BRIEFING

Land Information New Zealand regional elevation data proposal

Date:	28 June 2018	**Priority:**	Medium
Security classification:	In Confidence	**Tracking number:**	3859 17-18

Action sought		
	Action sought	**Deadline**
Hon Grant Robertson **Minister of Finance**	**Note** the information provided on LINZ's coordinated capture of regional elevation data (in 3D) project. **Agree** to one of the three options to fund the project in the form of a grant to LINZ.	2 July 2018
Hon Phil Twyford **Minister of Transport**		2 July 2018
Hon David Parker **Minister for Economic Development**		2 July 2018
Hon Shane Jones **Minister for Regional Economic Development**		2 July 2018

Contact for telephone discussion (if required)				
Name	**Position**	**Telephone**		**1st contact**
Robert Pigou	Acting Head of Investment Management	Privacy of natural persons	Privacy of natural persons	✓
Andrew Beaufort	Senior Policy Advisor	Privacy of natural persons		

The following departments/agencies have been consulted
Ministry for Primary Industries, Land Information New Zealand

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Purpose

This briefing provides information on Land Information New Zealand's proposal for up to $Commercial Information of Provincial Growth Fund (PGF) funding for the coordinated capture of regional elevation data (in 3D).

Executive summary

The proposal seeks funding for coordinated capture of provincial elevation data using Light Detection and Ranging (LiDAR) to support regional growth and resilience. The result will be a nationally consistent and open dataset covering the majority of New Zealand. It will be used by regional businesses and Government for a range of high-value activities.

An initial pilot has been undertaken in Northland and Tairāwhiti/East Cost – a data elevation improvement programme which has developed a scalable framework for working with councils.

New Zealand's regions face serious challenges such as improving land productivity, smarter infrastructure investment and adaptation to climate change. Elevation data allows for the production of maps and models land in precise 3D.

Land Information New Zealand (LINZ) is seeking up to $Commercial Information over three to five years from the Provincial Growth Fund (PGF) to fund this project.

LINZ has consulted with more than 40 stakeholders and believes it will be able to raise up to $Commercial Information in co-funding from regional and district councils.

With or without this proposal, regions will likely request co-funding from the Provincial Growth Fund (PGF) to improve their elevation data. This proposal is the most efficient way to administer requests, encourage uptake and ensure the benefits from Government investment are maximised to all stakeholders.

LINZ estimates the benefits of a national dataset at $Commercial Information per annum in monetised benefits and significantly more in un-quantified benefits. Monetised benefits include:

- Improved resilience to natural hazards and climate change;
- Cost-savings in forestry management and operations;
- Lower infrastructure design and construction costs; and
- Time and cost-savings to landowners who require site surveys.

The Provincial Development Unit (PDU) recommends funding the project noting certain matters below.

Recommended action

The Provincial Development Unit recommends that you:

a **Note** the information provided on LINZ's coordinated capture of regional elevation data (in 3D) project.

Noted

b **Note** the three options for funding the LINZ land elevation data project:

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- Option 3: a five year project – would fund coverage over nearly all of provincial New Zealand – requiring $Commercial Information from the PGF and $Commercial Information of extra co-funding from LINZ and councils (a work around option that would not require Cabinet approval).

Noted

c **Agree** to one of the three options above to fund the project in the form of grant funding to LINZ subject to milestones being met.

Agree / Disagree

Privacy of natural persons

Robert Pigou
Acting Head, Investment Management
Provincial Development Unit, MBIE

28 / 06 / 2018

Hon Grant Robertson
Minister of Finance

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Hon Shane Jones
Minister for Regional Economic Development
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Hon Phil Twyford
Minister of Transport
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Hon David Parker
Minister for Economic Development

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Project overview

1. This proposal seeks funding for coordinated capture of regional elevation data to support regional growth and resilience. The result will be a nationally consistent and open dataset covering the majority of New Zealand. It will be used by regional businesses and Government for a range of high-value activities.

2. Land Information New Zealand (LINZ) will administer and coordinate the initiative over a three or five-year period, working with surge and other regions prioritised by opportunity and regional engagement.

3. An initial pilot has been undertaken in Northland and Tairāwhiti/East Coast – a data elevation improvement programme which has developed a scalable framework for working with councils.

4. The data will be accessible to all who wish to use it, for any purpose at no cost

5. Commercial Information

6. With or without this proposal, regions will likely request co-funding from the Provincial Growth Fund (PGF) to improve their elevation data. This proposal is the most efficient way to administer requests, encourage uptake and ensure the benefits from Government investment are maximised to all stakeholders.

Elevation data is a foundational data asset

7. High-quality elevation data is an enabling infrastructure that allows us to accurately map and digitally recreate our physical world, both built and natural. It is a foundational data asset essential to decisions involving the physical world, with the potential to help drive regional economic growth and spur new investment across the country.

8. Elevation data is captured through Light Detection and Ranging (LiDAR), a technology that uses aircraft-mounted laser instruments to measure distances to features on the ground. The result is a highly accurate dataset measuring ground terrain and above-ground features such as buildings and vegetation.

There are three options for this project

9. LINZ is seeking approval for one of two options. Officials have added a third option, noting that one of the two options presented by LINZ would require Cabinet approval as it is seeking funding greater than $20 million from the PGF.

10. The three options are:

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- **A five year option** – would fund coverage over nearly all of provincial New Zealand – requiring **$**Commercial Information **from the PGF** and $Commercial Information

11. A cost breakdown of each option is below:

Funding Sought	Option 1 3 Years $m	Option 2 5 Years $m	Option 3 5 years $m
Project Costs: Capital Expenditure Operating Expenditure Total	Commercial I – –	Commercial – –	Commercial – –
Co-funding - Councils - LINZ Total	Commerc – –	Commerc – –	Commercia – –
PGF - Capital Funding - Operational Funding Total	Commerc – –	Commercial – –	Commercial – –

12. The capital expenditure component of the project would be for the instruments to capture the land elevation data.

13. LINZ will coordinate joint procurement across regions to ensure suppliers do not drive up prices due to limited capacity and high risk of weather delays, and that opportunities to shift data capture to where the weather is amenable are exploited (which will help suppliers as well). This will lead to cheaper, faster data collection compared to a bespoke approach.

Discussion

Alignment with PGF criteria

14. LINZ has identified the alignment of the project with a number of PGF criteria.

Increased Economic Benefit

15. LINZ estimates the benefits of a national dataset at $Commercial Information per annum in monetised benefits and significantly more in un-quantified benefits. The monetised benefits include:

Monetised benefit	**Description**	**Saving per annum ($m)**
Improved resilience to natural hazards and climate change Improved elevation data is a key input into hazard modelling that enables better planning and response, particularly for floods, landslides, coastal inundation, and raising sea-levels.	Accurate risk assessment informs better decisions around mitigations and adaptations such as building defences, response plans and insurance underwriting. Based on a business case for a proposed Local Government Risk Agency, elevation data enables reduced costs to local government from hazards by $Commercial Information p.a., funding that can be redirected to communities. The overall resilience benefit is expected to be much higher.	$Commercial Inform p.a.

Cost-savings in forestry management and operations Elevation data allows for reduced planning costs and greater certainty for operations such as planting, building access roads and harvesting.	Privacy of natur estimated savings in plantation engineering of approximately Commercia per cent, enabled through better design and planning. We conservatively estimate $Commercial Information p.a. savings in roading infrastructure costs, plus other un-quantified savings in areas such as harvesting. Elevation data will also enable better identification of new plantation forestry opportunities.	$Commercial In p.a.
Lower infrastructure design and construction costs Elevation data allows for improved planning on infrastructure such as roading and transport routes.	Having accurate elevation data available in advance of infrastructure development typically reduces design schedules by Commerc per cent and overall costs by Commercia percent. Data improves project planning, preliminary design of drainage features, cut and fill calculations, tree removal estimates, and cost-estimation.	High
Time and cost-savings to landowners who require site surveys Elevation information is required for many resource consent applications, with site surveys needed to assess the effect an activity may have on the environment.	Approximately 2,000 flood risk-related consent applications a year require a site survey, costing an estimated $Commercial Information An accurate national elevation dataset would mean these surveys would not be required. As this has not been fully validated, we have conservatively estimated that Comme per cent fewer surveys could be required.	$Commercial In p.a.

16. Other economic benefits include:

    - Better decisions around land use and stocking, leading to increased production and cost savings;
    - Increasing efficiencies in resource uses such as fertilisers;
    - Supporting environmental sustainability – model soil erosion, improved management of fertiliser and effluent runoff and supporting pest control; and
    - Assisting Maori freehold landowners in making better decisions to help realise economic returns from different land activities.

Climate Change

17. Improves understanding of both the short term impacts from intensified extreme weather events and long term trends and predicted impacts from climate change. This will help sectors, regional and district councils to understand and manage risks presented to them by climate change.

Māori Development

18. This data enables better decision-making by Māori freehold landowners realising economic returns from different activities on their land.

19. Many Māori communities are in areas vulnerable to climate change (e.g. coastal and hilly areas) but relatively sparsely populated where bespoke data procurement is unlikely. The resilience benefits will be concentrated in these communities.

Additionality

20. Builds on existing capability, enabling and supporting better, faster, and more confident decision making across a wide range of private and public sector activities.

21. Investment through the PGF will open access to data that smaller companies would not have been able to afford. There are only a small percentage of businesses that operate at a scale that makes the data collection viable (e.g. [redacted] per cent of forest owners).

22. Investment through the PGF will also build on an initial pilot undertaken in Northland and Tairāwhiti/East Cost – data elevation improvement programme which has developed a scalable framework for working with councils.

Alignment with regional plans/ Stakeholder support

23. The proposal has received letters of support from regional councils and other stakeholders including Department of Conservation, Earthquake Commission, Civil Aviation Authority, Ministry for Primary Industries (MPI), and Ministry for the Environment (MfE). MPI and MfE have been engaged by LINZ.

24. The proposal provides for a collaborative, managed approach reducing costs, rather than ad-hoc requests from various councils.

Risks

25. There is a risk of data capture delay due to limited supplier capacity. LINZ has indicated there is an insufficient supply of LiDAR technology to meet the expected increase in demand if the proposal goes ahead. We requested clarification as to what volume can they supply and whether this issue will significantly impact successful project delivery. LINZ expects that the funding sought from the PGF will be adequate to stimulate the market to increase capacity to achieve the proposed scope of work.

26. A risk is present in the uptake of the data by regions and clarification as to how the contribution from local government agencies will be agreed. LINZ has informed us the ability to provide funding will be tied to the ratings base of the regional partners, whereas the cost is driven primarily by their land area. The differences are significant, with regions such as the West Coast, Southland and Marlborough having several times lower population density than the Bay of Plenty or Taranaki.

27. There is a risk that the data is collected but is not accessed by businesses – potential users are not aware of the availability of the data and do not understand how to derive benefits from its use. We expect this to be mitigated through LINZ publicising the project and the potential applications for the data.

28. Data capture will be subject to weather conditions. However, we do not view this as a substantive risk to the project being carried out within the proposed timeframes.

Recommendations

29. Based on the above analysis, the PDU has assessed that the project fits the criteria of the PGF and we recommend that Ministers choose one of the three options discussed above.

30. Option 1 is the cheapest and would focus on surge regions and those willing to contribute to funding. However, options 2 and 3 would cover the entire country and in theory, bring about greater economic benefits than option 1. Option 2 would require Cabinet approval and if chosen by Ministers, officials would begin immediate work on a Cabinet paper.

31. The PDU considers Option 3 as the preferred option on the basis:

- It supports a managed approach across all regions in the collection of this data
- Generates significant economic benefits across all regions
- Considered a core infrastructure project supporting a range of services and products across a number of sectors
- In the longer term will help stimulate the market to increase supplier capacity of LiDAR technology to achieve the proposed scope of work
- Commercial Information

32. In all three options, the PDU considers an annual assessment undertaken to review progress of the national rollout and the level of uptake by end users appropriate. This will ensure that the project delivers the desired outcomes and provides stage gates where funding can be discontinued. The PDU will work with LINZ to establish what these measures are and how funding will be released upon those milestones being met.

33. The Independent Advisory Panel is providing a separate paper outlining its advice to you on this project.

Next steps

34. The PDU will take the required steps based on the decision by Ministers.