

Vicmap™ Catalogue 2016–17

Vicmap – Mapping for business intelligence

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Mission

To provide Victoria with authoritative, comprehensive and easily accessible spatial foundation data to underpin effective decision making.

Focus

Delivering policies and strategies to support the spatial information industry in Victoria. Providing secure and maintained foundation spatial datasets in Victoria helping realise the benefits of spatial information infrastructure.

Access to Vicmap products and services

There are various ways to access Vicmap to accommodate various data needs.

Victorian Government Data Directory (VGDD)

The Victorian Government Data Directory (<http://www.data.vic.gov.au/>) is a portal that helps you find data that Victorian government departments and agencies have made available to the public under the DataVic Access Policy. The portal links you to the datasets and data tools that exist on other government websites.

Spatial Datamart (SDM)

Spatial Datamart (<https://services.land.vic.gov.au/SpatialDatamart/search.html>) is the Department direct web service for accessing Vicmap and other Department datasets. You can search by type of data required, area type, dataset name, theme and review the metadata against your requirements.

Details available include:

- Timetable for release
- Usage and availability restrictions
- Licence restrictions and conditions
- Access constraints
- Exclusion of liability
- Supply and media formats
- Projections.

Vicmap products are also available directly from DELWP's network of official data service providers listed at: www.delwp.vic.gov.au/vicmapdsp.

Vicmap data not covered under the DataVic Access Policy is distributed under a Department licence which sets out the conditions of distribution. Refer to <http://www.delwp.vic.gov.au/vicmap> for more information.

Vicmap Position

Information about the GPSnet™ Continuously Operating Reference Station (CORS) infrastructure and for post-processing data refer to the following website <http://gnss.vicpos.com.au>.

Vicmap Topographic – Digital maps

Vicmap Topographic maps at 1:25 000, 1:30 000, 1:50 000 and 1:100 000 scale can be bought online at www.delwp.vic.gov.au/vicmap. Scroll down this page to Vicmap Topographic Maps Online.

Vicmap Topographic – Hardcopy Maps

The new series of available Vicmap Topographic – Hardcopy Maps can be accessed from the DELWP web at www.delwp.vic.gov.au/vicmap. Select from the sidebar:

- Vicmap Topographic Hardcopy Maps, or
- Vicmap Topographic Wholesalers & Other Retailers.

Vicmap Imagery

Vicmap Imagery – Aerial Photography is available directly from DELWP's Data Service Providers (DSPs) listed at www.delwp.vic.gov.au/vicmapdsp.

The imagery has been obtained from various projects over the State with most through the Coordinated Imagery Program (CIP). For further information select www.delwp.vic.gov.au/cip.



What Vicmap delivers

Confidence: Authoritative, quality products

Innovation: Creation of meaningful products, packaging and access

Inspiration: Ability to easily gain tangible business benefits.

Vicmap™ is the foundation that underlies most spatial information in Victoria. This portfolio of spatial related authoritative data products, made up from individual datasets, is developed and managed by the Department of Environment, Land, Water & Planning. The information provides the foundation to Victoria's primary mapping and spatial information systems, and is used for building business information and systems.

Vicmap is a registered trademark of the Victorian Government and is synonymous with authoritative statewide mapping since 1975.

The Vicmap portfolio includes:

- Vicmap Address
- Vicmap Admin
- Vicmap Crown Land Tenure
- Vicmap Elevation
- Vicmap Features of Interest
- Vicmap Hydro
- Vicmap Imagery
- Vicmap Lite
- Vicmap Planning
- Vicmap Position
- Vicmap Property
- Vicmap Topographic Mapping
- Vicmap Transport
- Vicmap Vegetation

Vicmap data is supported by a collection of reference tables, Vicmap Reference Tables. A reference table may list the full name, description and other attributes associated with a feature code or identifier.

Further information can be found at www.delwp.vic.gov.au/vicmap, or via email at vicmap.help@delwp.vic.gov.au.

Case study 1: Communication Modelling

Vicmap Elevation – DTM20m & DTM10m is a key dataset used for communication modelling. In conjunction with radio specifications, the DTM20m can be used to model a potential tower's range and quality of signal to identify possible black spots. This will help in the decision making process determining a location for a new radio tower to gain optimum coverage.



Above: This shows the area of coverage for a proposed radio tower in the Otways. The colours represent range and signal strength. Red represents areas of good reception for hand held radios, orange marginal reception for hand held radios, green for good for in-vehicle radios and yellow marginal reception for in-vehicle radios.

Case study 2: Precision agriculture controlled traffic farming

Vicmap Position is capable of providing ± 2 cm horizontal positioning for precision agriculture applications. A farmer in Inverleigh, just west of Geelong, is using the Networked Real Time Kinematic (NRTK) solution with agriculture equipment to increase yield, year on year. By using Vicmap Position to auto-steer his farm machinery to ± 2 cm of accuracy he is able to implement controlled traffic farming techniques. Over 500 hectares of barley have been cropped in the region using this technology increasing yield by up to 20%.



Above: Vicmap Position – NRTK being used for precision agriculture near Inverleigh.

Vicmap Address



Victoria's authoritative, accurate and current address data base

Vicmap Address is Victoria's authoritative geocoded database of property address points for the State. The product includes predominately, but not exclusively locational property address identifiers assigned by Local Government, considered to be the primary creator and Custodian of property addresses. Additionally and where accessible, other 'real life' property addresses created and used by the community (but not recognised by Local Government) including retirement villages, assisted care facilities, industrial, alpine resorts and public housing estates etc.

Vicmap Address can be used to map the location of addressed assets or to verify the content of business address data.

Key inclusions are:

- Street number and street name
- Locality
- Cross reference to Local Government
- Post code and State
- Cross reference to Vicmap Property, and
- Census District Attribute.

Specifically excluded are non-property related, and electronic address details such as email, post office (PO) boxes, roadside delivery points, roadside mail boxes and the like.

The minimum address attributes required for a property address to be included in Vicmap Address are road name and locality. However, the standard address details include the unit/house number(s), road name (including any type or suffix) and locality (town/suburb/rural district).



Above: ESTA use Vicmap Address to quickly and accurately dispatch emergency and essential services across the State.

Case Study 1: Emergency Services Telecommunications Authority use Vicmap Address for computer aided dispatch

Victoria's Emergency Services Telecommunications Authority (ESTA) utilise Vicmap Address to quickly and accurately dispatch emergency service appliances. ESTA utilise Vicmap Address in their Computer Aided Dispatch and require a high level of data quality to assist in providing timely and accurate information to the attending service(s). A combination of Vicmap Address, Vicmap Admin and Vicmap Transport can provide ESTA with the ability to quickly locate an incident, facilitating prompt attendance for emergency events.

Case Study 2: GPS enabled devices use Vicmap Address for locations based services

Mobile telecommunication companies are joining forces with navigational software companies through smart phones to provide an alternative to stand-alone satellite navigation devices. Vicmap Address is a key component of navigational systems, providing the commencement and destination locations for each journey. Telecommunication companies utilise this data in their products to help determine the best route to a chosen destination.



Left: A Smart phone incorporating Vicmap data

Technical detail

Source information	Various – refer to the Product Description
Coverage	Statewide
Currency	Updated Weekly
Scale of capture	Based on scale of capture (between 1:480 and 1:25,000) of the original Vicmap Property data. For developing areas survey accurate CAD files $\pm 0.1\text{m}$ nominal accuracy.
Spatial accuracy	Rural property entrance locations for distance based addressing (i.e. Rural Road Numbers) captured via GPS or submetre accuracy aerial photography. Urban addresses generally located at an 8 m offset from the relevant property road frontage based on scale of capture (between 1:500 and 1:2,500) of the original Vicmap Property data.
Coordinates	Geographic (Latitude/Longitude) MGA and VicGrid94 on application
Datum	GDA94
Format	Various digital formats

Vicmap Admin



Victoria's administrative boundary information

DELWP helps you visualise administration boundaries. Vicmap Admin provides authoritative administrative boundary information for Victoria. Vicmap Admin enables customers to locate and relate to administrative boundaries such as local government areas, suburbs (localities) and postcodes, for applications such as asset or product location and market research. Current users include Victoria's utilities, government agencies and emergency service organisations.

Vicmap Admin combines designated and gazetted boundaries of administrative interest across Victoria into one easy to use package.

Authoritative sources through custodianship agreements are used to produce the Vicmap Admin product. For example, LGA boundaries are compiled under the direction of Local Government Victoria within The Department of Environment, Land, Water & Planning; electoral data is supplied by the Victorian Electoral Commission; and postcodes are compiled using the latest boundary alignment information supplied directly from Australia Post.

Vicmap Admin is comprised of the following boundary themes:

- Local Government Area (LGA) boundaries and names
- Locality boundaries and names
- Postcode boundaries and numbers
- State Electoral boundaries and names
- Local Government Ward boundaries and names
- Parish and Township boundaries and names
- State Government Departmental boundaries and names
- CFA Regions, Districts and Total Fire Ban Districts boundaries and names
- MFB Regions and Districts boundaries and names

Vertical alignment is based on the cadastral boundaries of Vicmap Property.

Case Study: Victorian Electoral Commission using Vicmap Admin

As custodian of the State Electoral Boundaries, the Victorian Electoral Commission (VEC) creates electoral boundaries using many of the Vicmap products. This includes Locality and LGA boundaries from Vicmap Admin, as well as Parish and Township boundaries. In 2013, the Legislative Council (Upper House) boundaries were redrawn using these products. The same products are also used by the VEC to draft the Local Government Ward Boundaries as part of the Victorian Electoral Representation Reviews.



Above: Sample of municipal map showing wards. Vicmap Admin Localities (green), LGA Boundary (black line and yellow buffer) and ward boundaries (black lines).

Technical detail

Source information	Refer to the Vicmap Admin product description
Coverage	Statewide
Currency	Updated Weekly
Scale of capture	Based on scale of capture (between 1:480 and 1:25,000) of the original Vicmap Property data
Spatial accuracy	Ranges from 0.1 m to 25 m
Coordinates	Geographic (Latitude/Longitude) MGA and VicGrid94 on application
Datum	GDA94
Format	Various digital formats



Vicmap Crown Land Tenure



Victoria's Crown Land Tenures information

Vicmap Crown Land Tenure assists users to manage their interaction with Victoria's Crown land by providing information about the private use of Crown land and government roads. DELWP provides the only Crown Land Tenure layer available, which will assist customers planning, evaluating and managing their own assets in relation to Crown land, roads and reserves. Key customers include resource and mining companies, water businesses and councils.

Vicmap Crown Land Tenure plays a key role in the management of Victoria's Crown land. The product provides information about the private use of Crown land parcels and Crown roads.

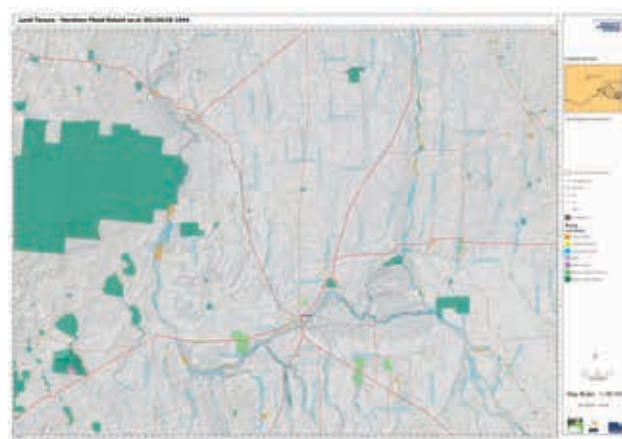
The product includes land use licences such as:

- Grazing, water frontage and unused road licences
- Leases for commercial purposes
- General or miscellaneous licences, permits and consents
- Pipeline and Water Supply licences
- Apiaries and bee farm licences
- Reserve status and reserve management – land gazetted or set aside for a specific use.

The database is continually maintained by gaining regular input from authoritative sources within State Government. Vertical alignment is based on the cadastral boundaries of Vicmap Property.

Case Study 1: Using Crown Land Tenure to rapidly assess Impact on Flood affected Towns

The Department of Environment, Land, Water and Planning Bushfire Rapid Impact Assessment teams were kept busy during the months of September 2010 and December – February 2011 – not on Bushfires, but on the Floods in Victoria. The teams produced a large range of maps and conducted data analysis assessing the impact of the Floods in various towns. The maps and analysis were used in draft reports to help assessment teams investigate the various type of impacts – Asset Management, Biodiversity, Cultural Heritage, Flooding and Erosion, and Soils.



Above: This map shows the flood extents in comparison to various tenures and land use.

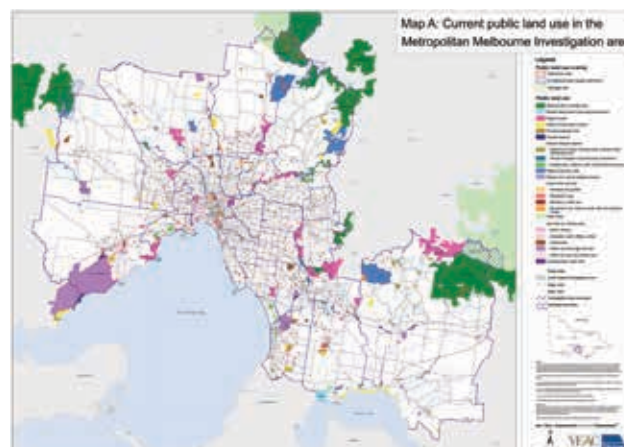
Case Study 2: Using Crown Land Tenure to help identify Melbourne's Public Land and Public open space.

The Minister for Environment and Climate Change requested the Victorian Environmental Assessment Council (VEAC) to carry out an investigation of Crown land and public authority land in metropolitan Melbourne.

The purposes of the investigation are to:

- systematically identify and assess the uses, resources, condition, values and management of Crown land and public authority land in metropolitan Melbourne;
- assess values of Crown land and public authority land for areas not committed to a specific use, and report on appropriate future uses relevant to Melbourne's livability and natural values; and
- report on the contribution of Crown land and public authority land to Melbourne's livability and opportunities for enhancement of this contribution.

VEAC produced a range of maps and detailed studies of public land use and public open space in the metropolitan Melbourne area. These maps were used in a discussion paper and provided for public comment, and are currently available on the VEAC website. These maps are assisting with the planning process and preparation of the final report.



Above: This map shows the current public land use using the Crown Land Tenure layer.

Technical detail

Source information	Refer to the Vicmap Crown Land Tenure product description
Coverage	Statewide
Currency	Updated Weekly
Scale of capture	1:500 to 1:25,000
Spatial accuracy	Ranges from 0.1 m to 25 m
Coordinates	Geographic (Latitude/Longitude) MGA and VicGrid94 on application
Datum	GDA94
Format	Various digital formats

Vicmap Elevation

Victoria's ground surface information

Vicmap Elevation assists with terrain analysis and land assessment by providing contour and relief data. This product is able users and can be combined with other data to enable more efficient and effective planning of landscape sensitivity, catchment modelling and habitat suitability.

The Vicmap Elevation is comprised the following:

- Statewide 10–20m contours & relief: represents Victoria's elevations in the form of contours, spot heights and surface features including cliffs, embankments and rock outcrops. This product can be used in a variety of applications, particularly in emergency services, natural resource management, planning and development, and digital map publication.
- Digital Terrain Model (DTM): represents Victoria's terrain surface at 20m & 10m grid resolution and are hydrologically enforced. Improvements in the DTM increase their usability for catchment, flood and landscape analysis, and natural resource oriented applications when used with other Vicmap products and imagery.
- Statewide 1–5m contours & relief: sourced from the former Melbourne Metropolitan Board of Works surveys conducted in the 1970s and 1980s. This valuable dataset enables a more detailed contour overlay of the Melbourne metropolitan area. This spatial information can be used for feature and contour surveys, planning applications and broad scale volume estimations.
- Topographical coastal 1m Digital Elevation Model (DEM) & 0.5m contours: high resolution representation of Victoria's natural relief features along the coast. This data can be used as an input for sea level rise modelling, landscape analysis, planning, hazard mitigation and environmental modelling. This data has been used in projects across Victoria, including identifying the impact of sea level rise on local communities, settlements and coastal wetlands.
- Multi-resolution: Compilation of project data, both DEMs and contours, at various resolutions covering the major flood plains across Victoria & Greater Melbourne and environs. Applications include planning and environmental modelling in both natural and man-made environments.

Case Study 1: Coastal hazard modelling and climate change modelling

Vicmap Elevation – Coastal Topographic 1m DEM & 0.5m contours can be used to model sea level rise, storm surge, inundation and erosion, identify how the coastline is likely to change over time and areas of high risk from flood areas.

Case Study 2: Communication modelling

Vicmap Elevation – DTM is a key dataset used for communication modelling. In conjunction with radio specifications, the DTM 20m can be used to model a potential tower's range and quality of signal to identify possible black spots. This will help in the decision making process determining a location for a new radio tower to gain optimum coverage.



Above: This shows the area of coverage for a proposed radio tower in the Otways. The colours represent range and signal strength. Red represents areas of good reception for hand held radios, orange marginal reception for hand held radios, green good reception for in-vehicle radios and yellow marginal reception for in-vehicle radios.

Technical detail

Vicmap Elevation	DTM	10–20 Contours & Relief	1–5m Contours & Relief	Multi – Resolution	Topographic Coastal 1m DEM & 0.5m Contours
Source information	10–20 Contours & Relief	Vicmap Topographic Maps	Melbourne Water	Lidar & Photogrammetry	LiDAR Surveys
Coverage	DTM20 Statewide DTM10 70% coverage	Statewide	Metropolitan Melbourne	Project Based and not always seamless between projects.	Victorian Coastline up to 10m elevation line
Currency	Various	Various	Various	Various	Various
Scale of Capture	1:25,000	1:25,000	1:500 to 1:10,000	N/A	N/A
Special features	20m grid resolution 10m grid resolution	10m contour intervals (20m in steep terrain), spot heights, surface features (e.g. cliffs and levee banks)	Generally at 1m intervals but some locations have only 2 or 5 m contours	Products may include DEM, contours or LiDAR Point Cloud. Resolution, Products, formats vary between projects	1m DEM & 0.5m contours
Coordinates	VicGrid94	10m contour intervals (20m in steep terrain), spot heights, surface features (e.g. cliffs and levee banks)	Generally at 1m intervals but some locations have only 2 or 5 m contours	Products may include DEM, contours or LiDAR Point Cloud Resolution, Products, formats vary between projects.	1m DEM & 0.5m contours
Datum	GDA	GDA	GDA	GDA	GDA
Format	ESRI Grid	Various digital formats	Various digital formats	Supplied in tiles. Where applicable: <ul style="list-style-type: none"> • DEM: XYZ ASCII and/or ESRI ASCII • Contours: Shapefile & MapInfo • LiDAR: XYZI Ascii and/or LAS 	Supplied as 2km square tiles. DEM supplied in XYZ ASCII only contours supplied as ESRI Shape or MapInfo formats only.



Vicmap Features of Interest



Victoria's Features of Interest

Vicmap Features of Interest (VMFoI), first created in 2009, is a topologically structured digital dataset covering the state of Victoria and describing features of interest, their location and names. Examples of features includes, but not limited to: education centres, reserves, emergency facilities and landmarks. VMFoI has a large range of applications, including asset management, location based services, logistics management and map production.

A significant characteristic of this product is its topological data structure enabling spatial relationships between features, such as adjacency, connectivity, and containment, to be explicitly stored. For example, the relationship of the children's playground is "within" the respective reserve. This permits a range of automated functions and analyses to be performed on features that would otherwise be complicated to achieve.

Key benefits to users are:

- The database is a fundamental spatial reference file which will allow you to link and map your business intelligence
- Combines all features into a single dataset
- Enhances search and find capability on features of interest
- Allows for efficient and effective asset database management
- Links to the Geographic Names Register, Vicmap Address and other authoritative registers.

Feature and feature sub-type examples

The datasets within the VMFoI product utilises approximately 200 cultural/infrastructure themes of the 300 sub-features described in the products features catalogue. Each sub-feature is represented as points, lines and/or polygons defined by coordinate spatial data (latitude and longitude) with associated attributes.

- Education centres – primary schools, tertiary institutions
- Reserves – zoo, gardens, parks
- Hospital's & care facilities – child care, general hospital, aged care
- Emergency facilities – fire/police/ambulance stations
- Community venue – hall, neighbourhood house
- Admin facility – law court, municipal office, post office
- Sporting facilities – sporting ground, tennis courts, velodromes
- Power facility – gas power station, hydro power station, windfarm
- Landmark – cairn, monument, tower, lookout.

Key features of Features of Interest

- Provides the location and describes the features with a sub-feature type classification
- Allows links by mapping parent and child relationships between features. Example: University can have multiple Campuses' and a reserve can have many sporting grounds
- Identifies the data's Custodian and provides linkages to other databases. Including the Custodian's unique feature identifier for each feature in their database
- All features have a common data structure, and
- The data model allows users to link and map against their own data or other authoritative information.

How is the information represented?

The spatial definition of these features can be represented as points, lines, polygons, a series of linked lines or a series of related polygons. Note: This is dependent on feature type and display scale.



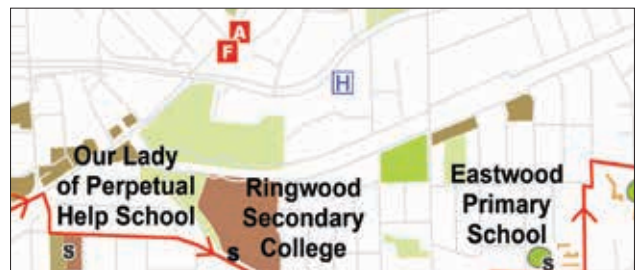
Above: This image shows features overlaid by aerial photography to enhance how they relate geographically in the community.

Case study 1: Assists with infrastructure planning

Planners designing the community needs for services such as life saving clubs, aquatic centres, maternal and child-care centres, scout camps, etc can use VMFol overlaid over the Imagery, Transport, Property and Address Vicmap products. This can be mixed with council, utility, census data such as population, ethnicity, education, family, income, labour force, and dwelling characteristics to best locate and administer each service.

Case study 2: Linking your business intelligence with the community

A large publishing house of educational text books will use the schools 'education centre' feature to link to individual schools, their location and population. This spatial relationship will aid ordering of these books. This can also be linked with other business information to assist logistics including delivery, routing, invoicing and follow up with each school.



Above: The route of the delivery is clearly seen using these products.

Technical detail

Source information	Refer to the Vicmap Features of Interest product description
Coverage	Statewide
Currency	Varies with each features authoritative source
Scale of capture	Varies with each features authoritative source
Spatial accuracy	Generally ranges from 0.1 m to 25 m
Coordinates	Geographic (Latitude/Longitude) MGA and AMG66 on application
Datum	GDA94
Format	Various digital formats

Vicmap Hydro



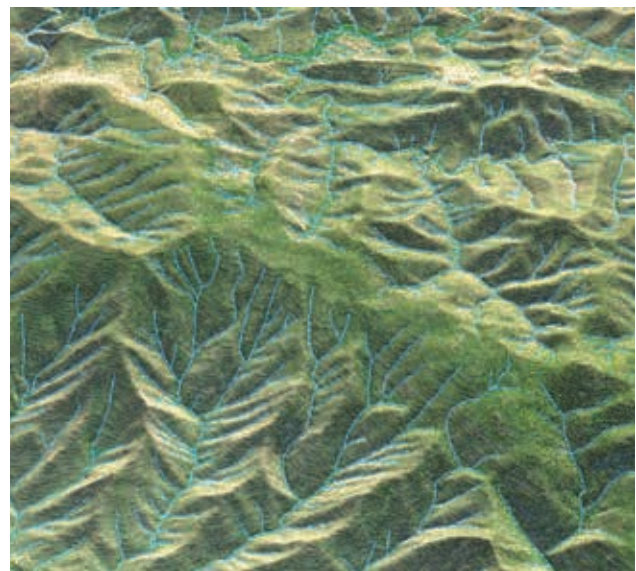
Victoria's water features information

Vicmap Hydro helps users in designing and managing infrastructure by providing the State's hydrographic dataset. DELWP provides an accurate, current and maintained representation of hydrographic features across Victoria at a capture scale of 1:25,000, or better.

Topologically structured, Vicmap Hydro depicts natural and water infrastructure, including selected water related structures and coastal navigational features. Vicmap Hydro, combined with clients' business datasets, provides information on water storage, management, and utilisation of water and related assets.

Case study 1: Watercourses used to improve digital elevation models

Watercourses and water bodies are used as input to improve Vicmap Elevation – DTM 20m through stream enforcement. The output terrain is aligned closely with the watercourses and water bodies from Vicmap Hydro for more effective hydrological or flood plain modelling.



Above: Aerial photography has been draped over a Digital Elevation Model (DEM) to create a three dimensional image. The streams and water bodies used as input into the DEM construction process have been overlaid in blue.

Case study 2: Melbourne Water realigning waterways within their jurisdiction

Melbourne Water are utilising the Custodianship Program with DELWP to improve the data quality and location of waterways within their area of responsibility. Melbourne Water is increasing the spatial accuracy for Vicmap Hydro by realigning the waterways data to suit their business needs to an improved accuracy of around 1:5,000. Integration with Melbourne Water data is undertaken regularly to ensure Vicmap benefits from the addition of high accuracy waterway data.



Above: This image clearly shows the differences in accuracy, with the existing Vicmap Hydro (purple) compared to Melbourne Water realignment (light blue).

Technical detail

Source information	Refer to the Vicmap Hydro product description
Coverage	Statewide
Currency	Updated Weekly
Scale of capture	1:500 to 1:25,000
Spatial accuracy	Ranges from 0.1 m to 25 m
Coordinates	Geographic (Latitude/Longitude) MGA and AMG66 on application
Datum	GDA94
Format	Various digital formats

Vicmap Imagery

Victoria's imagery repository

Vicmap Imagery products assist users in mapping the changes in asset and infrastructure maps, date specific information, flood mapping and damage estimation. Geo-referenced aerial imagery has been captured over many areas at different times. The use of this photography will lead to accurate decision making, better risk management and a base for future analysis. Key customers are utilities, town planners, developers, real estate agents, architects and emergency services organisations.

Many georeferenced projects of varying resolutions and spectral bands, and dates have been captured from 2005. The imagery is sourced most recently through the Coordinated Imagery Program. See www.delwp.vic.gov.au/CIP.

Case study 1: Mapping urban expansion for Melbourne

The Urban Development Program within Department of Environment, Land, Water and Planning is currently using aerial photography to map urban expansion for Melbourne. The information obtained from this program can be used by urban planners, land developers, local councils and utility providers.

Case study 2: Property identification and matching using imagery

A number of local councils use the imagery in the areas of planning, engineering, local laws and emergency management. For example, rates departments have used it to help update land valuation records and for property identification/matching to the cadastre.



Above: The 2005 sample aerial photography imagery overlaid with Vicmap Property boundaries.



Above: The 2009 imagery over the same area as Case Study 1, clearly shows the development over a four year period.

Technical detail

Source information	Aerial Photography Projects
Coverage	Varies
Currency	Varies
Scale of capture	MGA 54, MGA 55
Coordinates	Geographic (Latitude/Longitude) MGA and AMG66 on application
Datum	GDA94

Vicmap Index

Victoria's reference indexes and extents

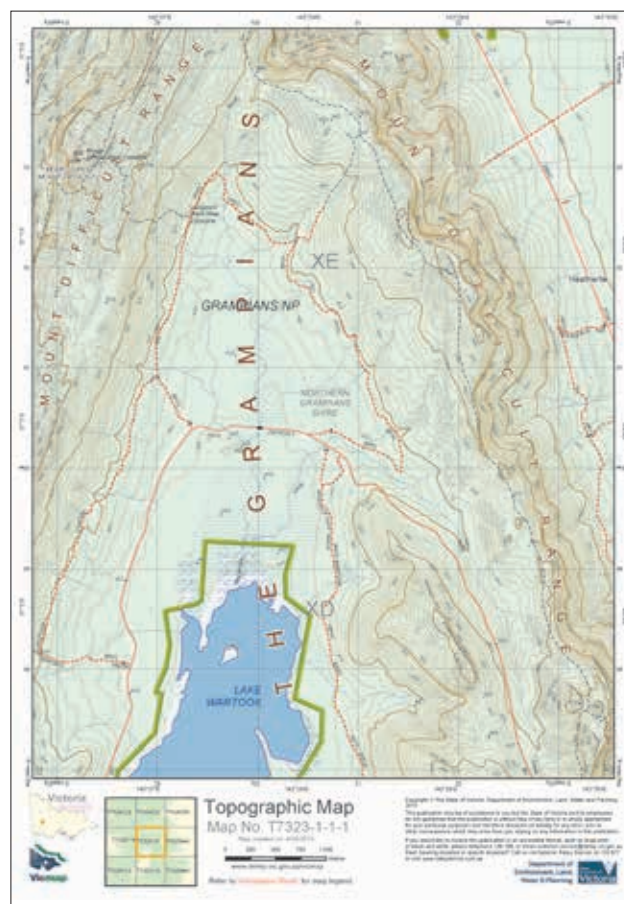
- Key extents for Vicmap framework products
- State border and coastline
- Vicmap Topographic Indices
- Spatial Visions Mapbook Indices
- VicRoads Book Indices

Vicmap Index comprises several individual datasets depicting the extents of a number of government and industry map series products as well as the State boundary, zero contour coastline and the extent of information of Vicmap Framework data.

Vicmap Index will assist users in spatial location, map production, web based searches, dispatch, delivery and GIS analysis.

Case Study: Automated map creation – Vicmap Topographic 1:30 000 A4

Vicmap Index is used to generate Vicmap Topographic 1:30 000 A4 Maps. The VICMAP_MAPINDEX_30A4 index, is used to facilitate the automatic creation of over 6,000 individual map sheets state wide every twelve months. These PDFs maps are then made available online for immediate viewing, downloading and printing. As they are geo-referenced these PDFs can interact and be viewed with an Apple iOS devices such as iPod Touch, iPhone and iPad, as well as android devices.



Above: A Vicmap Topographic 1:30 000 A4 map sheet. The extent of this map is derived from VICMAP_MAPINDEX_30A4

Technical detail

Source information	Refer to Vicmap Index product description
Coverage	Statewide
Currency	Various
Scale of capture	Various
Special features	Key extents for Vicmap framework products State border and coastline, and extents for government and industry map series products
Coordinates	Geographic (Latitude/Longitude) MGA and VicGrid94 on application
Datum	GDA94
Format	Various digital formats

Vicmap Lite



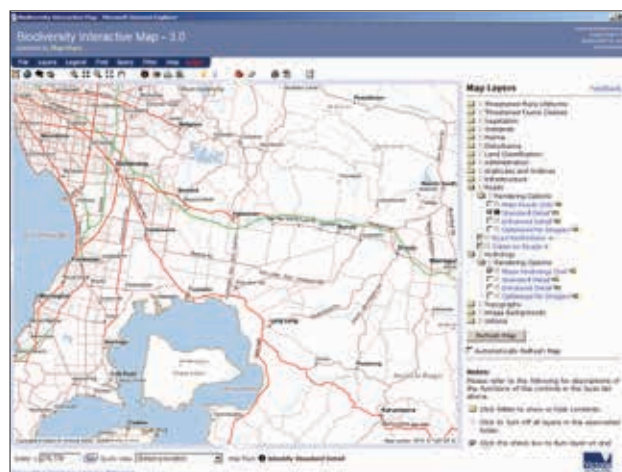
Victoria's Topographic reference information

Vicmap Lite can assist users in referencing their information with key topographic features by providing an accurate backdrop or image for their business information. DELWP provides a conveniently accessed and maintained base map that will enhance the communication of business decisions. Key customers are web image producers, GIS users, educators, cartographers, geographers and report producers.

Vicmap Lite is a statewide generalised and simplified series of datasets, 'weeded' to a useful scale of 1:250,000. Vicmap Lite is ideal for use in mapping applications, the production of information displays and reports or wherever a background map is required.

Vicmap Lite:

- Is derived from key Vicmap datasets such as transport, hydrology, elevation and administrative boundaries
- Is a statewide, simplified spatial dataset
- Is generalised or 'weeded' to a suggested useful scale of 1:250,000
- Includes some Victorian Spatial Data Library (VSDL) datasets such as public land
- Is very easy to use and fast to load or display.



Above: The scale use code attribute allows uncluttered data viewing at different zoom scales.

Case study 1: Lite used successfully in internet mapping application

DELWP is using the Vicmap Lite datasets in its internet mapping application, MapShare. MapShare is used by both the general public and internal staff. This application accesses the department's corporate spatial data store and allows users to customise the display according to their area of interest.

The use of the scale use code attribute allows users to control the number of features retrieved and rendered (at a given scale). This feature significantly reduces the time required to display a map. Another reason to use Vicmap Lite is because it is designed to make the labelling of features easy and intuitive. These two features of Vicmap Lite, have significantly improved the look of the maps shown on Mapshare. Vicmap Lite also provides a seamless link with the Vicmap framework datasets (which are used at scales less than 1:200,000).



Above: Screen capture of Barwon Water data.

Case study 2: Barwon Water uses Lite in their Corporate GIS

Barwon Water is currently utilising layers from Vicmap Lite to generate a front screen view for their corporate GIS. Vicmap Lite fills the void where Barwon Water's data is too detailed and not suitable for viewing at smaller scales. The layers used include geographic features, localities, roads, watercourses and areas, forests and built up areas and are applied at scales of 1:100,000 and above. The result is a base map that is clear, uncluttered and provides a good base on which to view Barwon Water's reference layers.

Technical detail

Source information	Various – See product Description
Coverage	Statewide
Currency	Updated annually or as required.
Scale of capture	Various
Spatial accuracy	≤125 m
Coordinates	Native – GDA94 Lat/Long; others (ie MGA and AMG66) on application
Datum	GDA94
Format	Various GIS formats available

Vicmap Planning



Victoria's Planning Scheme map information

Vicmap Planning can assist users in visualising and analysing planning information with their business information by providing Victoria's planning scheme map information. DELWP provides planning scheme zones and overlays and Melbourne's urban growth boundary which result in certainty in land use zone status and overlay control. Key users are town planners, water businesses and authorities, utilities and government.

Each planning scheme contains:

- **Zones:** which indicates the type of land uses that may be appropriate in that zone, such as residential, industrial or rural
- **Overlay controls:** which reflect specific characteristics of land in an area, for example significant vegetation or heritage values.

Vicmap Planning represents the land use zone and overlay controls for all Victorian planning schemes. Planning schemes are based on the 79 local government areas and also cover three other areas in Victoria – French Island, Alpine Resorts and Port of Melbourne Planning Schemes.



Above: Zoning layer with Vicmap Address information

Case study 1: LANDATA®'s title and property certificate (TPC) service provides Land Victoria certificate products online

One of the statutory products available via this service is the Planning Certificate issued by LANDATA® on behalf of the Minister for Planning.

Vicmap Planning is the source of data used to produce the Government guaranteed Planning Certificate. LANDATA®'s TPC application utilises the links with Vicmap Address and Vicmap Property to determine the correct planning scheme information and produce the Government guaranteed Planning Certificate

Case study 2: Free Planning Website – Planning Maps Online

Planning Maps Online (PMO) is an interactive mapping service which allows the user to search planning scheme maps using property address, Melway reference or lot and plan number. The user can view planning zones and overlays and use simple tools to move around and view the planning scheme.

The user can also turn zone and overlay layers on and off to customise each planning scheme view. One of the most popular features of PMO is its ability to prepare, print and save a customised Planning Report as a PDF document. This process uses Vicmap Planning data. PMO produced Planning Reports are often used by Real Estate agents or conveyancers for preparing their Section 32 documents for vendors.



Above: Zoning layer with Vicmap Address information.

Technical detail

Source information	Refer to the Vicmap Planning product description
Coverage	Statewide
Currency	Updated weekly
Scale of capture	1:500 to 1:25,000
Spatial accuracy	0.1 m to 25 m
Coordinates	Geographic coordinates (Latitude/Longitude) MGA and AMG66 on application
Datum	GDA94
Format	Various digital formats. NOTE: DWG, DXF and DGN formats contain linework only



Vicmap Position



Victoria's GNSS network

Vicmap Position – GPSnet™ is a cooperative network of Continually Operating Reference Stations (CORS) that supports Global Navigation Satellite System (GNSS) users throughout Victoria and supplies high accuracy real-time positioning solutions state-wide. Accurate positioning information is provided in real time or for a post-processing environment. Users gain lower cost equipment deployments with highly accurate, authoritative and reliable positioning solutions.

There are four components to Vicmap Position:

- **Vicmap Position – GPSnet™**
Continuously Operating Reference Station (CORS) network infrastructure using a combination of GNSS satellite constellations, which currently includes statewide coverage using GPS and GLONASS and some areas utilising QZSS, BeiDou and Galileo.
- **Vicmap Position – NRTK**
Network Real Time Kinematic (NRTK) positioning service based on Virtual Reference Station (VRS) technology, where CORS network baselines are approximately 50–70km, providing a nominal horizontal accuracy of $\pm 2\text{cm}$.

- **Vicmap Position – DGNSS**

Sub-metre (nominal) horizontal accuracy network Differential GNSS (DGNSS) positioning service where CORS network baselines are approximately 200 km or less.

- **Vicmap Position – Single base RTK**

Real Time Kinematic (RTK) positioning providing a nominal horizontal accuracy of $\pm 2\text{cm}$ within 20km of a CORS.

The Department has coordinated and facilitated the development of Vicmap Position in cooperation with all levels of government, industry, academic institutions and the community to provide homogeneous position information 24 hours a day, statewide.

Vicmap Position data is available from wireless Internet enabled devices with position correction accuracies achievable to centimetre level (depending on CORS base line separation, equipment and techniques used). Vicmap Position services include a statewide Differential GNSS (DGNSS) networked solution, Networked Real Time Kinematic (NRTK), local Single Base RTK and post processing data accessible via the Internet (<http://gnss.vicpos.com.au> or www.delwp.vic.gov.au/gpsnet).

GPSnet™ Satellite Correction Data Provides:

- High accuracy positioning compared to autonomous (uncorrected) positioning
- Network integrity, reliability, availability, and continual quality monitoring
- A homogeneous solution state-wide
- Easy real-time access via the Internet
- Immediate Geocentric Datum of Australia (GDA) compliance
- System information including ionospheric modelling and satellite availability
- User customisable data for post processing (i.e. duration and epoch rate)
- Access to competitively priced positioning via Value Added Resellers (VAR's)

Case study 1: Surveying – Feature surveying

A prominent survey company has been using Vicmap Position for feature survey work and capture of rural Victorian railway stations and level crossings in real-time. They have been achieving nominal horizontal accuracies of better than ± 2 cms. The use of Vicmap Position is assisting accurate surveys of Victoria's rail network to ensure the future safety of Victorian level crossings.



Above: Vicmap Position – GPSnet's CORS coverage (as of June 2015 – see website for live Network status).

Case study 2: Aerial photography

Aerometrex Pty Ltd, an interstate aerial photography company, uses a specialised Flight Management System (FMS) that guides the aircraft using GNSS and an Inertial Measurement Unit (IMU) during missions. The FMS communicates with the camera, automatically triggering exposures at predetermined coordinates, and records the GNSS and IMU data for post processing purposes.

To achieve the accuracies required it is essential to have a GNSS CORS within (or as close as possible to) the survey area. This procedure can become an expensive and timely process when having to deploy a local base station, especially when incorporating aviation costs, landing fees and 'weather windows', which all present logistic issues and ultimately extra costs.

Operating within Victoria alleviates many of the mentioned issues. Vicmap Position has enabled Aerometrex to capture imagery without the need to deploy a base station locally. Aerometrex are able to rely on the data logged by GPSnet for quality and accuracy. Most importantly, there is reliability and availability of the data to spatially control aerial photography projects.

Much of the aerial photography offered in Vicmap Imagery is coordinated using position control supported by satellite correction data from GPSnet.

Case study 3: Construction

Small and medium construction companies are turning to Vicmap Position to solve their base station needs. Often these companies run multiple smaller sites across a large area of Victoria. Deploying their own base stations on each site would be costly and not practical, or require moving their own base stations which affects productivity.

By utilising Vicmap Position construction companies can use their GNSS guided machines wherever they are needed. This will enable moving machines between jobs on a weekly or even daily basis, maximising the use of equipment without shutting down one job in preference for another. The construction company benefits from reduced daily setup times, less errors and infrastructure costs.



Vicmap Property



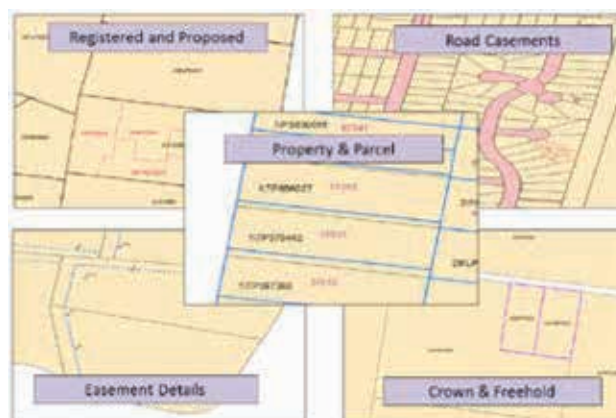
Victoria's most complete, authoritative, accurate and current property index

Vicmap Property helps users identify, manage and analyse assets by providing geographic context to their business information. DELWP provides the authoritative property dataset. This will result in customers being able to make more informed business decisions.

Vicmap Property is Victoria's cadastral map base, which provides information about land parcels and property details. The database is continuously maintained and obtains maintenance information from authoritative sources within local and state governments.

Vicmap Property offers:

- Parcel and property polygon views
- Parcel and property Identifiers – Standard Parcel Identifiers (SPI) and council property numbers
- Registered and proposed parcels
- Crown and freehold land differentiation
- Cadastral road casement boundaries
- Easements
- Unique Feature Identifiers, date stamps and data quality information
- Cross reference to Vicmap Address and Vicmap Admin.



Above:

Property & Parcel

- Property Boundaries are Blue and Property Identifiers are Pink
- Parcel boundaries are black and Standard Parcel Identifiers are Black

Registered & Proposed

- Registered Plan Boundaries are Black
- Proposed Plan Boundaries are Red

Road Casement

- Road Casement Polygons are Pink

Easement

- Easement Boundaries are Dashed Blue Lines

Crown & Freehold

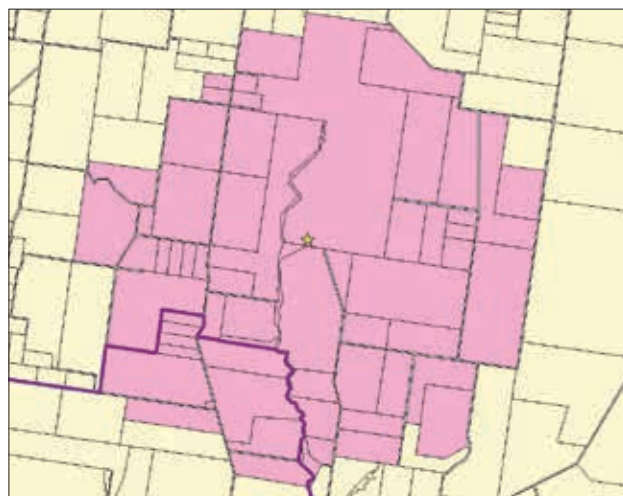
- Crown Boundaries are Pink, Freehold Boundaries are Black

Case study 1: Enabling Management and Analysis of Telecommunication Assets

Utility companies use a combination of Vicmap products to improve their telecommunications services throughout regional Victoria. Vicmap Property provides a graphical context for utility companies enabling them to more efficiently design, construct and record their assets. It also provides the utilities with an up to date analysis tool which enables them to make more informed decisions for their business needs.

Case study 2: Efficient area quarantining

Agricultural Authorities wishing to quickly quarantine an area to reduce the risk of spreading a serious disease are able to utilise Vicmap Property to identify the properties within a set distance of the effected area. This information is used in combination with the specific Local Government Property and Rates databases. With this they can quickly identify the property owners or contacts to enforce a restriction area boundary.



Above: Vicmap Property boundaries (black), Locality boundary (purple) yellow star (centre of effected properties) and effected properties (pink).

Technical detail

Source information	Authoritative sources: <ul style="list-style-type: none"> • Parcel – Victorian Online Titling System (VOTS) • Property – Local Government
Coverage	Statewide
Currency	Updated Weekly
Scale of capture	1:500 to 1:25,000
Spatial accuracy	0.1 m to 25 m
Coordinates	GDA94 Lat/Long; others (ie MGA and AMG66) on application
Datum	GDA94
Format	Various GIS formats available.

Vicmap Topographic Mapping – Hardcopy



Victoria's statewide Topographic Maps

Vicmap Topographic Hardcopy Mapping is Victoria's authoritative hardcopy topographic mapping. It is created using the Vicmap Digital Framework datasets and Victorias Spatial Data Library (VSDL). Some of the many uses of these maps are emergency management, navigation, recreation, natural resource management, environmental management, infrastructure planning and route planning.

- Over 290 maps published
- Complete State wide coverage at 1:50,000 scale
- 1:25 000, 1:100,000 and Specials over selected areas
- Sourced from the most current available Vicmap and DELWP information
- Map sheets are updated every four to seven years
- Seven new maps published every month
- Mapping series now in its fourth statewide refresh/update.

These products display natural and constructed features on the ground including contours, rivers, streams, waterfalls, lakes, vegetation, roads, cliffs, localities, park boundaries, shipwrecks and more.

The Hardcopy Mapping Index

The current Vicmap Topographic Hardcopy Index is available online at www.delwp.vic.gov.au/vicmap. Select from the Hardcopy Maps section. To view the Index open the PDF and scan your area of interest. The revision map, with information on map sheet currency and edition number, is also available.



Above: Topo hardcopy maps at 1:50,000 allow for good coverage with clear detail.

Case study 1: Large format maps ideal for emergency management

Hardcopy Mapping is used extensively by emergency services throughout Victoria. The ground detail displayed on the map as well as the large scale and format make these maps ideal for emergency planning, operations, response and recovery. The features depicted, and symbology used, on this product are consistent with Vicmap digital topographic mapping products ensuring seamless integration across the suite of mapping products and allowing for effective and timely emergency response.

Case study 2: Hardcopy Topographic maps used as planning tool for Landcare groups

Organisations such as Landcare groups use the Vicmap Hardcopy Topographic maps to plan and navigate around the areas under consideration for their activities. Verified road and feature location and naming by authoritative sources and broad vegetation classification allow confidence in the use of this quality sourced product.



Above: Vicmap Topographic – Hardcopy Maps sample.

Technical detail

Source information	Vicmap and other government data
Coverage	Statewide
Currency	2009–2017, updated every 4 to 7 years
Scale of capture	1:25,000
Spatial accuracy	12.5 m
Coordinates	Latitude and longitude in an MGA projection
Datum	GDA94
Format	A0 hardcopy

Vicmap Topographic Mapping – Digital



Through the DELWP website and map shops, customers will be provided the Vicmap Topographic Mapping A3 & A4 product range which is current, easily accessible, authoritative, convenient sized, and customisable. Some of the many uses of these maps are navigation, recreation, natural resource management, environmental management, infrastructure planning and emergency management.

Vicmap Topographic Mapping – Digital displays natural and constructed features on the ground including contours, rivers, streams, waterfalls, lakes, vegetation, roads, cliffs, localities, park boundaries, shipwrecks and more. These map products display the same features, using the same symbology, as Vicmap Hardcopy Maps thus ensuring seamless integration between products.

Several digital Vicmap Topographic Mapping products are available online:

Product/Scale	Size	Digital / Hardcopy	Update Cycle	Last Ed.
Vicmap Topo 1:25K	A0	GeoPdf	18 mths	2015
Vicmap Topo 1:50K	A0	GeoPdf	18 mths	2015
Vicmap Topo 1:100K	A0	GeoPdf	18 mths	2016
Vicmap Topo 1:30K	A4 Mapsheet & Custom	GeoPdf	18 mths	2016
	A3 Mapsheet & Custom			2016
Vicmap Hardcopy Mapping 1:50K statewide 1:25K and 1:100K– selected areas	A0	Hardcopy	Four to seven years	2009–2017
Vicmap Topo 1:25K Mosaic	n/a.	GeoTiff/ECW	18 mths	2016
Vicmap Topo 1:50K Mosaic	n/a.	GeoTiff/ECW	18 mths	2015
Vicmap Topo 1:100K Mosaic	n/a.	GeoTiff/ECW	18 mths	2015
Vicmap Topo WMS	n/a.	WMS	6 mths	2016

Two Vicmap Topographic Online products are available; 1:30,000 A4 & A3 Maps and 1:30,000 Custom Maps.

Vicmap Topographic – 1:30,000 Maps Online are georeferenced PDFs (Adobe Acrobat required) and are ready to print, from: www.delwp.vic.gov.au/vicmap > Vicmap Maps > Vicmap 1:30 000 Maps Online

Case study 1: App for Reading Georeferenced Vicmap Topographic Maps

Vicmap Topographic Mapping – Digital are georeferenced PDFs, users can view and interact with these maps on Apple iOS and Android smartphones and tablets using the free Avenza PDF Maps app. Users can now:

- View their location on the PDF map using the device's built-in GPS.
- View the coordinates of the current position and any waypoint (latitude and longitude)
- Plot waypoints, enter attribute data, add descripts and insert geo tagged photos.
- Export waypoints and associated attribute data to CSV, GPX or KML
- Toggle between map and aerial imagery over the same extent
- Measure distance and area in map units.

Case study 2: Rogaining adventures using Vicmap

Rogaining is an outdoor sport involving long distance cross-country navigation and route planning using various mapping. The objective is to visit as many checkpoints as possible in a specified time. In Victoria, rogaines are typically run over periods of between 6 and 24 hours. In a bush rogaïne, teams travel entirely on foot, navigating by map and compass between checkpoints in terrain that varies from open farmland to hilly forest.

The Victorian Rogaining Association utilises Vicmap Topographic 1:30 000 in two distinct ways. Firstly the georeferenced maps are used by event planners via a tablet to identify potential locations and final position of checkpoints. Secondly hardcopy versions are used by event participants for navigation and route planning in order to locate these checkpoints.

Vicmap Topographic – 1:30,000 A4 & A3 Maps – where a mapsheet is selected.

Sheet size	Area selected by mapsheet number – example	Map area	File sizes
A4 portrait	7921–1–4–2	6 x 7.5 Km	700Kb to 5 Mbyte (average of 1 Mbyte)
A3 landscape	7921–2–3–S 7.	5 x 12 Km	750Kb to 10 Mbyte (average of 3 Mbyte)

Vicmap Topographic – 1:30,000 Custom Maps – where a floating tile is placed over your area of interest

Sheet size	Area selected by mapsheet number – example	Map area	File sizes
A4 portrait or landscape	A floating tile is placed over your area of interest	6 x 7.5 Km	500 Kb to 6 Mbyte
A3 portrait or landscape	A floating tile is placed over your area of interest	7.5 x 12 Km	750 Kb to 10 Mbyte

Technical detail

Source information	Vicmap and other government data
Coverage	Statewide
Currency	Refreshed every 18 months
Scale of capture	1:25,000
Spatial accuracy	12.5 m
Coordinates	Geographic (Latitude/Longitude)
Datum	GDA94
Format	GeoPDF format

Vicmap Transport



Victoria's transport network

Vicmap Transport helps users in logistics planning and route management by providing information on road, rail, tram and air infrastructure networks. DELWP provides an accurate, current and maintained statewide transport network dataset for Victoria that results in greater efficiencies in moving people and assets.

This seamless, topologically structured dataset is made up of point, line and polygon area features. Primary feature types in Vicmap Transport are road centrelines, road structures, railways, tramways and structures, railway stations, airports and ferry routes.

Intermediate feature types representing infrastructure include bridges, tunnels, barriers, stations and intersections. Further classification and description of real-world features are provided by attribute tables such as road restriction, condition, class code and bridge construction type.

Case study 1: RACV state-wide dispatch

The Royal Automobile Club of Victoria (RACV) has been providing roadside assistance services for more than 100 years across the State of Victoria. Today, to dispatch servicemen to vehicles of members, a geographically based system is used to locate both the member's vehicle and track the movement of the service van.

RACV utilises the Vicmap Transport mapping product to establish the location of the vehicle and this, together with the service vehicle's location from an onboard GPS receiver provides the mechanism for the computer system to select the next most appropriate service vehicle to attend the breakdown.

Once this association has been established, details of the member's vehicle and location are automatically transmitted to the service vehicle.

Case study 2: 000 Dispatch

The Emergency Services Telecommunications Authority (ESTA) manages the 000 response for Emergency Service Organisations (ESOs). ESTA receives regular statewide updates of Vicmap Transport and other Vicmap products to aid in the timely location of emergency incidents.

Three State Emergency Communications Centres (SECCs) are managed by ESTA at Melbourne City, Burwood East and Ballarat. ESTA services the 3.5 million residents of metropolitan and outer Melbourne and Greater Geelong, and also take calls for the CFA in rural and regional Victoria.

Vicmap Transport provides authoritative road name, road type and road extent used in conjunction with the ESO response boundaries to ensure emergency incidents are responded to in a timely manner.



Above: Emergency services officers providing assistance at the Melbourne State Emergency Communication Centre.

Technical detail

Source information	Various authoritative sources such as Local Government, Property Developers, VicRoads and other Land Managers
Coverage	Statewide
Currency	Updated Weekly
Scale of capture	1:480 to 1:25,000
Spatial accuracy	Generally ranges from 0.1 m to 25 m
Coordinates	Geographic (Latitude/Longitude) MGA and AMG66 on application
Datum	GDA94
Format	Various digital formats

Vicmap Vegetation



Victoria's vegetation information

Vicmap Vegetation assists users in identifying woody vegetation areas across the state. This will enable customers to assess risk, manage current vegetation and use the layers for mapping products. Key customers are utilities, environmental managers, local government, cartographers and emergency services organisations.

Vicmap Vegetation consists of a forest density layer that shows the presence of woody vegetation, and has been divided into three distinct classes. The density classes show the spatial separation of woody vegetation of dense, medium and scattered. The layer is a seamless and topologically structured data set.

Features include:

- Vegetation density
- Vegetation boundaries.

Case study 1: Forest density for Topo maps

The Department of Environment, Land, Water and Planning uses the forest density layer in the production of their Vicmap Topographic map series.

The layers provides the base information to show where tree cover/forest exists across the state, as well as supplying the additional detail of broad tree cover density classes of dense, medium and sparse.



Above: Sample of Vicmap Topographic map with Vegetation density layers included to enhance the product.

Technical detail

Source information	Satellite imagery
Coverage	Statewide
Currency	Variable across the State from 1993 up until 2001
Scale of capture	1:25,000
Spatial accuracy	15m
Coordinates	Geographic (Latitude/ Longitude) MGA and AMG66 on application
Datum	GDA94
Format Various	Various digital formats

