

Local Survey Control Networks

On-going needs?

John Ritchie | National Geodetic Office



XXV FIG Congress, 16-21 June 2014

newzealand.govt.nz

Presentation will cover

- Organisational roles/responsibilities
- Positioning Strategy
- [Changing] role/requirements of local networks
 - Geodetic, Cadastral, *Other users*
- Who else can provide service?
- What are the hurdles?
- Responsibilities: - network maintenance, records, database management

newzealand.govt.nz

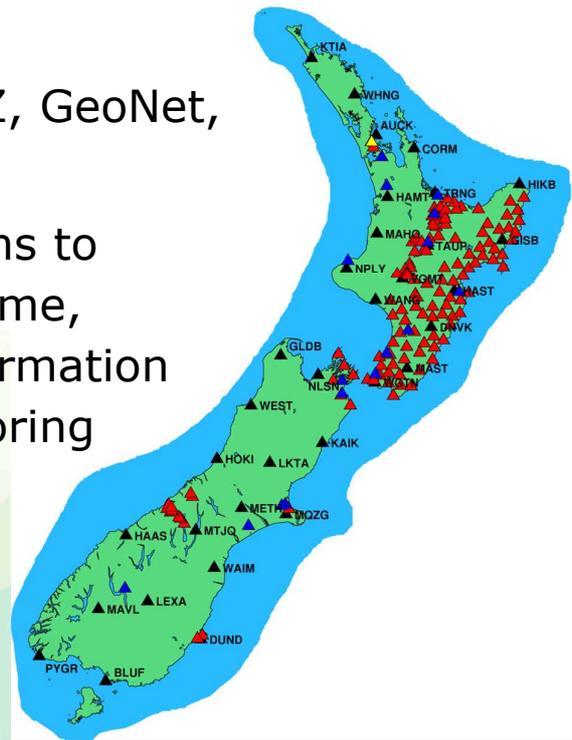
- Land Information New Zealand (LINZ) is the government agency that has the responsibility for administering the survey system.
- Integrated system providing
 - underlying spatial reference framework (geodetic)
 - common and regulated system for accurate documentation of property location (cadastral)

Landonline

- Components of the geodetic and cadastral systems are integrated in the electronic **Landonline** survey and title system
- Lodgement of geodetic and cadastral digital datasets for validation, authorising and integration

National control network

- Active stations – PositionNZ, GeoNet, Private
- Used for datum connections to international reference frame, national and regional deformation monitoring, hazard monitoring and general positioning services



National control network

- Passive control – 100K + marks – still being developed
- Uses include:
 - local deformation monitoring, national height network, local transformation, cadastral horizontal and vertical networks, digital cadastre improvement, basic geospatial network



Change of focus

- While passive control networks will continue to be an important component
- There is an increasingly broad range of users and uses to be considered, and
- A wider range of options available for delivering positioning products.

Current situation

- Close to completing passive network

But

- Faced with limitations of finite resources required to cover a broadening range of activities

However

- Still a demand from users and a commitment from LINZ to provide passive control

Are there other options?

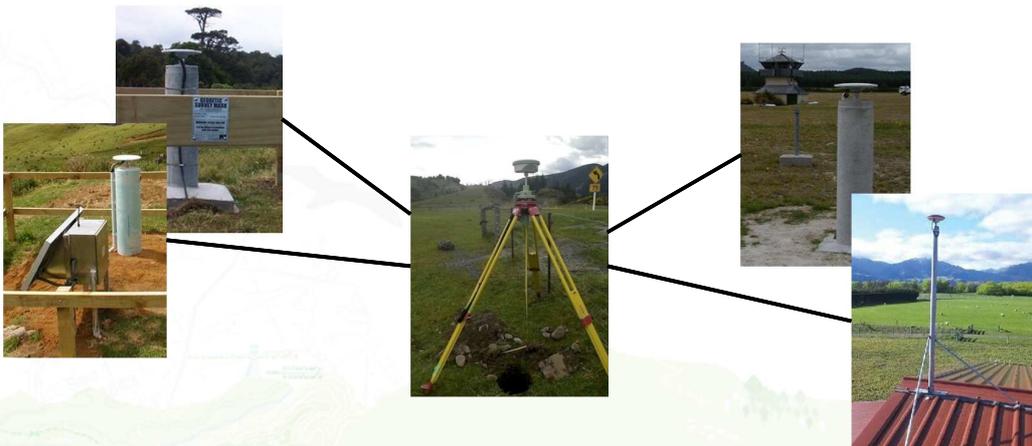
Other options to deliver control

- **Active control networks** – PosiNZ (LINZ), GeoNet (GNS Science) & Private/commercial
Provide access to the datum but don't necessarily add to passive local network
- May require users to incorporate deformation models into their calculations

However with additional services...



Online GNSS processing service



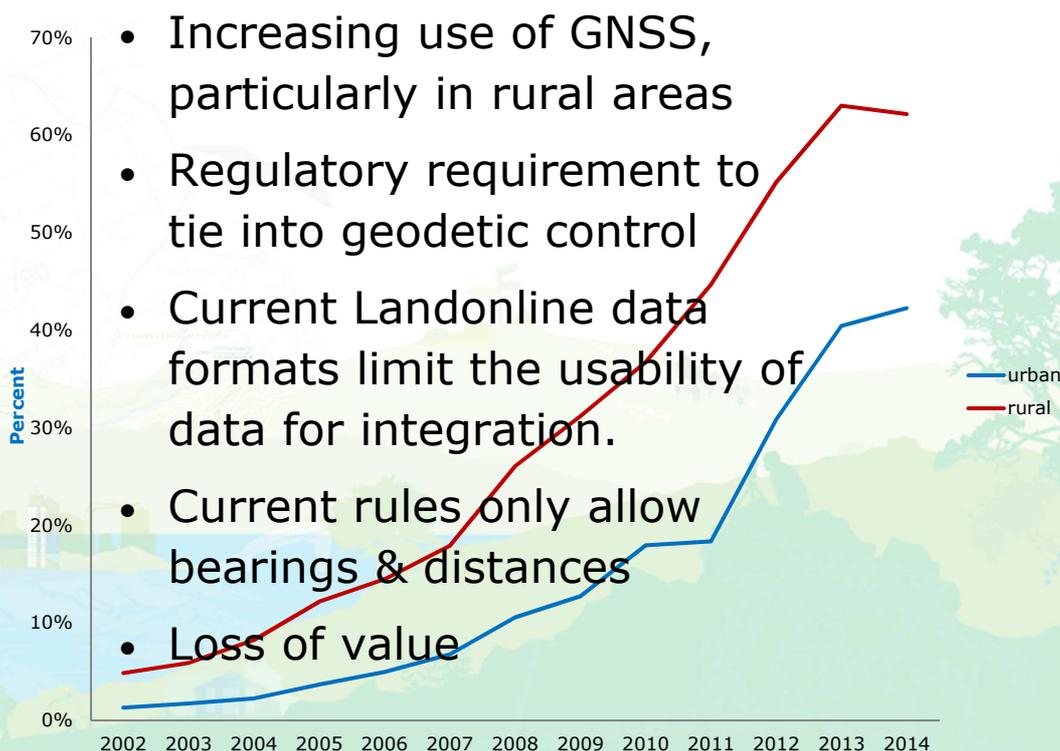
- Removes the requirement for users to directly address deformation issues to provide coordinates in terms of the local datum
- Does require a relatively long observing session

And with further developments

To:

- Enable data processed by the online service to be integrated into the network database, and
- Provide functionality for users to submit additional mark details to support the coordinate data
- This process would support both cadastral and non cadastral users

Cadastral survey datasets



Incorporate GNSS vectors into Cadastral Datasets

System would allow cadastral surveys to incorporate GNSS vector data into their Landonline datasets



Advantages

- Control placed where it is needed
- On a “just in time” basis
- Networks will be developed/maintained for as long as there is a user requirement
- At a fit for purpose density
- Removes the requirement for users to deal directly with deformation issues
- Maximises the use of observation data

- Systems need to be in place to ensure required standards are met
- Do we attribute the source of data?
- More straight forward for Cadastral Surveys as we have some control and certification.
- How do we bring in and manage other users

And observations

- Need to get systems absolutely right for users to recognise the benefits and readily adopt.

No or minimal additional overhead

- Previous initiatives have not been overwhelmingly successful e.g.:
supply GNSS vector data directly to LINZ Geodetic Office for processing.
- While these processes provide control there is still the overhead of providing and maintaining records (database)

There are overheads to maintaining local control:

- Maintaining database – Importance of maintaining current, up to date supporting data and documents
- Also provides scope for crowd sourcing



Mark and site details	
Name: UE 93	Mark type: Pin
Land District: Canterbury	Plan References:
Topo50 Reference: BX24 787 770	NZTM: 5177002 157866
Date established: 1-Jan-1980	Date of Inspection: * 3-Dec-2012
Mark Description: Stainless steel pin set in concrete block capped in footpath.	
Mark Protection Structure Type: Cast Iron Cover.	
GNSS Suitability: Good	
Public ownership: Road Reserve	

There are overheads to maintaining local control:

- Mark protection service to ensure marks aren't destroyed – marks are constantly under threat from other activities (e.g. maintenance of underground utilities)
- Also incorporates aspects of crowd sourcing



Conclusions and Observations

- Recognised demand for cadastral and other users and uses
- Required to maintain datum, but in the future could be replaced by other methods.
- Crowd/industry sourcing is a viable alternative – will sustain the system based on user needs
- Collecting data is not the issue – ensuring systems allow and enable integration
- Maximising the use of data



Questions?

