

Empowering local resilience to landslide risk through good land-use planning

A Strategic Science Investment Fund case study:
Platform 2 - Geological Processes and Hazards

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Landslide Planning Guidance

To support New Zealand to be safe, resilient, and prosperous in a future of increasing landslide hazards, the new GNS [Landslide Planning Guidance](#) encourages landslide risk to be considered early in the land-use planning process, particularly in district plans and resource management decision-making.

Doing so will help avoid costly and potentially dangerous developments that could pose a risk to people, property, and the environment.





▶ [Watch](#) a short introduction to the GNS Landslide Planning Guidance

The problem

Landslides cause on average \$250 to \$300 million of damage a year in New Zealand and have caused more fatalities than all other geohazards combined. Estimates for landslide damage from Cyclone Gabrielle alone were close to \$1.5 billion.

This highlights the importance of considering both the likelihood and the consequence of landslide hazards from large storm events, particularly with a changing climate.

A review across councils found a patchwork of approaches to landslide hazard and risk. There were few landslide susceptibility maps whereas other hazards like earthquake and flooding had higher priority and yet possibly did not cause as much damage or death.

What was missing was a blueprint for planners in how to reduce landslide risk through land-use planning using a risk-based approach that considers climate change, and current legislation and practices.

\$250 to
\$300 million

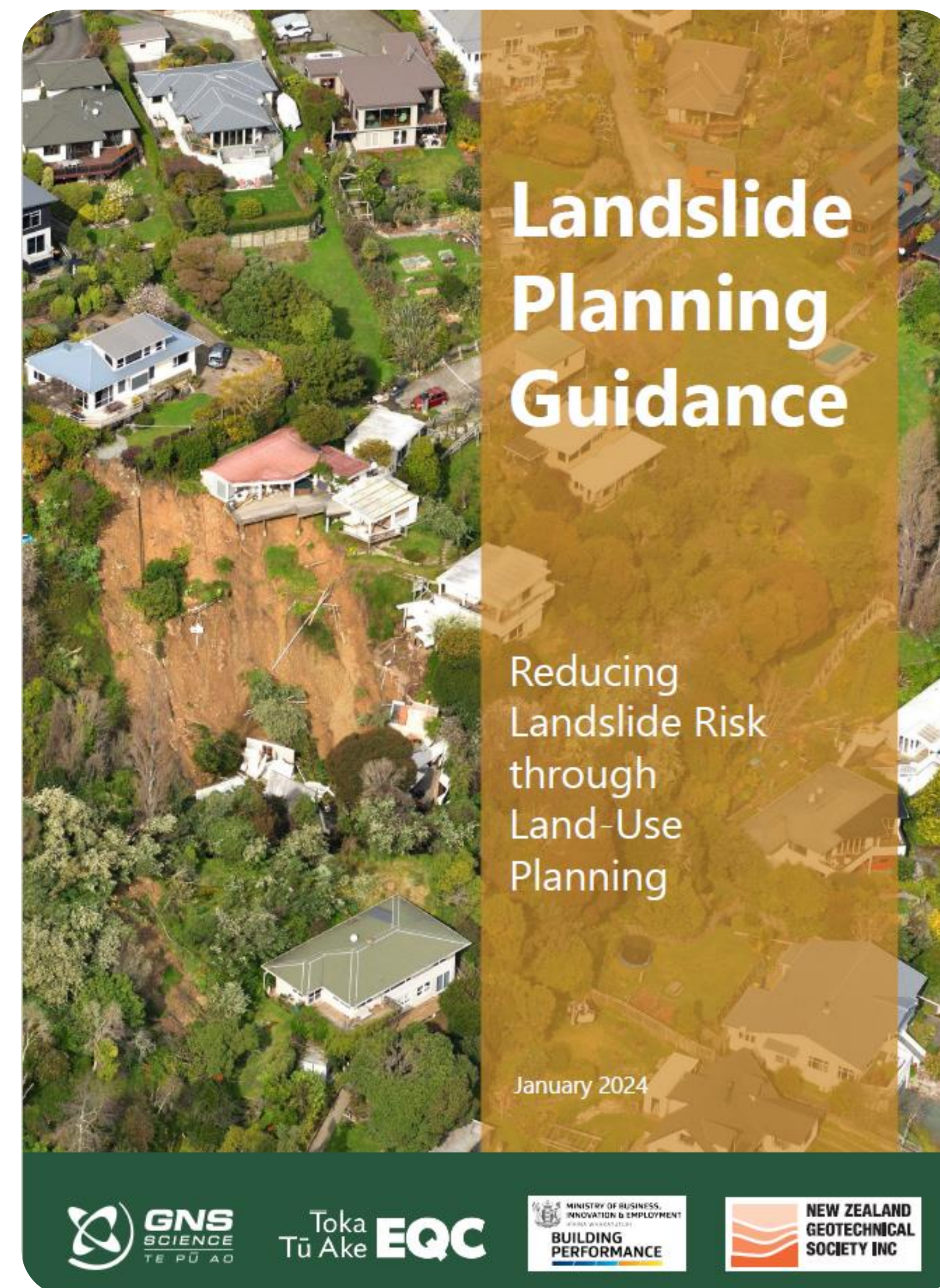
Annual average cost
of landslide damage

The research

In developing the new Guidance, the authors reviewed existing guidance, knowledge, and practices; considered current legislation; and consulted with end-users.

Specifically, these activities included:

- Reviewing international standards.
- Analysing other land-use planning for natural hazards guidance.
- Reviewing and incorporating advances in landslide knowledge, particularly following the Canterbury Earthquake Sequence and 2016 Kaikoura earthquake.
- Reviewing local practices on incorporating landslide risk into land-use planning.
- Establishing a multi-disciplinary steering committee.
- Incorporating advice on climate change scenarios likely to exacerbate landslide hazards.
- Adapting changes in resource management legislation.
- Developing and testing a Guidance framework with end-users.



The results

The Guidance sets out how landslide risk can be reduced through consistent land-use planning practices and walks users through multiple planning tools available to manage, mitigate and avoid landslide risks.

Depending on the land-use decision-making process, five levels of susceptibility, hazard and risk assessment are recommended. As a minimum, the Guidance recommends users develop a susceptibility map identifying areas that may be and *may not* be impacted by landslides.

This screening analysis identifies where further investigation may be needed depending on the type of development. Each level adds more quantitative detail to support additional decision-making.

This framework allows for flexible decision-making and having the right information to inform the right development in the right place.

In the first six months following its release in January, the Guidance was downloaded 841 times and an accompanying [webinar](#) attended by 160 participants has had 426 subsequent views.

The Guidance was also recently recognised as an exemplar of best practice by the New Zealand Planning Institute (NZPI) with an [award for Non-Statutory Planning](#).

MEDIA COVERAGE

[RNZ](#) ↗
27 January 2024

[Three News](#) ↗
28 January 2024

[Newstalk ZB](#) ↗
29 January 2024

[Ground Engineering \(UK\)](#) ↗
7 May 2024

[The Landslide Blog](#) ↗
21 March 2024



“...the most brilliant
exposition of practical
landslide risk analysis that
I have seen”

Prof. Dave Petley, University of Hull (UK)

[The Landslide Blog ↗](#), Eos magazine, 21 March 2024

Who it helps and how

While the Guidance's primary audience is planning, policy and building compliance staff, it also considers the requirements of engineering geologists, geotechnical engineers, developers, and professionals who are all essential to planning development.

The Guidance presents a framework that is familiar to each discipline, takes a holistic approach and supports improved collaboration.

Further, it was designed to be similar to other natural hazard guidance, for example, liquefaction and coastal hazard guidance, to complement other planning priorities.

The Guidance has been endorsed by NHC Toka Tū Ake, NZ Geotechnical Society and MBIE Building Performance.



Collaboration and funding

The Guidance was overseen by a steering committee made up of members from NHC Toka Tū Ake, Nelson City Council, Ministry for the Environment, NZ Geotechnical Society, Environment Canterbury, Queenstown Lakes District Council, Auckland Council and GNS Science.

The committee included planners, policy analysts and geotechnical engineers to account for the unique perspectives of each profession and test the framework against their practices.

The Guidance was largely funded using \$210,000 of the \$8.19 million Earthquake-Induced Landscape Dynamics Endeavour programme as part of a research aim to deliver tools for managing landslide hazards and risks.

Additional SSIF funding of \$110,000 was used to ensure the Guidance was aligned with a dynamic resource management legislative environment, that it met end-user needs, and to see it through to its final delivery.





Visit gns.cri.nz/landslideplanningguidance for more information