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Land Information New Zealand
Toitū te whenua

Topographic Strategy

National Topographic Office
March 2015

New Zealand Government

>> Foreword

Topographic information is vital to understanding our country and its assets, and for supporting economic development.

For over a century, LINZ and its predecessor organisations have been responsible for managing this information and making it available through topographic maps. These have been carried into the back country by generations of Kiwis, and have uses as diverse as defence, land management, and search and rescue.

As LINZ looks forward, we are confident that topographic information will play an important part in our vision for growing the value generated by location information over the next decade. This vision recognises the way location information can help to unlock new patterns and knowledge, particularly when it is combined with other types of information. It has the power to drive better decision making, benefitting our economy, environment and communities.

This strategy sets the direction the New Zealand Topographic Office will take to help make this possible. In developing it LINZ has consulted users and stakeholders. Through its goals we will continue to reflect the need for our maps, while ensuring that accurate data is at the core of our topographic products.

We will work with our customers to ensure it meets their needs, and to gather data from a wider range of sources. We will also look at the potential for new digital products that mean this data can be adapted, enabling enterprise and innovation.

Understanding our land and its features is essential to a range of industries and activities. These actions will increase New Zealanders' access to LINZ's topographic information, making it more usable in ways that have even greater benefits for our customers – unleashing 'the power of where' to drive New Zealand's success.

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Deputy Chief Executive
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>> Introduction

This strategy sets the direction LINZ will take with its topographic information, as well as data such as elevation and imagery. It aims to increase the value this data has for New Zealanders, making it available in new forms and at standards that better meet the needs of users.

In taking on this direction, LINZ has a strong base to build on. The Topo50 map series, launched in 2009, adopted the new national datum (New Zealand Geodetic Datum 2000), which had changed the way that coordinates (latitudes and longtitudes) of points in New Zealand were determined. The Topo50 maps were produced directly from digital data which provided the opportunity to supply them in a GeoTIFF format. In 2011 we launched the LINZ Data Service, which made topographic data available in a greater range of digital forms on the one website alongside other LINZ datasets. LINZ has also worked with local government and others to open up the availability of the aerial imagery captured by airborne cameras and sensors. As a result, New Zealand's most current publicly owned imagery, covering 95 percent of the country, is now freely available through the LINZ Data Service.

"Over the next five years we will build on these successes."

We have reviewed our mapping programme and have talked to our customers and stakeholders. We have also consulted mapping agencies overseas. This review and consultation identified a number of areas where topographic information and its availability could be improved so that it can make an even greater contribution to our economy and way of life.

Through the goals in this strategy we will continue to deliver topographic mapping for New Zealand with national coverage and consistent standards, supporting national security, emergency services responses, land management and planning, recreation and tourism. We will coordinate initiatives for imagery and elevation data acquisition and release.

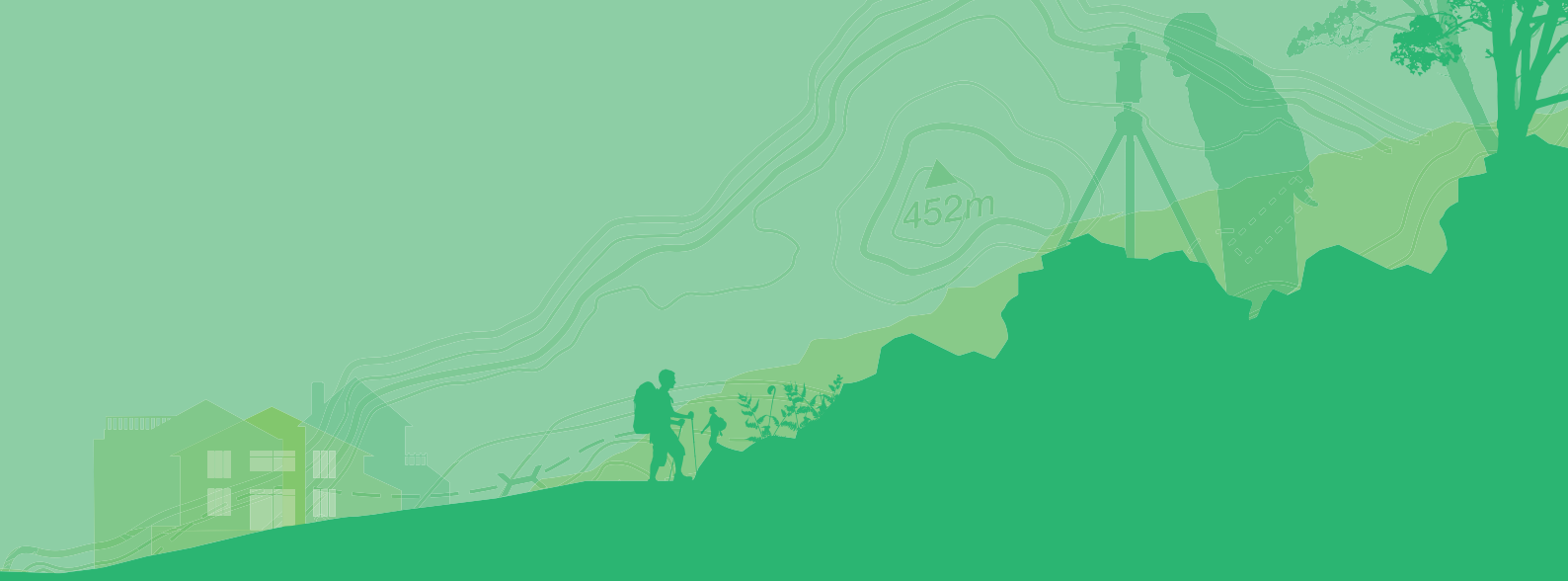
The strategy ensures topographic resources are spent in areas where they will provide the maximum value and benefit for New Zealand.

It will also result in a more targeted approach to the maintenance of LINZ's topographic data and products that better meets the needs of both its enduring and emerging customers. In this way we will identify high priority topographic data and products that require maintenance more often than others, as well as topographic features that require a higher level of accuracy. Implementation of this strategy will also see a move to greater reuse of topographic data as we work with other organisations who produce or have uses for it. New topographic products and services specifically for digital use will be created.

These goals ensure topographic information will not only continue to make an important contribution to New Zealand, but that this contribution will grow and play an important part in achieving the aims of LINZ's 10 Year Vision.

>> Vision

This strategy sets a vision of:
Accurately mapping New Zealand for the future



>> Five Year Goals

This vision will be achieved through the following five-year goals:

1	2	3	4	5
Actively engage with customers, stakeholders and the international topographic community.	Ensure topographic data reflects real-world change at levels of spatial, temporal and attribution accuracy that maximise its value.	Coordinate other sources of topographic data into open national datasets to maximise opportunities for its reuse.	Coordinate the acquisition and release of imagery and elevation data into open national datasets to maximise opportunities for its reuse.	Expand the production of topographic products and services to include those specifically for digital use.
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>> Goal 1

Actively engage with customers, stakeholders and the international topographic community.

Technology is changing at ever increasing rates and so too are the expectations for location information. Mobile devices can already show location to within a few metres and, when combined with location information, they can help users make decisions such as where to go for dinner or which is the quickest route home.

Topographic information is an important subset of location information and by showing the features of the land, it gives context to other information. As expectations for location information increase, so will the requirements for topographic data.

LINZ will need to engage with customers and stakeholders to understand and respond to their changing requirements.

Users provide valuable feedback on the currency and accuracy of topographic information. Engaging with those users will give LINZ a better understanding of the many uses of topographic information and help to improve its quality. There is also opportunity for LINZ to learn from other national mapping agencies that are facing (or have already faced) similar challenges and opportunities. These learnings can then be refined and shared with others who work with topographic information.

The implementation of Strategic Goal 1 will ensure that evolving customer and stakeholder requirements and expectations are understood and that LINZ can meet them.

>> CUSTOMERS AND STAKEHOLDERS

a) Establish mechanisms for engaging with customers and stakeholders that:
enable LINZ to understand and respond to customer and stakeholder requirements and expectations now and as they evolve
encourage active participation and allow for two-way communication
cater for a broadening range of customers and stakeholders

>> INTERNATIONAL TOPOGRAPHIC COMMUNITY

b) Engage with the international topographic community so that:
LINZ can learn from the practices and processes used by other national mapping agencies
LINZ remains informed on current and emerging technologies and techniques
LINZ can pro-actively contribute to the international topographic community for the benefit of the community and New Zealand

>> Goal 2

Ensure topographic data reflects real-world change at levels of spatial, temporal and attribution accuracy that maximise its value.

The National Topographic Office's processes and techniques for data collection and maintenance have served the current products well. The Topo50 and Topo250 map series are still world class. Presently the data maintenance programme is driven by the Topo50 map series and, as a result, this is New Zealand's core topographic dataset. This dataset is a result of more than 40 years of map production, with the majority of the data having been digitised from an earlier map series. Features in this dataset were and are captured with a 1:50,000 publication scale as the goal.

Demands for data and data reuse highlight the need for a new set of topographic data standards. It is expected that the data captured is fit for purpose at larger scales to maximise data reuse opportunities.

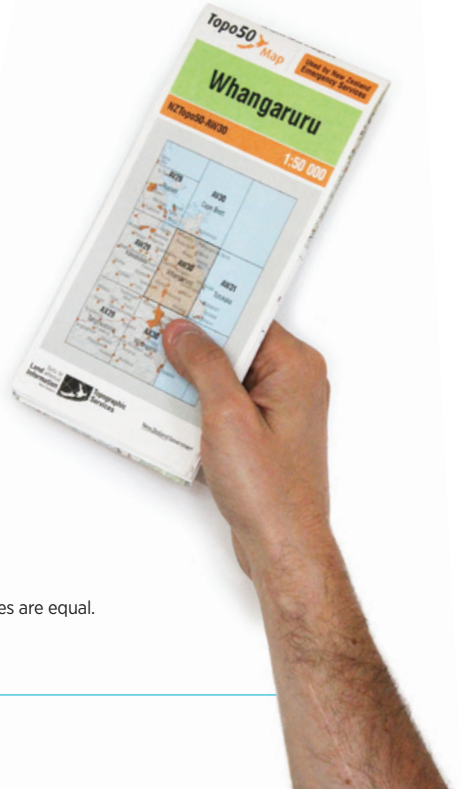
In combination with Strategic Goals **1** and **3**, Strategic Goal 2 aims to establish a new core topographic dataset for New Zealand. This will be used to produce multiple topographic datasets, products and services that meet the currency and accuracy requirements of both our enduring and emerging customers.

>> CURRENCY & COMPLETENESS

a) Develop and implement standards for keeping topographic data complete and up to date that:
ensure real-world change is reflected in topographic data within defined timeframes
reflect that some features will have a higher maintenance priority[1] than others
preserve historic (updated or removed) features for the 'topographic record' of New Zealand

>> ACCURACY & CONSISTENCY

b) Develop and implement standards for topographic data accuracy and consistency that:
ensure the spatial, temporal and attribution accuracy of topographic data meets the needs of both enduring and emerging customers of topographic data, products and services
reflect that some features have higher customer expectations than others (including three dimensional (3D) information)
ensure metadata is available for all topographic features and datasets



1 While topographic information covers a wide range of features (rivers, roads, tracks, huts, fences, etc), not all features are equal. For example, features such as roads and tracks will have a higher priority for maintenance activities than fences.

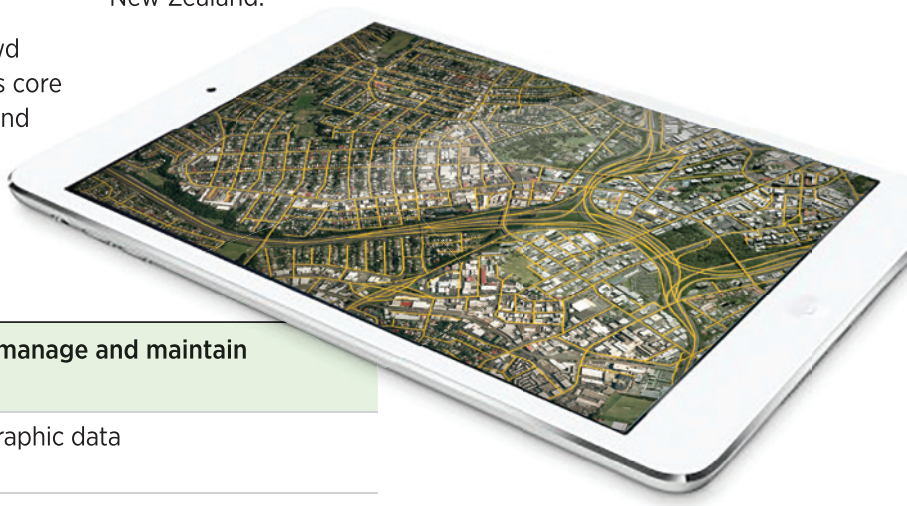
>> Goal 3

Coordinate other sources of topographic data into open national datasets to maximise opportunities for its reuse.

Many organisations collect and maintain topographic data that has the potential to be reused in LINZ's core topographic dataset. In addition to official names in the New Zealand Geographic Board's Gazetteer, data is currently being sourced from organisations such as Landcare Research (vegetation data), the Department of Conservation (track and hut data) and Transpower (transmission line data). However, there are other datasets (including privately maintained and crowd sourced datasets) that could be included in LINZ's core topographic dataset, such as datasets managed and maintained by territorial and local authorities.

LINZ aims to aggregate these organisations' topographic data into national datasets and make them available for reuse, as well as use them in our own topographic products and services (e.g. to assist in the maintenance of the Topo50 and Topo250 map series).

Through Strategic Goal 3, LINZ will seek to establish positive and mutually beneficial agreements with all organisations that manage and maintain topographic datasets, ensuring that a 'capture once and use many times' philosophy is applied to topographic data in New Zealand.



>> IDENTIFY ORGANISATIONS AND DATASETS

a) Identify and engage with organisations that manage and maintain topographic datasets of New Zealand that:
are suitable for inclusion in LINZ official topographic data (i.e. make an improvement to the data)
inform LINZ topographic data collection activities (i.e. a source of change information)
b) Identify opportunities for the use of crowd sourced topographic data

>> SECURE DATA SUPPLY

c) Establish appropriate agreements with organisations identified in (a) to:
include their datasets into the LINZ core topographic dataset
ensure the supply of data is sustainable into the future
ensure the data quality is maintained and/or improved to meet standards defined through Strategic Goal **2**

>> PRODUCE NATIONAL DATASETS

d) Produce, maintain and release national topographic datasets for:
inclusion into official LINZ topographic products and services
reuse by other people/organisations requiring topographic data

>> Goal 4

Coordinate the acquisition and release of imagery and elevation data into open national datasets to maximise opportunities for reuse.

As fundamental datasets, imagery and elevation are the sources from which nearly all topographic data is generated. They also provide the basis of many other location datasets, such as land use and land cover mapping, the management and monitoring of waterways, hazard risk assessments (e.g. flooding and tsunami inundation) and emissions trading. Such initiatives are typically undertaken at local or regional scales and are, more often than not, government funded.

Historically, LINZ's predecessors were responsible for the acquisition and creation of national imagery and elevation data and products. More recently, this has been the domain of local government agencies, which have produced data and products at local and regional level, often under restricted licence. In early 2012, LINZ began an initiative to remove licensing restrictions on all current local and regional imagery datasets. In early 2013 it began coordinating the acquisition of aerial imagery to ensure it would be available under open licence and maximise efficiency across local and central government.

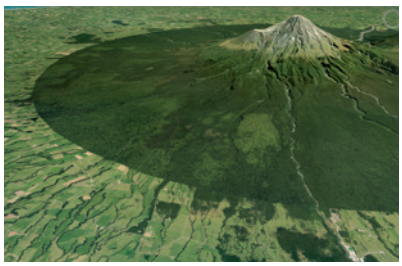
Through Strategic Goal 4, LINZ will coordinate the acquisition and open release of both imagery and elevation data to ensure a 'capture once and use many times' philosophy is applied to imagery and elevation data in New Zealand.

>> IDENTIFY ORGANISATIONS AND DATASETS

a) Identify and engage with all government organisations that procure imagery and elevation data and products, and ensure that:
procurement is coordinated across both central and local government
the data and products are released under open licences

>> PRODUCE NATIONAL DATASETS

b) Produce, maintain and release national imagery and elevation datasets for:
inclusion into official LINZ topographic products and services
reuse by other people/organisations requiring imagery and elevation data



A 'capture once and use many times' philosophy.

>> Goal 5

Expand the production of topographic products and services to include those specifically for digital use.

There is demand[2] for digital topographic products and services from both our enduring and emerging customers. Under this goal, focus will be on expanding LINZ topographic products to include new products and services that can be easily used in geographic information systems, web and mobile applications. This is in addition to existing LINZ topographic products such as the Topo50 and Topo250 map series.

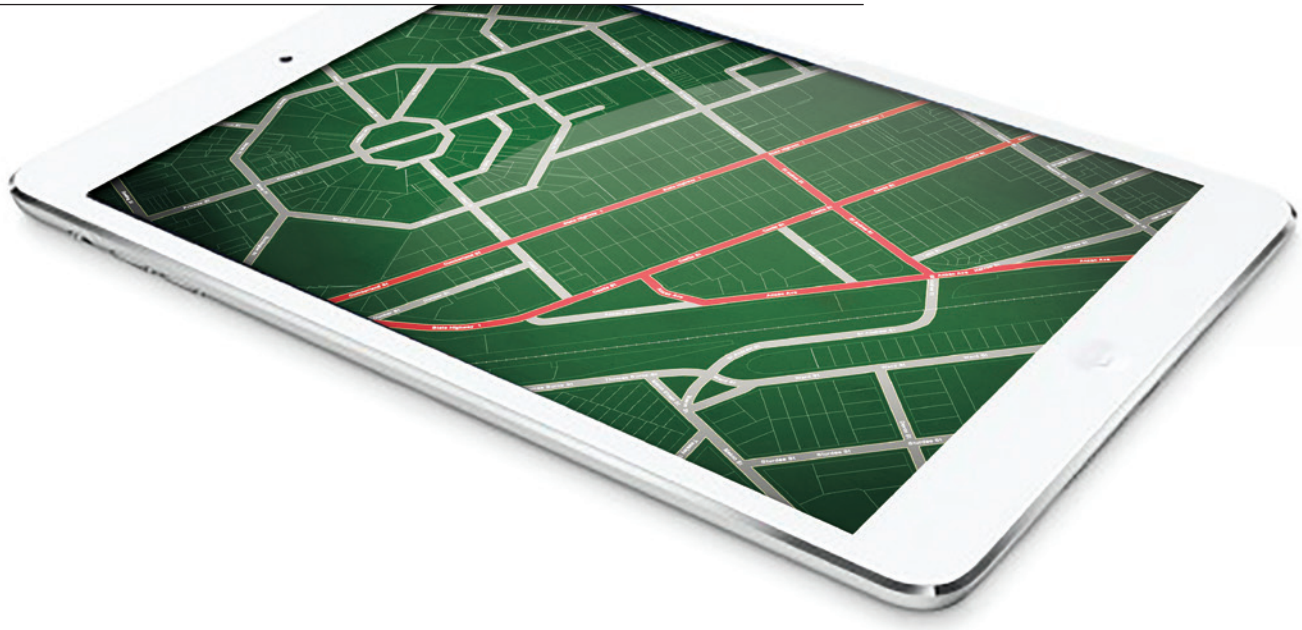
The first example of the expanded products will be a number of digital base maps[3] of New Zealand.

The purpose of these is to provide a consistent spatial context on which to overlay spatial information. These base maps would be kept current with the latest topographic data and would be able to be used at varying scales unlike digital versions of fixed scale maps (e.g. Topo50 geo-tiffs or web map services (WMS)).

In combination with Strategic Goal **1**, the implementation of Strategic Goal 5 will ensure that appropriate topographic products and services meet customer content and delivery requirements.

>> PRODUCE OFFICIAL DIGITAL PRODUCTS AND SERVICES

a) Produce and deliver official digital products and services that:
can be easily used in GIS, web and mobile applications
are updated automatically when official topographic datasets are maintained and released
meet standards that comply with the requirements of customers and stakeholders



2. For example, use of topographic maps via web map services on LINZ Data Service has steadily increased since the services began in December 2011.
3. The base maps will be multi-scale maps delivered, as a minimum, via Open Geospatial Consortium (OGC) web map tile service standard.

>> Appendix

>> CURRENT TOPOGRAPHIC PRODUCTS

Topo50 Series	445 map sheets at 1:50,000
Topo250 Series	31 map sheets at 1:250,000
Offshore Islands	19 maps at 1:50,000/1:25,000
Antarctica Series	55 map sheets at 1:50,000
Pacific Islands	19 maps (Cook Island, Tokelau, Niue)
Infomap 242 Series	4 map sheets at 1:500,000
Infomap 265 Series	2 map sheets at 1:1,000,000
Infomap 266	1 map sheet at 1:2,000,000
Infomap 267	1 map at 1:3,000,000
Infomap 268	1 map at 1:4,000,000

>> CURRENT TOPOGRAPHIC DATA PRODUCTS

686 layers of topographic data on the LINZ Data Service **https://data.linz.govt.nz/data/category/topographic/**
104 layers of recent aerial imagery on the LINZ Data Service **https://data.linz.govt.nz/data/category/aerial-photos/**

This information can be found at:
http://www.linz.govt.nz/

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