

Tasmanian Imagery Program

The *Spatial Information Foundations (SIF)* project delivered a range of contemporary products and services to enable the more effective management, delivery and use of spatial – location-based – information, including a sustainable strategy for the ongoing acquisition and delivery of imagery (remotely sensed data) for Tasmania.

Remote sensing is the art of acquiring information about an object without actually making contact with that object, typically including data about the earth's surface that is acquired through the use of airborne or satellite sensors:

- *passive* sensors returning multi-spectral data (aerial imagery, infrared imagery) and
- *active* sensors returning elevation data (LiDARⁱ, Radarⁱⁱ).

With the support of stakeholders, the Department of Primary Industries, Parks, Water and Environment (DPIPWE) implemented the **Tasmanian Imagery Program** to:

- *coordinate* the procurement of remotely sensed imagery and elevation data, reducing duplication across all tiers of government
- *standardise* data capture specifications, where possible, to ensure consistency and accuracy
- *deliver* data through the [LIST](#) (Land Information System Tasmania) infrastructure
- *centralise* the storage and distribution of data acquired
- *reduce cost* to individual stakeholders, through improved coordination and cost-sharing.

Why a new program?

In the past, DPIPWE conducted an annual program of aerial survey mapping, using film-based photography and contracted aircraft and crew. While this approach worked well for many years, a combination of factors – including the advent of new technology, increased demand for remotely sensed products, a rapid decline in the availability of film and the increasing cost of the program – created the need for change.

Today, both public and private sector organisations require a more extensive range of remotely sensed data products. These include products derived from imagery (satellite, aerial, infrared and hyperspectral), along with elevation data (LiDAR and IFSARⁱⁱⁱ) and their resulting products.

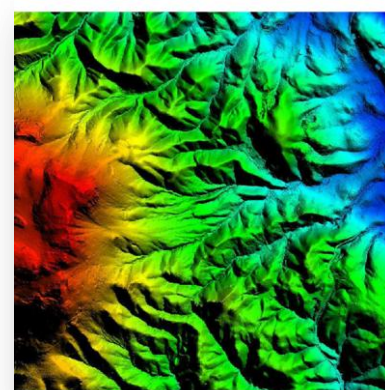
As part of the SIF project, an independent report was commissioned to assess current and projected stakeholder requirements for the acquisition and use of remotely sensed data. The report highlighted a strong need and willingness among stakeholders to consolidate and centralise purchasing, storage and distribution activities for the benefit of all.

The report also established that “*remotely sensed imagery and data is a core information infrastructure element supporting the economic, environmental, and cultural planning and management of Tasmania.*”



Above: 1:15000 scale photo (Bridport)

Below: LiDAR image



What does the program entail?

The Tasmanian Imagery Program (TIP) is a statewide, coordinated approach to data acquisition that will ensure that an appropriate coverage of remotely sensed information about Tasmania is available to meet the requirements of a wide range of users across all tiers of government.

Features of the program are:

- *acquisition* of imagery and elevation datasets – both base level and project coverage – consistent with user requirements
- *quality assurance* to ensure conformity with specifications
- *central archive and hosting* that provides access for contributing organisations
- *supportive policy* framework
- *reduced cost to organisations* through sharing of contributions and coordination of acquisition programs
- *delivery* of the most current ortho-rectified imagery through the LIST infrastructure
- *sustainable costing* structure and processes to meet current and anticipated demand
- *efficient data capture and management* that encourages minimal duplication and optimal use.

Procurement panel

A panel of pre-qualified data providers has been established to deliver maximum ‘value for money’ in remotely sensed data procurement across government. This will facilitate the delivery of an ongoing, state-wide program of data capture, with regional and urban coverage at resolutions and frequencies that continue the historic aerial photographic record of Tasmania and meet current and future national standards.

While other government organisations are under no obligation to use the panel, organisations wishing to acquire imagery are strongly encouraged to contact DPIPW and consider the benefits of this arrangement before approaching external providers. This enables specific requirements to be compared, aligned and included with other projects, maximising opportunities to reduce the cost to individual stakeholders through collaboration and partnering.

Stakeholders are also encouraged to provide feedback on provider performance as well as input into the overall program.

Management and delivery services

The program has established supportive structure and processes within DPIPW to facilitate the procurement, management, storage and delivery of remotely sensed data across all tiers of government.

DPIPW continues to monitor advances and growth in the remote sensing industry, and provide advice and support to stakeholders on the relevance, implications and benefits offered by those advances.

What does this mean for stakeholders?

Minimum – or base level – requirements for the capture of remotely sensed data have been established. These support a range of general requirements for most imagery users but also allow for the capture of other remotely sensed data types, including projects where a higher resolution or other specifications are mandated.

A collaborative, inter-organisational annual planning process has been established. Through this process, the resources of key stakeholders are combined so that remotely sensed data can be acquired in line with user requirements, to a consistent and quality assured standard, and in a timely manner. The aim is to avoid duplication, with reduced spending (at all levels) on imagery and elevation data products.

The Intellectual Property (IP) of all data acquired resides jointly with the contributing partners and the Tasmanian Government (Crown in Right of Tasmania), allowing access and distribution of the data across a wider range of users, including the general public.



Above: 1:24000 scale photo (Bicheno)

Below: 1:24000 scale photo (Stanley)



Program processes include:

- *Request For Tender (RFT)* to maintain the panel of preferred suppliers is reviewed every three years
- *Specifications* developed and maintained in line with ICSM^{iv} guidelines and agreed by stakeholders
- *Systematic base level imagery capture* comprising 0.5 metre state-wide coverage of non-urban areas and 0.1 metre coverage of urban areas
- *Project-based acquisition of elevation data* assessed and implemented according to demand
- *Specific project capture* as required, at resolutions/specifications beyond base level standards
- *Data delivery and distribution network* through LISTmap and web services
- *Ongoing consultation* with contributing partners and other stakeholders
- *Specialist advice and contract management services* for remotely sensed data acquisition
- *Systematic review* to ensure ongoing relevance and adherence to program objectives.

Capture zones

TIP is based on three broad data capture zones: *Urban*, *Rural* and *Remote*. Each zone is assigned different specifications, based on Ground Sample Distance (GSD), being pixel size and frequency of capture.

Urban: areas of cultural development and expansion, including residential, industrial and business zones where there is a high degree of building density and associated services (includes cities, towns and villages, and the adjoining peri-urban areas).

Rural: areas of primary industry that have significant cultural, resource and/or agricultural activity, population is generally dispersed and there are little or no services.

Remote: areas of little or no activity of a cultural or industrial nature, generally undeveloped wilderness and/or reserved land.

Base imagery specifications

TIP base imagery is captured in four bands: *Red*, *Green*, *Blue (RGB)* and *Infrared*. The minimum deliverables based on this capture are controlled stereo models and RGB orthoimagery.

Base resolution

- *Urban*: 10 centimetre GSD
- *Rural* and *Remote*: 50 centimetre GSD

Capture cycle

- *Urban*: every two years where there is ongoing urban development, three to five yearly where there is little development
- *Rural*: every five to seven years
- *Remote*: every ten years

Note: These are the minimum requirements. Greater resolution, additional products and/or frequency of capture is negotiable with stakeholders. Specifications for elevation data are not included due to variations in project requirements.

Contact

For further information about *TIP*, please contact:

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ⁱ *Light Detection and Ranging*: system for detecting distant objects and determining their position, velocity, or other characteristics by analysis of pulsed laser light reflected from their surfaces.

ⁱⁱ *Radar*: system for determining the presence and location of an object by measuring the direction and timing of radio waves.

ⁱⁱⁱ *Interferometric Synthetic Aperture Radar*: technique used in geodesy and remote sensing that uses two or more synthetic aperture radar images to generate maps of surface deformation or digital elevation, using differences in the phase of the waves returning to the satellite or aircraft.

^{iv} *Intergovernmental Committee on Surveying and Mapping*