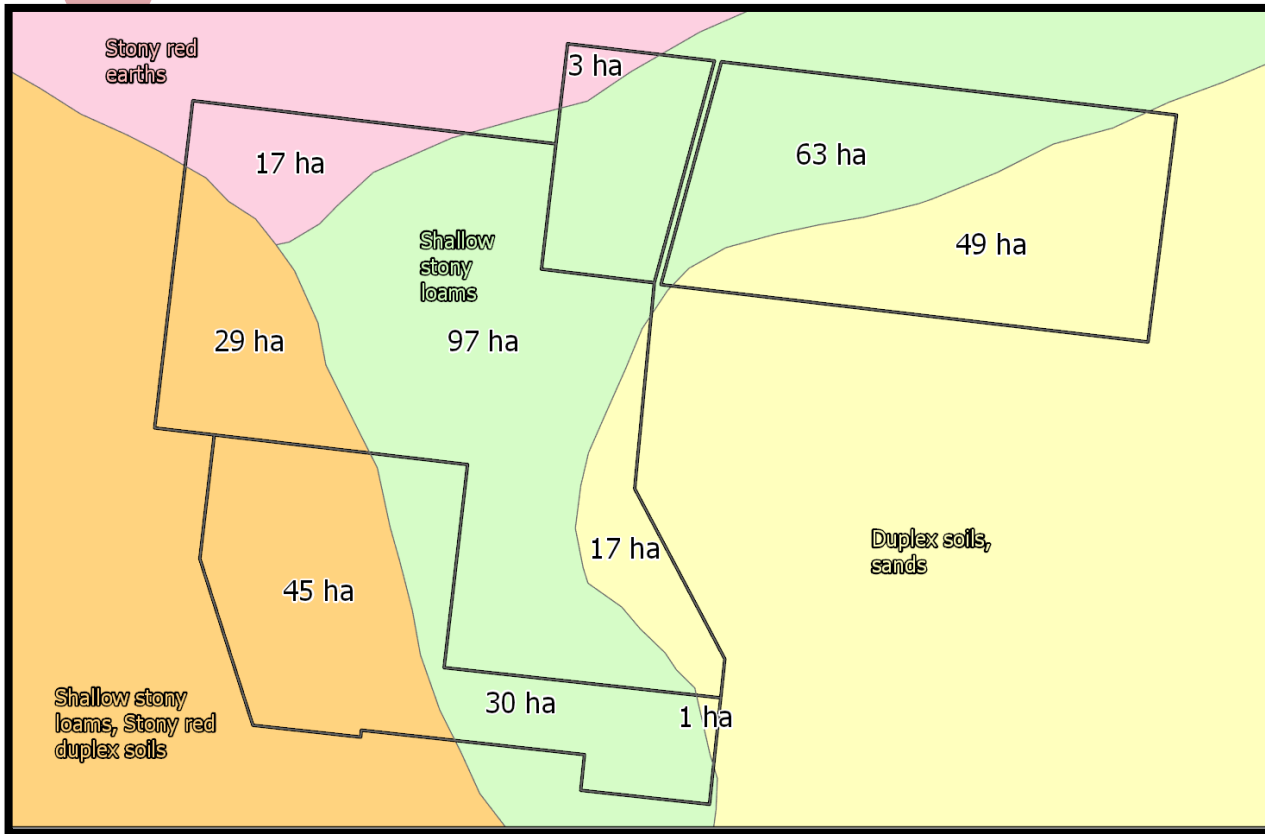
Mass Appraisal - Planning



Valuation System



Mass Appraisal Rural - Soil Maps



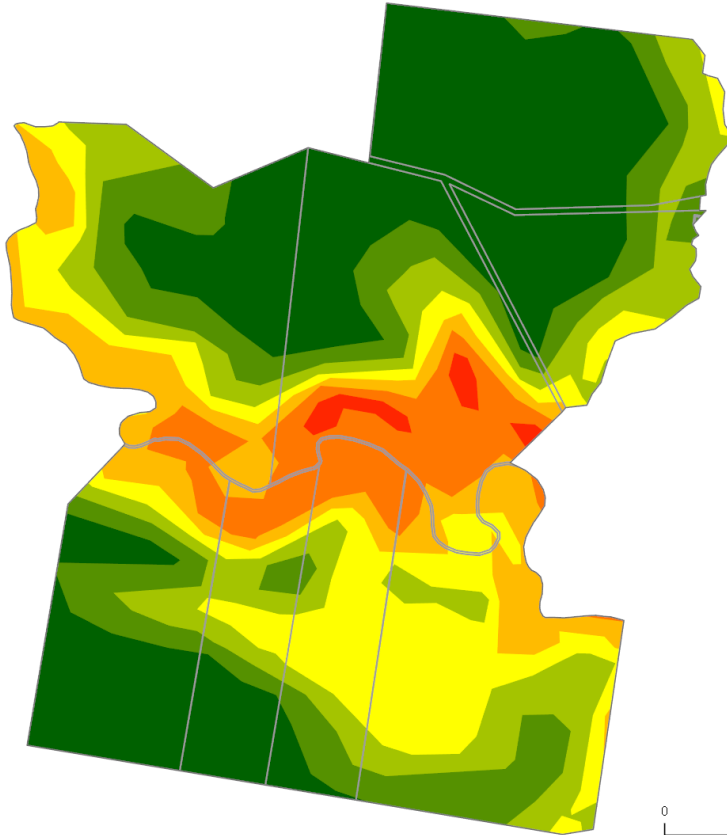
Valuation System



Mass Appraisal Rural - Slope

Slope

- 0-5 deg
- 5-10 deg
- 10-15 deg
- 15-20 deg
- 20-25 deg
- 25-30 deg
- 30+ deg
- Property Boundary



Valuation System



Property - Tree Density

Tree Density

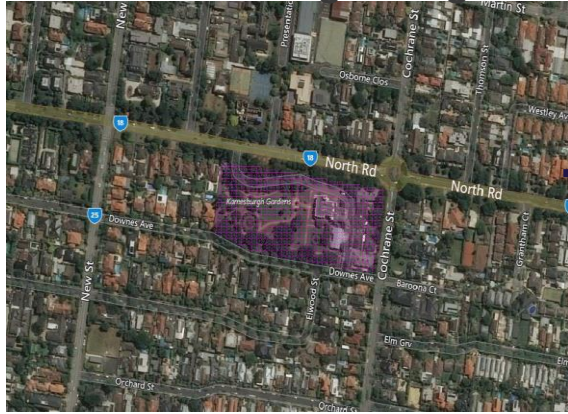
- DENSE
- MEDIUM
- SCATTERED
- Property Boundary
- watercourse_area_river
- watercourse_area_drain
- watercourse_area_channel_drain
- watercourse_area_channel
- wb_lake
- wb_lake_salt



Valuation System



Victoria Heritage Register

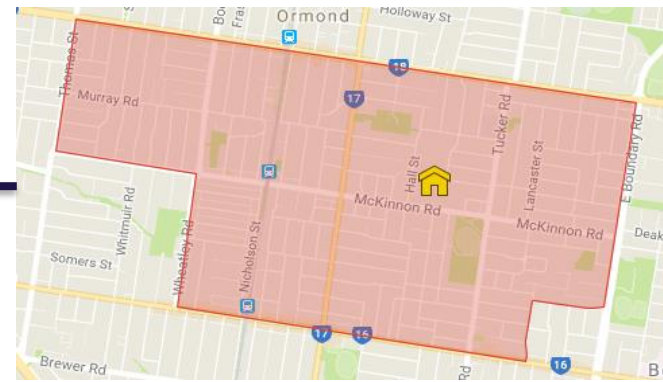


Transmission Easements

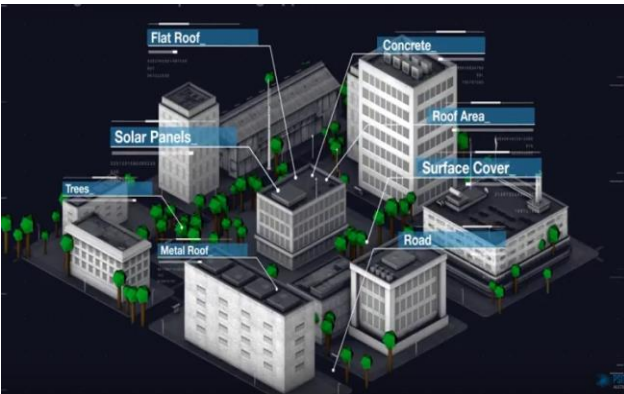
Valuation System



School Zones



Train Stations \ Shopping Centres



*source PSMA (Geoscape)

Valuation System



Building Area

Floor Area

Views

Natural Light

Noise

Construction Material

Renovation Details

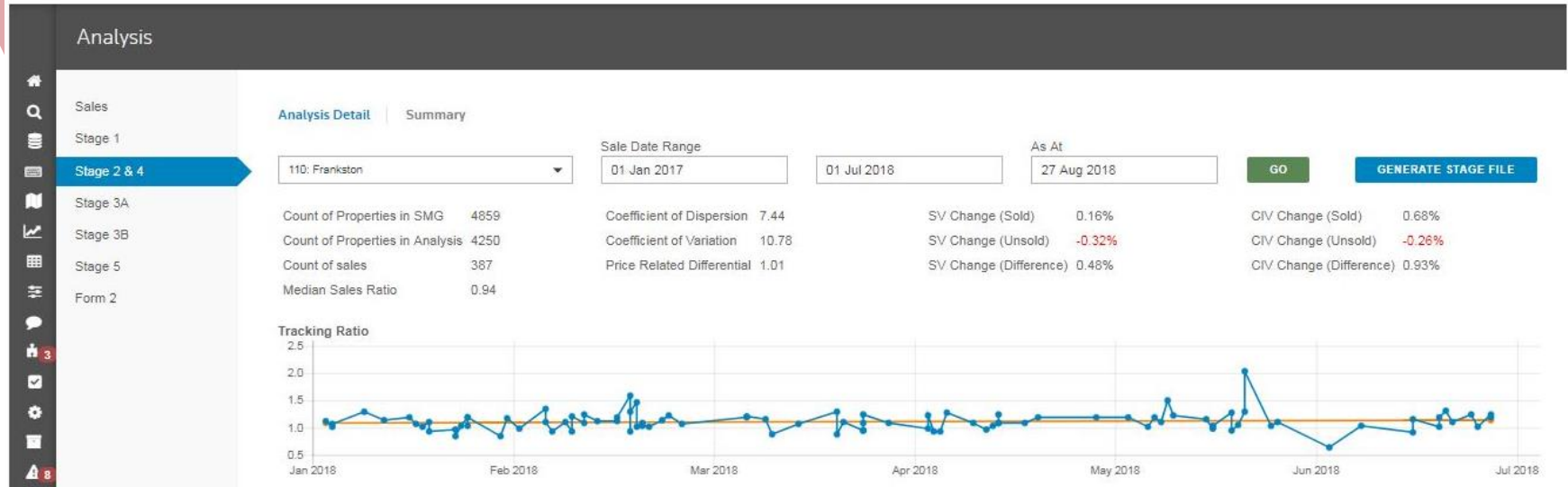
Improvements



Mass Appraisal Analytics

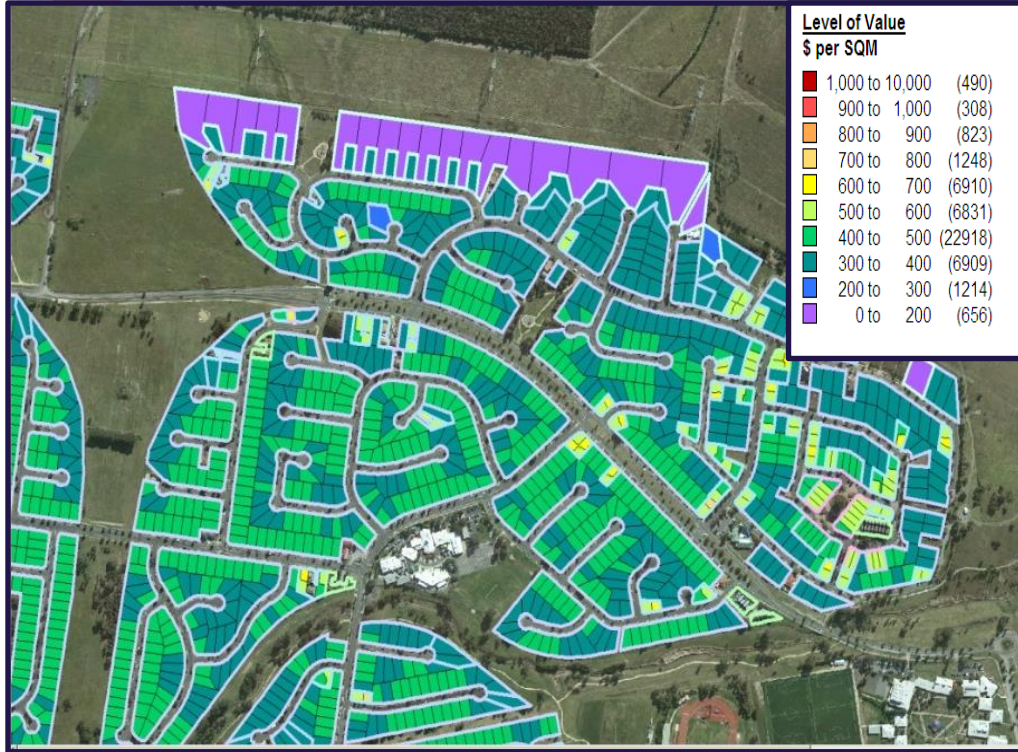


Mass Appraisal Analytics



Valuation System





Valuation System





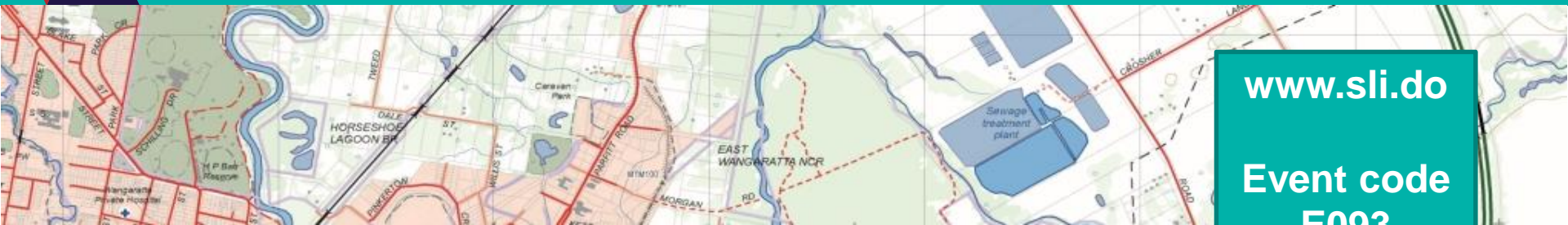
Valuation System



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Social media - #DELWP_CSDS



www.sli.do

Event code
E093

Anthony Cheesman

Geospatial Systems Stream Lead - Forest Fire and Regions

Supporting emergency operations with Vicmap core spatial data

DELWP and Forest Fire Management Victoria have legislated emergency management responsibilities for many different emergency events. These include:

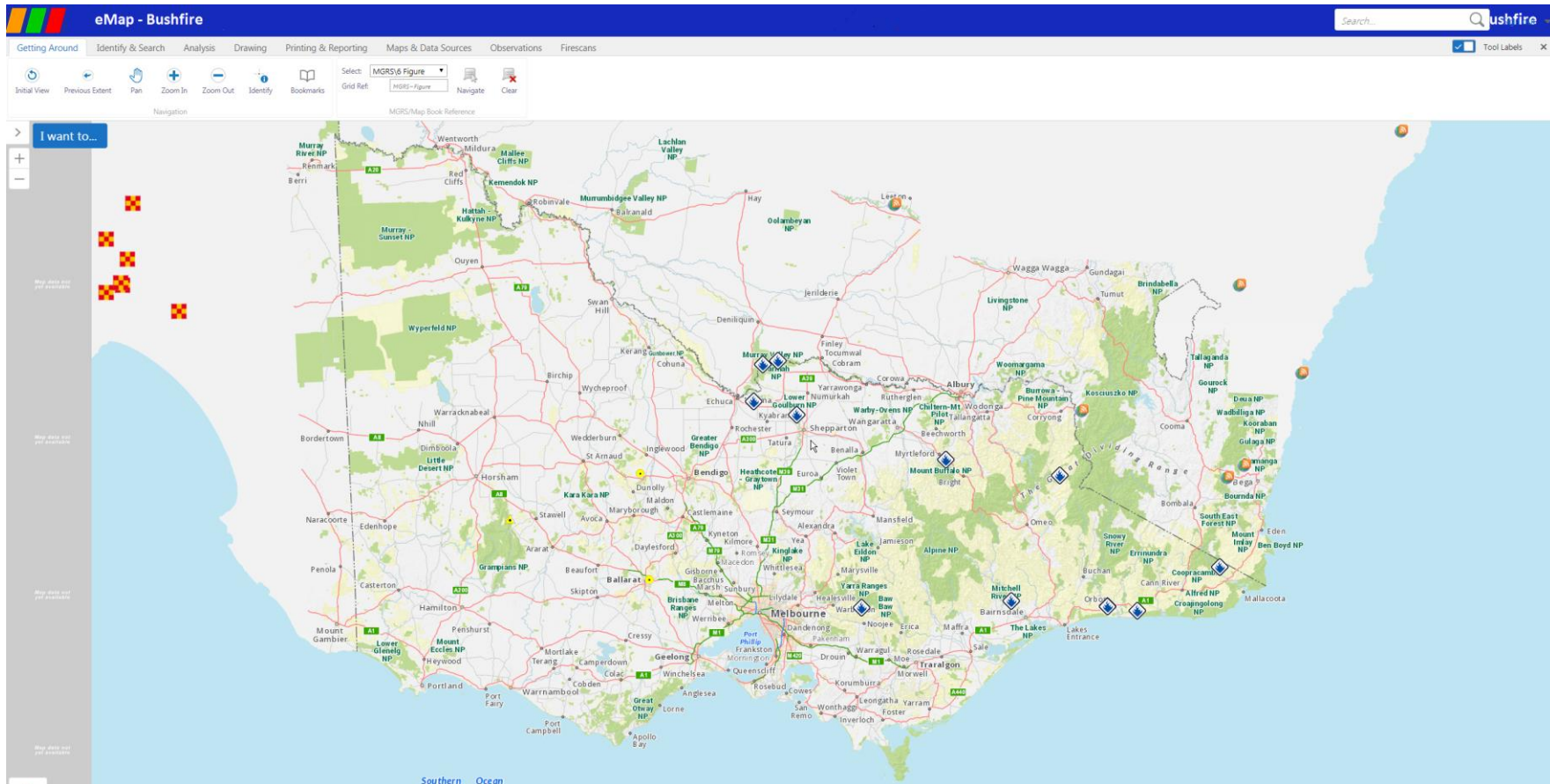
- Bushfires on public land
- Assisting wildlife affected by fire
- Marine pest incursions
- Whale strandings and entanglements
- Dam safety, water supply and waste water incidents.

Our response to emergency events is guided by the ***State Control Priorities***, which include:

- Protection and preservation of life is paramount
- Issuing of relevant and timely community information and warning messages
- Protection of critical infrastructure and community assets

Spatial systems to support emergency operations

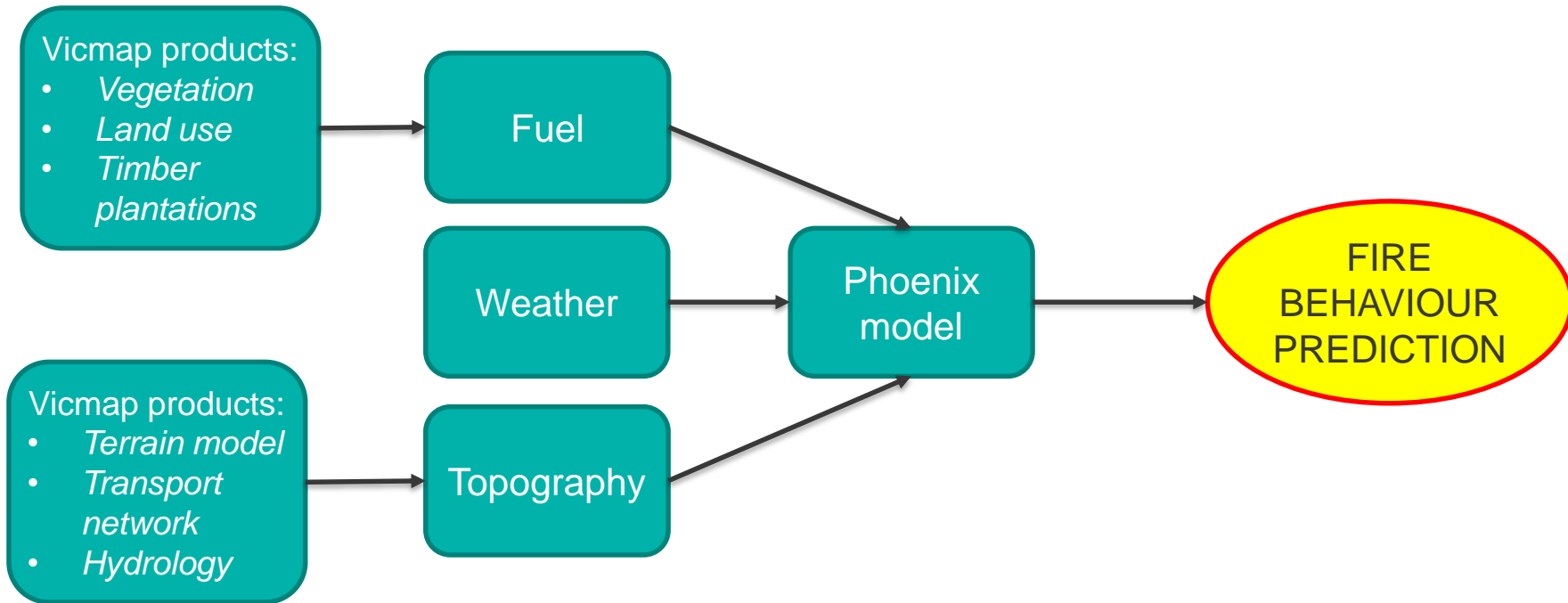
- Spatial technology is critical to support our efforts in responding to emergency events quickly, resourcing our response to events appropriately, and ultimately in managing and controlling events safely for both our operational personnel and the community.
- A key component of our spatial technology is the ability to access, visualise and analyse current and authoritative spatial data.
- FFMV have developed a web-based emergency management mapping and analysis platform, which is used throughout the emergency management sector in Victoria.
- eMap is built using a Geocortex front end viewer, with data management and processing managed by ArcGIS Server.
- eMap is available in a number of different themes, which then supports different types of emergency events.
- Themes include Bushfire, Flood / Storm, Maritime Emergency, Blue-green algae and HAZMAT.



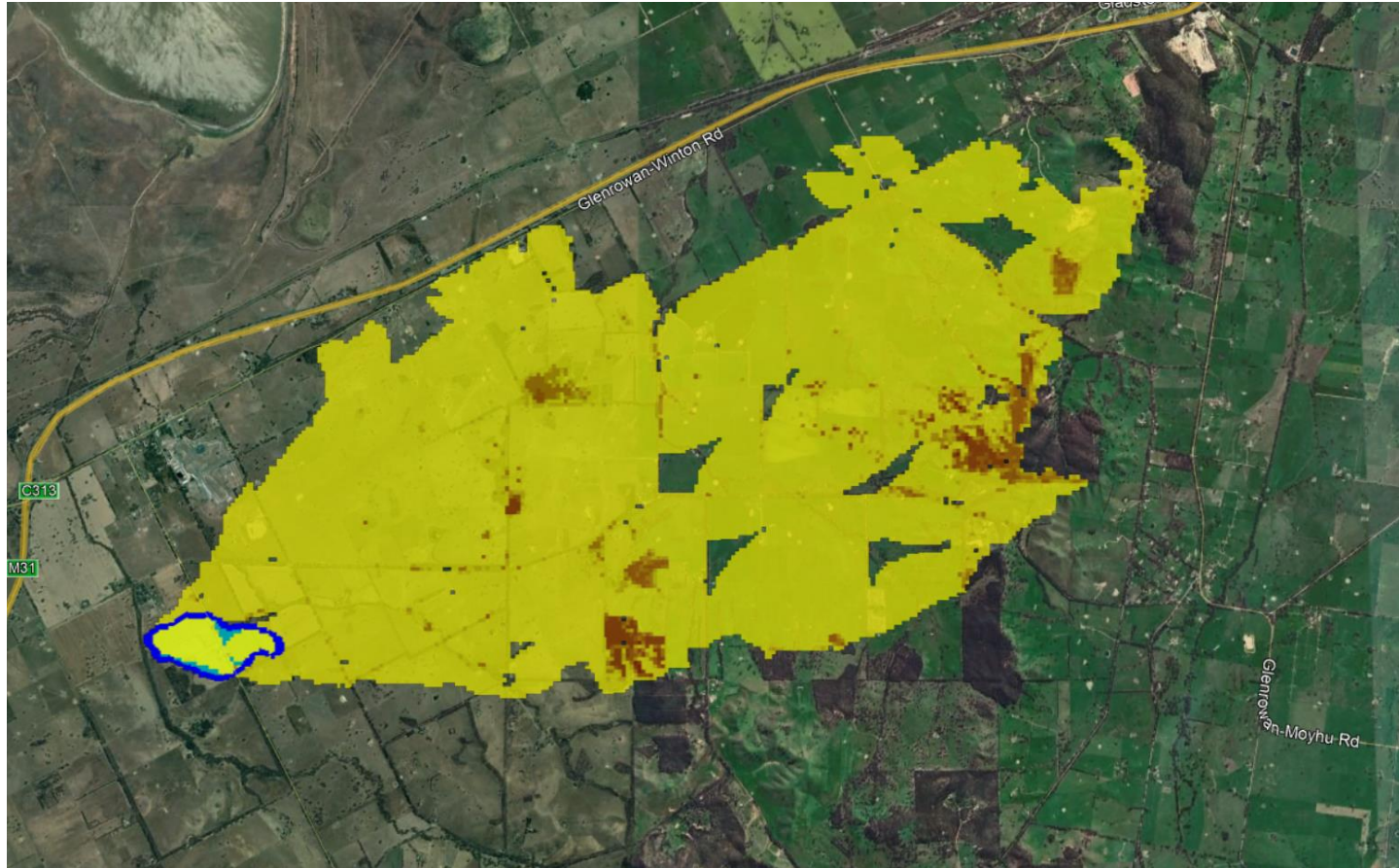
- **RISK = LIKELIHOOD** of an event occurring X the **CONSEQUENCE** of an event actually occurring.
- Using authoritative Vicmap foundational data allows us to understand **Likelihood** and **Consequence**, which allows us to better understand **Risk**.
- Understanding Risk allows us respond to, resource and manage emergency events quickly, appropriately and safely.

Using Vicmap data to support fire spread predictions

- FFMV and CFA use a spatial fire behaviour model called 'Phoenix' to synthesise and model potential fire spread and behaviour.

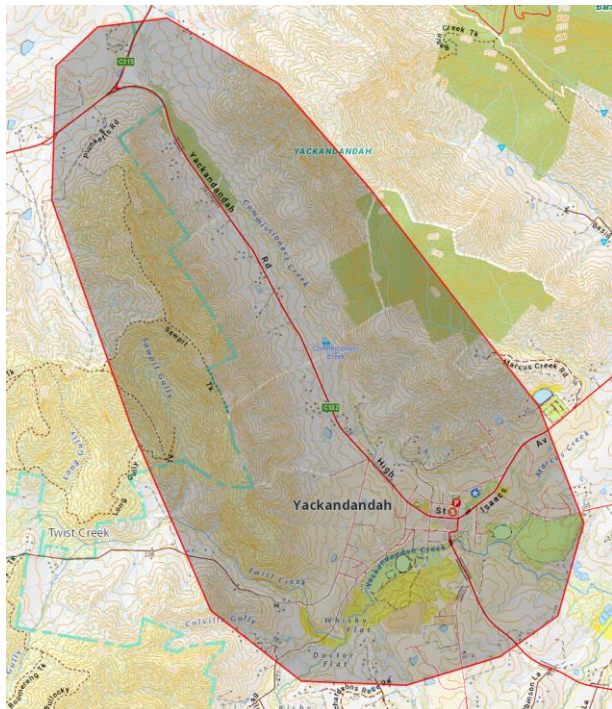


Example Phoenix fire spread prediction



Using Vicmap core spatial data to understand consequence

- A number of custom reporting tools have been built within eMap that assist us in understanding the potential consequence of an emergency event.
- These reports allow us to spatially query underlying Vicmap foundational data.



Life

Townships	1
Properties	699
Hospitals	0
Health Care Facilities	1
Care Facilities	4
Retirement Villages	1
Schools/Pre-schools	1
Prisons	0
Camp Grounds	0
Caravan Parks and Group Camps	1
Neighbourhood Safer Places	2
Cultural Centres	1
Community Venues	4
Census - Population	175
Census - Dwellings	720

Economic

Apiary	0
Vineyards	0
Industrial Facilities	0
Plantations	0.0 (ha)
Intensive Animal Production	0.0 (ha)
Irrigated Horticulture	0.0 (ha)
General Farming / Grazing	812.6 (ha)

Infrastructure

Power Facilities	0
Power Company Boundaries	1
Major Transmission Lines	0.0 (km)
Oil Pipelines	0.0 (km)
Gas Pipelines	0.0 (km)
Major Roads	101 (km)
Major Rail	4.8 (km)
Wind Farms	0
Emergency Services - Police, Fire, Ambulance, SES	5
Communication Services	1
Proclaimed Water Supply Catchments	0.0 (ha)
Water Asset (point)	2
Water Asset (line)	0.0 (km)
Water Asset (polygon)	0.0 (ha)
Water Infrastructure (point)	0
PTV School Bus Route	6
PTV Metro Bus Route	0
PTV Regional Bus Route	4
PTV Regional Coach Route	0
PTV Night Bus Route	0

Using Vicmap core spatial data to understand consequence

Life

Townships	1	Yackandandah
Properties	699	
Hospitals	0	
Health Care Facilities	1	Yackandandah Maternal And Child Health Centre (maternal/child health centre)
Care Facilities	4	Community Early-Years Childcare - Yackandandah (child care) Yackandandah Health Residential Aged Care (aged care) Yackandandah Kindergarten (child care) Yackandandah Primary School Outside School Hours Care (child care)
Retirement Villages	1	Yackatoo Retirement Village
Schools/Pre-schools	1	Yackandandah Primary School (primary school)
Prisons	0	
Camp Grounds	0	
Caravan Parks and Group Camps	1	Yackandandah Holiday Park (caravan park)
Neighbourhood Safer Places	2	Yackandandah (Memorial Gardens) NSP Yackandandah (Senior Citizens Hall) NSP
Cultural Centres	1	Yackandandah Museum (museum)
Community Venues	4	Atheneum (hall) Yackandandah Community Centre (community centre) Yackandandah Memorial Hall (hall) Yackandandah Senior Citizens Centre (senior citizens)
Census - Population	1715	
Census - Dwellings	720	

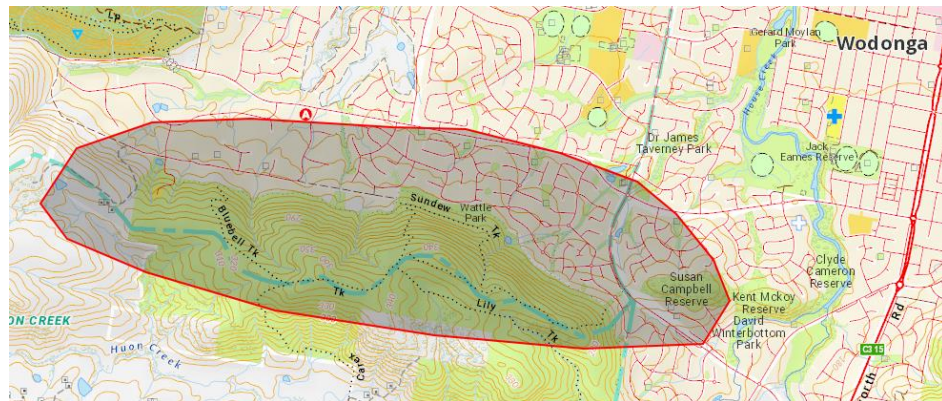
Economic

Aplary	0	
Vineyards	0	
Industrial Facilities	0	
Plantations	0.0 (ha)	
Intensive Animal Production	0.0 (ha)	
Irrigated Horticulture	0.0 (ha)	
General Farming / Grazing	812.6 (ha)	Domestic Livestock Grazing Mixed farming and grazing (generally more than 20ha) Non-Native Animals

Infrastructure

Power Facilities	0	
Power Company Boundaries	1	SP AusNet
Major Transmission Lines	0.0 (km)	
Oil Pipelines	0.0 (km)	
Gas Pipelines	0.0 (km)	
Major Roads	10.1 (km)	Beechworth - Wodonga Rd High St Isaacs Av Myrtleford - Yackandandah Rd William St Windham St Yackandandah Rd
Major Rail	4.8 (km)	BEECHWORTH-YACKANDANDAH RAILWAY
Wind Farms	0	
Emergency Services - Police, Fire, Ambulance, SES	5	Yackandandah (Memorial Gardens) NSP Yackandandah (Senior Citizens Hall) NSP Yackandandah Fire Station CFA Yackandandah Police Station Yackandandah Unit
Communication Services	1	None
Proclaimed Water Supply Catchments	0.0 (ha)	
Water Asset (point)	2	CHURCH ST PUMP STATION, YACKANDANDAH (SEWERAGE) COMMISSIONER CREEK STORAGE, YACKANDANDAH (POTABLE)
Water Asset (line)	0.0 (km)	
Water Asset (polygon)	0.0 (ha)	
Water Infrastructure (point)	0	
PTV School Bus Route	6	Allans Flat - Wodonga (Bartel's Bus Service P/L, 02 6027 3543) Back Creek - Wodonga (Bartel's Bus Service P/L, 02 6027 3543) Back Creek - Yackandandah (Yackandandah Bus Lines P/L, 5728 2182) Yackandandah - Beechworth (Strathglen Pty Ltd, 0417 594 860) Yackandandah - Wodonga (L C Dyson's Bus Services P/L, 9463 3878)
PTV Metro Bus Route	0	
PTV Regional Bus Route	4	Beechworth - Albury Via Yackandandah & Wodonga (Dysons Wangaratta) Myrtleford - Albury Via Wodonga (Dysons Wangaratta)
PTV Regional Coach Route	0	
PTV Night Bus Route	0	

Using Vicmap core spatial data to understand impact



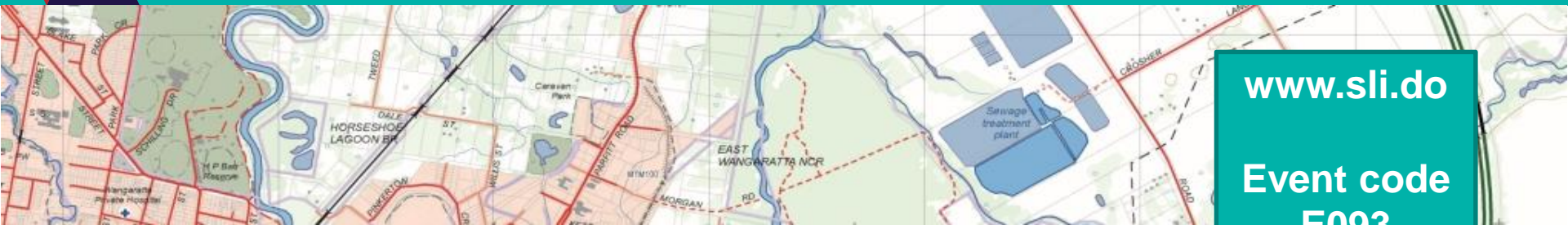
PROP_LGA_CODE	PROP_PROPNUM	PROP_PFI	ADD_EZI_ADDRESS
374		125435465	5 LYONS PLACE WEST WODONGA 3690
374	305448	5267180	8 HAMER MEWS WEST WODONGA 3690
374	308379	5267140	28 LAWSON STREET WEST WODONGA 3690
374	300900	102191239	93 BARTON STREET WEST WODONGA 3690
374		133805336	13 CHIFLEY STREET WEST WODONGA 3690
374		125439559	9 PAGE COURT WEST WODONGA 3690
374	316124	100117117	1 BOWEN PLACE WEST WODONGA 3690
			1/14 MCEWEN CRESCENT WEST WODONGA 3690
374	309527	5268077	
374	300871	100084371	58 BARTON STREET WEST WODONGA 3690
374	300883	53026887	71 BARTON STREET WEST WODONGA 3690
374	302825	5281180	4 CHAUNCEY COURT WEST WODONGA 3690
374	305608	5264004	22 HARTWIG ROAD WODONGA 3690
374	316580	100651717	10 RIVERSDALE PLACE WEST WODONGA 3690
374	313224	5267066	17 SHIELDS COURT WEST WODONGA 3690
374	307239	52459687	12 JEVINGTON DRIVE WODONGA 3690
374	305603	5264776	17 HARTWIG ROAD WODONGA 3690
374	305591	5264788	5 HARTWIG ROAD WODONGA 3690
374	309486	5264713	7 MCDERMOTT COURT WODONGA 3690
			35 PRENDERGAST STREET WEST WODONGA 3690
374	312170	5281154	
374	310266	5265897	31 MENZIES STREET WEST WODONGA 3690
374	313131	125469581	11 SCULLIN COURT WEST WODONGA 3690
374	304847	5266344	9 FRANCIS COURT WEST WODONGA 3690
374	300891	53026891	79 BARTON STREET WEST WODONGA 3690
374	313128	5268163	2/9 SCULLIN COURT WEST WODONGA 3690
374	316215	100214239	37 BALLARA DRIVE WEST WODONGA 3690
374	305068	5267001	3 GILLIES COURT WEST WODONGA 3690
374	316892	100531723	6 KOENDIDDA COURT WODONGA 3690
374	306221	5281108	14 HOGAN COURT WEST WODONGA 3690
374	306213	5281096	6 HOGAN COURT WEST WODONGA 3690
			32 PRENDERGAST STREET WEST WODONGA 3690
374	312167	5281051	

- Access to authoritative Vicmap spatial data is a cornerstone of our ability to manage emergency events.
- Vicmap spatial data:
 - Assists us in understanding the potential risk and consequence of an emergency event.
 - Allows us to plan ahead and to ensure community safety.
 - Allow us to develop and implement appropriate control strategies in line with the State Control Priorities.

www.sli.do - event code E093

Twitter - @DELWP_Vic

Social media - #DELWP_CSDS



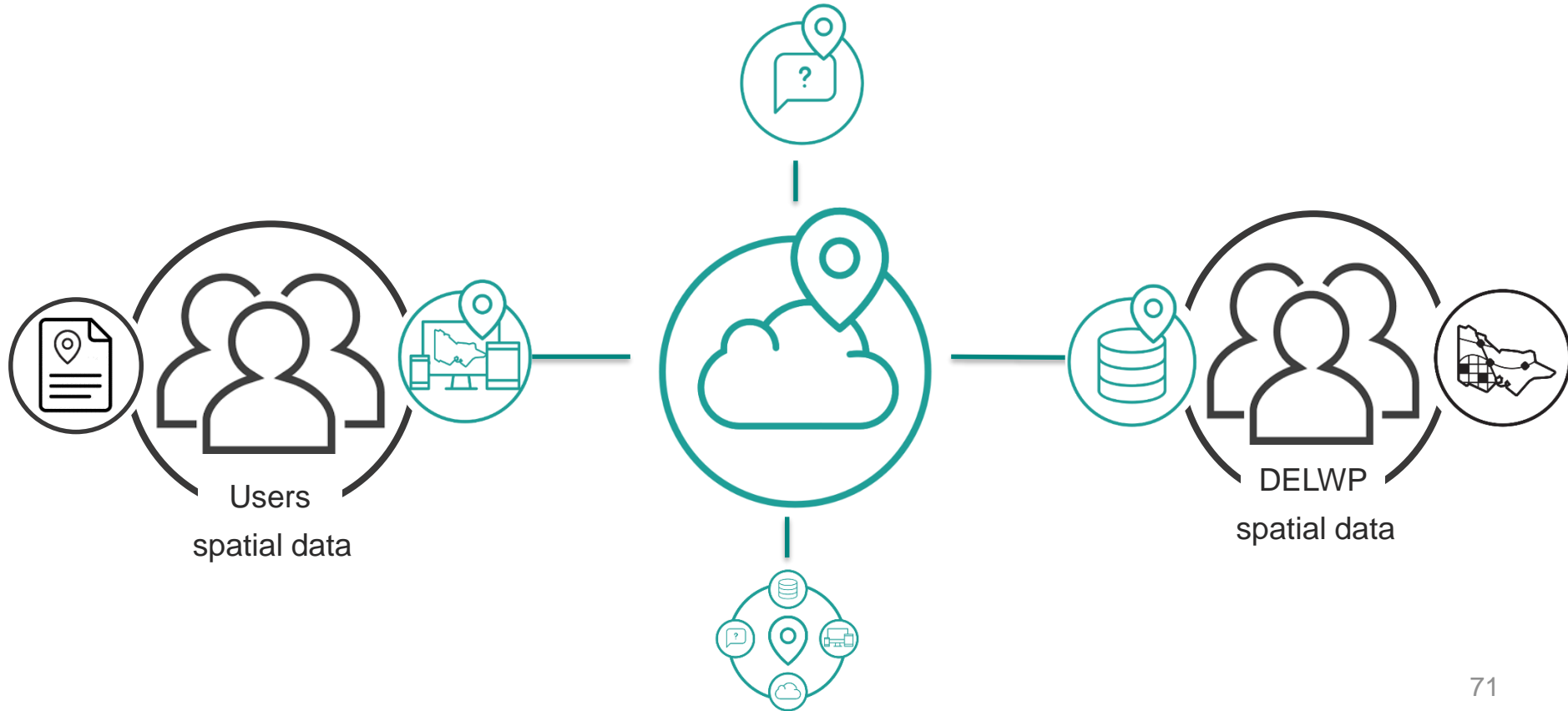
www.sli.do

Event code
E093

Anthony Draga
Manager, Enterprise Spatial Services

Supporting emergency operations with Vicmap core spatial data

Connect users to spatial data through services



Enterprise Business Core



3

We will provide
effortless
access to our
core spatial
data services

h innovation

We catalyse innovation and increase the value
generated from spatial data

GOALS

We keep in

FOCUS
AREAS



1

We must
efficiently source
high quality and
trustworthy data



2

We must
effectively
manage
information
through
its lifecycle

g
s with
s and
vers



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



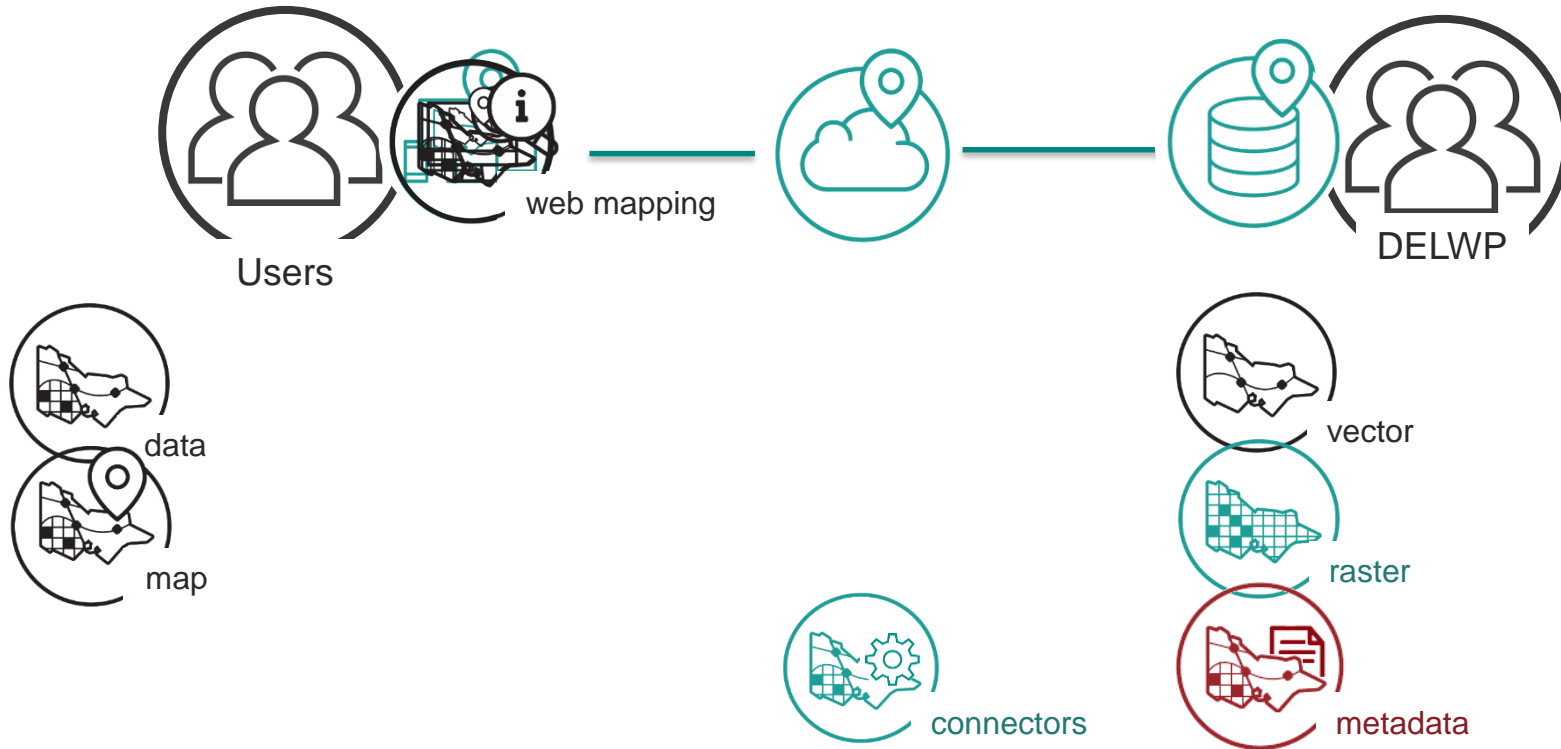
7

We will target our
investment in R&D
and innovation



8

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



Our Approach

integrated



supported



licenced
configurable



cloud
Amazon Web Services



siloed



out of support



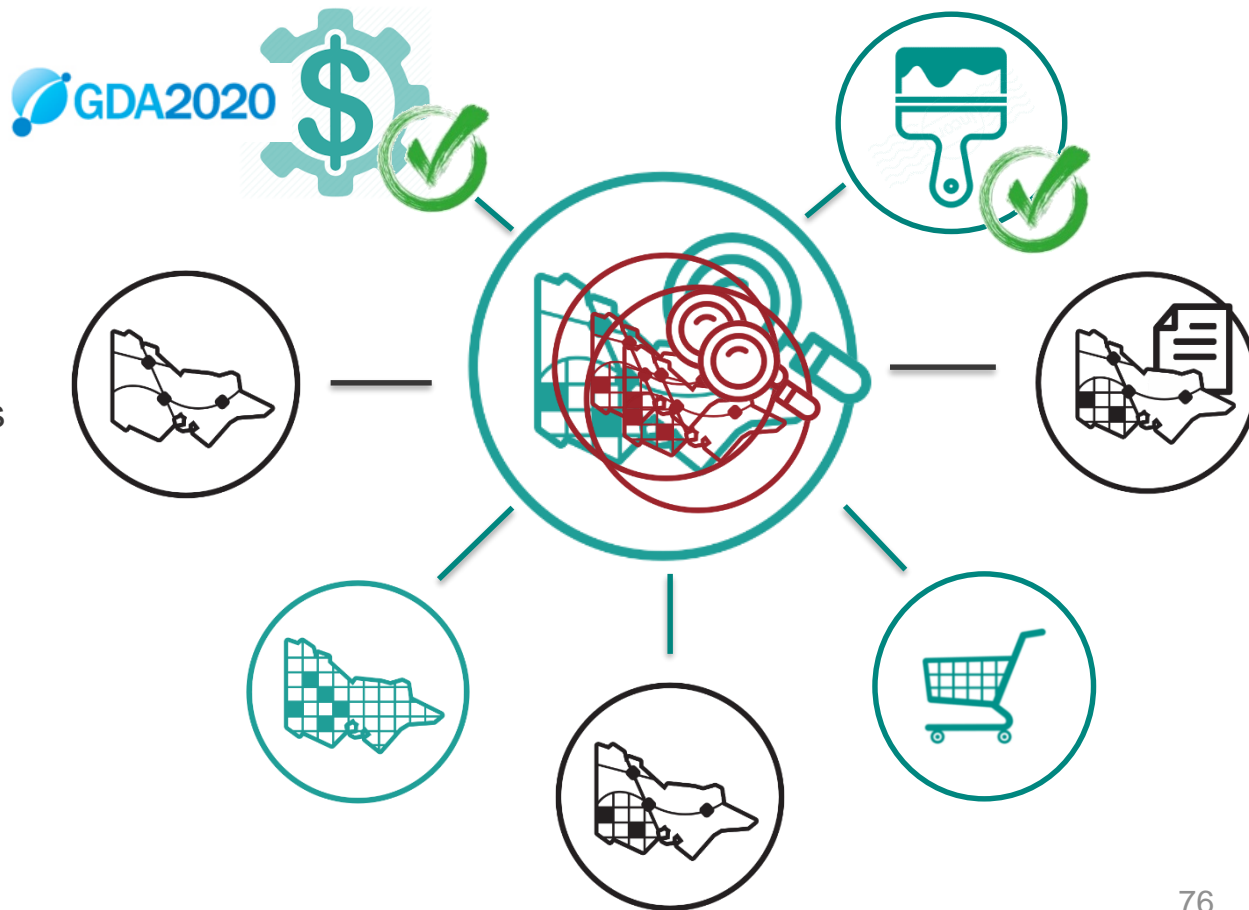
bespoke



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**



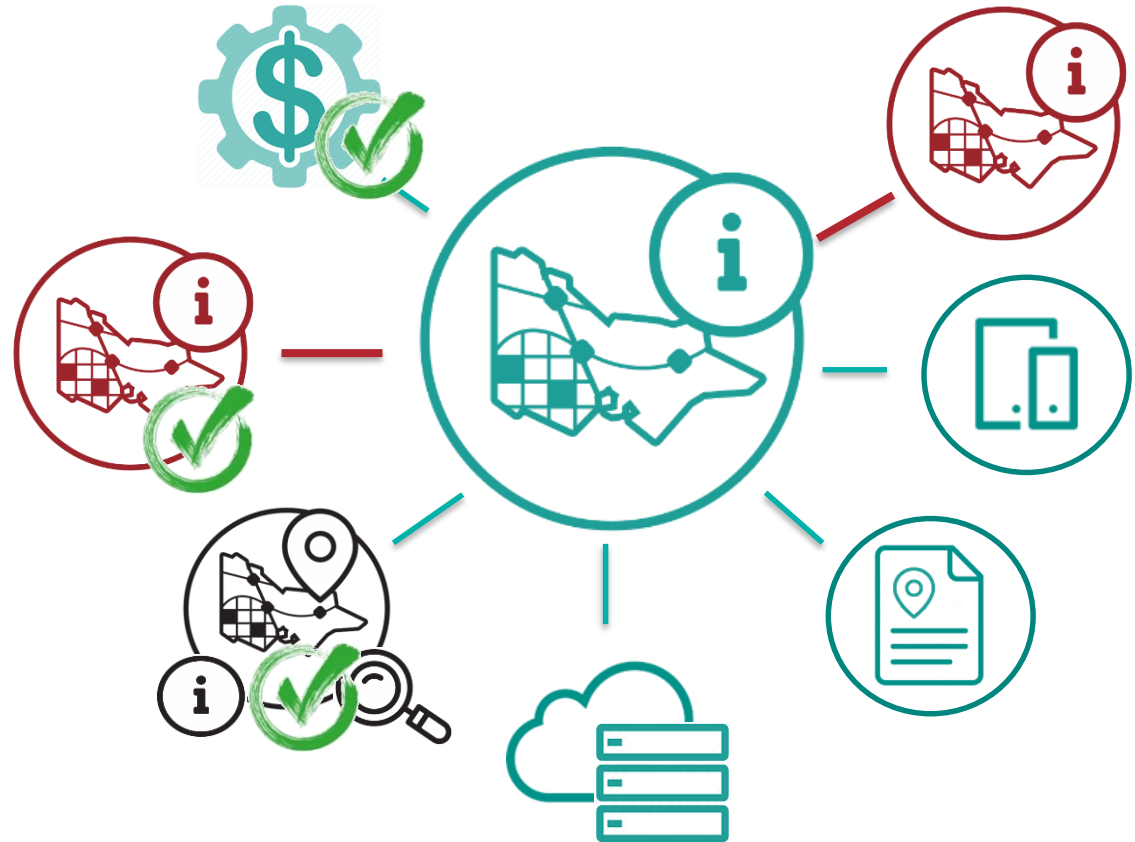
Map Service

- architecture
- operations infrastructure
- 256 pixel tiles
- currency
- new styles
- easier integration



Web Mapping

- consolidate
- maps
- functionality
- searches
- new architecture
- reports
- mobility
- Land Channel retired





Datashare
Search & Discover



Mapshare
Web Mapping



Vicmap API
Map Service

www.sli.do - event code E093

Twitter - @DELWP_Vic

Social media - #DELWP_CSDS



Thank you

Technical workshops commence 1pm

Technical workshops commence 1pm