

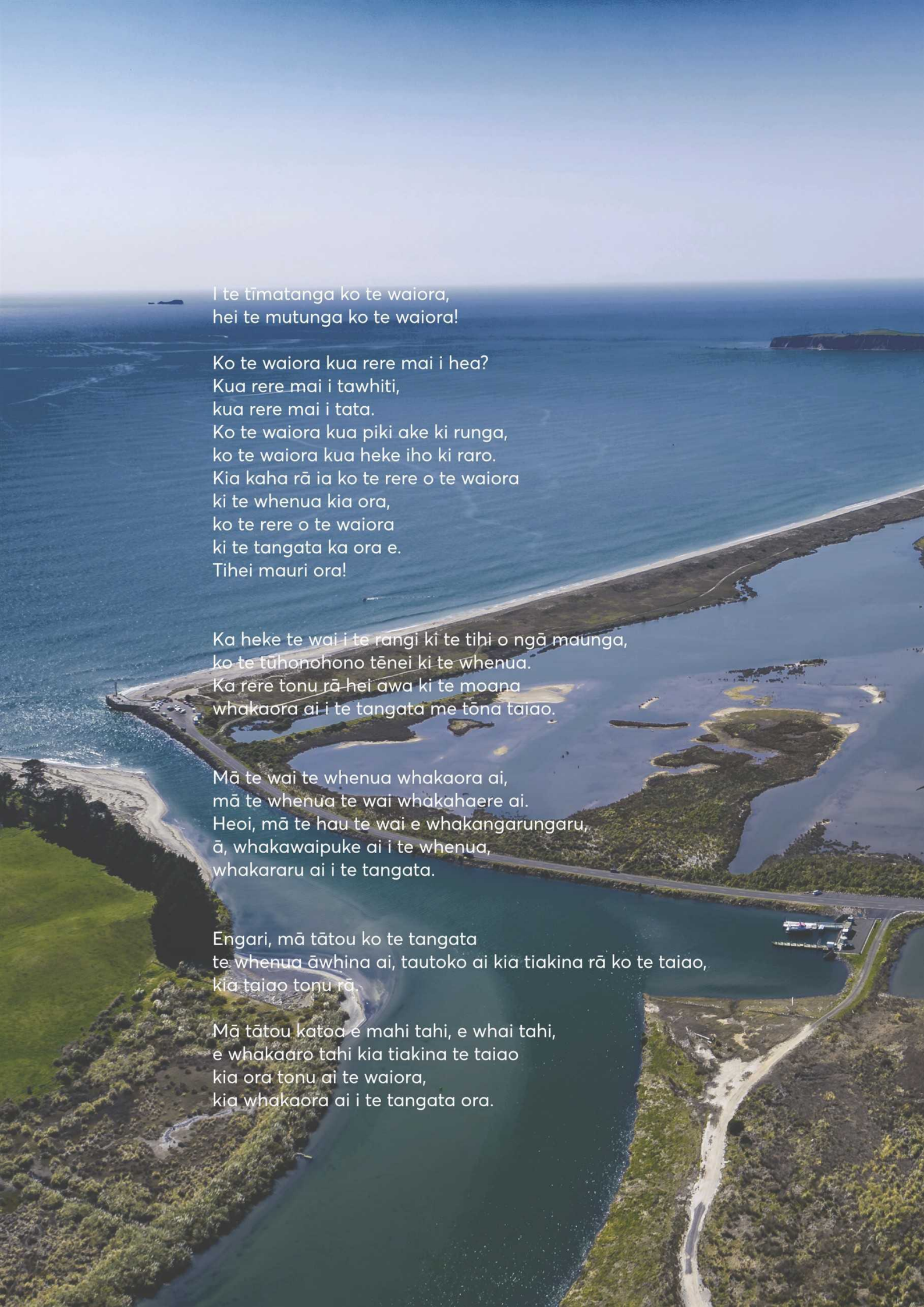
BEFORE THE DELUGE | 3.0

Taking the long view of flood risk resilience in Aotearoa New Zealand

Te Uru Kahika

Regional and Unitary Councils Aotearoa

Version 1.0 | 24 July 2026



I te tīmatanga ko te waiora,
hei te mutunga ko te waiora!

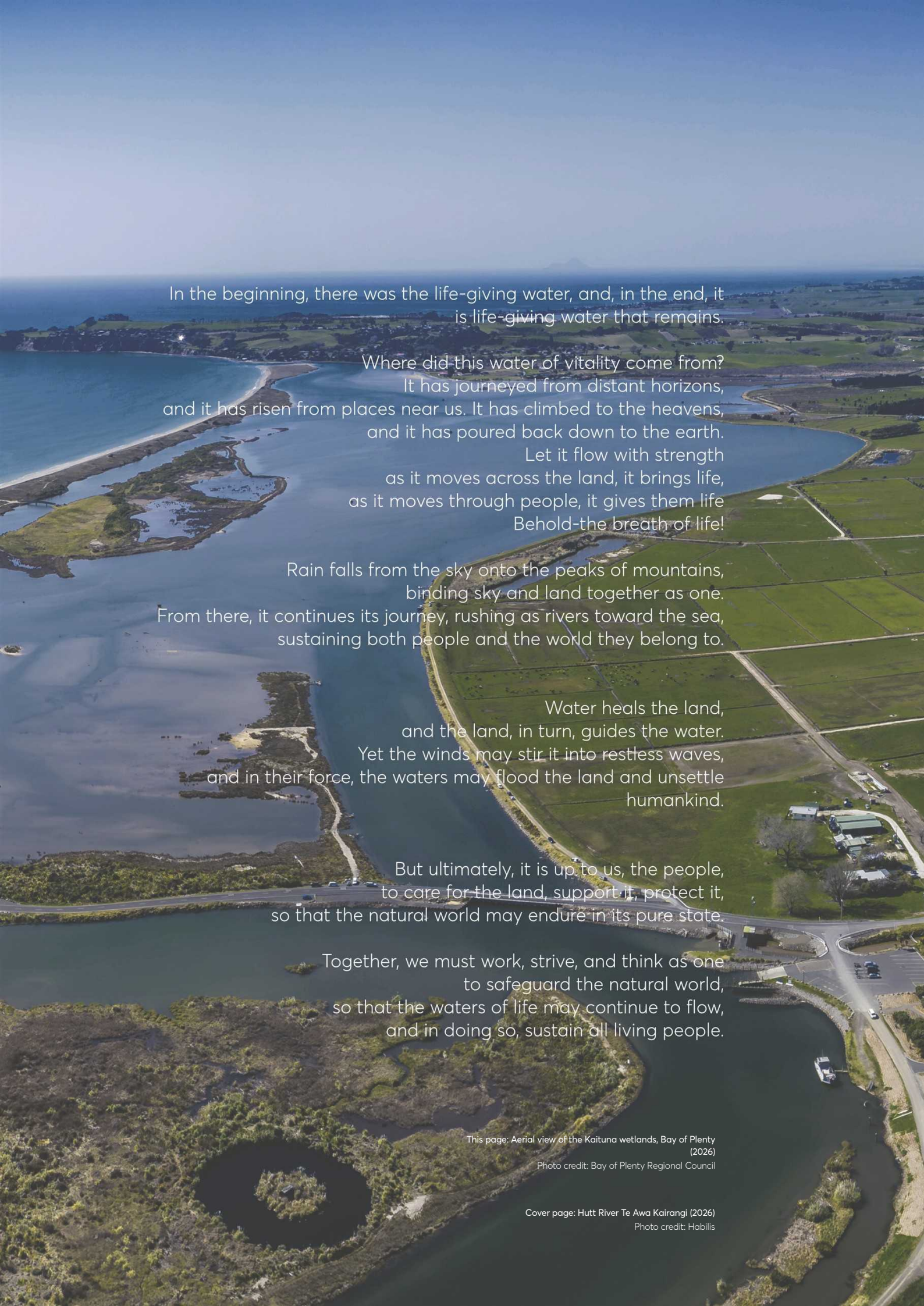
Ko te waiora kua rere mai i hea?
Kua rere mai i tawhiti,
kua rere mai i tata.
Ko te waiora kua piki ake ki runga,
ko te waiora kua heke iho ki raro.
Kia kaha rā ia ko te rere o te waiora
ki te whenua kia ora,
ko te rere o te waiora
ki te tangata ka ora e.
Tihei mauri ora!

Ka heke te wai i te rangi ki te tihi o ngā maunga,
ko te tūhonohono tēnei ki te whenua.
Ka rere tonu rā hei awa ki te moana
whakaora ai i te tangata me tōna taiao.

Mā te wai te whenua whakaora ai,
mā te whenua te wai whakahaere ai.
Heoi, mā te hau te wai e whakangarungaru,
ā, whakawaipuke ai i te whenua,
whakararu ai i te tangata.

Engari, mā tātou ko te tangata
te whenua āwhina ai, tautoko ai kia tiakina rā ko te taiao,
kia taiao tonu rā.

Mā tātou katoa e mahi tahi, e whai tahi,
e whakaaro tahi kia tiakina te taiao
kia ora tonu ai te waiora,
kia whakaora ai i te tangata ora.



In the beginning, there was the life-giving water, and, in the end, it is life-giving water that remains.

Where did this water of vitality come from?
It has journeyed from distant horizons,
and it has risen from places near us. It has climbed to the heavens,
and it has poured back down to the earth.
Let it flow with strength
as it moves across the land, it brings life,
as it moves through people, it gives them life
Behold-the breath of life!

Rain falls from the sky onto the peaks of mountains,
binding sky and land together as one.
From there, it continues its journey, rushing as rivers toward the sea,
sustaining both people and the world they belong to.

Water heals the land,
and the land, in turn, guides the water.
Yet the winds may stir it into restless waves,
and in their force, the waters may flood the land and unsettle humankind.

But ultimately, it is up to us, the people,
to care for the land, support it, protect it,
so that the natural world may endure in its pure state.

Together, we must work, strive, and think as one
to safeguard the natural world,
so that the waters of life may continue to flow,
and in doing so, sustain all living people.

This page: Aerial view of the Kaituna wetlands, Bay of Plenty (2026)
Photo credit: Bay of Plenty Regional Council

Cover page: Hutt River Te Awa Kairangi (2026)
Photo credit: Habilis

A LETTER FROM OUR CHAIRS

In 2022 Te Uru Kahika presented Before the Deluge, the business case for co-investment in national flood risk resilience. As a result of the business case and subsequent work from the sector and officials, the Government committed to multiple tranches of co-funding for some of the country's most pressing flood resilience challenges.

This investment has been hugely successful. Deferred projects have been reactivated, jobs created, and capacity and capability expanded across regional Aotearoa New Zealand.

And most importantly, the projects have worked – essential flood resilience upgrades have been tested in the severe weather events that have battered the country over the last few years. Yet stopbanks held, pump stations preformed, and communities and businesses and farms remained protected from the worst effects of widespread and destructive flooding.

We can now begin to capitalise on these benefits as a nation, by extending the tranche-by-tranche commitment to a long-term national flood risk resilience framework.

Te Uru Kahika is now presenting an updated Before The Deluge, our plan for how the sector and the Crown can jointly build a 30 year investment pipeline that will protect our people and our economy for the next 100 years. It stands on the principles and working relationships developed over previous tranches of investment, and sets out how we can understand flood risk, prioritise investment, and deliver outcomes at scale and at pace.

We know that the world is changing. Climate change continues to challenge the infrastructure developed over the last century with larger and more frequent events; and as our economy and communities have grown the value of what we wish to protect has increased.

So we need to take a long view: what will the weather bring, and what do our communities and businesses require. This business case begins to answer those questions, and propose a way for all of us – communities, Councils, and the Crown – to develop a way forward that will benefit us all.

Nāku iti noa, nā



Daran Ponter

Chair, Greater Wellington Regional Council



Dr Deon Swiggs

Chair, Canterbury Regional Council

On behalf of chairs and mayors of Regional and Unitary Councils of Aotearoa New Zealand

Fllod control gates at the Moutoa floodway (2026)
Photo credit: Horizons Regional Council

THE ROLE OF TE URU KAHIKA

Te Uru Kahika Regional and Unitary Councils Aotearoa

Te Uru Kahika is as key mechanism for national collaboration amongst the 16 Regional and Unitary Councils.

The 16 regional and unitary councils across Aotearoa are tasked with the integrated management of land, air, and water resources; supporting biodiversity and biosecurity; provision of transport services regionally; and building community resilience against climate change and natural hazards such as floods.

Collectively the regional sector's efforts are represented – through council Chief Executives – under Te Uru Kahika. The organisation draws on expertise from across the country and the local knowledge of our people to promote the wellbeing of our environments and our communities.

In recent years, Te Uru Kahika has boosted its capacity to prepare for and respond to the impacts of climate change and natural hazards. The increase in flooding expected due to climate change has been a particular focus of this collective, as well as for the councils themselves.

The work is being led by the River Managers' Special Interest Group (SIG), comprised of regional and unitary councils working collaboratively to increase community flood resilience.

River management and flood resilience schemes, managed by the regional sector, have a critical role in mitigating against the full consequences of damaging flood events, the most frequent natural hazard experienced in Aotearoa New Zealand. However, climate change is expected to lead to more frequent and intense floods, and adapting to these increasing risks in the face of climate change comes with costs that should not be shouldered at a regional level alone.

Accordingly, Te Uru Kahika has drawn on the knowledge and experience of the River Managers, their Integrated Catchments teams, scientists and specialists from a wide range of disciplines, and the skills of the wider regional and unitary councils in areas such as asset management, financial planning, procurement, and communiry engagement, to develop the document you hold in your hands.

This is our collective view of how we can help secure more resilient communities and a stronger economy, working with and alongside the rivers that sustain us.

THE SCOPE OF THIS BUSINESS CASE

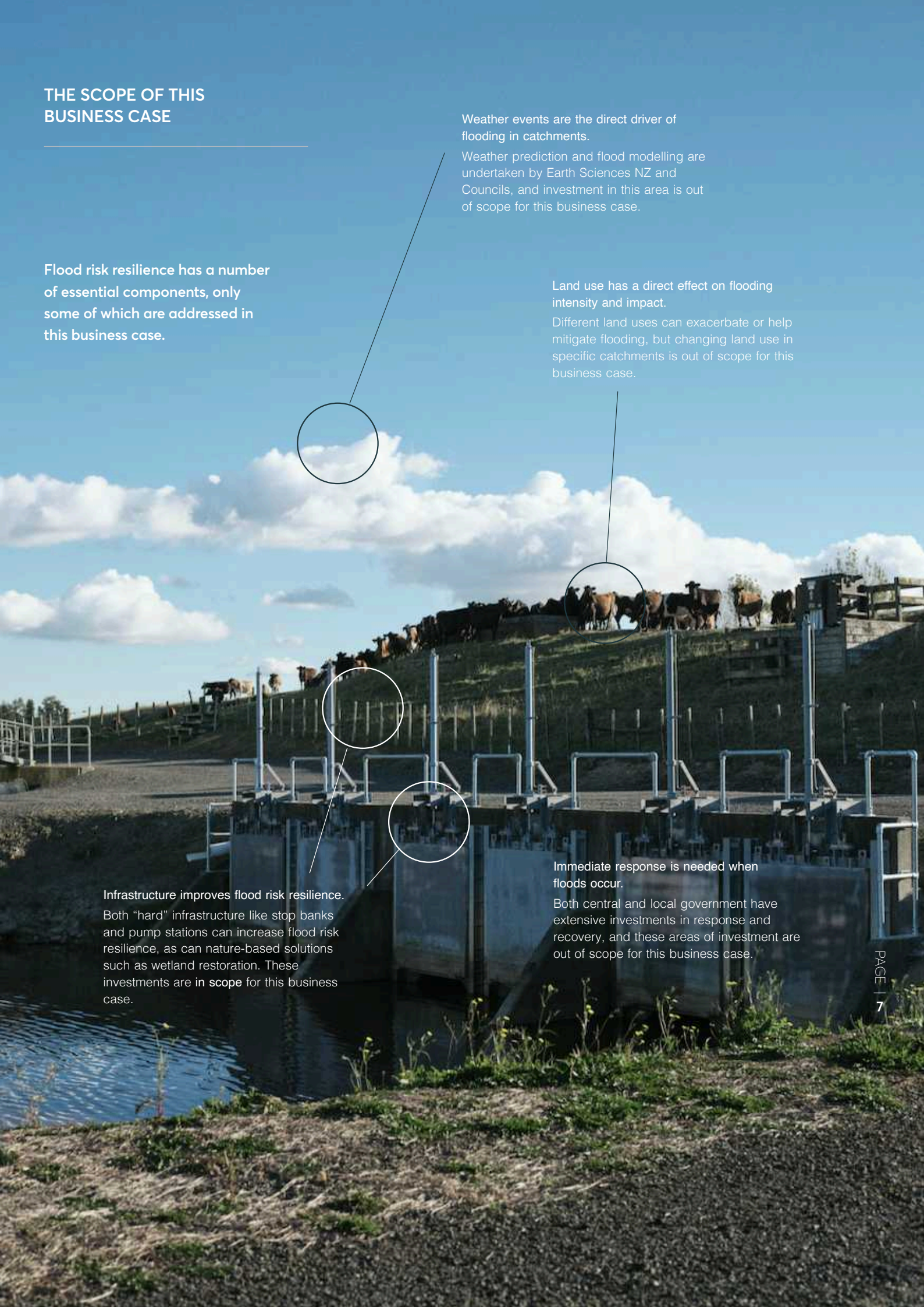
Flood risk resilience has a number of essential components, only some of which are addressed in this business case.

Weather events are the direct driver of flooding in catchments.

Weather prediction and flood modelling are undertaken by Earth Sciences NZ and Councils, and investment in this area is out of scope for this business case.

Land use has a direct effect on flooding intensity and impact.

Different land uses can exacerbate or help mitigate flooding, but changing land use in specific catchments is out of scope for this business case.

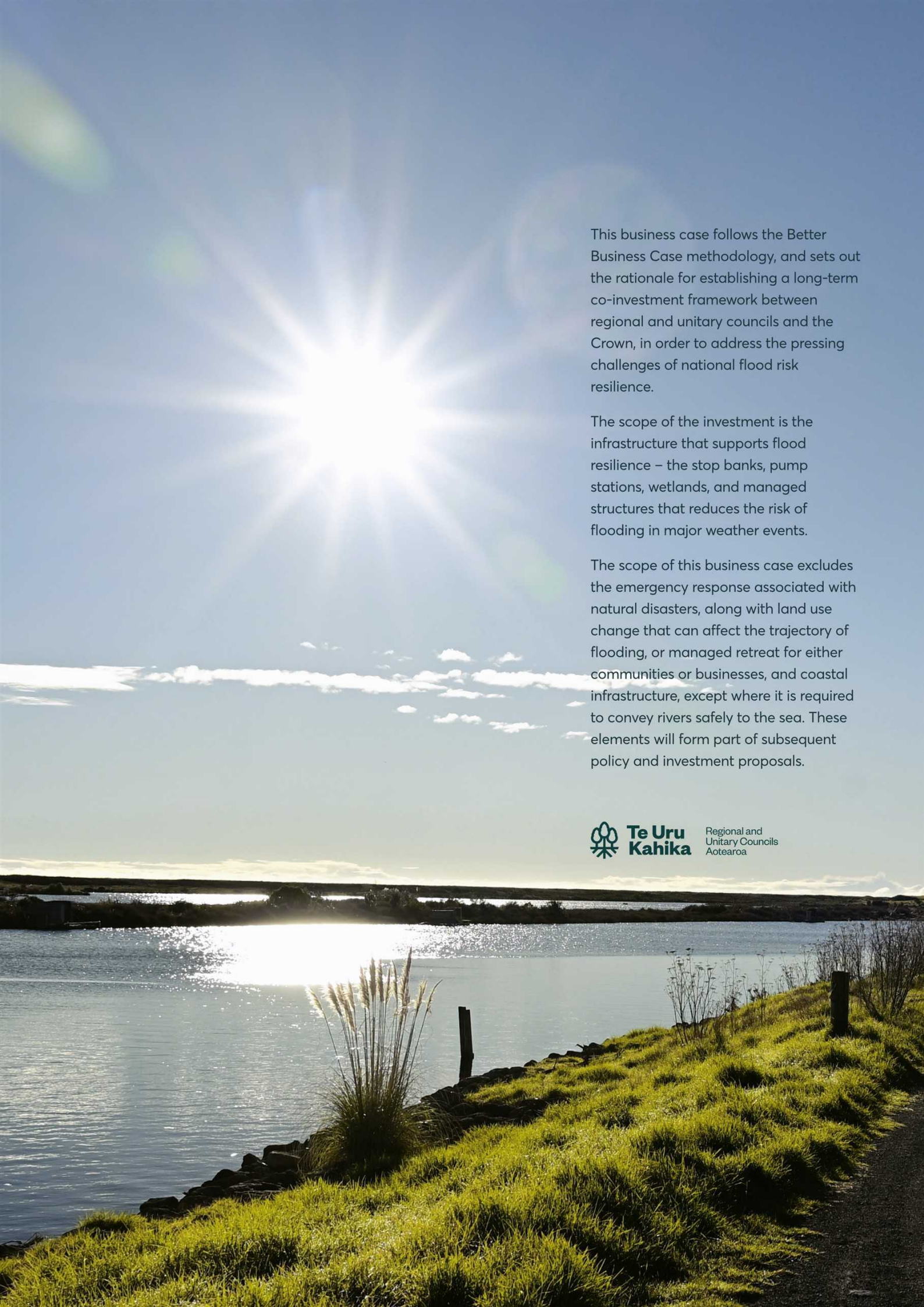


Infrastructure improves flood risk resilience.

Both "hard" infrastructure like stop banks and pump stations can increase flood risk resilience, as can nature-based solutions such as wetland restoration. These investments are **in scope** for this business case.

Immediate response is needed when floods occur.

Both central and local government have extensive investments in response and recovery, and these areas of investment are out of scope for this business case.



This business case follows the Better Business Case methodology, and sets out the rationale for establishing a long-term co-investment framework between regional and unitary councils and the Crown, in order to address the pressing challenges of national flood risk resilience.

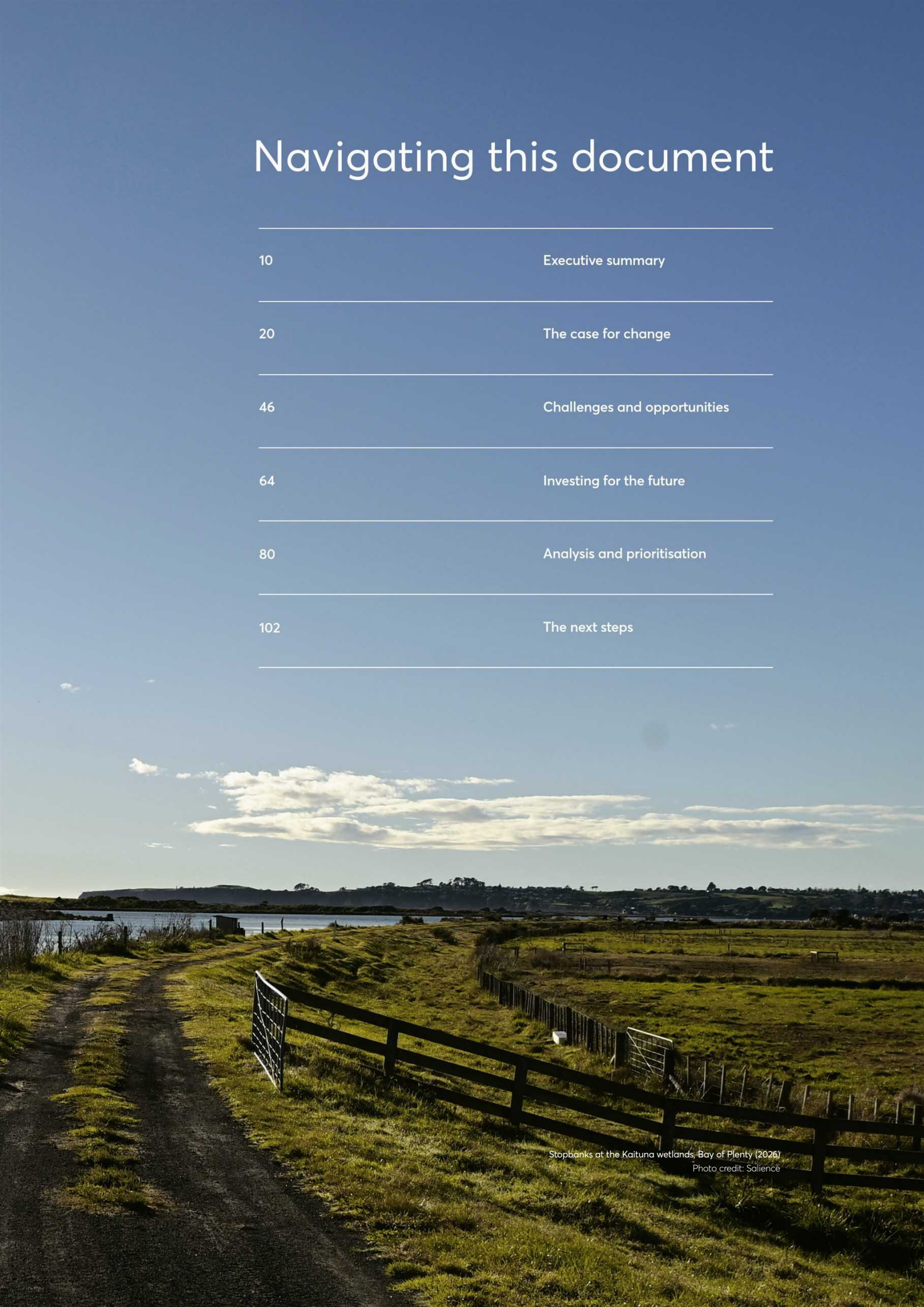
The scope of the investment is the infrastructure that supports flood resilience – the stop banks, pump stations, wetlands, and managed structures that reduces the risk of flooding in major weather events.

The scope of this business case excludes the emergency response associated with natural disasters, along with land use change that can affect the trajectory of flooding, or managed retreat for either communities or businesses, and coastal infrastructure, except where it is required to convey rivers safely to the sea. These elements will form part of subsequent policy and investment proposals.

Te Uru Kahika
Regional and Unitary Councils Aotearoa

Navigating this document

10	Executive summary
20	The case for change
46	Challenges and opportunities
64	Investing for the future
80	Analysis and prioritisation
102	The next steps



Stopbanks at the Kaituna wetlands, Bay of Plenty (2026)
Photo credit: Salience

0 Executive summary





Maketu flood control gates (2026)
Photo credit: Tim D

THE CASE FOR LONG-TERM INVESTMENT CERTAINTY

We are seeking Crown co-investment of $240 million per annum in flood resilience infrastructure to help protect our nation.

Aotearoa New Zealand is planning to invest hundreds of billions of dollars in infrastructure over the coming decades, but those investments can only deliver their intended value if they are protected from flooding – our country's most frequent and costly natural hazard.

The very first point of defence for our country's infrastructure – along with the people and the interdependent systems that rely on it – is flood resilience infrastructure. This shares the same objectives and outcomes as our national infrastructure – while also protecting it; yet, it has remained largely peripheral to the long-term investment conversation despite its direct and indirect reach across almost every asset and stakeholder in the country.

As the regional sector collective will argue throughout this document, flood resilience infrastructure is not simply an investment in stopbanks, floodways, and drainage systems; it is an investment in the continued functioning of the people, places, businesses, and infrastructure that underpin Aotearoa New Zealand's economy and wellbeing. That's why the conversation about infrastructure must include flood resilience.

The time for a national commitment to co-investment is now.

We are therefore seeking a long-term co-investment commitment from the Crown of $240 million per annum, alongside the $160 million per annum provided by regional and unitary councils.

This 60/40 co-investment split builds on the successful tranches of projects delivered since 2021 – and will provide the certainty for councils, communities, the rural sector, and the construction sector, to build homes and businesses, workforces and capability, and long-term certainty for our nation.

Some of the flood resilience assets of councils were originally constructed a century ago, with an eye to the protection and future prosperity of our nation. Many were constructed with support from the Crown, investing alongside local farmers and businesses and communities.

Throughout this document, we make the case that investment in protection and resilience is far cheaper than paying the costs of response and recovery; the events of Cyclone Gabrielle and even the floods of January 2026 have taught us this lesson, again and again.

So councils are seeking a renewal of our collective commitment to flood resilience, and seeking an ongoing Crown commitment to the infrastructure that we all rely on. We look forward to working with Ministers and officials to make this a reality.

NEW ZEALAND IS IN A PERPETUAL STATE OF EMERGENCY

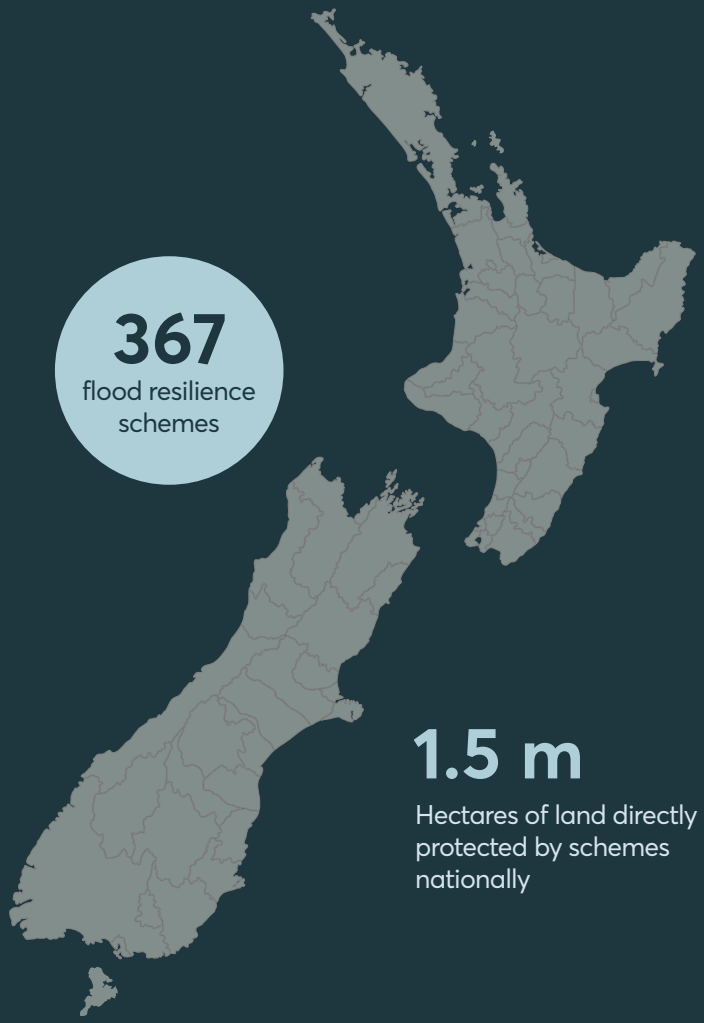
Flood risk

NO. 1 HAZARD
Floods are our most common natural hazard in New Zealand

$213 BILLION
Replacement value of for >282,000 houses in flood-prone zones

750,000 PEOPLE
1 in 7 New Zealanders living in flood-prone zones

$446 MILLION
Annual average cost of repairing critical infrastructure damaged by flooding alone.



367
flood resilience schemes

1.5 m
Hectares of land directly protected by schemes nationally

Costs and benefits

$2.3 BILLION
Capital value of schemes

$11 BILLION
Annual benefits from schemes

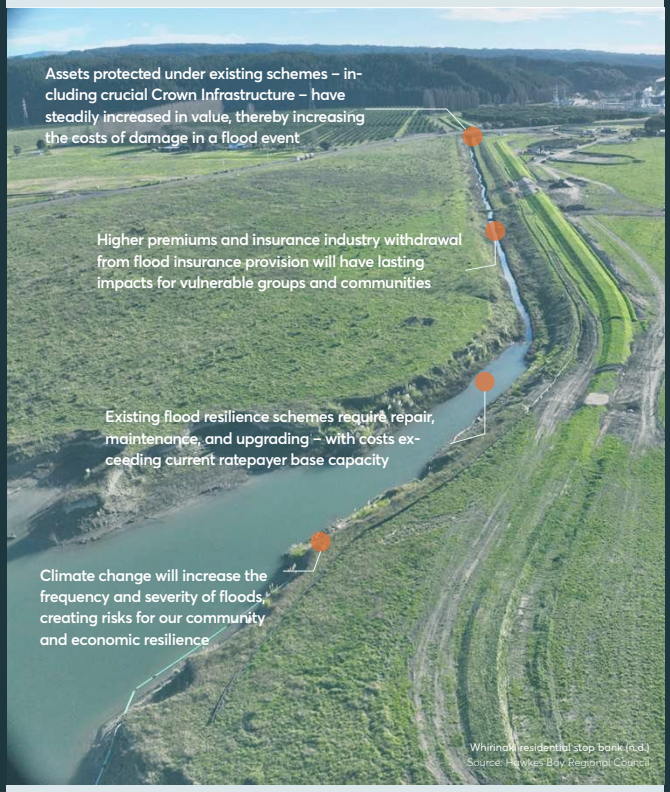
$200 MILLION
Annual op-ex for schemes to maintain current level of service

5:1 BCR
Benefit-to-cost ratio of flood resilience in New Zealand

Flooding is the most common natural hazard in Aotearoa New Zealand, with a major flood event occurring on average every eight months. Across the country, around 750,000 people – or 14% of the population – live in areas prone to flooding.

Flood resilience schemes comprise a core economic enabling infrastructure and are crucial to the economic, social, cultural, and environmental wellbeing of Aotearoa.

Here's where the problem lies. Our ageing flood resilience infrastructure is facing pressure from all sides: climate change, affordability, legislation requirements, and land use change. Schemes are largely funded through targeted rates and operated and managed by local and regional councils – and the pace of investment can't keep up with the growing challenges.



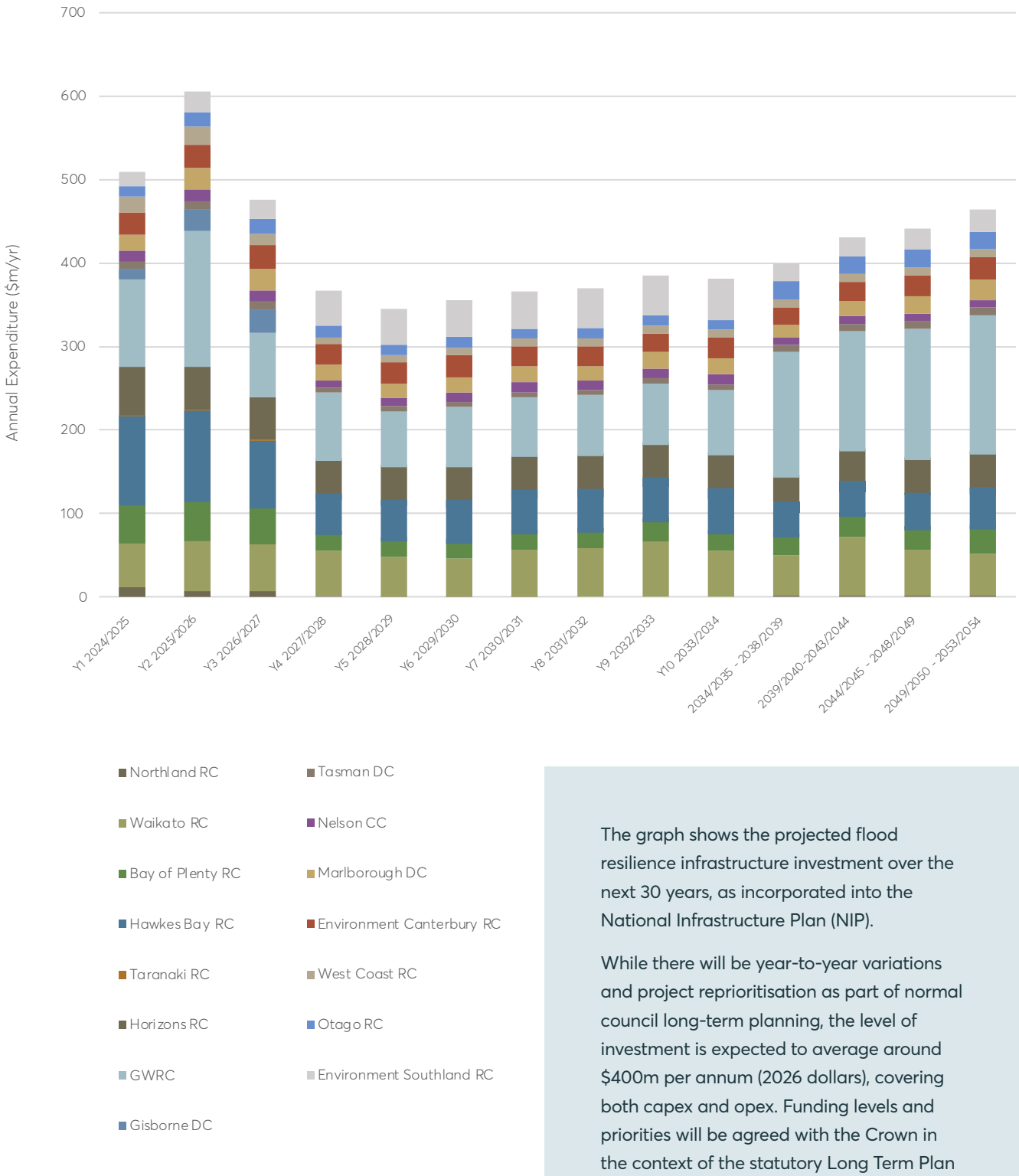
Whirinaki residential stop bank (n.d.)
Source: Hawkes Bay Regional Council

Flood schemes deliver billions in protection and avoided losses of Crown assets on non-rateable land, and critical national infrastructure such as three waters, transport networks, and energy and telecommunication links. Yet, flood resilience has sat largely outside central government conversations for the past three decades – until five years ago. While recent investments has been transformative, flood resilience cannot be delivered through stop-start funding approach.

Planning, maintaining, and upgrading infrastructure requires certainty and continuity, not intermittent funding that makes it harder to take a strategic, long-term approach.

THE SECTOR IS PROPOSING A $400M ANNUAL CO-INVESTMENT

We are proposing the Crown invests $240 million per annum, alongside regional and unitary council investment of $160 million per annum.



The graph shows the projected flood resilience infrastructure investment over the next 30 years, as incorporated into the National Infrastructure Plan (NIP).

While there will be year-to-year variations and project reprioritisation as part of normal council long-term planning, the level of investment is expected to average around $400m per annum (2026 dollars), covering both capex and opex. Funding levels and priorities will be agreed with the Crown in the context of the statutory Long Term Plan (LTP) processes.

CONTINUING THE CURRENT INVESTMENT SHARING

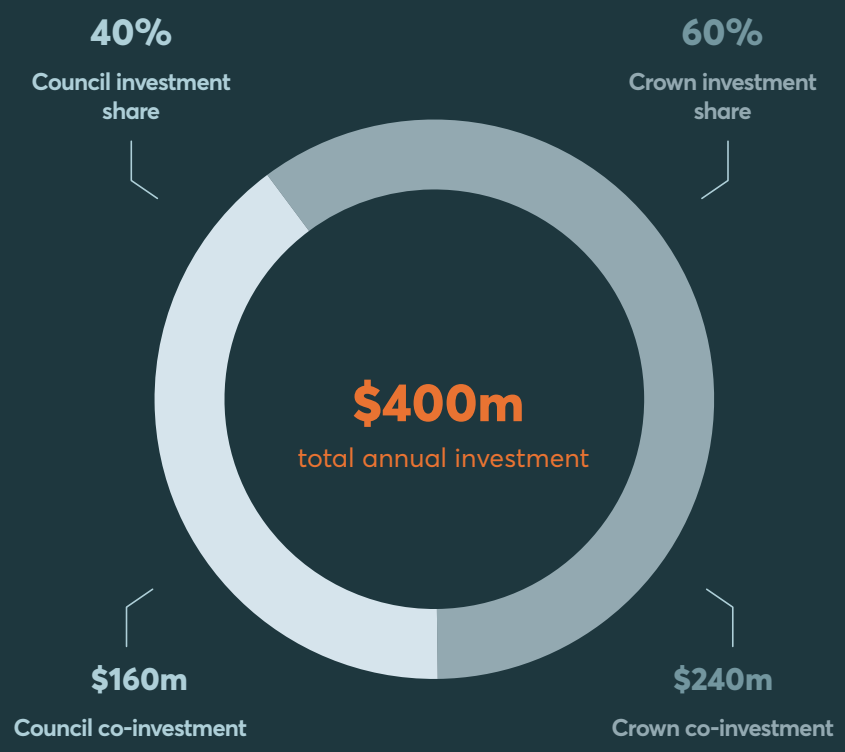
Starting with post-COVID recovery funding in 2021, the Crown and the sector have agreed four tranches of co-investment in flood resilience, totalling $659m. This has enabled long-delayed projects to be accelerated, with resultant benefits to communities and businesses – including effective protection during Cyclones Hale and Gabrielle, and the severe weather events of early 2026.

A further $370m of co-investment is being discussed as part of the next tranche of activity, which will enable longer-term projects to be progressed.

In all tranches, 60% of the investment has been provided by the Crown, with the remaining 40% coming from regional and unitary councils. The sector – via Te Uru Kahika – is proposing to formalise this co-investment methodology into a long-term commitment, in order to build a national pipeline of flood resilience projects.

As the graph on the preceding page shows, around $400 million in annual investment is required to address the challenges of climate change pressure, the growing value of economic activity on land vulnerable to flooding, and a growing population. The Crown commitment being sought is $240m per annum, significantly less than the repair and recovery costs being incurred by the government from flood events.

The co-investment approach is similar to that agreed with councils for local roads, via the NZ Transport Agency, where there is a proportional commitment that allows the Crown, councils, and the contracting sector to plan and deliver projects with certainty. The approach will be supported by a national prioritisation framework provided via Te Uru Kahika, which will deliver a high degree of investment transparency.



This value represents the long-term average annual investment, comprising both CAPEX and OPEX, split evenly (50/50) and expressed in constant 2026 dollars.



Recent upgrades in Paeroa worked as intended during Cyclones Hale and Gabrielle, and most recent severe weather events (2026). Photo credit: Flood Control International

THE BENEFITS TO THE CROWN ARE SIGNIFICANT

There are significant savings to be made by the Crown by investing in protection rather than recovery.



Homes, businesses, farms, and roads flooded in south Dunedin (2024)
Photo credit: Otago Regional Council

The size of the risk to Aotearoa New Zealand's economic and social infrastructure from major flooding events is significant, with damage able to reach into the billions of dollars – as was the case with Cyclones Gabrielle and Hale in 2023.

This means the fiscal benefits to the nation from flood resilience are high. According to analysis undertaken by New Zealand Institute of Economic Research (NZIER) in 2021, the benefit-cost ratio (BCR) of flood resilience is at least 5:1, which means that every dollar invested returns $5 in direct economic benefit through avoided loss. If we take into account the indirect and social benefits to businesses and communities, the benefits are even greater.

The Crown is also a direct beneficiary of investment in flood resilience infrastructure. Under the Local Government Act, councils are required to consider who benefits from infrastructure when determining how costs are apportioned. Given the significant fiscal and economic benefits that accrue nationally through avoided disaster recovery costs, protected public infrastructure, and reduced disruption to economic activity, there is a strong rationale for Crown investment alongside local government. In this context, the Crown is exposed to the fiscal impacts of flooding in a number of ways:

1. Crown infrastructure – including roads, schools, hospitals, and many other asset classes – is exposed to flood damage.
2. The Crown is the primary funder of recovery costs, as shown by 2023 weather events which costed the Government around $6.65 billion, where national resources were mobilised to provide immediate assistance and support to affected communities and businesses.
3. The Crown becomes the insurer of last resort when flood damage exceeds commercial insurance cover and the assets are nationally important, even where the asset may not be owned directly by the Crown. Essential land remediation after a major flooding event is an example.
4. The Crown bears the long-term fiscal impacts of social and economic disruption, with social welfare costs from displacement, income support, health and education impacts, and much more. Research following Cyclone Gabrielle shows that these effects can last for years after the disaster.
5. The Crown also bears the impact of post-flood economic disruption, expressed as lower tax revenues from businesses and individuals.

Investment in flood resilience is therefore a sensible and prudent step for the Crown to take, in order to decrease the immediate and long-term impacts of major flood events. Doing so – putting money into prevention rather than recovery – brings us into line with our OECD peers, who tend to invest to a greater level than Aotearoa New Zealand does in the first lines of defence against the most common natural disaster.

PRIORITISING AND AGREEING THE CO-INVESTMENT PIPELINE

We need to meet the challenges of our times by providing certainty to communities and businesses.



Construction of stopbank in Porangahu (n.d.)
Photo credit: Hawkes Bay Regional Council

A key component of our national investment in flood resilience is ensuring we're prioritising the right projects at the right time. The first step in this process is to co-develop a pipeline of investment, and the sector is proposing an approach similar in concept to the National Land Transport Programme, as follows:

1. **Three-yearly statements**

   The Government publishes a three-yearly policy and prioritisation statement, potentially as part of updates to the National Infrastructure Plan

2. **Project prioritisation**

   Regional and unitary councils respond to the policy statement by providing a prioritised national list of flood resilience investments, including the cost-benefit assessment for each project

3. **Agreed pipeline**

   The pipeline of prioritised projects is agreed between the government and councils, and co-investment milestones and drawdowns are agreed on an annual basis as part of normal Budget processes

4. **Oversight and monitoring**

   Oversight and monitoring is provided by a responsible government agency, with progress reporting provided by councils.

Te Uru Kahika is proposing that the prioritised pipeline of investments is maintained within the GIS-based Flood Resilience Investment Prioritisation Platform (FRIPP) – currently under development. One of the key objectives of the FRIPP platform is to enable decision makers at all levels – community, regionally, nationally – to assess options and set priorities for the decades ahead through a combination of functions such as scenario modelling, prioritisation modelling, regional and national flood modelling, and valuation layer. More on this in Section 5.

The approach builds on the mechanisms developed through multiple tranches of co-investment via the Regional Infrastructure Fund, and establishes the processes as a permanent part of the machinery of government.

There are some open questions that will require further discussion with the Crown, such as the choice of overseeing agency, integration of the pipeline with the National Infrastructure Plan, and whether any enabling legislation is necessary for long-term certainty. These and related operational matters can be explored by officials and council staff as part of the implementation plan discussed later in this document.

> *"Storms and flooding will become more severe and frequent over the next 30 years due to climate change. Infrastructure investment will be needed to respond to damaging events and to improve community resilience."*
>
> *– National Infrastructure Plan, ten priorities for the coming decade ahead*

PERSPECTIVES: MAINTAINING MOMENTUM

My name is Graeme Campbell, I'm a Chartered Professional Engineer, a Fellow of Engineering NZ, and I'm the Principal Flood Management Advisor at Te Uru Kahika.

We're a nation shaped by water, enriched by our rivers, and threatened by rains and floods. Our rivers have determined where we've built our cities and the kinds of activities we undertake on the land. They provide the life to our land, nurture our wellbeing and they help drive our economy. So whether we appreciate it or not, our rivers are at the heart of our country and how we inhabit this land.

My career has followed the trajectory of flood risk resilience in Aotearoa New Zealand. I started by designing and building major flood resilience projects in Tairāwhiti around Cyclone Bola, which led to flood risk management roles and 20 years at Greater Wellington Regional Council, managing the flood resilience team. So my career has gradually evolved into working with people, then convening the national River Managers Special Interest Group for a decade to 2025, and now facilitating our national response to the emerging flooding challenges.

We need all the tools in the box to help communities live with and be resilient to the floods that are happening with ever increasing regularity and intensity. This business case focuses on the flood infrastructure investment, but it's only part of the story. We also need good emergency management capability, and to match our land use to the flood risk that remains after the infrastructure is in in place. This is going to be the biggest challenge we face into the future and will take time to address, so in the meantime we have to invest in infrastructure to give communities and businesses time to adapt.

Over the last few years – in close partnership with the Crown – we've taken the first steps to catching up on the delayed projects, and it's paid dividends. Based on all my decades of engineering experience, I know there would have been major flooding earlier this year if key flood gates and pump stations and stop banks hadn't been upgraded through the Regional Infrastructure Fund co-investments. I'm proud of how the sector has developed over the last decade what we've achieved working together across the sector and with Government.

But the thing about being a flood engineer is that it teaches the discipline of taking the long view. The challenges are increasing, the value of what we're protecting is growing, and we need to work together more than ever.

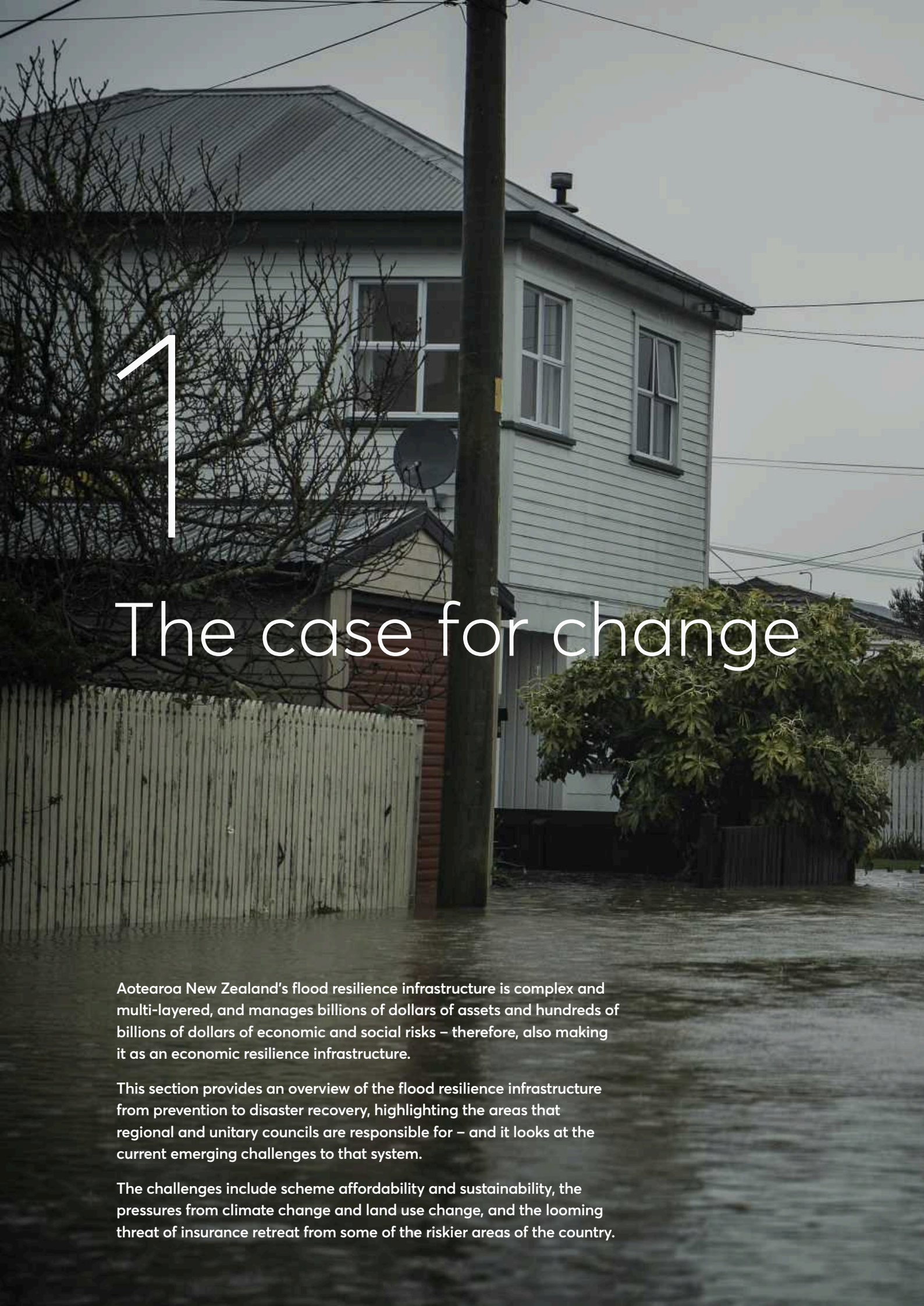
That's why we've developed this business case: because we need a national response to a national challenge. We need an agreed and prioritised roadmap of investment, a stable co-investment approach, a predictable pipeline of projects, and certainty for communities and businesses and farmers. We can be much more efficient in our delivery with a consistent investment stream, one that enables us to invest in training and develop our younger generations of engineers who will be essential to meeting the challenges of the future.

These projects translate into the things Kiwis want: knowing that the risk of flood waters through their homes and businesses and farms is being managed and mitigated, as much as we can. It's not in our national DNA to walk away from these challenges but we need the resources, both human and financial, to help navigate a path through them. So we're looking forward to continuing to work with the Crown to achieve as much long-term certainty as we can for our nation.



Graeme Campbell
Principal Flood Management Advisor
Te Uru Kahika

Photo credit: Tim D



1 The case for change

Aotearoa New Zealand's flood resilience infrastructure is complex and multi-layered, and manages billions of dollars of assets and hundreds of billions of dollars of economic and social risks – therefore, also making it as an economic resilience infrastructure.

This section provides an overview of the flood resilience infrastructure from prevention to disaster recovery, highlighting the areas that regional and unitary councils are responsible for – and it looks at the current emerging challenges to that system.

The challenges include scheme affordability and sustainability, the pressures from climate change and land use change, and the looming threat of insurance retreat from some of the riskier areas of the country.


RN7667

FLOOD RESILIENCE IS THE INFRASTRUCTURE BEHIND THE INFRASTRUCTURE

The objectives of flood resilience and the national infrastructure investment are one and the same; however, before infrastructure can grow the economy, it must first survive the storm.



Mill Street, Wellington (n.d.)
Photo credit: Greater Wellington Regional Council

Aotearoa New Zealand is investing heavily in infrastructure – but without coordinated flood resilience, that investment remains exposed.

Infrastructure is the foundation upon which Aotearoa New Zealand's economy, communities, and way of life depend. From energy and water systems to transport and communications networks, these assets enable the movement of people, goods, and services while supporting the physical, financial, social, and natural capital that drives living standards. Therefore, it makes sense as to why delivering and maintaining better infrastructure is a key part of the Government's plan to fix the basics and build the future New Zealanders both need and deserve, now and into the future.

Before infrastructure can support our aspirations, it must first be able to withstand the forces that threaten it. "We can't stop severe weather events from happening, but we can be much better prepared for them", as Nicola Willis noted in May 2026. Indeed, flood events is New Zealand's most common and disruptive natural hazard, and its about to get much worse both in frequency and severity.

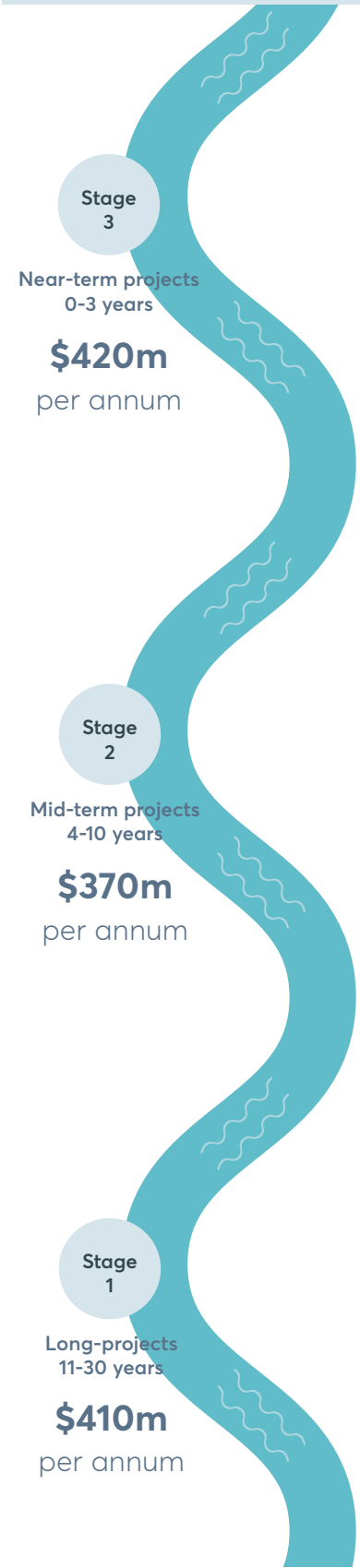
The very first point of defence to the country's infrastructure – along with the people and the interdependent systems that rely on it – is flood resilience infrastructure. Flood resilience infrastructure share the same objectives and outcomes as our national infrastructure – while also protecting it; yet, it has remained largely peripheral to the infrastructure conversation despite its direct and indirect reach across almost every asset and stakeholder in the country.

Almost every part of the economy depends on infrastructure functioning effectively and reliably, and by extension, on flood resilience infrastructure that protect it. Time and again, we have seen how severe weather events and flooding have damaged our natural and built environment, disrupted critical services, and destroyed physical assets. These impacts generated significant localised economic losses that, when compounded across communities, sectors, and supply chains, translated into substantial costs for the wider economy. We've seen this with the Auckland Anniversary floods and Cyclone Gabrielle.

That's why the conversation about infrastructure must also be a conversation about flood resilience. Aotearoa New Zealand is planning to invest hundreds of billions of dollars in infrastructure over the coming decades, but those investments can only deliver their intended value if they are protected from our most frequent and costly natural hazard. Flood resilience infrastructure is not simply an investment in stopbanks, floodways, and drainage systems; it is an investment in the continued functioning of the people, places, businesses, and infrastructure that underpin Aotearoa New Zealand's economy and wellbeing.

WE'RE ASKING FOR LONG-TERM CROWN CO-INVESTMENT

Capital investment pipeline



The Government's recent infrastructure direction, including its acceptance of the Infrastructure Commission's recommendations, closely aligns with the intent of this programme.

Te Uru Kahika is seeking to establish a long-term co-investment agreement with the Crown. The co-investment mechanism proposes an approach similar in concept to Te Waihanga's National Infrastructure Plan, as follows:

1. **Three-yearly statements**
   The Government publishes a three-yearly policy and prioritisation statement, potentially as part of updates to the National Infrastructure Plan (NIP)
2. **Project prioritisation**
   Regional and unitary councils respond to the policy statement by providing a prioritised national list of flood resilience investments, including the cost-benefit assessment for each project
3. **Agreed pipeline**
   The pipeline of prioritised projects is agreed between the government and councils, and co-investment milestones and drawdowns are agreed on an annual basis as part of normal Budget processes
4. **Oversight and monitoring**
   Oversight and monitoring is provided by a responsible government agency, with progress reporting provided by councils.

Te Uru Kahika is proposing that the prioritised pipeline of investments is maintained within the GIS-based Flood Resilience Investment Prioritisation Platform (FRIPP) – currently under development. One of the key objectives of the FRIPP platform is to enable decision makers at all levels – community, regionally, nationally – to assess options and set priorities for the decades ahead through a combination of functions such as scenario modelling, prioritisation modelling, regional and national flood modelling, and valuation layer. More on this in Section 5.

The approach builds on the mechanisms developed through multiple tranches of co-investment via the Regional Infrastructure Fund, and establishes the processes as a permanent part of the machinery of government.

There are some open questions that will require further discussion with the Crown, such as the choice of overseeing agency, integration of the pipeline with the National Infrastructure Plan, and whether any enabling legislation is necessary for long-term certainty. These and related operational matters can be explored by officials and council staff as part of the implementation plan discussed later in this document.

FLOOD RESILIENCE PROTECTS INFRASTRUCTURE PIPELINE

Insufficient investment in flood resilience risks new infrastructure investments increasingly being placed into systems already vulnerable to disruption – leading to repeated cycles of damage, repair, and reinvestment.



Moutau floodgates opening (2026)
Photo credit: Horizons Regional Council

We are asking the Crown to co-invest about 50-56% of the average cost they pay every year to fix infrastructure damage caused by flooding.

The Te Waihanga | Infrastructure Commission's 30-year NIP – backed by almost all of Parliament, with the Government declaring support or support-in principle of the recommendations outlined – sets out a pathway for maximising the economic value from Aotearoa New Zealand's infrastructure spend.

With around 12,000 individual projects in planning and delivery valued at $275 billion across every sector and region within the next 10 years, NIP highlights that Aotearoa is planning on delivering more infrastructure projects that we can afford. Our country spends 5.8% of gross domestic product (GDP) on infrastructure – placing us among the highest in the Organisation for Economic Co-operation and Development (OECD) – yet continues to rank low in terms of efficiency and value for money. NIP sets out recommendations under four high-level themes:

- Planning what we can afford
- Looking after what we have
- Prioritising the right projects
- Making it easier to build better

Flood resilience is not an adjacent consideration to NIP – it is a prerequisite for its success. Without it, the goals of better planning, better prioritisation, and better delivery for our current and future generations cannot be achieved at system scale. Especially at a time when the Government's focus is increasingly on renewing and maintaining existing infrastructure in a fiscally responsible manner, it is not cost-effective to continue investing in infastructure without addressing the most common natural hazard that threaten their performance, lifespan, and value.

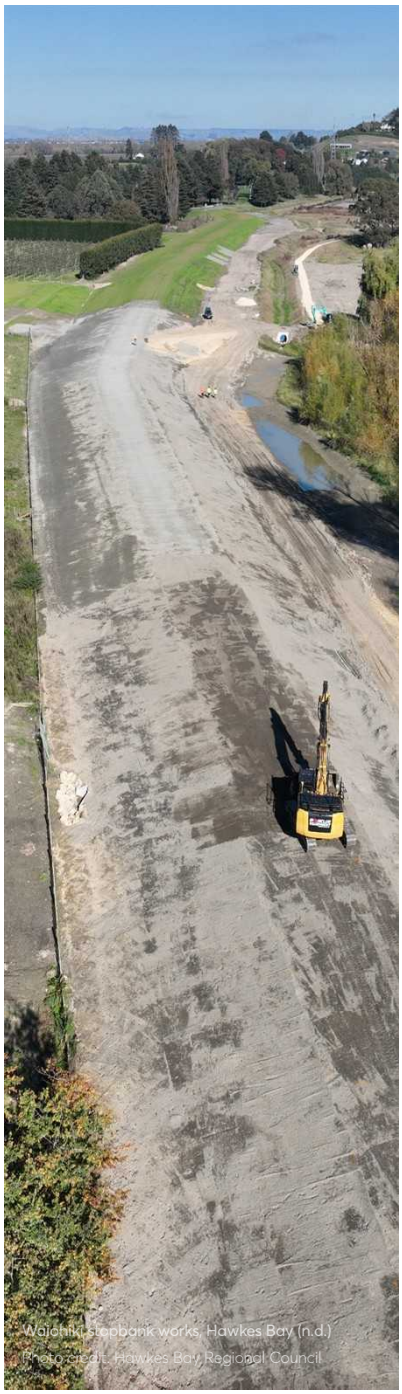
A new unpublished study by Earth Sciences NZ and Te Waihanga reveals the average cost of losing infrastructure to flooding is at $446 million a year – $281 million from rainfall and river flooding, and $165 million from coastal flooding. As climate change intensifies, these costs will unsurprisingly increase. The true cost of flooding is substantially higher once indirect economic, social and environmental costs, impacts on the productive sector, flood infrastructure damages, and emergency response and recovery costs are taken into account.

By comparison, the average annual investment sought through this programme to maintain and renew Aotearoa New Zealand's flood resilience infrastructure is $26 to $76 million less than the cost of flood damage incurred in a single year, and only 50-56% of what we're asking from the Crown. The difference is that one is a planned investment that reduces future risk; the other is an escalating liability.

As Aotearoa embarks on its largest infrastructure programme in generations, continuing to place or upgrade assets into increasingly flood-prone systems without addressing their underlying resilience risks locks the country into an expensive cycle of damage, repair, and reinvestment.

CO-INVESTMENT IS THE SOLUTION

We are not starting at zero; recent co-investment between government and local authorities has delivered real results.



Wajohiki stopbank works, Hawkes Bay (n.d.)
Photo credit: Hawkes Bay Regional Council

Our work to date is a proof of concept that Crown co-investment is the way forward.

In 2020, central government co-invested $217 million into 55 flood resilience projects across the country, as part of the COVID-19 recovery programme. This investment represented the most significant contribution to flood resilience from central government in over 30 years and fast-tracked 'shovel-ready' projects to improve long-term community flood resilience much sooner than planned. This highly successful programme was the first step in establishing an effective ongoing co-investment partnership for flood resilience between central and local government.

Realising the effectiveness of unity in managing the scale of the challenge, Resilient River Communities (RRC) was formed in 2021 – a joint initiative between government (managed by Kānoa - Regional Economic Development & Investment Unit) and regional and unitary councils.

Collectively, regional and unitary authorities through the River Managers' Special Interest Groups got to work through the development of *"Before the Deluge"* business case. Tranche One established the foundation, with central government co-investment positioned as essential to enabling regions to deliver resilience projects at the scale and pace required, to bring together fragmented regional assessments into a national picture of vulnerability and opportunity. It framed flood resilience as core infrastructure, not discretionary spending, and positioned early investment as the economically rational path. The argument was built on avoided loss: fewer damaged homes, fewer broken roads, fewer disrupted services, and reduced long-term fiscal exposure for both councils and central government. Then the climate stopped being an abstraction. Cyclones Hale and Gabrielle shifted the conversation decisively. Infrastructure that had been flagged as vulnerable in Tranche One failed in ways that were both predictable in hindsight and devastating in practice. The system was no longer describing what might happen; it was documenting what had already occurred.

"Before the Deluge 2" emerged from this urgency. It strengthened and accelerated the original investment case, refining the evidence base and reprioritising projects in light of recent events. The focus shifted from building the argument to enabling delivery. Projects were reassessed through the lens of recent events, with greater emphasis on protecting critical infrastructure, restoring resilience to damaged systems, and reducing the likelihood of repeat impacts in the same locations. Before the Deluge 2 strengthened the case for accelerated co-investment, recognising that climate resilience is a shared national responsibility rather than a burden that can be carried by local communities alone. Before the Deluge 2 has been successfully delivered in three tranches.

A permanent co-investment commitment is the natural progression of this work – providing the certainty needed to plan, prioritise, and deliver flood resilience investment over the long term, supporting the resilience of the infrastructure, businesses, and communities that underpin Aotearoa New Zealand's economy.

CURRENT STATE OF FLOOD RESILIENCE INFRASTRUCTURE

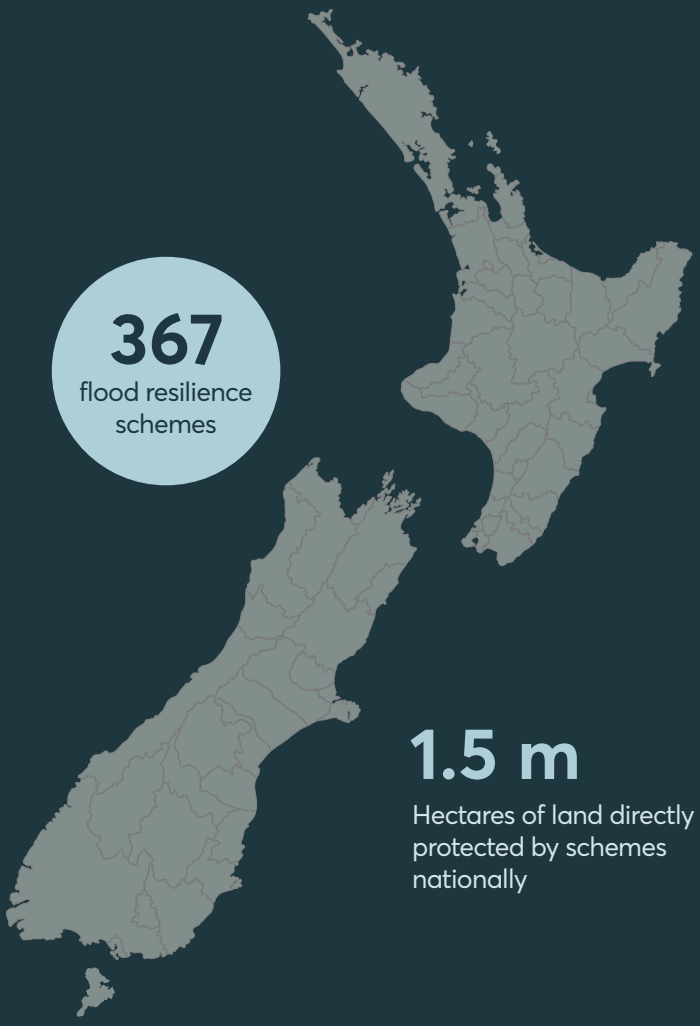
Flood risk

NO. 1 HAZARD
Floods are our most common natural hazard in New Zealand

$213 BILLION
Replacement value of for >282,000 houses in flood-prone zones

750,000 PEOPLE
1 in 7 New Zealanders living in flood-prone zones

$446 MILLION
Annual average cost of repairing critical infrastructure damaged by flooding alone.



Costs and benefits

$2.3 BILLION
Capital value of schemes

$11 BILLION
Annual benefits from schemes

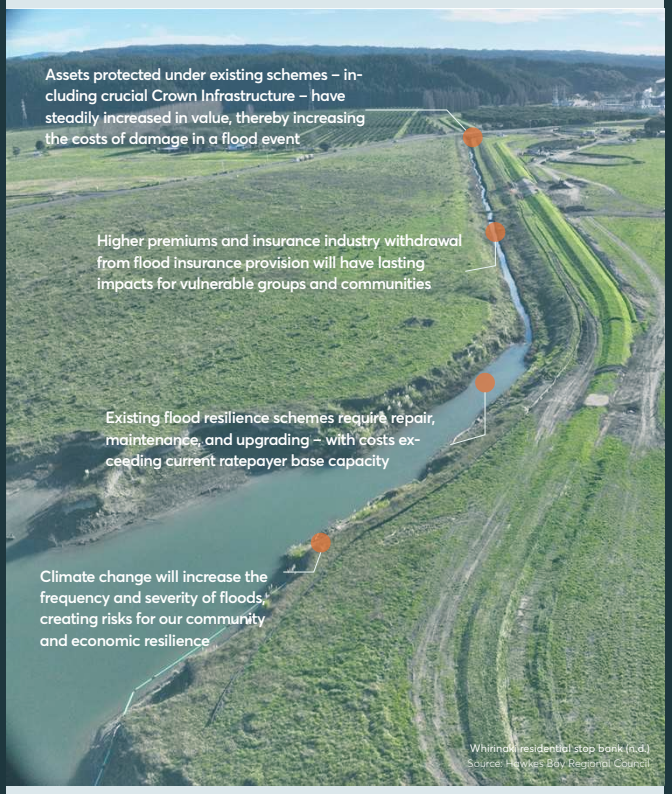
$200 MILLION
Annual op-ex for schemes to maintain current level of service

5:1 BCR
Benefit-to-cost ratio of flood resilience in New Zealand

Flooding is the most common natural hazard in Aotearoa New Zealand, with a major flood event occurring on average every eight months. Across the country, around 750,000 people – or 14% of the population – live in areas prone to flooding.

It is evident that flood resilience schemes comprise a core economic enabling infrastructure and are crucial to the economic, social, cultural, and environmental wellbeing of Aotearoa.

Here's where the problem lies. Our ageing flood resilience infrastructure is facing pressure from all sides: climate change, affordability, legislation requirements, and land use change.Schemes are largely funded through targeted rates and operated and managed by local and regional councils – and to say councils are struggling to keep up is an understatement.



Whirinaki residential stop bank (n.d.) Source: Hawke's Bay Regional Council

Flood schemes deliver billions in protection and avoided losses of Crown assets on non-rateable land, and critical national infrastructure such as three waters, transport networks, and energy and telecommunication links. Yet, flood resilience has sat largely outside central government conversations for the past three decades – until five years ago. While recent investments has been transformative, flood resilience cannot be delivered through stop-start funding approach.

Planning, maintaining, and upgrading infrastructure requires certainty and continuity, not intermittent funding that makes it harder to take a strategic, long-term approach.

THE EVOLUTION OF NATIONAL FLOOD RESILIENCE

To see why change is needed, we first need to look at the path that led here.

Early 1900s

Piecemeal approach to river management and land drainage, leading to soil erosion issues and floods.

1940s

Collaboration between central government, catchment boards, and communities.

Soil Conservation and Rivers Control Act 1941

Late 1980s - early 1990s

Decentralisation of river management – shift responsibility to regional authorities and removal of central funding

Local Government Act 1889

Resource Management Act 1991

2020

Climate Resilience Programme – the first major funding from Government – co-funding 55 shovel-ready projects with councils through the COVID Recovery Funding on a 64/36 split

2021

Tranche 1 and 2 projects co-funded by central government and councils by 60/40 as part of Regional Infrastructure Fund

Present day

Funded and managed at regional and unitary levels primarily through rates, with central government providing disaster response and relief after flood events, and on ad-hoc basis

Next few years

Permanent arrangement of co-investment between Government and Councils at 60/40, respectively

The current state of our national flood resilience reflects the absence of a once key partner – the central Government.

Aotearoa New Zealand's approach to river management and flood resilience has evolved significantly over the past century. Before the 1940s, it was fragmented and reactive – a patchwork of local efforts struggling to manage erosion, flooding, and pressure on waterways.

That changed with the Soil Conservation and Rivers Control Act 1941. In a major shift, Aotearoa became a global leader in recognising that land and water must be managed together at a catchment scale. Catchment boards were established to plan and deliver flood resilience infrastructure, much of which underpins the system today.

At its peak, this was a genuine partnership. Catchment boards worked alongside communities and central government to deliver schemes that protected people and property while supporting economic wellbeing. Central government contributed 50–75% of capital works and around a third of maintenance. This funding acknowledged that Crown assets were directly benefiting from these schemes, whilist also recognising the wider national interests and government's responsibilities in being a joint investor. Local contributions, in turn, anchored ownership at community level.

That model shifted. Reforms in the 1980s, including the Local Government Act 1989 and the Resource Management Act 1991, transferred responsibility for river management and soil conservation to local government. This means regional and unitary councils funding flood resilience works almost entirely through regional and targeted levies on property owners on a beneficiary-pays approach – covering construction, maintenance, and upgrades of river control, flood resilience, and land drainage schemes.

On the other hand, central government's role has largely shifted to disaster response and recovery, rather than prevention and resilience. This is in contrast to international practice, where countries such as the United Kingdom, Europe, Australia, and the United States maintain significant central government investment in flood mitigation as it is recognised as a shared national risk rather than a purely local burden.

Flood resilience infrastructure is struggling to keep pace, councils are under mounting pressure, and ratepayers can no longer carry the burden alone. Over the last five years, the Crown has provided three rounds of funding for flood resilience projects – effectively fast-tracking critical projects that deliver billions in avoided costs that simply would not have happened otherwise.

We need to move beyond the stop-start nature of the current funding arrangements to achive greater certainty and maximise the benefits of flood risk resilience.

PERSPECTIVES:
HOW TO INVEST WELL

I'm Mark Townsend and I'm the Engineering Manager for the Bay of Plenty Regional Council. My home is here, and I grew up in the Bay; all three of my children were born in Whakatāne. After studying in Auckland I came back here to be closer to the water, the beaches, the outdoors, all the things that makes this place great.

In my line of work I see lots of change, whether it's the beach profiles, river alignment or weather patterns. Sometimes is sudden, other times it's more gradual, but one thing I see most is the changes in our climate. Whether I'm looking at the data from the catchments or investigating on the ground with my team, the evidence is all around. We are experiencing more extremes; the big storms are bigger than before. We are having periodic prolonged wet periods with rainfall totals that exceed previous records, and our lakes have risen and stayed at high levels for longer. And then there are the droughts. It's getting more complex and more difficult to manage every year.

My degree is in Civil Engineering, so I'm definitely the guy that can tell you about how high we need to make the stop banks or the benefits of a set of control gates, like the ones at the Kaituna wetlands just around from Maketu. But I'm also the guy that's going to tell you we can't continue to build the stop banks higher year after year – the climate is outrunning us and it's just not affordable.

Our traditional flood resilience methods aren't sustainable in the long term.We need joined up approaches that mean real resilience for our communities and productive land, that keep the wetlands healthy and the fish running in the rivers, and can respond when the big rains come. No single organisation or community can do all that, so we need to get better at working together.

Like in the rest of the country, we look at what's going to work for the whole catchment. In places that means improved community resilience, enhanced emergency response, nature based solutions, restoring wetlands and giving the river room to move, but it also means hard engineering – earthworks and concrete and steel to constrain the flows and channel the water in floods. We try to limit hard engineering wherever possible to critical infrastructure that needs to be defended.

We spend a lot of time working with communities on what happens where. Access to our rivers is a key theme we hear out in our communities. Sometimes people want stop banks for the reassurance, but it's not always the right solution, so we need to keep talking and keep exploring the options and keep learning from the locals about what's important for them, how the river behaves and what's happening on the ground in a big flood.

That's really the best part of my job: talking to people. Whether it's a hui with local hapū or chatting to the guys fishing off the end of the pier at Kaituna or a meeting with representatives of a flood scheme, everyone has the same concerns: how do we protect each other and protect what's here. Because everyone can see the climate changing.

Most times, after a few cups of tea and a bit of a chat, what comes out is the very strong desire to make good decisions for future generations. Sure, people want to keep the water out of their houses and farms in the here and now, but we all see the need to invest well and come up with solutions that will work long after we've handed it all to our kids and grandkids.

There's plenty of great bits of engineering and whole schemes I'm really proud of in the Bay. And if I do my job right, I'm hopeful that all the people who come after us will be proud of them as well.

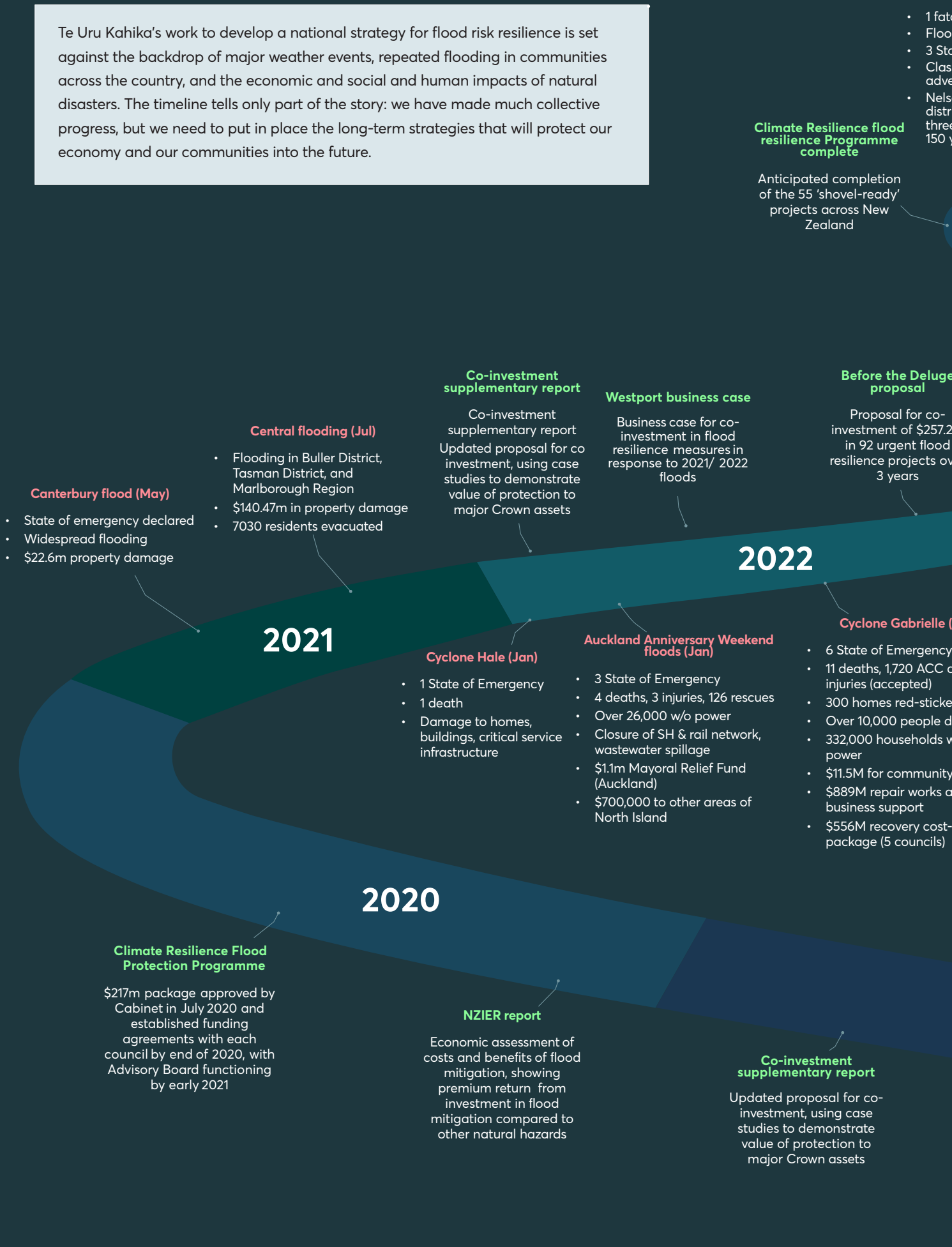


Mark Townsend | Engineering Manager
Bay of Plenty Regional Council | Toi Moana

Photo credit: Tim D

TAKING THE LONG VIEW

Te Uru Kahika's work to develop a national strategy for flood risk resilience is set against the backdrop of major weather events, repeated flooding in communities across the country, and the economic and social and human impacts of natural disasters. The timeline tells only part of the story: we have made much collective progress, but we need to put in place the long-term strategies that will protect our economy and our communities into the future.



2034

2026

Wellington (Jun)

- States of Emergency
- 100+ flights cancelled
- 5000+ homes lost power

Wet weather system (Feb)

- 1 fatality
- 6 States of Emergency
- 100+ flights cancelled
- 5000+ homes lost power
- SH closures, school closed, infrastructure damages,

Tranche Three proposal submitted

Request to fund 30 projects based on avoided costs on assets

2025

Selwyn district flooding (May)

- Local State of Emergency
- Roads closed and damaged

Severe weather (Jan)

- 10 fatalities
- Flooding and landslips
- 2 States of Emergency
- $2.2m Government relief package
- 80+ people evacuated

Otago flooding (Oct)

- Local State of Emergency declared for Dunedin City
- $1.5m road and infrastructure damage
- $33.8m private insurance claims

2024

Updated co-investment case

Refresh of Before the Deluge proposal with updated list of priority projects and investment requirements

Ex-tropical Cyclone Lola (Oct)

- SH closures, school closures
- Roads damaged and closed, transport disruptions

2023

Heavy rain & flooding (June)

- 1 State of Emergency (Tairawhiti)
- Over 130 residents evacuated
- SH closures, 91 local roads damaged or closed,
- restricting access to region
- Grid emergency in Hawke's Bay / Gisborne
- $200M recovery package

Heavy rain & flooding (Sep)

- 2 States of Emergency declared (Queenstown, Southland)
- 100 homes evacuated
- SH closures, damage to school and water treatment plant
- Widespread power outages

Torrential rain & floods (May)

- 1 State of Emergency (Auckland)
- 1 death (Northland)
- Damage to homes, school closures
- Several road closures
- Transport disruptions

Winter floods (Jun)

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ates of Emergency
sified as medium-scale
erse event
on, Tasman, and Marlborough
icts, where Nelson experienced
e waves of flooding "worst in
years"

Feb)
claims
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isplaced
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22 State of Emergencies

in 2026 alone,
with 127 days declared at a local or regional level.

$462 million

average annual cost
spent on repairing critical infrastructure as a result of flooding

2019

2018

Hiding in plain sight

Tonkin + Taylor report documenting extent and value of flood protection schemes in Aotearoa New Zealand

$5.23 billion

insurance claims from storm and flooding between 2020 to 2024

OVERVIEW OF THE CURRENT CHALLENGES

The challenges identified in the 2021 Before the Deluge business case (and its refresh) are not new; they are echoed again in Te Waihanga's National Infrastructure Plan.

A huge portion of the country's flood resilience schemes were originally built around late 1950s and 1970s to drive economic development, shaped by local landowners who contributed land and agreed – sometimes formally, sometimes not – on how these assets would be managed. Those arrangements matched the realities of their time: simpler land use, fewer regulatory constraints and a far narrower set of expectations but so much has changed since.

Today, flood resilience infrastructure does far more than protect local landowners. It underpins communities, productive land, businesses, public assets, nationally significant infrastructure, and future investment – everything we need to prosper as a nation.

However, our ageing flood resilience infrastructure is facing pressure from all sides: climate change, affordability, legislation requirements, and land use change. Individually each of these pressures presents a significant challenge, but the reality is they are interlinked and experienced simultaneously, meaning they cannot be treated as separate issues. As a consequence, the cost of maintaining, renewing and upgrading flood resilience infrastructure is increasing, while the ability of local communities to absorb those costs is becoming more constrained.

Understanding these challenges exposes the limitation of the current funding model, and why it is critical to have a new approach aligned with the time now and the future.

The following pages sets out the five key pressures shaping the path ahead.



Climate change



Insurance retreat



Legislation



Affordability



Cost and benefits

NEW ZEALAND IS IN A PERPETUAL STATE OF EMERGENCY

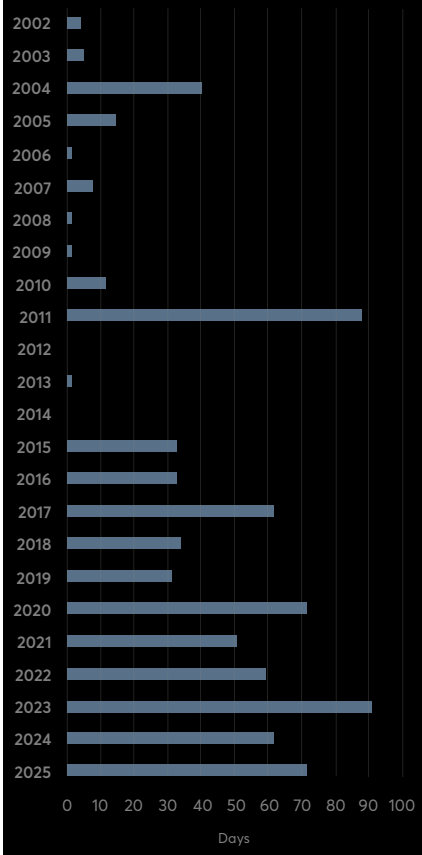
Flood resilience in the country is being shaped by a cluster of pressures growing in scale and complexity.

> "If tomorrow's extreme events exceed historic records more often, infrastructure designed for those past conditions may no longer be enough to protect people and property."
>
> *– The University of Waikato (2026)*

$235 billion

property value at risk of of inland flooding

Civil Defence-listed regional states of emergency since 2022



25 States of Emergency

as of July 2026,

with 137 declared days at a local or regional level

As global temperatures rise, the atmosphere can hold more water vapour, increasing the likelihood of heavier rainfall during storms. Flooding is already one of Aotearoa New Zealand's most frequent, damaging, and disruptive natural hazards; hence, as the climate changes, flooding caused by both increased rainfall and rising sea levels – in coastal areas and on floodplains – is expected to increase.

Indeed, these were the findings of recent research by the University of Waikato, which also found large increases under both moderate- and high-emissions scenarios, extreme rainfall is projected to become more frequent and more intense, particularly for the most severe single-day rainfall events. By the late twenty-first century, up to half of the locations analysed could experience historically rare rainfall events occurring two to three times more often than they do today; however, this will vary region-by-region due to differences in geography, weather patterns and climate variability. Future extreme rainfall events are also expected to resemble some of Aotearoa New Zealand's most damaging storms, including Cyclone Bola and the 1923 Canterbury storm, but with greater rainfall intensity.

Moreover, research in Dunedin found that worsening flooding during heavy rainfall is linked to rising sea levels, as higher groundwater levels reduce the land's ability to absorb water. This occurs because the ocean is connected to groundwater systems beneath coastal towns, cities, and floodplains. As sea levels rise, groundwater levels can also rise far inland, meaning that in some areas the first sign of sea level rise may be water coming up through the ground rather than over the coast. As a result, soil absorption is reduced thereby increasing flood risk during storm events; therefore, even those not living by the coast should be concerned about rising sea levels. Over 65% of New Zealanders live within five kilometres of the coast, and more than half a million buildings are already exposed to inland flooding, with at least $235 billion at risk.

Graham Leonard, principal scientist at Earth Sciences New Zealand, states that as a country, we need to start planning 50 or even 100 years ahead when mapping hazards and building infrastructure. Without change, the country will keep facing repeated damage to the same infrastructure, leading to "rebuild-and-repeat" costs it can't afford.

EXISTING INSURANCE APPROACHES HAVE LIMITS

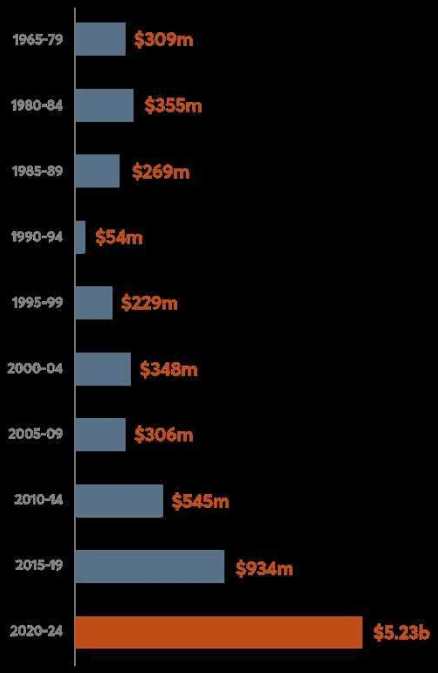
Rising insurance premiums are not simply a market response – they are an economic indicator of increasing climate risk and the growing cost of deferred investment in resilience.

Aotearoa New Zealand's framework for managing natural hazard risk is fragmented, under-resourced, and falling behind the pace at which those risks are growing – and without structural reform, the consequences will extend to insurance availability, public finances, and long-term economic stability.

Findings of IAG New Zealand report 'A long-term approach to natural hazard risk reduction'

Inflation adjusted insurance costs for flood and storm events

70% of flood and storm costs since 1965 were incurred in last 10 years ($m)



Source: ICNZ / Tower Insurance via Newsroom (2025)

916%
increase in house insurance since 2000

40%
increase in house insurance in the last 2 years

256%
increase in weather-related IAG insurance claims between Mar 25' to Feb 26'

Climate change

More tropical cyclones

Increased storm surges

Sea level rise

More extreme weather

Increased rainfall intensity

First layer of protection
Infrastructure

Flood infrastructure is paid for by property / land owners that the specific scheme protects through predominantly targeted rates and some through general rates.

This model is known as a 'beneficiary-pays' model.

This beneficiary-pays approach can create affordability challenges, particularly where small communities face high costs to protect against major flood risks.

Flood resilience infrastructure



Infrastructure is paid through a beneficiary model, or those who have property or land that the scheme directly and/or indirectly protects.

With increasing climate change events, outdated infrastructure built decades ago is under strain. This means it requires more work, and therefore money, to meet the Level of Service required to protect the

Second layer of protection
Insurance

Natural Hazards Insurance (NHI) levy helps fund insurance for houses and land in the event of certain natural hazards, including floods and storms.

Only those with private insurance are eligible for this fund.

Generally, the first $300,000 plus GST towards repairing or replacing your home is provided by the Natural Hazards Commission.

Private insurers pay the rest of any claim for any damage to your home up to the amount agreed in insurance policy.

Natural Hazard Cover



Government-backed natural disaster insurance. Paid by all insured homeowners through a compulsory flat levy (NHI) automatically added to private insurance

Ongoing costs are about $650-750 million a year for operating expense, reinsurance premiums, and small claims.

Recognising the incoming disasters about to hit the country in the next few years, Treasury has proposed increasing the levy at three different levels. This is currently under review.

Treasury projects it will be underfunded by about 34% over its first five years, meaning levy income and investment returns are unlikely to cover expected claims over that period.

About 40% of insurance premium paid by property owners go towards tax and levies

Higher flood risks generally relate to:

- higher excess for flood claims
- sub-limit for the amount of flood cover available
- blanket exclusion for flood cover

Increase of disasters, and consequently, payouts overseas means higher reinsurance costs for our insurers. These costs are often passed on to domestic premiums, along with higher replacement costs.

Private insurance



Insurance transfers the financial risk of damage from homeowners and businesses to an insurer in exchange for a premium

Reinsurance



Reinsurance is the insurance for insurance companies. Insurers pay a premium to global reinsurers, who help cover the cost of major disasters that would otherwise be too large for a single insurer to absorb

The final layer of protection
Crown

Once the Natural Hazard Cover and private insurance and international reinsurance are exhausted after catastrophic event, the remaining costs fall to the Government's balance sheet – and ultimately taxpayers.

Crown guarantee



Statutory natural disaster scheme with an unlimited Crown guarantee

Insurance unaffordability leads to underfunding, and underfunding means either higher levies in future – something already signalled by Treasury – or greater reliance on the Crown guarantee in major events. Either way, costs ultimately fall back to the public.

Based on modelling done by Treasury, the natural hazards cover will be insufficient for the incoming disasters. Crown-funded bailout is not something the Government wants or can afford.

Against this backdrop, flood resilience is not another cost – it is one of the key solutions. It reduces expected losses, stabilises insurance affordability over time, and strengthens the entire risk-sharing system. In doing so, it protects every other form of public and private capital, while reducing pressure on both future levies and the Government's balance sheet.

New policies temporary halts in Westport

Westport demonstrates that insurance retreat is no longer a future risk – it is already occurring in Aotearoa New Zealand. Following repeated flooding, including the 2021 event that left more than 100 homes uninhabitable, AA Insurance announced in late 2025 that it would temporarily stop offering new home, landlord and business insurance policies across the Westport postcode, while continuing to cover existing customers.

The decision was driven by elevated flood risk and AA Insurance reaching its maximum exposure limit in the area. AA Insurance indicated it would resume offering new policies if flood risk was reduced below its exposure.

The decision reflects a growing shift in how insurers respond to escalating climate risk. Rather than relying solely on higher premiums, insurers are increasingly limiting their exposure in areas where flood risk exceeds their appetite.

The insurer's transparency is appreciated, and also represented a "shift" in approach in Aotearoa New Zealand, where insurers had been reluctant to publicise areas they were no longer insuring.

The temporary halt is interpreted by experts as the insurer pushing for an investment in flood defences, from either local or central government.

Flood resilience work is underway in Westport. The West Coast Regional Council and Buller District Council planned to update insurers - who will visit the town at the end of February - as different stages of the flood resilience scheme were completed.

Victoria University emeritus professor Jonathan Boston, who was part of a previous government expert working group on climate adaptation, said AA Insurance's decision was just the first of many to come.

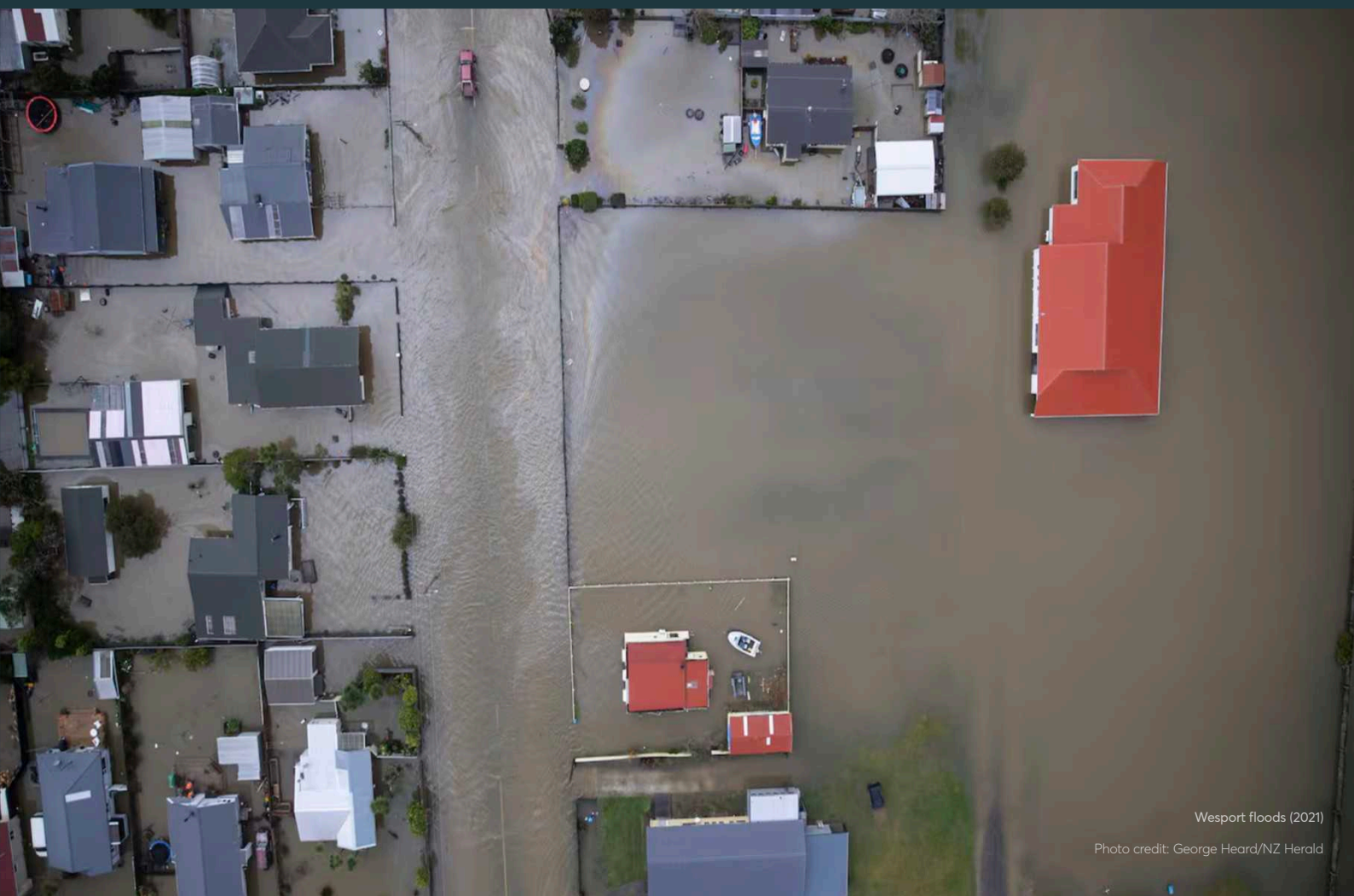
"There will be more and more situations in which insurers, understandably, say the risks are too great to provide insurance, even with very large excesses, and will pull out."

Experts noted that Suncorp (AA Insurance's parent company) has previously used similar approaches in Australia, withdrawing or restricting insurance on the condition that massive investment in flood resilience is taken. More insurers are expected to adopt similar approaches as climate risks increases.

Insurance retreat also raises broader governance questions. As insurers withdraw or restrict cover in high-risk areas, their decisions may increasingly influence where public investment is prioritised, shifting decision-making away from councils and communities towards private insurers and global reinsurance markets.

AA Insurance's withdrawal from new policies in Westport brought the issue of insurance retreat into the spotlight, reinforcing concerns reflected in subsequent Treasury analysis of rising insurance costs and the proposed increase to Aotearoa New Zealand's natural hazard insurance levy. As insurance coverage declines, the base over which the natural hazard levy is applied may also shrink, reducing the scale of pooled funding available for disaster recovery and increasing reliance on Crown-backed support when major events occur.

This programme aligns with the direction signalled by insurers: invest in reducing flood risk before disasters occur, rather than continuing to absorb the costs of escalating costs of disasters.



Wesport floods (2021)

Photo credit: George Heard/NZ Herald

INSURANCE RETREAT IS A MAJOR CROWN LIABILITY

Insurance withdrawal in the face of growing flood risks is a strategic challenge for Aotearoa New Zealand.

10,000
coastal homes potential full insurance withdrawal by 2040

750,000
people at risk of flooding and coastal inundation

>282,000
houses at risk of flooding and coastal inundation

Insurance retreat is already seen in some areas of the country. Unbundling flood cover from standard home policies, as seen in Australia, may also become a reality here.

Alongside rising insurance premiums, insurance retreat is emerging in some parts of Aotearoa New Zealand as insurers respond to increasing climate-related risks. People in areas prone to floods and earthquakes such as West Coast, Canterbury, are finding it difficult to get home insurance. Some people with beachhouse property worth millions of dollars are having a hard time getting renewals from insurers.

And this is the uncomfortable reality: Aotearoa New Zealand is one of the most vulnerable countries in the world to natural hazards. The Climate Change Commission has estimated 750,000 people and nearly half a million properties are at risk from climate-related events such as flooding and coastal inundation. On top of this, we have the ninth longest coastline in the world, with a significant proportion of our communities are built on flood plains or flood-prone areas.

Recent research by the Helen Clark Foundation also estimated that more than 10,000 coastal houses across Wellington, Auckland, Christchurch, and Dunedin may potentially experience full insurance withdrawal by 2050. And this may also apply to those living in flood-prone areas. In some cases, the level of flood risk may be too high or unprofitable for re/insurers to underwrite, making insurance unaffordable and/or restricted in certain regions (partial retreat) or creating 'no-go' zones where insurance companies fully retreat from providing coverage.

However, full insurance retreat is not the only risk. As seen in Australia, insurers have also responded by unbundling flood cover from standard home insurance policies, requiring homeowners to purchase flood insurance separately or excluding certain types of flood damage altogether. Given Aotearoa New Zealand's two largest insurers are Australian-owned, there is a real possibility that similar approaches could emerge here in Aotearoa New Zealand. ICNZ Chief Executive Kris Faafoi has acknowledged that flood cover could eventually be carved out of standard policies if a long-term climate adaptation framework is not established.

Whether through higher premiums, reduced cover, or complete withdrawal, the direction of travel is the same: unaddressed flood risks leads to increased costs across the system which ultimately falls back on taxpayers, reinforcing the need to reduce our country's most common and costly natural hazard risk at its source through sustained investment in flood resilience.

THE LEGISLATIVE FRAMEWORK FOR FLOOD RESILIENCE

Where national policy settings drive investment requirements, it is reasonable that the costs of meeting those requirements are shared between central and local government.

Councils are increasingly being asked to deliver outcomes that extend well beyond traditional flood resilience and support wider national objectives; therefore, the funding model must evolve accordingly.

Flood resilience sits within one of the most complex and multi-layered legislative environments in the local government sector, as defined by the Crown. Councils are required to protect communities and manage major river systems under several pieces of legislation that assigns clear responsibilities, sets environmental safeguards, and dictates how schemes must be funded and operated.

National legislation	Relevance to flood resilience
Soil Conservation and Rivers Control Act 1941	Gives councils the core legal duty to build, operate and maintain flood resilience and drainage works to prevent or mitigate flooding and erosion
Local Government Act 2002	Requires councils to plan, fund and manage flood assets prudently and transparently through long-term, sustainable decision-making
Local Government (Rating) Act 2022	Sets out the lawful mechanisms for how councils can levy rates, including the use of targeted rates to fund flood resilience and drainage schemes
Resource Management Act 1991 (incl. NPS & NES)	Regulates how councils carry out river works and drainage activities, ensuring they protect freshwater, wetlands and environmental values
Civil Defence Emergency Management Act 2022	Requires councils to identify flood hazards, provide warnings and support regional emergency responses to flooding
Climate Change Response Act & National Adaptation Framework	Requires councils to incorporate climate projections into flood-scheme planning and future-proof major infrastructure
District Council Functions (under the RMA)	Territorial authorities control land use in flood-prone areas, and must integrate the council's flood hazard information into their planning decisions
Public Works Act 1981	Enables councils to acquire land rights necessary for constructing and maintaining flood resilience infrastructure

Since 2021, more than 15 relevant Acts have been amended or introduced, with further change expected as central government resets national policy direction. Each legislative shift raises the standards councils must meet – tighter environmental requirements, more complex compliance obligations and new performance expectations. The requirement to retrofit fish passage on pump stations, introduced through several freshwater regulations, is one example of how a single regulatory change can reshape both design and cost.

Legislation is now actively influencing how assets are renewed and replaced. Like-for-like upgrades no longer pass muster on their own. These considerations improve outcomes but also change the scale, timing and cost structure of asset management. As central government continues to expand the outcomes expected from flood resilience schemes, there is a corresponding need for a funding model that reflects this shared responsibility.

Emergency Management Bill – new responsibilities, same funding model

The proposed Emergency Management Bill – recently passed its second reading as of the 30th June 2026 – aims strengthen national resilience by expanding and clarifying responsibilities of central government, local government, emergency services, iwi, lifeline utilities, businesses and communities across all phases of emergency management.

Local Government New Zealand (LGNZ) estimates implementation will cost councils **$82.8 million over four years,** excluding the cost of meeting higher service standards, with no dedicated funding mechanism provided.

On top of this, Government has also proposed rates cap would further limit councils' ability to meet expanding responsibilities within the existing funding constraints.

The issue is no longer just the amount of funding – it is that the funding model is becoming increasingly misaligned with the responsibilities councils are expected to fulfil.

The funding model must also evolve to recognise these are increasingly national – not solely local – outcomes.

SUSTAINING LEVELS OF SERVICE, NOW AND INTO THE FUTURE

Statutory requirements must be converted into clear Levels of Service (LoS), resulting in investment and coordinated work that keeps communities protected.

The Audit Office observations from council's 2024-34 LTPs

Financial forecasts from LTPs

Councils propose to spend 34% more on their assets during 2024-34 than they proposed in their 2021-31 LTPs

Revenue to increase by **47%**



Operating expenditure to increase by **43%**

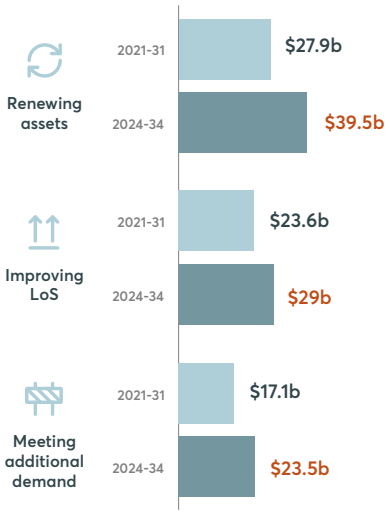


Debt to increase



Financial capital expenditure

Comparisons between the 2021-31 and 2024-34 LTPs are between the same 58 councils that completed the 2024-34 LTPs



There is a growing gap between infrastructure investment required to maintain intended Levels of Service and what councils can sustainably fund.

Turning those statutory duties into real flood resilience on the ground demands a disciplined internal system that links national direction to regional strategy, operational planning and day-to-day asset management.

A council's Long-Term Plan (LTP) sets out the activities it will undertake over the next 10 years, including flood resilience, along with the intended Level of Service (LoS) for each activity. For flood resilience, the LoS defines the level of protection the council intends to provide, typically expressed as the ability to manage floods of a specified likelihood, such as a one-in-50-year or one-in-100-year event. These levels may vary depending on land use and risk.

Periodic reviews are necessary because sustaining LoS demands more than routine upkeep – it requires a deliberate, long-view approach to managing the councils' flood resilience network, with an investment programme to match. Although councils are not required to regularly reassess the appropriateness of their intended LoS, they are expected to deliver the LoS they commit to in their LTP. Failure to do so may expose councils to legal liability if flood damage occurs that could reasonably have been mitigated by achieving the intended LoS.

According to the Audit Office (2025), climate change, rising operating costs and the need to increase capital expenditure, and funding constraints are making it increasingly difficult for councils to maintain their agreed LoS. As a result, they face difficult trade-offs such as:

- maintaining existing assets versus investing in new infrastructure;
- protecting all communities equally versus prioritising the highest-risk areas;
- increasing rates versus accepting lower levels of flood resilience; and
- investing now to reduce future risk versus responding after flood events occur.

These competing priorities can and have resulted in councils deferring maintenance, slowing asset renewals, or postponing capital projects to manage affordability. In response, councils are increasing rates at historically high levels. To pay for much-needed investment in infrastructure, councils are also increasing their debt to some of the highest levels in decades.

As a result, some councils are close to or exceeding their debt limits. Part of this pressure reflects the ongoing cost of response and recovery after major flood events, thus strengthening our argument that proactive investment in flood resilience can reduce long-term recovery expenditure and debt growth.



Wairoa during Cyclone Gabrielle (2023)
Photo credit: Hawkes Bay Civil Defence

Wairoa 2023 flooding: targeted rates in small communities

Wairoa suffered devastating floods during Cyclone Gabrielle in 2023, with a total of 816 properties covering 378ha partially or completely flooded during the cyclone.

Following the floods, the report of the Hawke's Bay Independent Flood Review noted the known historic risk to flood-prone areas of Wairoa, and identified that a plan to address these following Cyclone Bola in 1988 was not progressed due to affordability constraints. The report noted that in the 1990s the Hawke's Bay Regional Council embarked on developing a Floodplain Management Plan for Wairoa that included stop bank options and recognised the importance of flood warnings and evacuations.

"However, due to affordability constraints, none of the stop banking proposals was progressed, leaving the North Clyde community exposed to flooding from events greater than a 20-year flood and reliant on flood warnings and evacuations to manage its safety," the report said.

The ability of the Wairoa community to fund the required infrastructure was the constraining factor on the flood resilience works proceeding. Under the rating system in place at the time, the cost of any flood mitigation would have needed to be funded by Wairoa ratepayers.

"The proposal was assessed as unaffordable for the community, the proposal was not adopted and therefore no operating flood control scheme exists today," the Hawkes Bay Regional Council said. Since Cyclone Gabrielle, the council said it had recognised "the limitation of a targeted rating approach on the ability of smaller, less prosperous local communities to achieve the protection of a flood control scheme".

Resolving the flood resilience funding gap has required a $70m capital investment by the Crown, on top of the tens of millions of dollars in uninsured losses, response and recovery costs already incurred by the government following Cyclone Gabrielle.

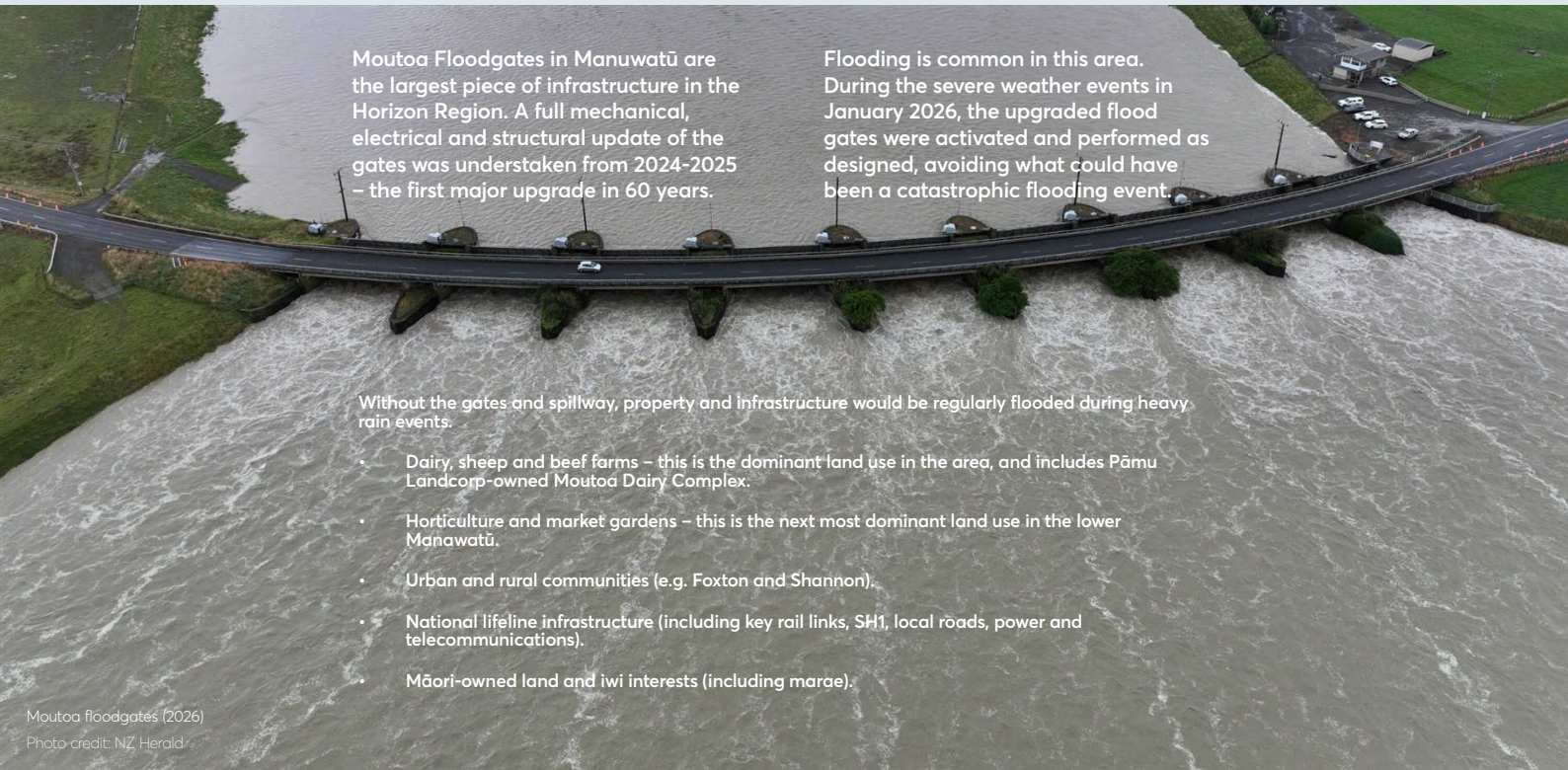
"If we don't act, costs could run into the billions and affect every part of people's lives.

Communities are already doing the hard work locally – now we need to make sure the national settings are right to back that up. A lot of effort goes into recovery, which matters – but it can't come at the expense of making things more resilient.

We currently have an imbalance where 97% of government spend is on responding to natural hazards and only 3% on building resilience.

By getting it right at the national level, and turning our focus to building climate resilience, we can break the cycle of react and recover."

– Jo Hendy, Climate Change Commission Chief Executive



Moutoa Floodgates in Manuwatū are the largest piece of infrastructure in the Horizon Region. A full mechanical, electrical and structural update of the gates was understaken from 2024-2025 – the first major upgrade in 60 years.

Flooding is common in this area. During the severe weather events in January 2026, the upgraded flood gates were activated and performed as designed, avoiding what could have been a catastrophic flooding event.

Without the gates and spillway, property and infrastructure would be regularly flooded during heavy rain events.

- **Dairy, sheep and beef farms – this is the dominant land use in the area, and includes Pāmu Landcorp-owned Moutoa Dairy Complex.**
- **Horticulture and market gardens – this is the next most dominant land use in the lower Manawatū.**
- **Urban and rural communities (e.g. Foxton and Shannon).**
- **National lifeline infrastructure (including key rail links, SH1, local roads, power and telecommunications).**
- **Māori-owned land and iwi interests (including marae).**

Moutoa floodgates (2026)
Photo credit: NZ Herald

COSTS AND BENEFITS ARE NOT WELL MATCHED

The mismatch between who pays and who benefits is becoming one of the central challenges in flood resilience.

As the benefits of flood resilience become more broadly shared, so should the responsibility for funding it.

Flood resilience delivers significant value nationwide, yet the benefits are not evenly shared. Some areas depend on engineered defences to remain viable, while others experience only indirect advantages such as reduced disruption to transport routes, supply chains or regional services. This uneven distribution makes equity a core issue: who gains from the system, who pays for it, and how should those contributions be structured?

Councils fund the flood resilience infrastructure through a "beneficiary pays" model. Most of this is from targeted rates for the community or people owning land that a specific scheme protects, with some from general rates from property owners and businesses. However, under this model because of legislations, the Crown as a major beneficiary has not contributed in proportion to the protection flood resilience infrastructure provides their assets, aside from episodic co-investment over the past five years.

> *"Central government has a direct stake in managing flood risk. As the largest infrastructure owner and investor, it benefits when communities and assets such as state highways, schools, and hospitals are better protected. Consistent, stable expectations, and clear co-funding settings all influence whether councils can act early or are left responding after disasters."*
>
> *– National Infrastructure Plan, 2026*

As of 2025, the Crown's total asset value is at $598 billion, with $292.6 billion making up the property, plant, and equipment. Looking solely at infrastructure, the Crown owns almost 44% of critical infrastructure worth more than $393 billion in 2024, excluding Kainga Ora housing and forestry.

Crown assets accounts for 45% of our total stock of critical infrastructure, and almost half of all infrastructure investment each year.

Assets exposed to flooding due to rainfall events across Aotearoa New Zealand

Buildings value

Current climate	$235 billion
1° warmer	$254 billion
2° warmer	$272 billion
3° warmer	$288 billion

Roads

Current climate	26,800 kms
1° warmer	28,200 kms
2° warmer	29,500 kms
3° warmer	30,800 kms

Stormwater pipelines

Current climate	14,100 kms
1° warmer	14,600 kms
2° warmer	15,000 kms
3° warmer	15,400 kms

Electricity sites
e.g. National grid, substations

Current climate	21%
1° warmer	25%
2° warmer	26%
3° warmer	29%

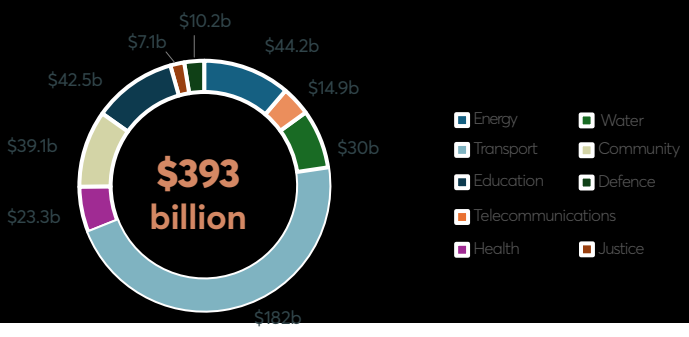
36%
of the $353 million
Crown Resilience Programme (previously Transport Resilience Fund) is investment in proactive resilience against events directly or indirectly related to flooding

$142m
annual average cost of power infrastructure damage for all natural disasters

$139m
annual average cost of water services damage for all natural disasters

Value of Aotearoa New Zealand's critical infrastructure assets (2024)

44%
owned by central government



THE BENEFITS TO THE CROWN ARE SIGNIFICANT

There are significant savings to be made by the Crown by investing in protection rather than recovery.

Flooding event

Tangible damages (immediate)
- Asset damage
- Displacement
- Mortality
- Emergency responses
- Clean up

Indirect losses (short-term)
- Loss of business revenue
- Loss of income
- Post-recovery costs

Intangible impacts (long-term)
- Reputation damage
- Loss of education
- Stress and anxiety

Future for Local Government Revew Panel (2023)

The Panel's recommendations on the theme "increasing funding":

14 Central Government pays rates on Crown property.

16 Cabinet is required to consider the funding impact on local government of proposed policy decisions.

This independent review was initiated 2021 in response to growing concerns that Aotearoa New Zealand's local government system was not equipped to meet long-term challenges such as climate change, infrastructure investment, demographic change and community wellbeing.

The review examined whether councils' roles, governance arrangements and funding mechanisms remained fit for purpose in the next 30 years, including how responsibilities and costs for climate adaptation and flood resilience should be shared between local and central government.

The recommendations are on the table. The Crown must now act on them.

The size of the risk to Aotearoa New Zealand's economic and social infrastructure from major flooding events is significant, with damage able to reach into the billions of dollars – as was the case with Cyclones Gabrielle and Hale in 2023.

This means the fiscal benefits to the nation from flood resilience are high. According to analysis undertaken by New Zealand Institute of Economic Research (NZIER) in 2021, the benefit-cost ratio (BCR) of flood resilience is at least 5:1, which means that every dollar invested returns $5 in direct economic benefit through avoided loss. If we take into account the indirect and social benefits to businesses and communities, the benefits are even greater.

The Crown is also a direct beneficiary of investment in flood resilience infrastructure. Under the Local Government Act, councils are required to consider who benefits from infrastructure when determining how costs are apportioned. Given the significant fiscal and economic benefits that accrue nationally through avoided disaster recovery costs, protected public infrastructure, and reduced disruption to economic activity, there is a strong rationale for Crown investment alongside local government. In this context, the Crown is exposed to the fiscal impacts of flooding in a number of ways:

1. Crown infrastructure – including roads, schools, hospitals, and many other asset classes – is exposed to flood damage.
2. The Crown is the primary funder of recovery costs, as shown by 2023 weather events which costed the Government around $6.65 billion, where national resources were mobilised to provide immediate assistance and support to affected communities and businesses.
3. The Crown becomes the insurer of last resort when flood damage exceeds commercial insurance cover and the assets are nationally important, even where the asset may not be owned directly by the Crown. Essential land remediation after a major flooding event is an example.
4. The Crown bears the long-term fiscal impacts of social and economic disruption, with social welfare costs from displacement, income support, health and education impacts, and much more. Research following Cyclone Gabrielle shows that these effects can last for years after the disaster.
5. The Crown also bears the impact of post-flood economic disruption, expressed as lower tax revenues from businesses and individuals.

Investment in flood resilience is therefore a sensible and prudent step for the Crown to take, in order to decrease the immediate and long-term impacts of major flood events. Doing so – putting money into prevention rather than recovery – brings us into line with our OECD peers, who tend to invest to a greater level than Aotearoa New Zealand does in the first lines of defence against the most common natural disaster.

Strategic priorities		Alignment with our programme
• Build a stronger, more productive economy that lifts real incomes and expands opportunity for New Zealanders • Deliver more efficient, effective, and responsive public services • Restore discipline to public spending and strengthen the Government's financial position	**Government Budget (2026)**	Flood resilience infrastructure contributes to our economic stability and productivity by reducing disruptions, protecting critical infrastructure, business continuity, and stronger productivity. It also reduces long-term exposure to emergency and reconstruction costs, strengthening the Government's position through lower lifetime expenditure and more targeted, forward-looking investment.
• Reduce vulnerability, enhance adaptive capacity, and strengthen resilience over the long term • Identify key climate-related risks for preparation • Implement the first national adaptation plan (2022–2028) • Improve risk-informed decisions and climate-resilient development in appropriate locations • Develop strategies and tools to understand and respond to climate risks (including managed retreat) • Embed climate resilience across government systems	**National Adaptation Plan**	Our proposed national platform (more on Section 4) combines local and national datasets to enable flood modelling, scenario modelling, valuation for cost-benefit analyses, and project prioritisation modelling using PARA framework. This provides a consistent national picture of flood hazards across catchments to show flood extent, depth, and frequency and future conditions and their likely impacts and costs using the PARA framework.
• Plan within what is affordable • Prioritise the most critical infrastructure projects • Maintain and renew existing assets • Streamline processes to enable better infrastructure delivery	**Infrastructure Commission | National Infrastructure Plan (2026)**	Our proposed national platform enables consistent, policy-aligned prioritisation of projects based on transparent cost–benefit assessment. Projects focus on upgrading existing infrastructure to maintain performance under increasing climate-driven flood risk. The pipeline also provides delivery certainty, supporting stronger planning, sector capability, and more efficient project execution.
• Translate and share hazard risk data to reduce current and future risk • Strengthen leadership, policy, and governance in hazard risk management • Lead and support risk reduction decision-making and action • Promote innovative, world-leading approaches to risk reduction in New Zealand	**Natural Hazards Commission | Risk Reduction Strategy (2025-29)**	The coordinated national approach via Te Uru Kahika and the national platform will put Aotearoa New Zealand at the forefront of national responses to growing flood risks in a climate changing world. Sectoral coordination through Te Uru Kahika is leading to a more informed and coordinated national pipeline, including data and knowledge sharing, and a national prioritisation methodology.
• Maintain accessible and available insurance markets • Collaborate to reduce the natural hazard protection gap through resilience investment • Ensure regulation is coordinated, efficient, and cost-effective	**ICNZ Strategic priorities**	Having a shared national platform that provides consistent data on flood vulnerability, levels of service, planned infrastructure upgrades, and the costs and benefits of flood risk resillience will enable all stakeholders to work with common data and assumptions. Improved infrastructure assurance and upgrades to levels of service should result in the insurance industry offering more affordable insurance premiums with a greater degree of long-term predictability.
• Strengthen planning, resilience investment, risk information, and clarify funding and responsibilities • Align legislation and expand funding to support resilience and managed retreat • Improve infrastructure resilience and support large-scale adaptation (including relocation and withdrawal from high-risk areas)	**IAG NZ | Long-term approach to natural hazard risk reduction (2026)**	The national pipeline of projects improves infrastructure resilience, increases the funding available to protect communities and businesses, and sets out a cost-benefit framework for assessing whether alternative options such as managed retreat are financially and logistically viable. The prioritised pipeline of infrastructure upgrades planned over the next 30 years provides certainty for landowners and the insurance sector alike.

PERSPECTIVES: FUNDING THE FUTURE

I'm Shaun McCracken, and I'm the Chief Engineer for Environment Canterbury's infrastructure – and we've certainly got a lot of that. I work closely with my colleagues, particularly David Aires, who's one of the River Managers.

I think our most pressing issue is deciding as a country, as a community, what frequency of flooding is acceptable and plotting a pathway to how we're going to get there. And importantly, how we're going to fund that. Because the funding has to match the level of service needed for the frequency and scale of flooding, and the level of expectation from our communities.

As David puts it, "Building flood resilience is not just about infrastructure – it is about building knowledge, capability, and trust over time. That requires a stable funding pipeline." That really gets to the heart of the challenge.

Our big issue on the Canterbury plains is that the infrastructure is not going to be affordable for those communities. Just maintaining the status quo of what we've got is becoming more expensive every year, just because the weather events keep getting bigger. So we have conversations with communities to talk about the work that we're doing and the money we need to collect from them to do it, and we can see the financial stress that's already causing for people and businesses.

If we put a proposal in front of them that says, we need to upgrade the scheme and we want to increase your rates by double-digits to achieve that, it's a big increase, and so we receive pushback, which is just natural for any big change in a regular cost.

But if we look at it and ask, is it a good investment or the best use of those folks' available money to do that? In many cases the answer is yes, the protection schemes are very good value for money compared to the costs of flooding. But that doesn't take away from all the other financial pressures that every landowner has, whether it's a rural property or an urban property.

So right now, the current paradigm is largely dictated by the community's ability to pay. Now, in some cases, that has really positive outcomes, like for the Waimakariri River near Christchurch. The city is a major beneficiary and the ability to pay is quite high, both because of population and wealth. And the amount you're paying may only be a few dollars a year.

We can contrast that with the Rangitata scheme where there are 70 or 80 mostly rural landowners, who contribute to the funding of that scheme. And their annual bill for their property is $10,000 to $20,000 a year, which is just a totally different financial burden.

Some regions are bridging the gap by moving away from the targeted schemes into a general rate, whether it's the whole region or part of the region, to effectively amalgamate all the schemes into one. But to do that, we have to have a public conversation to explain why my house in Christchurch gets flooded less often than Rob's house in Rangitata, and how sharing the financial cost is still fair.

Ultimately, we can't fix this just in Canterbury. We need to work out a fair way for the costs of the schemes we have and the schemes we need to be shared across the whole community, because when the big rains come we're all in this together, whether it's our houses flooded or not.



David Aires | Rivers Manager
Environment Canterbury

Shaun McCracken | Chief Engineer – Infrastructure
Environment Canterbury

Photo credit: Tim D



2 Investing for the future



Tairāwhiti rural flooding (2023)
Photo credit: Gisborne District Council

THE RESPONSE HAS BEEN COLLABORATIVE

In response to the emerging issues in flood resilience, a co-investment approach has developed.

> "River management, flood protection, and waste services should be explicitly included as essential infrastructure."
>
> *– Local Government New Zealand submission on Emergency Management Bill*

Our national response to the COVID pandemic provided the starting point for co-investment in flood resilience infrastructure, and led to a series of investment tranches delivered via Kānoa. This has begun addressing the infrastructure deficit that had built up in the preceding decades as communities began to reach the limits of flood scheme affordability.

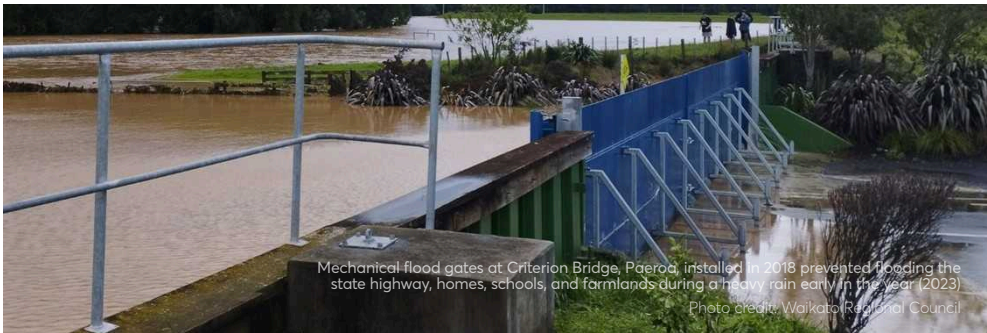
Starting with the post-COVID recovery funding, there have been three tranches of co-investment totalling $658m over five years, with a 60%/40% split between the Crown and councils. And as a result of the Government's episodic investments in flood resilience, much has been achieved and disasters have been averted. Essential flood resilience projects across the country have been progressed, and the impact of the co-investment tranches is discussed in more detail in the following pages.

Following the success of these projects, Te Uru Kahika has put forward the latest tranche of co-investment totalling $370 million. This tranche extends to longer-term projects that extend investment from remedying immediate issues into building long-term flood resilience. Work is continuing with Ministers and officials to progress this next phase.

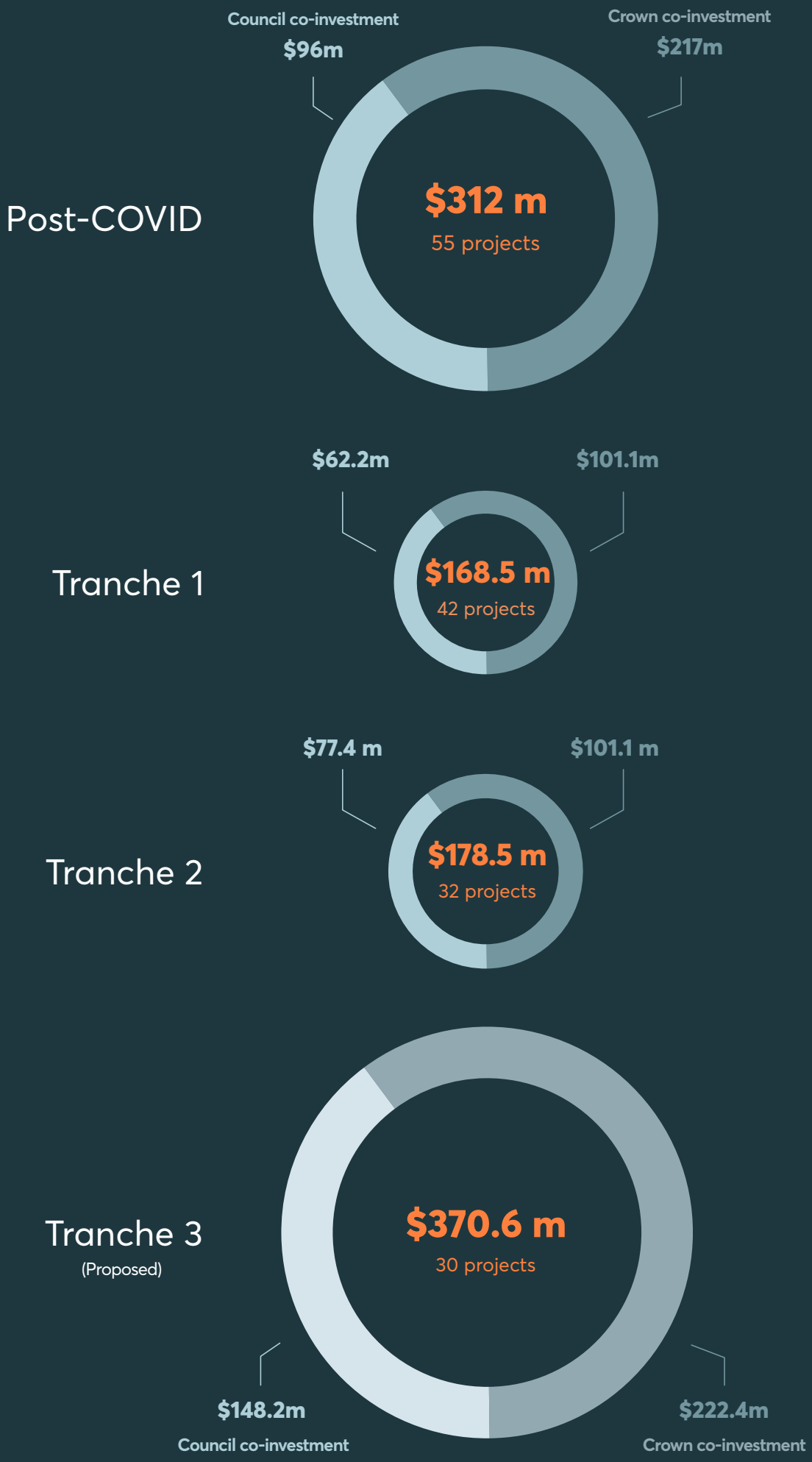
This is because the challenge is no longer getting started – it is maintaining momentum. The country requires a long-term national commitment to flood resilience, backed by enduring Crown co-funding and a coordinated national approach to keep pace with growing flood risk and avoid much greater costs in the future.

And while co-investment started as part of our national recovery from the pandemic, susbequent work – by councils, the Infrastructure Commission, research bodies, and other government agencies – has demonstrated the high return on investment that is achieved through investing in flood resilience. The analysis demonstrates that the returns from providing communities and businesses and the rural sector with greater flood resilience are significantly higher than the majority of other high-profile infrastructure projects.

There is a strong fiscal and economic and social rationale for continued investment and long-term certainty in flood risk resilience, and this is discussed in more detail on the following pages.



Mechanical flood gates at Criterion Bridge, Paeroa, installed in 2018 prevented flooding the state highway, homes, schools, and farmlands during a heavy rain early in the year (2023)
Photo credit: Waikato Regional Council


Post-COVID
Council co-investment
$96m
Crown co-investment
$217m
$312 m
55 projects
Tranche 1
$62.2m
$101.1m
$168.5 m
42 projects
Tranche 2
$77.4 m
$101.1 m
$178.5 m
32 projects
Tranche 3
(Proposed)
$370.6 m
30 projects
$148.2m
Council co-investment
$222.4m
Crown co-investment

Council co-investment
$96

Crown co-investment
$217



Awanui Flood Scheme Upgrade - Kaitaia
Otiria-Moerewa Flood Mitigation Project
Punguru Flood Protection
Dargaville to Te Kopuru Stopbank Project
Raupo Upgrade

Piako River Ngatea Town Left stopbank
Fish Passage Pumps
Lake Kimihia Ecological and Cultural Enhancement
Replacement Vessel
Piako River Mouth, Right Stopbank Asset Rationalisation
Erosion and Protection in the catchments of Lower Waikato Lakes and Wetlands
Foreshore East and West Stopbanks
Mill Road Pump Stations Upgrade
Roger Harris Pump Station Upgrade

Rangitāiki River Resilience – Edgecumbe
Bay of Plenty River Schemes

Waipaoa River Flood Protection Scheme – Gisborne

Foxton flood Mitigation
Lower Manawatu Flood Protection Resilience
Palmerston North West Stopbanks upgrade
Rangitikei River Enhancement

Heretaunga Plains Flood Control Scheme
Wairoa River Scheme – Ferry Road Erosion Control
Upper Tukituki Flood Control Scheme - SH50 Bridge
Upper Tukituki Flood Control Scheme - Gravel Extraction

Saxton Creek Flood Protection – Nelson

Motueka Stopbank Refurbishment project

Major Projects (Raumahanga River Scheme and Riverlink)
Erosion Projects (Hutt River Erosion Edge Protection)

Westport (Buller River) Flood warning system
Hokitika Flood and Coastal Erosion Protection
Mawhera Quay Flood Protection Wall upgrade (stage 2)
Franz Josef Flood Protection

Wairau River Flood Protection – Blenheim

Waiau Township Flood Protection
Ashley/Rakahuri River Protection
Waimakariri River Protection – Kaiapoi
Rangitata 2019 Flood Recovery
Region wide river berm transition programme

West Taieri Contour Channel & Bridges Upgrade
Riverbank Road Flood Protection, Lower Clutha
Robsons Lagoon
Outram Flood Protection

Mataura Town Stopbanks
Gore Stopbank Upgrade
Wyndham Stopbank Upgrade
Waiau Flood Repairs
Invercargill Stopbank Upgrade
Stead Street Pump Station
Stead Street Stopbank Upgrade

Official opening of the stopbank along Tūtaekurī in Taradale Napier.
Photo credit: Resilient River Communities



POST-COVID FUNDING PROVIDED THE START

In 2021, Kānoa invested $217 million into 55 flood resilience projects nationally as part of the government's COVID-19 recovery programme.



5,297 ha
catchments with protected fish-safe pathways created



835 ha
wetlands created or enhanced



8,642 ha
of community resilience



653
local jobs created



$117,184,773
local business contract value



$8,429,984
Māori business contract value

This funding represented the most significant contribution from central government in over 30 years and fast-tracked projects to improve long-term community flood resilience – it was considered the first step in an establishing an effective ongoing co-investment partnership for flood resilience between central and local government.

The first round of government co-investment proved what was possible – but it was a one-off response to a long-term challenge.

In 2018, the River Managers' SIG commissioned a current state assessment of Aotearoa New Zealand's flood resilience system, which at the time comprised 364 schemes. A central finding of the report produced by Tonkin + Taylor was that most river management and flood resilience schemes were constructed up to half a century ago; yet the value of the assets they protect – both directly and indirectly – has steadily increased. Adjacent urban development has also intensified. In most cases the value of these protected assets is disproportionately higher than the value of schemes themselves; and as a result, schemes may be under-designed for what they protect and enable, creating risks of asset failure.

In response, Te Uru Kahika, brought together regional flood risk data into a single national co-investment proposal for Ministers. The message was direct: local government could not carry the burden alone. The report sought a further $150 million per annum from central government to help build the level of resilience increasingly required to protect communities, infrastructure, and regional economies from escalating flood risk. What strengthened the case was not only the data, but the reality behind it. Alongside investment modelling, the report documented the devastating impacts flood events had already inflicted on communities across the country over the preceding five years.

At the same time, central government was beginning to acknowledge that the policy settings underpinning flood resilience were no longer fit for purpose. A 2020 Cabinet paper recognised that funding arrangements established more than 30 years earlier could not sustainably respond to the increasing scale, frequency, and complexity of climate-related flood events; thus, signalling an important shift that resilience was becoming recognised not simply as a local issue, but as a matter of national interest requiring long-term partnership and co-investment.

That shift quickly translated into action. In 2021, the Government committed $217 million through the 'shovel ready' programme to support 55 flood resilience projects across Aotearoa New Zealand that would accelerate ready to go existing or planned flood resilience works that could not go ahead because of the lack of funding.

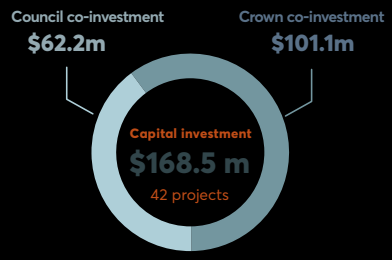
It was valued and valuable to those regional communities that received funding. The pervading problem was that this funding was a 'one-off,' and available only to those projects that were ready to go. The funded projects did not necessarily all align with the areas of greatest flood risk or most urgent community vulnerability. While it delivered tangible benefits, it also exposed the limitations of short-term funding cycles in addressing long-term climate resilience needs.

Hence the purpose of the development of Before the Deluge business case in 2021.

TRANCHE ONE: BEFORE THE DELUGE

'Before the Deluge' proposed co-investment of 92 projects – new and existing – of the most critical projects identified by 16 regional councils, of which 42 were approved.

Tranche One approved funding



Tranche One progress
as of March 2026

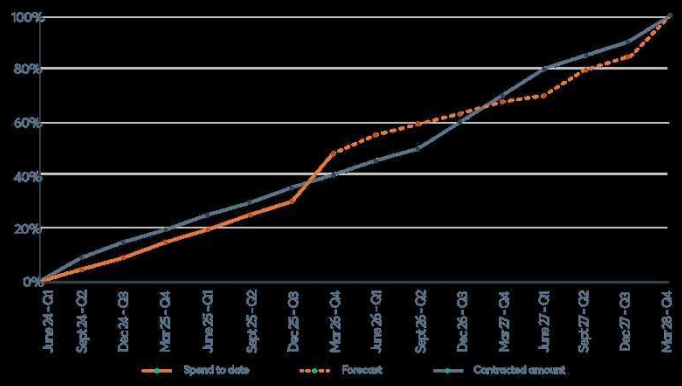


Tranche One prioritised shovel-ready and more urgent, critical flood resilience works over three years. Most are underway, with some already completed.

The co-investment from COVID-19 programme relief funded ready-to-go projects, but urgent, critical projects that had not yet been consented and approved did not make the initial list. The backlog of flood resilience works was still long, and the intensification of climate change-induced weather events is still an issue, so a further programme of work was put forward by Te Uru Kahika.

In 2022 the Before the Deluge business case was developed, which made the case for the continuation of the funding made available via Kānoa, to allow the momentum developed over the last few years to be maintained – for the sake of communities, businesses, and avoided fiscal costs. The case for co-investment was accepted by the Government in the 2022 Budget, as part the Regional Infrastructure Fund (RIF). Out of the proposed 92 critical projects, 42 were approved nationwide – with most well underway, on track and on budget, and some already completed or near completion as of March 2026.

Tranche One actual and forecast spent to date vs planned spend



The Tranche One funding was highly effective, not only because it reduced the backlog of critical upgrades of ageing and no longer fit-for-purpose infrastructure, but also because it delivered short- and long-term benefits for communities, councils, the insurance sector and the Crown. Crown investment flowed into the regional economies by providing sustained employment to local contractors and suppliers, giving businesses confidence in continued trading, protecting private and public assets, and strengthening infrastructure resilience to withstand future flood events.

The outcomes of Tranche One are closely aligned with the Government's 2024 strategic goals – deliver modern, reliable infrastructure critical in driving economic growth – and the Crown investment did just that. However, the underlying issue remained: funding was episodic, the infrastructure backlog continued growing, and sustained investment certainty had not yet been achieved.

TARADALE STOPBANKS: JUST IN TIME FOR CYCLONE GABRIELLE

The Taradale stopbank beside the Tūtaekurī River in Hawke's Bay was upgraded to increase its level of service from a 1% AEP (against 100-year flood) to 0.2% AEP (against 500-year flood) as part of the Tranche 1 co-investment programme. The work raised 2.5 km of the stopbank by 1 metre in height and increased its slope from 1:2 to 1:4 for greater resilience.

The work cost $4 million and was completed in November 2022, just in time to protect the area from the flooding caused by Cyclone Gabrielle in February 2023.

There are nearly 10,000 properties with a capital value of $7.6 billion in the floodplain protected by this stopbank. In other parts of Hawke's Bay, there were 30 breaches or over-toppings of stopbanks across 5 km of the stopbank network during Cyclone Gabrielle, including some on the Tūtaekurī River.

However, the properties behind the Taradale Stopbank escaped significant damage by the timely completion of this upgrade, aided by government co-funding, and contributed to Napier having only 132 damaged properties 'stickered' for damage during the cyclone, compared to 920 in Hastings and 530 in Wairoa.

10,000
Properties protected by the Taradale stopbanks

32+ jobs
Created across the region whilst providing local training opportunities

5x-8x ROI
Investment in prevention avoids 5-8x greater cleanup and recovery costs

$4 million
Investment in upgrades for the stop banks



Taradale stop bank under construction (n.d.)
Photo credit: Hawkes Bay Regional Council

The stopbank upgrades more than paid their way by the averted costs from Cyclone Gabrielle alone.

- **400 houses** *avoided damage as a result of the upgrades prior to Cyclone Gabrielle*
- **$14.6 million** *in insurance claims for houses and contents were avoided*
- **$24 million** *in indirect impacts were avoided from this single event*
- **Payback period** *for the upgrades was less than a year, with lifetime benefits expected over the next 100 years*

In May 2023, Hawke's Bay Regional Council (2023) estimated the cost of the damage caused by Cyclone Gabrielle to amount to $4 billion, primarily due to losses in the primary sectors (mainly agriculture, horticulture and viticulture), damage to local government infrastructure, central government response and relief costs, and cancelled events. Adding private insurance claims of just over $979 million brings the total identified damage to $5 billion.

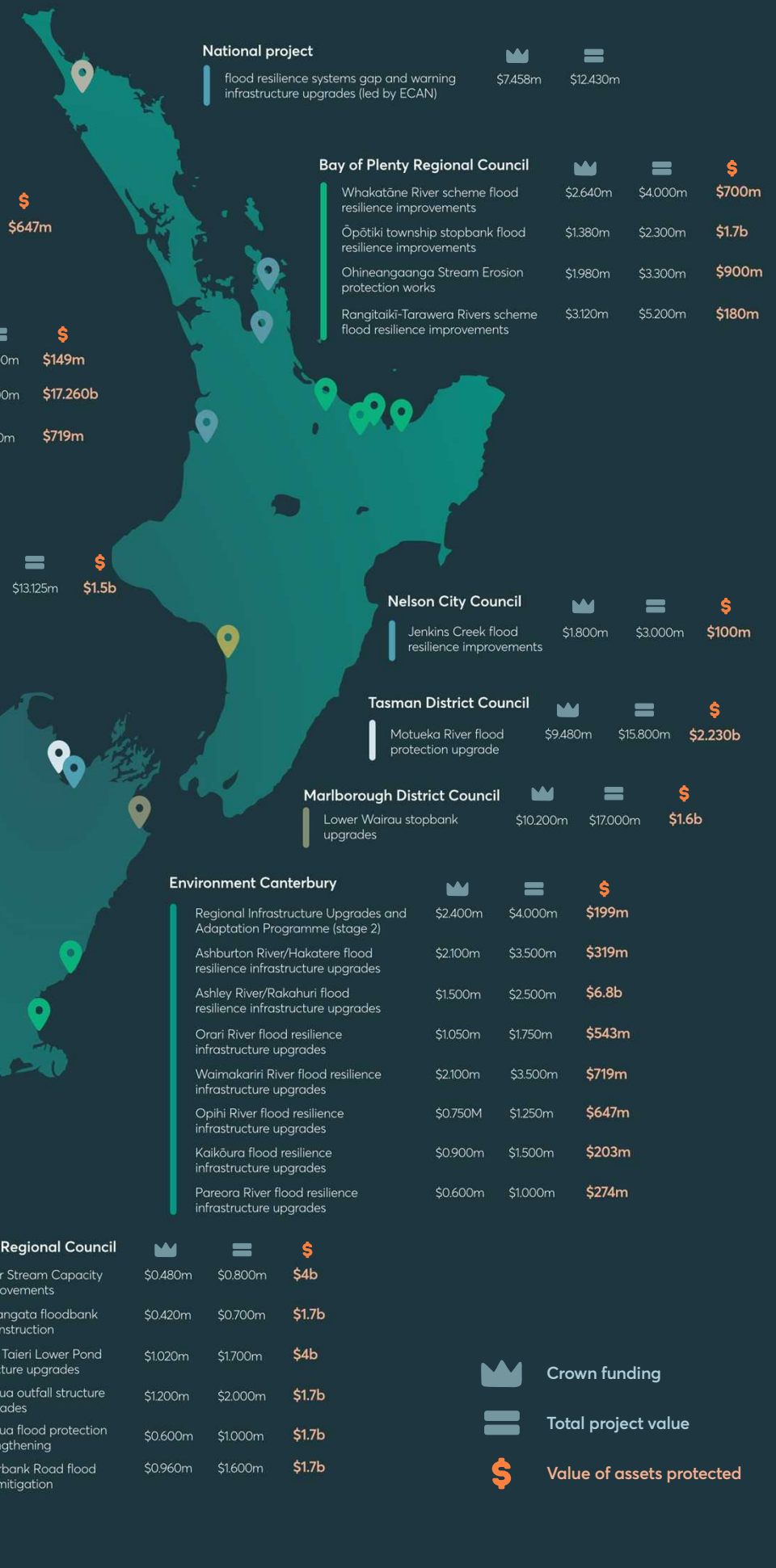
Had the Taradale stopbanks not been upgraded as part of the Tranche 1 co-investment, it's likely the damage bill from Cyclone Gabrielle would have risen significantly depending on flooding extent.

32 projects

underway nationwide, saving assets with a total capital value of

$54.544 billion





National project

	Crown funding	Total project value
flood resilience systems gap and warning infrastructure upgrades (led by ECAN)	$7.458m	$12.430m

Northland Regional Council

	Crown funding	Total project value	Value of assets protected
Lower Whangatane Spillway stopbank setback	$1.501m	$2.502m	$647m

Bay of Plenty Regional Council

	Crown funding	Total project value	Value of assets protected
Whakatāne River scheme flood resilience improvements	$2.640m	$4.000m	$700m
Ōpōtiki township stopbank flood resilience improvements	$1.380m	$2.300m	$1.7b
Ohineangaanga Stream Erosion protection works	$1.980m	$3.300m	$900m
Rangitaiki-Tarawera Rivers scheme flood resilience improvements	$3.120m	$5.200m	$180m

Waikato Regional Council

	Crown funding	Total project value	Value of assets protected
Lower Piako River stopbank upgrades	$4.200m	$7.000m	$149m
Coromandel Peninsula flood resilience infrastructure upgrades	$1.680m	$2.800m	$17.260b
Waikato, Waipa and West Coast erosion and sediment reduction	$2.502m	$4.170m	$719m

Horizons Regional Council

	Crown funding	Total project value	Value of assets protected
Te Pūwaha Lower Whanganui River flood resilience strengthening	$7.875m	$13.125m	$1.5b

Nelson City Council

	Crown funding	Total project value	Value of assets protected
Jenkins Creek flood resilience improvements	$1.800m	$3.000m	$100m

Buller District Council

	Crown funding	Total project value	Value of assets protected
Buller River stopbank infrastructure project	$2.400m	$4.000m	$1.6b

Tasman District Council

	Crown funding	Total project value	Value of assets protected
Motueka River flood protection upgrade	$9.480m	$15.800m	$2.230b

West Coast Regional Council

	Crown funding	Total project value	Value of assets protected
Greymouth Flood Resilience Upgrades Stages 2/4/5	$2.400m	$4.000m	$1.5b
Hokitika Stopbank Construction Stage 3	$2.400m	$4.000m	$85m

Marlborough District Council

	Crown funding	Total project value	Value of assets protected
Lower Wairau stopbank upgrades	$10.200m	$17.000m	$1.6b

Environment Canterbury

	Crown funding	Total project value	Value of assets protected
Regional Infrastructure Upgrades and Adaptation Programme (stage 2)	$2.400m	$4.000m	$199m
Ashburton River/Hakatere flood resilience infrastructure upgrades	$2.100m	$3.500m	$319m
Ashley River/Rakahuri flood resilience infrastructure upgrades	$1.500m	$2.500m	$6.8b
Orari River flood resilience infrastructure upgrades	$1.050m	$1.750m	$543m
Waimakariri River flood resilience infrastructure upgrades	$2.100m	$3.500m	$719m
Opihi River flood resilience infrastructure upgrades	$0.750M	$1.250m	$647m
Kaikōura flood resilience infrastructure upgrades	$0.900m	$1.500m	$203m
Pareora River flood resilience infrastructure upgrades	$0.600m	$1.000m	$274m

Otago Regional Council

	Crown funding	Total project value	Value of assets protected
Silver Stream Capacity Improvements	$0.480m	$0.800m	$4b
Kaitangata floodbank reconstruction	$0.420m	$0.700m	$1.7b
East Taieri Lower Pond structure upgrades	$1.020m	$1.700m	$4b
Puerua outfall structure upgrades	$1.200m	$2.000m	$1.7b
Puerua flood protection strengthening	$0.600m	$1.000m	$1.7b
Riverbank Road flood risk mitigation	$0.960m	$1.600m	$1.7b

Environment Southland

	Crown funding	Total project value	Value of assets protected
Invercargill and Oreti flood resilience stopbank upgrades	$4.110m	$6.850m	$803 m
Mataura River flood protection improvements (Gore and Mataura)	$10.800m	$18.000m	$567 m

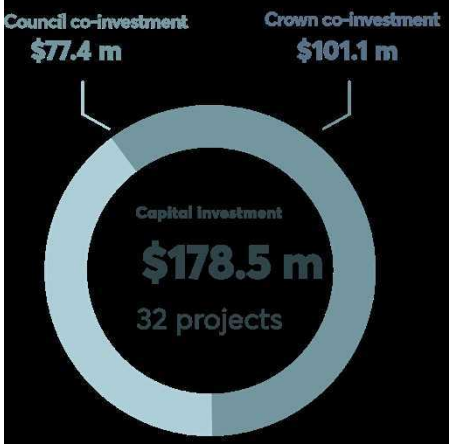
Crown funding

Total project value

$ Value of assets protected

TRANCHE 2: KEEPING THE MOMENTUM GOING

The devastation of Cyclones Hale and Gabrielle reinforced the urgent need for sustained investment in national flood resilience.



Tranche two projects, as outlined in Before the Deluge v2, prioritised projects

Ironically, the 'Before the Deluge' business case landed with Government only weeks before the devastation of Cyclones Hale and Gabrielle and attention was diverted to recovering from these events. As we saw from that flooding, and from other earlier events in Westport, Nelson, Ashburton and beyond, these severe weather events cause loss of life and livelihoods. They also create tremendous strain on Government resources and funds in response and recovery, and in repair of Crown assets.

Hence, the development of the refreshed co-investment business case *'Before the Deluge 2.0'* to reflect a changed funding and delivery environment. It outlined the need for co-investment in flood resilience infrastructure to improve Aotearoa New Zealand-wide community resilience against the impending climate change-induced extreme weather events.

The case sought Government co-investment of $197m in the upcoming Mini-Budget toward the construction of 80 ready-to-go flood resilience infrastructure projects, or the Tranche Two, throughout Aotearoa New Zealand over a three-year period.

It removed projects already funded through subsequent Government initiatives, including the North Island Weather Events 2023 recovery programme, updates costings to account for construction price escalation, and strengthens alignment between individual projects and councils' broader work programmes through the Protect, Accommodate, Retreat, Avoid (PARA) framework.

As part of tranche 2, the Otago Regional Council upgraded the flow management structures at the Robson Lagoon.

The Robson Lagoon is ranked 5th out of the 10 most significant wildlife habitats, and is home to a broad range of native flora and fauna, including many rare and threatened culturally-significant species. The tranche 2 funding enabled the replacement of ageing infrastructure with new solar-powered flow control gates, allowing better management of tributary flows and flood control within the 566 hectare lagoon complex.



Image: New solar power gate at Robson Lagoon
Source: Otago Regional Council

TRANCHE THREE: THE NEXT STEPS

Te Uru Kahika is proposing the next tranche of co-investment, supported by a new prioritisation methodology.



215,401
total people affected by the flood schemes

161,730
building assets with a replacement value of
$67.89 billion

3064 km
roads

221 km
railway lines

124 km
transmission lines

2116 km
wastewater pipes

3449 km
water supply pipes

1447 km
stormwater pipes

Having addressed many long-delayed priorities, the Tranche Three focuses on achieving the greatest return from every dollar invested.

The events of early 2026 show that severe weather will continue to challenge the country into the future. And in order to keep protecting property and assets and our economy, we need to keep investing in flood risk resilience.

Around the world, governments and major institutions are moving towards impact-based, consequence-driven modelling when it comes to climate-risk and flood-risk assessments. This is exactly what RiskScape does – the evidence-based tool Te Uru Kahika is using to prioritise targeted investment decisions for the third tranche of projects. RiskScape is a nationally developed, impact-based risk modelling tool developed by Earth Sciences NZ to assess risk to people, buildings, and infrastructure from natural hazards such as flooding. Further analysis is also underway by the New Zealand Institute of Economic Research (NZIER) to link the exposure data to national and regional economic impacts, which will allow us to refine the BCRs and evaluate the impacts on different sectors.

The initial work has put forward 30 critical regional projects (table on the right) on behalf of Regional and Unitary Councils, covering the length of Aotearoa New Zealand. This is the third tranche of investment, totalling $370.6 million, which will take action on some of the country's most pressing flood risk challenges. Once again, Te Uru Kahika is proposing the 60/40 investment approach used in prior tranches.

The proposed tranche of 30 projects begins the process of proactive investment, rather than simply addressing pressing infrastructure deficits. These are longer-run and in some cases significantly larger projects which will protect communities for many decades to come, and which will have a more significant economic impact.

The diagrams on the left and below shows the extent and value of the assets and infrastructure being protected by the 30 priority projects – 960 square km of urban and productive land, thousands of kilometres of roads and pipelines, more than 200,000 people, and $67 billion of buildings.

Assets protected by flood schemes across the country

	Area (km²)	Capital value ($b)	Improvement value ($b)	Land value ($b)
Built-up area or infrastructure	87.62	70.19	33.90	40.28
Water	4.84	2.68	1.15	1.52
Productive land	867.97	32.89	14.76	18.11
Total	960.44	109.73	49.82	59.92

Council	Project	Total cost ($m)	Crown ($m)	Council ($m)
Northland Regional Council	Donald Road Capacity Improvements	$ 1.70	$ 1.02	$ 0.68
Waikato Regional Council	Lower Piako Stopbanks - Phase 2	$ 25.00	$ 15.00	$ 10.00
	Smartification of Pump Stations Waihou & Piako	$ 3.90	$ 2.34	$ 1.56
	Wharekawa Coast Flood Resilience	$ 1.50	$ 0.90	$ 0.60
Bay of Plenty Regional Council	Waioweka - Otara Rivers Scheme, Wharf floodwall and stopbank upgrades	$ 2.20	$ 1.32	$ 0.88
	Rangitāiki-Tarawera Rivers Stopbank strengthening	$ 6.20	$ 3.72	$ 2.48
	Waioweka- Otara Rivers Scheme, Duke Street Pump Station	$ 3.50	$ 2.10	$ 1.40
Gisborne District Council	Te Karaka Stopbank Upgrades	$ 35.00	$ 19.20	$ 15.80
Taranaki Regional Council	Waiwhakaiho FPS: Rimu Street to Devon Road protection improvements	$ 3.00	$ 1.80	$ 1.20
Horizons Regional Council	Reid Line Spillway	$ 15.00	$ 9.00	$ 6.00
	Rangioutu Floodgates	$ 5.20	$ 3.12	$ 2.08
Hawke's Bay Regional Council	Waitangi / Ngaruroro Confluence - Channel Capacity Improvements	$ 10.00	$ 6.00	$ 4.00
	Wairoa River Mouth	$ 20.00	$ 12.00	$ 8.00
Greater Wellington Regional Council	Te Wai Takamori o Te Awa Kairangi stage 1	$ 50.00	$ 30.00	$ 20.00
	Moonshine stopbank upgrade	$ 6.50	$ 3.90	$ 2.60
	Waipoua Urban Reach stopbank upgrade	$ 30.00	$ 18.00	$ 12.00
Nelson City Council	Saltwater Creek Pump Station	$ 4.80	$ 2.88	$ 1.92
Tasman District Council	Tapawera Township Stopbank Assumption and Refurbishment	$ 3.00	$ 1.80	$ 1.20
	Motueka Stopbank Upgrades	$ 20.00	$ 12.00	$ 8.00
Marlborough District Council	Taylor Dam Revitalisation	$ 12.00	$ 7.20	$ 4.80
Canterbury Regional Council (Environment Canterbury)	Ashley Rakahuri Secondary Stopbank	$ 15.00	$ 9.00	$ 6.00
	Structure upgrades/adaptation programme #3	$ 36.53	$ 21.92	$ 14.61
West Coast Regional Council	Westport Flood Resilience Programme	$ 25.05	$ 15.03	$ 10.02
	Greymouth Small Catchments Programme	$ 3.46	$ 2.08	$ 1.38
	Hokitika Stopbank Construction Stage 2 (Kaniere)	$ 8.72	$ 5.22	$ 3.48
Otago Regional Council	Riverside Road Spillway Resilience Improvements	$ 5.00	$ 3.00	$ 2.00
	Lake Ascog Pump Station - Pump Renewals	$ 1.00	$ 0.60	$ 0.40
Environment Southland	Invercargill City Flood Resilience Stage 1	$ 5.77	$ 3.46	$ 2.31
	Tuatapere Domain Bank	$ 0.25	$ 0.15	$ 0.10
	Mataura Flood Resilience Stage 2	$ 19.55	$ 11.73	$ 7.82
Total		**$ 370.62**	**$ 222.37**	**$ 148.25**

PERSPECTIVES:
COMMUNITY EXPECTATIONS

My name is Greg Ryan, and I'm the Director of Integrated Catchment Management at Waikato Regional Council.

One of our areas of responsibility is the Hauraki Plains, which is a good example of how community expectations and levels of service and how we adapt to the future are all intersecting.

Both urban and rural people in the Hauraki are very reliant on our schemes, even day-to-day, because they are effectively tidal schemes that enable the productive use of land. And across the catchment there are some pretty big challenges with rising sea level, increased rainfall intensity, some areas of settling land, and there's some tectonic movement in that area as well. It's all putting increased pressure on the level of service and what it looks like in the decades ahead.

So we're having ongoing conversations with the community about the existing schemes and the level of service that's agreed to, making sure they operate well day to day and during events, and making sure we can operate and fund the schemes effectively.

As part of that discussion we're putting a lot of effort into making sure that people understand the limitations of our infrastructure. We have a communications campaign that's going at the moment, called Come High Water. It's on our website and Facebook and all the usual places, and it's about the fact we can't stop all the floods. We ran a similar campaign about 10 years ago which was really well received, and the Officer of the Auditor General recommended last year that we continue the community conversation around levels of service and what to expect, so we're doing that now.

But even when everyone understands the challenges, we still need to figure out the right solutions. The productive use of land is high on the agenda for our rural community, and they have businesses to run, and so they're very focused about how they sustain their business models in the future.

And what's becoming clear is that some areas of land might have to be retired or used for other purposes, because our traditional engineering approach just isn't going to be enough. So that means we and landowners have to focus on and prioritize land where we can maintain productive use.

in the past, we'd build a pump station to a 10 year event or build a stop bank to a 100 year event, and that would be fine and everyone can run their business and plan their lives. I think there is real acknowledgement now that firstly, we've got to think beyond our designs and prepare the community for what might happen. And secondly, we need to acknowledge that there are shifting goal posts these days. So if we designed for a hundred year event 20 years ago, In 30 years' time, that's going to be a very different goal post and a very different risk to the community.

I think our community – both urban and rural – pretty much gets it. Everyone can see the big events are getting more frequent and more serious, and that climate change is a big driver. I think for everyone it's shifting the time horizon, to think ahead about what the future will look like, and what we do about that together.

That means we need to think about where we're prioritising growth in our community and how we're using the land so we don't create issues that we can't solve in 50 years time. Let's do things well now so we don't create problems for our children and grandchildren.



Greg Ryan | Director of Integrated Catchments
Waikato Regional Council

Photo credit: Tim D

RETURN ON INVESTMENT FOR FLOOD RESILIENCE

Research by NZIER demonstrates that flood resilience is an excellent fiscal investment.

Return on investment for flood resilience is defined as the costs that can be avoided through the implementation of resilience measures, including the construction of infrastructure; it is an avoided cost, rather than a direct facilitator of additional economic activity. From a national perspective, flood resilience can be viewed as a form of insurance – the capital and operational investments in the programme are cheaper than the costs of response and recovery, particularly when the long-term and indirect effects of major flood events are taken into account.

And as the table from the Ministry for the Environment shows, there are billions of dollars of property exposed to flood events:

5 year increment	Estimated number (count)			Estimated property value ($ millions)		
	Low	Medium	High	Low	Medium	High
2026 - 2030	300	700	1,700	200	600	1,500
2031 - 2035	300	700	1,900	300	600	1,600
2036 - 2040	300	800	2,000	300	700	1,700
2041 - 2045	300	800	2,100	300	700	1,900
2046 - 2050	300	800	2,200	300	700	2,000
2052 - 2055	300	800	2,300	300	700	2,100
2056 - 2060	300	800	2,300	200	700	2,100
TOTAL	**2,200**	**5,300**	**14,500**	**$1,900**	**$4,800**	**$12,900**

Estimated number of residential properties and property value (in millions) in coastal inundation and inland flood zones expected to experience at least one damaging event by 2060, distributed across 5-year increments under three damage threshold scenarios (low, medium, high)

– Climate Sigma report for Ministry for the Environment, January 2025

In 2021 Te Uru Kahika asked the New Zealand Institute of Economic Research (NZIER) to assess the direct costs and benefits of flood resilience investment, and this work showed that every $1 invested produced $4-$5 in avoided costs from damage, response and recovery. Despite the narrow focus of the analysis – only the direct impacts were assessed – it shows that the return on investment is significantly higher than for most infrastructure projects in the country.

In 2025 Te Uru Kahika asked NZIER to extend the analysis by looking beyond the direct impacts, and the table on the following page shows the scope of the costs that can be avoided by careful investment.

THE DIRECT AND INDIRECT IMPACTS OF FLOODING

Cost of flooding	Direct	Indirect	Intangible
Human costs			
Deaths			
Injuries			
Persons and days in evacuation			
Rescue operation costs			
Hospital & treatment costs			
Lost productivity from injury			
Mental anxiety/insecurity			
Heritage degradation			
Environmental health			
Property damage & losses			
Buildings			
Homes			
Infrastructure			
Vehicles			
Stock			
Disruption costs			
Temporary infrastructure closure			
Business lost revenue			
Business added costs			
Other added costs			
On-going production loss			
Recovery/treatment cost			
During event costs			
Post-event costs			
Reputational costs			

"Floods cause damage to inundated properties, but can also adversely affect activities that are not directly touched by flooding, but are curtailed by it because of supply chain disruption. That distinction is behind the common categorisation of flood impacts into Direct impacts (caused by contact with flood waters) and Indirect impacts (caused by disruption of activities in locations not directly flooded).

A third impact category is so-called "intangible" impacts on things of value to people that are not generally traded or readily valued through market processes. These include fatal and non-fatal injuries to people, impairment of natural and cultural heritage sites, and reputational hits on flooded areas. Intangibles are most likely from direct contact with floodwaters, but they can also arise indirectly, such as deferring of critical medical treatment due to flood disrupted transport systems."

– NZIER



Stop bank at Porongahau (n.d.).
Photo credit: Hawkes Bay Regional Council.

THE IMPORTANCE OF MAINTAINING MOMENTUM

Despite the advances in successive tranches of investment, challenges remain.

Risks and consequences of the stop-start funding model

Higher costs

Without a predictable pipeline, procurement becomes less efficient and repeated unnecessarily, inflation compounds delays, and projects cost more to deliver; mobilisation and demobilisation costs occur more. Economies of scale lost because projects cannot be bundled together.

Loss of capability

Specialist capability, experienced project teams, and institutional knowledge are difficult to retain between funding rounds. New teams have to be established when funding resumes.

Project delays

Projects are paused while waiting for funding decisions. Planning, consenting and design work may need to be revisited if significant time has passed; construction windows can be missed, particularly where seasonal constraints apply.

Reactive investment

Funding tends to follow disasters instead of preventing them. Priority may be given to "shovel-ready" projects rather than those with highest long-term value. Councils focus on securing next funding rather than planning long-term.

Reduced confidence

Businesses delay investment decisions and communities remain uncertain about whether protection will actually be delivered.

Tranche two projects, as outlined in Before the Deluge v2, prioritised projects

The effect of the co-investment tranches has been hugely positive for communities and businesses across the country. However, the successes need to be set against the backdrop of some decades of under-investment in flood risk resilience, as investment failed to keep pace with the increasing risk profile from a changing climate and increased economic activity.

The co-investment pipeline to date has focused on projects that can start quickly and which will complete in relatively short timeframes. The reason projects have met these criteria is because they represent an overhang of critical works – they are the projects that councils wished to prioritise because of their importance, but which could not be funded from local or regional resources.

The sector is now at the point where longer-term perspectives are needed. There are still projects – particularly within tranche 3 – that are increasingly urgent as the severity of major weather events increases. With the immediate backlog largely addressed, attention can now turn to the medium-term projects that can take a more considered and cost-effective approach to design and delivery.

But momentum is important. Providing certainty to the construction sector with a decade-long pipeline of confirmed projects will allow capacity and capability to be developed, which will help contain costs and increase quality. Crucially, it will also provide certainty to communities and businesses, and give people and companies confidence to invest.

From the perspective of the sector, continued commitment also means the gains made over the last five years – by addressing the most urgent areas of under-investment – won't start to erode. If we return to the status quo funding model, the cycle of delayed and deferred projects will start again, because the issues of affordability, fairness of funding approaches, and ability to pay haven't materially changed; we risk a return to the high levels of vulnerability we are only just escaping now.

The following sections of this business case set out how we continue the journey and deliver the outcomes our communities expect and our economy requires.



3 The scale of investment



PERSPECTIVES:
THE BRAIDED RIVERS

My name's Manon Prin, and I'm originally from France where I studied environmental protection followed by a master's degree in agronomy, before making my way to Aotearoa New Zealand. Now I work in the Braided River Revival team at Environment Canterbury. What we do is mostly focused on reintegrating wild systems into the modified braided river systems.

As part of the rivers team in the regional council, we're working to help keep our flood resilience assets functional by combining traditional measures with ideas from the restoration world and ecological concepts. We assist with berm management and fairway management to control weeds, and to build biodiversity across the river corridors, constructing habitat and biodiversity patches along the river.

We don't do this alone. We work with a lot of different groups – we work with community groups, sometimes with DOC, we engage with schools and with rating district groups. We talk to national and international experts, universities, and ecologists. We had the opportunity to meet with experts in community-led projects from the US who came and talk to us about their challenges and wins, and we've exchanged on what we've learned too. All of this informs our work and our practices.

By doing this, we restore some of the natural functions of a braided river. Sometimes it's small interventions and sometimes it's larger projects, just depending on where we are within the catchment, depending on what's allowed, depending on the resources or the existing constraints. It can be very site specific.

The biggest challenge in our braided river landscape is the loss of resilience, the loss of wild systems that would naturally act as buffers. This means that flood resilience assets need to be managed differently in places and better supported so the rivers and the ecosystems can revitalise themselves. That's the most pressing issue, especially with climate change and the costs associated with it.

Our history of managing rivers is linked to early urbanisation as we needed to protect cities built near river corridors. In many cases these were too close, compared to what we might consider safe these days. This is why we have pinched and constrained reaches now and why we have limited options for holding infrastructure in place. In tight reaches good, smart engineering is needed.

Over the longer term, we need to establish sections and spaces where the river has room to do things by itself to provide flood resilience and regeneration of habitat. These rivers are wild dynamic systems that are a lot wider and broader than the fairway plus berm elements that we normally think about, and the more we try to constrain the river the harder it becomes to manage the flood risks and try and keep them environment healthy.

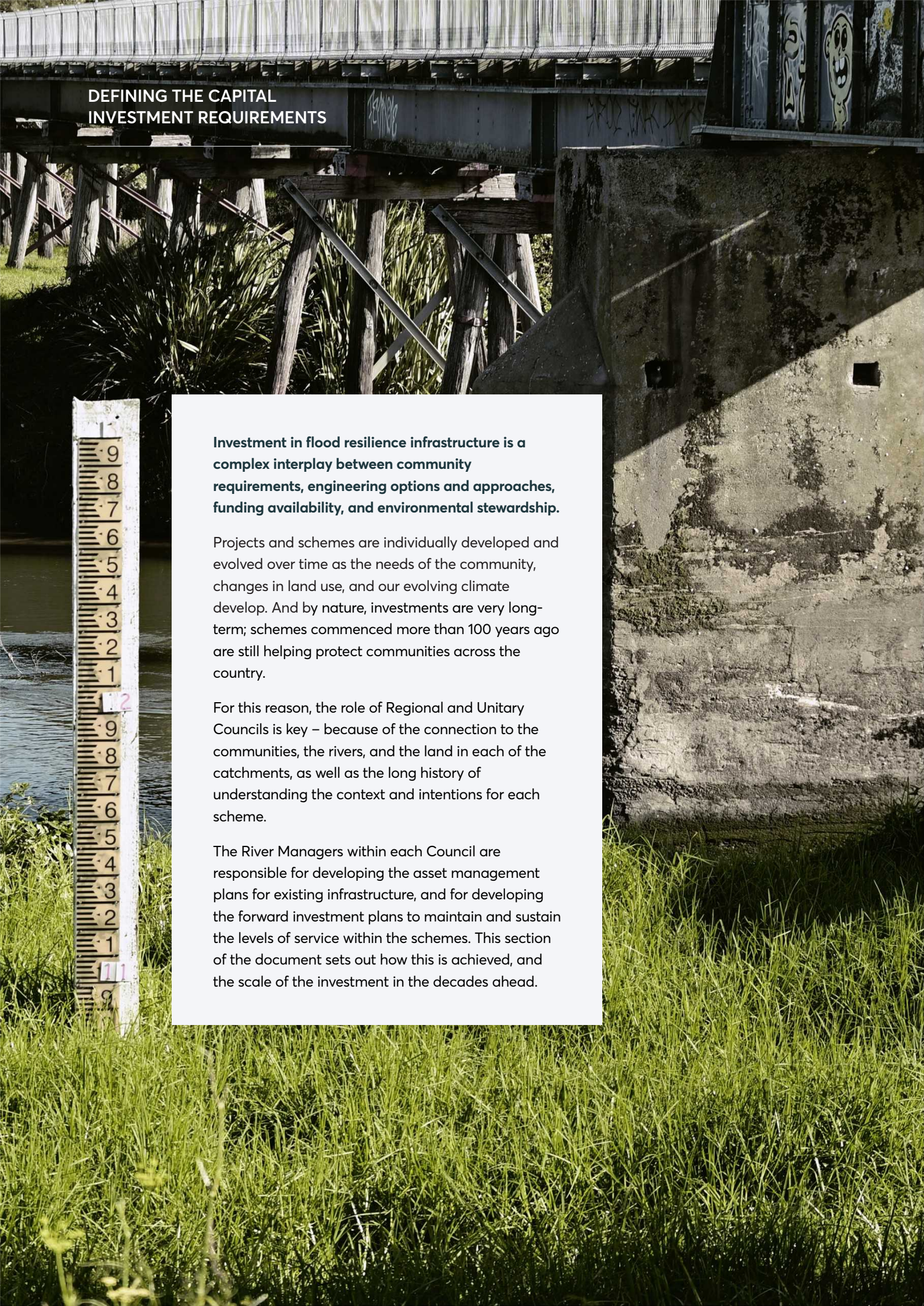
We know what we are doing now, and we know how to get the best outcomes in our berms. Our berm transition projects are establishing so quickly and achieving many outcomes, including flood resilience support and wild native growth. This work is widely appreciated as it becomes visible that our recipe is working. We need to maintain momentum.



Manon Prin | Braided Rivers Officer – Natural Infrastructure
Environment Canterbury

Photo credit: Tim D

DEFINING THE CAPITAL INVESTMENT REQUIREMENTS



Investment in flood resilience infrastructure is a complex interplay between community requirements, engineering options and approaches, funding availability, and environmental stewardship.

Projects and schemes are individually developed and evolved over time as the needs of the community, changes in land use, and our evolving climate develop. And by nature, investments are very long-term; schemes commenced more than 100 years ago are still helping protect communities across the country.

For this reason, the role of Regional and Unitary Councils is key – because of the connection to the communities, the rivers, and the land in each of the catchments, as well as the long history of understanding the context and intentions for each scheme.

The River Managers within each Council are responsible for developing the asset management plans for existing infrastructure, and for developing the forward investment plans to maintain and sustain the levels of service within the schemes. This section of the document sets out how this is achieved, and the scale of the investment in the decades ahead.

DEFINING THE CAPITAL INVESTMENT REQUIREMENTS

The planned national approach to flood risk resilience infrastructure is an integrated programme of investment.

The scale of the challenge demands a coordinated and enduring investment response.

Building national flood risk resilience requires moving beyond siloed responses toward an integrated programme that aligns priorities, shares data and tools, and scales investment according to risk and need. What we are asking the Government stands: a long-term 60%-40% Crown-Council co-investment model for flood resilience.

The forward investment programme provides a consolidated national view of flood resilience investment requirements across Regional and Unitary Councils. It draws together investments identified through Long Term Plans (LTP), infrastructure strategies, asset management plans, and river management programmes, highlighting the scale and continuity of investment required to maintain and strengthen resilience across Aotearoa New Zealand.

The programme is not a fixed portfolio of projects, but an investment pathway based on the best information at the time of preparation, and should be expected to evolve.

Current investment requirements identified by Councils fall into three broad categories:



Immediate investment

Tranche 3 flood resilience infrastructure projects that are ready for delivery within the next 0–3 years



Asset maintenance and renewal

Ongoing investment to maintain, upgrade, and replace existing flood resilience infrastructure



Future resilience investments

New infrastructure required to respond to changing climate risks, population growth, land use change, and other environmental pressures

Individual projects will continue to evolve through established Council processes, including community consultation, technical assessment, and application of the Protect, Accommodate, Retreat and Avoid (PARA) framework.

This reflects a continuing need to renew ageing flood resilience assets, maintain agreed Levels of Service, respond to escalating climate risks, and support long-term community resilience. While specific projects may change over time, the underlying investment requirement remains constant.

THE WAY FORWARD – CAPITAL INVESTMENT PIPELINE

Considerable work has been done by the sector to align the multi-decadal investment pipeline within the context of Infrastructure Commission Te Waihanga's Infrastructure Strategy and the evolving National Infrastructure Plan.

The investment pipeline maps required projects – immediate investments, asset maintenance and renewal, and future resilience investments – identified by the sector into three Stages, aligned with Te Waihanga programme business cases.

We are proposing a 60/40 co-investment between the Crown and councils.



Stage 3

Near-term projects
0-3 years

$420m
per annum

These figures are typically developed from detailed business cases or committed programmes through Council LTP processes.

In Aotearoa New Zealand, this aligns with NZTA's P95-ready or P90 mature estimates, which incorporate design-level detail, recent market rates, and risk-adjusted costings. As a result, there is a relatively higher confidence associated with these figures.

Stage 2

Mid-term projects
4-10 years

$370m
per annum

These are often based on concept-level plans or indicative project pipelines.

International best practice (including NZTA's cost estimation guidance and UK Green Book principles) suggests these are generally at a P50 confidence level – i.e., expected to be exceeded 50% of the time.

Stage 1

Long-projects
11-30 years

$410m
per annum

These are broad projections based on asset reinvestment methodology, with consideration of Infrastructure Strategy. These numbers are typically inflated for risk, escalation, and future climate-driven needs, incorporating less granular data but accounting for compounding uncertainty.

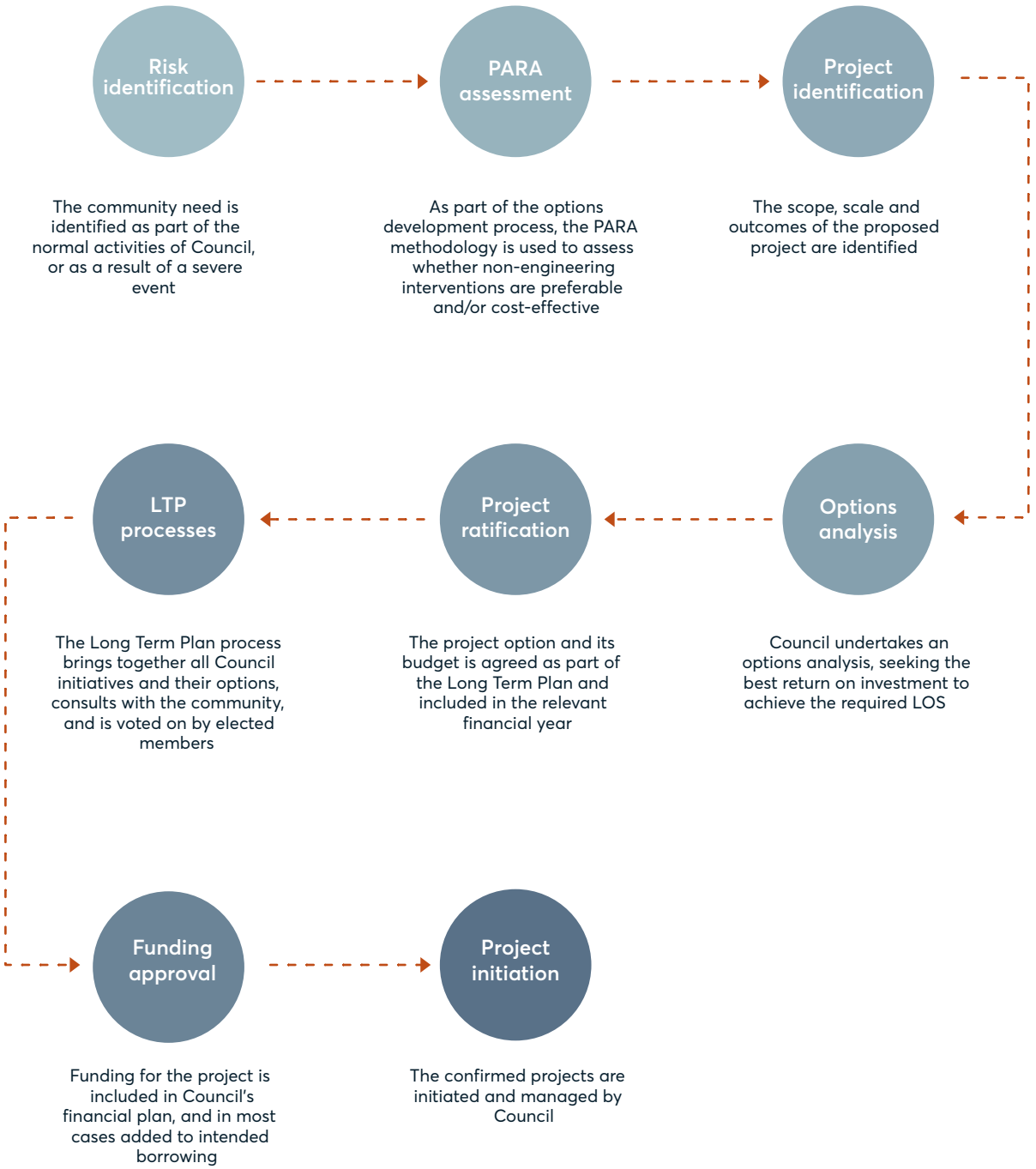
In this sense, they can be viewed as policy-level high-side forecasts rather than project-ready budgets.

THE CAPITAL INVESTMENT PROCESS

Investment decisions are grounded in Council LTPs but remain adaptable under PARA framework to reflect the evolving risks, community priorities, and long-term outcomes.

The process diagram below shows how flood resilience investments are developed within the statutory frameworks defined in the Local Government Act 2002, which mandates Regional and Unitary Councils to consult with their communities every three years, as part of their LTPS.

As required by the legislation, there are multiple stages of investment development, options analysis, and community consultation before the project is confirmed and commenced.



LONG TERM ASSET STEWARDSHIP

Councils have increasingly sophisticated long term asset management strategies for flood resilience.



Workers pumping out floodwater in Northcote (2023)
Photo credit: NZ Herald

Some flood resilience assets can date back around 100 years, as we began protecting our towns and farms from the threat of riverine floods. The stopbanks in the lower reaches of the Waimakariri River in Canterbury were first constructed from onsite materials in the 1920s, for instance.

Understanding the extent, condition and likely lifecycle of the many thousands of assets in each council is the starting point for developing the long-term investment pipeline. Considerable work has been done by individual regional and unitary councils on their long-term asset management plans, and there has been extensive coordination via the River Managers Special Interest Group (SIG) to establish common standards and approaches for asset management. The River Managers SIG has supported the sharing of knowledge and promoted greater consistency in asset management approaches. It is acknowledged that asset management practices vary and there is an opportunity to raise the level of maturity across the sector.

However, assessing condition and lifecycle is complex – particularly when it comes to stopbanks and similar structures. In many cases they have been built and rebuilt over many decades to different engineering standards, periodically repaired and replaced, whilst being managed by a variety of public sector organisations with varied record keeping practices. In addition, they are increasingly exposed to more severe weather events and flooding scenarios.

For near-term upgrade and replacement projects, assets are inspected and evaluated so the engineering options can be assessed and costed. This is the case with the projects in the 0-3 year time frame, as the diagram on the following page shows.

Projects in the 4-10 year time horizon make estimates for likely asset condition based on council records and other assessments, but further investigations are typically needed before engineering design can occur – which means costs are more uncertain.

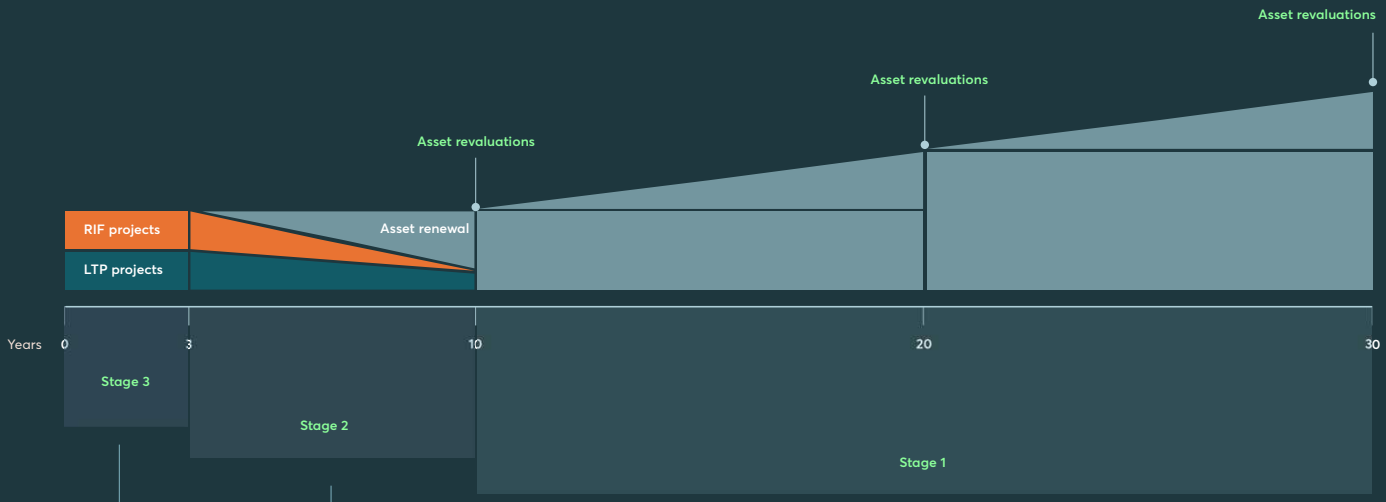
Over the 11-30 year range, asset lifecycles are estimated from the asset management records and are a financial calculation only – which means the future investment is based on ranged estimates of asset renewal or replacement, with little direct validation of the asset condition or assessment of the engineering options. These estimates carry the greatest uncertainty.

The diagram on the following page shows how the different estimation methodologies are combined to produce a forward investment pipeline.

THE LONG TERM ESTIMATION APPROACH

The diagram below shows how the capital estimates for the programme have been developed, which are applied consistently across all Councils from year 1 to

The asset renewal approach takes the current value of the assets held by Councils, and estimates that a 50% reinvestment cycle will be required to ensure they are able to meet the LOS requirements in the face of growing climate change challenges. For the purposes of the modelling, the assets are revalued every decade



The Stage 3 programme is made up of the confirmed projects from Council LTPs plus the additional projects funded through the RIF.

The Stage 2 programme is made up of the confirmed projects from Council LTPs, the additional projects funded through the RIF, and an allowance for unbudgeted asset renewals.

The Stage 1 programme is exclusively made up of unbudgeted asset renewals, derived from the long-term asset plans of Councils plus the national resilience overlay.

Stage 3

In years 0-3, the planned investments in each scheme have been identified in the RIF funding and in the Long Term Plans of Regional and Unitary Councils, using the current 2024-2034 LTPs.

However, the planned investments are constrained by the debt ceilings and ability to service for each Council, so reflect the funding limitations rather than the infrastructure requirements within each catchment.

Stage 2

In years 4-10, the proposed investments are drawn from the Long Term Plans, and scaled to reflect the impacts of climate change-induced level of service requirements, plus likely construction cost inflation.

In many cases, the capital investment requirements would result in either the Council exceeding its debt capacity, or incur a level of rates burden that is unsustainable for communities and businesses.

Stage 1

From year 11 onwards, the estimates are based on the likely asset life and replacement cycle for the flood resilience infrastructure, reflecting the projected end of life of the assets.

Scalars have been applied for climate change and construction costs, using the same methodology as in years 4-10.

It's worth noting that these projections are for existing assets, and don't take account of any entirely new flood resilience schemes required by communities such as in Westport and Wairoa.

CONTINUING THE CURRENT INVESTMENT SHARING

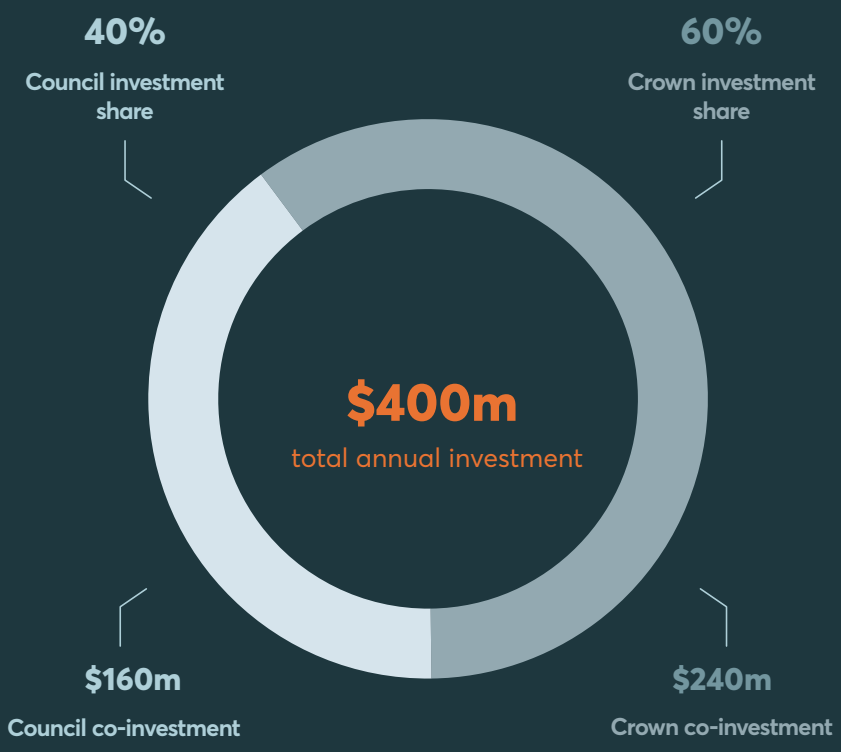
Starting with post-COVID recovery funding in 2021, the Crown and the sector have agreed multiple tranches of co-investment in flood resilience, totalling $659m. This has enabled long-delayed projects to be accelerated, with resultant benefits to communities and businesses – including effective protection during Cyclones Hale and Gabrielle, and the severe weather events of early 2026.

A further $370m of co-investment is being discussed as part of the next tranche of activity, which will enable longer-term projects to be progressed.

In all tranches, 60% of the investment has been provided by the Crown, with the remaining 40% coming from regional and unitary councils. The sector – via Te Uru Kahika – is proposing to formalise this co-investment methodology into a long-term commitment, in order to build a national pipeline of flood resilience projects.

As the graph on the following page shows, around $400 million in annual investment is required to address the challenges of climate change pressure, the growing value of economic activity on land vulnerable to flooding, and a growing population. The Crown commitment being sought is $240m per annum, significantly less than the repair and recovery costs being incurred by the government from flood events.

The co-investment approach is similar to that agreed with councils for local roads, via the New Zealand Transport Agency, where there is a proportional commitment that allows the Crown, councils, and the contracting sector to plan and deliver projects with certainty. The approach will be supported by a national prioritisation framework provided via Te Uru Kahika, which will deliver a high degree of investment transparency.



This value represents the long-term average annual investment, comprising both CAPEX and OPEX, split evenly (50/50) and expressed in constant 2026 dollars.

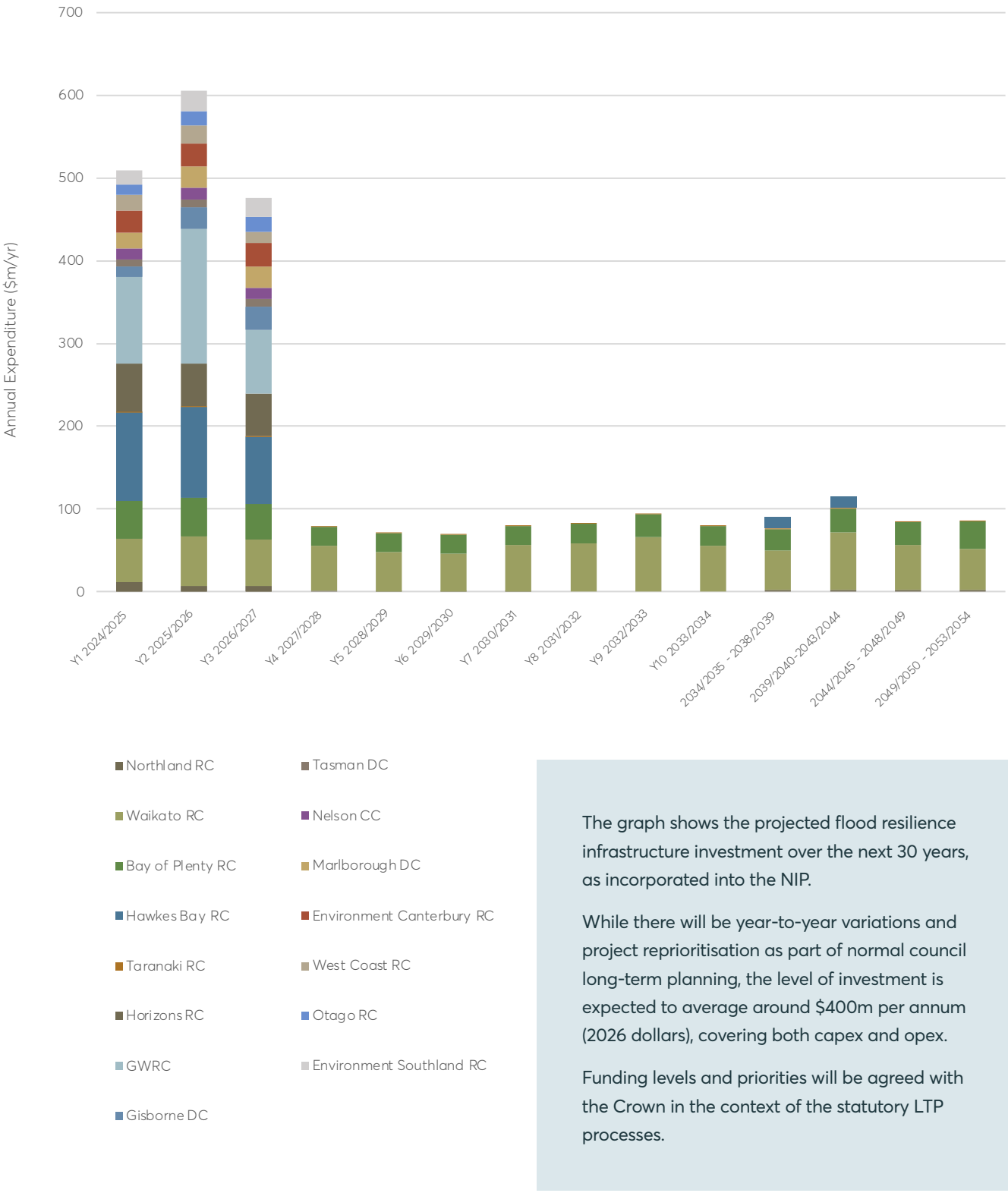


Railbridge over Rangitata River, in South Canterbury, sags after flood water washed away one of 34 piers (2024).

Photo credit: Conner Haley / Allied Press

INVESTMENT FORECASTS FOR THE NEXT 30 YEARS

Forecast annual investment including proposed Crown funding
Capex plus opex



The graph shows the projected flood resilience infrastructure investment over the next 30 years, as incorporated into the NIP.

While there will be year-to-year variations and project reprioritisation as part of normal council long-term planning, the level of investment is expected to average around $400m per annum (2026 dollars), covering both capex and opex.

Funding levels and priorities will be agreed with the Crown in the context of the statutory LTP processes.

OPERATING COSTS ARE KEY TO FLOOD RESILIENCE

While there are billions of dollars of flood resilience assets, ongoing operational expenditure is required.



Operational costs tend to be largest and most critical expense in flood resilience, hence we are proposing to include opex as part of the co-investment partnership.

The big-ticket investments associated with flood resilience infrastructure tend to receive the greatest focus from communities; however, much of the successful performance of flood resilience schemes depends on ongoing and diligent operational activities, which must be funded annually.

Operating expenditures fall into different categories:

Ongoing maintenance

of flood resilience assets, such as replacement of components for pump stations, repairs to stop banks, the removal of debris from screens, etc.

River management

including the targeting of weed species in the catchments, the development and maintenance of nature-based catchment elements such as wetlands, the removal of excess vegetation, gravel, silt, and other debris from river beds to maintain clear waterways

Funding of depreciation costs

for capital assets, in accordance with Council asset management and financing policies.

In practically all cases, the operating costs associated with flood risk resilience are greater in most financial years than the capital costs of schemes, and this has largely been the case since their inception.

Operating costs must be fully borne by ratepayers in the year in which they are incurred. The nature of year-by-year operating costs also means that Councils cannot borrow to fund them, in comparison with capital costs, where borrowing can be used to equitably spread long-term costs across the generations.

This means that the level of rates is highly sensitive to operating costs, to a much greater extent than new capital costs – but the successful performance of flood resilience schemes in major weather events means maintenance and river management cannot be deferred into future years without significantly increased risks.

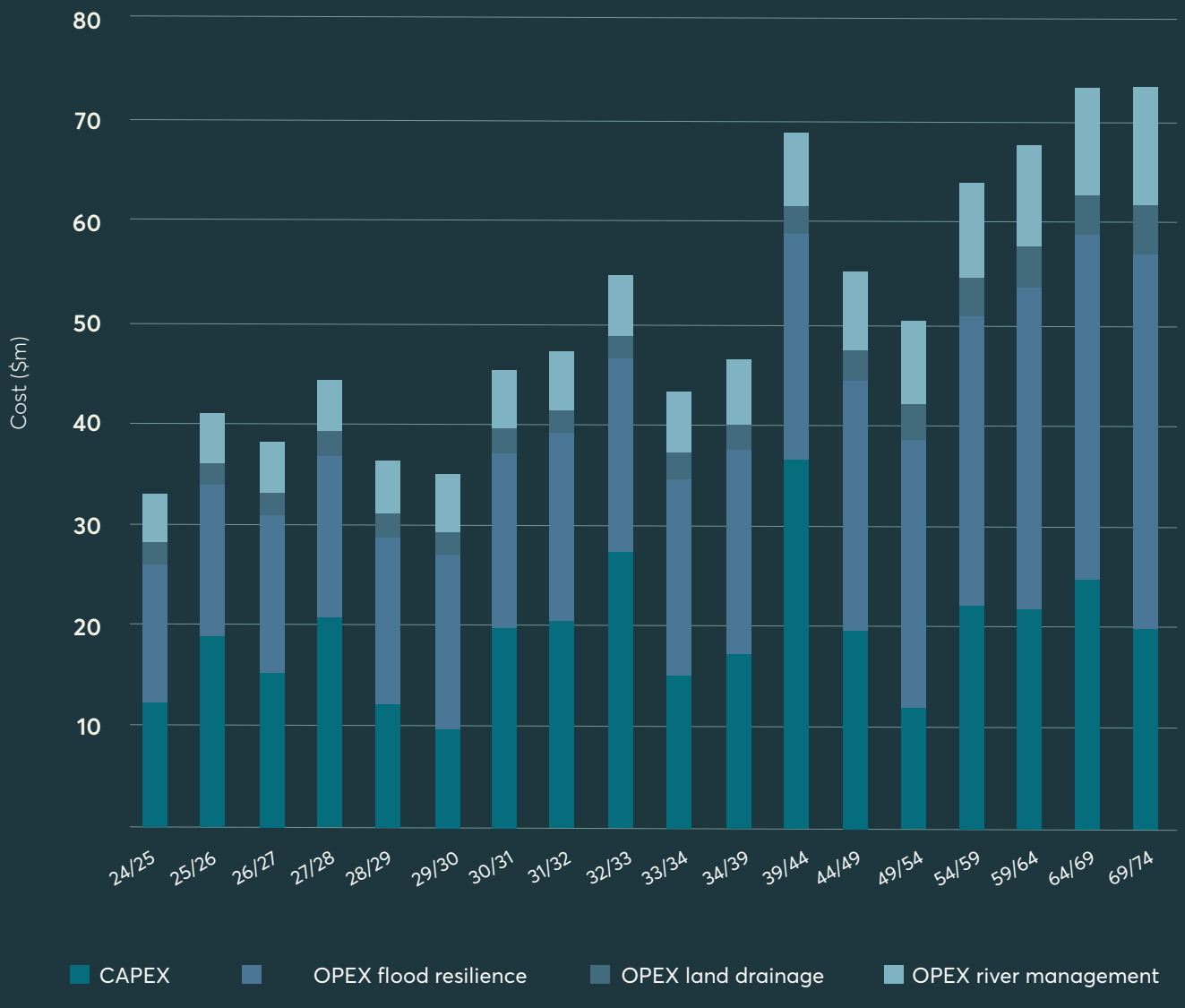
For these reasons, we are proposing that the operational costs of flood risk resilience are included in the co-investment partnership between Councils and the Crown.

Case study: Waikato Regional Council

Forecast spend profile 2024-2074

The 50 year forecast for capital and operational expenditure for Waikato Regional Council is shown in the diagram below, illustrating the ongoing and significant expenditure required to maintain assets, undertake river management and drainage management, and fund long-term depreciation.

In most years, the operating costs exceed the capital investments and will continue to do so over the coming decades.



Waikato Regional Council's Regional Asset Management Plan translates capex and opex projections into a 50-year expenditure profile, illustrating how operational, renewal and new capital needs shift over time.

The first 10 years are shown individually, with years 11–50 presented in five-year averages.



Mike Jensen | Area Engineer
Greater Wellington Regional Council

Photo credit: Tim D

PERSPECTIVES:
CARING FOR THE RIVER

My name's Mike Jensen and I'm an Area Engineer at the Greater Wellington Regional Council. I've been working on and around the Hutt River for the last 45 years, starting with the organisation that morphed into the regional council in my late teens.

Back then, the focus was on controlling the river, keeping it within the narrowest reach we could. So we built stop banks and planted willows and poplars, and tried to tighten it up. But a river is a natural system, and so now we talk about resilience and how we have the right infrastructure and assets in the correct place. Giving more room for the river.

That's what the Flood Operations team does every day. We look at how the river is moving and we figure out where hard interventions like rock groynes and rock walls need to go. We create soft river banks with plants and trees, and slow down the flow and, where needed, we cut out the major weeds like gorse and broom.

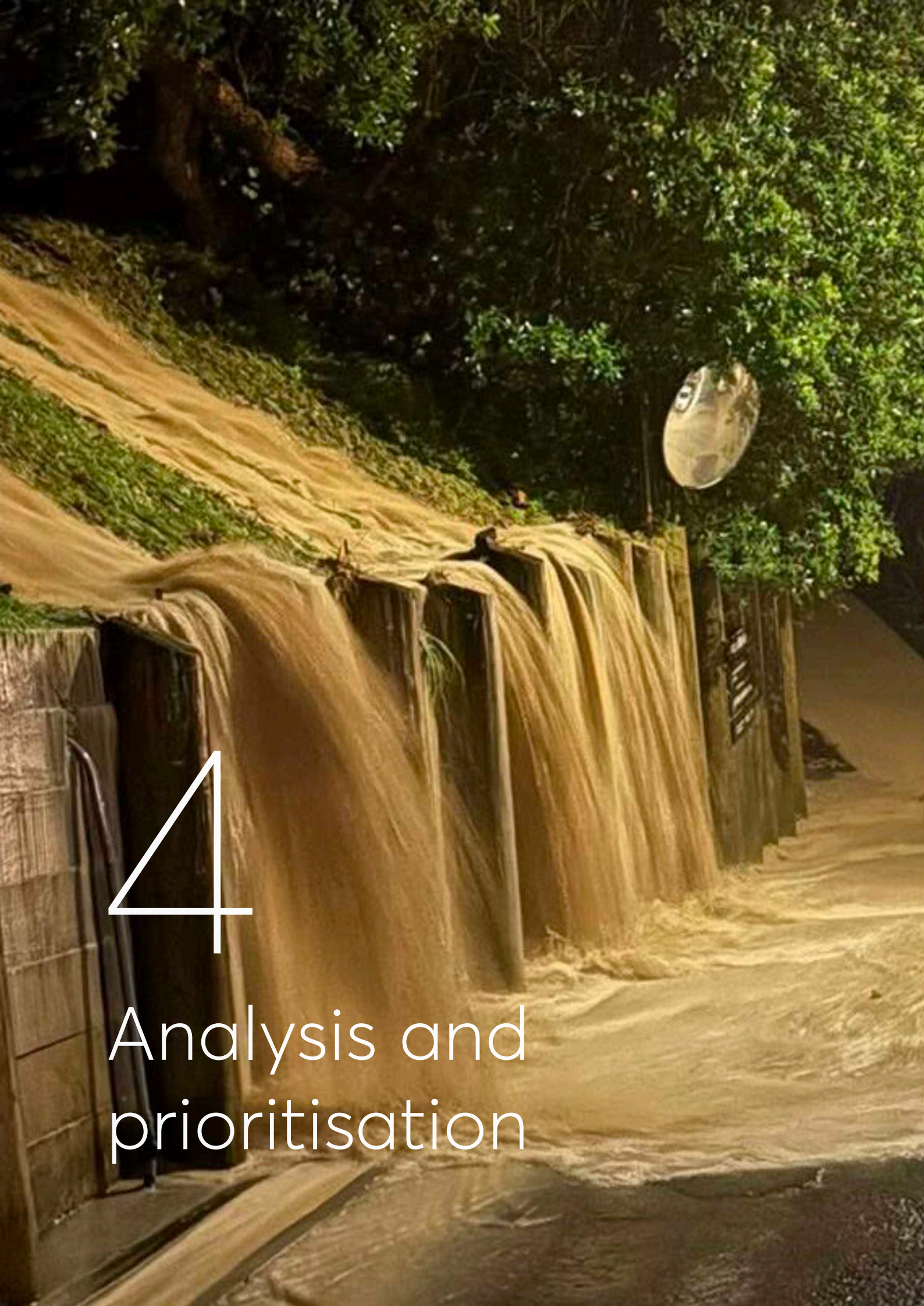
It's a dynamic environment but it's an essential part of keeping the river healthy, creating better habitats and building flood resilience. The big stuff – the diggers and the piles of armour rock – that's what gets people's attention when they're driving past, so they don't tend to see a few people working on the river bank. But when the big rains come and the river rises, it's the soft stuff that's our first line of defence.

It's easy to look at a contoured river bank with some grass on it and think it's just a bit of landscaping. But the location and the angle and the vegetation have all been carefully thought about, to manage the flow, to give the river space to spread in a flood so it doesn't do more damage downstream. It's not obvious but it's very effective.

We spend a lot of time working on the succession of trees along the Hutt River. Willows do a great job holding the banks together and slowing the flood flows, but trees get swept away or the river changes course or the trees die, and we need to have smaller ones coming through to keep up the protection. And these days we're doing as much as we can with native plantings, using the willows as a pioneer or nursery plant. We now plant twice as many natives as willows.

All that takes time and effort and money. The Flood Operations team is gradually growing, because we know how effective the natural solutions can be, and there's a lot more work to be done given how frequently flood events are occurring. In some cases we're having to go flat out to get plantings established, because we know the next flood could be just around the corner.

So we do the quiet job, if you like, working on the river banks. People come up and ask us what we're up to, and some days we spend more time chatting to them about floods and rivers and ecology than all the rest of the council put together. But the team love the work, out in the outdoors, getting things done. Come and say hi if you see us working.



4

Analysis and prioritisation



Flooding in Mount Cook (2026)
Photo credit: Ray Peek

ABOUT THIS SECTION OF THE DOCUMENT

This section sets out the analysis methodology for prioritising flood risk resilience.



Aftermath of Auckland flooding (2023)
Photo credit: Brett Phibbs/NZ Herald

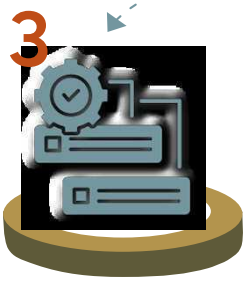
High-level overview of the methodology of analysis and prioritisation of projects



Undertake **risk assessments using the national platform**, and existing regional and national flood models to understand the impact of flood events on people, places and assets. The models allow us to explore a range of scenarios, based on both historic events and projected climate change-driven future events.

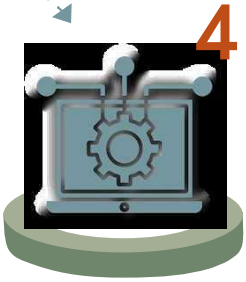
Impacts of modelled risks on people and businesses and infrastructure are assessed, and turns these into **dollar-equivalent valuations** informed by cost-benefit analysis (CBA) and social return on investment analysis (SROI) so we can understand where and how the costs of flood events are felt.





Flood infrastructure projects are prioritised using different sets of criteria based on different perspectives – impact and costs on people, infrastructure and assets.

Development of a national platform that records risks and mitigations for flooding to inform decision-making available to relevant parties – from Government, local authorities, businesses, communities, and individual property owners. This is discussed later in the section.



USING SOFTWARE TO ASSESS RISK

Te Uru Kahika is developing a national prioritisation platform to provide a national assessment of risk and impact.

The proposed national platform measures risk and quantifies it before disasters become losses.

Around the world, governments and major institutions are moving towards impact-based, consequence-driven modelling when it comes to climate-risk and flood-risk assessments. This is the evidence-based toolset Te Uru Kahika is developing to prioritise targeted investment decisions for this tranche of projects.

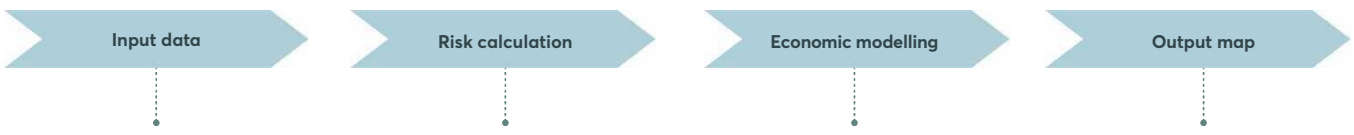
As described later in this section, the platform will provide a nationally consistent impact-based risk modelling tool to assess risk to people, buildings, and infrastructure from natural hazards such as flooding.

This approach has been piloted for tranche 3, and allows us to integrate flood hazard data with detailed information about buildings, businesses, farms, infrastructure, and community assets, so we can calculate the real economic, social, and environmental costs of flood events in a consistent and accurate way across the country.

What we're doing is innovative, but firmly grounded in evidence-based modern international best practice. This model moves beyond static flood maps to understanding who and what is affected, by how much, the economic and fiscal impacts, and the broader social costs. It enables us to quantify both the direct damage caused by floodwaters and the wider indirect impacts on the regional and national economy.

Using the national platform, we systematically identify the assets exposed to flooding, assess the damage they would sustain under defined scenarios, and translate those losses into economic and fiscal terms. This provides the evidence needed to compare options, prioritise projects, and demonstrate where mitigation

How the platform works



Input data into the platform includes, but is not limited to:

- Flooding scenario (with and without scheme changes
- Geographical areas
- Assets' type and value
- Population data

Where the modelling happens.

This is where input data are aligned and reshaped spatially.

Basically, this tells us what is damaged, how badly it's damaged, repair/replacement cost for each asset.

The output of the modelling is the impact map, which tells us the direct damage on the assets caused by the flood.

From here, we calculate direct physical asset damage to direct economic impact, and indirect economic impact.

This is fed back into the platform.

The platform outputs table, maps, and summaries that quantify and visualise:

- Asset-level impacts
- Total economic loss
- Indirect economic effects
- Fiscal exposure
- Scenario-by-scenario difference

These outputs are used to compare against areas with schemes located.

We are using the latest national and international research and evidence to assess the risks of flooding.

The first step is to understand how floodings affects communities.

Local and regional councils have made significant investment in Geographic Information Systems (GIS) and other systems that underpin the spatial understanding of the their territories and flood models that can assess the impact of future events. These systems and models provide the foundation for understanding the hazard, exposure, and vulnerability of people and assets to flooding.

Risk assessment integrates these elements to translate modelling outputs into an understanding of real-world consequences – identifying where impacts are likely to occur, who may be affected, and the potential scale of economic and social losses under different scenarios.

Flood risk is assessed by considering the interaction between three components, commonly expressed as:

Flood risk = Hazard x Exposure x Vulnerability

Identifies areas exposed to floodwaters and the likely magnitude of impacts under different scenarios by analysing the physical characteristics of flooding, including where flooding may occur, its severity, and how risks evolve over space and time.



Application of flood models to communities and businesses, and identifies the physical elements and stakeholder groups that will be affected.

Looks at hazard, exposure and stakeholder assessments and combines them with external economic and demographic data to understand physical, financial and social vulnerability to the flood event. This step translates the physical attributes of flooding into financial and non-financial impacts on communities and businesses.

Inputs

- Topography and terrain data
- Hydrological data
- Hydraulic modeling inputs
- Flood scenarios
- Land use / surface inputs
- Meteorological inputs

- Assets / Built environment
- Infrastructure datasets
- Land use and natural systems
- Stakeholder groups
- Asset valuation and cost data

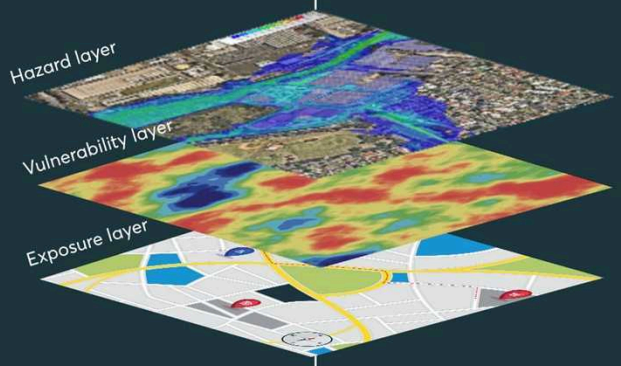
- Asset characteristics
- Depth-damage functions
- Population data
- Sociodemographic data
- Insurance data
- Critical service dependence

Assessment

Hazard assessment

Exposure assessment

Vulnerability assessment



Layers

Many different types of data will be integrated into a GIS and represented as a map layer.

This can include streets, parcels, zoning, buildings, roads, asset costs, people, land use, topography, flood models, etc.

By overlaying these datasets, the GIS allows the spatial relationships between flood hazards, exposed assets, and stakeholder groups to be analysed.

Assessment

Relative risk assessment allows for a comparative evaluation of risk across locations, populations, or assets, based on the combination of hazard, exposure, and vulnerability.

It doesn't usually produce absolute loss figures; instead, it identifies which areas or groups are at higher or lower risk relative to others.

Relative risk assessment



Risk map

Output

The output is a risk map – a spatial visualisation of flood risk showing how flood risk varies throughout the region.

It illustrates where and to what degree flooding could affect elements at risk, which allows us to estimate what could be damaged and / or lost to translate this to monetary terms and broader societal costs.

HAZARD

Hazard assessment is the starting point for understanding flood impacts, defining how flooding behaves across the landscape.

Significant modelling has already been completed by the most councils, meaning this analysis builds on established flood scenarios – including the New Zealand Flood Map being developed by Earth Sciences New Zealand that unifies best available local, regional, and national-scale flood risk data for the whole country. This maintains consistency nationally and with earlier work while allowing new scenarios to be incorporated as they emerge.

A key component of the hazard assessment is analysing the temporal and spatial evolution of flooding events. GIS enables spatial analysis by combining terrain data, hydrological and hydraulic data, and environmental datasets, amongst others, as inputs into mapped flood hazard layers.

In broad strokes, hazard inputs are answering three questions:

how much water?

flood depth, to show where flooding occurs in a geographic area

where can it go?

flood extent, to indicate severe potential damages and safety risks

how does it move?

flood duration, to determine how long an area remains inundated during and after a flood event

Inputs in the platform

- Topography and terrain data
- Hydrological data
- Hydraulic modeling data
- Flood scenarios
- Land use / surface data
- Meteorological data

Scenario modeling

Scenario 1: Banks up

Scenario 2: Banks down

These inputs allow flood behaviour to be modelled spatially and over time, producing hazard layers that describe the physical characteristics of flooding.

The resulting outputs establish the physical basis of flood risk and provide the evidence needed to assess exposure and vulnerability in subsequent stages of the analysis.



Sandbagging of the Strand in Parnell, Auckland (2026)
Photo credit: Dean Purcell/NZ Herald

EXPOS

While hazard assessment describes how flooding occurs, exposure assessment focuses on what is physically located within the flood footprint under each scenario.

Exposure assessment identifies 'elements at risk', or who and what's exposed to potential loss or damage when flooding occurs. These can be assets, systems, and people.

Physical assets can be categorised to dwellings, buildings, land, critical infrastructure, and natural systems. The relevant stakeholder – person, community, demographic, entity – associated with the asset is also identified.

Physical assets

Assets
- Contents
- Stock
- Vehicles
- Livestock, crops, equipment

Buildings
- Dwellings
- Marae
- Commercial / industria
- Community / social
- Agricultural
- Lifestyle / rural

The next step is to identify the people and stakeholder groups associated with these built environment elements spatially, so that their exposure to flood events can be assessed.

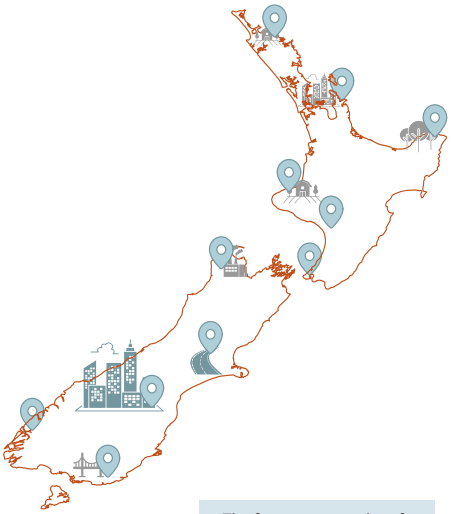
While the physical assets define what may be directly affected by flooding, understanding exposure also requires identifying who relies on, occupies, owns, or manages those assets.

These groups represent, for instance, those who may experience direct, indirect, or wider impacts from flooding.

Stakeholders may include residents, businesses, landowners, infrastructure operators, community organisations, and wider population.

These exposure outputs provide the foundation for the next stage: vulnerability assessment.

SURE



The first step is to identify the elements at risk of flooding within the built environment of across all the region – assets, buildings, infrastructure, and natural systems.

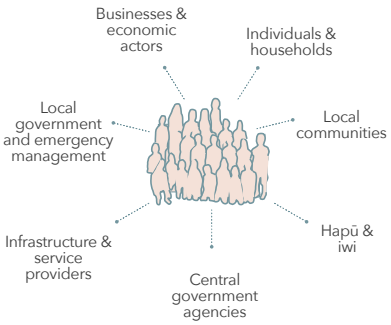
Critical infrastructure

- Rail lines
- Roads
- Telecommunication
- Three waters
- Transport
- Power

Natural systems

- Water systems
- Taonga sites
- Geological sites
- Landscape

Relevant stakeholders

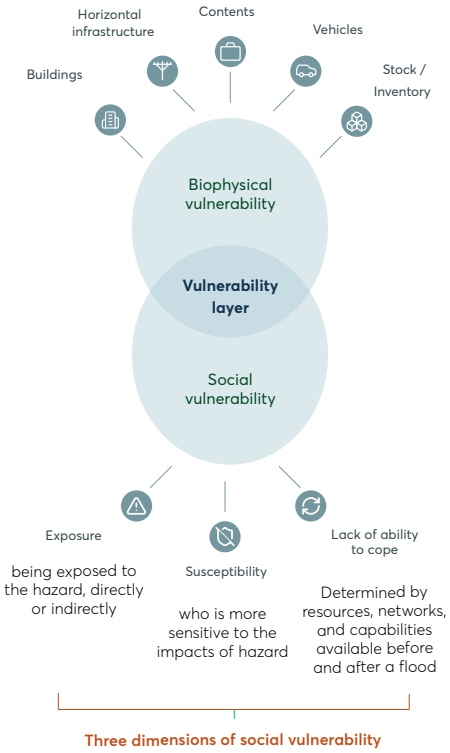


Inputs in the platform

- Assets / Built environment
- Infrastructure data
- Land use and natural systems
- Stakeholder groups
- Asset valuation and cost data

VULNERABILITY

Understanding vulnerability is crucial to assessing potential consequences of flooding – basically, it shows how badly those exposed will be damaged or affected. This analysis considers two components of vulnerability – physical vulnerability that leads to economic damage and social vulnerability that may lead to society's inability to cope and recover with flooding.



Biophysical vulnerability captures the physical dimension of risk – the measurable, tangible elements exposed to flooding such as built and natural environment and assets. It focuses on what can be physically affected and how severely.

This includes factors such as building materials and design, infrastructure resilience (roads, power, water systems), land elevation, drainage capacity, and proximity to coastlines or floodplains.

Traditional flood risk assessments typically only capture biophysical vulnerability. But flooding is not just a physical event, it is also social.

Social vulnerability captures the human dimension of risk – the degree to which people and communities may be vulnerable to adverse impacts of flooding and their capacity to respond and recover.

It focuses on social, economic, and cultural factors – such as health and wellbeing, socio-demographic characteristics and circumstances, and pre-existing conditions – that shape how impacts are felt and managed.



'Everything's gone': Aftermath of torrential rain in Wellington (2026)
Photo credit: Lawrence Smith/Stuff

Inputs in the platform

- Functions
- Population data
- Sociodemographic data
- Insurance data
- Critical service dependency

QUANTIFYING THE IMPACTS FROM THE RISK ASSESSMENT

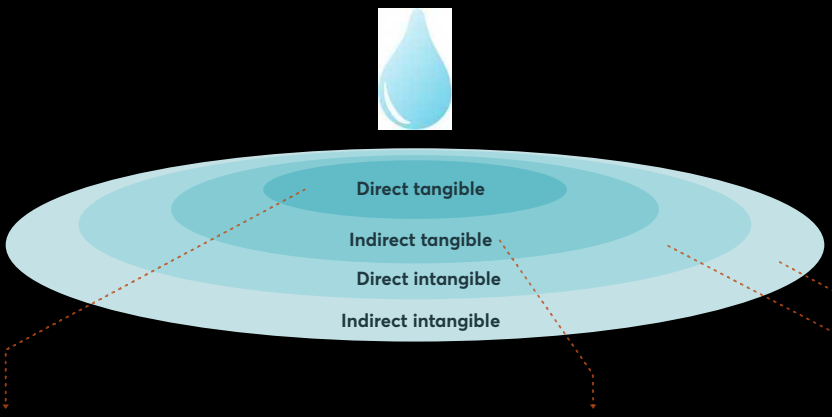
The output map illustrates what the potential consequences are to allow for damage estimation – therefore avoided costs of having flood resilience.

Put simply, the impact analysis identifies the potential damage and loss arising from flooding by describing the physical harm to assets and the wider disruptions experienced by communities and economic systems.

From assessing flood extent to mapping the impacts.

Having mapped where flooding may occur, the assessment now turns to understanding its potential impacts. Impact analysis takes the risk identified in the risk map and translates it into the consequences for elements at risk – people, communities, built environment, and assets – considering what could be damaged, lost, or disrupted physically, economically, culturally, or socially.

This provide the foundation for assessing how costs are avoided because flooding is reduced. The benefits of flood risk reduction are primarily realised through the avoided costs of flood damage that would occur in the absence of mitigation, as well as any enhanced value for production or consumption achieved by lowering the risk of flooding. In essence, flood mitigation provides economic benefits by reducing both the frequency and severity of flood events, thereby protecting assets and livelihoods.



Direct tangible impact refers to the physical damage caused by floodwaters to assets and the built environment.

This includes damage to homes, buildings, roads, bridges, utilities, and other infrastructure, as well as impacts to land such as agricultural areas or natural systems.

Direct impacts are typically the most visible and immediate consequences of flooding and can often be estimated using information on asset type, location, and value within affected areas.

Indirect tangible impacts arise from the disruption that flooding causes to economic and social activity.

Even where assets are not directly damaged, flooding can interrupt transport networks, close businesses, disrupt supply chains, and limit access to essential services.

These impacts can extend beyond the flooded area itself, affecting workers, businesses, and communities that rely on the affected systems.

Direct and indirect intangible impacts capture the broader social, cultural, and environmental consequences of flooding that are more difficult to measure in monetary terms.

These may include impacts on community wellbeing, displacement of households, disruption to cultural sites and practices, and effects on natural ecosystems.

While harder to quantify, these impacts are an important part of understanding the full consequences of flooding for communities across the region.

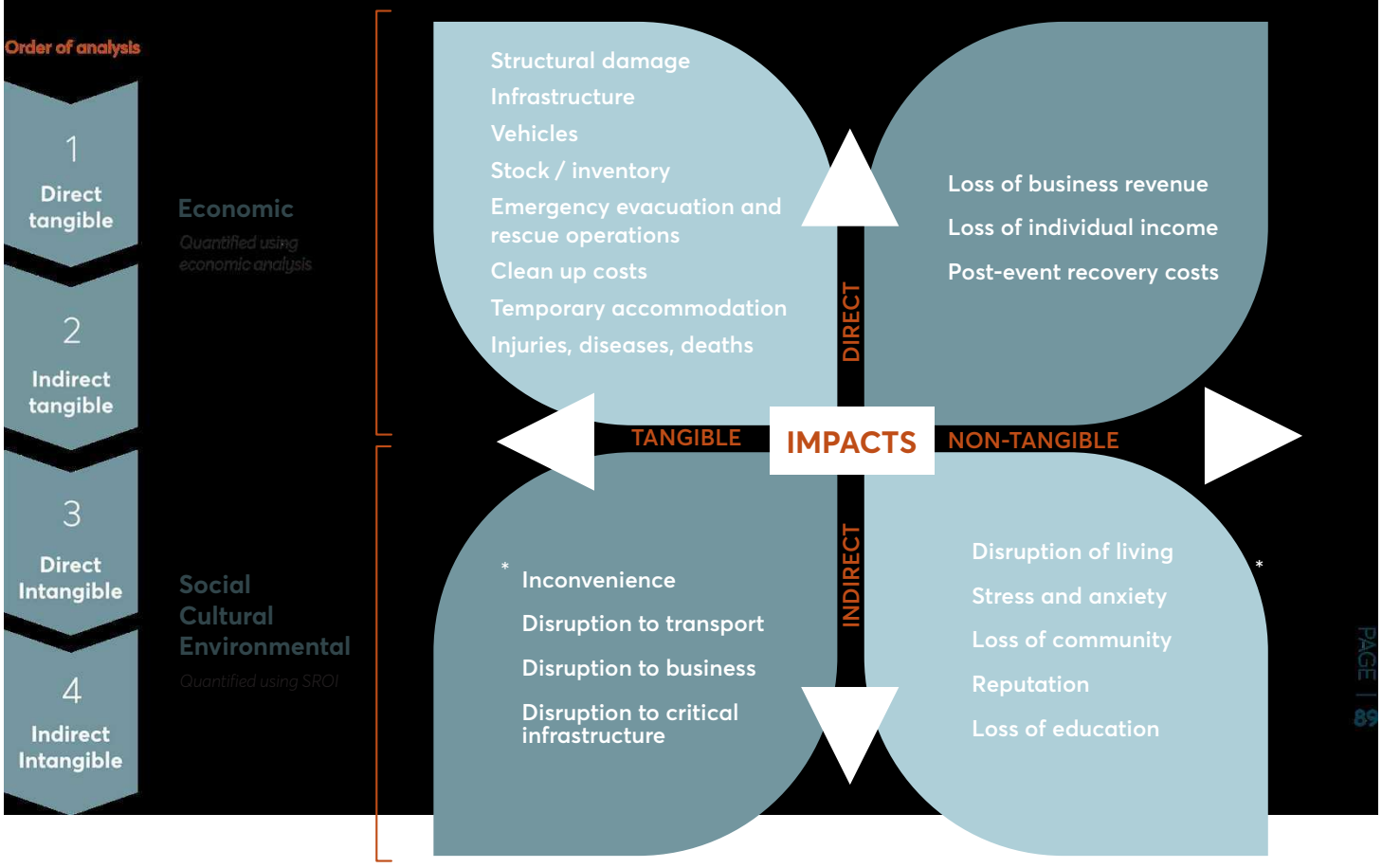
DIFFERENT TYPES OF IMPACTS IN FLOODING SCENARIOS

Understanding the damage and loss as a consequence of flooding allows for estimation of avoided costs from having flood resilience infrastructure.

We are avoiding costs when we protect landowners from flooding.

Impact analysis often estimates both damage and loss to understand the full consequences of flooding. Damage captures the direct physical impacts, while losses capture ongoing disruptions and economic effects that result from those damages – this way, both immediate and longer-term impacts of flood events are accounted for.

The table below, adapted from NZIER, outlines what is in scope for this analysis – note that this list may be subject to change as the analysis progresses.



**These impacts are preliminary and are typically finalised within the SROI following engagement with affected stakeholders.*

Putting dollar values on these different types of impacts require different methodologies. The following pages will entail detailed approach for each category of damage.

QUANTIFYING DIRECT TANGIBLE DAMAGES

Direct tangible damages are physical, quantifiable losses of assets and built environment caused by direct contact to flooding.



Consolidated data in RiskScape (such as Ratings database, Census data, LINZ, etc.) will show information as seen on the table.

Parcel information
Address
Category *(e.g., Commercial, Dairying, Residential)*
Subcategory *(e.g., Commercial-retail)*
Capital value
Land value
Improvement value
Land cover type
Building age, construction type

This classification underpins the allocation of asset profiles to each property to allow for differentiated estimation of asset holdings based on sector-specific occupancy, economic activity, and land use

Estimation of assets



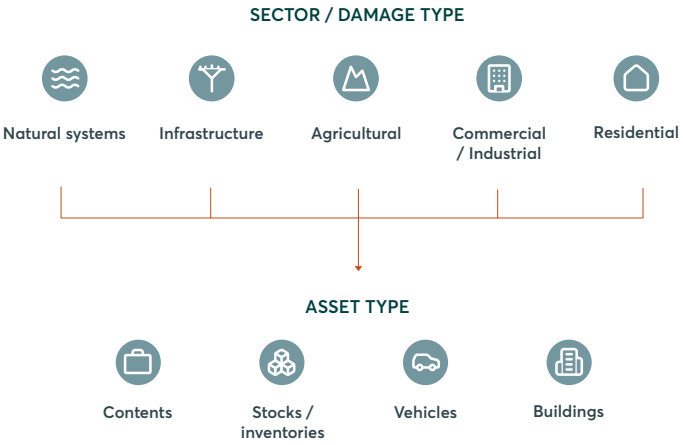
The sector / category type allows allocation of assets profiles typically associated to that sector. The values of those assets are then estimated using other datasets – like national accounts, Council data – along with parcel information.

This way, different estimation of asset holdings are based on sector-specific occupancy, economic activity, and land use.

Asset exposure is spatially aligned with the built environment to estimate direct, tangible losses beyond buildings using real data.

Direct tangible damages to buildings refer to the physical damage to structural and non-structural components, resulting in repair or replacement costs to its pre-event condition. As the severity of damage increases, repair costs rise accordingly.

The first step to assessing the benefits of flood resilience infrastructure is to identify what is directly impacted by a flooding event – as this determines the direct costs. Damages are grouped into broad sectors or 'damage types'. For this analysis, the broad sectors and asset types are:



These categories are grouped as such as they experience flood differently, as well as it helps to organise large numbers of affected assets into manageable groups. These groups are further broken down into subcategories, for instance infrastructure such as roads can be split further to motorway, highway, urban, rural, etc.

Using GIS flood modelling, tangible assets exposed to flooding are mapped and the likely level of damage estimated. This spatial analysis helps identify where physical damage would occur and provides the basis for estimating the economic value of those losses. Because these assets can be valued in monetary terms, the costs associated with repairing or replacing them can be estimated using existing market values or replacement cost estimates.

To assess direct damages, the value of exposed assets is combined with estimates of the proportion of damage likely to occur at different flood depths. Flood models provide information on the expected water depth and extent during a flood event. The resulting estimate represents the direct economic loss caused by flooding, expressed as the cost required to repair or restore the damaged asset.

DIRECT COSTS BEYOND PHYSICAL ASSETS

Damages on physical assets and people are linked to other direct economic losses such as temporary accommodation costs, loss of business revenue and individual income. In addition to direct physical damages to assets, flooding also generates a range of direct response and recovery costs incurred by households, businesses, councils, and government.



Clean-up costs

represent the expenses associated with post-event debris removal, sediment clearance, waste disposal, and the cleaning and sanitisation of affected properties and public spaces.

These costs are estimated based on unit rates for clean-up activities (e.g. per property or per square metre), informed by Council operational data, contractor rates, and evidence from past flood events.

Where available, historical data on clean-up efforts – such as volumes of waste collected, number of properties serviced, and resource requirements – are used to establish relationships between flood extent and clean-up costs. These relationships are then applied to estimate clean-up costs under future flood scenarios.



Emergency response costs

during the event are associated with the different types of emergency response activities triggered by flooding events using existing councils financial and operational data. Historical flood events (i.e., flood depth, rainfall intensity, duration, properties affected, damages) will be analysed to identify the response actions undertaken – such as staffing deployments, equipment use, contractor engagement, and emergency coordination – and the costs associated with each response type.

These costs are then linked to measurable flood characteristics, including extent, duration, and level of impact. The resulting relationships enable emergency response activities and associated costs to be inferred for future flood scenario models.

Damages to the physical assets and people are linked to other direct economic losses



Temporary accommodation costs

for residential properties are the costs to move to a temporary accommodation. Temporary accommodation costs are estimated using publicly available market rental values for equivalent dwellings, based on bedroom size and location, as a proxy.



Health costs

represent the direct medical expenses arising from physical injuries and health conditions attributable to flooding events. These include costs associated with visits to general practitioners, physiotherapy services, and hospital treatment.

Where possible, costs are estimated using standard healthcare unit costs (e.g. per consultation or hospital admission) and scaled based on the number of affected individuals, informed by evidence from past flood events and relevant public health data.

QUANTIFYING INDIRECT TANGIBLE LOSSES

Wider economic losses are estimated using a bottom-up disruption-based modelling approach following physical damage.



The length of disruption is time required to repair and re-instate the building to a usable condition based on the building type and age; hence, the length of disruption is assumed to be directly proportional to the extent of physical damage to the building.

The economic effects extend beyond the affected properties.

Beyond the immediate costs of repair, physical damage also results in loss of functionality which gives rise to indirect tangible damages in the form of disruption. Disruption is the loss of normal use or function of an asset due to damage.

Indirect tangible impacts are then captured through a bottom-up disruption-based modelling approach that quantifies the economic consequences of lost functionality following physical damage. Rather than relying solely on aggregate economic multipliers, this approach explicitly models how disruptions to individual assets and activities translate into measurable economic losses over time.

As buildings become inhabitable or unusable, this translates into measurable economic impacts for occupants, including:



Loss of business revenue

Due to operational downtime, reduced access or supply chain disruption. Refers to the decline in income generated by businesses due to operational disruption due to inability to operate from the damaged site, reduced customer access, or supply chain disruption.

Loss of individual income / labour disruption

Due to interruption of employment activities. Refers to the reduction or loss of personal earnings due to disruption of normal work due to missing shifts, reduced hours, or losing clients during building repairment. This varies by industry type as an office worker may be able to work from home, therefore a high recapture, whereas restaurant worker will have a lower recapture as they cannot recover missed shifts.





Post-recovery costs

Pertains to activities following event occurrence undertaken by councils and central Government following flooding events. These include costs associated with restoration of public infrastructure and support services, for instance, provided to affected communities.

Economic losses are estimated using regional economic, land use, and employment data to assess how disruption impacts businesses, industries, and regional productivity over time. These impacts are analysed not only at the site or sector level, but across the wider economy through input–output modelling, which captures how disruption flows through supply chains, employment, household spending, and interconnected industries.

It is recognised that not all losses represent permanent reductions in economic activity. Some impacts may be partially offset over time through recovery, delayed production, or substitution effects. Accordingly, the estimates presented reflect gross disruption-based losses, with recovery dynamics incorporated where appropriate.

Input–output modelling assumes fixed production relationships and does not account for capacity constraints, price changes, or adaptive behaviour. As a result, it is most appropriate for smaller-scale disruptions and may overestimate impacts in large-scale events.

THE IMPACT ON PEOPLE AND COMMUNITIES

Wider social impacts of flooding are quantified in monetary terms using SROI-informed social valuation methodology, based on literature and pending future community fieldwork by some of the councils.

This analysis adopts an SROI-informed social valuation methodology that feeds into an Annual Average Loss (AAL) framework.

The effects of flooding on people, communities, and business owners can significantly outweigh the impacts on buildings and properties, and putting a dollar figure on these impacts is significantly more difficult.

Non-market impacts are monetised using an SROI-informed valuation framework, drawing on Aotearoa New Zealand and international methodologies and publicly available data from Statistics New Zealand and other authoritative sources, and integrated into an Annual Average Loss (AAL) flood risk modelling approach.

AAL modelling is a risk-based approach used to estimate the expected annual value of flood-related losses by combining the probability of flood events with their associated consequences over time. AAL is used to integrate direct and indirect tangible losses with monetised social, cultural, environmental, and economic impacts derived from an SROI-informed valuation framework.

These combined loss estimates are modelled under two scenarios: a "banks down" scenario representing conditions without flood resilience infrastructure, and a "banks up" scenario representing conditions with flood resilience infrastructure in place. For each scenario, losses are estimated across a range of flood magnitudes and weighted by their probability of occurrence to produce an annualised expected loss value.

The difference between the two scenarios represents the avoided annual losses attributable to flood resilience infrastructure, capturing the reduction in total expected flood impacts across all consequence types, including both market and non-market effects.

SROI-informed methodology

Identify stakeholders

Identify stakeholders through parcels affected by flooding in GIS risk model. Validate list with Council and other relevant groups

Map outcomes

Construct an impact map that sets out how flood exposure leads to a range of social outcomes

Evidence outcomes and assign value

Collect and analyse data through surveys, interviews, and secondary sources to validate identified outcomes to quantify scale and assign appropriate financial proxies

Establish impact

Adjust results to reflect additionality where relevant including deadweight, attribution, and drop-off

Incorporate findings into AAL model

Generated monetary values are incorporated into the AAL model to estimate the expected annual losses with and without infrastructure, and avoided losses attributable to infrastructure



'Lost everything' : Auckland family's red sticker nightmare after swimming to escape, no insurance
Photo credit: Givealittle

PERSPECTIVES:
SEATS AT THE TABLE

I'm Jon Roygard, I'm Group Manager Catchment Operations for Horizons Regional Council, and I've been working in catchment and environment management in the Council for around 25 years.

Horizons stretches from Whanganui down to the Horowhenua and all the way across to the East Coast. We have three major catchments plus a sizeable number of smaller ones, and about $1.24 billion invested in more than 3,800 flood resilience assets. So we have a really big area of the country that we're responsible for, but there are only about 110,000 ratepayers in the whole Horizons region.

In the photo I'm standing on the Botanical Road bridge over the Mangaone stream in Palmerston North, which is part of the Manawatū catchment. The river extends all the way from the Manawatū Gorge out to Foxton Beach on the coast, and it passes through everything from steep rocky gorges to heavily built-up urban areas to really valuable farmland.

One of the most challenging areas is Palmerston North where we have 90,000 people, so we need high-quality infrastructure to keep everyone safe. The stop banks on this stream are engineered to 1-in-500 year standard, and we've used a lot of engineering to do that – concrete and steel sheet piles and rock walls, and carefully designed structures. And you can see why when you stand on the stop banks, because you're looking at the roofs of houses and businesses right up against them. There's not much room to move, and not much room for error.

To make this happen we have to work very closely with the Palmerston North City Council, NZTA, Kiwirail, the power companies, landowners, business owners … we all have a stake in flood resilience, and we all need a seat at the table. So we collectively work on challenges together, like the growth of the city and how we accommodate that. For instance, what was previously farmland with perhaps 1-in-50 year protection gets converted to a business park or a new subdivision, so we need to look at what level of service is needed for that new use.

That's our big challenge. We have a growing and expanding city, so we have to pay a lot of attention to spatial planning and what it means when it comes to flood resilience. Adding more hard surfaces always adds more stormwater to the river systems, so good urban design has its part to play too. It's a complex system and it takes a lot of work and a lot of thought and a lot of discussion to make sure it functions the way the community expects.

Funding is our big issue. We may have more than 2 million hectares in our region, but there just aren't that many people here compared to the big cities. So the co-investment from the government has been a huge factor for us, and has allowed us to start catching up on infrastructure the community can't afford on its own.

And it's worked – we were able to upgrade the flood control gates at Moutoa thanks to the Tranche 2 funding, and we replaced and improved the old 1960s-era components. In the storms earlier this year, the upgraded gates worked exactly as designed and kept water out of the farms and towns and people's houses, so that was a pretty huge thing.

Working together makes all the difference, and getting the long-term funding partnership in place with the government will have a massive impact for the future of this region.



Jon Roygard | Group Manager Catchment Operations
Horizons Regional Council

Photo credit: Tim D

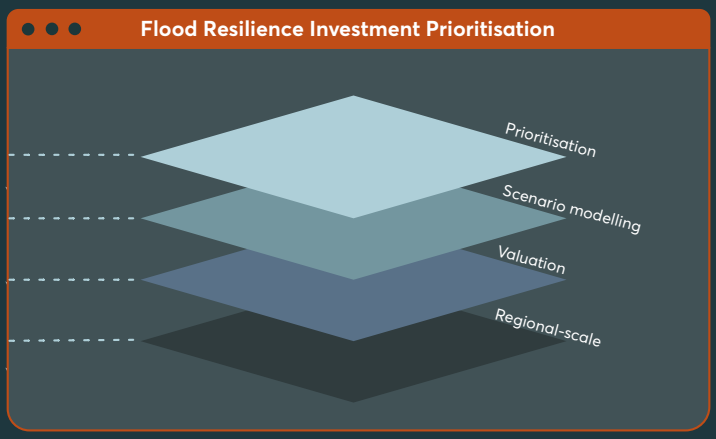
HOW THE NATIONAL PLATFORM WORKS

Prioritisation modelling

Provides a transparent and consistent framework for assessing investment options at both regional and national levels. Agreed prioritisation lenses are utilised by decision makers to understand the trade-offs between competing investments and direct funding towards projects that deliver the greatest overall benefit.

Scenario modelling

Enable councils and decision-makers to test different flood resilience approaches and assess their likely impacts. This includes evaluating combinations of protection, accommodation, retreat and avoidance measures to understand how different interventions affect flood risk, resilience outcomes and investment requirements.



Valuation layers

Identify where flood impacts occur and quantify the value at risk by bringing together information on communities, infrastructure, economic assets, cultural values and environmental outcomes to allow decision makers to better understand the potential costs and benefits of different investment options.

Regional flood modelling

Regional flood models provide a consistent national picture of flood hazards across catchments. They show the extent, depth and frequency of flooding under current and future conditions. Input data, updated as necessary, include, but not limited to:

- Topography and terrain data
- Hydrological and hydraulic inputs
- Land surface
- Flood infrastructure assets

End users

National agencies

Local and regional councils

Communities and other stakeholders

Business owners and investors

Insurance sector

THE PLATFORM IS A NATIONAL PORTAL FOR THE SECTOR

FRIPP will provide a common toolset and approach accessible to councils and national decision makers alike.

A single platform for better investment decisions.

One of the key objectives of the FRIPP is to enable decision makers at all levels – community, regionally, nationally – to assess options and set priorities for the decades ahead.

FRIPP will be designed to connect with existing flood models and other authoritative spatial datasets held across regional councils, central government agencies, and infrastructure providers. Ongoing engagement with data custodians will be prioritised to ensure datasets remain consistent, accurate, and up to date, while promoting greater alignment and interoperability across organisations. Where possible and useful, links will be maintained to external systems within regional councils and nationally – so important data about everything from regional land use maps to employment data is kept up to date automatically. This will reduce duplication, improve data quality, and provide the sector with a shared, trusted evidence base for flood risk management and investment prioritisation.

As a national platform, it will support a wide range of users – from regional councils, central government agencies, and emergency management organisations through to infrastructure providers, consultants, researchers, iwi and hapū, and local communities.

The platform is more than a flood resilience initiative for the sector; it is a national capability that supports wider government priorities and objectives.

National Infrastructure Plan (2026)

Improve access to high-quality natural hazard data so councils and communities can make more effective, affordable decisions and better manage insurance pressures. This will also support greater coordination to manage flood risk hazards.

Natural Hazard Commission Risk Reduction Strategy (2025-2029)

Translate and share hazard risk data and information to reduce current and prevent future risk.

Encourage Aotearoa New Zealand's approach to risk reduction to be innovative and world class.

National Adaptation Plan (2022-2028)

Enabling better risk-informed decisions by providing access to the latest climate projection data,

Driving climate-resilient development in the right places

Laying foundations for a range of adaptation options including managed retreat

CASE STUDY:
OUR PLAINS OUR FUTURE

The FRIPP approach is being prototyped within the Our Plains Our Future project within the Waikato.

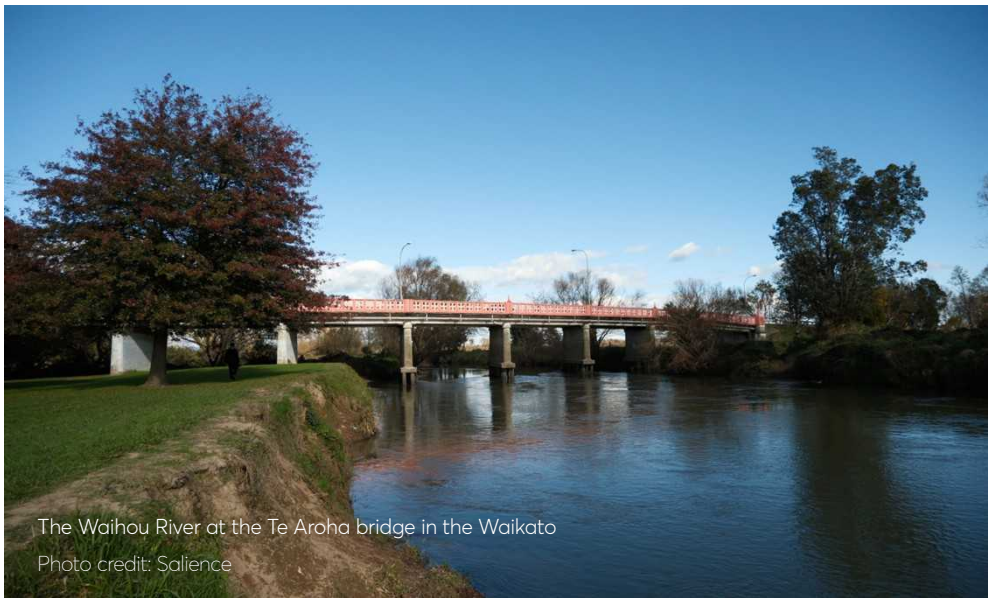
Hauraki District Council and Waikato Regional Council are working with the communities on the Hauraki Plains to develop a plan for the future in the Our Plains Our Future (OPOF) project. OPOF is using a dynamic adaptive pathways planning process in partnership with the community to address natural hazard risk, particularly focusing on flood risk.

In order for the risks of flooding to be understood and the options explored, the OPOF project has developed a sophisticated model within the Resilience Explorer® GIS platform, which provides insights that can be navigated geospatially in an online portal. This approach is strongly aligned with the FRIPP approach, and the OPOF project has successfully demonstrated the value of flood modelling and adaptation planning for regional decision makers and community members alike.

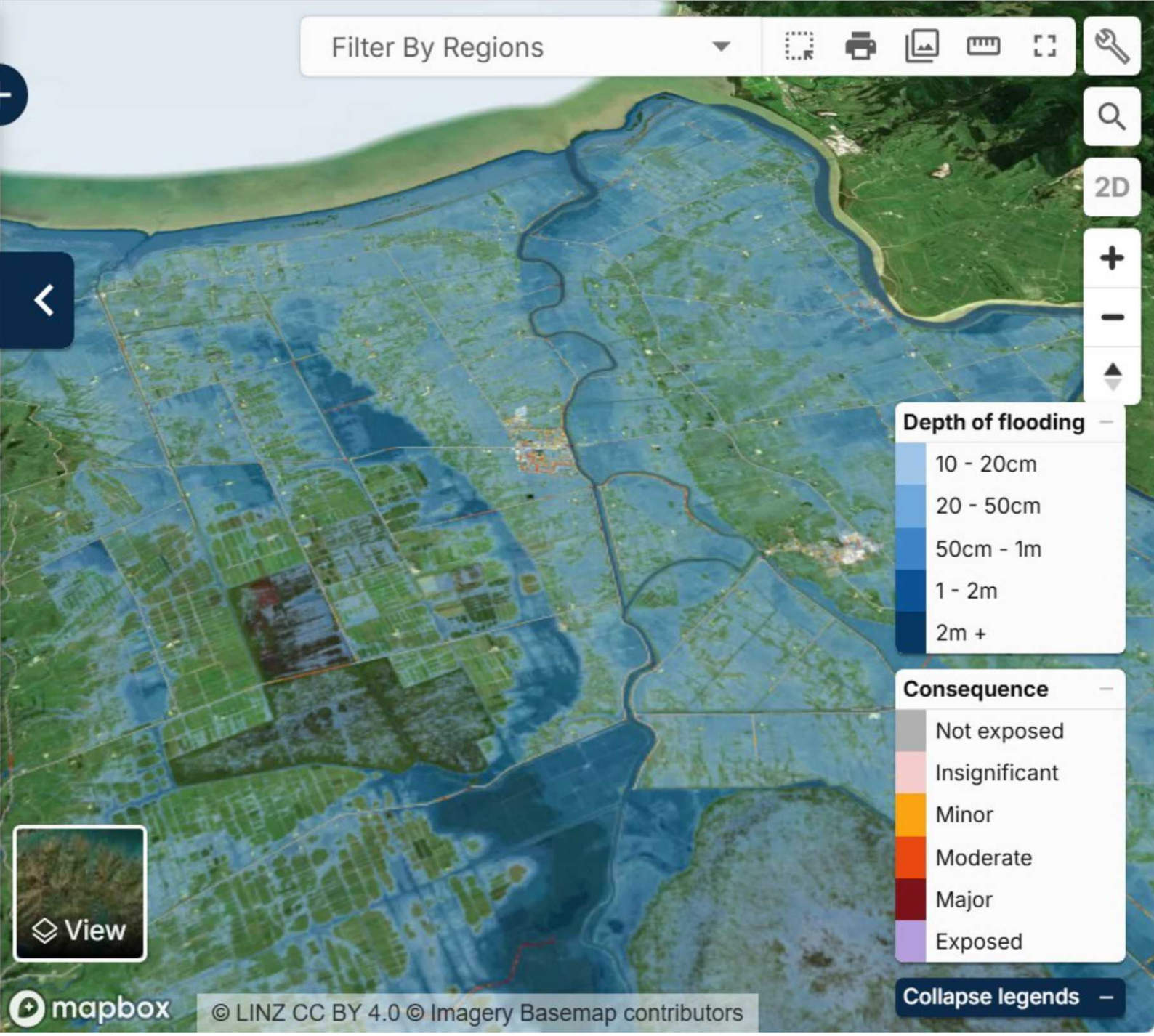
Additional work is planned in coming months, aimed at adding valuations and cost-benefit assessment to OPOF's Resilience Explorer® platform. This will enrich the information available to councils and the community and enable more sophisticated options assessment when it comes to developing the adaptation pathways for the Hauraki Plains.

While the software components may not be the same as the FRIPP platform, the technical requirements being developed in the Waikato are directly applicable, and the OPOF project is serving as a very successful test-bed for the approaches that can be scaled up nationally.

The screenshot on the following page shows an example of an output from OPOF's Resilience Explorer® platform. It shows the expected damage to roads in Ngātea from a large flood event scenario, allowing councils and the community to understand the risks and impacts of these events. This is a subset of the functionality that the FRIPP platform will deliver.



The Waihou River at the Te Aroha bridge in the Waikato
Photo credit: Salience



Roads

Flood Event: 1% AEP rainfall, 5% AEP storm tide

Approximately **3.01** of **12 km** of roads are threatened under this scenario.

Damage State

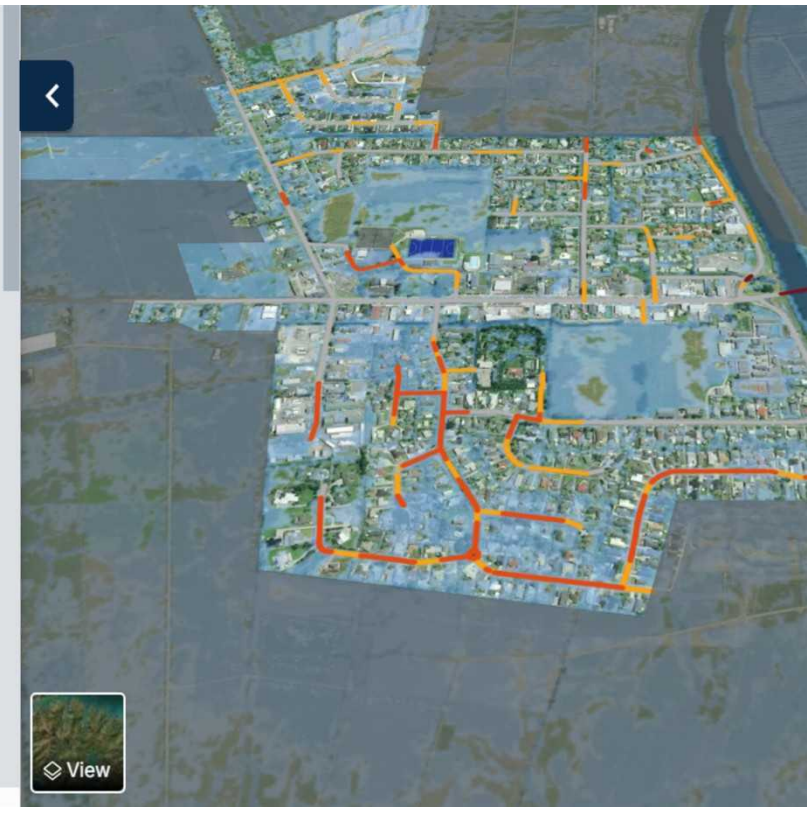


Percent Exposed



Exposure Distribution





PERSPECTIVES:
WHY WE DO THIS



I'm Leigh Griffiths, and in my day job I'm General Manager of Hazards at Environment Canterbury. At the same time I'm also the national convener of the River Managers SIG for Te Uru Kahika.

One way or another I spend a lot of time thinking about and working on how we make our communities safer in what's becoming a pretty challenging environment, both in Canterbury and nationally. Most days that means talking about infrastructure, data modelling, funding, and all the other complexities of natural hazards – of which flooding is the one most New Zealanders are vulnerable to.

Like the other river managers across the country, I also have a role to play in our civil defence function – it's one of my major areas of responsibility at ECan. And sometimes, like in the big floods of 2021, that means calls in the middle of the night and very long hours as we try and predict where flooding is going to happen and how we try and keep people safe.

Working in flood resilience it's easy to focus on the rivers and the infrastructure, but I don't think we can underestimate the sociological and psychological impacts that flooding has on communities. I've certainly talked to plenty of people on the phone that are awake during the night or out in their paddocks, watching the water come, worrying about how high it's going to get and realising the roads are impassable or the bridge is flooded, and they're home alone.

Flooding isn't just about cleaning mud off the roads and maybe patching up houses. It really does have an impact on people's well-being and their emotional states, for whole communities. The biggest and hardest part of the job for river managers up and down the country is the unseen stuff; it's the way people feel when the big rains come because they remember back to the last big flood and their vulnerability to something they couldn't predict or control.

So when we stand in community meetings and talk about affordability or levels of service, there's always the deep currents in the room: the worry that people can lose their homes or their livelihoods, or they won't be able to get their kids or their grandparents to safety if the water rises too fast or there's not enough warning.

I've walked through silt-covered paddocks, homes and businesses, and what always sticks with me isn't the damage; it's the looks on the faces of the people. Kiwis are pretty stoic in disasters and we rally together when things are tough, but there's no denying the stress and anguish is real.

That's what keeps me awake at night in a big storm – sure, I'm thinking about how the flood schemes will perform. But mostly, I'm hoping we've done enough and that all the people in the communities across the plains, the big ones and the small ones, from the mountains to the sea, that everyone stays safe. That's the real reason we do what we do.



Leigh Griffiths | General Manager Hazards
Environment Canterbury

Photo credit: Tim D



5 The next steps



The Waimakariri River, Canterbury
Photo credit: Tim D

THE TIME IS RIGHT FOR A NATIONAL PIPELINE

We need to meet the challenges of our times by providing certainty to communities and businesses.

A visit to the Tairāwhiti region is like taking a trip to the future of New Zealand. This is where the impacts of climate change and land use change and demographics are written across the landscape for all to see.

Weather events that would have resulted in states of emergency a couple of decades ago are now treated like business as usual. As the saying goes, the future is already here – it's just not widely distributed yet.

So the issues Tairāwhiti experiences today are the ones that will affect every community and every council in the country in the decades ahead, whether or not we're ready. Which is why Te Uru Kahika has prepared this business case – to provide a pathway forward, collectively, in a way that makes good economic sense.

As the experience of Tairāwhiti shows, our investments need long-term consistency in order to provide certainty for communities and businesses. To do that, we need an investment approach that endures for decades.

So the next step is to agree with the Crown that long-term co-investment in flood risk resilience is not only the right thing to, it's the cost-effective and pragmatic thing to do. We are therefore seeking a Crown commitment of $240 million per annum over the next decade, alongside the matching $160 million per annum from regional and unitary councils.

Our request is to work with Ministers and officials to determine how to make this long-term co-investment commitment work: the prioritisation approach, funding criteria, responsible agencies, legislative support if necessary, and other key matters.

So Te Uru Kahika welcomes the opportunity to build on our co-investment successes to date, and to talk further about the shape and mechanisms for the decades ahead.



Chair, Greater Wellington Regional Council



Chair, Canterbury Regional Council

On behalf of chairs and mayors of Regional and Unitary Councils of New Zealand



Silt sits across farmland in Tairāwhiti following Cyclone Gabrielle (2023)

Photo credit: Gisborne District Council

THANKS AND CREDITS

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Special thanks to

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