LET'S talk about RISK

Engaging communities in natural hazard and climate change conversations

Natural hazard and climate change risk tolerance conversations

GUIDANCE TO AID DESIGN

About this guidance

Living with natural hazard risk is one of the defining challenges of our time. Decisions about adaptation: what risks to accept, what protections to build, who should pay, are not just technical questions. They touch on deeper issues of fairness, responsibility, and what we owe to one another. These decisions are shaped not only by what communities and individuals value but also by the social, economic, and institutional capacity to act on them.

Across Aotearoa New Zealand, these questions are playing out in real time. Agencies and communities are navigating unfamiliar territory, often without clear guidance. Many of these conversations happen locally, where the impacts are most visible and urgent. Yet the consequences ripple far beyond those directly affected, which means local decisions cannot be separated from regional and national ones.

This guidance document focuses on one aspect of this larger challenge: how to bring a diversity of voices into decisions about risk tolerance and adaptation at a range of scales. It draws on examples from practice around the country and offers explanations of key concepts to support communities, agencies, and local government political representatives - recognising that these are often complex and sometimes difficult ideas to navigate.

As part of our ongoing effort to provide information, awareness, and options for public engagement on natural hazard and climate change risks, we have drawn on the experiences of practitioners to support those working in this evolving field. There will be areas not yet covered, and approaches will continue to change over time.

About the authors

Let's Talk About Risk (LTAR) team
We are a small interdisciplinary group working to improve New Zealand's understanding of the challenges, needs, and options for better public engagement around natural hazard and climate risk.
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Acknowledgements

We gratefully acknowledge the funder of this research project, Natural Hazards Commission Toka Tū Ake. We also thank the members of our reference group: Kerry Gosling (BOPRC), Emily Grace (NZPI), Niki Gladding (QLDC), Simon Wright (Trust Democracy), and Rachel Puentener, and the many participants who contributed their time and insights through interviews and our practitioner workshop, including Paula Blackett, Alejandro Cifuentes, Ruby Clark, Paul Dudfield, Monique Eade, Alexa Forbes, Nina Murphy, and Laura Robichaux.

Cite guidance as

Let's Talk About Risk Team (Kilvington, M., Brown, C., Horn, C., Ross-Donald, C.). 2025. Natural hazard and climate change risk tolerance conversations: Guidance to aid design. Let's Talk About Risk, resorgs.org.nz/wp-content/uploads/ltar_risk_tolerance_conversations_guidance.pdf.

Funded by Natural Hazards Commission Toka Tū Ake

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1.Introduction

1.1. Why this guidance was developed

Across New Zealand, institutions and organisations are continually making choices about how to manage hazard risks. Whether it is how to manage the risk of tsunami in Milford Sound, how to manage seismic risk in buildings, how to plan for climate change, or deciding what land is suitable for development, the concept of risk tolerance, our willingness and capacity to bear a risk, is implicit in the natural hazard and climate risk decisions we make.

In 2023, the Natural Hazards Commission (NHC) published a Risk Tolerance Methodology (Toka Tū Ake EQC, 2023b) to encourage consistency in how New Zealand accounts for risk tolerance when making decisions about the potential impact of hazards on the things we value (such as our health, environment, economy, buildings, and infrastructure).

A critical input into the assessment of risk tolerance is the elicitation and interpretation of public perspectives on risk tolerance. Alongside technical/expert input, this provides a basis for risk tolerance assessments and subsequent risk management decisions, whether for an imminent risk management decision or to inform enduring policy/planning.

Despite the important role of incorporating public perspectives in risk management decisions, there is very limited guidance on how to elicit and interpret community perspectives. NHC engaged the Let's Talk about Risk (LTAR) team to build on our existing framework published in 2023, and develop guidance to support those engaging communities on their risk tolerance.

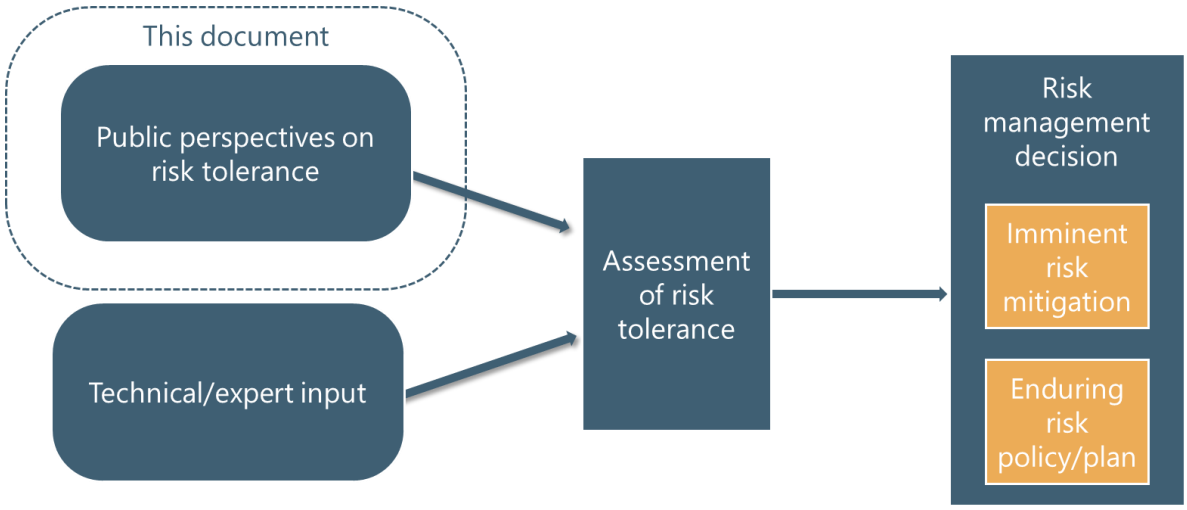

Figure 1 How this document feeds into assessments of risk tolerance and risk management decisions

1.2. How this guidance was developed

This guidance is based on the views of a range of professionals, on current approaches to risk tolerance conversations as well as the challenges faced in eliciting, interpreting and integrating community perspectives into decision-making processes. Professionals spanned engagement specialists, council hazard planners and policy advisors, academics, and Councillors. Data was captured through interviews and structured discussion groups, as well as case study analysis and literature review. Throughout the guidance, reference is made to in-depth case studies. These case studies are summarised in Appendix 2.

1.3. What this guidance offers

This guidance is intended for practitioners and agencies seeking community perspectives on risk tolerance. It is designed to support engagement at community, local, regional, or national scale; with those directly or indirectly affected by hazards; and across a wide range of hazard risk management situations (see Tip 1).

The guidance builds on earlier work by the LTAR team. The LTAR natural hazard and climate risk engagement framework (referred to throughout as the *LTAR engagement framework*) sets out the basic considerations for engaging the public in any kind of natural hazard and climate risk conversation. This guidance extends that work by focusing on the design and interpretation of engagement in situations where perspectives on risk tolerance are being sought to inform decision-making. Below is a schematic of how this document complements the original framework.

In this document, you will find:

- **Section 2** introduces key concepts related to risk tolerance and outlines important elements in the elicitation of community preferences.

TIP 1: RISK TOLERANCE APPLICATIONS

There is a range of situations across national, regional, and local policy, planning, and regulatory processes where community risk tolerance perspectives have been — or could be — considered. Below is a list of applications and examples of where community perspectives on risk tolerance have been sought to inform these processes.

- **Hazards management regulation design,** e.g. The Bay of Plenty Regional Policy Statement was informed by community perspectives captured in the "I can live with this" project (Kilvington & Saunders, 2015).
- **Hazards management policy**, e.g. DOC has recently evaluated its risk tolerance to inform the management of life safety risks for DOC assets (DOC, 2024).
- **Built environment design standards,** e.g. The Resilient Buildings Project explored societal expectations for the seismic performance of buildings, with the intent to inform future seismic policy and design standards (Brown et al., 2022).
- **Emergency management planning**, pre- or post-event, e.g. Community-driven recovery work prioritisation for Cyclone Gabrielle Recovery Plan (Northland Emergency Management, 2023)
- **Land use planning**, e.g. Auckland Council elicited perspectives on risk tolerance to inform the Auckland Unitary Plan for Plan Change 78 in process late 2024.
- **Climate change adaptation planning**, e.g. Waikato Regional Council and Hauraki District Council sought to understand community risk tolerance to inform the Wharekawa Coast Community Plan (Hauraki District Council et al., 2023).
- **Infrastructure asset management planning**, e.g. NZTA undertook community engagement following the Kaikōura earthquake to inform the Marlborough Sounds Future Access Study(Marlborough District Council, 2023).
- **Infrastructure mitigation option assessment**, e.g. Queenstown District Council undertook community engagement to inform risk management of a debris flow risk in the Gorge Road project (Kilvington, 2022; Queenstown Lakes District Council, 2025).

- **Section 3** addresses the purpose and scope of the engagement, highlighting contextual factors that influence design. It includes thoughts on working with Māori and key questions to consider early in the process.
- **Section 4** outlines the range of methods and tools available from surveys to deliberative processes and the different purposes they can serve.
- **Section 5** supports the design of an overall elicitation approach, with guidance on tailoring and sequencing methods to fit the context and combining them to generate meaningful insight.
- **Appendix 1** demonstrates how the scoping factors (introduced in Section 3) could be applied across different risk tolerance elicitation situations.
- **Appendix 2** provides three detailed case studies.
- **Appendix 3** provides two standalone guides: one for public representatives involved in decision-making, and one for communities seeking to better understand risk tolerance assessments and their use.

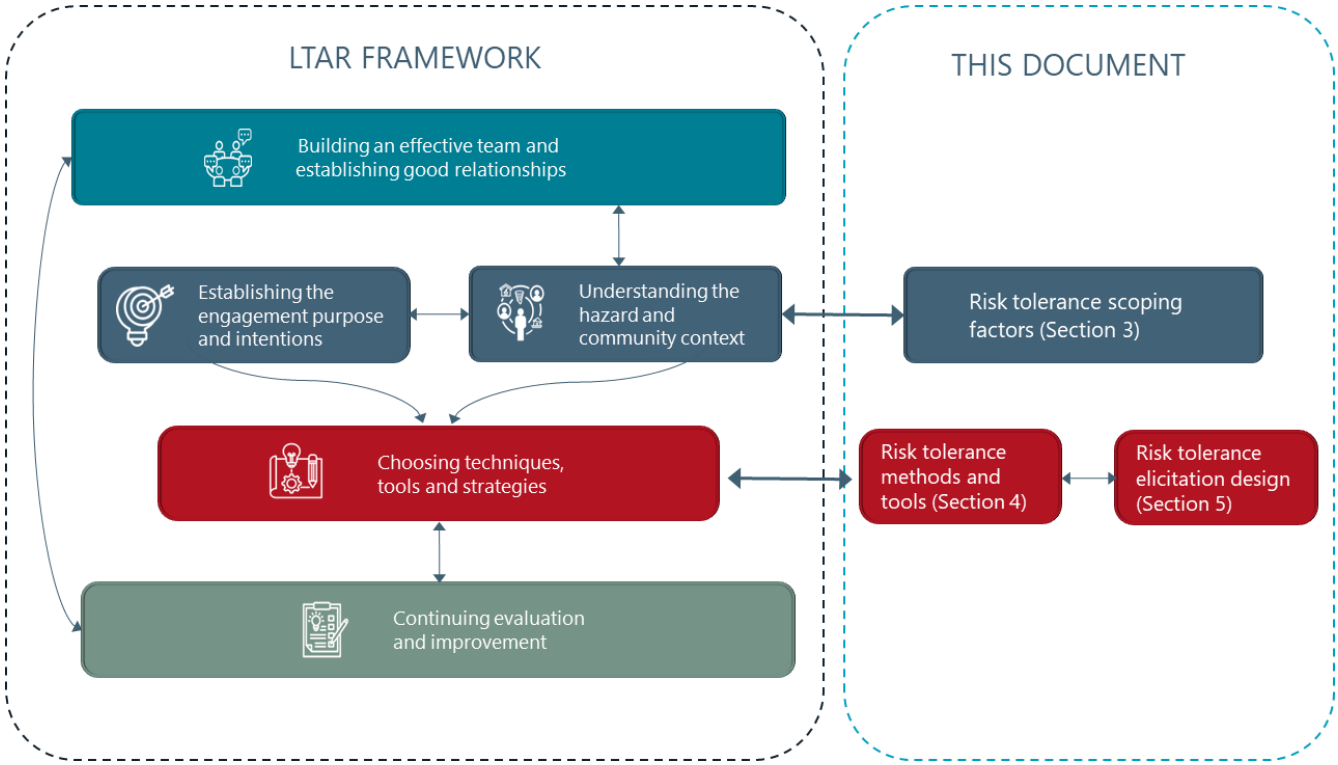

Figure 2: How this document builds on the LTAR engagement framework

2. What is risk tolerance?

2.1. Key concepts

The NHC risk tolerance methodology (NHC Risk Tolerance Methodology, 2023) highlights the assessment of risk tolerance as a crucial step that links the analysis of hazards and their impacts with the social and political decisions involved in risk management. While hazard assessments provide technical insights into the probability, magnitude, consequences, and spatial extent of hazard events, assessing risk tolerance addresses the question "what are we individually or collectively willing to accept potentially losing, and what do we seek to preserve and safeguard?". This is essential for identifying appropriate risk management measures.

Widely used definitions of risk tolerance include:

- "Our willingness to bear risk" (Toka Tū Ake EQC, 2023b).
- "Our ability to bear risk" (ISO 31000, 2018).

In general usage, risk tolerance refers to the amount of risk people are prepared to live with, balancing the potential losses against the costs and impacts of mitigation measures. See Tip 2 for useful concepts and their definitions.

TIP 2: IMPORTANT CONCEPTS AND THEIR DEFINITIONS

RISK: The likelihood and consequences of a hazard (Civil Defence Emergency Management Act 2002). Often depicted by the equation Risk = likelihood x consequence. Also described as the effect of uncertainty on objectives (ISO 31000, 2018).

RISK PERCEPTION: An individual or stakeholder's view on risk. Reflects one's needs, issues, values, and beliefs (Adapted from ISO 31073, 2022).

RISK APPETITE: Amount and type of risk that an organisation or individual is willing to pursue or retain in pursuit of their objectives (Adapted ISO 31073, 2022).

RISK CAPACITY: Amount and type of risk that an organisation or individual is able to support in pursuit of their objectives (Adapted ISO 31073, 2022).

RISK THRESHOLD: A limit beyond which the risk is treated differently (Adapted from Project Cubicle, 2022, in Toka Tū Ake EQC, 2023a).

RISK TOLERABILITY: Typically, three levels of risk tolerability are considered:

- **Acceptable risk**: Broadly acceptable. Monitor and maintain assurance that risk remains at this level (Toka Tū Ake EQC, 2023a).
- **Tolerable risk:** Risk is accepted only if the benefit gained is shown to outweigh the risk (using the 'As Low As Reasonably Practicable' principle). Tolerable only if risk can be mitigated at a cost proportional to the benefit gained (Toka Tū Ake EQC, 2023a).
- **Unacceptable risk:** Risk cannot be justified except in extraordinary circumstances. Activity must cease until risk is removed or reduced (Toka Tū Ake EQC, 2023a).

Individual and community characteristics that shape risk tolerance

Risk tolerance, whether at an individual, community, regional, or national level, is shaped not only by views and concerns about the hazard and its impact but also risk appetite and capacity (willingness and ability to cope with a hazard event). These in turn are influenced by:

- **Life stage** – Older residents, for example, may be less able to recover from the loss of their homes and more physically vulnerable during a hazard event. Alternatively, they may be less concerned about longer term impacts and more willing to trade these off for immediate/short term benefits (e.g. remaining in their family home). Families with young children may have greater concerns about vulnerability during emergencies and a different risk tolerance than those without children or with older children.
- **Financial situation** – Income, wealth, and insurance status will likely influence tolerance. Those with greater financial resources typically have more options and support available, both during and after a disaster. This can make them either more willing to accept a risk (due to their capacity to cope with losses) or provide them more choice in how they manage the risk
- **Health and disability** – Physical and mental health conditions can affect mobility, communication, and resilience during emergencies, reducing their capacity to manage risk.
- **Community connections** – Strong social networks aid psychological wellbeing and can provide practical support in emergency preparedness. These connections can help people feel less vulnerable and can strengthen a community's capacity to act collectively, enhancing shared control and agency in managing risk.
- **Values and place attachment -** Risk tolerance is also strongly shaped by the perceived impact of that risk (or impact of managing that risk) on what people value most. In some cases, the disruption caused by mitigation (e.g. needing to leave a meaningful place) can feel more threatening than the hazard itself.
- **Psychological factors -** These can be broadly grouped into:
    - **Factors related to experience and cognition**, such as familiarity with the hazard and memorability of past impacts. Direct exposure to hazards does not always lead to greater concern — in some cases, it can foster acceptance. Conversely, awareness of highly traumatic events can make risk less acceptable, even among those who were not directly affected.

> "…we felt that the storm affected people had… so much more knowledge and personal experience and possibly trauma to share … that it might overwhelm the perspectives of the … people who were less affected or not affected and, and had less knowledge ….Actually, the storm affected people ended up being… more tolerant of risk…in many ways. … it's almost counterintuitive!"
>
> *Policy and resource consent planner*

    - **Factors related to values and perceptions of agency**, such as sense of control, perceptions of fairness, and moral acceptability of the risk, will affect an individual's risk tolerance.
- **Process of engagement** - Importantly, the way information about the hazard is shared — and the processes used to explore options and determine a way forward — can itself influence how risk is perceived and tolerated – e.g. risk can be more tolerated where there is reduced uncertainty and increased trust.

2.2. Elicitation of public risk tolerance preferences

Elicitation of public risk tolerance perspectives complements technical risk assessments, providing crucial insight into what people value and the trade-offs they are willing to make. Understanding public preferences around risk is essential to ensure that risk management is proportionate to public priorities and is not unduly risk-averse (for example, driven more by agency liability than public risk) or disconnected from the lived realities of those exposed to risk and those who, even indirectly, will bear the cost of mitigation.

Eliciting public perspectives about risk tolerance is also a practical means of improving both the quality and legitimacy of decisions. They can provide decision-makers with a picture of the differing circumstances faced by stakeholders, attitudes toward management and mitigation, and insight into how the consequences of risks and management fall across the community. They can give early insight into potential unintended consequences and a clearer mandate to act. They can also help surface tensions early, reducing the risk of conflict and enabling more constructive policy and planning approaches. For participants, engagement can offer the opportunity to influence policy and planning, clarify their own values and concerns, reflect on how they might respond to different risk scenarios, and hear how others are thinking about the same issues. At a community level, these conversations can broaden awareness of hazard impacts and possible responses and create space for people to be heard and taken seriously in decisions that either directly or indirectly affect them.

> "We don't know all the answers, and we don't have the interests in the land that's been affected. So it's fundamentally important that we [include a community's risk tolerance]. … you know, it's embedded in the RMA, and it's embedded in the LGA. It's embedded in lots of different policies … we're accountable to the rate payers at the end of the day. … clearly [community perspectives] are incredibly important. But I would say it's just about managing how we balance that information against all the other information."
>
> *Council planner*

Public perspectives provide critical context and legitimacy and complement rather than replace technical risk thresholds such as Annualised Individual Fatality Risk (AIFR). These quantitative risk thresholds are widely used in Australia and New Zealand and can be useful in some situations. However, they only consider the likelihood of fatalities and do not account for other important impacts such as injury, loss of assets, or broader social and cultural consequences. Moreover, these technical risk thresholds do not always explicitly account for the trade-off between the benefits of inaction and the costs of mitigation.

Guidance on risk thresholds is available for some hazards (e.g. from the Australian Geomechanics Society on landslides), but the basis used in guidelines is not always transparent, making it difficult to judge how well they reflect what matters to the public. For instance, while the Australian Geomechanics Society's landslide guidance recommends managing or reducing both moderate (1×10^{-5} AIFR) and high (1×10^{-4} AIFR) risks where practicable, in practice thresholds around 1×10^{-5} AIFR have triggered very different responses in different contexts: compulsory relocation for Matatā (Whakatāne District) debris flow hazard, risk mitigation requirement in the Skyline Gondola case (Queenstown Lakes), and management through resource consent for the Port Hills rock fall (Christchurch). These variations highlight that risk thresholds alone do not dictate responses; context and public perspectives remain critical.

Involving the public in risk management decisions is sometimes seen as risky in itself. There can be concerns that it could lead to support for developments that prioritise short-term gains over long-term safety and increase future liabilities or that inviting open-ended public preferences could set expectations for action that exceed what an agency can deliver. In addition, communicating complex risk concepts is challenging, there is potential for the public to be either disengaged or overly focussed on uncertainty and dismissive of seemingly low-probability events. There is also a risk of igniting fears and triggering anxieties. This highlights the importance of carefully crafted elicitation methods that support public understanding of complex risk and generate usable insights.

> "We thought that the community were going to have a lower tolerance to the major events... And it was really interesting looking at the results and actually seeing our hypothesis switched the other way... they had a higher tolerance to the major event, but a lower tolerance to the smaller event."
>
> *Council resilience specialist*

2.3. Key elements of eliciting public risk tolerance preferences

Eliciting risk tolerance goes beyond straightforward data collection. Whether through surveys or dialogue, it acts as a generative process that engages people in reflecting on hazard information alongside their own circumstances, leading to the emergence of more informed and considered perspectives rather than simply recording pre-fixed opinions.

Elicitation can explore a community's:

- underlying community values, including fairness, equity, and trust,
- awareness of the hazard and views on its significance,
- comfort with the likelihood and consequences of hazard events, as they affect individuals and the community as a whole,
- capacity to live with or adapt to the impacts of a hazard event, and
- priorities and concerns related to risk management or mitigation including balancing the costs and benefits of action versus inaction.

To effectively uncover these insights, elicitation techniques need to:

- support understanding of both the hazard likelihood and the consequences in a way that is meaningful to those potentially affected,
- build people's awareness of their preferences that includes appreciation for both their risk capacity and their appetite,
- be inclusive of diverse views shaped by differing circumstances, and
- reveal core values and concerns shaping people's judgement – surfacing what consequences and impacts people are most concerned about and how people are weighing up the costs and benefits of action and inaction.

> How do we make these terms seem real? We needed to like, build people up, they enable them to understand the concepts of risk, the implications for them and their community.
>
> *Senior Community Engagement Advisor*

It is important to be aware that views on risk tolerance are not fixed. Perceptions shift over time in response to factors such as community makeup, hazard experience, policy settings , and how risks are communicated. This means any assessment reflects a moment in time, shaped by present-day perspectives. For long-term decisions, for example in climate adaptation, this presents a challenge: today's values may not align with future needs. Recognising this temporal sensitivity is important for designing and interpreting risk tolerance assessments, including designs that enable ongoing risk tolerance monitoring. See Sections 4 and 5 for ideas on how this can be supported in practice.

CASE STUDY EXAMPLE 1: MAKING HAZARD INFORMATION MEANINGFUL - WHAREKAWA'S LOCATION-SPECIFIC APPROACH

The Wharekawa Coast project demonstrated how to make hazard information meaningful to those potentially affected by creating location-specific booklets for each geographic compartment along the 20km coastline. Rather than using generic scenarios, each booklet described how major and moderate coastal inundation events would specifically impact that area's roads, properties, and community assets. This approach ensured that residents weren't considering abstract risks, but concrete consequences to their own familiar environment - making the likelihood and consequences personally meaningful and enabling more informed risk tolerance judgements. For more on the Wharekawa case, refer to Appendix 2.

3. Scoping the elicitation of public views on risk tolerance

The practical design of elicitation processes depends heavily on context—what's at stake, who's involved, and what kind of decisions are being informed. This section outlines the importance of clarifying purpose and sets out key scoping factors to ensure the elicitation is well matched to the situation.

3.1. Purpose

There are a range of reasons why agencies may want to engage the public about natural hazard and climate change risk tolerance. They include short-term, localised decisions about how to manage a particular risk, through to long-term planning for land use or climate adaptation. The objectives of risk tolerance assessments differ according to the decisions they are intended to inform. For instance, in situations where a hazard is progressing cumulatively or intensifying over time, risk tolerance assessments play a key role in establishing thresholds—i.e., defining limits beyond which the risk is treated differently. In such cases, they help answer the question: "What would make us change what we do?". Alternatively, risk thresholds can be used to shape policies that guide long-term action, such as determining building codes or land-use development practices in flood- or earthquake-prone regions, ensuring they align with appropriate risk tolerance expectations. In situations where communities face threats from a newly identified hazard, risk tolerance assessments help answer: "Can we live with this hazard or are willing to pay the costs of mitigation?". Clarifying the purpose defines the key questions and boundaries for the elicitation, enabling the scoping factors (detailed next) to provide a thorough understanding of the context and requirements.

3.2. Scoping factors

While the broad purpose of eliciting public views on risk tolerance is generally clear from the outset, the specific characteristics of each risk scenario and community context shape how the elicitation should be designed. Identifying and understanding these key factors helps clarify which design choices will best suit the situation and support meaningful, relevant insights.

Some critical factors to consider when scoping the design of risk tolerance elicitation include:

- **Temporal aspects -** the period over which risks emerge, and decisions will play out.
- **Scale** – the level at which risk tolerance is assessed (e.g., community, local, regional, or national).
- **Consequences** – the types of impacts included in the assessment (e.g., life safety, built environment, livelihoods, long-term economic effects).
- **Risk perspectives** – ranging from individual through to collective views.
- **Risk capacity** – the way in which risk capacity will be considered.

- **Public role** – the degree and nature of public involvement, from consultative to empowering approaches.
- **Needs of decision-makers and preferred information type** – the balance of qualitative and quantitative and reporting style of information on public risk tolerance to support decision-making.
- **Community context** – key social, cultural, and environmental factors shaping how the community experiences the hazard and perceives risk.

Temporal aspects

The context for evaluating public risk tolerance can vary depending on factors such as the immediacy and duration of potential impacts**.** It is essential to consider both how soon people may be affected (or how imminent the risk threat is that requires management) and how long those effects will last. This helps ensure risk tolerance assessments are aligned with the actual stakes and time horizons of the decisions in question; particularly in the context of climate change, where decisions made today can shape the futures of generations to come.

Where threats are imminent, emotions can be high and risk tolerance considerations need to be embedded in the reality of the current risk. Conversely where threats are longer term, participants in an engagement process may need to be taken on a journey to understand and engage in the risk conversation.

It helps to consider two intersecting dimensions:

- **Immediacy of decisions** – how soon the decision takes effect or how imminent the risk threat is, including any urgency created by the implications or costs of proposed mitigation.
- **Longevity of impacts** – how enduring the impacts of decisions are likely to be.

CASE STUDY EXAMPLE 2: CRISIS RESPONSE VS. GENERATIONAL PLANNING - WHEN TIME PRESSURE CHANGES EVERYTHING

Two New Zealand projects demonstrate how different temporal contexts require fundamentally different engagement approaches.

Long-term planning context: In the Wharekawa Coast process, where decisions had 100–200 year consequences, people needed space to make sense of abstract future risks and translate long-term probabilities into meaningful decision points. Engagement was allowed to unfold over four years, enabling participants to build the depth of understanding needed for decisions with lasting intergenerational impacts. For more on the Wharekawa case, refer to Appendix 2.

Immediate crisis context: The Gorge Road project faced debris flow and rockfall hazards posing imminent risk to life and property. This active threat meant residents were less willing to engage in abstract risk tolerance discussions and instead a process was needed that acknowledged the emotional urgency whilst still gathering meaningful input. For more on the Gorge Road case, refer to Appendix 2.

These contrasting examples show how temporal aspects directly influence method selection, community expectations, and process duration.

Table 1 Temporal aspects of different engagement purposes

Purpose	Immediacy of decisions	Longevity of impacts	Notes
EMERGENCY MANAGEMENT PLANNING	Immediate–short	Short-term	Designed for rapid response; effects are generally short-lived.
HIGH-RISK HAZARD MITIGATION	Short–medium	Medium–long-term	Urgent implementation but reshapes exposure patterns over time.
HAZARD REGULATION DESIGN	Medium	Medium–long-term	Implementation may be staged; reviewed or adapted periodically.
HAZARD MANAGEMENT POLICY	Medium–long	Varies by scope	Some policies are flexible; others may entrench long-term effects.
INFRASTRUCTURE MITIGATION ASSESSMENT	Medium	Long-term	Informs major investments with enduring infrastructure implications.
INFRASTRUCTURE ASSET MANAGEMENT	Short-medium	Long-term	Influences maintenance and replacement cycles over decades.
BUILT ENVIRONMENT DESIGN STANDARDS	Medium	Very long-term	Sets construction norms that shape the built environment for decades.
LAND USE PLANNING	Long-term	Effectively permanent	Difficult to reverse; foundational to community form and function.
CLIMATE CHANGE ADAPTATION PLANNING	Medium–long	Intergenerational	Often anticipatory; decisions may lock in future pathways or risks.

Monitoring changes

Public risk tolerance can change over time, and subsequently our approach to risk management may need to change. This is particularly relevant in the context of climate change adaptation, where future decisions may need to respond to shifting hazards impact and societal factors, such as economic conditions, population change or lived hazard experience. In situations where impacts being considered are medium to long term, risk tolerance elicitation processes need to be set up to allow for ongoing or long-term monitoring of risk tolerance preferences. Monitoring can provide an ongoing pulse of public sentiment that can signal where sentiment is changing, and risk management approaches may need to change.

> "...in South Dunedin...50% of that population has turned over in terms of homeownership within the past decade ... we're coming up to the 10th anniversary of the 2015 floods, and if the flood last month, hadn't occurred, you would have had half the people there, not having experienced a flood in the area ... and wouldn't necessarily know that know how it feels to have experienced a flood."
>
> *Laura Robichaux, Risk Engagement Consultant*

Monitoring public perspectives on risk tolerance can also support evaluation of the success or limitations of risk reduction policies and planning tools. To enable this, initial assessments of risk tolerance need to be designed with a view to future monitoring and revision.

Scale

Risk tolerance assessments can happen at community, local, regional, and national level. Here, 'community level' refers to situations involving engagement specific to a geographic area smaller than a territorial authority. The scale at which a decision is being made will dictate who, and how, you should engage with the public.

Different scales bring distinct challenges. At the local and community level, the immediacy of risk means that personal impacts, fears about the decision-making process, and existing relationships with the lead agency can all influence baseline views on risk tolerance. Process design needs to contend with strong emotions, vocal interests and the potential for participants to want to "game" responses to sway outcomes in their favour. By contrast, at regional and national scales, public perspectives on risk may become overly abstract. Without direct experience of the hazard or its consequences, views can lack the grounded realism found when working more. Figure 3 highlights how individuals' connections to hazard risk (and the potential costs of mitigation) tend to increase at community and local levels, along with a heightened emotional investment in the issue.

> "Reflecting back, even though the methodology for setting our risk thresholds…was a good approach…I'm nervous around how we're going to roll that out in a bigger community because this is just a very small 22-kilometre coastline like 400 buildings on the coast, you know, a very tiny population"
>
> *Council Resilience Specialist*

> "So, I think ones like South Dunedin, for example, where we're targeting a population of around 10,000 that usually has multiple mechanisms of engagement, to try and get a good cross section of people and allow people to provide input the way that's most convenient for them."
>
> *Laura Robichaux Risk Engagement Consultant*

CASE STUDY EXAMPLE 3: SMALL COMMUNITY ADVANTAGES - AMBERLEY BEACH'S DIRECT ENGAGEMENT

Amberley Beach Coastal Adaptation Plan project's risk tolerance elicitation process demonstrated the unique advantages of working at very small community scale. With approximately 100 residents, the council representatives were able to meet with about 80% of households by the end of the project, enabling direct engagement with virtually all affected residents. This small scale allowed for collective decision-making approaches that would be impossible in larger communities - residents preferred hearing others' perspectives in group discussions rather than individual consultation. The intimate scale meant there was high attendance and sustained engagement at all community meetings and elected members could be involved directly in the process. For more on the Amberley Beach case, refer to Appendix 2.

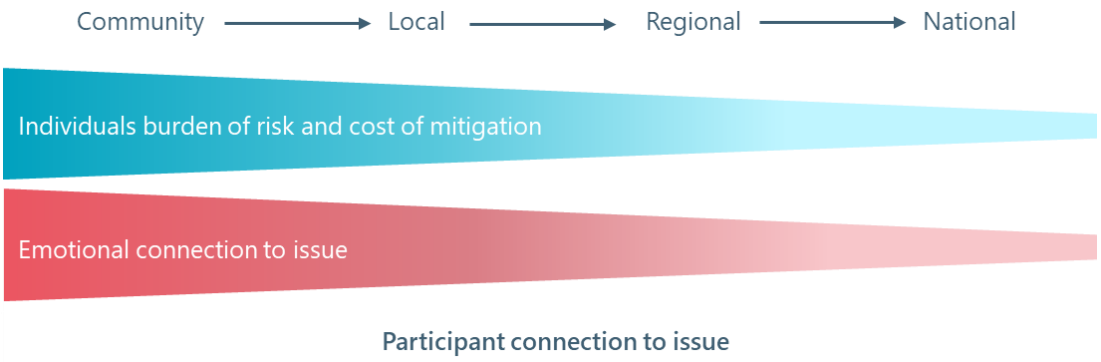

Figure 3: How engagement scale affects individuals' connection to risk tolerance conversations

Consequences

Another important factor in engagement design is the range of consequences under consideration. In this context, "consequences" refers specifically to different types or domains of hazard impacts—such as life loss and injury, effects on the built environment , impacts on economic activity, and livelihoods. Table 2 illustrates these commonly distinguished consequences.

Crucially, people attach different values to different consequences and weigh certain impacts more heavily than others. This variation in values must be acknowledged, particularly when risk management options involve trade-offs and may transfer risk from one consequence to another. This includes not only the consequences of the hazard itself, but also the potential consequences of mitigation options. For example, while relocation may reduce exposure to life-threatening risks, it can also result in social dislocation, cultural disconnection, or reduced access to livelihoods. In local, community-based immediate hazard management situations these trade-offs are very real. They need to be made visible and explored with communities as part of the elicitation process, so that both hazard and mitigation consequences are reflected in public perspectives on risk.

What are people most concerned about? What do they value most?

Hazard assessments often focus on life loss and potential for injury, as a primary basis for establishing thresholds of tolerability (AIFR). However the biggest concern for people in these situations is often not health and life risk (which is uncertain and might not happen) but loss of property values. This has been illustrated in a number of cases, including Southshore/South New Brighton multi-hazard situation and the management of contaminated land in Canterbury. As a result, people may respond more positively to an option that protects property values even if this poses greater safety risk than they would be comfortable with if those property values were not affected. Understanding the consequences people care most about is critical to effectively exploring risk tolerance.

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The elicitation process therefore needs to clearly define which consequences are being evaluated and examine how different values attached to particular consequences influence perspectives on risk. Some consequences (e.g. deaths and injuries) may be more easily understood than others (e.g. long-term impacts of drawn-out recovery processes), which will affect how much education or framing is needed to support the elicitation process. Where available, elicitation of community values (such as 'what matters most' conversations) can provide useful insights into which consequences are likely to matter most to the public.

Table 2 Consequences that may be considered in a risk tolerance assessment (from Risk tolerance methodology (Toka Tū Ake EQC, 2023a))

Environment	Examples of Elements at Risk
BUILT	Commercial, residential, and industrial buildings; infrastructure; urban fabric; critical lifeline utilities; and community facilities (schools, hospitals, churches, etc).
SOCIAL	Public health; living standards; cultural and social capital; casualties (injuries or deaths of people); community assets and networks; relationships; and support systems.
ECONOMY	Economic growth; financial stability; currency and price; businesses; jobs; trade; and services.
NATURAL	Air quality; land and marine ecosystems and their services; recreational amenities (e.g., parks); agriculture and horticulture.
GOVERNANCE AND SOVEREIGNTY	Ability of government agencies to make effective decisions and provide services; law and order; effective international partnerships, treaties, and agreements.

Risk perspectives

When eliciting views on risk tolerance, you need to make a conscious choice about the perspective you seek; this can range from an individual through to a collective perspective, or a mix of both.

An individual perspective is where you want to elicit an individual's own risk tolerance. Individual views may be useful in situations where you are seeking to understand whether there is a social licence for certain risk management approaches. For example, a survey of a sample of New Zealanders might be a useful input when evaluating the scope of a national risk management policy. Individual perspectives may also be useful where you want to understand the diversity of individual views, this could be particularly relevant in situations where you need to understand the capacity of individuals to withstand a risk. There also may be practical reasons why you seek out individual perspectives, for example where the community of interest is geographically diverse or where you are seeking high numbers of participants on a constrained budget.

A collective view on risk tolerance is where individuals are encouraged to consider risk from a community perspective. This could include encouraging individuals to think of the views and concerns of others (such as their neighbours) through the way that an engagement is framed; or through a collective or collaborative decision-making process, for example, the use of a community panel or citizens' jury. Collective risk tolerance assessment may be particularly relevant in small communities where the cost, or success, of risk management strategies depends on a cohesive strategy across the community.

On the other hand, there will be situations where it is very difficult to seek collective perspectives on risk tolerance. For example, as decisions draw closer to the individuals who bear the risk and are likely to pay for the cost of mitigation (and are emotionally invested in the decision), it may be difficult to engage affected persons in a way that enables a collective risk view of risks. In these situations it is likely that processes will need to be more individually focussed.

Risk capacity

As part of understanding risk tolerance, it is equally important to consider an individual's or community's capacity to recover from the impacts of an event. How you do this, and the degree to which this is important, will depend on the context.

Where decisions focus on managing risks across large populations, such as at national or regional levels, understanding the collective capacity of a community or country to cope with risks is often the primary consideration. This includes assessing capacity to bear the costs of managing a risk and the impacts of not managing it.

At smaller scales or in contexts where individuals or groups will directly bear the consequences of a risk, it is also important to support people in understanding their own risk capacity. Helping individuals build this awareness enables more informed decisions about their risk tolerance and the actions they might take.

Risk capacity can be approached in two ways, depending on the situation and the resources available:

1. **Risk capacity is integrated into risk tolerance elicitation processes**: As part of the engagement process, you can provide opportunities for individuals or groups to better understand their own capacity to respond to and recover from hazard events. This will then inform subsequent conversations on risk tolerance. In other words, risk tolerance perspectives will be informed by considerations of both appetite and capacity.
2. **Risk capacity is considered separately to risk tolerance:** If risk capacity is considered separately from risk tolerance, you can gather this information through direct elicitation or through a third party assessment.
    a. **Direct elicitation of individual or community risk capacity**: As part of the engagement process, you can prompt participant perspectives on individual or community risk capacity. This could include information on demographics, property ownership, income, and also things like social connections and support structures. You can collect and evaluate these alongside risk appetite perspectives. Direct elicitation might be useful if you are collecting individual perspectives and wish to understand the diversity of risk capacity and how that relates to attitudes around risk tolerance.
    b. **Third party assessment of community capacity**: A broader assessment (e.g., through social impact assessment or other means) could be undertaken to identify key factors that influence risk capacity across different groups within impacted communities.

TIP 3: INDEPENDENCE OF RISK CAPACITY AND RISK APPETITE

Risk capacity, the ability to withstand or recover from impacts, and risk appetite, the willingness to accept risk, are distinct and may not always move in tandem. For example:

Individuals with low-risk capacity (e.g., low socio-economic or marginalised groups) may exhibit high risk appetite due to factors like the high cost of mitigation or strong attachment to their community.

Conversely, those with high-risk capacity (e.g., wealthy individuals or groups with political influence) may also have high risk appetite because they can absorb impacts or because the benefits outweigh the risks.

However, the opposite can also be true:

Individuals with low-risk capacity may have low risk appetite, recognising their vulnerability to harm.

Those with high-risk capacity may choose a low-risk appetite, opting to avoid risks because they can afford mitigation or prefer greater safety.

Public role

There are two broad pathways for eliciting and incorporating public views on risk tolerance in current practice related to who the decision makers are. Drawing on IAP2 terminology, we refer to these as **consultative** and **empowering** approaches.

Consultative approach

This approach often (although not exclusively) occurs within established statutory and policy processes, where agencies seek public input to inform specific decisions (e.g. national building standards, local government hazard response planning). It typically aims to incorporate community views alongside technical assessments to help define risk thresholds or guide policy. Consultative processes can occur at national (e.g. standards setting), regional (e.g. policy development), or local levels (e.g. land use planning). While often focused on shorter-term decisions, they may also feed into longer-term strategies.

Empowering approach

Empowering approaches are usually longer-term, adaptive, and rooted in local contexts, particularly in areas such as climate adaptation. They can also be found within local government settings, often running alongside and informing statutory and long-term strategic planning processes. Their goals centre on working with communities to explore and resolve issues and develop agreement. They often draw on frameworks related to vulnerability and resilience and aim to build both individual and collective capacity for risk management. Rather than feeding into a single policy decision, these processes support broader conversations and enable action across a wider range of actors.

CASE STUDY EXAMPLE 4: EMPOWERING COMMUNITIES AS DECISION-MAKERS - AMBERLEY BEACH'S OWNERSHIP MODEL

The Amberley Beach Coastal Adaptation Plan project exemplified a truly empowering approach where the community served as primary decision-makers rather than consultees. The council provided facilitation and technical support whilst the community drove consensus decisions. This role emerged from existing strong relationships and trust between council and community. Rather than creating a "council plan," the council adopted the "community's plan" with community-identified values forming the framework for assessing adaptation options. The empowering approach required synthesis of qualitative community discussions into formal planning documents, but ensured the community had genuine ownership over both the process and outcomes. For more on the Amberley Beach case, refer to Appendix 2.

Information needs

Decision-making contexts vary, shaping the types of information (quantitative, qualitative, or a combination) that are considered most credible and useful for understanding public views on risk tolerance. Many decision-makers place high value on quantitative data to support decision-making. For instance, national-level decisions on risk management often require a large representative sample. Quantitative data may also be attractive at regional and local levels to demonstrate social licence for a chosen risk management approach. However, in the highly uncertain environment of estimating hazard impacts and measuring subjective public perceptions, quantitative data can give a misleading

impression of certainty. Care is needed to ensure that a quantitative rendering of public views does not mask real variability or overlook significant divergent perspectives

Qualitative information, including lived experiences, is valuable across all decision-making levels. It can reveal significant values and offer insight into why people hold certain views. This is not an either/or situation. Even when quantitative methods are used, qualitative insights can support analysis and communication, adding depth, context, and meaning. These lived experiences, shared as stories, can also make public perspectives more concrete and accessible to decision-makers.

> "We found it a lot easier to engage with somewhere like Amberley Beach, where they are permanent residents, because we also have settlements like Motunau which is the fishing settlement, and Gore Bay, which is surfing settlement, but they have a really low number of permanent residents."
>
> *Council Climate Change Adaptation Leader*
> *Change Adaptation work leader*

Whether qualitative or quantitative, seeking a good cross-section of a community is important, particularly where the population is large and you cannot engage with everyone.

Community context

As with all public engagement processes, even if aimed at broad public scale engagement, e.g. regional or national, understanding and accounting for the context of the community/communities is critical in effective engagement design. The LTAR engagement framework identifies some general community contextual factors that need to be considered, as well as some factors specific to engagements where natural hazard and climate risks are being considered.

The factors are summarised in Table 3 below. For more information on how to account for these factors you can refer to the LTAR engagement framework (Brown et al., 2023).

COMMUNITY PROFILING – SUPPORT FOR ELICITATION DESIGN

Community profiling can be a useful input to support engagement design. A systematic process that gathers demographic, social, economic, and cultural information about communities exposed to hazards. It identifies community characteristics, vulnerabilities, assets, and capacities that influence risk tolerance and resilience. Community profiling uses existing data sources, surveys, and participatory mapping to create a comprehensive understanding of community composition and risk context. This can provide valuable information to help identify vulnerable populations who may need targeted engagement and tailor risk tolerance discussions to community realities and capacities.

Note a less resource intensive option can be to engage with 'key contacts' – people in different positions in the community who can help represent a spectrum of views, particularly those that might be hard to reach otherwise.

Table 3 Community contextual factors to consider in engagement design (Brown et al., 2023)

General	Risk specific
• Demographics • Nature of relationship between community and council/agency (trust) • Factors impacting the community's ability to engage • Previous engagement experience • Size of community and community connectedness (trust) • Community buy-in to the engagement • Values and norms (and agreement on these across community)	• Temporal proximity to hazard • Spatial proximity to hazard (direct and indirect impact) • Hazard familiarity and acceptance • Distribution of impact / Inequitable impacts • Competing priorities • Connection to place

Needs of decision-makers

Decisions about risk management that require public input on risk tolerance occur across a wide range of contexts, shaped by the factors discussed above. One key influence, both emerging from and distinct from these contextual factors, is the decision-making context itself. This includes questions such as: Who are the decision-makers? and What parameters frame the decision-making? These parameters encompass the scale and scope of the decisions, relevant legal and regulatory frameworks, timeframes for action, authority and responsibility structures, available resources, and political or stakeholder considerations.

As noted earlier, consultative and empowering approaches represent broad pathways to elicitation of public views on risk that are adapted to the needs of different decision-making contexts. In a consultative approach such as might be used in a local government planning context, statutory and political processes shape the decision-making context and different actors within this have varying needs. While formal decision-makers are often elected representatives or, in some cases, resource management commissioners, planning and technical staff play a key intermediary role—using both technical and community inputs to develop policy advice and spatial planning options. Council technical and planning staff seek relatively fine-grained guidance on risk tolerability, and often need to reconcile or relate public and technical perspectives on risk tolerability to:

- support evidence-based recommendations to elected members,
- establish risk thresholds to guide policy and planning choices (such as where to limit housing density, allow development, or consider retreat).

In contrast, political representatives weigh multiple "risks" to community, infrastructure, legal compliance, finances, and politics; balancing hazard risk alongside other policy goals (e.g., housing supply and infrastructure investment). Their needs of the process include:

- whether the process demonstrates procedural legitimacy—i.e. was public input sought fairly and were engagement opportunities adequate,
- identifying signals of potential outrage or distrust, such as concerns about the hazard assessment, the integrity of the process, or the council's responsiveness, and
- clarifying if there is a clear public mandate to act or significant division over specific actions.

In empowering approaches, communities may be both the source of knowledge and the decision-makers regarding actions they are individually or collectively prepared to take in response to hazards. These approaches are more likely to be used in adaptive situations where change occurs progressively, and all parts of the system need to learn and determine their paths forward. Risk tolerance is often addressed more implicitly as part of broader community-led exploration and dialogue.

Decision-making in these contexts relies on supported learning, dialogue, and reflection. Taking the time to elicit and understand views on risk tolerability can contribute to this by:

- exploring the future consequences of hazards,
- grounding those consequences in the real impacts for communities,
- revealing which consequences matter most to the community,
- encouraging both individual and collective resilience.

Working with Māori

While there is little specific guidance on having risk tolerance conversations with Māori communities, the principles, scoping considerations, and methods outlined in this guidance can inform engagement approaches. Approaches should also be developed in partnership with Māori and applied in ways that respect their special situation and Treaty partner status.

> "[The Iwi we spoke to] kind of understood and expected that [as individuals] . . . they would pretty much experience and be expected to think about risk in a way that was probably no different to what anyone else's would be at that level.
>
> But they were interested in identifying a whole bunch of interests in cultural areas, matters of significance and locations and ways of looking at risk. And you know, their land, their wāhi tapu and all these other locations that we need to be aware of and to take account of when we're actually developing our plan change."
>
> *Council Policy and Resource Consent Planner*

There is significant literature on engaging with Māori communities produced by Māori authorities, government departments and councils (see for example Bay of Plenty Regional Council Māori Policy Unit (2011)). In addition, there is a growing body of work on Mātauranga Māori in relation to climate change, risk, resilience and disaster preparedness, including the Te Kaahui o Rauru and the Ministry for the Environment's Ngā Rauru Kiitahi Climate Change Strategy (2021), the work of the Māori Disaster Risk Reduction Research Centre, and Rout et al.(2024).

From these sources, it is clear that tangata whenua are likely to view hazards and risks uniquely, to have strong relationships to place and its natural and historical features, and to hold relevant knowledge of local hazards (which may or may not be public). This connection to place is deeply rooted in ancestral, collectively owned land, meaning that alternatives to that connection are generally not an option. It goes far beyond a simple preference for where one lives. The temporal aspects scoping factor is particularly relevant as Māori perspectives often include long intergenerational time horizons. Including intergenerational time horizons means risk tolerance assessments should consider the long-term impacts of decisions across multiple generations, reflecting Māori values of sustainability, cultural continuity, and guardianship of ancestral lands. Closely linked is the consequences scoping factor, which for Māori communities extends beyond immediate tangible

effects to include cultural and spiritual impacts on sites such as urupā (burial grounds), marae, and other places of significance. These consequences span diverse cultural values and community priorities that must be explicitly acknowledged and integrated into risk management and planning processes.

As outlined elsewhere, meeting decision-maker needs and parameters shapes effective risk tolerance assessments. For Māori communities, this means recognising their role as decision-makers themselves. Treaty-based, co-designed approaches enable Māori meaningful input and control over engagement and assessment content. Early involvement of iwi liaison staff and relevant organisations, alongside appropriate resourcing, ensures alignment with both community priorities and wider decision-making contexts.

3.3. Questions to ask before starting your elicitation design

Below is a list of questions that can help you scope your engagement across the considerations discussed above.

TIME HORIZON	How long will the effects of the decision endure? How likely is it that risk tolerance will change over that period? Does an approach need to be developed to monitor risk tolerance over time to support adaptation?
SCALE	What is the scale of the engagement? Community, local, regional or national?
CONSEQUENCES	What consequences are most important to the decision? What consequences are most important to the community?
RISK PERSPECTIVES	Is it more important to understand a collective view on risks or do we need to focus on perspectives of individuals that may be affected?
RISK CAPACITY	To what extent do we need to understand the capacity of a community to cope with the risk versus the appetite of a community to live with the risk?
PUBLIC ROLE	How will public perspective be integrated? As part of a one-off consultation or embedded in an ongoing decision-making process? Is there a desire to empower the community through the decision process?
INFORMATION NEEDS	To what extent is quantitative data on public perspectives required?

COMMUNITY CONTEXT	How will the hazard impact different groups in the community? How personally familiar are people in this community with the short and long-term effects of hazards or significant hazard events? How might hazard impacts (e.g., to council, social and physical infrastructure, business, individual, households, or even central government) accrue across this community? What other issues are currently front of mind for this community? Does this place have characteristics that make it special and of importance for the people who live there or who use the area?
NEEDS OF DECISION MAKERS	Who are the decision-makers, and what kind of input do they find most useful (e.g. fine-grained thresholds, stories of concern, clear mandates)? What constraints shape how public views can be used (e.g. statutory timelines, political pressures, pre-defined planning frameworks)? Does the approach help reconcile different needs, such as technical planning needs for clear thresholds and political needs for visible legitimacy?
WORKING WITH MĀORI	Does the design allow Māori communities meaningful input and control over engagement and assessment content? How are intergenerational time horizons reflected in the questions and scenarios used? Have consequences beyond physical and economic impacts—such as cultural, spiritual, and community connections—been considered? Is adequate resourcing in place to support a co-designed process?

4. Methods and tools

There are many practical ways to elicit public views on risk tolerance. Approaches vary widely — from structured deliberative processes to simple surveys; and can be used to support anything from rapid input on specific issues to in-depth exploration of public risk preferences and trade-offs.

The elicitation of risk tolerance often unfolds in stages. These may include individuals reflecting on their own exposure, values, and priorities; combining individual perspectives to build a collective picture of risk tolerance; and feeding those insights into decision-making. The process used at each stage can differ, depending on the scale, purpose, and context of the elicitation.

Methods range from small-group conversations (such as community meetings in Amberley Beach Coastal Adaptation plan project), to representative panels (e.g. the community panel in the Wharekawa Coast Climate Adaption planning process), to discussion groups based on shared risk exposure (as used in Gorge Road), or national-scale surveys on willingness to pay. Each has strengths and limitations depending on what is being sought (more details are available on these case studies in Appendix 2.

Within these methods, the choice and design of specific tools, such as visual aids, or scenario prompts—play a critical role in shaping how effectively risk tolerance perspectives are elicited and understood. The interplay of methods and tools allows tailoring the elicitation to suit different community contexts and objectives.

The next two sections outline a range of methods commonly used to elicit risk tolerance (Section 4.1), followed by tools that can support and strengthen those methods (Section 4.2).

Method: A structured way of eliciting views on risk tolerance (e.g. survey, panel, focus group).

Tool: A specific strategy or component that can be used within a method (e.g. visual aids, consequence tables, scenario prompts).

4.1. Methods

Method	Explanation	Value of method
Surveys	Structured questionnaires that collect quantitative and/or qualitative data from participants about their risk tolerance.	To obtain baseline or foundational data to build a picture of community risk tolerance from. To compare risk tolerance across geography, demographics or risk levels. To reach many people.
Interviews	Individual or small group conversations using structured, semi-structured, or open-ended questions to explore individuals' risk tolerance.	To deeply explore individual perceptions that shape risk attitudes. To create nuanced understanding of individual risk tolerance. To address sensitive or triggering feelings around risk tolerance, personal stories or experiences.
Drop-ins	Informal, accessible events that participants can visit at their convenience to learn about hazards, risks, view information displays, talk to experts, and provide feedback on risk tolerance.	To build awareness and understanding of hazard impacts. To establish initial community values/concerns that inform the engagement process and future decisions.
Structured discussion groups	Facilitated small group discussions designed to explore specific risk tolerance questions in depth with carefully selected participants.	To explore the perspectives of specific demographics or interest groups. To seek feedback on proposed approaches. To develop a shared vocabulary and understanding of the risks. To understand the spread of viewpoints. To do this, multiple groups can be run, strategically segmented by key factors such as hazard exposure or demographic.
Community workshops	Structured, interactive sessions where community members actively participate in learning through facilitated activities around values and risk tolerances.	To enable collective learning and deliberation about the risks. To build a community's capacity to engage with information about the risks they face. To seek input on risk management questions.

Method	Explanation	Value of method
Community panels	Groups of community representatives who meet regularly over an extended period to consider risk information, develop recommendations, based on their understanding of the community risk tolerance.	To seek ongoing input throughout a process. To build community capacity for informed choice. To accommodate diverse representation.
Citizen juries	Randomly selected groups of citizens who are provided with extensive information and expert testimony before deliberating and making recommendations on risk tolerance.	To seek carefully considered public judgment on the risk. To provide high levels of legitimacy for decisions that may have significant long-term implications. To understand diverse views.
Whole community engagement	Comprehensive approaches that employ multiple methods to involve an entire affected community in discussions and decision-making about risk tolerance.	To build community cohesion and subsequently resilience. To foster consensus and create broad support for risk management strategies. To ensure equitable participation.

CASE STUDY EXAMPLE 5: COMMUNITY PANELS AS TECHNICAL TRANSLATORS – BUILDING LOCAL EXPERTISE

Community panels can serve as technical translators, as demonstrated by the Wharekawa Coast Climate Adaptation project where panel members became "risk experts" themselves over their 4-year engagement. Rather than simply collecting general public opinions, the panel members spent extensive time understanding complex technical risk assessments so they could meaningfully translate this information for their neighbours. When distributing risk tolerance survey booklets throughout the community, panel members often discussed the technical content over "cups of tea," helping residents understand probability data and consequence scenarios. This translation role meant the community panel didn't just represent community views to councils but also helped build community capacity to engage with technical information - ensuring more informed risk tolerance judgements across the wider population. For more on the Wharekawa Coast case see Appendix 2.

4.2. Tools

Most methods can support the elicitation of risk tolerance if the right tools are used. Some tools lend themselves to certain methods, but most are versatile depending on how they are designed and applied. The tools outlined below can help surface, structure, and evaluate public perspectives on risk tolerance — and, importantly, contribute to the quality of those perspectives by supporting reflection, building understanding, and strengthening people's capacity to form informed judgments.

Risk tolerance matrices

A risk tolerance matrix is an analytical framework designed to systematically assess, visualise, and quantify the level of risk a community or individual is willing to tolerate before action becomes necessary. It combines probability with consequence to establish risk tolerance thresholds. The matrix typically shows these relationships in a grid format where one axis represents event frequency, and the other axis represents different impact categories or scenarios. This provides a tangible way to transform subjective perceptions of risk into objective criteria for decision making.

A risk tolerance matrix can consist of:

- Likelihood - How often or how likely an event is expected to happen (e.g., once every 100 years or 10% chance in 20 years).
- Consequences – The type and degree of impact. These can be scenario based (e.g. major or moderate) or can be based on type of impact (e.g. human, economic, built, natural).

The matrices provide a structure for participants to indicate tolerance thresholds - the point at which impacts become intolerable (often through use of a traffic light system for acceptable, tolerable and intolerable).

Key features

- Scenario definition establishes what constitutes major and moderate hazard events in the local context.
- Impact category selection identifies relevant impact types such as human, buildings, infrastructure, or economic impacts.
- Stakeholder engagement gathers community input on when impacts become acceptable, tolerable, or intolerable.
- Threshold visualisation marks the frequency points where impacts cross critical tolerance boundaries.

The matrix visually represents when stakeholders can no longer tolerate specific impacts at specific frequencies. For instance, stakeholders might tolerate major flooding if it occurs only once every 100 years but find it intolerable if the same flooding happens every 50 years.

Benefits

- Provides a structured approach to evaluating subjective risk tolerance.
- Enables comparison between different stakeholder groups.
- Helps prioritise resources for risk reduction.
- Creates a transparent process for decision-making.
- Establishes clear thresholds that trigger action.
- Accommodates changing conditions by allowing periodic reassessment.

CASE STUDY EXAMPLE 6: CREATING LOCATION-SPECIFIC RISK MATRICES - WHAREKAWA'S DESIGN PROCESS

The Wharekawa Coast Adaptation project used risk tolerance matrices to support their community elicitation process. First, they divided their 20km coastline into five geographic compartments, each split into coastal (A) and inland (B) segments to reflect different exposure levels. For each compartment, they developed specific scenarios describing major and moderate coastal inundation events, detailing impacts across four consequence categories: homes and properties, rural land, roads and bridges, and recreation and tourism.

Community members then used tables showing return periods from once every 24 months to 200 years to indicate how often they could tolerate each described consequence in their specific location. Crucially, the final section asked people to consider their responses across all impact categories together to determine their overall risk tolerance for their area - requiring participants to weigh different types of consequences against each other to arrive at a comprehensive tolerance threshold.

For more information on Wharekawa Coast's case see Appendix 2.

Examples

Below are examples of what an individual risk tolerance matrix assessment might look like. Figure 4 shows how Wharekawa Coast survey participants were asked to consider their tolerance to disruptions. For each impact category (e.g. roads), participants indicated how often they could tolerate the described consequences (presented as two scenarios: a moderate and major event), marking preferences on a table with a range of return periods. Participants marked their tolerance with an X once they felt they couldn't handle the impacts happening at that level of frequency. Figure 5 shows a slightly different application of risk matrices in the Bay of Plenty, "I can live with this" project (Kilvington & Saunders, 2015). The risk tolerance matrix simply represents combinations of scale of consequences (described as scenarios from 1 minor to 5 catastrophic) and likelihood (from likely to very rare). Participants at public workshops were asked to assess whether each combination of consequence and likelihood was acceptable, tolerable or intolerable.

ARP	200yr	100yr	75yr	50yr	20yr	10yr	5yr	2yr	1yr	6mth	2.4mth
Major event				X							
Moderate event								X			

If a threshold is not reached because the impacts are low, colour all squares green.

Figure 4: Example of a risk tolerance matrix from Wharekawa **(Hauraki District Council, 2022)**

BOPRC – Community sessions on risk and natural hazard management – worksheet

I can live with this risk …

Your councils could spend millions of dollars and set new rules to protect the community from all sorts of natural disasters, but some of them might not happen for another 1,000 years – or they could happen tomorrow. That's the risk. How much do you think we need to plan for?

Nothing we do is free from risk, so how often do you think the community would put up with each of these disasters? *We have based these assumptions of lifetime on an 80 year lifespan.*

Think of an event that could happen in your community then apply this image when working through this table – read the scenario in each cell across the page and mark your thoughts in each box using ticks – how bad is it? How likely is it? ● Acceptable – this is part of life that I could put up with ✓ Tolerable – my family and community could recover in time if we had to *X* Intolerable – NO WAY – this risk is too great. It can't be justified		Likelihood				
		Once every 50 years *90% chance for me*	Once every 100 years *80-90% chance for me*	Once every 100 - 1000 years *15-80% chance in my and my grandchild's lifetime*	Once every 1000-2500 years *5-15% chance in my and my grandchild's lifetime*	More than 2,500 years *Less than 5% chance in my and my grandchild's lifetime*
Consequences	The natural event is catastrophic: Nearly half of the liveable homes are wiped out. Some can be rebuilt but many can never return. One quarter of hospitals/maraes have been badly damaged and unable to be used safely; Many are beyond repair. It kills over 100 people. Businesses and livelihoods are lost.					
	Up to a quarter of schools, hospitals, and maraes have been damaged. Half of the homes in your community have been damaged; some need to be rebuilt but many can't. It may take up to six months to fix water/roads etc.. Over 10 people died with more than 100 injured. About 20% of the town centre will be closed off for anything from a week to a month.					
	In your community of 1000 homes, about 60-100 are unlivable. Power and water networks are knocked out. For a week daily life revolves around getting bottled drinks and queueing for portaloos. Some businesses can't open. Up to 100 injured.					
	This event has affected about 20–100 houses in your community of 1,000 with local marae and school out of action for up to a day and the town centre is closed briefly. The hospital has some damage but is able to function. You may need to use a bucket for the toilet for the day. No one died but 10 people were injured.					
	You had a big fright from this event but basically there was no real damage, and the local shops were only closed for a couple of hours. No one was injured.					

Figure 5: Bay of Plenty Risk matrix assessment sheet for the "I can live with this" project **(Kilvington & Saunders, 2015)**

Willingness to pay surveys

Willingness to Pay (WTP) surveys offer a quantitative approach to evaluating risk tolerance by measuring the monetary value individuals place on risk reduction. This economic valuation technique (one of a family of techniques called *Contingent Valuation*) asks respondents how much they would be willing to pay to avoid a specific risk or to reduce its probability or consequences. Risk tolerance can be directly inferred from these responses. Lower WTP values indicate higher risk tolerance (greater willingness to accept the risk), while higher WTP values suggest lower risk tolerance (stronger desire to avoid the risk). The relationship between payment amounts and risk levels creates a quantifiable threshold that reveals the point at which risks become unacceptable to respondents.

Common techniques

- Direct questioning about payment amounts.
- Dichotomous choice scenarios with specified costs.
- Payment card selections from value ranges.
- Bidding game techniques with adjustable amounts.

While WTP surveys face challenges like hypothetical bias and difficulty in valuing low-probability/high-consequence events, they remain a powerful tool for understanding risk tolerance through the lens of economic valuation, complementing other tools like risk tolerance matrices.

Benefits

- Quantifies public preferences for risk reduction in comparable monetary terms.
- Informs cost-benefit analyses of potential risk mitigation measures.
- Highlights differences in risk tolerance across communities or demographic groups.
- Supports transparent, evidence-based decision-making in public policy.
- Establishes benchmarks for evaluating the economic efficiency of regulations.

Scenarios

Scenarios are static, credible descriptions of the impacts of hazard events. They allow community members to visualise possible outcomes of different hazard events, helping to turn abstract risks into a tangible situation. Agencies can maximise the effectiveness of scenarios by ensuring impacts described are set within the specific community context, ensuring technical accuracy through expert verification. Scenarios can be used as a reference point to support other risk tolerance elicitation tools such as surveys, risk tolerance matrices or multi-criteria analyses) on risk tolerance.

Key features

- A fulsome description of a plausible hazard event, detailing impacts on people, infrastructure, economy, and environment.
- Visuals (e.g. maps) can help participants to visualise the impacts.
- Multiple scenarios, of varied impacts and likelihood, can help participants explore their risk tolerance and risk capacity.

Scenarios are a low-cost way of building understanding and drawing out risk perspectives amongst participants. Scenarios are particularly useful where participants have low knowledge or experience of the hazards or impacts being explored.

Benefits

- Low cost.
- Support understanding of risks.
- Can be integrated with and/or support other tools.

Simulations

Immersive simulations provide interactive scenarios that allow participants to visualise and experience potential hazard impacts. They have the potential to stimulate emotional responses. Simulations are dynamic (through time) applications of scenarios and can be applied as a simple tabletop exercise through to a fully immersive virtual reality environment. As with scenarios, the inclusion of recognisable local landmarks enhances relevance. Guided debriefing discussions help participants process their simulation experiences and articulate insights about risk tolerance.

Key features

- Virtual reality environments create immersive experiences that trigger authentic emotional responses to simulated hazards.
- Physical mock-ups provide tangible demonstrations of potential impacts using scale models.
- Augmented reality tools overlay hazard information on familiar environments.
- Tabletop simulations allow collaborative exploration of scenarios in a controlled setting.

Simulations are more resource intensive than static scenarios. However, immersive simulations are particularly valuable when abstract risks are difficult to conceptualise, where buy-in is low, or where there may be value in challenging individual bias'.

Benefits

- Enhances comprehension of complex risk concepts through experiential learning.
- Emotional engagement that creates memorable impressions of potential consequences.
- Inclusive participation that accommodates different learning styles and knowledge levels.
- Contextual relevance through incorporation of local features and familiar scenarios.
- Transparent decision frameworks that help participants understand trade-offs involved in risk management.

Comparative experience or ranking

Comparative ranking evaluates risks, consequences, or mitigation options by having participants directly compare alternatives instead of using absolute values. Participants rank options based on their judgment of importance, severity, or effectiveness, often using tools like placing tokens in boxes representing options (either in one box for strict prioritisation or distributed to show nuanced

preferences). This approach reveals collective preferences by making implicit judgments explicit. Risk tolerance levels become apparent by observing where participants draw the line between acceptable and unacceptable risks in their rankings.

Key features

- Direct ranking organises items from highest to lowest priority based on predetermined criteria.
- Token allocation distributes a fixed number of points among options to indicate relative importance.
- Dot voting allows participants to place visual indicators on options to show preferences.
- Pairwise comparison evaluates items by comparing them two at a time, revealing preference hierarchies.

Comparative ranking serves as an effective bridge between technical assessment and public values, creating a framework for discussing and addressing not only which risks matter most, but also which consequences are least acceptable and which mitigation strategies offer the most promising solutions that align with community preferences.

Benefits

- Simplifies complex assessments when quantitative data is limited.
- Makes implicit value judgments explicit and transparent.
- Facilitates stakeholder engagement and builds shared understanding.
- Accommodates multiple perspectives and types of expertise.
- Reveals differences in perception across groups.
- Provides clear prioritisation to guide resource allocation.
- Can be implemented with minimal technical resources.
- Creates logical connections between risks, consequences, and mitigation options.

CASE STUDY EXAMPLE 7: TOKEN VOTING FOR OPTION PREFERENCES - GORGE ROAD'S PROPORTIONAL CHOICE

After thorough discussion of four management options, Gorge Road elicitation process participants used tokens to vote proportionally for their preferences rather than selecting single options. The four choices ranged from "status quo" (accepting current risk) through "engineering" and "manage" (with three development levels) to "reduce" (removing vulnerable structures). This token allocation method allowed participants to express nuanced preferences and indicate how strongly they supported different approaches, helping reveal both primary choices and secondary preferences.

For more information on Gorge Road case see Appendix 2.

Multi-criteria analysis

Multi-criteria analysis (MCA) is a useful framework to elicit risk preference information. MCA enables participants to score a range of options (for example risk mitigation options and a 'do nothing' option) alongside a set of pre-agreed criteria. The criteria can represent 'what matters most' to a community and could include any number of consequence types such as risk to life, property, environment, community, cost etc. Options can be scored based on a simple summing of score under each criterion, or criteria can be weighted based on importance. MCA provides participants with a structure to address the trade-offs between different options. It builds on comparative ranking approaches by not just looking at overall preference but understanding the value of each option across a range of criteria.

Key features

- A set of pre-agreed or co-designed criteria, to score options against.
- Determination of weights for each criterion (if any).
- A set of options to score against the criteria.

MCAs are suited to short-term decisions, where multiple consequences need to be considered and weighed, and where quantitative outputs are desired. It is useful to couple MCAs with scenarios to help participants visualise the impacts of different options. Table 4 provides an example of what an MCA analysis output looks like.

Benefits

- Provides a structured approach to evaluating risk management options.
- Enables comparison between different stakeholder groups.
- Helps prioritise resources for risk reduction.
- Creates a transparent process for decision-making.

CASE STUDY EXAMPLE 8: INTERACTIVE DECISION-SUPPORT TOOLS - AMBERLEY BEACH'S ADAPTATION EXPLORER

The Amberley Beach Coastal Adaptation risk tolerance elicitation process used the council's "Coastal Adaptation Explorer" as an interactive decision-support tool that allowed residents to systematically evaluate adaptation options (such as bunds, rock revetments, or managed retreat) against multiple criteria. The tool assessed options against cost, reduction in hazard exposure, community priorities and values, and ease of consenting. This was brought together visually to assist the community in making informed trade-off decisions, effectively supporting the weighing up of costs and benefits of action versus inaction. The interactive nature helped residents surface priorities and concerns related to risk management whilst developing informed judgement rather than reactive responses. For more information on Amberley Beach case see Appendix 2.

Table 4: Example of MCA analysis

	Weighting	Option 1 – do nothing	Option 2	Option 3	Option 4
CRITERIA 1 – E.G. LIFE SAFETY	50%	4	6	8	3
CRITERIA 2 – E.G. PROTECTION OF PROPERTY	20%	5	4	7	5
CRITERIA 3 – E.G. COST	30%	2	9	5	7
SCORE		**3.6**	**6.5**	**6.9**	**4.6**

Values mapping

Values mapping explores risk tolerance by grounding engagement in what people care about over the long term. It includes two distinct but related approaches: *Outcomes Mapping*, which invites people to reflect on future goals, and *What Matters Most*, which focuses on prioritising specific values or concerns.

Outcomes Mapping shifts the conversation from immediate options to longer-term aspirations, such as a thriving coastal community or a safe and connected whenua for future generations. Participants are encouraged to think about what must be preserved, what could adapt, and what kinds of change would be acceptable over time. This helps surface deeper social, cultural, and ethical priorities that might not emerge in more conventional risk discussions.

What Matters Most is a more structured prioritisation exercise. Participants identify which values are most important to them — either from a pre-populated list or through open discussion — and may be asked to rank or allocate points to show relative importance. This can reveal variation across the community and make explicit the trade-offs that people are willing (or unwilling) to make.

Key features

- Outcomes Mapping supports visioning by asking people to reflect on long-term goals, necessary conditions for success, and acceptable forms of change.
- What Matters Most captures value preferences through simple ranking or sorting tasks, often using lists or token allocation.
- Both approaches can be applied individually or in groups to reveal shared and divergent priorities.
- Helps clarify which risks, consequences, or changes are considered tolerable, and which are not.

Benefits

- Expands the range of impacts considered in risk tolerance elicitation.
- Surfaces ethical, cultural, and long-term concerns.
- Makes implicit trade-offs explicit.
- Helps identify potential pressure points early.
- Grounds technical assessments in community values.
- Strengthens legitimacy and alignment of decisions with public priorities.

CASE STUDY EXAMPLE 9: VALUES IDENTIFICATION UNDER STRESS - WHAT MATTERS MOST?

The Gorge Road elicitation process included a "What matters most?" station during their drop-in sessions where people could add their own value statements and agree or disagree with others' contributions. The tool was designed by drawing on the Social Impact Assessment and discussions with council staff for their views on possible community concerns. This proved essential for linking what technical and planning experts thought people should worry about with what people were actually concerned about. The process expanded understanding beyond initially considered consequences of life loss, injury, and property damage to include long-term uncertainty, financial impacts, property value changes. Importantly, some concerns related more to the proposed risk management solutions than the risk itself. The values identified were then used to assess how well each response option addressed people's actual concerns (i.e. formed the basis of a multi criteria analysis).

For more information on Gorge Road see Appendix 2.

Serious games

Serious games evaluate risk tolerance by engaging participants in immersive, interactive scenarios where they make consequential decisions under uncertainty. Participants navigate simulated risk situations through role-playing, digital simulations, or board games, making choices that reveal their comfort levels with different hazards. Unlike conventional surveys, serious games capture risk attitudes through behaviour rather than stated preferences, often incorporating elements like limited resources, time pressure, and realistic consequences. This approach reveals actual decision-making patterns in risk contexts, uncovering both explicit and implicit risk attitudes. Risk tolerance levels become apparent by analysing which risks participants are willing to accept or mitigate during gameplay, and how their strategies change as stakes or probabilities shift.

Key approaches

- Role-playing exercises place participants in stakeholder positions to reveal how different perspectives influence risk decisions.
- Digital simulations provide interactive computer-based scenarios that can capture detailed decision metrics.
- Tabletop exercises foster collaborative problem-solving under pressure, revealing group risk dynamics.
- Virtual reality experiences create immersive environments that elicit authentic emotional responses to risks.

Serious games serve as powerful tools for understanding risk tolerance by creating safe spaces to experience risky situations, observe decision-making patterns, and reflect on risk preferences. The interactive nature of games helps participants develop more nuanced understandings of their own risk attitudes while generating valuable insights for researchers and policymakers about how different stakeholders perceive and respond to risks in practice.

Benefits

- Reveals actual behaviours rather than hypothetical statements about risk tolerance.
- Provides experiential learning about complex risk concepts.
- Allows safe exploration of high-consequence scenarios.
- Creates emotional engagement that better reflects real-world decision processes.
- Facilitates group learning and consensus-building about risk management.
- Uncovers unconscious biases and heuristics in risk assessment.
- Bridges knowledge gaps between technical experts and non-specialists.
- Enables testing of different risk communication approaches.

5. Designing the elicitation approach

Designed well, you can apply almost any engagement method or tool to any situation. In practice, many assessments of risk tolerance actually involve more than one method, and often these methods are used in ways that help inform the others. It is possible, for example, to do a set of interviews to learn about the context and the community, develop a survey based on what comes out of those interviews, and then use the interviews or perhaps a ground truthing process to help interpret the results of the survey. Similarly, simulations or serious games might be used to build hazard and consequence awareness, and a multi-criteria analysis or survey using a risk matrix might be subsequently applied to gather quantitative data on risk tolerance perspectives. However, there are some situations where some methods or tools are better suited than others.

Section 5.1 focuses on tailoring methods and tools to fit the specific context and intended outcomes of an elicitation, based on scoping factors introduced earlier. Section 5.2 then addresses the practical challenge of putting these pieces together — combining methods thoughtfully and sequencing them to build on each other's insights.

5.1. Methods, tools and how they map to scoping factors

In the table on the next pages, the scoping factors from Section 3 are used to help identify appropriate methods and tools, based on the situation and the intended outcomes of the elicitation. Note that the factors below are not the only things that will affect your choice of method. Community demographics (and their ability to engage), existing relationships between community and agency, and availability of agency resources (time, money and people) will all impact your choice. Refer to the *LTAR engagement framework* for more information on how community context affects engagement approaches.

Time horizon immediacy

SHORT

In situations where there is a pressing risk and emotions amongst participants might be high, then you need to choose methods and tools that are quick to establish, are grounded in the current situation, and allow you space to manage participant emotions.

EXAMPLE METHODS
- Drop ins
- Workshops
- Interviews

EXAMPLE TOOLS
- Comparative experience or ranking
- Multi-criteria analyses

LONG

In situations where you likely have longer to plan and run your engagement, and emotions are less likely to be heightened, you can choose methods that are more time intensive. You can also choose tools that allow participants to explore a range of outcomes.

EXAMPLE METHODS
- Citizen jury
- Community panel
- Whole of community engagement

EXAMPLE TOOLS
- Risk tolerance matrices
- Simulations
- Scenarios
- Serious games
- Values mapping

Time horizon longevity

SHORT

In situations where the impacts of decisions are short-lived, almost any method or tool can be applied. Your focus will be on capturing current risk preferences.

EXAMPLE METHODS
- Any

EXAMPLE TOOLS
- Any

LONG

In situations where decisions will have implications long into the future, it is helpful to choose methods that allow you to understand the drivers behind risk preferences. This information can help decision makers consider how risk preferences could change in the future and factor that into decision-making. Experiential tools are useful to help abstract future risks be more relatable.

EXAMPLE METHODS
- Citizen jury
- Community panel
- Whole of community engagement
- Workshops
- Structured discussion groups
- Interviews

EXAMPLE TOOLS
- Simulations
- Scenarios
- Serious games
- Values mapping

Scale

SMALL (E.G. COMMUNITY)

There are some methods more suited to smaller scale engagement processes as they do not easily scale up to cover large populations/geographic areas. Most tools can be applied at a small scale.

EXAMPLE METHODS
- Drop-ins
- Whole of community engagement

EXAMPLE TOOLS
- Any

LARGE

In situations where risk tolerance elicitation needs to capture a wide range of perspectives, methods and tools that can scale up to capture diverse and representative perspectives are helpful.

EXAMPLE METHODS
- Citizen jury
- Survey
- Interviews
- Structured decision groups

EXAMPLE TOOLS
- Risk tolerance matrices
- WTP Surveys
- Comparative experience or ranking
- Scenarios

Consequences

SINGLE

In situations where you are considering one consequence type (e.g. life safety) in isolation, almost any method or tools can apply.

EXAMPLE METHODS
- Any

EXAMPLE TOOLS
- Any

MULTIPLE

In situations where there are multiple, complex consequences, methods and tools that allow participants to understand and make sense of varied and competing consequences are helpful.

EXAMPLE METHODS
- Citizen jury
- Community panel
- Whole of community engagement
- Workshops
- Structured discussion groups

EXAMPLE TOOLS
- Simulations
- Scenarios
- Serious games
- Multi-criteria analysis
- Values mapping
- Comparative experience or ranking

Risk perspective

INDIVIDUAL

In situations, where you are focussed on gaining individual perspectives on risk tolerance, then methods that elicit responses from individuals with limited interaction are most suitable. Almost any tool can be applied to elicit individual perspectives.

EXAMPLE METHODS
- Survey
- Interviews
- Drop-ins

EXAMPLE TOOLS
ANY

COLLECTIVE

In situations where you are aiming to get a collective view on risk tolerance, methods that allow multiple voices to be heard and discussed are helpful. Most tools can be designed to support collective views.

EXAMPLE METHODS
- Citizen jury
- Community panel
- Whole of community engagement
- Workshops
- Structured discussion groups

EXAMPLE TOOLS
- Any

Risk capacity

SEPARATE

In situations where risk capacity is considered separately from risk tolerance, almost any method can apply. Methods and tools that do not easily integrate education and learning elements are suitable.

EXAMPLE METHODS
- Survey
- Interviews

EXAMPLE TOOLS
- Risk tolerance matrices
- WTP surveys

MULTI-CRITERIA ANALYSIS

INTEGRATED

In situations where it is important to ensure risk capacity is considered in subsequent consideration of participants' risk tolerance, methods and tools that readily allow education and learning to be embedded are helpful.

EXAMPLE METHODS
- Citizen jury
- Community panel
- Whole of community engagement
- Workshops
- Structured discussion groups

EXAMPLE TOOLS
- Simulations
- Scenarios
- Serious games

Public role

CONSULTATIVE

In situations where elicitation of views is undertaken for input into subsequent decision processes, almost any method can be used, provided they demonstrate representative and/or diverse perspectives of the community in question. Similarly, almost any tools can be applied.

EXAMPLE METHODS
- Survey
- Interviews
- Drop-ins
- Structured decision making
- Workshops

EXAMPLE TOOLS
- Any

EMPOWERING

In situations where communities are empowered to drive the decision process, methods that enable discussion and consensus decision-making are important. Almost any tool can be designed to support this.

EXAMPLE METHODS
- Citizen jury
- Community panel
- Whole of community engagement

EXAMPLE TOOLS
- Any

Information needs

QUANTITATIVE

In situations where quantitative data is sought, methods and tools where representative counts of opinions can be collected will be more suitable.

EXAMPLE METHODS
- Survey
- Drop ins

EXAMPLE TOOLS
- Risk tolerance matrices
- WTP surveys
- Multi-criteria analysis
- Comparative experience or ranking

QUALITATIVE

In situations where qualitative data is, almost any method or tool can apply.

EXAMPLE METHODS
- All

EXAMPLE TOOLS
- Any

5.2. Putting together an elicitation approach

Sequencing and integration

Designing an elicitation approach involves thoughtfully combining methods and tools to match the purpose, context and resources available. While Section 5.1 focused on matching methods and tools to scoping factors, this section considers how to assemble these components into a coherent process that meaningfully engages with the key elements of risk tolerance elicitation outlined in Section 2.3:

1. **Underlying community values, including fairness, equity, and trust** – These may seem like "nice to have" features, but they are often central to how communities judge what is tolerable. For example, questions of fairness across locations or populations, such as whether inland rural residents should help bear the cost of coastal risk mitigation, can strongly shape what people see as acceptable. Tools like outcomes mapping or 'What Matters Most' can help surface these social priorities.
2. **Awareness of the hazard and views on its significance** – This forms essential grounding for any elicitation process. People cannot form meaningful views on tolerability without first being aware of the hazard and believing it poses a real possibility. Eliciting views on comfort with a hazard (element 3) is only meaningful once a baseline understanding of the hazard exists. If participants say, "I don't believe there is a hazard," then their tolerance of it is moot. In most contexts, some form of education or awareness-raising will be needed, for example, through visuals, storytelling, or staged drop-ins that help make the hazard real and personally relevant.

> "... we presented them with the science. But then, at the same time, we asked them to present us with their testimonies and their photos and their recollections. So it was balanced like they had a chance to, I guess, validate our science, or we could use their experiences to validate our science."
>
> *Council climate change adaptation work leader*

3. **Comfort with the likelihood and consequences of hazard events** – This element sits at the core of any risk tolerance elicitation process. It involves exploring how people feel about both the probability of a hazard occurring and the potential consequences if it does.
4. **Capacity to live with or adapt to hazard impacts** – Comfort with risk also depends on whether individuals and communities believe they can withstand, adapt to, or recover from impacts. Acceptability is not just about the risk itself, but about the resources and resilience available to respond.
5. **Priorities and concerns related to risk management, including trade-offs between action and inaction** – Elicitation must help people understand the implications of their judgments both in terms of the impact if the risk is not reduced and the impact of the proposed risk reduction measures. Risk cannot be accepted or rejected in the abstract; what matters is what that acceptance or rejection *means*. For example, saying a risk is intolerable may imply managed retreat from an area, which in itself might be unacceptable to some. People need enough information to weigh the real consequences of their choices.

Not all elicitation methods or tools will address all these elements equally. For example, a national willingness-to-pay survey may provide quantitative insight into trade-offs (element 5) but may not

adequately capture community values or hazard awareness (elements 1 and 2). Conversely, small group discussions or outcomes mapping exercises can reveal rich insights into values and social priorities but may not produce broadly generalisable quantitative thresholds.

Therefore, combining multiple methods and tools is often necessary to develop a fuller picture. Awareness-building activities such as drop-in events or scenario exercises can lay a foundation by improving understanding of the hazard and its impacts (elements 2 and 3). These can be followed by surveys or structured discussions to explore comfort with risk and management priorities (elements 3 and 5). Qualitative approaches like interviews or community panels add depth by surfacing values and concerns (elements 1 and 4) which may not emerge through quantitative means alone.

Careful sequencing and integration enables participants to reflect and refine their views over time, moving beyond initial reactions toward more considered perspectives. Directly asking about comfort with a hazard and its impacts (element 3) only makes sense after participants understand and accept the hazard's existence and how it might affect them personally (element 2); without this foundation, discussions about risk tolerance can be meaningless. However, any method or tool can integrate some form of information sharing and assessment of awareness to help build this foundation.

Sequencing can also guide the progression from abstract or general ideas about risk to more concrete decisions. Methods and tools can be layered to support different elements of risk tolerance at different points. For example, building hazard awareness early (element 2) through staged drop-ins that help participants understand hazard impacts for them personally; then supporting reflection on values (element 1) with activities like outcomes mapping or 'What Matters Most' exercises; before finally asking people to weigh up trade-offs (element 5) using scenarios or risk matrices. For instance, scenario-based activities in community workshops can help shift participants from abstract conversations to concrete trade-offs (elements 3 and 5), while tools like risk tolerance matrices may be better introduced after capacity-building activities that support participants to consider thresholds more confidently and realistically (element 4).

CASE STUDY EXAMPLE 10: THOUGHTFUL SEQUENCING — BUILDING UNDERSTANDING AND VALUES TO INFORM RISK TOLERANCE

Both the Wharekawa Coast and Gorge Road risk tolerance elicitation processes demonstrate how sequencing engagement activities so each phase builds on the last can foster meaningful community input.

At Wharekawa Coast, the process began with "What Makes Our Place So Special" workshops to establish foundational community values. This was followed by technical education sessions on flood hazards, designed to build awareness and understanding of risks. Only after these foundations were set did the process move to risk tolerance matrices, which explored participants' comfort with specific likelihoods and consequences. This progression meant that when community members set tolerance thresholds, their judgements were grounded in clearly articulated values and solid understanding of the risks.

Similarly, the Gorge Road process involved two distinct phases. Phase 1 consisted of day-long Drop-in sessions featuring staged stations staffed by technical experts and council staff, supported by visual aids and presentations. This flexible, largely self-paced format helped community members absorb complex hazard information and ask questions, addressing heightened anxiety. Two weeks later, Phase 2 held structured discussion groups segmented by risk exposure, High, Moderate, Low, and Businesses, enabling dialogue among people in similar situations. These sessions combined presentations with group discussions and collected feedback via questionnaires and a token-based preference-ranking exercise for risk management options.

For more on both cases see Appendix 2.

Practical constraints and considerations

Practical constraints such as resource availability, participant accessibility, and existing relationships also shape how the elicitation is put together. Even where scoping factors point to an ideal method, these practicalities may require adaptation. For instance, where deliberative approaches are desirable but not feasible, it may be necessary to layer simpler tools like surveys with targeted workshops or interviews to meet multiple needs within constraints.

Time investment is critically shaped by whether you're seeking opinions or informed judgements about risk tolerance. Quick tools like surveys can efficiently gather individual opinions from a public sample, while deliberative approaches aimed at developing informed judgements through building a base of knowledge that participants can draw from requires substantially more time. If the goal also requires a consensus, the time requirement may be even larger because you may have diverse stakeholders with different contextual factors that play into their ability to form judgement. Finding shared understanding across diverse perspectives takes considerably longer than collecting individual viewpoints.

The size and makeup of a community significantly affect time requirements for risk tolerance engagement. Larger or more diverse communities typically encompass a wider range of risk perceptions, knowledge levels, and cultural backgrounds and will likely include community members both directly and indirectly affected by hazards and risk reduction measures. Communities with limited previous hazard experience or technical knowledge require more extensive educational groundwork before meaningful risk discussions can occur. Additionally, community capacity and appetite for engagement vary considerably. Some communities have robust networks of engaged residents with time to participate, while others face participation barriers that require creative, flexible approaches to gather representative input.

Budget realities directly impact the time available for risk tolerance engagement, resource constraints must be balanced with community outreach, staff time, technical expertise, and logistics while recognising that relationship-building efforts must be scaled to match available funding.

A tailored, adaptive approach that balances methodological strengths with these realities is key

CASE STUDY EXAMPLE 11: BUILDING ON EXISTING RELATIONSHIPS - WHEN TRUST ENABLES DEEPER DIALOGUE

The Amberley Beach project demonstrated how existing positive relationships between council and community provided a foundation of trust that made risk tolerance discussions more productive from the start. This trust enabled honest conversations about community capacity - residents were pragmatic and self-aware about their vulnerabilities as an older population with limited financial resources, health constraints, and access challenges. The strong relationship allowed the council to establish clear financial parameters upfront, helping focus conversations on adaptation options the community could realistically afford and implement. Trust also enabled residents to openly discuss their actual capacity to cope with hazards based on lived experience, rather than presenting overly optimistic or defensive assessments. The community's realistic understanding of their collective wellbeing constraints - from managing health needs during floods to affording rate increases - informed practical discussions about adaptation pathways. This relationship foundation enabled genuine collective deliberation about both risk appetite and capacity rather than defensive positioning, showing how community context fundamentally shapes what engagement approaches are possible and how honestly capacity constraints can be explored.

For more information on the Amberley Beach project, see Appendix 2.

to generating trustworthy, useful insights for decision-making. Many of the broader engagement design principles — such as enabling authentic conversation, ensuring diverse voices are heard, and linking engagement to decision-making — also apply. A further consideration is duty of care: conversations about risk tolerance can be stressful or triggering, even when posed hypothetically, and care should be taken to support participants appropriately throughout the process.

For more on general risk engagement considerations refer to the *LTAR engagement framework*.

The importance of adaptability

Flexibility is key when navigating public risk tolerance discussions, as often both immediate and longer-term risk concerns will arise. Communities often prioritise visible, short-term threats over distant risks, so you must be adaptable in your approach and timeline. Be prepared to adjust your engagement process if discussions reveal urgent hazard management priorities requiring immediate attention, while still creating space for thoughtful consideration of longer-term risks. This flexibility allows you to respond to community needs while ensuring comprehensive risk tolerance discussions address both immediate concerns and future hazards, maintaining trust throughout the engagement process.

> "We went in thinking coastal inundation is the main issue in that area and that's what we need to focus on, and they feedback that it's actually river flooding, that is their key concern currently... So that local knowledge was just so important to the project."
>
> *Council Strategy Planning Manager*

5.3. From input to insight – ensuring credibility and usefulness

While previous sections explored how to develop an appropriate approach to eliciting public views, this section focuses on what else is needed to ensure those views are credible and useful. This depends not just on good design, but on how input is gathered, how it's interpreted and analysed, and how insights are integrated into decision-making.

Designing for meaningful input

How risk tolerance data is gathered strongly influences its credibility and usefulness. Thoughtful design of the elicitation process helps ensure that public input can meaningfully inform decision-making, while reflecting the complexity and diversity of public perspectives.

> "...What seemed. . . really core, I guess, coming out from that first initial meeting . . ., and the pushback on all of that, it was clear that people really needed a lot of information and . . . they also needed a lot of time to process it."
>
> *Risk Engagement Specialist*

Design with purpose

Be clear from the outset about what the engagement aims to uncover. In the context of risk tolerance, input is most useful when it reveals how people perceive the hazard and its impacts, who is affected and how, what they most want to protect, and how they weigh the costs of action versus inaction. This clarity helps keep the process focused and relevant, even when time or resources are limited.

Clarify the role of public input

Public views on risk tolerance rarely stand alone. They need to be understood alongside other sources of information—such as technical risk assessments, expert judgments, and social impact analyses—to support well-rounded decision-making. Being transparent about how public input will fit within this broader context builds trust and sets realistic expectations.

> "The only other learning that we have from the project in that space is we had a couple of properties, change hands through the process, and we probably didn't get onto those - it was on their LIM. People don't read LIMs, it turns out - but ... I didn't upskill them fast enough, because I didn't realize how powerful their voice could be. So they were holiday home purchasers, and they were, like, "We need our seawall, we need it now, I've got the most coastal property. I'm the 1st to be affected by this, so, therefore. ... you know. Christchurch City would have paid for a sea wall; You guys need to pay for a sea wall too."
>
> *Council climate change adaption work leader*

Seek diversity and inclusion, even in constrained settings

Credibility depends on including a meaningful mix of voices. While full participation may not always be feasible, deliberate efforts should be made to capture diverse perspectives, especially from groups who may be most affected or vulnerable. This can include considerations of age, gender, ethnicity, socioeconomic status, and geographic location.

Support informed judgement, not reactive responses

The process should enable participants to consider risks thoughtfully rather than react impulsively. This can be achieved by presenting risk information grounded in real scenarios, explaining implications clearly, and encouraging reflection on trade-offs.

Combine qualitative and quantitative methods where possible

Using multiple methods can provide both breadth and depth of insight. Quantitative approaches offer a way to identify patterns and the distribution of views across a population, while qualitative methods add context and explanation, revealing why certain perspectives are held. Together, they strengthen the overall understanding and utility of the data collected.

Careful interpretation and analysis

Interpreting community views on risk tolerance requires care to ensure findings are accurate, meaningful, and useful.

Avoid misleading averages and oversimplified thresholds

Interpreting averages requires caution. Quoting an average or median alone can obscure important variation in individual views. Measures of spread and qualitative insights into why people respond as they do often provide more meaningful information than the numbers alone.

Look for patterns, divergence, and underlying drivers

Variations in risk tolerance often reflect differences across demographics such as gender, age, disability, ethnicity, income, as well as whether people are directly or indirectly affected by a hazard. Both quantitative and qualitative data can help uncover the reasons behind these patterns. Because risk tolerance is complex and context-dependent, surface-level or simplistic explanations can be misleading — for example, assuming people living closer to a hazard are always more risk-averse, when other factors like experience or cultural values may play a stronger role.

In some cases, aggregating individual views can help reveal broad trends — for instance, to assess general support for a risk management approach (or establish social licence). However, care must be taken not to obscure divergent perspectives. Rather than forcing binary categories or applying overly simplistic thresholds, analysis should aim to clarify where consensus exists, where disagreement lies, and why such differences matter. These divergences may reflect unequal exposure, vulnerability, or differing values across the community — all of which carry important implications for equitable and effective risk decisions.

USE OF COLOUR CODING – VISUALISING CONSENSUS

Preferences can be collated and communicated using a colour-coded risk matrix, reflecting levels of acceptability based on community feedback. The traffic light system (red unacceptable, yellow tolerable, green acceptable) – can be used to signal where there is consensus. Other colours can be used to indicate mixed views or trending views. Different groups that have been sampled independently can have their own coded risk matrix which can then be visually compared to show divergence and agreement.

This form of consensus mapping:

Condenses complex information: Especially with large-scale input, this method translates qualitative or semi-quantitative data into a format that's easy to grasp at a glance.

Reveals the distribution of views: It not only shows where consensus exists, but also highlights divisions or clusters of opinion

Promotes transparency and inclusivity: Stakeholders can see that areas of agreement and disagreement are being acknowledged rather than simplified or ignored. This helps ensure that dissent is valued as a legitimate and important signal, not something to be smoothed over.

Guides engagement and decision-making: It helps identify where further dialogue, information-sharing, or trust-building is needed, so effort can be focused accordingly.

Supports adaptive management: Revisiting the matrix over time creates a visual record of change, showing whether interventions or new information shift community views.

Example: Gorge Road public feedback on how risk management options addressed key concerns -colour-coded table summarises complex input

	Addresses concerns over risk for now and in the future			Addresses concerns over impacts of managing the risk								
				Financial impact			Maintains opportunities			Provides clarity and certainty		
Status Quo												
Engineering						unsure						
Manage							unsure					
Reduce		unsure										
Risk level	High	Med	Low	High	Med	Low	High	Med	Low	High	Med	Low

Source (Kilvington, 2022)

Qualitative and quantitative work together:

Combining quantitative data with qualitative insights provides a fuller, more meaningful picture of public risk tolerance. Quantitative methods, such as surveys, help show how views are distributed across a population, while qualitative approaches — including interviews, workshops, or open-ended responses — help explain why people hold those views. Each method has limitations on its own, but together they can reveal both patterns and underlying drivers. This mixed-method approach strengthens interpretation, supports more informed judgments, and helps ensure that findings are grounded in the realities and reasoning of the people affected.

DIFFERENT APPROACHES TO GROUND-TRUTHING

Community panel validation

"And then we took that back to the Community panel, and we said we've just averaged all the risk thresholds across all the different responses, and this is the average that we got. Is that actually representative of what you think that risk threshold is for that particular part of the Community?... And I'll say probably about 90% of the tolerances we got back from the community, the Community panel were bang on like, yep, that's exactly what we thought it was going to be."

Council Resilience Specialist

Cross checking within the Council

"And we also did the [risk tolerance mapping] exercise with the council asset managers...I was really hoping that [the hazard occurrence] would be intolerable for Council before it was intolerable for people. Because if it is the other way around, then you're going to end up with a whole lot of people really worried and the Council not really worrying yet. So that was quite good that is did work out that way."

Council strategic planning manager

Triangulation and "ground truthing"

Where you have used a variety of methods and/or have diverse data sources, triangulation of results can help to demonstrate robustness of the data. This could include comparing in-depth qualitative data gained from deliberative or discursive methods with a small number of people against more 'shallow' quantitative data from a survey. The latter may show how risk tolerance patterns are spread across a population, while the former helps to explain them and may offer information that can help with the "so what" of risk tolerance perspectives.

Where there is little qualitative data available to help explain patterns etc, consider the use of *ground truthing* – presenting findings to a community after responses to surveys or discussions have been analysed so that the community can help interpret the results.

Integration into decision-making

Communicating results

Agencies and individuals within agencies have varying degrees of trust and belief in the usefulness and robustness of public perspectives on risk tolerance. There are several things practitioners can do to enhance the potential for public perspectives to effectively inform decision-making.

- **Best practice engagement**

  Demonstrate that best practice engagement approaches have been followed. This includes following recognised standards (such as those set by IAP2) as well as designing the process

with care and sensitivity to the context, including the agencies own guidelines and engagement values and protocols.

- **Representation**

  Demonstrate that a meaningful mix of voices has been included. Full engagement may not always be feasible, but you can demonstrate that your processes have sought a cross-section of the community, particularly in larger or more diverse populations. It is also good to be clear on the scope of the risk tolerance assessment. The scoping factors in Section 3 will be helpful for this.

- **Useful format**

  Where available, quantitative and qualitative data are both useful. Quantitative data is often viewed as more trustworthy, particularly at the national level, where it may inform priority setting or social licence. However, in uncertain or emotive contexts, such as hazard scenarios or concerns about loss, quantitative data can give a false sense of certainty.

Even when quantitative methods are used, qualitative insights can support analysis and communication, adding depth, context, and meaning; for instance, through narratives that illustrate why certain views are held. This is particularly useful when considering decisions where the impacts of a decision will have a long time frame.

Situating public input within the broader decision context

Risk tolerance is largely a qualitative and potentially imprecise "measure" that is reached through a process of weighing up and trading off against priorities.

In empowerment-oriented approaches, public views are often embedded within broader processes rather than extracted as standalone results. In more consultative settings, feedback may be presented as discrete inputs to a decision process.

Regardless of the approach, public risk tolerance perspectives should always be considered alongside other data sources and/or inputs. This can include:

- social impact assessments,
- cost-benefit assessments,
- expert perspectives, and
- community panel/representation.

The relative importance of each of these sources will depend on the nature of the decision, including who bears the cost and the risk.

Final decisions are rarely based on a single input. Rather, they are shaped through the interaction of multiple sources: public and elected member feedback, technical advice, policy direction, and national, regional and local policy direction. Each contributes a different lens: public and elected voices reflect public values and lived experience; technical advice informs what is feasible; and policy direction supports strategic consistency.

Other inputs when evaluating risk tolerance

Expert elicitation

A structured approach to gathering judgments from subject matter experts about hazard risks, uncertainties, and potential impacts.

It involves formal protocols for eliciting, documenting, and synthesizing expert knowledge and professional judgments.

Expert elicitation can take various forms:

- formal surveys or Delphi processes,
- expert interviews or panels,
- technical reports and briefings.

Social impact assessment

A social impact assessment (SIA) is a structured process that identifies, analyses, and manages the potential social consequences of hazards, planned interventions or changes on communities or stakeholders.

It evaluates the social effects (positive and negative) of the risks, and decisions or actions taken to mitigate the risk, and examines how impacts might affect different demographics.

Cost-benefit analysis

A cost-benefit analysis is a structured economic analysis that compares the costs of action/inaction against the benefits of action/inaction. It can be a useful tool where the burden of cost (for either the risk or the mitigation) falls on taxpayers.

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Appendix 1: How scoping factors apply to risk tolerance elicitation examples

EXAMPLE	SIGNIFICANT HAZARD RISK FOR EXISTING COMMUNITY (E.G. QLDC GORGE RD)	CLIMATE ADAPTATION (E.G. WHAREKAWA)	REGIONAL NATURAL HAZARD MANAGEMENT POLICY (E.G. BOPRC)	NATIONAL BUILDING CODES (E.G. RESILIENT BUILDINGS PROJECT)
Temporal aspects: immediacy	Short	Medium to long	Short	Short
Temporal aspects: longevity	Long term	Variable	Medium term	Medium to long term
Scale	Local	Local/community	Regional	National
Consequences	Life & injury; property damage; disaster recovery costs; loss of property value; costs of relocation; loss of community/connection to place	Wide ranging – potentially identified in with input by community	Broad categories – life/injury, livelihood, infrastructure	Life/injury social, economic, natural
Risk capacity	Important to develop and share information about risk capacity	Important – particularly to assess for future community as well as existing	Encourage consideration of risk capacity as part of risk tolerance perspective	Understand capacity to manage disruption at national level
Risk perspectives	Individual, collective	Collective	Individual/collective	Aggregated individual perspectives

EXAMPLE	SIGNIFICANT HAZARD RISK FOR EXISTING COMMUNITY (E.G. QLDC GORGE RD)	CLIMATE ADAPTATION (E.G. WHAREKAWA)	REGIONAL NATURAL HAZARD MANAGEMENT POLICY (E.G. BOPRC)	NATIONAL BUILDING CODES (E.G. RESILIENT BUILDINGS PROJECT)
Public role	Consultative	Empowering	Consultative	Consultative
Information needs	Mix of quantitative and qualitative data –	Mix of quantitative and qualitative data	Mix of quantitative and qualitative data	Strong desire for quantitative data, supported by qualitative data
Community Context	High stakes, high emotion Potential for "gaming" to achieve preferred outcome	Community may change and current risk context may not reflect risk of the future	Region has high diversity – need to recognise differences in risk tolerability – particularly linked to capacity	Communities across country – wide diversity. Important to ensure risk is sufficiently grounded - public perspectives on risk may become overly abstract.
Decision-making needs	Reveal: • level of community consensus • spread of capacities and vulnerabilities • what 'consequences matter most' • potential "outrage" issues Inform risk thresholds and mitigation options Provide • decision makers with to mandate to act Need to relate public views on risk to technical risk analysis	• Raise understanding of consequences and probabilities of future impacts • Reveal what consequences matter most • Encourage individual and collective resilience	Reveal: • Level consensus across the region • Expectations about how and when to act to reduce (informing thresholds) • Balance technical and agency views on risk	Reveal: • Performance aspects that are most important • Drivers behind risk preferences (and how this might change in the future) • Willingness to pay for increased seismic performance Ensure risk perspectives aren't aggregated in a way that excludes those more vulnerable/less vocal.

Appendix 2: Case studies

Case study 1 – Wharekawa Coast climate adaptation

Case study 2 – Amberley Beach climate adaptation

Case study 3 – Gorge Road debris flow risk mitigation

LET'S talk about RISK

Engaging communities in natural hazard and climate change conversations

RISK TOLERANCE ENGAGEMENT CASE STUDY

WHAREKAWA COAST

This document was developed as part of the let's talk about risk project. It was informed by interviews with practitioners, elected representatives, and community members who have participated in risk tolerance processes across New Zealand.

For more detailed information refer to the Let's Talk About Risk "Natural hazard and climate change risk tolerance conversations: Guidance to aid design" available at *resorgs.org.nz/wp-content/uploads/ltar_risk_tolerance_conversations_guidance.pdf*. The guidance includes detailed information on scoping factors, methods, tools, and design principles; and includes several case studies.

Citation: Let's Talk About Risk Team (Ross-Donald, C., Brown, C., Horn, C., Kilvington, M.). 2025. Risk Tolerance Engagement Case Study: Wharekawa Coast. Let's Talk About Risk, *resorgs.org.nz/wp-content/uploads/ltar_risk_tolerance_conversations_wharekawa_coast_case_study.pdf*.

Engagement purpose

The project aimed to gather community risk tolerance perspectives to define a sustainable path for Wharekawa Coast's future in the face of climate change. The vision was to bring together the community, mana whenua, and councils to explore issues and possibilities to develop plans for a resilient future for all. The outcome was a comprehensive community plan informed by community voices and recommendations that the council could consider to enhance community resilience along the coast.

Community context

At the time, approximately 849 people lived in the project area. Nearly 50% of the population was between the ages of 30 and 64, and another 30% over the age of 64. There were around 400-500 buildings, and 143 businesses. Rural towns and villages are scattered along the coast.

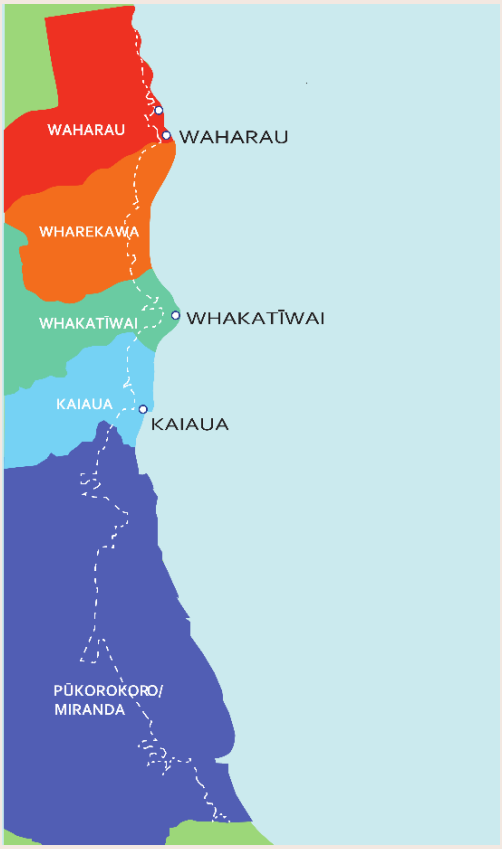
The population fluctuates with the seasons as holidaymakers visit. It is also a popular retirement option for those looking for somewhere quiet and less expensive than Auckland.

Contextual factors specific to risk conversations

Relationship with lead agency	The area had recently moved council jurisdiction, so the level of trust between the community and the council was low.
Hazard familiarity and acceptance	The Wharekawa Coast area and community are familiar and accepting of the hazard risk, having experienced numerous recent flood events.
Spatial proximity to hazard	Towns and properties are near or directly adjacent to the coastline and seafront or located on floodplains.
Connection to place	There are permanent residents with a robust sense of place attachment. However, seasonal visitors' connections vary, and some likely have weaker place attachment.

Scope

The Wharekawa Coast is along the western shore of the Firth of Thames in the North Island of New Zealand. The project area spans more than 20 km between Waharau and Pukorokoro/Miranda.



Hazards

Coastal inundation and erosion

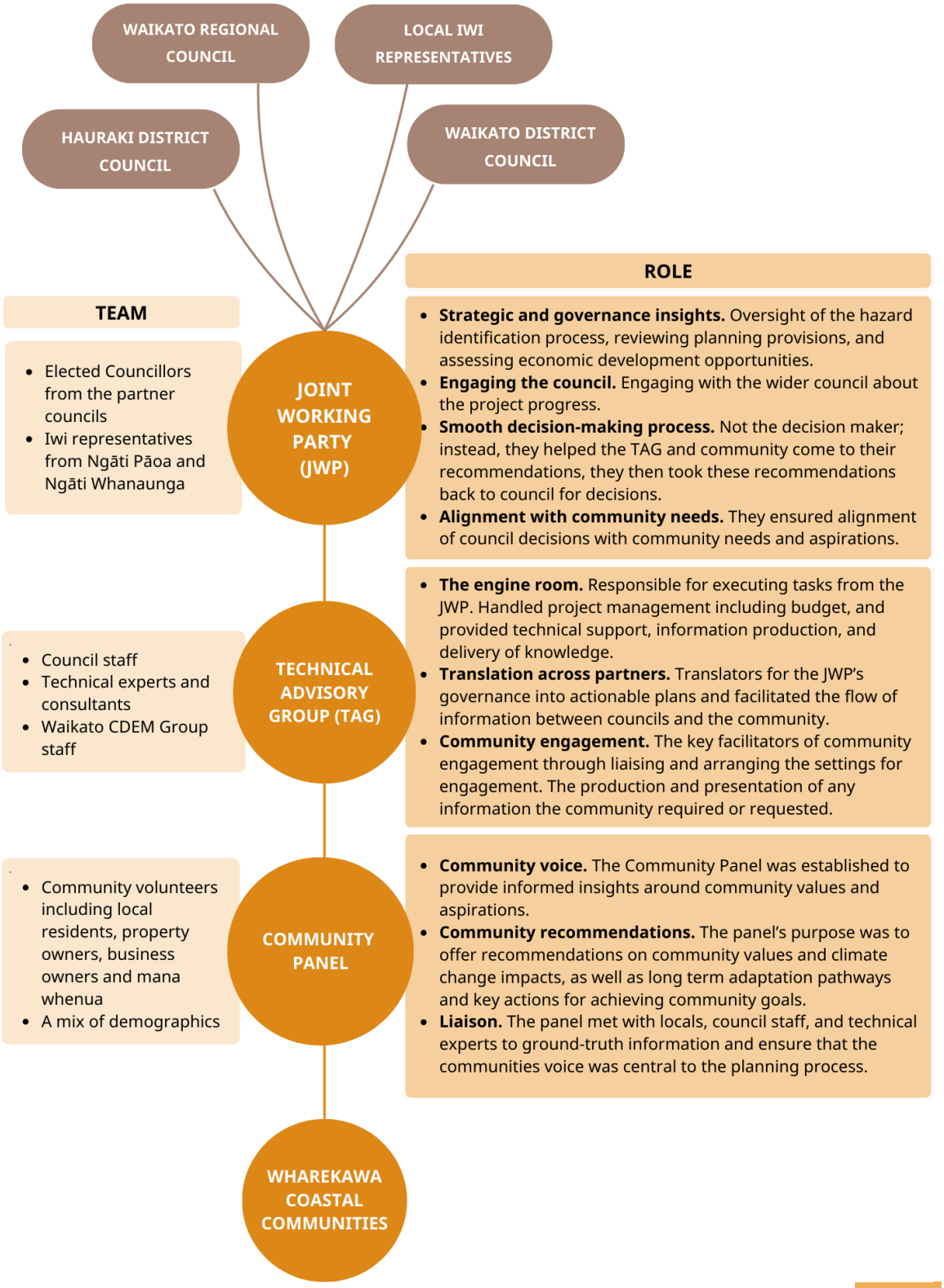
Coastal inundation caused by storm surges, high tides, and sea level rise from climate change threatens properties, agricultural land, and road access.

Pluvial and fluvial flooding

Excessive rainfall creates regular flooding, which affects community assets and infrastructure, and combined with coastal hazards and land instability, creates complex, multi-layered risks.

Engagement collaborators

The engagement was a joint project led through a collaboration between Waikato Regional Council, Hauraki District Council, Waikato District Council, and Waikato CDEM Group (including local CDEM) from Hauraki and Waikato District Councils. The engagement was at the community level. A community panel was established to provide an informed link between the Council and the community, ensuring the process was inclusive of diverse views shaped by differing circumstances.



Risk tolerance elicitation process

The engagement process followed the Ministry for the Environment's "Coastal hazards and climate change guidance for local government"[1]. The risk tolerance elicitation formed part of step four in the framework; however, the guidance did not provide an outline on how to determine risk tolerance. The community panel, TAG, and JWP completed steps one to seven of the MoE process, and the councils continued the process with steps eight to ten. Aspects of the engagement process that occurred before the risk tolerance elicitation included community meetings and a variety of community panel sessions to establish what mattered most to the community and to understand which risk tolerance elicitation tool might work best.

> "We went in thinking coastal inundation is the main issue in that area and that's what we need to focus on, and they fed back that it's river flooding that is their key concern currently... So that local knowledge was just so important to the project."
>
> Council Strategic Planning Manager

Designing the process

The goal was to understand the point at which the community could no longer tolerate the impacts of a hazard event, indicating when to implement adaptation actions or pathways to ensure the risk never became intolerable. The community panel decided that thresholds to indicate when a risk became intolerable should be determined by those directly experiencing the risks, so a community survey was developed.

Eliciting risk tolerance went beyond straightforward data collection. The generative process engaged people in reflecting on hazard information alongside their own circumstances, leading to the emergence of more informed and considered perspectives rather than simply recording pre-fixed opinions.

The risk perspectives sought were individual views on community risk tolerance that were then aggregated to provide a collective view on thresholds. Throughout the process, underlying community values were established through the community panel's extensive conversations and engagement with other community members, allowing what mattered most to the community to be woven into the process and decisions.

Survey design and implementation

To address the temporal aspects of this engagement (its intergenerational impacts and long time horizon), and the spatial aspect of the community being spread across a large geographical area, the survey consisted of scenarios describing two coastal inundation events (major and moderate) with impacts specific to geographic sub-compartments along the coast. This approach recognised that hazard impacts varied significantly across the area.

[1] Ministry for the Environment. 2024. *Coastal hazards and climate change guidance.* Wellington: Ministry for the Environment. environment.govt.nz/assets/publications/Coastal-hazards-and-climate-change-guidance-2024-ME-1805.pdf

The consequences considered were deliberately comprehensive, examining five impact categories:

1. homes and properties, and disruption to residents,
2. rural land,
3. roading and bridges (road access),
4. recreation and tourism, and
5. impact to services.

Impacts were generated specific to each sub-compartment so that community members were considering the effects in their immediate environment. There were five compartments split into A (coastal) and B (inland) segments.

The survey booklets also included information from asset and emergency managers from the council and transport agencies on their risk tolerance in terms of the resources required for their response to an event. This was necessary to alleviate issues arising from the community misunderstanding the level of tolerance their providers were willing to accept, so they were informed upfront.

For each impact category (e.g. roads), community members indicated how often they could tolerate the described consequences, marking preferences on a table with return periods between once every 200 years and 2.4 months. Participants marked their tolerance with an X once they felt they couldn't handle the impacts happening at that level of frequency (Figure 1).

ARP	200yr	100yr	75yr	50yr	20yr	10yr	5yr	2yr	1yr	6mth	2.4mth
Major event				X							
Moderate event								X			

Figure 1: Risk tolerance matrix the community were asked to fill in

The final section asked people to consider their responses across all impact categories together to determine their overall risk tolerance for their area. By people aggregating their responses across impact categories and ongoing community panel discussions, priorities regarding risk management emerged.

The community panel distributed survey booklets throughout the project area, and they went out into their neighbourhoods and talked to people about the booklets and the process. Many booklets were filled in and discussed over cups of tea or worked through with panel members at community gatherings. The panel members performed informal drop-in type gatherings to ensure as much representation and understanding as possible. The TAG provided cheat sheets and FAQs to support the community panel in socialising the survey.

> "The community panel members kind of had to become risk experts themselves, and understand the process themselves, because they had to walk their own community through it. So, we spent a lot of time with our community panel members, probably three or four more community panel meetings than what was originally planned."
>
> Council Resilience Specialist

This approach was effective given the community context - the area's familiarity with flooding from numerous recent events meant residents could meaningfully respond to survey questions about risk scenarios.

The TAG compiled the survey booklets into risk tolerance thresholds by calculating the median results from the responses for each sub-compartment. These median values were then classified using a qualitative risk matrix that categorised tolerance levels from very low (indicating the community cannot tolerate those risks occurring) to very high (indicating they can tolerate the risks). Where median results fell between the average return period (ARP) options provided, they were rounded up to take a conservative approach. The community-defined thresholds, alongside sea level rise projections under the RCP 8.5 climate scenario, were then used to estimate when these tolerance levels would be reached in the future.

Integration into the decision-making process

The risk threshold results were used to calculate the estimated time available before the risk thresholds were reached. This provided an indication of how much time there was before adaptation actions needed to be implemented. The tolerance levels and recommendations for mitigation actions were then presented in a comprehensive Community Panel Recommendation Report.

The JWP endorsed the recommendations and took the report to their relevant councils. The councils adopted the plan but did not commit to any actions or mitigation.

Some areas were identified for immediate mitigation where community risk tolerance thresholds had already been exceeded. For other areas, councils understood that "the status quo is an okay option for them right now" until impacts reach the community-defined threshold levels.

> "For some compartments, the threshold had already been met or had already been exceeded... So those were the key areas in which we put forward actions that we know could be implemented right now... versus some parts of the coast where their threshold might not be reached for another 30... the status quo is an okay option for them right now."
>
> Council Resilience Specialist

Reflections on the process

Collaboration was key throughout the process, specifically between the partner councils, as the local councils didn't have the resources to support the technical assessments needed and the community panel. The collaborative process was unique, with everyone learning and adapting throughout the project.

The high level of engagement from the community panel and commitment to the cause were key points of success in the process. Community panel involvement extended from the planned ten meetings to over four years of service. While some of the extension was driven by COVID, the level of detail and thorough nature of the panel also lengthened the process.

There was some underrepresentation of specific groups. Local iwi representatives wanted to participate but lacked capacity at the time, so the project continued with the understanding that iwi could join when they were able. Because of this and other factors, the project struggled to fully incorporate Te Ao Māori and Mātauranga Māori. There was also a lack of youth engagement, despite community panel efforts to include Rangatahi.

Resources

For more information and resources on the Wharekawa Coast project visit wharekawacoast2120.hauraki-dc.govt.nz/.

For further key contextual factors to consider in a risk engagement process, see the Lets Talk About Risk: Framework for designing natural hazard and climate risk community engagement.

Appendix: Key scoping factors in eliciting risk tolerance

In the Let's Talk About Risk guidance on risk tolerance conversations, nine scoping factors were identified to help in the design of risk tolerance elicitation processes. In the table below, these scoping factors are mapped to the Wharekawa Coast case study. This is designed to help understand how transferable the Wharekawa Coast approach is to other contexts.

Temporal aspects *The period over which risks emerge and decisions play out*	Medium immediacy (climate adaptation planning), intergenerational longevity (100-200 year time horizon). The Council looked 100 years into the future, whilst the community looked at what impacts would be tolerable once every 200 years. It was understood that decisions made today shape the community's futures across generations.
Scale *The level at which risk tolerance is evaluated*	Community-level assessment across 20km coastline, requiring representation from diverse geographic sub-compartments with varying hazard exposure.
Consequences considered *Different types of impacts considered during elicitation.*	Ecological and environmental values, home and property disruption to residents, road access, recreation and tourism, critical infrastructure, cultural and heritage values, community safety and wellbeing.
Risk perspectives sought *Ranging from individual through to collective views.*	Individual views accumulated to provide collective thresholds, balanced through community panel deliberation and ground-truthing.
Understanding risk capacity *How appetite and capacity were considered and/or addressed.*	Risk appetite was more heavily examined than risk capacity. The process focused extensively on what the community was willing to accept through risk tolerance thresholds and adaptation pathway preferences, whilst capacity was addressed through community education using risk assessment booklets and external technical assessments.
Public role *How involved the community are in the process.*	Empowering approach – the community panel operated independently to develop recommendations that councils were expected to implement.
Information needs *Information gained from process and how it was gathered and presented.*	Mixed data requirements: quantitative thresholds for policy implementation, qualitative insights for understanding community priorities and building legitimacy.

Monitoring changes *Importance placed on tracking risk tolerance over time.*	The collaborative framework recognised that views on risk tolerance evolve over time. The process established a foundation for ongoing monitoring and potential revision of thresholds as conditions and priorities change, although specific monitoring protocols were not detailed.
Community context *Key social, cultural and environmental factors.*	Demographics: Geographically dispersed rural community spread across over 20km of coastline, including locals, property owners, businesses, and mana whenua with varying demographics across the area. Relationship with council: Strained trust relationships due to recent council boundary changes, with the area having moved council jurisdiction. Hazard experience: High familiarity with flooding from numerous recent events, providing residents with practical understanding. Engagement preferences: Comfortable with informal discussions "over cups of tea" and community gatherings, requiring socialisation and local expertise.

Why they chose the methods and tools

The Wharekawa Coast project selected a multi-method approach to address the challenges of engaging a geographically dispersed community across over 20km of coastline with varying degrees of hazard familiarity and council trust.

A community panel was chosen as an engagement method because recent community experience of coastal inundation indicated that the community needed a change and a fresh perspective on the region's hazards. The area had also recently moved council jurisdiction and lacked strong relationships or trust between community and council. The panel approach enabled representation from locals, property owners, businesses, and mana whenua to ensure diverse perspectives across the demographic spread. This method provided essential ground-truthing opportunities where the panel could meet with locals, council staff, and technical experts to triangulate information and validate that findings reflected genuine community views. The panel format was particularly suitable for building community buy-in and trust between the community and council through direct engagement.

Surveys using risk assessment booklets were selected to maximise engagement across the community, with support from communications and social science teams. The area's familiarity with flooding from numerous recent events meant residents could meaningfully respond to survey questions about risk scenarios. Surveys enabled the efficient collection of both quantitative risk tolerance data and qualitative insights across the geographically dispersed community, whilst allowing all community members who wanted involvement to have input into decisions.

Risk matrices provided a consistent and structured approach for collecting perspectives across the geographically dispersed community. The matrix format, incorporating scenarios of coastal inundation, erosion, and freshwater flooding, was suitable because residents had experienced these hazards and could relate to the presented scenarios. This tool enabled systematic comparison of risk tolerance across different locations along the 20km coastline where spatial proximity to hazards varied significantly.

Engaging communities in natural hazard and climate change conversations

RISK TOLERANCE ENGAGEMENT CASE STUDY

AMBERLEY BEACH

This document was developed as part of the Let's Talk About Risk project. It was informed by interviews with practitioners, elected representatives, and community members who have participated in risk tolerance processes across New Zealand.

For more detailed information refer to the Let's Talk About Risk "Natural hazard and climate change risk tolerance conversations: Guidance to aid design" available at *resorgs.org.nz/wp-content/uploads/ltar_risk_tolerance_conversations_guidance.pdf*. The guidance includes detailed information on scoping factors, methods, tools, and design principles; and includes several case studies.

Citation: Let's Talk About Risk Team (Ross-Donald, C., Horn, C., Kilvington, M., Brown, C.). 2025. Risk Tolerance Engagement Case Study: Amberley Beach. Let's Talk About Risk, *resorgs.org.nz/wp-content/uploads/ltar_risk_tolerance_conversations_amberley_beach_case_study.pdf*.

Engagement purpose

Hurunui District Council (HDC) and the Amberley Beach community set out to create a sustainable, adaptable approach for the future, amid risks from climate change and coastal hazards. They worked on developing a comprehensive Adaptation Plan through 2120 informed by community voices. The goal of the plan was to guide HDC's decision-making while helping the community adapt to changing coastal risks through collectively supported interventions.

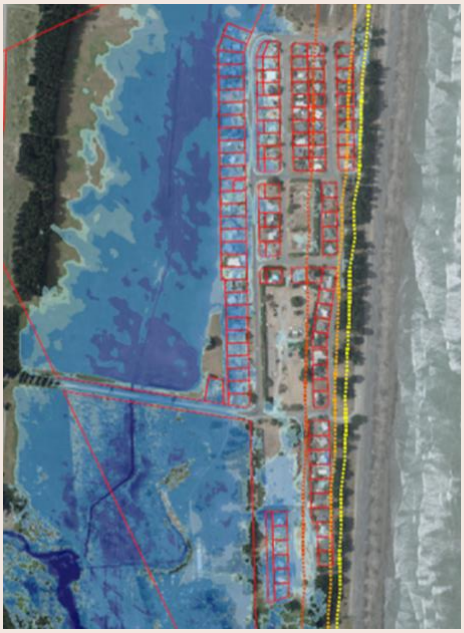
Community context

Amberley Beach is a small community of 109 residential properties. There is a mix of holiday homeowners (about a third) and permanent residents (two thirds). Many residents are retirees on a lower income. The community are pragmatic and prepared to take practical steps to protect their homes from flooding and coastal erosion. Their goals are clear: they don't want houses to flood, and they need access to their settlement.

Relationship with lead agency	There is an established, positive relationship with the Council through collaborative management of a protective bund for coastal flooding control. Residents are responsible for bund maintenance; the Council collects rates on behalf of the residents who allocate funds as needed.
Hazard familiarity and acceptance	Many of the community are long-time residents who have witnessed the ongoing hazard risk and risk management. This fosters familiarity with, and acceptance of, coastal threats.
Temporal proximity to hazard	Many residents have been evacuated due to flood risk. All residents have seen the erosion of the coastal bund which gets renourished approximately every 5 years.
Spatial proximity to hazard	Homes are immediately adjacent to the seafront.
Connection to place	Residents value the environment and the close-knit community. Many would struggle to buy property elsewhere.

Scope

Amberley Beach is on the east coast of the South Island of New Zealand in the Hurunui district.



Hazards

Coastal inundation and erosion

Coastal inundation caused by storm surges and long-term sea level rise threatens property and infrastructure.

Rising groundwater

Rising groundwater levels affect infrastructure and property foundations.

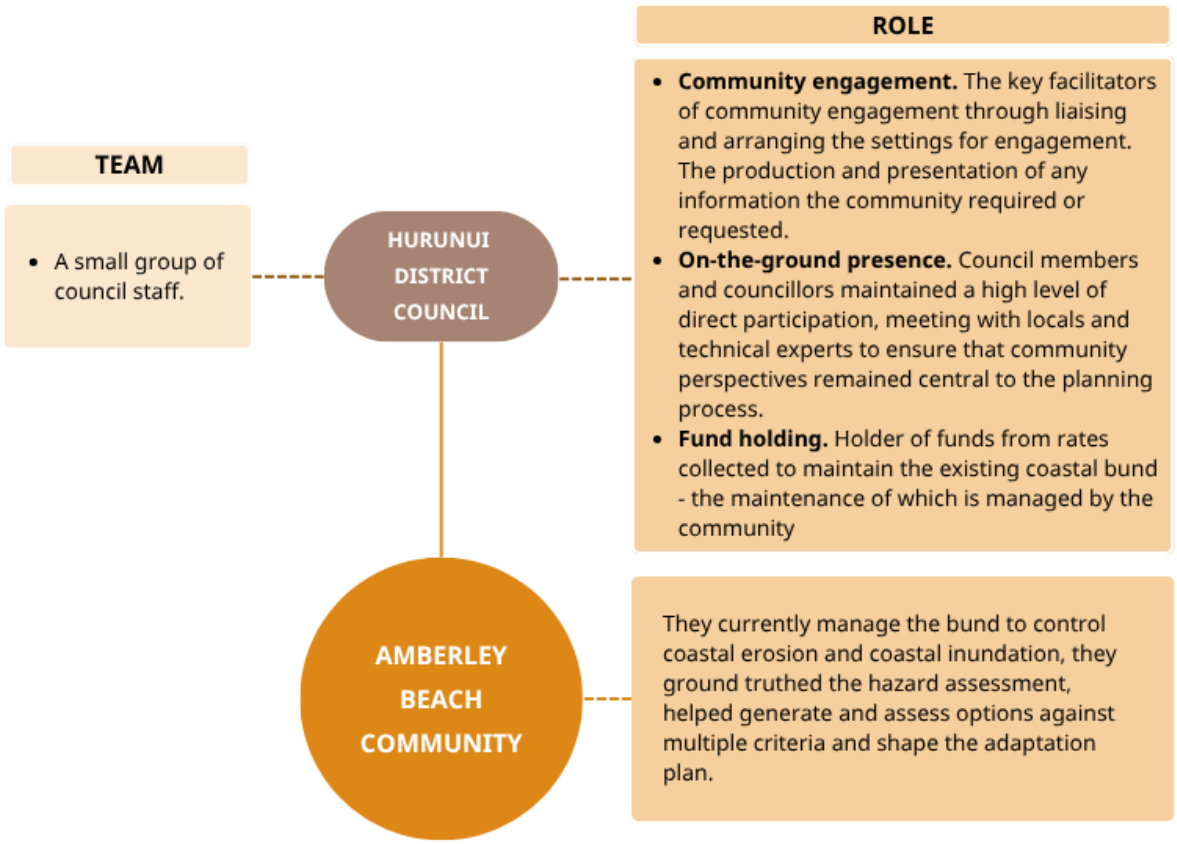
Pluvial and fluvial flooding

Excessive rainfall creates regular flooding through surface water accumulation and river overflows. Flooding can cause water damage to homes and properties.

Engagement collaborators

The process followed an empowering model of engagement where the Amberley Beach community served as primary decision-makers, with Hurunui District Council providing facilitation and technical support. This community role emerged from existing relationships, creating a foundation of trust essential for exploring risk tolerance. While Environment Canterbury (the regional council) was also involved, the community had a stronger, positive long-term relationship with the local Hurunui District Council.

> "There was starting to be a bit of pressure from that community that, "hey - this bund isn't going to last forever. We need support. We need something to happen." So, there was quite a good buy in right from the start"
> *Council Climate Change Adaptation Leader*



Risk tolerance elicitation process

The risk tolerance elicitation began by exploring fundamental community values, and priority outcomes, with three key objectives emerging: having a home that is insurable and free from water, maintaining the small-town community atmosphere and access to nature, and ensuring reliable 24/7 access to services outside of Amberley Beach. This process built people's awareness of their preferences by helping residents appreciate their risk capacity (as an older population with limited financial resources), and their risk appetite (willingness to accept certain risks to maintain community characteristics).

The Council worked collaboratively with the community to support understanding of both the hazard likelihood and consequences in ways meaningful to residents. This included ground-truthing technical assessments of the risks (for example, how often flooding occurred). Community members shared their lived experiences of the hazards and compared memories against technical hazard assessments, creating shared understanding of risk significance. This approach recognised that many residents had awareness of the hazard and views on its significance through previous exposure.

> "We presented them with the science. But then at the same time we asked them to present us with their testimonies, and their photos, and their recollections. So, it was balanced - they had a chance to validate our science and we could use their experiences to validate our science."
>
> *Council Climate Change Adaptation Leader*

Working together, the Council and community developed a long list of potential adaptation options before narrowing them to a practical shortlist. This collaborative approach ensured the process was inclusive of diverse views whilst recognising the consequences considered needed to extend beyond traditional life safety metrics to include what mattered most to the community. The comprehensive list was then workshopped using the Council's "Coastal Adaptation Explorer" (Figure 1).

The Coastal Adaptation Explorer is an interactive tool that allowed Amberley Beach residents to consider different adaptation options or combinations of options (such as bunds, rock revetments, or managed retreat). It was developed as a workshop tool to support discussion on the various options, the benefits of each, and on some of the trade-offs. This was underpinned by a multicriteria analysis developed from the community objectives along with other considerations including consent-ability and adaptability. This was brought together visually to assist the community to discuss and make informed trade-off decisions (Figure1).

Over the course of the project, the Council held 16 community meetings. Nine of these were full community meetings, and a further seven were hosted by the Residents' Association. These sessions combined presentations with extensive discussion periods, ensuring comfort with the likelihood and consequences of hazard events was developed through accessible communication. Small group workshops with scientists and council staff enabled deeper, more technical conversations about specific options. Informal conversations between the council staff and community members also occurred throughout the process. The community could also provide written feedback (surveys/submissions) on multiple occasions, ensuring individual perspectives were captured alongside collective discussions.

OTHER KEY INPUTS INTO THE PROCESS

- Identification of at-risk populations along the entire coast.
- Assessment of flooding and coastal hazards in 30-, 50- and 100-year periods.
- Creation of maps to visualise the scenarios.
- Social impact and economic assessments of the chosen mitigation option.

Drawing on workshop feedback, the Council developed a Draft Adaptive Planning Pathway, which was presented to the community. This pathway illustrated various adaptation options over time, with the preferred approach involving continued bund maintenance in the near term, transitioning eventually to managed retreat - an option first put forward by the community itself.

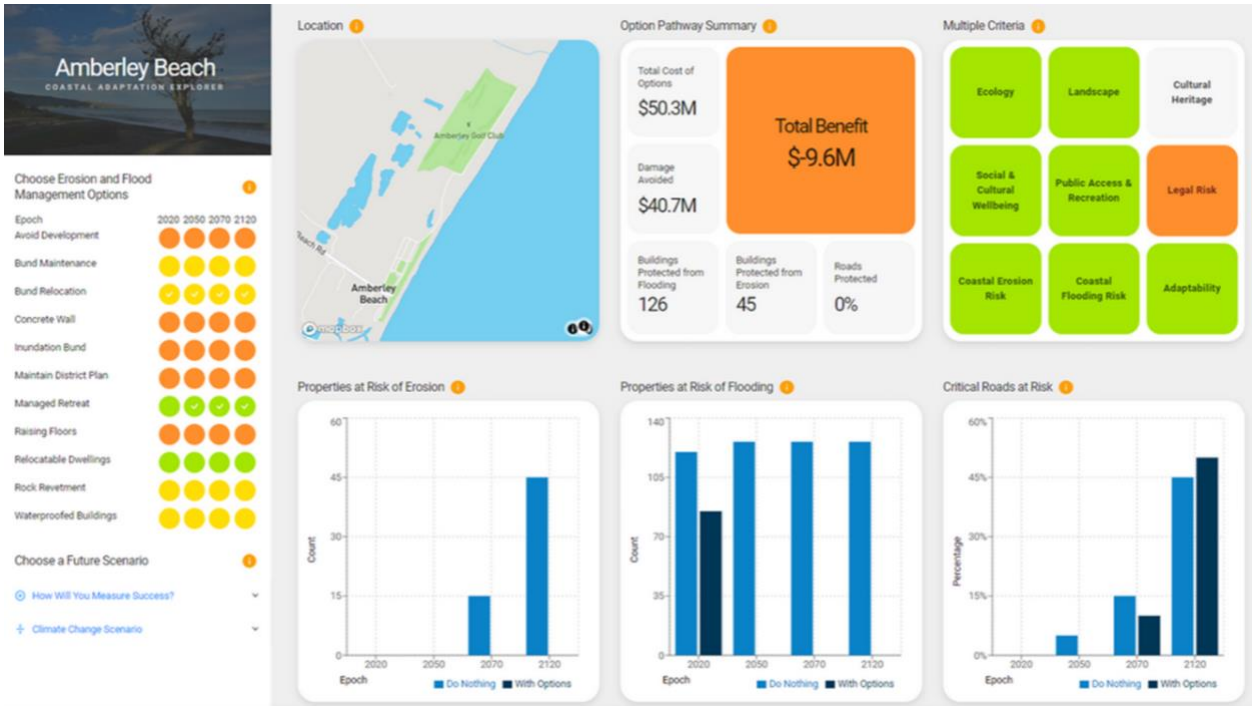


Figure 1: Coastal Adaptation Explorer

Integration into the decision-making

The collective risk perspectives gathered through community discussions were synthesised into a community plan subsequently adopted by the Council. Based on this community input, the Council created a formal Adaptation Plan to guide implementation. This integration reflected the empowering approach, where public input drove consensus decisions with technical expertise providing support rather than direction.

Council members were present throughout the engagement process, with a high proportion of councillors relative to community participants, ensuring they had direct insight to community perspectives and could understand and base decisions on how core values and concerns shaped community judgement about acceptable risk levels.

The process balanced risk appetite and capacity through dialogue rather than formal assessment. The community's pragmatic self-awareness of their vulnerabilities (health, financial, and access-related) informed realistic discussions about affordable adaptation pathways. Early establishment of clear financial parameters helped focus conversations on options the community could realistically implement.

Reflections on the process

Existing relationships between the Council and the community provided a foundation of trust that made the engagement process more productive from the start, demonstrating how a positive community context enables more effective risk tolerance discussions.

The community was pragmatic and self-aware of its risk capacity. They were also aware of the practicalities of managing their collective wellbeing in relation to threats from inundation from the river, groundwater and ocean.

Collective conversation characterised the engagement approach, with community perspectives gathered qualitatively through the "feeling" of group discussions rather than formal polling or voting mechanisms. This reflected the collective risk perspectives sought, enabling genuine consensus-building.

Direct contact was possible with virtually all community members, allowing the Council representative to meet approximately 80% of residents by the end of the project, creating stronger relationships and tailored communication.

Face-to-face engagement worked well with the older population who were comfortable with public meetings and direct conversation, with high attendance maintained throughout the process. This approach suited the community context and scale.

The deliberative approach is effective due to the small nature of the community, suggesting this method works well for communities where direct engagement with most residents is feasible and collective risk perspectives can be meaningfully developed.

Boundaries and limits were established upfront by the Council, creating a practical framework within which community decisions could be made whilst ensuring clear financial parameters supported realistic discussions.

Transparency about costs allowed residents to immediately understand how different options would affect their rates and personal finances, supporting informed weighing up of costs and benefits.

Vetted options were presented by the Council while still allowing space for community suggestions, striking a balance between expert guidance and community ownership of the process.

Methodology was flexible, with council staff testing and assessing their approaches throughout the project, adapting methods to better suit the community context and improve outcomes.

> “The only other learning that we have from the project is we had a couple of properties change hands through the process, and we probably didn't get onto those. [The hazard] was on their LIM, but people don't read LIMs - it turns out. I didn't upskill them fast enough because I didn't realise how powerful their voice could be.
> They were holiday home purchasers, and they were, like, “We need our seawall, we need it now, I've got the most coastal property, I'm the 1st to be affected by this, Christchurch City would have paid for a sea wall - you guys need to pay for a sea wall too.””
>
> *Council Climate Change Adaptation Leader*

Resources

For more information and resources on the Amberley Beach Road project visit hurunui.govt.nz/environment/coastal-conversations-in-the-hurunui/amberley-beach.

For further key contextual factors to consider in a risk engagement process, see the Lets Talk About Risk: Framework for designing natural hazard and climate risk community engagement.

Appendix: Key scoping factors in eliciting risk tolerance

In the Let's Talk About Risk guidance on risk tolerance conversations, nine scoping factors were identified to help in the design of risk tolerance elicitation processes. In the table below, these scoping factors are mapped to the Amberley Beach case study. This is designed to help understand how transferable the Amberley Beach approach is to other contexts.

Temporal aspects *The period over which risks emerge, and decisions play out*	**Immediacy:** Deteriorating coastal protection and community-requested discussions about bund erosion requiring near-term decisions. **Longevity:** 100-year adaptation planning with time frames dependent on sea level rise and changing rainfall patterns. The resulting plan focuses on triggers that can lead to action.
Scale *The level at which risk tolerance is evaluated*	Very small community (around 100 properties) enabling direct engagement with virtually all residents, and collective decision-making approaches.
Consequences considered *Different types of impacts considered during elicitation.*	Damage to property and access, being unable to get out to necessary services, and loss of community character The community and the Council requested a discussion about the erosion of the current bund and the coastal erosion, and coastal inundation issues they were facing.
Risk perspectives sought *Ranging from individual through to collective views.*	The process was designed to seek collective community views. The community preferred collective deliberation to hear others' perspectives and build genuine consensus.
Understanding risk capacity *How appetite and capacity were considered and/or addressed.*	The assessment of appetite and capacity relied largely on dialogue, enabled by the community's pragmatism and a strong relationship with the Council
Public role *How involved the community were in the process.*	This process was highly empowering in nature, heavily involving as many community members as possible. The Council adopted the "community's plan" rather than creating a "Council plan," with community-identified values forming the framework for assessing adaptation options.
Information needs *Information required to support decision-making.*	The process required synthesis of qualitative community discussions into formal planning documents that could guide implementation.

Monitoring changes *Importance placed on tracking risk tolerance over time.*	Rather than monitoring changes in community attitudes, the approach focused on monitoring hazard events that would indicate when risk tolerance thresholds had been exceeded. The assumption is that the community composition is likely to remain mostly retirees with some holiday homes, though if demographics change (e.g. proportion living in area full-time), risk tolerance may change over time.
Community context *Key social, cultural and environmental factors.*	**Demographics:** Small, close-knit community of approximately 100 people, predominantly older retirees. **Relationship with council:** Strong, positive, long-term relationship with Hurunui District Council. **Hazard experience:** The community had direct lived experience with flooding and coastal hazards, making them pragmatic and aware of risks. **Financial capacity:** Limited financial resources as older population, requiring realistic approach to adaptation costs. **Community character:** Strong preference for maintaining small-town atmosphere and access to nature. **Engagement preferences:** Comfortable with face-to-face meetings and collective discussion. **Self-awareness:** Pragmatic community with realistic understanding of their vulnerabilities.

Why they chose the methods and tools

The methods used in this process emerged from the existing strong working relationships between the Council and community, as well as the small size and close-knit character of the community. These community context factors fundamentally shaped the method selection. Community meetings were chosen over drop-in sessions because the close-knit community preferred hearing others' perspectives, making collective discussion more suitable than individual consultation. The scale of the community—approximately 100 residents—enabled comprehensive direct engagement with virtually all households, supporting the empowering approach to community decision-making.

Written feedback was used to validate the collective discussions and check individual household views throughout the process, ensuring genuine consensus was emerging whilst allowing quieter members to contribute meaningfully. This approach maintained inclusive representation of diverse views while accommodating the community's preference for collective deliberation and ensuring individual perspectives were captured alongside group discussions.

The Coastal Adaptation Explorer was selected to provide a structured framework for systematically evaluating adaptation pathways, helping the community weigh options against cost, effectiveness, and community goals through multi-criteria analysis that supported their evidence-based collective decision-making preference. This tool enabled the community to assess multiple criteria, including cost, reduction in hazard exposure, community priorities and values, and ease of consenting options, revealing core values and concerns that shaped their judgements about acceptable risk levels whilst supporting informed weighing up of costs and benefits of action versus inaction.

LET'S talk about RISK

Engaging communities in natural hazard and climate change conversations

RISK TOLERANCE ENGAGEMENT CASE STUDY

GORGE ROAD

This document was developed as part of the Let's Talk About Risk project. It was informed by interviews with practitioners, elected representatives, and community members who have participated in risk tolerance processes across New Zealand.

For more detailed information refer to the Let's Talk About Risk "Natural hazard and climate change risk tolerance conversations: Guidance to aid design" available at *resorgs.org.nz/wp-content/uploads/ltar_risk_tolerance_conversations_guidance.pdf*. The guidance includes detailed information on scoping factors, methods, tools, and design principles; and includes several case studies.

Citation: Let's Talk About Risk Team (Ross-Donald, C., Kilvington, M., Brown, C., Horn). 2025. Risk Tolerance Engagement Case Study: Gorge Road. Let's Talk About Risk., *resorgs.org.nz/wp-content/uploads/ltar_risk_tolerance_conversations_gorge_road_case_study.pdf*.

Engagement purpose

The purpose of the engagement process was to inform the Queenstown Lakes District Council's decision about a significant hazard affecting the Gorge Road community. The process aimed to elicit community perspectives on risk tolerance that would be used alongside technical risk assessments and inform land use planning decisions. They sought to surface underlying community values, explore capacity to live with or adapt to hazard impacts, and understand priorities and concerns related to risk management including the trade-offs between action and inaction.

Community context

At the time, the community had a large working population with 210 businesses. It was one of the few areas in Queenstown offering relatively low-cost housing. It also provided rental opportunities for the high numbers of seasonal workers involved in tourism and hospitality. This contributed to greater ethnic diversity compared to surrounding areas.

Demographically, there were relatively low numbers of children and elderly residents. While residents were generally physically capable of responding to natural hazards, lower-than-average household incomes suggested limited financial resilience.

Contextual factors specific to risk conversations

Relationship with lead agency	The community were wary of the Council, so the Council were operating in a low-trust context.
Hazard familiarity and acceptance **Temporal and spatial proximity to hazard**	Most of the community felt there was a tangible, immediate, active risk. Some residents who had relocated after the Christchurch earthquakes were particularly vulnerable to psychological distress.
Connection to place	The somewhat transient nature of the community indicates weaker connections and place attachment than more established neighbourhoods.

Scope

The Gorge Road project was in Queenstown's northern suburbs, in New Zealand's South Island. The project area spanned from Brewery Creek to Reavers Lane.

Hazards

Debris flow

A fast-moving mixture of water, rock, and soil, flowing down slopes.

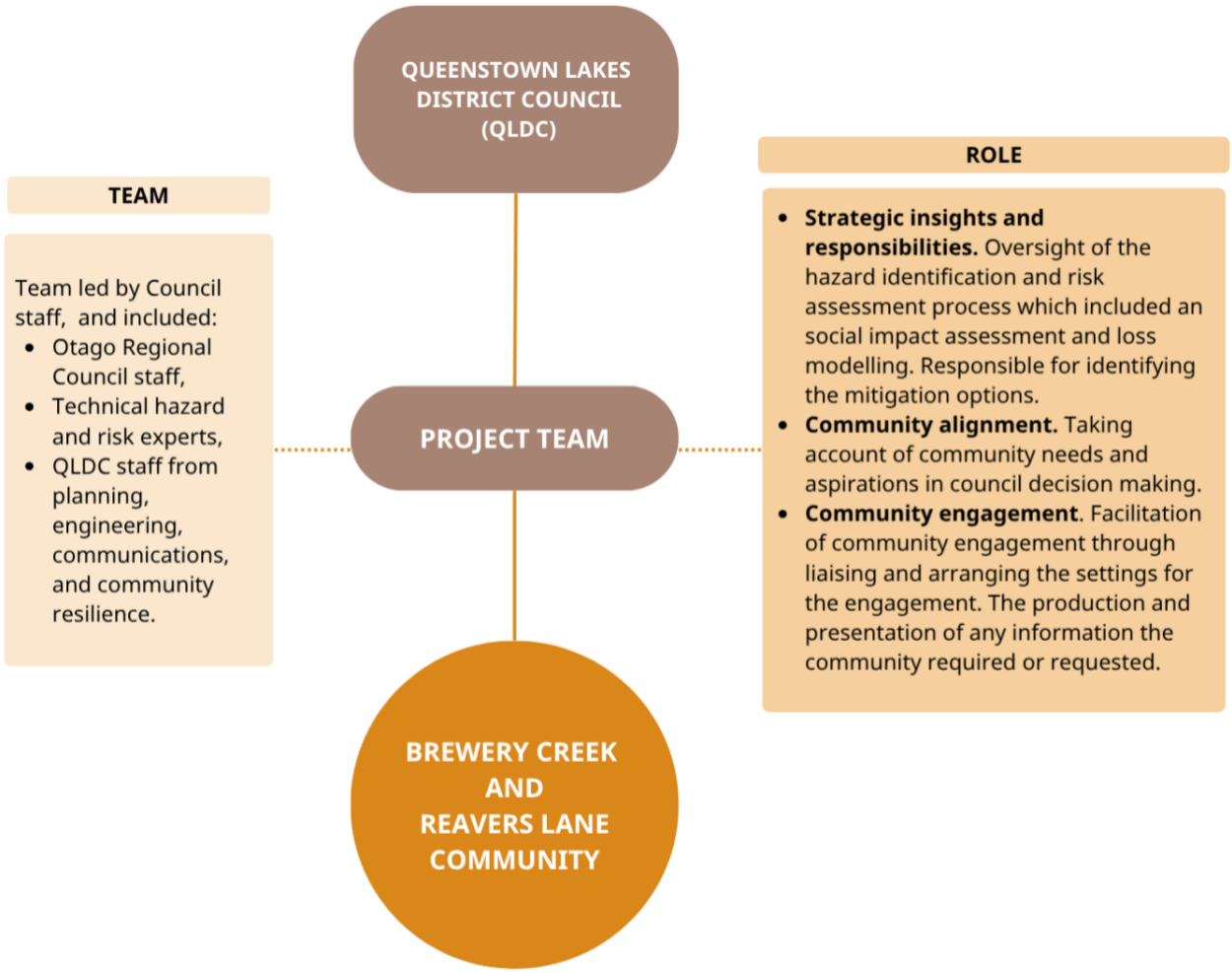
Rockfall

Rocks or rock fragments falling from steep slopes.

The hazards posed a high risk to life, property, and infrastructure.

Engagement collaborators

The engagement was led by Queenstown Lakes District Council, supported by input and advice from Otago District Council, and by external technical experts and an engagement advisor.



Risk tolerance elicitation process

Initial engagement: Public meeting

A public meeting was held with the local community to discuss their tolerance for different risks. Many residents were already aware of the hazard and questioned why input was being sought instead of planned actions being presented. Despite this, useful information about risk tolerance was received from this early stage in the project. Further engagement and understanding was needed to develop response options.

> "They'd had a lot of pushbacks about: "Why are you asking us what's acceptable risk? We've got a real situation here... You just need to tell us what our options are... Why would we sit here and say, Oh, look! This risk is acceptable. This risk isn't acceptable... That seems like a waste of time. You just need to tell us what our options are and what we can choose between"."
>
> *Risk Engagement Advisor*

Phase 1: Drop-in sessions – "Hear About the Hazard"

Two, 1-day long drop-in sessions were held with over 50 visitors. The community-scale engagement dealt with people who had high emotional investment due to direct personal impacts on their homes and livelihoods. This phase was designed to support understanding of both the hazard likelihood and consequences in ways meaningful to those potentially affected, and to introduce possible response options

OTHER KEY INPUTS INTO THE PROCESS

- Technical assessment of the risk.
- Creation of visual scenarios using RiskScape.
- Brochures about the mitigation options.
- "Let's Talk" website displaying reports, videos, and FAQs.
- Online feedback forms.
- Final submission form after discussions closed.
- Meetings with key community connectors/champions.
- Staff were available for consultations or follow-up conversations.

Different stands were staffed by experts with posters and leaflets providing clear information (Figure 1). The first station showed a map of the area, while another focused on revealing underlying community values by asking, "What's most important to me?" People were able to add their own value statements and agree with what others had included. This tool helped surface what consequences and impacts people were most concerned about and expanded understanding beyond the initially considered consequences of life loss, injury, and property damage to include long-term uncertainty, financial impacts, and stigma.

The flow of the session moved the community through a story, allowing them to talk to technical experts and digest information. Engineers and Civil Defence staff were present, along with council staff and representatives.

A wellbeing counsellor was present to provide support for community members or staff who found the situation distressing, recognising that the community context included high emotional stress due to the temporal proximity to hazard and spatial proximity to hazard.

While most of the session was self-paced, there were also set times for formal presentations. Throughout the day, when a bell was rung, a presentation began for everyone to gather and listen to. At this time presenters briefed the community on the full picture.

The sessions were designed to be inclusive of diverse views shaped by differing circumstances, accommodating the community's ability to engage while managing the challenging context.

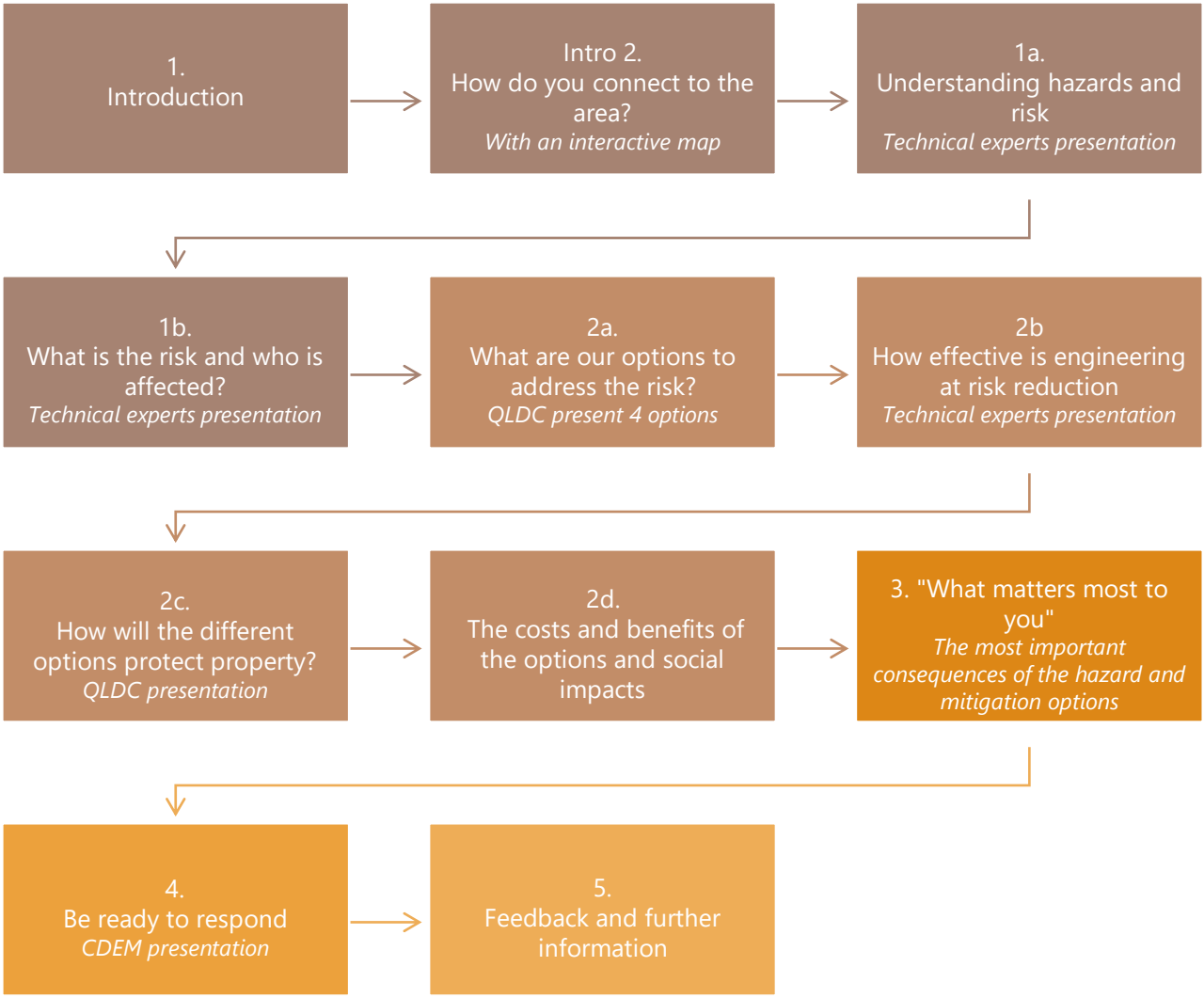


Figure 1 "Hear About The Hazards" engagement session. How the session was staged to build understanding

Phase 2: Targeted consultation sessions – "Risk Response Discussions"

Four smaller workshops were held two weeks after the "Hear About The Hazards" drop-ins, each focused on a different risk zone (High risk, Moderate risk, Low risk, and Businesses). These sessions provided participants with a more focused opportunity to discuss how they felt about the risks and potential risk mitigation options. They grouped participants by similar levels of exposure, allowing discussion among those with shared concerns.

While structured for collective dialogue, the workshops were designed to gather individual perspectives, acknowledging the personal nature of the risk and the emotional intensity surrounding property-specific impacts. This approach reflected a deliberate decision to support informed individual input within a shared-risk context, rather than aiming for consensus or collective positioning.

The workshops aimed to build impacted people's awareness of their preferences including appreciation for both their risk capacity and appetite. The staging was designed to build people's capacity for judgement, by ensuring adequate knowledge was given before asking for opinions.

Sessions were held in closed rooms, with between 1 and 10 participants. The session included a presentation about the hazard, risk level, potential impacts and management options, followed by group discussion. This approach recognised that elicitation goes beyond straightforward data collection and serves as a generative process that engages people in reflecting on hazard information alongside their own circumstances.

Each participant completed a questionnaire exploring their overall views of the hazard risk, its impacts on them, and how well they thought the risk management options addressed their key concerns (identified through the "what matters most" stand at the "Hear about the Hazards" drop ins). The goal was to understand the reasons behind participants choices.

After thorough discussion, four options were presented to participants (see Figure 2):

- **Option A "status quo"** suggested accepting the current risk and managing it case-by-case.
- **Option B "engineering"** would mean supporting development and conducting mitigation works.
- **Option C "manage"** allowed for three levels of development, from no further development to limited development
- **Option D "reduce"** called for the removal of vulnerable structures and no further development in at-risk areas.

Participants each used tokens to vote proportionally for their preferred (and next preferred) options. This tool helped people weigh action versus inaction and what costs they considered acceptable, surfacing priorities and concerns related to risk management including the trade-offs between costs and benefits.

Preferences expressed during these sessions were also treated as proxy indicators of risk tolerance—for example, support for the "Reduce" option (effectively managed retreat) was interpreted as a signal of perceived unacceptable risk, while support for the Status Quo indicated a higher tolerance for ongoing exposure.

<table>
<tr><th>RISK LEVEL</th><th>OPTION A – Status quo</th><th>OPTION B – Engineering</th><th>OPTION C – Manage</th><th>OPTION D – Reduce</th></tr>
<tr><td>Significant</td><td rowspan="3">Risk assessed on a case by case basis</td><td rowspan="3">Construct mitigation structures and enable development</td><td>Same built form - no change / increase, same or less vulnerable use</td><td rowspan="2">Remove all built form and uses</td></tr>
<tr><td>Intolerable</td><td>Small / limited increases in built form, same or less vulnerable use</td></tr>
<tr><td>Tolerable</td><td>Allow development and vulnerable uses within tolerable limits</td><td>No further development, same or less vulnerable use</td></tr>
<tr><td>Low risk</td><td colspan="4">No intervention</td></tr>
</table>

Figure 2 Risk management options correlated to risk tolerance.

Integration into the decision-making

Results of the elicitation were summarised in a colour-coded table showing trends across the four management options, with red (negative), yellow (mixed), and green (positive views) (Figure 3). This visual approach condensed complex information whilst also revealing the distribution of views and not forcing artificial consensus.

	Addresses concerns over risk for now and in the future			Addresses concerns over impacts of managing the risk								
				Financial impact			Maintains opportunities			Provides clarity and certainty		
Status Quo												
Engineering						unsure						
Manage							unsure					
Reduce		unsure										
Risk level	**High**	**Med**	**Low**	**High**	**Med**	**Low**	**High**	**Med**	**Low**	**High**	**Med**	**Low**

Strong negative: Complete or predominant view is "does not address concerns"	Strong positive: Complete or predominant view is "Addresses concerns well"	Mixed views
Soft negative: General trend is does not address concerns or only partially.	Soft positive: General trend is does address concerns or only partially	Uncertainty plus mixed views

Figure 3. Colour coded views on risk management options

The colour coding analysis combined quantitative data from questionnaires with qualitative insights from discussions and meeting notes. This mixed approach recognised that while quantitative data provided clear signals to decision-makers, it needed qualitative interpretation to understand how risk appetite and capacity varied across the community and what lay beneath headline levels of acceptance or concern. Rather than using fixed percentages, classification was determined through response trends and qualitative judgement due to the variation in group sizes and the small number of participants.

The QLDC staff project team presented findings to the Council. The report on community engagement explored the community's view on the risk and their expectations for the Council's response. It also highlighted the community's preferred mitigation option.

The findings revealed that almost no one regarded the risk as acceptable without mitigation, but there was no single tolerance for the risks - levels of concern varied as much within risk zones as between them, based on personal factors.

> "This is not an expensive part of Queenstown. This is one of the worst problems about it... the options for cheap housing in Queenstown are zilch. and these people have zilch in terms of alternatives...there were people who had already lost their homes in the Christchurch earthquakes...so they were pretty committed to the idea that there would be engineering solutions.
>
> *Risk Engagement Advisor*

The Council team reconciled the technical risk information and the community views and preferences for responding to the risk. They recommended a preferred option to the Council which could be taken forward for further investigation. The preferred package reflected the community feedback and was a combination of options B, C and D. The Council agreed to proceed with further investigations, including costings (there was no assumptions about who would pay for the options as part of the risk engagement process).

As this was a council-run process tied to a District Plan review, the key decision points were largely dictated by the statutory and political decision-making frameworks established for land use planning. However, the project morphed to be more than just a planning response to manage risk, with engineering and buy-out options considered alongside planning responses. Council planning staff sought public views on risk for inclusion in the information and recommendations they provided to elected representatives.

Reflections on the process

This process brought together a diverse group of stakeholders from the community and various invested sectors. The range of engagement formats, from larger group sessions to one-on-one consultations, allowed stakeholders to participate in ways that suited them. Vulnerable community members felt heard, and the council was pleased with the drop-in sessions, which facilitated dialogue between experts and residents.

However, reaching the business community proved particularly challenging. Despite extensive efforts (including door knocking, leaflet drops to engage tenants (including commercial ones), and standard letters to property ratepayers), uptake of the targeted session was limited. One-on-one meetings were more successful, allowing some perspectives from this sector to be included. This experience highlights the difficulty of engaging all affected sectors, especially where multiple layers of tenancy and ownership exist or where availability during working hours is limited. Reflecting on the process, it was suggested that forming a group of community champions could have improved outreach and encouraged broader participation.

Information sharing and learning through a staged process supported the progressive development of understanding and effectively elicited judgement rather than opinion. Recognising that risk relationships are personal and context-dependent allowed the process to accommodate different learning styles and information needs. This thoughtful approach to complex information contributed to more informed community feedback and positive engagement.

Future improvements to the process, as noted by those involved, included developing more robust mechanisms for eliciting risk tolerance and harnessing relatable scenarios and recent experiences. Strengthening systems for analysing and incorporating community feedback would help support decision-making. Visual tools, such as RiskScape representations of loss and damage with and without response options, were well received by both councillors and the public and offered a promising approach to presenting complex technical information more effectively to non-expert audiences.

> "I think maybe the biggest thing is just keeping the residents updated... every now and then. When I think about this project, I think, oh, what must those people in those houses been thinking if they haven't heard from council in like 2 years. I think that follow up kind of is important."
>
> *District Plan Review Team Member*

Process insights also revealed the importance of building knowledge and understanding before seeking input, particularly in emotionally charged situations. The community's impatience for action rather than continued consultation highlights the importance of timely decision-making following engagement.

Resources

For more information and resources on the Gorge Road project visit letstalk.qldc.govt.nz/brewery-creek-and-reavers-lane-natural-hazard-review.

For further key contextual factors to consider in a risk engagement process, see the Lets Talk About Risk: Framework for designing natural hazard and climate risk community engagement.

Appendix: Key scoping factors in eliciting risk tolerance

In the Let's Talk About Risk guidance on risk tolerance conversations, nine scoping factors were identified to help in the design of risk tolerance elicitation processes. In the table below, these scoping factors are mapped to the Gorge Road case study. This is designed to help understand how transferable the Gorge Road approach is to other contexts.

Temporal aspects *The period over which risks emerge, and decisions play out*	Urgent implementation that reshapes exposure patterns over time.
Scale *The level at which risk tolerance is evaluated*	Community.
Consequences *Different types of impacts considered during elicitation.*	Life loss and injury, property loss, economic and social impact of hazard event. Implications of mitigations, including stigma associated with area, loss of development potential and livelihood.
Risk perspectives *Ranging from individual through to collective views.*	While the drop-in session gained individual views, the workshops attempted to build collective understanding and consensus.
Risk capacity *How risk capacity was considered and/or addressed.*	The primary focus was on eliciting risk appetite. While the "Hear about the Hazards" sessions did attempt to build understanding of potential impacts, there was limited systematic assessment of the community's actual capacity to cope with or recover from hazard events. Capacity considerations were implicitly embedded rather than explicitly evaluated.
Public role *How involved the community were in the process.*	Consultative approach with the council pre-developing mitigation options for the community to provide feedback on and insight into.
Information needs *Information gained from process and how it was gathered and presented.*	Council planning staff required technically comparable information to justify planning regulations, whilst elected representatives needed assurance of due diligence and understanding of public views to demonstrate procedural legitimacy. Quantitative data on public views was attractive for providing a clear signal to decision makers, but it needed to be complemented by qualitative insights to interpret those views appropriately.

Monitoring changes *Importance placed on tracking risk tolerance over time.*	This wasn't explicitly addressed given the imminent nature of the risk and focus on immediate decisions, though the council's need for further engagement suggests ongoing monitoring may be required.
Community context *Key social, cultural and environmental factors.*	Demographics: Diverse working population with 210 businesses, low numbers of children and elderly residents. Economic characteristics: Low-cost housing area important for seasonal tourism workers, lower-than-average household incomes. Hazard experience: Aware of the hazard but had limited direct experience with debris flow or rockfall impacts. Relationship with council: Believed the council was there to make decisions for the community, they wanted decisive action. Engagement capacity: High emotional investment due to direct personal impacts on homes and livelihoods, some groups (businesses) difficult to engage despite targeted efforts. Hazard relationship: High temporal and spatial proximity to imminent risk, strong emotional connection due to potential impacts, risk levels varied significantly across different areas.

Why they chose the methods and tools

The project used a multi-method approach due to the key scoping factors. The imminent time horizon with high emotions required methods that could address immediate concerns whilst gathering future-focused information. Drop-in sessions and workshops were chosen because they were they were an accepted and expected council engagement process, particularly the 'town hall' drop-in, and provided essential one-on-one time with experts during this emotionally charged period.

The community scale made drop-in sessions and workshops particularly suitable for direct, personal interaction. Since risk levels differed across the community, consensus-seeking was unreasonable in such a highly emotional context. Individual-focused methods were therefore selected over collective approaches.

The "what matters most" tool revealed consequences beyond initial technical assessments (life loss, injury, property damage), identifying long-term uncertainty and financial impact as highly important. This finding shaped subsequent workshop design to explore these broader concerns.

Workshops and one-on-one interviews were chosen because individuals needed opportunities to think through issues independently. The design combined individual questionnaires with accompanying workshops, allowing people to complete forms whilst being aware of community views.

The "Hear about the Hazards" sessions built understanding about the hazard's full potential impact, integrating risk capacity into risk appetite assessment. The consultative approach met decision-maker needs: planners required technically comparable information whilst elected representatives needed to demonstrate mandate during a volatile situation.

Appendix 3: Advice guides

Advice for elected officials

Advice for communities

EVALUATING RISK TOLERANCE:

THE ROLE OF THE PUBLIC

ADVICE FOR ELECTED OFFICIALS

This document was developed as part of the Let's Talk About Risk project. It was informed by interviews with practitioners, elected representatives, and community members who have participated in risk tolerance processes across New Zealand. For more detailed information refer to the Let's Talk About Risk "Natural hazard and climate change risk tolerance conversations: Guidance to aid design" available at *resorgs.org.nz/wpcontent/uploads/ltar_risk_tolerance_conversations_guidance.pdf*. The guidance includes detailed information on scoping factors, methods, tools, and design principles; and includes several case studies.

Citation: Let's Talk About Risk Team (Horn C, Brown, C., Kilvington, M. Cara, Ross-Donald). 2025. Evaluating risk tolerance: the role of the public. Advice for elected officials *resorgs.org.nz/wp-content/uploads/ltar_evaluating_risk_tolerance_elected_members_advice.pdf*

Earthquakes, volcanoes and landslides have long been part of living in a geologically active country, and now with climate change, there are more and more floods, fires, and wind events. Councils are pivotal to managing the associated risks through activities such as long-term region-wide planning, decision making about local developments and helping communities manage an immediate hazard challenge.

These decisions are challenging because councils must balance pressures for immediate benefits with the long-term risks and costs associated with development. They also have to navigate political, financial, and legal responsibilities tied to managing hazard risks.

Why asking communities about their risk tolerance preferences is important

Asking communities about their risk tolerance preferences provides not only an overall sense of how much risk a community is willing to accept but also uncovers the reasons behind those views. Through public conversations, stories and explanations emerge that reveal how community members think about making trade-offs between different risks and benefits. These insights help decision-makers better appreciate the community's perspectives and values.

Commonly, in New Zealand, quantitative approaches to establishing risk tolerance thresholds, such as Annual Individual Fatality Risk (AIFR), have been used, but these usually focus on the likelihood of fatalities and may not consider other issues such as loss of valued assets, economic disruption or social dislocation. The thresholds are often set arbitrarily and do not consider what is important to the public and how the risks are balanced against the costs to reduce the risk (financial and non-financial).

> What seems commonsensical on the surface that, you know, it's obvious that we're going to have to retreat from here. It's obvious that it'll be too expensive and costly, and so on, to maintain mitigation or to adapt to things. . . But the minute you start talking to community there's a very different view.
>
> *Regional Councillor*

Public perspectives on risk complement technical risk assessments and indicate what people value and the trade-offs they are willing to make. Understanding the public's risk tolerance can substantially lower political and financial risks by helping councils to avoid under or over managing hazard risk and improving the legitimacy of related decisions. It can also strengthen the social licence or mandate for councils to act by demonstrating that decisions align with community values and have public support.

When assessing what communities find acceptable, tolerable or intolerable, consider:

- Was the engagement process fair, did it reach across all affected parties (including those indirectly affected), and will people feel that they had opportunities to engage in this discussion?
- Are there any signs of outrage or distrust in the process? How can you manage these and avoid letting them steer you too strongly?
- How consistent were the estimates of risk tolerance across the community? Were there areas of strong agreement or disagreement?
- Were there significant divisions between different groups in the community? How are those divergences reflected by different situations or values for these groups?
- What matters most to people in the affected communities? What are their key values and concerns? How might they be addressed as part of this risk management situation?
- Is there a clear mandate to act, or were people divided over what should happen moving forward?

As elected members you can improve your decision making capacity by:

- Advocating for good process. A process that is fair, provides good opportunities for engagement that surfaces what really matters to that community and uncovers how people trade these off against the risks they face.
- Being involved in the process by turning up to events, learning about how people are dealing with the discussions.
- Understanding that community members and Councils may have different priorities that need to be reconciled. Councils' political, legal and financial risks and mandates need to be balanced against risk to directly and indirectly affected communities and individuals.
- Recognising where the different priorities of council and community may lead. A council-led process might aim to meet statutory or planning requirements, while for the public, the same conversation can raise urgent, present-day concerns. Sometimes this sparks wider community-led discussions that go beyond the original scope. When that happens, it's important to consider whether the community has the leadership and capacity to carry those conversations forward. Without support, people may be left in a space of uncertainty or concern. Councils should be mindful of the expectations and momentum these processes create and be prepared to help the public navigate what comes next.

LET'S talk about RISK

Engaging communities in natural hazard and climate change conversations

EVALUATING RISK TOLERANCE: THE ROLE OF THE PUBLIC

ADVICE FOR COMMUNITIES

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Why talk about risk?

All communities around New Zealand face natural hazard and climate change risks. At some point, you, your community, and your council will need to weigh up the risks and costs of action or inaction.

Councils often need to understand how much risk a community is willing or able to bear (often known as your risk tolerance) so they can choose how to manage a risk, how to prioritise different risks, or how to plan for, or avoid, some future risks.

Isn't risk just a technical issue?

Technical hazard assessments give important information about how likely and severe hazard events might be, but they don't tell us what risks people are willing to accept or what they want to protect.

Understanding community risk tolerance answers the question: "*What losses are we willing to accept, and what do we want to safeguard?*" It helps ensure risk management decisions reflect both scientific knowledge and community values. Every hazard and community is different, so risk tolerance needs to be understood in context.

Levels of risk

Usually, an agency wants to know what is acceptable risk, what is tolerable risk, and what is intolerable risk.

Acceptable No action needs to be taken, or no restrictions need to be in place to counter the risk of damage or loss.

Tolerable Some work may need to be done to lessen the risk if the cost or impact of reducing the risk is not high.

Intolerable Action must be taken to reduce the risk.

Risk thresholds

People may be comfortable living with a certain level of risk for now, but that can change. At some point, the risk might start to feel too high, and that's when it crosses a ***risk threshold*, the point where the way a hazard is managed needs to change.** Risk thresholds are often based on a combination of the size and type of impact and the expected frequency of impact.

Risk thresholds can guide both short-term decisions (like upgrading a local drain) and long-term planning (like changing where new homes can be built).

Talking with communities about what levels of risk feel acceptable, and what would trigger a change in response, is a key part of good planning.

Weighing things up

Risk tolerance emerges from weighing up various factors. It requires understanding the nature, likelihood, and potential impacts of a hazard and what this means *for you and your community*. It also means understanding the impacts and costs of any actions that could be taken to reduce the risk. Make sure you fully understand how the hazard might affect you, both now and in the future. Note that if you have multiple potential hazards in your area, this process can be challenging.

What to think about when weighing things up

When thinking about your risk tolerance, it is important to think about your or your community's ability to deal with disruption, or your **risk capacity.** A community's risk capacity can be affected by a range of factors, including financial situation, insurance, how connected a community is and how likely it is to work together to deal with a situation. To understand your individual risk capacity, it can help if you think through the following for your own household.

- How well connected are you with people who may be able to help?
- What is your family's financial situation?
- What is your insurance situation?
- How did you find any previous experiences of adverse events?
- How might these things impact your capacity to manage an adverse event (including recovering from the event)?

Stress and uncertainty

It's natural to feel stressed or overwhelmed when you learn about a hazard you didn't know existed. People often feel shocked, and that stress can affect how you think and make decisions. When you're feeling anxious or upset, it can be harder to take in information or weigh up your options clearly. Good processes take this into account. They allow time for people to settle, ask questions, and talk things through.

It's okay to ask for more information about things that are concerning you. This helps create space to understand the situation and come up with practical steps, including plans for what to do if something does happen.

Talk with others

Be prepared to take time to think about and discuss these things with your family and neighbours.

Everyone sees things in different ways, even when they find themselves in the same situation, so it is worth talking to people before an event happens.

Some people are more likely to focus on the likelihood and less on the consequences, while others will do the opposite. Make sure you have discussions within your household to understand the different perspectives that you all have. It is also good to hear how others are thinking about the risk because they may have some useful ways of seeing things that can help you understand your own feelings and perspectives. You may even find that your risk tolerance is different from what you initially thought.

Risk management decisions

In general, agencies are trying to understand risk tolerance at a community level. Usually, there is no single right answer. Arriving at a community's risk tolerance will involve weighing up different information, and this can be done by agency staff or a group of community members, or often, discussions involving both groups. Sometimes the results can be brought back to the community so the decision can be discussed and assessed by people in the community. Whatever the process, the agency should make it clear exactly how the decisions are made and who is involved in those conversations.

What is your perspective being used for?

It is worth checking how your input to Council processes will be used. The council may want something very different from the conversation than your community does. For example, they may be doing the work as part of a future-focused planning process, where you may be more interested in doing something about the hazards that threaten you now. This is not because of any shortcomings on anyone's part. Communities can have different priorities from those of the local council or a government agency (which is why they are consulting in the first place). So make sure you are clear on the purpose, and the Council is aware of any specific needs you have.

You may want to do something more as a community

Your community may want more action than the agency is thinking about. It could be worth working with your neighbours to consider what you can do to manage the risk for yourselves or how you might advocate for yourselves as a whole group – a stronger form of advocacy than doing it as individuals.

Where communities have good leadership, it may be possible to take what has been learned from an assessment of risk tolerance and start to develop a plan for how to deal with it (if that is not something the agency is already doing).

Who pays?

'Who pays' is a question that may be worth raising, early in a process, particularly if the process is aimed at considering what to do about a hazard and its effect on your community, because it will help with weighing up the risk. Understanding your risk tolerance involves weighing up the risk of the hazard occurring and the impacts and cost/impact of measures to reduce the risk (including who pays).