Kawatiri – Deep and Swift

Proposal to Hon Nanaia Mahuta, Minister of Local Government

Co-Investment in Westport's Resilience

BULLER DISTRICT COUNCIL
Te Kaunihera O Kawatiri

THE WEST COAST REGIONAL COUNCIL

NGĀTI WAEWAE ARAHURA
TE RŪNANGA O NGĀTI WAEWAE

30 June 2022

Photo courtesy of Westport.nz

Foreword

Tēnā koe Hon Minister Mahuta. Greetings from the West Coast.

We welcome this opportunity to submit this proposal to you and the Government.

We are very grateful to you for the invitation to develop a case for co-investment. We have been thrilled with the level of the Government's financial, moral, and political support following the July 2021 flood event. We want to formally thank you, on the record, for that.

As we have developed this proposal, we note the event has adversely impacted the economic and social wellbeing of the community. While there has been tremendous scientific, engineering, and economic analysis undertaken in support of this proposal, there are still psycho-social impacts on our community.

As you will see, we have put the people of Westport at the heart of our thinking. The analysis shows that livelihoods and possibly lives are at stake, and we really need your assistance.

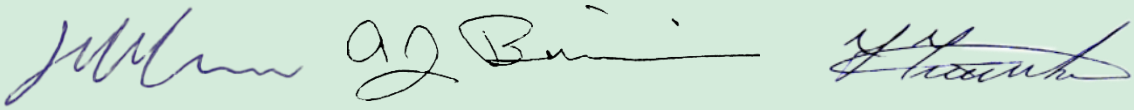
We believe we can also help you. We know there are similar challenges to those being experienced in Westport across the motu, and we are willing to be the blueprint community that tries some new ways of doing things, recognising that this is an opportunity for us both.

One thing is abundantly clear – neither Local nor Central Government can act alone here. We need to be collaborative from now on, or the issues will never be resolved. We have worked hard to deepen the relationship between the West Coast Regional Council and the Buller District Council, and we are keen to do the same with the Government.

We have also found that Westport has catalysed some strategic thinking with MBIE, Kāinga Ora, Kānoa, NEMA and DIA. More operationally, Waka Kotahi has been engaged and engaging, and KiwiRail has been at the table. In general, we have found that agencies and Crown Research Institutes are collaborating extensively to deal with climate adaptation.

We are realistic about the challenges that lie ahead, but we think that this proposal meets those challenges head on and is one that others might emulate. We hope that you think so too. This is not a *hand out* but rather a *hand up* as we address the future together.

Nāku noa, nā



Jamie Cleine
Mayor
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Chair
Te Rūnanga Ngāti Waewae

30 June 2022

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Executive Summary

When it boils down to it, there are two simple questions that remain unanswered when it comes to flooding and climate related change:

- Who's going to pay?
- Who gets to decide?

We have an abundance of reports and guidelines from scientists, engineers, academics, and policy advisors that provide input, but still these questions remain unanswered. Everyone seems to have an opinion on what needs to be done, but until now it has been very difficult to navigate actually getting these things done.

Westport is not well-heeled. To use Government language, we are one of the most deprived communities in Aotearoa. We are the oldest population and have one of the lowest rates of disposable incomes in New Zealand. But we're here to stay – we're an established community with a rich history.

There are 4,600 people in Westport, and we need a hand. We realise that we are not the only ones faced with a similar prospect. We also realise that the cost of doing nothing is vastly more expensive than acting. The cost of last year's flood alone was double the total identified in this proposal.

So we welcomed Minister Mahuta's invitation for a co-investment proposal. This is potentially a circuit breaker, answering the two questions above and becoming a case study for others to emulate. Local Government cannot deal with this challenge on its own. Climate related flooding challenges our existing governance arrangements, funding mechanisms and statutory framework. It will therefore require close collaboration between Local Government, Central Government and Mana Whenua.

We are clear that the Westport community is at the centre of this process. Adaptation is not about flood protection structures and managed retreat – it is about people, families, their aspirations, and their legacy.

It is also about change. In developing this proposal, it became obvious to us that Westport cannot remain unchanged forever. Eventually the water will win – it is impossible to completely eliminate the risk of flooding in Westport. Equally, we realise we do not need to make all the decisions today. We can do some sensible things immediately and make sure the decisions we take today do not prevent future decision makers from making their own sensible decisions when the time comes.

What we are seeking

Ultimately, we think that over time as Westport grows, this growth needs to occur in low hazard areas. This could occur over the next 50 years. Land could be purchased today to enable future decision makers to be able to speed up or slow down decisions, depending on which climate scenario eventuates.

In the meantime, there is still considerable flood risk for the citizens of Westport. We are proposing some modest work to armour the riverbanks of the Buller River, and to construct some embankments and walls that will reduce (but not eliminate) flood risk. This will buy us time. We also think it makes sense not to put more people in harm's way. We intend to put in place a regulatory framework that restricts development in flood zones – but we need your help here.

We are proposing a four-pronged PARA approach (Figure 1), with each component enabling practical steps. These components are not alternatives. They are an interdependent strategic package of initiatives.

They do not all need to occur immediately. Many of these initiatives have already been canvassed with the people of Westport via the Westport 2100[1] and other work.

Figure 1: PARA Model - Westport's Resilience

Our cost profile is outlined in Table 1. But we do not see this as simply a cost. It might seem expensive, but it is vastly less expensive than doing nothing. Our analysis shows that this investment is likely to avoid $400m of damage to Westport buildings alone. That does not account for economic losses, the human cost or the damage to our national reputation if we do nothing.

We have commissioned Infometrics to undertake economic analysis. It states:

> ... *the analysis in this report, …clearly shows that (the) stopbank option recommended by the Technical Advisory Group…is highly cost effective… the case for pursuing (this option) …could not be clearer.*

We see this as an investment in one of New Zealand's most longstanding communities, and we feel there could be massive co-benefits. Through relocation of growth, we could achieve positive housing outcomes by establishing more intensive, low energy homes that are connected to active transport, shops, parks, and resilient infrastructure. We think that this investment will pay back substantially when AF8 eventuates, resulting in less trauma, social and economic loss for all of us. And our planners are already thinking that embankments might double as cycleways – properly designed, they can also enhance inanga breeding areas and help to secure an old landfill along the estuary.

We acknowledge this proposal will test the existing funding and regulatory frameworks, and it will antagonise some in the community who do not wish to change. However, it is also an opportunity to showcase how small townships might address the climate challenge. The leaders of Westport are prepared to be bold and pragmatic in presenting this proposal, and we are looking forward to you joining us on our journey.

[1] The Westport 2100 Working Group was formed late in 2018. Its recommendations were forwarded to WCRC and BDC in September 2019. The purpose of the Group was to make recommendations about how best to enhance the resilience of the Westport community against the effects of fluvial flooding, coastal inundation, sea level rise, severe weather events, earthquake risk and the threats posed by Tsunami. The Group also discussed the Orowaiti overflow, gravel build-up, telemetry and warning systems, planning, and zoning and the robustness of critical infrastructure and transport routes.

Table 1 Cost Profile

The Ask			
Initiative	**Total Cost**	**Our Ask of Government**	**Comments**
Protect			
Westport ring-bank (Option B), plus Carters Beach	$19,550,000	$14,662,500	Year 1 (FY22/23) – planning and design Year 2-4 construction (75/25% split)
Organs Island reafforestation	$1,500,000	$1,125,000	Years 2-17 – 3 x 5-year tranches
Immediate works on the Buller riverbank	$3,300,000	$3,300,000	Years 0-2
Operational expenditure Buller riverbank	$3,000,000	$3,000,000	Years 3 -10
Operational expenditure over ten years on Westport ring-bank and Carters Beach	$3,500,000	$2,625,000	Years 3 -10[2]
Resource consents, owner agreement, Council project management, final design	$1,000,000	$750,000	Year 1
Contingency	$1,000,000	$750,000	
Avoid			
An Order in Council or other fast-tracking mechanism for TTPP resilience provisions			Minimal additional cost
Ability for BDC to align the Building Code with sensible flood resilience within the TTPP			Minimal additional cost
Retreat/relocate			
Invest in infrastructure at Alma Road			Live $18m IAF application
Development plan at Alma Road to ensure positive community outcomes	$250,000	$250,000	
Feasibility study into strategic land purchase at Alma Road or other resilient sites	$250,000	$250,000	
Adaptation Relief Fund to assist owners in areas like Snodgrass	$10,000,000	$10,000,000	Evaluation criteria to be developed
Accommodate			
CDEM capability	$500,000	$500,000	Over two years
Sea level monitor / tide gauge and GNSS	$250,000	$250,000	Via GNS and NIWA
Stormwater	$12,000,000	$8,000,000	Opex. @ 1-3%
TOTAL	**$56,100,000**	**$45,462,500**	

[2] Operational expenditure is phased in as assets come on-line. Generally operational expenditure funds would be accumulated as a flood damage reserve.

Context

The Big Picture

We have been following flood management developments around the world. There does not appear to be anywhere that is not affected by a changing climate. There are many, many places that have the same challenges as Westport.

According to Rockefeller's 100 Resilient Cities, average global flood-related losses will increase almost ten-fold to $52 billion by 2050. 40% of urban populations will be living with water stress by 2050.

Danang, Vietnam has a very similar profile to Westport

Surat, India is adjacent to a river like the Buller River

Aotearoa

Of course, you don't need to go to New Orleans to see trends with flooding. Flooding is the number one likely natural hazard in Aotearoa. New Zealand now faces, on average, one major flood event every eight months.[3]

About 675,000 (or one in seven) people across New Zealand live in areas that are prone to flooding, which amounts to nearly $100 billion worth of residential buildings that are at risk. The average annual cost of responding to flood events now exceeds $50m.

There are countless examples in New Zealand of flood resilience done well, and many others done poorly. While it didn't make international headlines, the failure of planning and infrastructure at Edgecumbe[4] was essentially the same thing that happened in New Orleans.

"New Orleans highlighted how the most vulnerable people are at risk, and the folly of relying on insurance and ignoring nature."

[3] Page 7, Central Government Co-investment in Flood Protection Schemes', Te Uru Kahika, January 2022.
[4] A major flooding event on 6th April 2017 breached the stopbank protecting Edgecumbe.

It is fortunate the recent floods in New Zealand have not yet resulted in a loss of life. It is only a matter of time before this changes. None of us wants that liability and responsibility.

While the emergency response structure enables flood warning and getting people to safety, the current 'after event' focus does not minimise future economic, financial, or human risk.

We think it is time to make some bold decisions that involve planning and infrastructure tools that, along with traditional flood defences, better secure the long-term future of places like Westport. A re-think is required, and we are supporters of the greater use of a multi-tool approach to building community resilience against the effects of flooding. This involves a move away from the current focus on insurance, alongside responding to and then attempting to recover from events. What we need is investment in resilience tools that are the fence at the top of the cliff, rather than the ambulance at the bottom.

This challenges the way we are currently set up, it challenges vested interests, and it challenges our legal framework. We are alive to these challenges. But we are also alive to the possibilities it brings, and we are willing for Westport to be a case study as we work together through this change. We are more vulnerable than most. While there is legislative change in the wind, time is not on our side, and we need to act swiftly and decisively.

Palmerston North dodges a bullet in 2004

Kawatiri 2021 – swift and deep

About Westport Kawatiri

The Coast and Coasters

The West Coast Region is New Zealand's least populated region, accounting for 0.7 percent of the population, but 8.5% of the land mass with 23,000 square kilometres. We have about 1.4 ratepayers for every square kilometre of land. More than 85% of that land is owned by the Crown.

When former Prime Minister Sir Geoffrey Palmer said …

> *sometimes it does us a power of good to remind ourselves that we live on two volcanic rocks where two tectonic plates meet, in a somewhat lonely stretch of windswept ocean, just above the roaring forties. If you want drama you've come to the right place …*

…he might well have been talking about the West Coast and its people. It is a wild place known for hard weather, and hard cases. Captain Cook called the headland *Foulwind* because the Endeavour was blown miles off course when he visited. The Māori name for Westport is *Kawatiri* – deep and swift.

Everyone knows that the Coast is a long, isolated region, hemmed in by the Southern Alps on one side and the angry Tasman Sea on the other. To survive and thrive on the West Coast you need something of a pioneer spirit. Māori and Pakeha came to the Buller in search of gold, coal, and pounamu. Extracting these treasures required hard work, persistence, a can-do attitude, directness, cunning and some might say, determination.

In more modern times, the same pioneer spirit has been required to flourish in fishing, dairy farming, mining, and cement manufacturing. Tourism pursuits such as mountain biking, surfing, tramping, and rafting are associated with the wet and wild reputation, and even the burgeoning arts community is of a specific coaster type.

That type is rugged but friendly, strong, and self-reliant. When you're isolated like us it teaches you the value of friendliness and hospitality, and of community resilience. We belong here - the proportion of people born overseas is 9%, compared with 27% nationally. There are 4,600 of us in Westport itself and 9,000 in the wider Buller District. Ahakoa he iti he pounamu - although we are small, we are of great value.

Te Rūnanga Ngāti Waewae

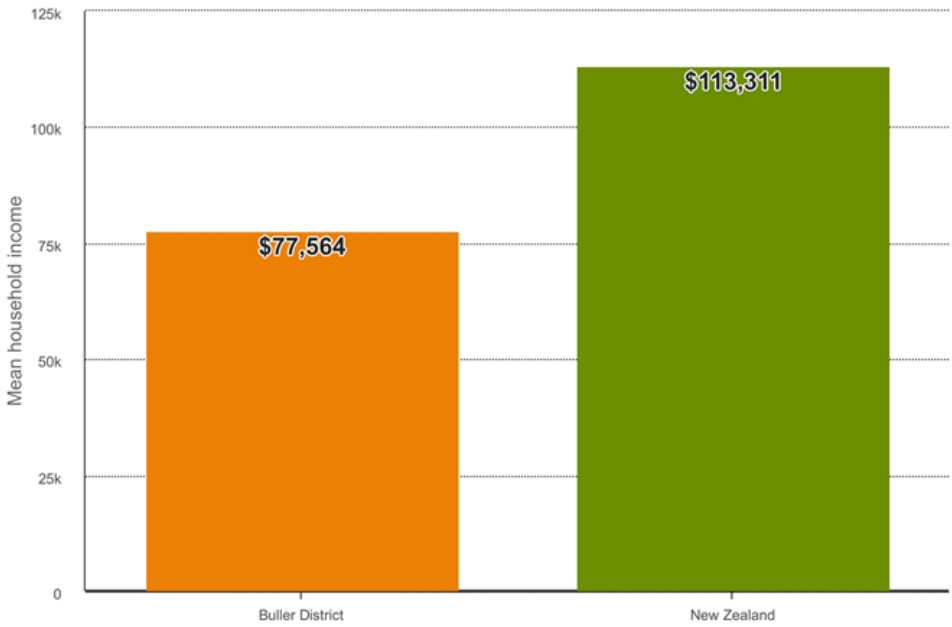
This project acknowledges the special status of Te Rūnanga Ngāti Waewae as tangata whenua and Treaty partners, and we have undertaken a collaborative approach to ensure Māori values and interests are protected and enhanced. From a Māori worldview, humanity is inseparable from the natural world. Land and its associated natural systems are connected to health through a variety of pathways, providing cultural, spiritual, social, and economic wellbeing. Māori environmental knowledge (mātauranga taiao) is characterised as a cumulative system of knowledge (mātauranga) and practice (tikanga) that has evolved through adaptive processes. Mātauranga and Te Ao Māori provide a unique source of expertise that can contribute to the management and mitigation of natural hazards in New Zealand.

Te Rūnanga o Ngāti Waewae is based at Arahura, a short distance from Hokitika on the West Coast. Te Rūnanga o Ngāti Waewae has assessed this proposal and has found no major roadblocks to any of the proposed options. Te Rūnanga o Ngāti Waewae wishes to remain part of the decision-making process going forward and has identified the need for consideration of Māori land blocks around Westport at the appropriate time.

Our Economy

Like other provincial centres, the Buller population is older than for the rest of New Zealand, with the average age at 47 compared with 39. The population has been shrinking in the 15-64 age bracket, with a flow on effect to the younger age group. People generally earn less than elsewhere in New Zealand. The mean income is $77,000 which is around 68% of the national mean at $113,000 (Figure 2) .[5]

Figure 2 - Mean household income in Buller District compared to the rest of New Zealand[6]

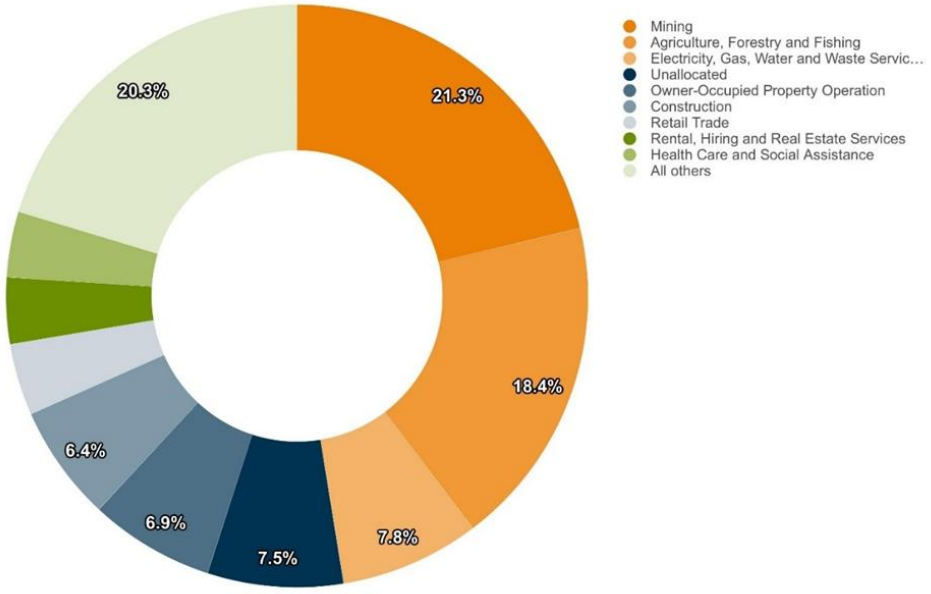


Perhaps unsurprisingly then, Infometrics analysis indicates most of the economic trends have been negative with a decline in GDP of 4.2% pa over the decade. In other words – the district has not kept pace socio-economically with the rest of New Zealand.

Currently 39.7% of people work in the mining and agriculture industries, although the picture is distorted by the lack of tourists in 2020 and 2021[7] (Figure 3).

[5] Real Options Analysis of Strategies to Manage Risks to Westport from Climate Change, Infometrics June 2022.
[6] Infometrics Report: *Real Options Analysis of Strategies to Manage Risks to Westport from Climate Change,* June 2022.
[7] Also, tourism is not an identified industry in the national accounts (it is captured under 'other' in the pie chart displayed in Figure 3).

Figure 3 - Buller District Council – economy (Source: Infometrics)



The Buller District Council (BDC) submission on the draft National (climate change) Adaptation Plan drew upon data compiled by Local Government New Zealand to suggest:

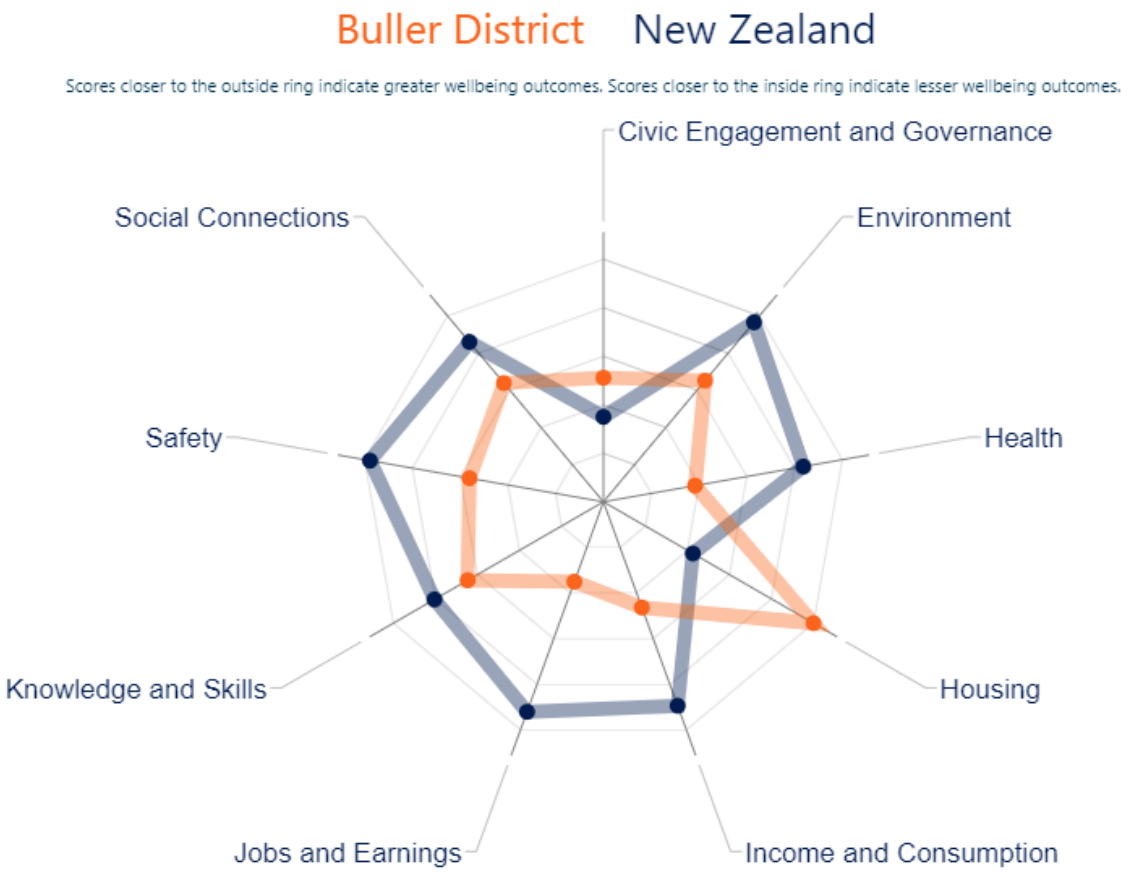
- The Buller District is the most deprived in the South Island with an overall deprivation index of 9 (where 10 is the most deprived).
- Urban Westport is ranked in the 92nd percentile for deprivation nationally.
- Buller district has the lowest household income level in New Zealand.

The Infometrics wellbeing framework shows how Buller performs on a range of measures relative to all New Zealand. In two areas - housing, and civic engagement and governance, Buller performs relatively well.[8] Despite a long-term trend of underperformance, Westport has an underlying economic viability. The Buller economy grew 15% in the year to March 2022, making it the second fastest growing territorial authority, although this was from a low base. Consumer spending was up 10% in the year to March 2022, running above the strong inflation rate of 6.9% in the same quarter.

Tourism expenditure has grown 9.8% over the past year, reflecting strong domestic visitor numbers that has offset the loss of international tourists. The Infometrics analysis suggests that tourism has both the existing economic mass and the potential to dominate economic growth in Westport and Buller over the next five years. Westport deserves investment in resilience building to help make this suggestion a reality.

[8] The housing measure is a combination of measures of home ownership, household crowding, housing affordability, and rental affordability. Civic engagement and governance are based on the turnout rates for local and general elections. The general picture, however, is of a region that has a lower level of wellbeing than the rest of New Zealand.

Figure 4 - Wellbeing framework (Source: Infometrics)



High commodity prices for the primary sector have also helped during the pandemic. The district dairy pay-out was forecast to grow by $24m in the 2021/2022 season, to a total of $150m.

Our housing market was strongly affected by the floods in 2021 and 2022, with house values falling 8.3% in the March 2022 quarter. But at the same time, new dwelling consents are up 94% in the year to March 2022, reflecting both the flood rebuild and renewed interest in the district that predates the flood. Non-residential consents have also been strong, growing 148% to reach $35m over the 12 months to March 2022.

We know that Westport is attractive to investment in tourism and in other industries. Although coal mining is a sunset industry, bituminous coal for steel production is found only on the West Coast, while further gold mining and rare earth mining (elements essential to electric vehicles) are also possibilities for the future.

We note the Crown has more than $1bn[9] in assets in Westport and will be a major beneficiary of resilience initiatives. The Crown does not pay rates.

Infometrics modelling indicates that tourism has both the existing economic mass and the potential to dominate economic growth in Westport and Buller in the medium term. We are positive about our economic future and have been actively working to improve both our economy and the wellbeing of our community.

[9] Page 32, Central Government Co-investment in Flood Protection Schemes, Te Uru Kahika, January 2022

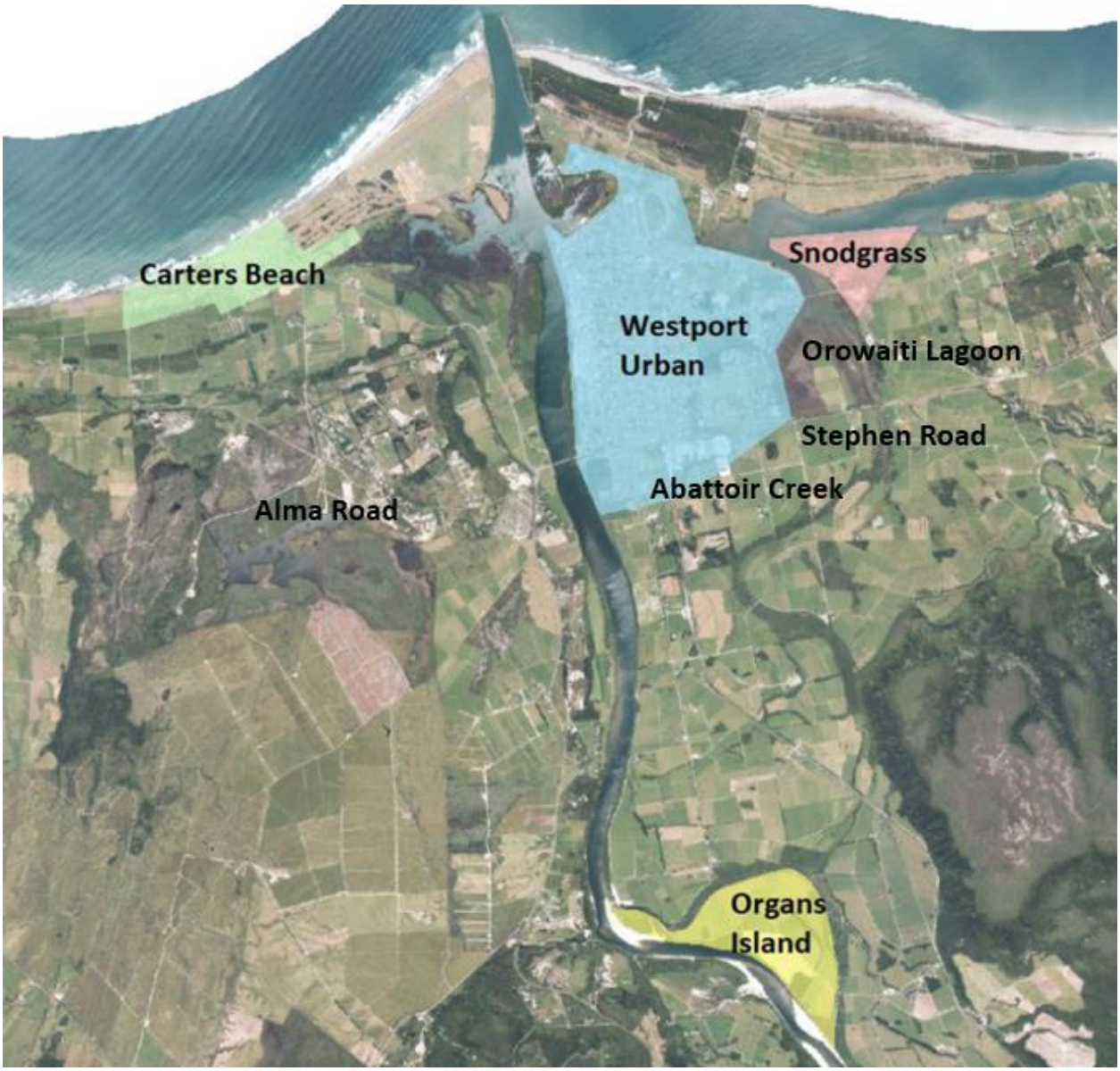
Welcome to Westport

In this proposal we will refer to some key areas of Westport (Figure 5):

- Carters Beach suburb (244 properties) includes wetlands, the airport, and a golf course. It already has rock revetment to help manage sea erosion around the airport.
- Westport urban (2,000 properties) is the main commercial and residential centre for the Buller District. It sits directly between the Buller River and the Orowaiti lagoon.
- Snodgrass Rd is a low-lying part of Westport that has been developed relatively recently, with a cluster of around 35 homes.
- Organs Island is not inhabited however it is a key piece of upstream reserve land that is owned by the Crown, but currently grazed by a local farmer.

This map contains the geographic scope of the project. Sea level rise is a factor and an input for modelling. There are resilience co-benefits from some of the investments (for liquefaction for example) but other than these co-benefits, other natural hazards are out of scope. They have, however, been considered in designing proposed flood risk mitigation structures.

Figure 5 – Westport and surrounds



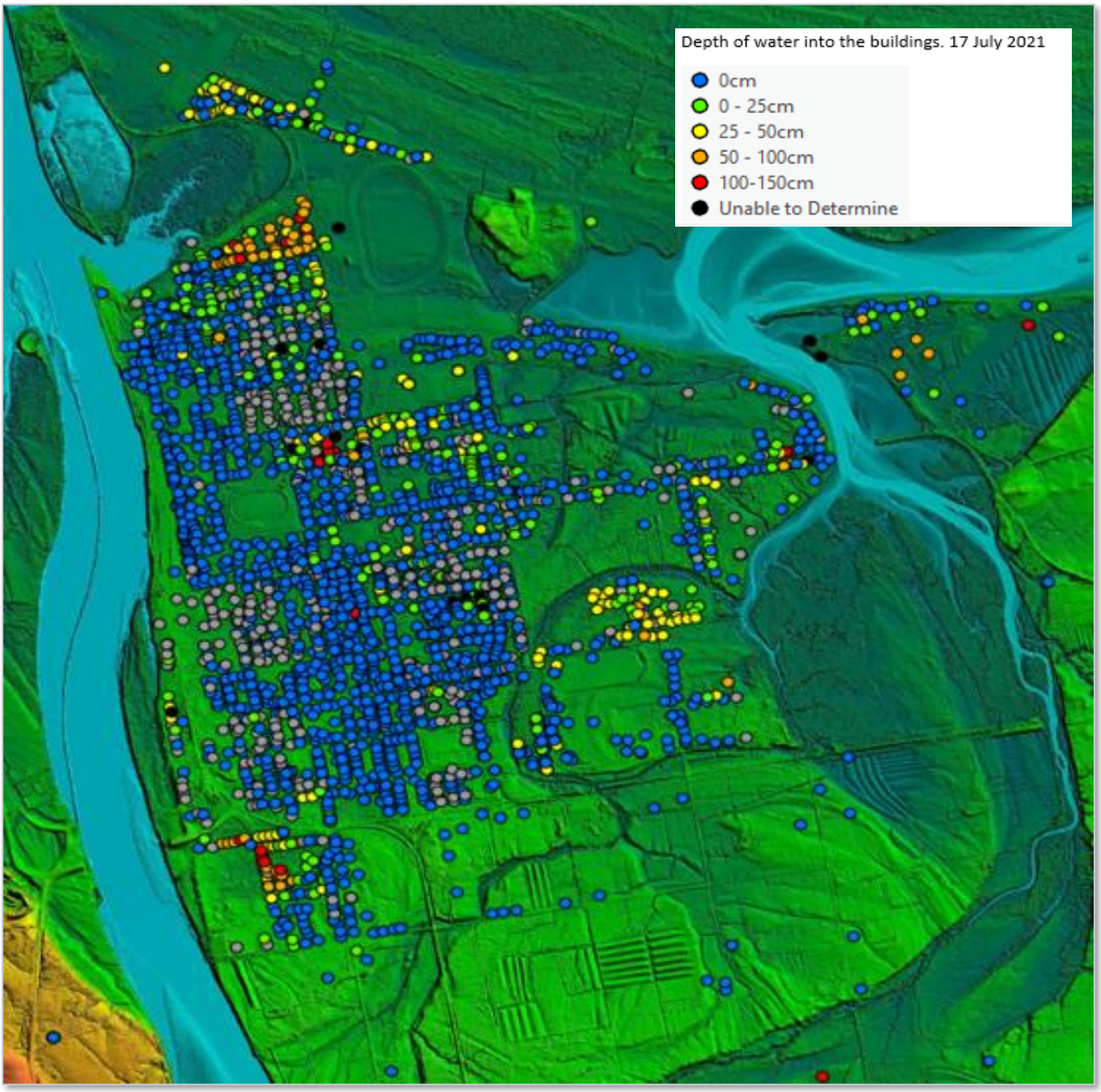
Flooding and Westport

The Buller River is the most powerful in New Zealand, with peak flows estimated at 12,700m^3/s in 1926[10], which is almost double any other recorded in New Zealand.[11] As a comparison, the mean flow of the Buller River is 454 cubic metres per second. The Buller catchment is very large.[12] The river passes through a small flood plain to discharge through a very confined exit (Figure 6).[13]

Figure 6 - The Buller River Catchment

[10] Flood modelling of the Buller River, Westport, NIWA.
[11] Flood flows on the Buller River were the largest of any NZ river recorded in almost a century | Stuff.co.nz.
[12] The headwaters of the Buller River are located in the Tasman District. This means that management of flood warning has been via a partnership between NIWA, Tasman District Council and WCRC.
[13] We gratefully acknowledge the assistance of Matthew Gardner of Land River Sea Ltd and Gary Williams of G&E Williams Consulting who prepared most of the Figures used throughout this Business Case.

Figure 7 – Flood depths, Westport, July 2021



Flooding has occurred throughout Westport's history. Major destructive events were recorded in 1873, 1926, 1970, and Cyclone Fehi in 2018 caused further flooding.

The town is also exposed to coastal flooding, and flood events are exacerbated by high tides surging up the Buller River and into the Orowaiti Lagoon. With sea levels expected to rise by at least 1m in the next century, impacts from this will be accentuated. Further to this, rising seas increase groundwater levels, exacerbating flooding for low lying coastal areas.

In July 2021 and February 2022, the district experienced further large flood events.

Heavy rainfall from 15 July 2021 to 18 July 2021 caused significant flooding with the Buller River having a peak flow of 8900 cubic metres per second (Figure 7). This is the largest gauged river flow ever recorded in New Zealand. The flow breached Westport's flood defences, with 826 properties and over 2,000 people requiring

evacuation. Three separate civil defence welfare centres were established to support displaced people in need of emergency accommodation.

A total of 563 houses were damaged (with 71 homes deemed unsafe for ongoing occupation) representing 23% of the town's housing stock. The Insurance Council of New Zealand puts the insurance claims for the West Coast flooding from July 2021 at $88m to date (not all claims are settled).[14]

Figure 8 - Flood waters at the Buller Bridge, July 2021

While Westport was still in recovery mode, a second heavy rainfall event, from 1-4 February 2022, saw a further State of Local Emergency declared in the District, with people in at risk areas again evacuated. There was widespread local flooding with substantial damage in infrastructure and inundation of homes. On 9-10 February access to Westport was cut off, and water supply infrastructure was damaged.

The Government saw the plight of Westport people, and NEMA – supported by other agencies - was quick to provide response and recovery relief.

[14] Cost of natural disasters – ICNZ, June 2022

Climate Change and Westport

Changes to the intensity and frequency of climate change-induced flood events is the biggest natural hazard challenge New Zealanders face. Climate change will substantially increase the severity and frequency of the risk of flooding. This will cause higher levels of damage and more frequent damage to the land and assets located behind existing flood protection structures and to adjacent communities. There will be associated increases in social, cultural, and environmental costs.

Recent Westport flood events are a salient reminder of this. Climate change will also shift the area of geographical risk of floods and make new areas, not presently affected by such events, more susceptible to floods.

There are many uncertainties around climate change predictions for the Buller Catchment. It is generally accepted that peak rainfall intensities are likely to increase, and sea level will rise. The main effects of climate change on Westport are expected to be increased rainfall and runoff from the Buller River catchment, along with an increase in bed load volume due to more landslip materials entering the river.[15]

The viability of industry located at flood-prone locations and the potential for disruption to business is further affected by the increased risk to infrastructure such as road and rail bridges that service these premises. Westport is not alone in the challenges it faces. Significant Central and Local Government owned infrastructure is exposed to sea level rise[16].

The recently released research published by NZ SeaRise[17] shows that, in many places throughout New Zealand, rising sea levels - due to climate change, will impact as soon as 2040, rather than 2060. This is because land subsidence (and in some instances – uplift) is now being factored into predictions. This means Local and Central Government's time to react is effectively being squeezed.

Climate change warms the air. Warm air carries more moisture (8% per degree). The Tasman Sea is also warming. As a result, we can expect more intense rainfall more often.[18] Increased rainfall will increase erosion, increase river flows, and potentially cause more gravel deposition. As a result, rivers are likely to widen. Research[19] suggests:

- There was 10% higher rainfall in the July 2021 event due to climate change than would have been the case without climate change.
- There may be 9-19% more rainfall by 2100.
- There may be a 11-25% increase in the 1% AEP[20] flood flow at Te Kuha by 2100.[21]

This does not mean that we can wait until 2100. We are living this here and now, and we are more vulnerable than most. Families are worried about their safety and their immediate futures. As decision makers, none of us will be forgiven if we fail to act swiftly and decisively. We realise that legislative change is in the wind, however time is not on our side, and we cannot wait. The worst thing we can do is to do nothing.

[15] Gravel bed load movements from the catchment will also increase due to more intense rainfall and greater flood flows. Natural deposition rates at the river mouth will increase due to the rise in average sea level.

[16] LGNZ submission on the draft National Adaptation Plan, June 2022.

[17] Te Tai Pari O Aotearoa, May 2022.

[18] Stone D.A., Rosier S.M., Bird L., Harrington L.J., Rana S., Stuart S., Dean S.M. (2022) The effect of experiment conditioning on estimates of human influence on extreme weather. Weather and Climate Extremes 36(September 2021):100427.

[19] https://doi.org/10.1016/j.wace.2022.100427.

[20] AEP is the probability of a flood event occurring in any one year.

[21] Zammit C. (2022) Climate change impact on peak discharge and bank-full flow duration at Te Kuha Stream: An analysis of Te Kuha streamflow gauging station under different warming scenarios and for different return periods and durations, NIWA Client Report 2022038CH.

Other Natural Hazards

Sea level rise

By the year 2090, the mean sea level and the coincidence of peak tides and large river flows is expected to increase. These effects all combine to imply that today's 0.01 AEP (annual event probability of 1:100 years) magnitude storm event will become much more frequent.

Westport survey and sea level rise measurement devices provide uncertain benchmark data about the rate of sea level rise. This is because of the influence of waves, their short record and the possibility of local subsidence affecting the Westport Harbour quayside. The main point we note is that sea levels are higher[22] now than they were at the time of the 1926 and 1970 floods[23].

Liquefaction

Liquefaction records[24] for the area show that during previous seismic events, large areas of Westport are vulnerable to liquefaction due to its location on the Buller River flood plain. This plain consists of loose, fine river sediments.

Liquefaction vulnerabilities present an acute risk given the Alpine Fault has a high probability (estimated at 75%) of rupturing in the next 50 years[25]. This rupture is expected to produce one of the largest (if not the largest) earthquakes since European settlement in New Zealand. If this occurred, it would likely cause widespread damage.

The most vulnerable area is likely to be around the northern end of Westport near the Orowaiti Lagoon. This area experienced liquefaction during the 1968 earthquake[26]. We also note that liquefaction in Westport occurred during events previously considered too small to cause liquefaction (i.e., less than a Magnitude 6 earthquake). This means that during large seismic events (i.e., greater than a Magnitude 7 earthquake) liquefaction could potentially impact the entire town.[27]

Coastal accretion

Port construction and the rock groynes constructed to protect the mouth of the Buller River have caused significant coastal gravel build-up to occur on either side of the river mouth. This build-up has prevented the Orowaiti River from exiting to the sea at its historic exit point (Figure 9).[28]

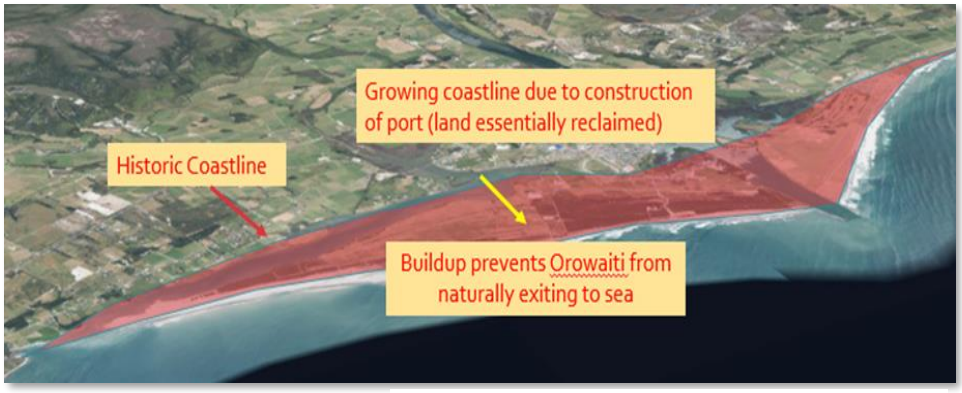


Figure 9 - Coastal Accretion

[22] Pers. Comm. Matthew Gardner, Land River Sea Consulting Ltd.
[23] We can see strong merit in placing a sea-level-rise measuring device off the coast at Westport. We address this suggestion later in our proposal.
[24] Liquefaction Records for Buller District to March 2011.pdf (wcrc.govt.nz).
[25] Alpine Fault / Major Faults in New Zealand / Earthquakes / Science Topics / Learning / Home - GNS Science.
[26] Liquefaction Records for Buller District to March 2011.pdf (wcrc.govt.nz).
[27] As will become apparent later in this report, the risk of liquefaction has been considered by the Technical Advisory Group (TAG) as part of the recommendations they have made about the design, composition, and alignment of the proposed embankment.
[28] Image sourced with thanks to Matthew Gardner Land River Sea Consultants.

Strategic Alignment

Our proposal aligns with several areas of Central and Local Government strategy.[29] We draw attention to these because they add context and evidence to demonstrate a clear alignment between our request and the existing policy settings.

Alignment with Local Government Aspirations

Flood resilience investment aligns strongly with the strategic intentions of the BDC and WCRC, as well as national policies. We also have a strong desire to collaborate with Te Runanga o Ngāti Waewae throughout the process. This section demonstrates how investment into flood reliance aligns with our statutory obligations and the aspirations of our local community.

BDC

BDC's proposed activities are documented in the 2021-31 Long-term Plan (LTP), a ten-year plan reviewed in partnership with the community every three years. The LTP 2021-2031 sets out the Council's goal as -
To promote the well-being of our local communities.

In achieving Council's goal its mission is -
To serve the residents of the Buller district, conscious of their needs, by providing facilities and services and creating an appropriate environment to progress development while preserving the distinctive natural environment, as well as cultural and historical environments.

In preparation for the LTP, an Environmental Improvement and Prosperity Strategy was developed. It seeks to create community wellbeing through five domains – socio-economic prosperity, affordability, climate change preparedness, environmental sustainability, and district revitalisation. Opportunity exists to advance the five domains through recovery and resilience building, thereby assisting in the creation of a thriving community. The strategy is imbedded within and guides the LTP's outcomes, activities, planning and prioritisation.

Investment in natural hazard management is directly linked with the following community outcomes and associated goals, as outlined in the Council's LTP:

- Social – our communities are vibrant, healthy, safe, and inclusive.
- Affordability – our communities are supported by quality infrastructure, facilities and services that are efficient, fit for purpose, affordable and met our current and future needs.
- Environment – our distinctive environment and natural resources are healthy and values.

WCRC

In its 2021-2031 LTP, WCRC identifies the following community outcomes for the West Coast region, which are supported by various council activities:

- Economy - a thriving, resilient and innovative economy is promoted, which creates many opportunities for growth, wealth generation and employment.
    - Flood warning services and flood protection works help the economy by ensuring business confidence in investing in flood protected areas. Protection works also increase property values in affected areas.
- Environmental - the high quality and distinctive character of our environment is retained.

[29] See Appendix three

- Safety - a region that is a safe place to live, with a strong community spirit and cohesion.
    - The Council's flood warning service and the flood protection works assist with community safety in areas protected by those services, during flood events.
    - Civil defence work is primarily concerned with community safety in a major emergency event.

Flood Protection Schemes

There is a general view in Local Government that the current model for funding flood protection needs an overhaul. To fund expensive flood mitigation works, most councils now top up funds, from targeted rates on property owners in areas of high flood risk. Some councils, such as Auckland Council, pay for flood protection entirely from general rates.

Council-run flood risk mitigation schemes do not benefit everyone equally, with property owners in less affluent communities like Westport being less likely to join voluntary funding schemes. We have many anecdotes of low-income ratepayers having to pay their rates at $5 per pay because they simply cannot afford to pay more than that. The current model of funding flood risk mitigation is no longer sustainable.[30]

A report by Te Uru Kahika[31] [32] outlines how regional councils are seeking Central Government co-investment in 'fit-for-the-future', risk-aligned, climate change resilient and environmentally sensitive flood protection schemes. This sought-after outcome was viewed as a necessary response to the increased magnitude and frequency of climate-change-induced flood events - exactly what we are seeing here at Westport.

Councils are seeking a national shift in Central Government attention from disaster relief and rehabilitation towards necessary 'top-of-the-cliff' mitigation of flood risks. Te Uru Kahika argues this is achievable if Central Government was to agree to co-invest in flood protection schemes, such as that proposed for Westport.

The Te Uru Kahika report noted that flood protection schemes have been some of the best value public investments ever made in New Zealand. The report also noted that addressing contemporary New Zealand-wide challenges would require a step-change in both the volume and type of investment in flood risk management.

The report envisaged the greater use of a 'multi-tool'[33] approach to building community resilience against the effects of flooding is required. This included a reference to the need for more focus on the more effective use of improved planning tools - to define where and how development occurs.

For the past three decades, Crown-owned and related assets have received flood protection at a cost to regional and targeted local ratepayers, with little contribution from the Crown. These protected Crown assets include rail and road infrastructure, the conservation estate and related assets, communication and electricity transmission infrastructure, some airports and education and health facilities.[34]

The cost of flood events may be counted not just in terms of the cost of replacing or restoring privately owned buildings and overcoming other property losses. There are also other tangible costs. These include the number of hours or days businesses cannot operate at full production and the cost of disruptions to the functionality of Crown assets.

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[30] See draft 'Funding and Financing for flood protection – progress to date' (Local Government briefing, LG202100747, 17 June 2021).
[31] Te Uru Kahika is a collection of 16 regional and unitary authorities that have been working together on a wide range of matters. They are charged with managing land, air, and water resources, supporting biodiversity and biosecurity, providing for regional transport services, and building more resilient communities in the face of climate change and natural hazards.
[32] Central Government Co-investment in Flood Protection Schemes (January 2022).
[33] This is explained in more detail later in the proposal. A multi-tool approach is encompassed in the PARA framework. We also explain this framework later in our Business Case.
[34] Economist Julian Williams has estimated the capital value of Crown assets in Westport to be more than $1 billion. This research is referenced in the regional council's substantive Te Uru Kahika 2022 report.

In addition, flood costs have both an immediate and sometimes an on-going effect on people's lives. This includes the effect on the willingness and ability of the residents affected by flooding to continue to live and invest in areas subject to flooding. Westport knows this problem all too well.

To avoid a worst-case flood disruption scenario, the Te Uru Kahika report called for scaled-up Central Government and regional council investment in flood protection schemes.[35] The overriding reason offered for this co-investment was to create resilient communities and sustain economic enterprise. We strongly support this request and the rationale underpinning it.

The Te Uru Kahika report clearly noted that flood protection schemes are nationally important. They are viewed as underpinning the integrity of public and private assets and lifelines and provide resilience and security to communities and their investments. The report concludes that Central Government co-investment in flood protection schemes is vital because it:

- Is fiscally responsible and fair to make such investments.
- Reflects Treasury's Living Standards Frameworks.
- Is supportive of wellbeing and social inclusion and is likely to reflect equity / ability to pay considerations.[36]
- Is supportive of job creation, protective of previous regional economic development investments and contributes to the desire to lift the future productive potential of the regions.
- Contributes to the security of access routes (rail and road) and the communication infrastructure that is vital for commerce and community functionality.
- Reflects international obligations, as recognised by New Zealand signing the UN Sendai Risk Management Protocols.
- Directly protects significant crown assets such as hospitals, schools, infrastructure etc.
- Contributes to investment opportunity costs – that is, it provides investment with the confidence required to want to invest in the future of their area.
- Diminishes the risk of escalating insurance premiums, the reduction in the uptake of private insurance and the associated risk of insurance companies refusing to provide insurance cover in flood risk areas – leaving the Government as the 'bottom of the cliff ambulance.'
- Contributes to the environmental and water quality expectations of our communities and iwi / Māori partners.
- Provides for resilience and adaptation against the effects of climate change-induced 'above-design' storm events.

We see strong sense in all the above reasons for Central Government to consider co-investing in flood risk mitigation at Westport. There are 367 flood risk mitigation schemes throughout New Zealand. The Westport flood risk mitigation scheme should bring the number to 368.

[35] Te Uru Kahika requested Central Government to contribute $150m per annum to the $200m currently committed by the regional sector.

[36] Equity and ability to pay considerations are likely to be one of the many important elements considered in designing the detail of a Central Government co-investment programme.

Alignment with Government's Infrastructure Plan

The government's Thirty-Year Infrastructure Plan records the average annual costs of responding to flood events now exceeds $50m. While necessary, the Plan notes – and we agree, this is sub-optimal expenditure compared to preventative investment. As such, it does not minimise future risk to the community or Central Government and Crown assets. This 'after event' focus means government bears an excessive unfunded future liability in its fiscal accounts.

The Plan also notes the severity of the consequences of not securing and enhancing the integrity and service levels of existing flood protection structures, and the community resilience role they play, increases every day. The fiscal consequences for government of not proactively investing at the top of the cliff are growing at a similar rate.

Alignment with advice from the Productivity Commission

The Productivity Commission enquiry into Local Government funding and financing[37] selected flood protection schemes as an example of a function deserving of a 'stepped-up' co-investment-focused-arrangement between central and Local Government.

The terms of reference for the Productivity Commission's enquiry, as issued by the Ministers of Finance and Local Government, noted that:

- Local authority debt has grown steadily since 2006 to the point where some councils are now coming close to their covenanted debt limits.
- One of the major factors influencing local authority debt is the cost of adapting communities and infrastructure to mitigate risks and hazards associated with climate change.

The Commission favoured the 'benefit principle' as the primary basis for deciding who should pay for Local Government services. In this regard, the Commission noted – with more than passing interest to Westport that '*some local assets and their associated services could benefit… national interests. In these cases, the benefit principle points to shared funding with a contribution from Central Government'*.

In addition, the Commission identified four key areas where the existing funding model is insufficient to address cost pressures:

- Supplying enough infrastructure to support rapid urban growth.
- Adapting to climate change.
- Coping with the growth of tourism.
- The accumulation of responsibilities placed on Local Government by Central Government.

All four of these identified areas support the need for co-investment by Central Government in flood protection schemes, such as that proposed for Westport.

In addition, the Commission suggested the Government should more clearly specify the role that may be played by Waka Kotahi[38] in assisting those councils such as WCRC and BDC, who are facing significant threats to the viability of roads and bridges from climate change. We need these parties to join us as we seek to overcome the exacerbation of flood risks because of the narrowing of river channels by bridge structures and related embankments. The Orowaiti and Buller River bridges are cases in point.

[37] Productivity Commission, Local Government Funding and Financing, 30 November 2019.

[38] Government may also provide aid to parties affected by flood events within the terms and conditions defined in the On-Farm Adverse Event Recovery Policy administered by the Ministry for Primary Industries.

Alignment with RMA Reform

The need for a comprehensive approach to flood risk management is clearly encompassed in the reform of the RMA programme, and especially the Climate Adaptation Act. The Climate Adaptation Act is to be developed next year, but it will come too late for Westport. Even today, as we attempt to address resilience through Te Tai Poutini Plan, we cannot prevent development in flood zones. We are working on it, but we are finding that, right now, we cannot avoid more people and property being put in harm's way. We hope our frustrations can help to inform the Act.

We noted wryly that Westport is a case study referenced in the draft National Adaptation Plan (NAP). Frankly, Westport is the case example of the NAP being actioned. We welcome the opportunity provided by Central Government to test and refine emergent adaptation policy. In anticipation, we are now actively applying a more comprehensive approach to flood protection than in the past.

We think that our experience to date has given us a sound understanding of what constitutes good governance and decision making around climate adaptation decisions. Our Westport experience will also inform other themes currently under consultation in the draft National Adaptation Plan, such as the intersection with the insurance sector. Through necessity, we have found ourselves making the long anticipated hard calls on who pays for adaptation and who benefits in the absence of a policy framework, while also attempting not to create winners and losers (although to be honest this almost seems unavoidable). We have found that published guidelines are not of much practical use.

Alignment with government's previous shovel-ready funding decisions

In 2021, regional councils received $217m toward 55 shovel ready flood protection projects. These projects had a total cost of $313m. Funding was provided at a 75% ratio for projects in those regions viewed as having comparatively high levels of deprivation.

This funding was part of Central Government's Covid recovery programme. A central / regional governance oversight arrangement is in place to provide governance to the delivery of the 55 projects. This is the 'IRG Kānoa Climate Resilience Flood Protection Programme.'[39]

There are many more projects needed throughout New Zealand of the type co-funded by the government in 2021. The proposed Westport flood protection scheme may well have been included in this programme but, at the time, it was not regarded as shovel ready. We are now shovel ready.

[39] This governance arrangement is suited to application to the Westport flood protection scheme.

Alignment with recent Cabinet policy decisions

The foundation for DIA's refreshed thinking about the funding models that may be applied to future flood protection investment was recorded in a July 2020 Cabinet paper *Improving Resilience to Flood Risk and Supporting Covid-19 Recovery.* This Cabinet paper noted:

- Current funding arrangements for flood protection infrastructure were established over 30 years ago and they are no longer considered sustainable or consistent with delivering outcomes in line with (the) proposed framework and principles.
- Subject to further work, Central Government's funding approach to building resilience should consider the benefit principle, fairness, and intergenerational wellbeing.
- Officials will work with Local Government to develop a revised funding model for flood protection, based on the proposed framework and principles, which would be implemented over the longer term.

The proposed principles[40] referenced in the Cabinet paper's appendix, state an intention to:

- Target action where national assets and national interests warrant Central Government intervention and funding.
- Intervene in projects where there is a significant economy of scale or time constraints, distributional concerns, to protect health and safety, and to protect kaitiakitanga.

We are strongly of the view that Cabinet's principles will be more than adequately satisfied by co-investment in a flood protection scheme at Westport.

[40] As included in Appendix B of the July 2020 Cabinet paper.

Our Story So Far

The Westport community will struggle to sustain another event, physically, psycho-socially, and financially. We are anxious and uncertain about the future, during a time of growth for the town. We are not in a position to invest heavily in flood resilience, and so we were very grateful to be invited to participate in a ground- breaking collaborative process that could see co-investment in Westport's long-term flood resilience. We welcome the opportunity to become a model for other small communities facing similar climate related challenges.

Things for us to address

It was made clear to the Councils that in order to win Government support, several factors needed to be satisfactorily addressed:

- A Steering Group should oversee proposed resilience initiatives.
- An integrated package of initiatives outlining Council(s) involvement should be displayed.
- Value for money should be demonstrated.
- Robust costing processes need to be applied.
- A clear plan of action should be defined.
- Outline why current policy and funding levers are insufficient.
- Describe why Buller is an urgent and compelling case.
- Describe how the proposal supports government goals in climate adaptation, community resilience, and resource management reform.

We recognised early that good governance would be the key to producing a positive outcome. The Buller Recovery Steering Group formalised its Terms of Reference (see Appendix two) and put in place a recovery work programme (Figure 10) and risk register - overseen by regular Steering Group meetings, to provide assurance that tasks were on track.

Better Business Case

The Steering Group was aware that Treasury's Better Business Case (BBC) framework is the accepted model for investment by Central Government. We have embraced the principles of this BBC framework, and we have attempted to address the challenge we face though a BBC lens.

An overview of the five BBC elements follows, together with a brief description of what we have done to satisfy these elements.

- **Strategic case**: the alignment of the need for change with wider national and sectoral priorities, goals, policy decisions and programmes, district equivalents of these matters, the scope of the project, the challenge to be addressed and the benefits sought – *we have addressed these matters in the previous 'strategic fit' section of our proposal.*
- **Economic case**: the critical success factors, the process applied to move from a long list of options to a preferred set of options, the economics of preferred options and the cost / benefit of these options - *we have provided details about what a flood risk resilient Westport community may look like at various points throughout our proposal. We started with a long list of options and reduced this to a preferred short list, and we have applied cost-benefit assessment to various intervention options.*
- **Management case:** the approach to be applied to deliver on the preferred set of options and the plan to allow for that delivery – *the last part of our proposal provides details about governance, management, timeline, and other things guiding the delivery of our proposal.*
- **Commercial case:** the procurement strategy and the ability of the market to meet needs - *we outline our proposed approach to procure the products and services we need in one of the latter sections of our proposal.*
- **Financial case**: a high-level assessment of the affordability of the short-listed options and possible funding sources – *we have already provided information about the socio-economic status of the*

Westport community. Details about our proposed co-investment / cost sharing arrangements are summarised at the end of each part of our proposal.

The conclusion part of our proposal provides a summary spreadsheet displaying how we have satisfied the above guidelines.

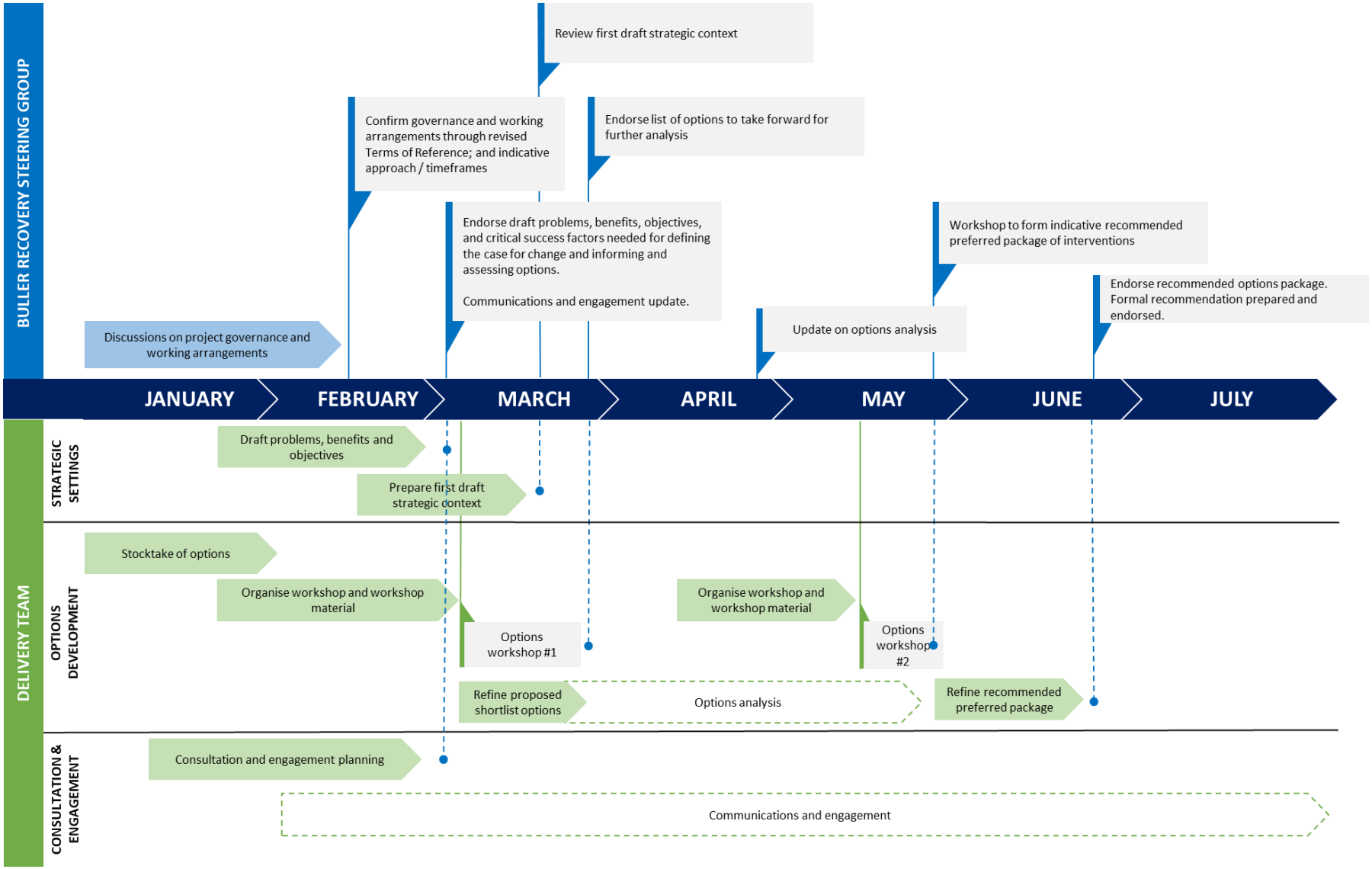
Critical success factors

Our proposal is underpinned by a set of strategic settings that the Steering Group agreed early in the preparation of our Business Case.[41] They include the project's Critical Success Factors. The settings also incorporate the following objectives, against which all options were assessed:

- Reduce the risk of flooding from severe weather events on the Westport community, recognising and providing for the likely impacts of climate change.
- Avoid increasing or transferring flood risk to other areas within the Buller catchment or wider region.
- Improve the ability of the Westport community to prepare for, continue functioning during and after, and recover quickly from flooding events.
- Minimise the long-term financial burden of flood mitigation and protection on the Buller community.

[41] We list these in the later 'protect' part of our proposal.

Figure 10 - Work programme

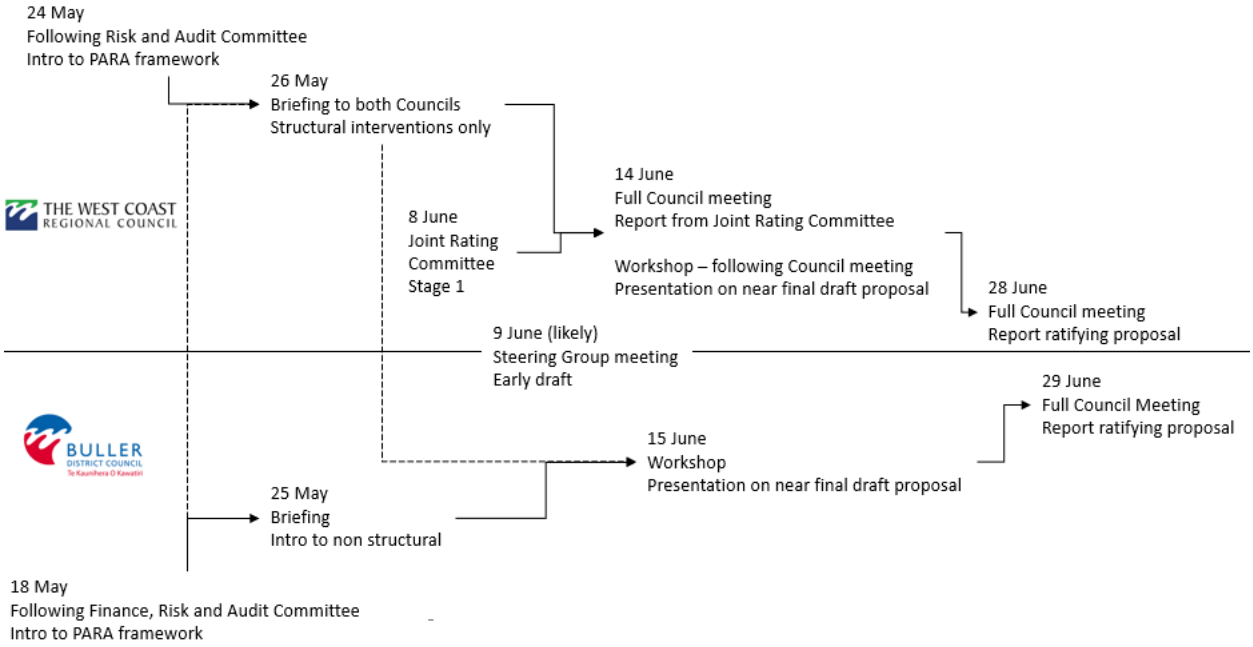


Communication

One of the key challenges with central and local collaboration is the synchronisation of respective democratic processes. The team carefully designed the process below to ensure integration between the Steering Group, Councils and Ngāti Waewae, to give the best chance of success.

Another one of our key challenges has been the synchronisation of communication around this process. No decisions have yet been taken. No decisions can be taken until funding is approved or otherwise. Nevertheless, a level of detail is required in order to provide robust costing and to demonstrate value for money. There is naturally a high level of interest in this detail. We could not in good conscience undertake decision making around the proposal in secret. At any rate, we do not consider that there is any reason under the Local Government and Official Information and Meetings Act for us to withhold information about this proposal. We have all fully engaged in this process (Figure 11).

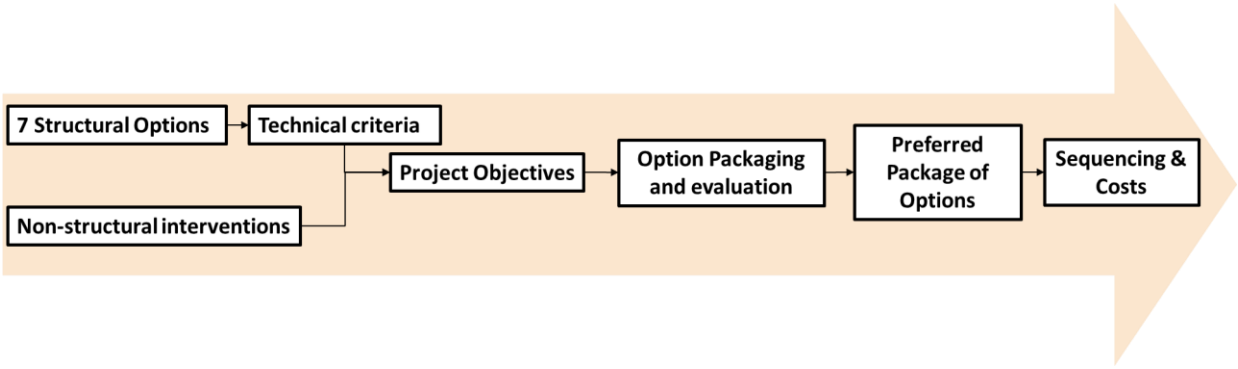
Figure 11 - Local Government democratic process



The engine room for developing the detail of our proposal is the process below. We co-opted the input of a wide range of stakeholders to develop a long list of interventions to grow Westport's flood resilience. Some of these were hard structures, others were non-structural interventions. We put these options through a series of technical and strategic evaluation criteria to distil the options down to the package presented in this proposal. This was a complex undertaking that did not sit comfortably within a traditional multi-criteria evaluation framework.

Process Overview

Figure 12 - Process Overview



We knew we would need both rigour and integrity around this process. We allocated senior internal resources from both Councils, and we engaged experts to provide technical inputs. This included:

- Establishment of a Technical Advisory Group (TAG) of senior experts to provide guidance around the structural options. The work of the TAG drew on the Westport 2100[42] work previously completed, and other local knowledge.
- Enlistment of two TAG members, Gary Williams from G & E Williams Consultants and Matthew Gardner from Land River Sea Consulting Ltd[43], to provide wider advice to decisions makers and, in the case of Matthew, to provide scientific advice to the wider public.
- Infometrics[5] provided high level economic analysis.
- WCRC and NIWA rainfall and river flow monitoring data.
- NIWA provided some detailed loss modelling using the RiskScape model.
- Poutini Environmental provided guidance around local Mana Whenua concerns and aspirations.
- Tonkin Taylor provided some technical advice and frameworks for the options evaluation.
- Government departments were very forthcoming with advice and assistance, in particular MBIE, DIA, NEMA and Waka Kotahi.
- Landmark Lile Ltd provided a report on the consent-ability of structural options.[44]
- A report was prepared by HenleyHutchings on the 'strategic fit' between the scheme options and national, regional, and local policy and contextual matters.[45]

[42] Among other things, the Westport 2100 Group recommended formation of the Westport Rating District Joint Committee and the development of the flood protection scheme detailed in the WCRC Long-Term Plan 2021-31.
[43] This modelling covered the effects of different flood frequency / magnitude scenarios and the flow management opportunities arising from more than seven different flood risk mitigation options. The modelling also considered the effects of a full range of future climate change scenarios.
[44] Advice was provided by Landmark Lile Limited, Resource Management Consultancy, Nelson.
[45] 'Strategic Fit' HenleyHutchings, June 2022

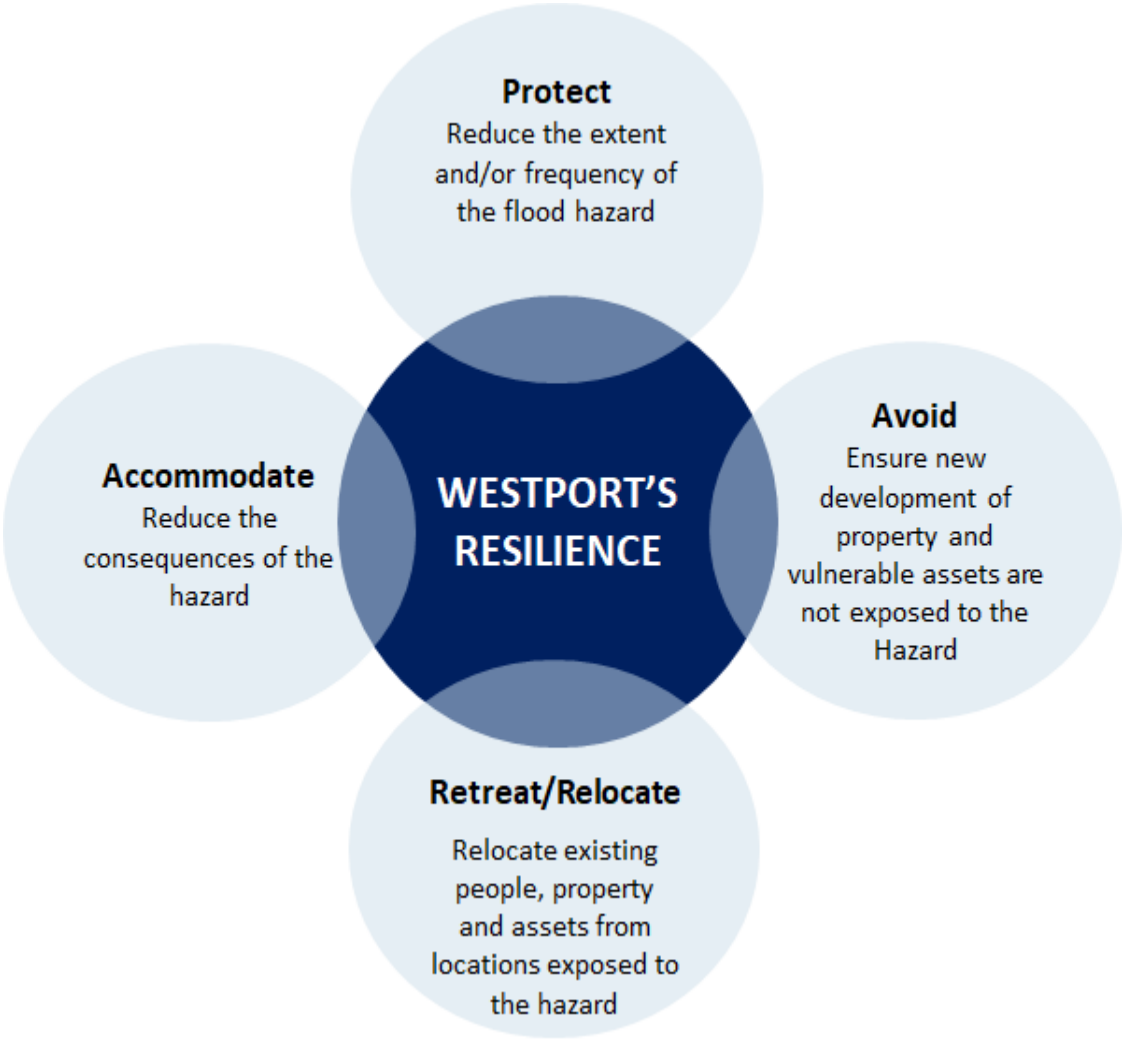
Planning Principles

We realised early on that there is no silver bullet for Westport. We have therefore been working hard on expectations to make sure key stakeholders and the wider public are aware of this. In addition, there are some obvious constraints, dependencies and tasks that need to be carried out. In this regard, we have used the following principles to guide expectations:

- *We cannot protect every single bit of Westport*. It is simply not feasible or affordable.
- *It is unlikely that we will be able to build our way out of this forever*. While it makes sense in the short term to build some embankments and structural defences, in the long term the reality is that we are unlikely to be able to afford or will want to do this forever – a range of adaptation options will be necessary.
- *We can't eliminate all the risk*. In agreeing on the structural solutions, we need to be very clear that embankments and other structural defences won't 'solve the problem'. Far from it – and no engineer will ever give a guarantee that the structures won't be overtopped – especially with more climate related weather events now certain.
- *We don't have to do everything tomorrow*. Proposed measures to avoid, retreat, and accommodate Westport flood risks will be delivered in an ordered sequence – some in the short term; some over the next 25-50 years.

Our Proposal – The PARA Model

We have embraced the PARA model for our proposal.



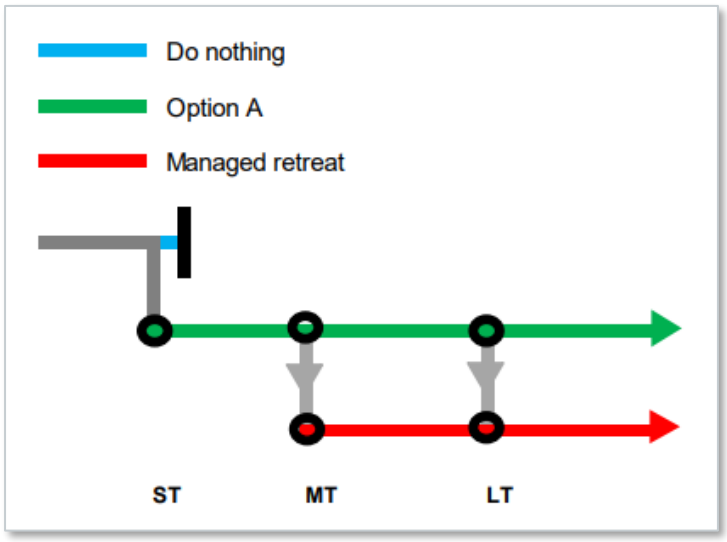
The model is adopted from overseas and has been utilised by both NEMA, DIA and the Ministry for the Environment. It is commonly used for managing sea level rise and flood risk to communities. The model appealed to us because:

- This is a logical and robust way of categorising the complex range of tasks that are required to manage climate related issues. It broadly aligns with the four Rs of CDEM[46]. It reflects the application of what we see as a necessary 'multi-tool' approach.
- It shows how resilience is not the domain of a single organisation. One of the challenges with achieving true resilience is the need to integrate across organisational boundaries and to find compromise.
- There is a range of co-benefits available from investing in resilience. The model provides for this to be brought into relief.

[46] Reduction, Readiness, Response, Recovery.

- Not everything has to happen at the same time. Often there is a temptation to 'solve' the problem by making all the decisions today. In fact, there is a range of short (ST), medium (MT) and long-term (LT) options available (Figure 13). Some decisions can be deferred until further knowledge is available. Adaptive pathways should be applied. This is covered in more depth later in the proposal.

Figure 13 - Adaptive Pathways (Source: Infometrics)

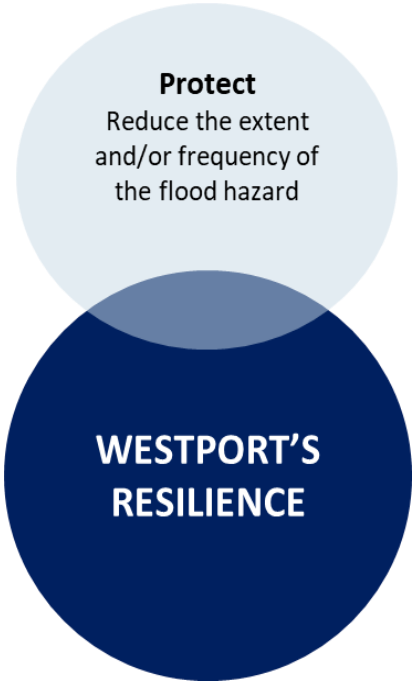


PARA highlights the interdependence between various decisions and helps decision makers to ensure an integrated package of initiatives is applied. It shows that decisions taken today must not prevent future decision makers from making their own sensible decisions. We have thought about our mokopuna and future generations as we have developed this proposal. Each facet of PARA, and its related flood resilience proposals, is described in detail in the following sections of our proposal.

Protect

Reduce the extent and/or frequency of the flood hazard

Protect



Approach

The focus of this part of our Business Case is on proposed Westport structural and nature-based flood risk mitigation measures.

The WCRC has investigated flood mitigation scheme options since the mid-2010s. The first significant step toward a solution took place in 2014. A Buller Working Group was formed as a joint working committee of BDC and WCRC. The Group consulted with the community and investigated a wide range of potential mitigation options. This included considering the options of clearing the Orowaiti overflow and dredging the Buller and Orowaiti Rivers. External experts provided advice to the Group.

In 2017, the Group put forward five flood risk mitigation options to the community. These options included the ring-bank options described in the WCRC 2021-31 Long Term Plan (LTP), as well as a cut to the sea at the Orowaiti River mouth.[47]

The next significant step was formation of the Westport 2100 Working Group (2018). The recommendations of this Group were forwarded to WCRC and BDC in September 2019. With this background work in mind, the draft 2021-31 WCRC Long-term Plan (LTP) included two choices for flood risk mitigation:

- Development of partial stopbanks and a flood wall scheme at an estimated cost of $3.4m or;
- Development of an extensive stopbank and flood wall scheme at an estimated cost of $10.2m.[48]

[47]There was no clear pathway forward identified through this consultation.

[48] These were preliminary estimates based on limited pricing information, without contingency factored in. Construction price index and the inflation occurring since these costs were first estimated has caused these base costs to increase, along with more rigorous modelling and engineering analysis.

The majority (71%) of those who submitted on the draft LTP supported the $10.2m choice.[49] This decision was subject to further investigation of adverse effects.

Following the floods in July 2021, the Minister and senior officials from DIA requested us to consider the following aspects of the structural (or protect) elements:

- Contributions that may be made by WCRC and BDC.
- Scale and nature of Central Government support.
- Robust costing processes.
- Effects of climate change.
- Value-for-money.
- Steps / stages for moving forward.

With these matters in mind, a Technical Advisory Group (TAG) was established by WCRC (December 2021). The role of the TAG was to satisfy the matters raised by the Minister / DIA and identify preferred flood risk mitigation structural and nature-based options.

Seven options (and permutations of these options) were considered by the TAG. The TAG also considered the influence of climate change scenarios on the options.

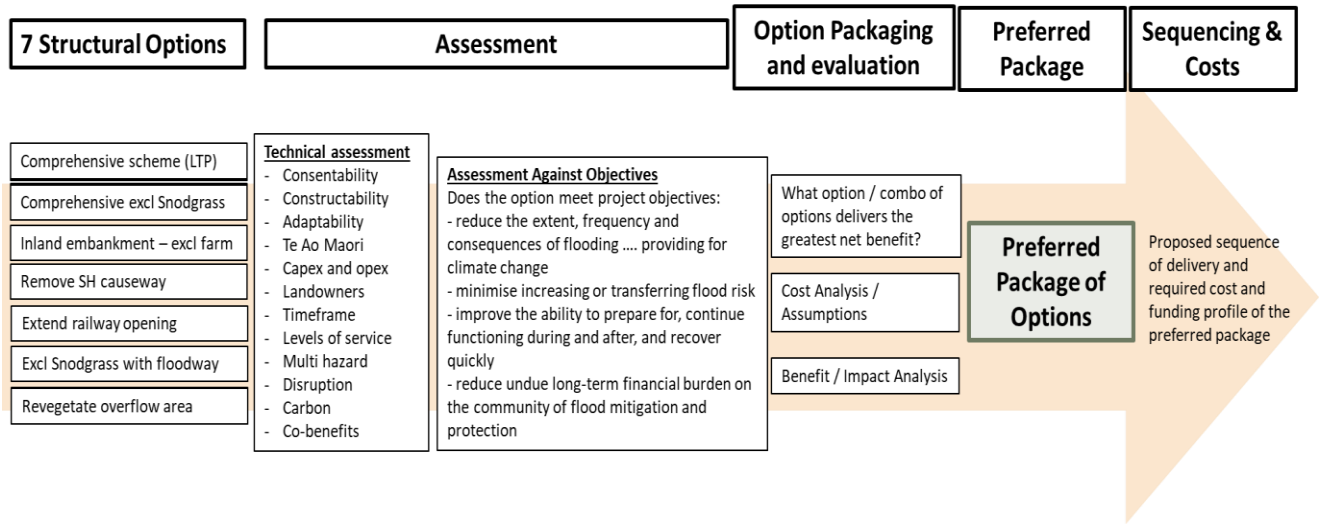
The work of the TAG was informed by the external advice identified under the *Process Overview* section of this report (p30). This advice was augmented by further detailed modelling carried out by Land River Sea Consulting Ltd[50], and flood risk mitigation, design and costing advice provided by G & E Williams Consultants. This work was indispensable, and Matthew Gardner and Gary Williams are to be commended for the quality and integrity of the advice they have provided through this process.

The TAG was also influenced by the reports from NIWA and Infometrics which described the damage likely to be caused and the cost of avoiding that damage – as the basis for determining the likely benefit of proposed flood risk mitigation scheme options.

In order to meet its objective, the TAG followed the process outlined in Figure 14.

[49] This percent is based on submissions from within the Westport Rating District.
[50] This modelling covered the effects of different flood frequency / magnitude scenarios and the flow management opportunities arising from more than seven different flood risk mitigation options. The modelling also considered the effects of a full range of future climate change scenarios.

Figure 14 - Process applied by the TAG



The TAG brought together the findings of all this work, together with other technical assessment criteria, as well as the objectives and critical success factors defined by the Steering Group. This enabled TAG to recommend a preferred package of structural and nature-based measures (as outlined shortly) to mitigate the effects of Westport flood risks. The TAG's recommendations were then considered by the Westport Rating District Joint Committee, the Buller Recovery Steering Group, WCRC and BDC.

Options

The seven core structural options, and permutations of these options, were as below:

OPTION 1 — Comprehensive scheme (as described in the WCRC 2021-31 LTP, $10.2m scheme)

Extensive ring-bank[51], including Carters Beach and the Snodgrass area.

OPTION 2 — Comprehensive scheme – but excluding the Snodgrass area

Extensive ring-bank, including Carters Beach, but excluding the Snodgrass area.

OPTION 3 — Inland Embankment - excluding southern farmland

Reduced area of ring-bank by excluding the southern area of farmland but including the Carters Beach and Snodgrass area.

[51] Ring-bank means the entire ring of protection around Westport. Embankment refers to an individual earthen component of the overall scheme. Walls refers to the proposed wood and earth structures (single and double) to be used mostly in the urban parts of Westport. Together all structural elements are referred to as the Westport Flood Risk Mitigation Scheme. NB we prefer to not use the term 'protect' because it creates a false sense of absolute security from flood risks.

OPTION 3A – Further shortening the inland length of ring-bank around Westport

Further limit to the length of the inland extent of the ring-bank around Westport so that it more closely abuts existing urban areas.

OPTION 4 — Remove State Highway causeway

Extensive ring-bank, including Carters Beach and Snodgrass area, with removal of the State Highway causeway, near the bridge crossing of the Orowaiti Estuary.

OPTION 5 — Extend Railway opening

Extensive ring-bank, including Carters Beach and Snodgrass area, with an extended opening (100 m) in the Railway embankment at Stephen Rd.

OPTION 6 — Exclude Snodgrass with floodway

Extensive ring-bank, including Carters Beach, excluding the Snodgrass area but including a Snodgrass floodway.

OPTION 7 — Revegetate overflow area near Organs Island

Extensive ring-bank, including Carters Beach and the Snodgrass area, with revegetation of the Organ's Island overflow area.

Figure 15 – Temporary stopbank at Snodgrass Road

Modelling

The above options were modelled for the estimated 20, 50 and 100-year flood flows, based on the historical record of the height and extent of the effect of these flows. They were also modelled for the estimated flows and sea level changes expected for the climate change scenarios of RCP6 and RCP8.5. In addition, this modelling took account of the different flood risks posed by the Buller / Orowaiti rivers and the effects of embankment alignment and revegetation changes on the flood flow split (the 'hydraulic effect') between the Buller main channel and the Orowaiti overflow.

Technical assessment

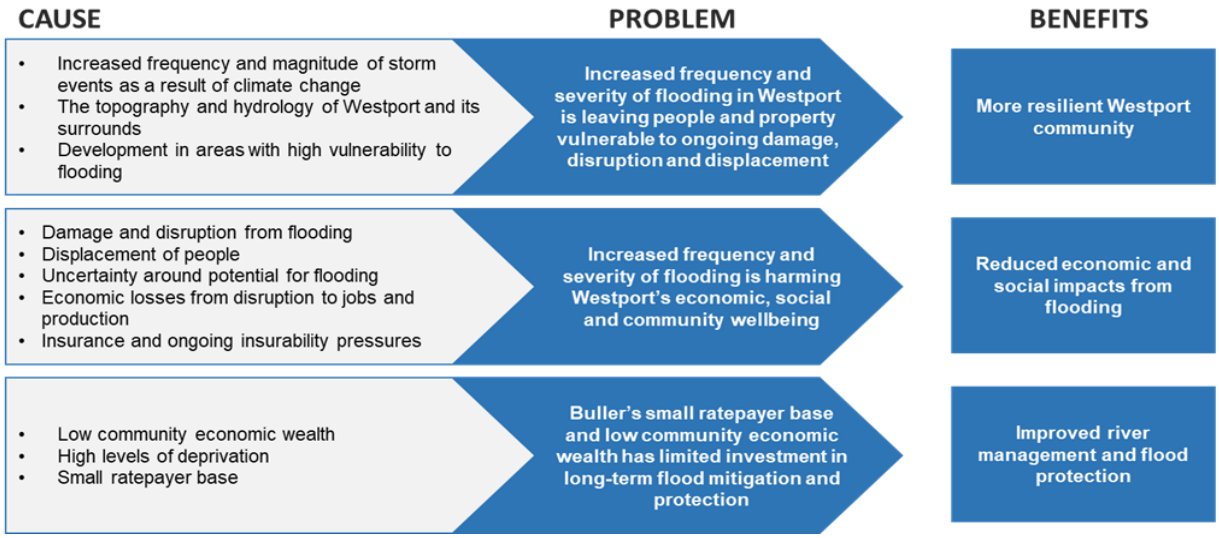
Each option was modelled extensively, and then tested against a set of technical assessment criteria.[52] This assessment was assisted by two site visits, numerous TAG meetings, and the consideration of the expert input reports. The core technical assessment criteria considered included:

- **Consent-ability**: Environmental effects and the ability to obtain resource consents.
- **Constructability**: Design practicality and suitability for site specific conditions.
- **Adaptability**: Capacity for adjustment to cater for future changes to climate-change-induced flood frequency or magnitude.
- **Te Ao Māori**: Compatibility with te mana o te wai and Māori world view.
- **Landownership**: Property status and likely landowner willingness to accommodate.
- **Timeframe**: Staging and total length of time for construction.
- **Levels of service**: Magnitude and frequency of flood flow / sea level rise able to be mitigated.
- **Multi-hazard**: Capacity to address non-flood hazards such as liquefaction and earthquakes etc.
- **Disruption**: Degree to which construction and operation may disrupt usual functioning of economy and community.
- **Co-benefits**: Ability to provide additional community, amenity, and ecological gains.

Assessment Against Project Objectives

Following technical assessment, options were evaluated against the objectives of this proposal, the challenge to be resolved (Figure 16) and the critical success factors as determined by the Buller Recovery Steering Group:

Figure 16 - Challenge to be resolved (as defined by the Buller Recovery Steering Group)



[52] These technical assessment criteria were defined with the assistance of DIA.

The critical success factors that are essential for the successful delivery of this project include:

- **Strategic fit:** How well the option meets agreed objectives and service needs, how well the option aligns with WCRC and BDC strategies and plans and how well the proposals align with wider national and governmental objectives or directions.
- **Value for money:** How well the option maximises the return on investment (benefits over costs).
- **Capacity and capability to deliver:** How well the option matches the ability of agencies and service providers to deliver it and how well the option appeals to suppliers.
- **Affordability:** How well the option meets likely availability of funding and how well it matches other funding constraints.
- **Achievability:** How well the option is likely to be delivered in the current environment and how well the option matches the level of skills required for successful delivery.

Service levels

We have agreed the Westport flood risk protection scheme should have a service level[53] expectation sufficient to protect Westport from flows arising from flood events occurring up to a 100-year ARI / RCP6[54] future climate scenario.

The decision to support the RCP6 level of service across the full length of the ring-bank was a 'line call'. Despite the additional cost of construction (an extra $1.5m), constructability challenges and despite the additional 0.6m+ height, the RCP6 *climate change aware* option is our preferred choice. A key benefit is the cost of avoided damages to Westport buildings. By applying the higher level of service at all locations, this will be close to $400m compared to $200m for the 1:100 historic regime level of protection.[55] Other benefits include: avoiding inflationary costs; and decreasing community anxiety / increasing confidence and wellbeing because of the higher level of service.

The costs and benefits of applying just a 1:100 level 'historic climate regime' level of service to the lower Orowaiti part of the scheme were carefully considered. Our early thinking – now overridden by the RCP6 decision, saw the benefits of applying this level of service to this part of the ring-bank to be:

- Less dangerous nature of flooding from the Orowaiti river and estuary compared to the Buller River.
- Reduced cost compared to the complete 'ring-bank' RCP6 flood mitigation option.
- A general desire to not extend flood mitigation structures into the estuary, and thereby associated reduced environmental impacts and reduced consent-ability challenges.[56]
- Comparatively constrained footprint available for construction at this location.
- Increased impacts on local amenity values due to an average height increase of the stopbanks / walls by 0.6m adjacent to the estuary.
- Availability of the longer-term option of upgrading the proposed structure to a higher standard if that is desired.

[53] 'Service level' means the flood mitigation expectations to be provided by the embankment structures.
[54] 'ARI': Annual Return Interval. 'RCP' – Representative Concentration Pathway' with RCP6 representing one potential 'middle of the range of probability' future scenarios for climate change (NB this scenario is based on an expectation of greenhouse gas concentrations increasing for a time and then stabilising).
[55] NIWA Riskscape report, May 2022.
[56] Advice to this effect was provided to the TAG by Landmark Lile Limited, Resource Management Consultancy, Nelson.

Preferred Structural Option

In summary terms, our favoured Westport flood protection scheme is as follows:

1. Rock lining repair works for bank protection near O'Conor Home (two sections) and Organs Island.
2. A combination of concrete wall, single board walls and double earth filled walls, with the use of each being selected to best suit site specific circumstances.
3. Embankments and walls with alignment, heights, and other design parameters to reflect the results of modelling and hydrological effectiveness research carried out by Land River Sea Consulting Ltd, and design considerations put forward by G & E Williams Consultants.
4. Extension of the flood risk mitigation at Carters Beach to the east to include houses along Schadick Avenue and to provide additional flood risk resilience to additional houses and the critical lifeline utility services provided by the airport.[57]
5. Revegetation of a relic Buller River meander near Organs Island.

Details about our favoured Westport flood risk mitigation scheme follow.

Westport Ring-Bank Options

We initially considered three 'ring-bank'[58] wall and embankment options[59] for the inland area surrounding the urban part of Westport. The first ring-bank alignment was that as notified as part of the WCRC LTP. This is the yellow line on Figure 17. The second was shorter than the LTP option but still extended inland to encompass rural land (Option A). The third option was closer to existing urban development (Option B on Figure 17). Options A and B provided similar levels of service and had roughly the same hydraulic / flow management benefits.[60]

We reviewed the option discussed in the LTP reasonably early on and found that it was comparatively more expensive, and it diverted significant additional flow volume down the Orowaiti in a 100-year ARI / RCP6 event and therefore adversely impacted downstream landowners. It also provided protection to a relatively large area of farming as opposed to the desired focus on areas of urban development. For these reasons we did not proceed with the LTP option, which we also note, had not previously been subject to rigorous engineering analysis.

Options A and B have pros and cons:

- **Cost differences** – Option B is $1.5m cheaper than Option A because it is about 1.5km shorter. It therefore has higher cost-benefits.
- **The number of road, stream and drain crossings** – Option B reduces the number of stormwater and other 'interface' structures required at their junction with the proposed embankment. It will also reduce the net volume of rural-sourced stormwater to be managed within the embankment structure.
- **Managing the extent of urban intensification within the protected area** – Option B provides a reduced area within which urban intensification could be incentivised'.[61]
- **Rural residential** – Option B provides flood risk mitigation to 15 fewer dwellings and implement sheds and four fewer landowners than Option A.

[57] The 244 properties at Carters Beach have a net capital value of about $81m (information supplied by J. Bell WCRC). The Carters Beach flood mitigation structures are estimated to cost $1.7m for the section immediately around the beach and $2.25m for the length extending past the Westport Airport (information supplied by G & E Williams Consultants – both at RCP6). This information suggests the cost benefit of investment at this location is attractive.
[58] Ring-bank is a generic term used to describe the structure proposed for around the town of Westport.
[59] Both options will provide the same service level.
[60] Not as much work was undertaken on the alignment, footprint and on the hydraulic characteristics of Option B compared to the other two options. Refinements will be required when funding is secured, and detailed 'project' design work is undertaken.
[61] Having a flood protection structure may create a possible 'misplaced sense of protection' from flood risks.

- **Affected landowners** - Option B may cause minor raised floodwater levels above floor levels for some upstream rural landowners.

While both options A and B are live, and require further analysis, in our view option B is marginally cheaper and better aligned with the overall intent of this proposal. It also aligns with the aspirations recorded in the following sections of our Business Case, where intensification within the ring embankment is discouraged. We therefore recommend proceeding with Option B.

Figure 17 - Showing LTP alignment, Option A, and preferred Option B alignment

Buller Riverbank erosion protection

The main risk of breach of the Westport and Carters Beach ring-banks would likely be lateral erosion of the riverbanks by floodwaters in the Buller River channel. While Carters Beach is less at risk, as it is behind the large wetland and subject to less erosion pressure, managing the Buller River is, in the long-term, the most challenging flood risk task we face. Re-instating / strengthening this protection is the most critical / urgent part of Westport's flood risk mitigation at the moment.

We estimated the cost of bank protection work to fix the breaching and displacement of rock in the bank lining at Organs Island during the July 2021 flood event, to be $1.7m. Bank erosion work at O'Conor Home will cost $0.92m. A second stage of additional work at O'Conor Home will cost a further $0.68m for a total of $3.3m to bring the protection back to a pre-flood level.

The extent of the above-mentioned works is known – it is future bank protection repair works that are more uncertain. We know there may be other old bank rock protection works that are covered by vegetation. These could fail in future flood events. Protection at these sites will be required if the current Buller River alignment is to be maintained. If this protection does not occur there is a risk that lateral bank erosion would undermine the Westport ring-bank.

Importantly, a longer-term Buller Riverbank protection renewal programme is now required. The initial assessment of our experts is that this would cost at least $300,000 per annum. For a ten-year period, this would be $3.0m. Our request to Central Government is that all the costs of the next ten years of Buller Riverbank protection – including the $3.3m of immediate works, be met by Central Government for a total of $6.3m.[62]

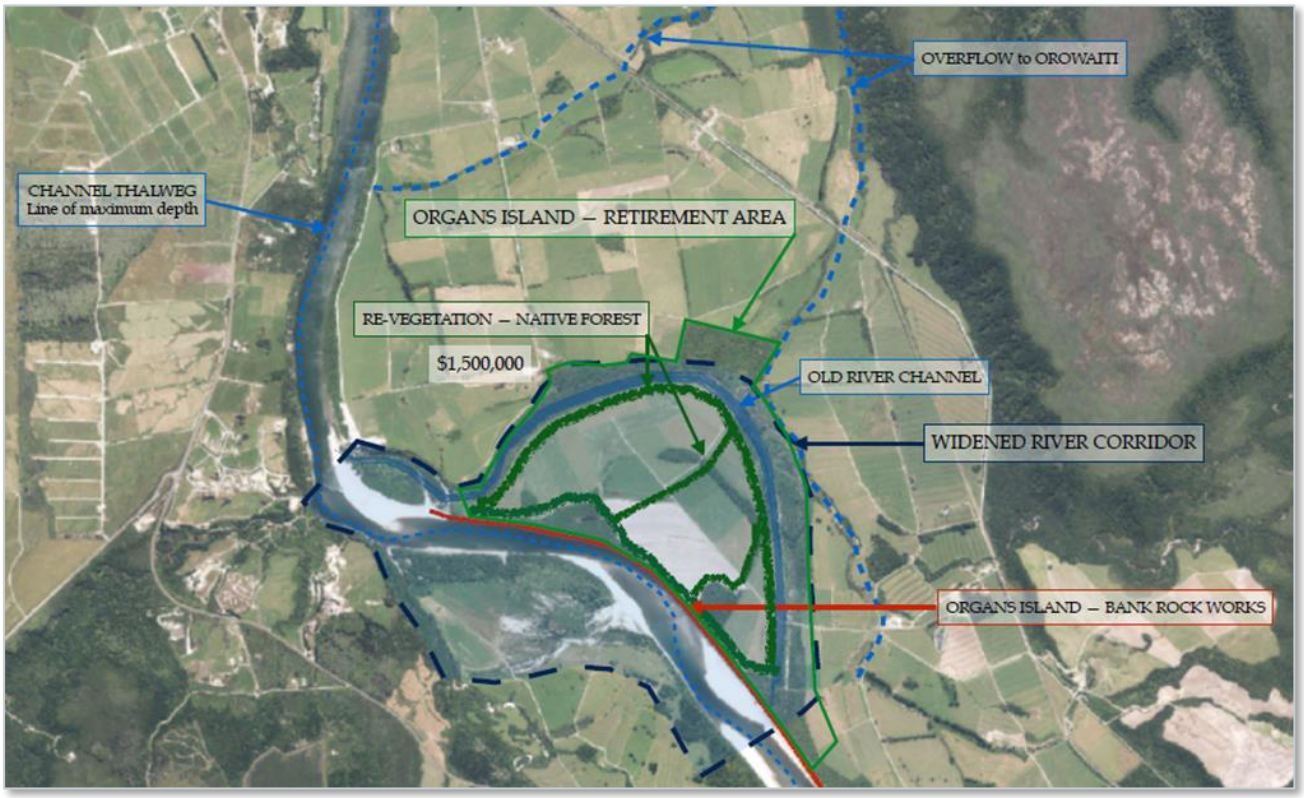
Revegetation of a relic Buller River meander near Organs Island

The area of land on the true right of the Buller River near Organs Island includes a 'relic' channel of the Buller River.[63] We propose this area be revegetated as a wide area of indigenous riparian forest.[64] This would be established over three phases of five years each (Figure 18). When revegetated, this area would provide flood protection by acting as a filter and moderator of flood overflows down the Orowaiti River.

An important river management benefit of this proposal is that, as this vegetation is established, the hard control of the Buller River rock lining could be relaxed. The river would be given more space to move in a natural way, prior to its entry into the sharp bend downstream at the valley-side bluff. This revegetation will also generate co-benefits for indigenous flora and fauna and carbon sequestration.

[62] We address the cost of maintaining the Westport ring-bank and Carter's Beach embankment later in this report.
[63] This land is currently administered by LINZ and leased for grazing. The lease comes up for renewal in June 2022. WCRC is liaising with LINZ. This is a relic Buller River Meander area.
[64] See Figure 14 in the attachment prepared by G & E Williams Consultants.

Figure 18 - Revegetation at Organs Island



Re-alignment of Abattoir Creek

The current alignment and grade of Abattoir Creek contributes to the unwanted re-direction of flood and storm water flows toward urban areas of Westport. We propose to re-grade the bed of Abattoir Creek to enable more flow to be diverted away from this 'at risk' area of urban development.

Flood risk mitigation options not favoured

Details about the risk mitigation options not favoured by the TAG – and the reasons why these were not favoured, are provided in Appendix five. These not favoured options included:

- Dredging of the Buller River.
- Direct cut to the sea from the Orowaiti estuary.
- Flood risk mitigation structures at the Snodgrass peninsula.
- Excavating a causeway on the Snodgrass peninsula.
- Constructing culverts at the railway embankment at Stephen Road.
- Constructing culverts on the embankment adjacent to the Orowaiti State Highway Bridge

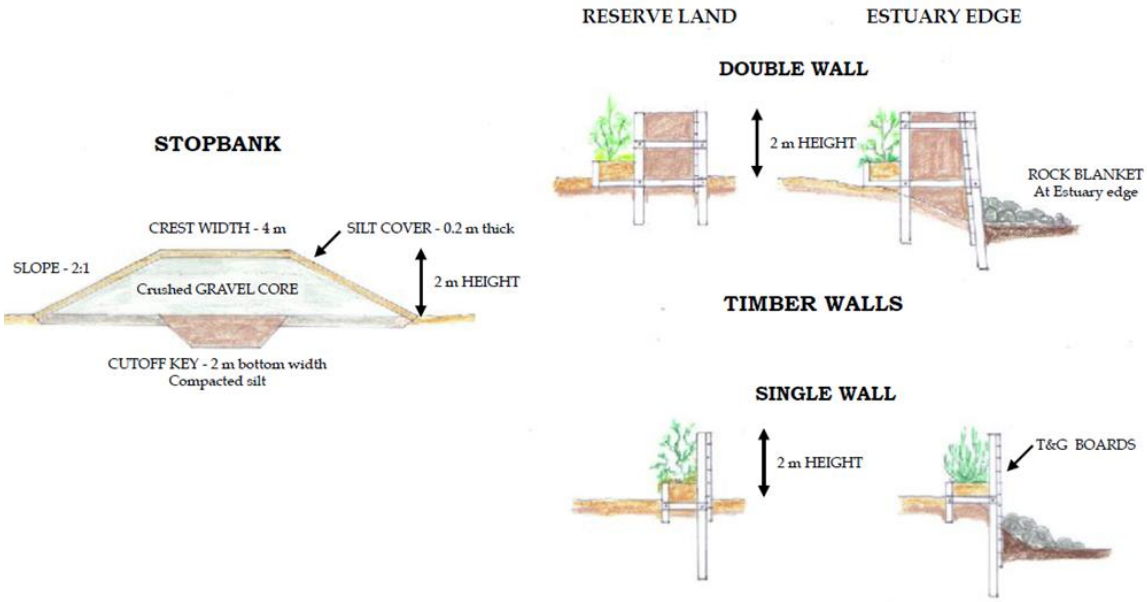
Design, construction. and maintenance

We commissioned a report[65] covering general concept designs for the Westport flood risk mitigation embankment and wall construction. The sketches below (Figure 19) show the likely appearance and proposed location (Figure 20) of the concrete, single board-wall, and double earth-filled walls. Additional information about the constructability of the proposed scheme, its physical and carbon footprint,

[65] G & E Williams Consulting Ltd

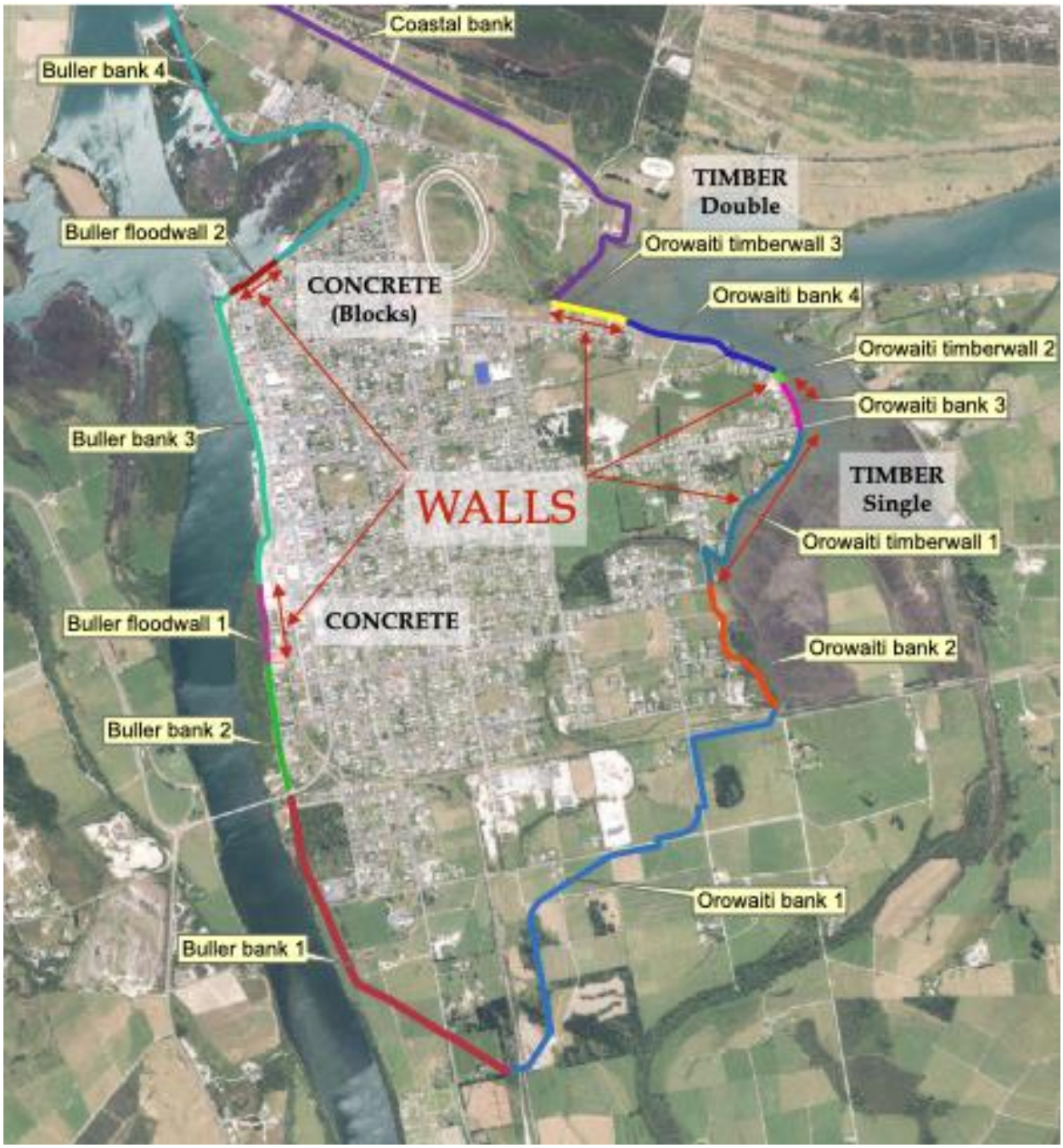
maintenance, structural failure implications, and the adaptability of the proposed structures[66], were also addressed in the report.

Figure 19 - Design of preferred embankment structures



[66] To accommodate more resilience against future climate change scenarios

Figure 20 - Location of different structural options



Resource consent, environment, and property

Resource consents and environment effects

We sought advice from the TTPP team, the TAG, and external experts[67] about resource consent and environmental matters. Key issues and potential mitigations identified within this advice included:

- Under the current Buller District Plan the scheme would be a permitted activity.
- Under the WCRC's Regional Land and Water Plan, earthworks and vegetation removal in the riparian area is a restricted discretionary activity. In other areas, earthworks are a controlled activity. With appropriate offsets and careful management, consent should be grantable.
- Under the Regional Coastal Plan, any activity falling within the Coastal Marine Area is a discretionary activity. In all but two small areas, the proposed embankment is likely to avoid the Coastal Marine Area. The toe of the proposed embankment provides an opportunity to plant reeds and other vegetation suited to extending the area available for inanga spawning.
- An area defined as a 'regionally significant wetland' is located near the proposed embankment at Carters Beach. Activities within 100 metres of this wetland are discretionary. Refined alignment of the embankment at this location will reduce the effect and risk of encroaching on this protected wetland.
- Several properties on the true left bank of the Buller River may be 'affected' by flood level increases because of the embankment. These 'effects' require consideration of the length and height of the Buller River embankment located on the true right of the Buller River, as a discretionary activity. The agreement of affected property owners at this location will need to be sought – with appropriate amelioration before works are undertaken.
- Some minor earthwork areas may have contaminated soil. Careful site management should be applied at these locations.

In summary, the advice provided to us on resource consent and environmental matters suggests that, with careful site management practices, additional design refinements and strong consultative processes, there is a low risk of our preferred proposal not receiving resource consent.

In addition to the above resource consent matters we note:

- Preliminary discussions have taken place with Waka Kotahi about the effects of the embankment on peak flood flows on State Highway bridges. As part of their future asset management planning, we have encouraged Waka Kotahi to give a higher priority to the works required to increase the clearance height at the Buller River State Highway bridge.
- Embankment design and construction between the Toki Poutangata and State Highway bridges will need to be integrated with the design and construction of the proposed enhancements to the Westport cycleway. Similarly, further discussions will be required with Westport Harbour operators and users to ensure the embankment is well integrated into other proposals for this area.
- As noted elsewhere in this report, amenity considerations have been considered as part of the process of selecting the alignment, height, and construction (concrete, single wall, or double wall) of the proposed embankment. At some locations, it is intended to include viewing platforms and other measures to enhance appreciation of the Orowaiti Estuary and Buller River.
- Protection of the lifeline utility value of the airport is a consideration for the extension of the Carters embankment to the Buller River. There is a proposal at some stage to relocate the airport to higher ground. The airport is jointly owned by the BDC and the Ministry of Transport. When detailed planning occurs, we will be aligning the investment in the Carters embankment with the plans for the airport.

[67] Landmark Lile Ltd

Property

The total length of the proposed Westport flood risk mitigation embankment and walls (Option B) is approximately 18 km. Around 50% of this is on public / reserve land, 44% is on private property and 6% is on KiwiRail property (Figure 21).

Most of the private property length of the embankment traverses six farms. In addition, up to 12 lifestyle blocks may be affected. The relatively small remaining length of the embankment will affect 7 properties which are primarily used for residential purposes. A further 15-20 properties will have the embankment or walls on reserve land adjacent to their properties.

Figure 21 - Location and ownership of affected properties

We acknowledge the agreement of all parties affected by the proposed structures will be required before construction can commence. This agreement will need to be formally recorded for resource consent, asset management, occupation, and access purposes.

The consultation challenge we currently face, is that the flood risk mitigation scheme can only be viewed as a proposal. This status will prevail until such time as funding is secured. Westport flood risk mitigation options will then move from a scheme proposal to become a scheme project. An active consultation process will be undertaken with both directly and indirectly affected parties as soon as the project and its funding are confirmed.

The significance of the project is such that the special consultative procedures defined in the Local Government Act 2002 will be triggered. This requires formal processes to be applied by the WCRC before

the project proper commences. In the shorter term, we intend to provide appropriate information to both the community and directly and indirectly affected property owners. This will include those located at Snodgrass, those located immediately inland of the Westport ring-bank and those affected parties located on the true left of the Buller River.

Estimated costs

Overview of scheme costs

Table 2 displays the cost of the various ring-bank scheme sections and the reafforestation proposal. Of importance, we note:

- The uncertainty currently troubling all capital works and supply chains in New Zealand, and for Local Government especially.
- Costs have been estimated on a contract schedule basis, with a preliminary estimate of unit costs and volumes, not as an engineer's estimate for tendering purposes.
- Costs include a percentage for engineering fees.
- Consent and other approval costs are not included.
- Costs for the Buller River rock works are based on a final design with a 10% contingencies allowance.

Operational costs

Provision will need to be made for the cost of interest and maintenance of the flood risk mitigation structures. Excluding interest, these add between 1% to 3% per annum to the final cost of the structures.[68] Based on expert advice, we are recommending provision be made for $350,000 per annum for the maintenance of the ring-banks at Westport and Carters Beach.[69]

Government co-investment to the tune of 75% is requested to assist Westport ratepayers to meet these costs. This would amount to $262,500 pa. This is too big a cost burden for Westport ratepayers to meet given their deprivation status. We request Central Government provide for the first ten years of this expense ($2.62m).[70]

Process costs and contingency

Preliminary work has been undertaken to estimate the cost of community engagement, acquire resource consents, negotiate property agreements, and put in place WCRC and BDC project management. These costs may total $1m. A further $1m should be allowed as a contingency against unforeseen costs.

Stormwater

The cost summary below includes $0.5m for the cost of the use of flap-gates and improved culverts, to better control the interface between the proposed flood risk mitigation scheme and stormwater culverts and pipes.[71]

[68] Less maintenance expenditure will be required early in the life of the proposed structures. More expenditure will be required as they age.

[69] As noted earlier in our report, an additional $300,000 pa will be needed for operational expenditure to maintain Buller riverbank protection.

[70] We believe this is a preferable approach to waiting for the structures to deteriorate during a flood event and then claiming for 'recovery' expenses from NEMA at the current 60:40 rate.

[71] We provide additional information about other stormwater / groundwater concerns later in our report.

Total cost of 'protect.'

The total cost of the 'protect' elements of flood risk mitigation is estimated to be approximately $33m (Table 2).

Table 2 - Total cost of protection

SCHEME COMPONENTS	COST	CENTRAL GOVERNMENT CO-INVESTMENT
Westport ring-bank, Carters Beach, Option B (urban area inland alignment)	$19,550,000	$14,662,500
Organs Island reafforestation (3 x five years @ $500,000)	$1,500,000	$1,125,000
Immediate works on the Buller Riverbank	$3,300,000	$3,300,000
Operational expenditure over ten years on Buller Riverbank	$3,000,000	$3,000,000
Operational expenditure over ten years on Westport ring-bank and Carter's Beach	$3,500,000	$2,625,000
Resource consents, owner agreement, Council project management, final design etc.	$1,000,000	$750,000
Contingency	$1,000,000	$750,000
Total cost @ Option B	**$32,850,000**	**$26,212,500**

Cost benefit

NIWA Analysis

WCRC commissioned NIWA to apply the RiskScape model to analyse the direct damage of flooding effects on Westport arising from several climate change and flood magnitude scenarios.[72] NIWA's report concludes that under an ARI100 / RCP6 flooding scenario[73] approximately $400m[74] of damages is estimated to occur to Westport buildings (the cost of the July 2021 flooding was estimated at $88m).
The work of NIWA thereby confirms significant cost benefits will arise from the investment of $33m in the proposed Westport flood risk mitigation scheme.

Table 3 - Cost benefit

Model Scenario	Buildings: Sum of Building $Loss ($NZ)	Roads: Sum of Exposure Costs ($NZ)	Rails: Sum of Exposure Costs ($NZ)	Scenario Total ($NZ)	Description of Flood Hazard Model Scenario
Base_ARI100_RCP6 (status quo)	404,927,949	$77,426,220	113,254,863	**$595,609,033**	Future Climate, 100-year ARI event (RCP6 2100) - no protection
OpB_ARI100_RCP6 (preferred option)	$15,490,025	$66,665,094	$26,956,520	**$109,111,640**	Future Climate, 100-year ARI event (RCP6 2100) all at this level of protection

[72] 'Direct Damage Analysis for Scenario Flooding in Westport', NIWA, May 2022
[73] This is the scenario recommended and used by TAG to guide the design of its preferred flood risk mitigation scheme
[74] These damage curves are generic, and the damage estimates can be refined upon detailed design

Infometrics Analysis

The work undertaken by NIWA was further confirmed in a report prepared for WCRC by Infometrics.[75] Infometrics applied a slightly different approach, but their results were similar to those generated by NIWA. With no flood risk mitigation structures, Infometrics calculate damages of $264m if an ARI 100 flood was to occur in 2022. If an RCP6 climate change scenario is applied, then these damages would be $488m by 2072 and $596m in 100 years' time (Figure 22).

Figure 22 Residual loss with no flood risk mitigation protection

ARI	AEP	2022	2072	2122
		$m	$m	$m
20	0.0488	**50**	74	84
50	0.0198	**106**	231	286
100	0.0100	**264**	488	**596**
200	0.0050	462	615	682

The Infometrics report concludes by stating…

> … *(p4) the analysis in this report, although based on rather patchy data, clearly shows that (the) stopbank option recommended by the Technical Advisory Group…is highly cost effective…(p15)… the case for pursuing (this option)…could not be clearer.*

Precedent

In the past, Central Government has applied a generous approach toward co-investing in flood risk mitigation at locations such as Westport:

- The 55 'Shovel Ready' flood risk mitigation projects funded[76] in 2021 by Central Government, as part of their Covid recovery programme, received a cost share of between 60% (for comparatively wealthy regions) and 75% (for less wealthy regions).
- The financial assistance rate (FAR) provided to BDC by Waka Kotahi for road projects is 72%.
- Prior to the early 1990s, the capital cost of substantial river management and flood protection schemes put in place by Catchment Boards was commonly supported at levels of 50% to 75% by Central Government.[77] [78] [79]
- The Te Uru Kahika[80] report calls for co-investment of up to 75% toward the cost of whole of catchment climate change adaptation approaches.

These precedents suggest there is more than adequate grounds for WCRC and BDC to seek a 25:75% co-investment with Central Government (75% from Central Government) to improve the resilience of the Westport community against flood risks. Normally, when the cost of mitigation or recovery exceeds the ability of a community to manage, Central Government provide assistance. Matata and Christchurch are examples of where this has occurred to varying degrees.

[75] 'Real Options Analysis of Strategies to Manage Risks to Westport from Climate Change', Infometrics, May 2022
[76] A total of $217m of funding was provided toward 55 projects with a total cost of $313m.
[77] The higher level was applied to less wealthy regions.
[78] The difficult financial period in the 1980's dealt a blow to this necessary investment.
[79] A review of documents from the time suggests this national support typically amounted to over $114m per annum in today's dollars.
[80] Central Government Co-Investment in Flood Protection Schemes', Te Uru Kahika, January 2022

Summary

Our favoured Westport flood risk mitigation scheme strongly satisfies the assessment criteria described previously. When all likely costs are factored in, the approximate cost of our preferred scheme is $33m. Given the affordability challenge faced by Westport residents, the local ratepayer contribution towards this *protect* part of the challenge will be around $7m.

Table 4 - Satisfying the assessment criteria

ASSESSMENT CRITERIA	HOW THE SCHEME WILL SATISFY THE ASSESSMENT CRITERIA
Reduce extent and frequency of flooding	Flood risks associated with storms with a RCP6 / 1:100 magnitude and frequency will be strongly mitigated
Reduce long term burden on the Westport community	The anxiety and uncertainty currently felt by the residents of most of Westport toward flood risk will be significantly reduced. Furthermore, financial stress will be mitigated, relieving long term monetary concerns
Sensitivity to Te Ao Māori	Scheme reflects a balanced approach toward Te Ao Māori
Integrated package	'Protect' is a strong component but just one of the four PARA elements reflected in the multi-tool approach proposed for contributing to Westport's resilience against flood risks. Nature-based solutions are an integrated part of the scheme
Consider options	Seven base options – with permutations and four climate change scenarios were considered
Cost share / co-investment / affordability	A 75% share from Central Government reflects the comparatively high level of deprivation experienced in the Westport community
Robust costing process	Well proven costing practices have been applied
Value for money / cost benefit	Two independent assessments have confirmed the overwhelming cost benefit of the proposal
Staging / phases / timeframe for construction	Works to protect the Buller Riverbank from further erosion are required immediately. Consultation, resource consent and project management matters for the ring-bank portion of the scheme will take 8-10 months. Construction will proceed in stages over a three-year period
Providing for climate change	Historic and RCP 4.5, 6.0 and 8.5 climate change scenarios have been applied to scheme option and cost assessment
Providing for Westport's hazard scape	Coastal erosion / accretion, tectonic movement and liquefaction have been considered as part of scheme design
Avoid transferring risk elsewhere	Flood protection structures have not been supported at the Snodgrass area primarily because of the effect they would have on the increased height of flood water for a distance of up to 6kms.
Consent-ability	There is a high likelihood of all parts of the scheme receiving consent
Environmental impacts	Sensitive wetlands and the coastal marine area will be avoided in all but minor ways
Constructability / capacity / capability / achievability	Scheme design reflects the availability of local construction skills and materials. WCRC systems provide for reliable asset management
Impacts on landowners	Scheme design and community benefits are such that no out-of-the-ordinary problems are expected in securing landowner endorsement / consent

Construction disruption	Some disruption is expected but no more than would be usual for a construction project of this type
Co-benefits	Amenity and ecological benefits will accrue. Certainty about the future resilience of the Westport community and economy is a significant benefit

The Ask

In this section we are asking for…

COMPONENTS	COST	CENTRAL GOVERNMENT CO-INVESTMENT
Structural and nature-based works	$33m	$26m

Avoid

Ensure new development of property and vulnerable assets are not exposed to the hazard

Avoid

Westport cannot be fully protected. The proposed Westport flood risk mitigation scheme will not provide complete protection on its own. We are therefore keen that residents understand and continue to prepare for future vulnerabilities and risks. As mentioned earlier, New Orleans provides us with some salutary lessons (Figure 23). Before Hurricane Katrina in 2005, the presence of an embankment, pumping systems and the availability of federal insurance led to New Orleans households and businesses being constructed in flood prone areas. Inevitably lower income people were living in the low-elevation areas at the greater risk of flooding and subsidence. Citizens earned on average, 30% less than the US median household income.

Hurricane Katrina killed 1,200 people and cost around US$106bn. It was acknowledged that in some parts of the city, embankments (levees) and walls were not tall enough to hold back the water; some floodgates did not close properly, and some structures collapsed entirely. Since then, the New Orleans flood-protection system was bolstered by expenditure of $15bn in federal funds, but in truth New Orleans has never fully recovered. Before Katrina, New Orleans provided the US with more oil and gas than was imported from Saudi Arabia. Thousands of Louisiana families who had relied on jobs in the oil and gas industry left for Houston. Post-Katrina, tourism is the main economic activity.

Figure 23 - New Orleans following Hurricane Katrina

For Westport, like New Orleans we know there is residual risk. Even with the ring embankment, we cannot guarantee there will not be flooding. Sooner or later there will be an 'overdesign' or extreme event. If the climate warms more quickly than expected, this will happen sooner. We think it would be a mistake to allow for uncontrolled intensification and development behind the embankments. We do not wish to place more people and property in harm's way, now or into the future. We want Westport to grow in areas that are outside the flood hazard zone.

We realise that this is a long-term goal. While it doesn't need to happen tomorrow, it does need to happen. It is not the right thing to do to do nothing. The longer we fail to act, the greater the risk. We do not wish to become New Zealand's New Orleans.

While this might seem sensible, in truth this is difficult to achieve under the current legislative settings.

The instrument for restricting development is the Buller District Plan prepared under the Resource Management Act. On the West Coast, the statutory obligations for preparing district and regional plans have been transferred from the three West Coast District Councils to the West Coast Regional Council. The statutory obligations are delegated to a joint committee comprising all four councils and local iwi, with an independent chair. Te Tai o Poutini Plan (TTPP) Committee is responsible for preparing and approving a combined District Plan covering the whole of the West Coast[81].

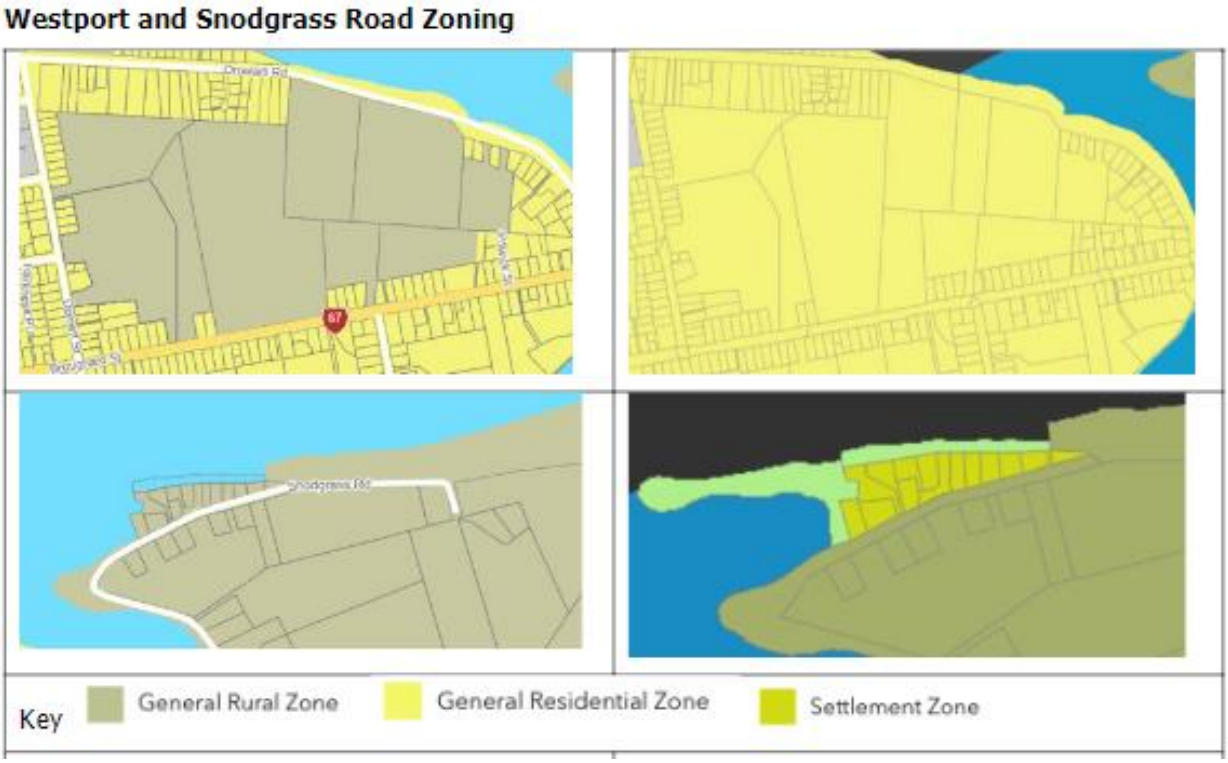
Westport's hazardscape has been the subject of discussion and consultation for many years. Westport 2100 was convened jointly between the WCRC and BDC following Cyclone Fehi in 2018. This led to a community development process (Westport 2100) ahead of TTPP looking at the major hazards in Westport and how to develop a resilient community into the 22nd century.

There was range of recommendations from this process, including specific hazard related recommendations. Provisions for long term managed retreat were also made.

A special rating district was established in 2019, driving the decision in the WCRC's Long-term Plan to construct a ring embankment. Detailed modelling was undertaken to inform protection options and to identify areas exposed to severe flooding and areas that are susceptible to flooding in the Proposed Plan. The TTPP team has applied the hazard overlays to Westport and drafted re-zoning to reflect the risk (Figure 24).

[81] An Order in Council detailing the formal scheme came into force on 19 July 2019 and the West Coast Regional Council through the TTPP Joint Committee, is legally required to prepare Te Tai o Poutini Plan.

Figure 23 - Example of proposed rezoning in draft TTPP



In response to feedback on the draft Plan, the Proposed Plan zoning provisions have been amended. The ring embankment will reduce the risk for many parts of urban Westport. It is difficult to show this when the funding remains unsecured, and the final design is not yet settled. Furthermore, this cannot be progressed until there is certainty with funding.

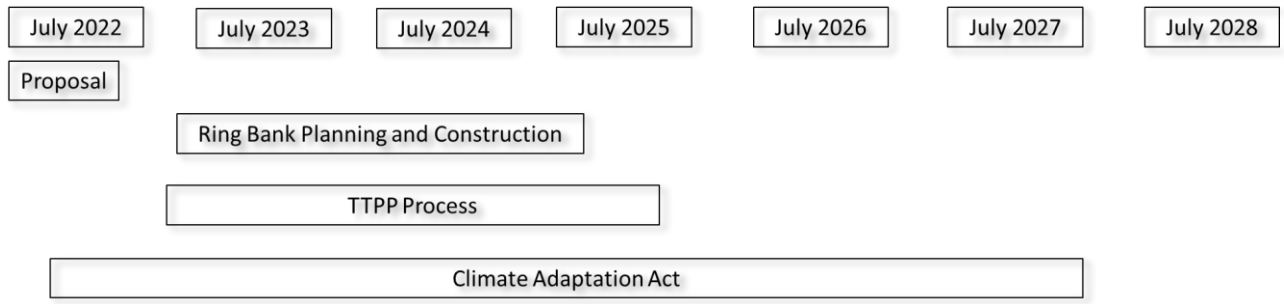
Currently, it is assumed a response from the Government on this co-investment proposal will be available in about September. Hearings on the Proposed Plan are likely to be held in mid-2023, so it is hoped that a government decision around the ring embankment will be available by then so that submissions can be made on TTPP with certainty.

As it stands, under the Proposed Plan, it is proposed to limit subdivision and intensification in high-risk areas through planning provisions that:

- Permit new buildings and alterations where these are protected by an embankment designed around a 1% event (1:100) plus a 1m sea level rise.
- Where new buildings are not protected, they must have a finished floor level of 1% plus 1m sea level rise plus 500mm freeboard for residential, or 300mm for commercial. Unoccupied buildings (such as garages) would require 200mm.
- Subdivision in the Westport Hazard Overlay is discretionary.

While these rules are far from perfect, we think this is a sensible step to prevent uncontrolled intensification and subdivision, and inappropriate development.

Figure 24 – High level timeframes



Prior to those provisions becoming operative,[82] we do not have the regulatory ability to prevent buildings being constructed in flood hazard zones. We cannot stop more people being put in harm's way. We are very keen that people are made aware of the risk when they come to live, work, and play in Westport. With a growth rate of 15% to the year to March 2022, there is a very real risk that many people and much property will end up being in harm's way.

We are very keen to educate people about this risk (see the *Avoid* section for our approach on this). Knowledge of flood risk must not be, in any way, withheld from owners and prospective owners. We think that Land Information Memoranda should explicitly link flood risk and mitigation to a property. But we think this needs regulatory backing.

Additional regulation is necessary to prevent a rush on applications for resource consent in flood prone areas. We are requesting a special order (or other fast track mechanism) to be enacted that allows appeals on the Westport hazard provision of TTPP to be limited to points of law only. A similar initiative has been taken in the past in other regions for required plan rules. We are aware Section 86D of the RMA enables us to apply to the Environment Court for a rule giving legal effect to specified provisions from a specified date. Such applications are problematic.

The alternative is waiting until the Climate Change Adaptation Act is passed and to renotify the provisions after the Climate Change Adaption Act is passed. While the Bill is expected to be introduced by the end of 2023, there is naturally some uncertainty around the RMA reforms, and it is not yet clear if natural hazard provisions can or cannot be appealed under this legislation.

We are also frustrated with the Building Code and more specifically, finished floor levels. Clause E1.3.2 of the Code says *Surface water, resulting from an event having a 2% probability of occurring annually, shall not enter buildings*. This applies only to housing, communal residential and communal non-residential buildings. 2% does not help to protect the people of Westport. All our modelling and planning are based around 1%. We are seeking your assistance either to urgently amend the Code, or to otherwise give flexibility to apply an appropriate standard for the area concerned. This would be of enormous assistance for Westport, and possibly other settlements.

In essence we believe the current building code provisions are not adequate for the hazard in Westport and would like them to be able to apply an appropriate standard sooner rather than later.

We believe there is merit for some property owners assessing the feasibility of raising their houses to provide some freeboard. This is reasonably common in the United States, although there is debate as to whether this is the best use of public money. We think this would need to occur on a case-by-case basis (see Adaptation Relief Fund) under Relocate/Retreat.

[82] This may take several years to work through the process outlined in Schedule 1 of the RMA.

Figure 25 House being raised in New Orleans

Finally in this section, we would like to bring a human element to bear. It is easy to overlook landowners who wish to subdivide or develop their land. These landowners are ordinary people who have aspirations, values and hardships and opportunities. In feedback on the draft TTPP, one submitter asked that financial hardship and mental anguish were taken into account. These dry discussions about planning rules and provisions can sometimes mask the impact they can have on people and their lives.

The Ask

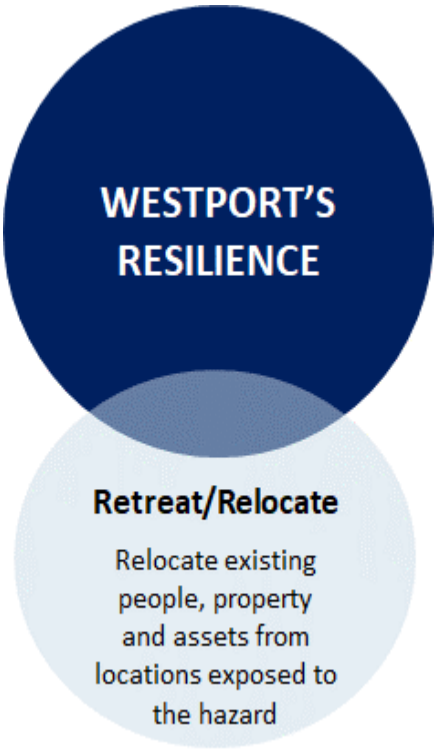
In this section we are asking for:

- An Order in Council or other fast-tracking mechanism for TTPP resilience provisions
- Ability for BDC in its role as a Building Consent Authority to align the Building Code provisions with sensible flood resilience within the TTPP

Retreat / Relocate

Relocate existing people, property and assets from locations exposed to the hazard

Retreat/Relocate

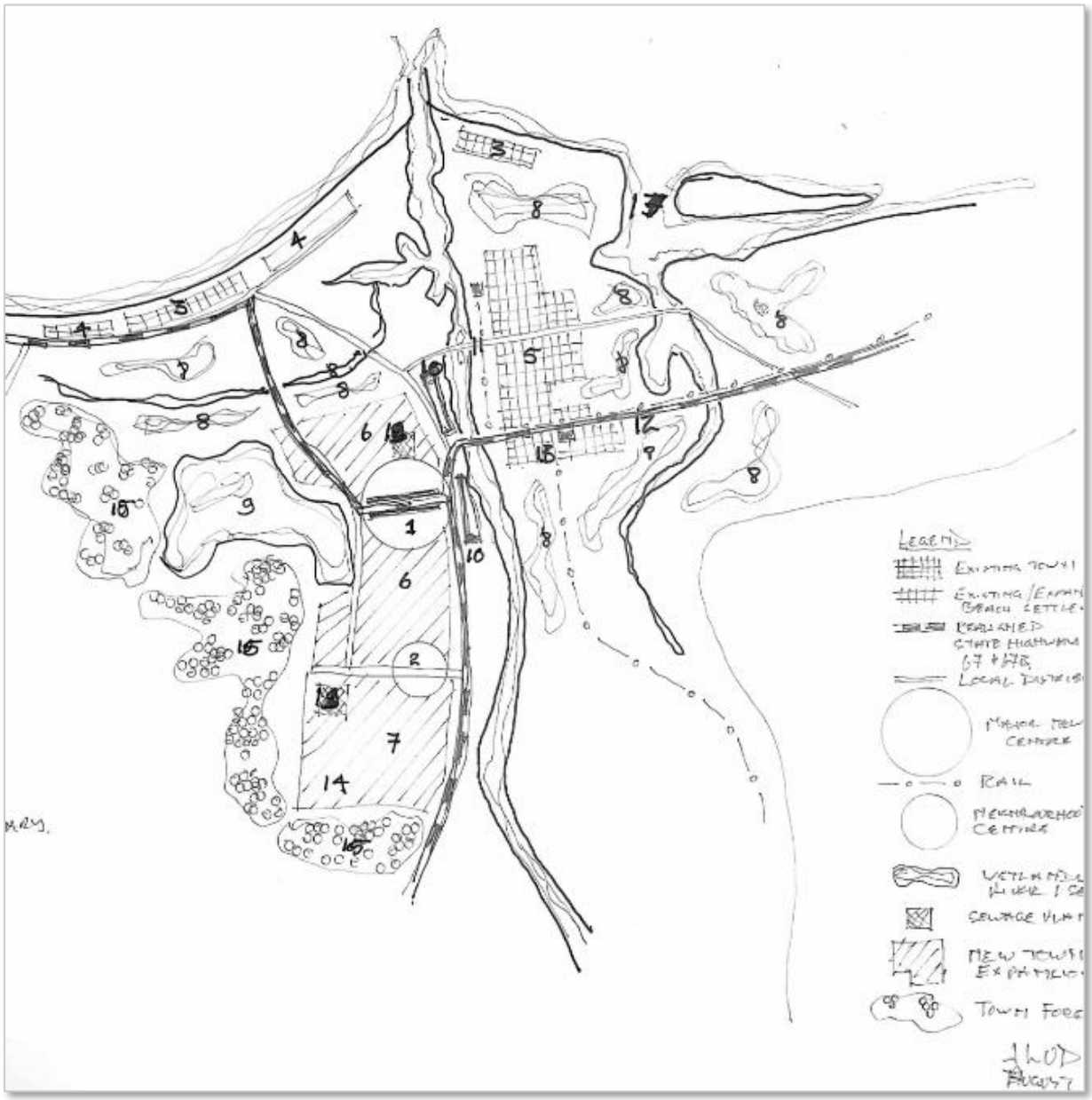


Managed retreat has long been the subject of speculation and unofficial analysis in Westport. It feels as though retreat is likely to happen at some unspecified time in the future. The draft National Adaptation Plan (NAP) outlines a proposal to develop legislation to support managed retreat over a three-year timeframe (2022–25). This will be an approach to *reduce or eliminate exposure to intolerable risk, which enables people to strategically relocate….* The problem for us is the risk in Westport is already unacceptable, and some in the community have already been forced to retreat from high-risk areas.

Westport is a real life, real time example for climate adaptation. All the ingredients are here. We have a burning platform of elevated flood risk. We have a town that needs to grow. We have land that could be available outside the hazard zone, and we have Councils that are willing to collaborate with Central Government, and to transition from forced retreat to *strategic* relocation based on future growth. Instead of focussing on the '*retreat'* we are keen to focus on the '*managed',* and to do this hand-in-hand with the community.

There is risk to this approach. Together we will be breaking comparatively new ground even though Edgecombe, the Christchurch red zone, rock fall areas in Christchurch and Kaikoura and Whakatane have faced similar challenges. There is always a chance that something might not work. With sound advice and analysis, we believe the risk of failure can be diminished and, if there is residual risk, we need to fail fast, learn, and share the lessons. Westport, in partnership with Government, can be used as a model for the preferred strategy going forward.

Figure 26 - Unofficial blue skies thinking around relocating parts of Westport



Zoning

There are several areas of land outside the flood zones where Westport might grow in future. Alongside the Alma Road location other sites were looked at including the Sergeant's Hill area and Cape Foulwind. While these other locations were seen as being suitable for additional development, the Alma Road location was generally considered the best option for large scale managed retreat, due to its proximity to the existing town, the ease of servicing by infrastructure, the elevated location away from coastal and flood hazards and its proximity to the main transport links.

Early in the TTPP development process, BDC staff and elected representatives identified that the Alma Road area was a preferred candidate for managed relocation. Some analysis on its suitability for this purpose was subsequently undertaken following the July 2021 storm. This was when locations for a temporary accommodation village were being investigated.

The temporary accommodation village is being established by MBIE's Temporary Accommodation Service (TAS). Funding for this initiative has been used to temporarily relocate some of the most vulnerable residents in Westport to an area that is not subject to flood risk. The intent of the village is to enable households to stay in their community and allow a more efficient repair programme to proceed. In the past, when TAS villages are no longer required, a community led review has been undertaken to consider repurposing as social or affordable housing.

Under the current TAS proposal, 20 newly constructed houses will be deployed on Council owned land to temporarily rehouse displaced residents. The general Alma Road location has been identified as suitable, and a consent for a temporary village has been lodged, and construction of supporting infrastructure to the site is underway. In addition, BDC currently has a $18m bid with the Infrastructure Acceleration Fund for continuing infrastructure past the village site, to enable further residential development in this area. We are keen to pursue this with vigour.

While the analysis referred to above was undertaken on the suitability of the Alma Road area for residential growth, as well as a *blue sky thinking* exercise and draft concept plans to ensure the area could accommodate growth prior to proceeding with the Infrastructure Acceleration Fund (IAF) application, there has been no formal development, spatial or structure plan developed for the area.

As an interim planning measure, and to seek community feedback on the proposal, a large part of the Alma Road terrace was identified in the draft TTPP as General Residential Zone. The intention is that details about the exact nature of the rezoned area be refined once more information on constraints and servicing capacity is available

It is planned that an area of approximately 80 ha will be rezoned in the TTPP to General Residential, with a small area of 2.4ha zoned as Commercial. The area that will be rezoned is shown below. Buffer zones have been identified to avoid reverse sensitivity issues with nearby industrial activities.

Figure 27 - Proposed Alma Road Development Area

BDC does not have the resources to draft a development plan – let alone a 'structure plan' for the Alma Road area. Nor does the Council have the resources to undertake the level of infrastructure planning necessary for a high quality, resilient and sustainable 'community-centred' development, broader than providing the basic infrastructure needed to enable the level of residential development already under consideration. This means that in reality, spatial planning is required to ensure development at Alma Road is strategically merged with the existing Westport township and areas within the Westport Flood Risk Mitigation Scheme.

We want a more 'integrated' approach to prevail. Our view is this is too good an opportunity to miss. Westport provides opportunities to become a model district within which to apply the provisions of the proposed Strategic Spatial Planning Act.

We are keen to discuss the resourcing required to achieve this objective with Government. We believe a relatively modest investment in a feasibility study around Alma Road (or other sites) could set the scene for Westport 2100. We think this would cost in the vicinity of $250,000. If we do not do this now, we will probably never do it.

Figure 28 - Earthworks for Temporary Accommodation Service at Alma Rd (photo courtesy Pam Johnston)

If the village is already viewed as sustainable for temporary accommodation, we are asking ourselves why it cannot be sustainable on a more permanent basis? Could we grow the village and its infrastructure for the benefit of the long-term resilience of Westport? Could we put infrastructure development on steroids. Could we incentivise relocation by making housing development at Alma Road more competitive than development within the current town? We think the answer to these questions is 'yes'.

Further, if previously vulnerable people can live in houses that are warm, safe, and dry, might this be an opportunity to build a more fulsome and resilient community in an area that will not flood?

Westport is going to grow in the coming decades. In our view, growth ought to be accommodated in areas like Alma Road and Sergeant's Hill. These are lower risk areas that avoid the hazard rather than trying to accommodate it. Alma Road already has significant costs sunk into it. It has been selected because of its location and geographic characteristics. It seems like an ideal opportunity to give effect to the government's intentions.

Strategic Land Purchase

Bearing this in mind, in our view one of the most sensible, proactive, and long-term actions available is for a public agency to strategically secure and repurpose additional land to enable Westport to grow in a lower-risk area. While the Alma Road terraces are an obvious candidate for this, there are other areas that should also be considered.

Realistically, this will be achieved through a Crown agency, or by iwi, unless the Crown provides funding for BDC to acquire land. This would align well with the NAP.

If the agency were to be Kāinga Ora, Alma Road could become a model for building community resilience through social cohesion and resilient public housing, with dwellings built well away from areas prone to climate hazards. Modern homes would be low maintenance, carbon sensitive, safe, warm and dry with commensurate health co-benefits. We think this is a wonderful opportunity, and indeed we have already spent time with Kainga Ora discussing workshopping what this might look like.

Infrastructure would also be resilient with pipes and pumps designed and specified to accommodate growth, to avoid flooding and to endure a seismic event such as AF8.

We propose that a business case be constructed in FY 22/23 by BDC, supported by Kāinga Ora and Kanoa, with a view to securing further land parcels in order to sustain a growth zone for Westport that is in a low-risk area.

We think this would cost $250k next year for detailed analysis, including a detailed spatial study, with a likely capital land purchase value of $3m-$5m, in out years. We do not recommend providing anything other than a provisional sum for infrastructure until the IAF funding decisions are finalised.

We propose to augment our request by setting aside some of our 'better off' funding from the Three Waters reform into a related area. In passing we note that currently we are considering improvements to our stormwater and sewerage separation, climate change preparedness and planning, airport relocation feasibility study and supporting development of the community resilience hub.

We are excited about the prospect of relocating parts of Westport, and we think that there could be merit in the Crown looking at other flood-prone towns with a view to Crown purchase of tracts of land that might be suitable for relocation. Westport's very real experience could be ideal intelligence to inform the NAP.

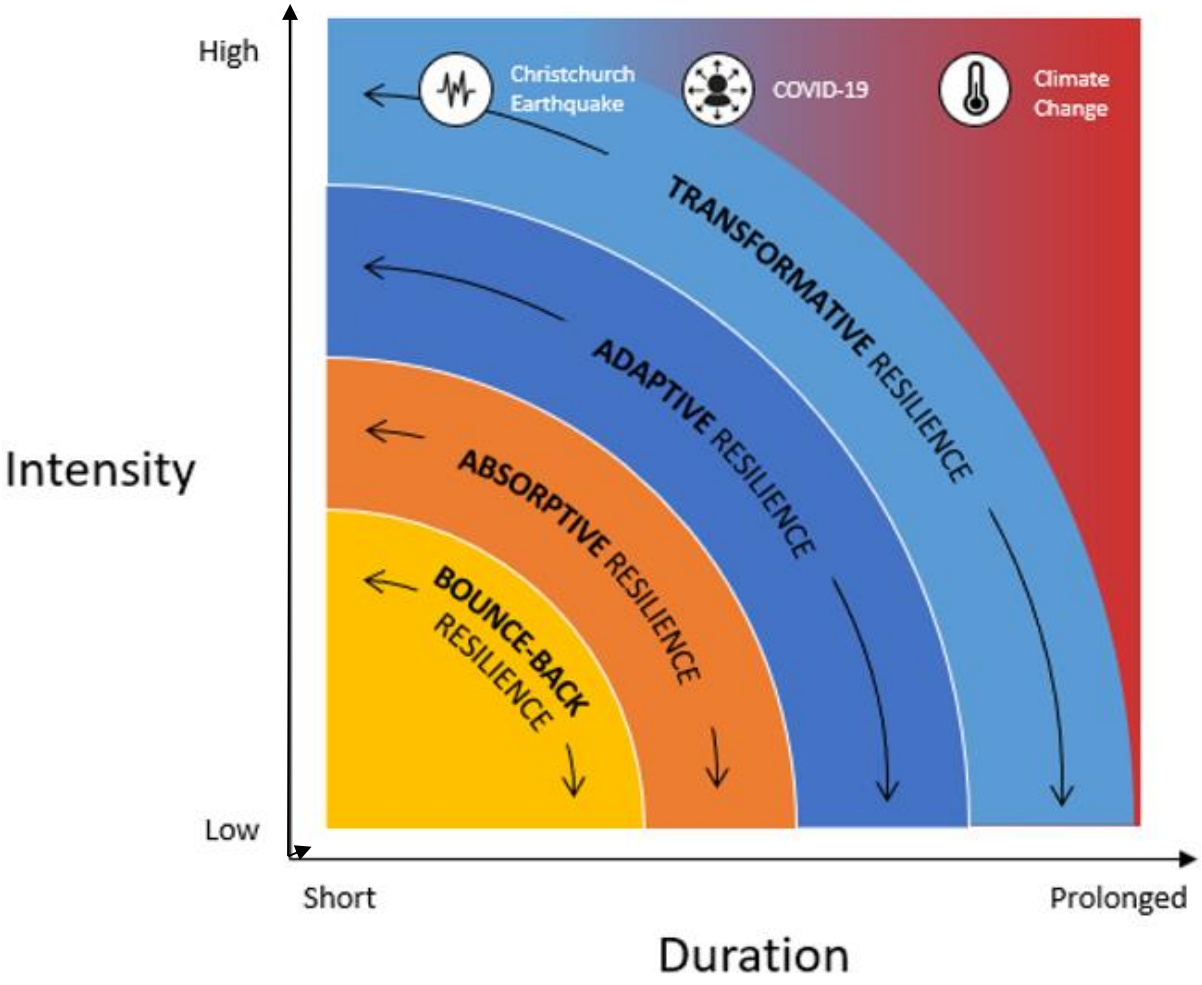
Adaptation and resilience

Because Snodgrass and other parts of the wider Westport area are unprotected, the area will continue to be more vulnerable than urban Westport. Technically, the level of service for Snodgrass will not be the same as the rest of Westport, and it is more likely this area, compared to other parts of Westport, will be subject to flooding. In all likelihood, this means that Snodgrass will be affected by climate change earlier. In addition, in other parts of Westport there will be effects from a degree of ponding or diverted flow as a consequence of the embankment and walls.

It is not our way on the West Coast to do nothing when communities are faced with this type of challenge. We realise that neither the Government nor Councils can undertake a full buyout. But we think it is reasonable to advocate for some level of assistance for people in this predicament.

What we need to head for is long-term 'transformative resilience'. While the intensity is similar, the scale of necessary change may need to occur over a longer period than that for the Christchurch earthquake and that experienced with Covid-19. To state the obvious, we know that responding to climate change-induced flooding presents significant community challenges (Figure 30).

Figure 30 - Climate change induced flooding and transformative resilience[83]



We are proposing establishing an Adaptation Relief Fund of $10m to allow for some local relief for Snodgrass property owners, and for others who might be affected downstream and upstream by the embankment and walls. The purpose of the fund will be to support people who are disadvantaged or unprotected, and who wish to take steps to adapt their circumstances as a result, for example:

- Independent advisory services, along the lines of the Residential Advisory Service in Christchurch.
- A subsidy where owners wish to raise their building's floor level.
- A subsidy where owners wish to relocate to a site outside the hazard zone.
- A subsidy where owners wish to undertake minor earthworks to manage water.
- Conveyancing, consenting or other legal advice.

We envisage this Fund will have a high degree of rigour around eligible candidate criteria and will be overseen by the 'reset' Steering Group[84]. The Fund would be used to partially fund owners who wish to help themselves – we envisage this Fund might cover up to half the cost of specified actions that align with the overall intent of achieving a more 'Resilient Westport'. There would be a cap on the fund.

[83] Source: HenleyHutchings – as adapted from the handbook of regional economic resilience.
[84] More details about the proposed reset of the Steering Group are provided later in our proposal.

It is easy to view seaside communities as places for affluent property owners with financial resilience. We think this is unfair. The Snodgrass community is at the forefront of New Zealand's adaptation effort. Every hazard risk and climate resilient policy quandary is captured in this small settlement. We appreciate that the Government will not wish to set a precedent, but we feel we have an ethical obligation to provide some measure of assistance.

The Ask

In this section we are asking for:

Initiative	Total Cost	Our Ask of Government	Comments
Invest in infrastructure at Alma Road			Live $18m IAF application
Development plan at Alma Road to ensure positive community outcomes	$250,000	$250,000	
Feasibility study into strategic land purchase at Alma Road or another resilient site	$250,000	$250,000	
Adaptation Relief Fund to provide assistance to owners in areas like Snodgrass	$10,000,000	$10,000,000	Evaluation criteria to be refined

Accommodate

Reduce the consequences of the hazard

Accommodate

West Coast CDEM Group

The West Coast is one of the most hazardous places in New Zealand, but with the lowest rating base and very high levels of deprivation. The result of these conditions is that Westport, as part of the West Coast CDEM Group, has the least means to invest in strong CDEM systems and structures. We have formally reviewed the CDEM capability and capacity and have identified areas that could be further enhanced.

Of course, it is not unusual for Civil Defence Emergency Management Groups to have competing pressures and tensions. They also attract fairly regular reviews and restructurings, in an effort to address perceived performance issues, in between events.

We appreciate Government is currently looking to address some of these issues through the 'trifecta' of changes to the CDEM framework. However, while this takes place, we have the existential threat of flooding right here and right now.

The fact is, on the West Coast we have four Councils with too few resources. Reviews have pointed out the need for stronger leadership and culture change, but the West Coast is currently reliant on outside resources to deliver their obligations under the CDEM Act.

We were grateful to receive $375,000 of shovel ready funding for the Westport Advanced Flood Warning System. This has been integrated into the WCRC flood monitoring and response system. The data from the monitoring stations informs alert and flood modelling for the Westport community.

Ideally key CDEM staff would strategically support planners with reducing risk though better land use planning, and through community education based around risk reduction and readiness. However, the focus is almost invariably on response during and after the event and in the case of Buller, lack of infrastructure investment and planning makes our community vulnerable.

While flood hazard is currently front of mind, AF8 is like Damocles Sword hanging over Westport, and the same concerns apply. We believe the associated CDEM reforms will likely increase the demands on our Councils without providing the resource required to implement them. Any change is likely years away. We can't wait.

We have had Emergency Management Assistance Teams assist with developing flood evacuation plans, but we do not have the skills and resources to socialise these plans with our communities. Nor do we have the resources to raise awareness of the hazard and how to respond.

As part of developing this proposal, we invited river and flood modelling engineer Matthew Gardner to make a public presentation about the history and challenges of flooding from the Buller and Orowaiti Rivers. Despite having been flooded three times in eight months, this was the first time we had the resources to be able to provide the community with an overview of the hazard they face every day.

These problems cannot be solved overnight, and that there is never enough resources to do everything in emergency management. But we also know the status quo is indefensible should there be another flood or earthquake.

We would like to propose the Government assist West Coast CDEM to grow its capability through the funding of a secondment of a senior officer or official for two years, a Resilience Officer, based in Westport and linking in to the CDEM structures. Such an officer would pursue the following objectives:

- To educate, connect with and grow community network and neighbourhood awareness of flood and earthquake risk, helping people to help themselves – before, during and after an event. This includes the development and communication of community-based evacuation plans.
- To progress the existing Community Hub and Navigator program, including analysis supporting a permanent hub that incorporates evacuation planning and providing people with the support to connect with agencies that can provide welfare, financial and mental health support.
- To connect people with agencies and funds where communities wish to engage in afforestation or riparian planting activities that contribute to flood risk mitigation.
- To grow Westport-based organic CDEM capacity and leave a legacy of elevated levels of competence.
- To assist to develop GIS systems to provide public facing information to grow hazard awareness.
- To integrate the Advanced Flood Early Warning project into a 'business as usual' framework.
- To liaise with the CDEM Group to strengthen relationships and processes.
- To grow and enhance the West Coast Lifelines Group in and around Westport.
- To develop strong connections and trust with relevant Government agencies and stakeholders, such as MSD, Waka Kotahi, KiwiRail, DoC and NEMA.
- To assess the practicality of deploying planned relocatable temporary flood barrier devices and sandbags.

We think this would cost around $250,000 per annum for two years. This would cover the key person's costs and provide them with a modest budget (for GIS, communications collateral) to achieve the above. By supporting Buller, this will in turn support the region as a whole as CDEM caters for the whole of the West Coast.

Figure 29 - Inflatable temporary flood barrier

Wave and sea level gauge

We have also become aware there is no accurate sea level gauge on the West Coast, nor an accurate wave height buoy. As a result, the coastal boundary conditions used in the modelling have significant uncertainty. We believe it would be prudent to invest in a more robust gauging station to inform future hazard management decisions. There is also significant uncertainty associated with local land movement - a land-based device would keep data relevant during and after an Alpine fault event. Local debate abounds about the balance between tectonic change and sea levels.

We have been told these gauges are installable for around $80k inclusive of a radar sensor and dual communication systems. Annual maintenance would add $10k to the cost. A co-located global navigation satellite system station would also be an advantage as this would address the land movement issue. Without such technology, which is readily available and deployed in other parts of the country – the West Coast is flying blind. The total cost of establishing a fully operational wave and sea level gauge is therefore estimated to be $250,000.

Stormwater and groundwater

The Westport rivers are one of three potential sources of flooding in Westport. Intense local rainfall, high water tables – and the influence of increased sea level heights on these water table levels will also contribute to the town's flood risks. A proposal for a flood resilient Westport would not be complete without addressing these other risks. Provision needs to be made for pumps to remove accumulated local stormwater. These would also provide for the removal of the additional groundwater that may accumulate in the lower parts of Westport because of sea level rise.

We propose that separate provision be made for these circumstances, at a cost $12m. In addition, this investment is required to remove the excess stormwater that may build up when Westport's rivers are at peak flow, the flap-gates are closed and – at the same time, Westport is receiving significant localised rain.[85] We recommend that detailed modelling be undertaken to estimate the circumstances, quantity, timeline and area of effect of sea level rise-induced effects more accurately on Westport's groundwater.

Accommodating through Insurance

Like most New Zealanders we have become accustomed to using insurance as a way of transferring risk. We appreciate this only works where the risks posed by a hazard can be quantified, and traded efficiently, to reduce potential financial impacts. Where hazards are either too frequent, or too rare and uncertain to price efficiently, they cannot be quantified and traded, and insurance may become uneconomic.

[85] Storm water Pumping Proposal. Technical report to the TAG, Buller District Council, 9 May 2022.

There are suggestions Westport is becoming uneconomic to insure. The Insurance Council reports that the estimated cost of the damage to Westport property from the July 2021 flood event at $88m.[86] The allied suggestion is that the industry is not willing to risk a repeat pay-out of this magnitude.

Exacerbating this view, in relation to Westport, Tower announced late in 2021 that it would be increasing premiums in high flood risk areas. Tower stated that: *it did not want to see those who lived in low flood risk areas subsidising those who had homes in high flood risk areas.*[87]

This has caused some community consternation, although insurers themselves report that insurance is still readily accessible in Westport.

There is an abundance of anecdotal but little concrete evidence available to verify the veracity of these stories, or to undertake analysis. However, it is widely expected that insurance in places like Westport will start to become either unavailable or very expensive. The insurance sector itself has signalled that in coming years, future insurers are not likely to take on customers in areas prone to flooding.

This does not come as a surprise. We have been watching developments with *Flood Re* in the United Kingdom.[88] Equal developments are occurring with the National Flood Insurance Program in the USA. Ultimately insurance withdrawal seems inevitable in high-risk locations.

For some years now, Treasury has been assessing options for the future of the market in New Zealand. This is for the benefit of places like Westport, but we are not aware that this is likely to be of much immediate help to Westport.

To be fair to the Insurance Council, for many years it has been strongly advocating for Local Government to take a long-term view on resilience and to not consent to developments in high-risk areas.

If parts of Westport are to become uninsurable, this will be distressing for many West Coasters. There is no silver bullet to fix this issue. In truth it is difficult to even find evidence of insurability, due to commercial sensitivity around that sector. This is difficult for Councils, as we have no wish to consent land use or buildings in uninsurable areas.

Eventually, we think there will be insurance retreat from parts of Westport and other at risk areas. This mirrors what has happened overseas. Inevitably, this means low- income households are increasingly exposed to the full economic risk of climate-related natural hazard events, exacerbating inequalities.

We see the proposal outlined in our Business Case, as an opportunity to mobilise and realign effort to build confidence that Westport manages risks well, related investment and planning are credible, the community is resilient, and we have a very good handle on the climate change impacts we are facing.

Our proposal is informed by what we are hearing from insurers. However, we are realistic about how the insurance sector works. We anticipate a need for expanded future Government involvement. This will be required, at least on a transitional basis, as private insurers find that they can no longer make profit from the transfer of flood risk – mirroring in principle what has occurred with EQC and earthquake risk. We understand this. We are happy to be involved in Government planning and thinking around insurance. We understand that Treasury has been looking at this area for some years, however we have not yet been invited to participate in this analysis.

[86] ICNZ website 22 Mar 2022 *Cost of Natural Disasters.*

[87] 10 November 2021 Residential Flood Risks Tool | Tower Insurance NZ

[88] Flood Re is a joint initiative between the UK government and insurers. It's aim is to make the flood cover part of household insurance policies more affordable.

The Ask

In this section we are asking for:

Initiative	Total Cost	Our Ask of Government	Comments
CDEM capability	$500,000	$500,000	Over two years
Warning buoys and GNSS	$250,000	$250,000	Via GNS and NIWA
Stormwater	$12,000,000	$8,000,000	Opex @ 1-3%

The Ask

A summary of our request

The Ask – a summary of our request

To summarise our request to you Minister, we are asking for a mix of financial and non-financial support:

Initiative	Total Cost	Our Ask of Government	Comments
Protect			
Westport ring-bank, Carters Beach Option B	$19,550,000	$14,662,500	Year 1 (FY22/3)– planning and design Year 2-4 construction (75/25% split)
Organs Island reafforestation	$1,500,000	$1,125,000	Years 2-17 – three x five yr phases
Immediate works on the Buller riverbank	$3,300,000	$3,300,000	
Operational expenditure Buller riverbank	$3,000,000	$3,000,000	Years 1 -10
Operational expenditure over ten years on Westport ring-bank and Carters Beach	$3,500,000	$2,625,000	Years 1 -10
Resource consents, owner agreement, Council project management, final design	$1,000,000	$750,000	Year 1
Contingency	$1,000,000	$750,000	
Avoid			
An Order in Council or other fast-tracking mechanism for TTPP resilience provisions			Minimal additional cost
Ability for BDC as a BCA to align the Building Code provisions with sensible flood resilience within the TTPP			Minimal additional cost
Retreat/relocate			
Invest in infrastructure at Alma Road			Live $18m IAF application
Development plan at Alma Road to ensure positive community outcomes	$250,000	$250,000	
Feasibility study into strategic land purchase at Alma Road or other resilient site	$250,000	$250,000	
Adaptation Relief Fund to provide assistance to owners in areas like Snodgrass	$10,000,000	$10,000,000	Evaluation criteria to be developed
Accommodate			
CDEM capability	$500,000	$500,000	Over two years
Sea level monitor / tide gauge and GNSS	$250,000	$250,000	Via GNS and NIWA
Stormwater	$12,000,000	$8,000,000	Opex @ 1-3%
TOTAL	**$56,100,000**	**$45,462,500**	

How We Will Implement

Governance

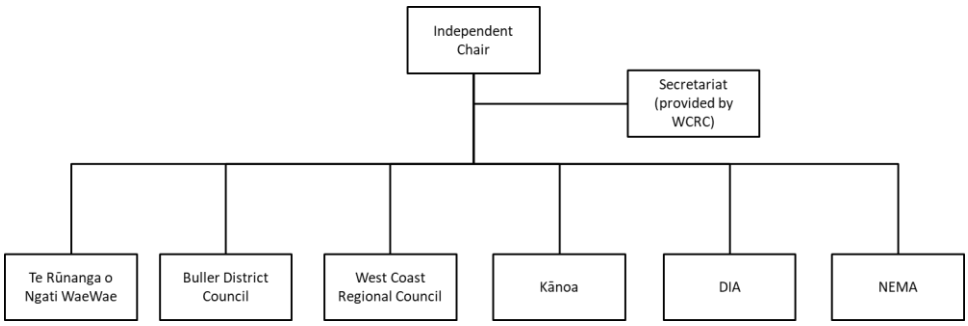
We propose to reset the Buller Flood Recovery Steering Group that has stood us in such good stead to date. The Group already has representatives from both Councils, NEMA, DIA, Ngāti Waewae and an independent chair. We would look forward to adding a representative from Kānoa or Kainga Ora as appropriate. One of the purposes of these additions is to ensure alignment between various governance interests.

We would also adjust the terms of reference to ensure the appropriate level of assurance, co-ordination and oversight for all four elements of the PARA framework was provided. In addition, we would revisit the strategic settings, including the Critical Success Factors. This would be to ensure the long-term purpose of the Steering Group was accurate and that the focus of the reset was clearly on benefits realisation.

We would be happy to invite a senior officer from the Ministry for the Environment to sit on the Steering Group as an observer, in order to provide living evidence of the challenges for those communities facing climate change. This would inform the National Adaptation Plan and the Climate Change Adaptation Act. We also believe we have some valuable insights that might inform the 'Future for Local Government' Review during their process.

We think the Steering Group structure could look like this:

Figure 30 - Proposed Steering Group structure



The costs of the Steering Group are capitalised programme management costs.

Asset Management

Once constructed, the new structural assets need to be properly maintained. WCRC are currently developing best practice Asset Management Plans (AMPs) to drive our future work programme. The AMPs are being designed so that they feed into our Infrastructure Strategies and Long-Term Plans. To help us do this, we have enlisted the assistance of Te Uru Kahika and Greater Wellington Regional Council. They are providing assurance we have the requisite people, systems, and processes in place.

As part of this work, we have adopted a comprehensive, risk-based framework. This is the system developed by New Zealand's River Managers to assess the performance of flood protection assets. This framework is known as the 'National Asset Performance Assessment Code of Practice'.[89] The Code aligns with the principles promoted within the International Infrastructure Management Manual (IIMM, 2015), and therefore also the requirements set out in the ISO 55000 (2014) international standards for asset management.

By applying the Code to Westport, the performance of all the flood protection assets along the river are assessed, with respect to required service levels, whilst considering the risks posed to communities. This system incorporates legacy assets handed down from the catchment board days. It also accommodates other assets (such as private assets) that contribute to flood protection. When completed, assessments produce a risk profile segmented into each distinct reach of a river. The asset performance assessments will enable the Council, on an annual basis, to:

- Identify critical assets and critical asset systems – including all assets established by the Catchment Board in the past, along the river scheme.
- Identify failure modes for particular assets and asset systems, in relation to the performance framework.
- Communicate risk to people.
- Undertake risk-based decision-making in relation to asset performance and flood risk.
- Prioritise remedial actions to the highest risk areas.
- Identify gaps in knowledge or lack of accurate data.

The performance assessments are undertaken by WCRC, but will be shared via the Steering Group, with Buller District Council and other stakeholders such as Waka Kotahi and KiwiRail. This is to ensure integration with other investments such as stormwater systems and bridges, and to ensure an abundance of clarity about who is responsible for managing which assets, both new and existing. Ultimately the AMPs will drive the capital investment and operating budgets in Long-Term Plans.

Programme Management

Given the size and complexity of the work programme described in our Business Case, we are adopting a programme management approach (alongside project-specific management for structural flood risk mitigation elements). This will enable a road map of all the PARA projects to be created with each area grouped into tranches and each able to be processed in tandem. Using this method, we expect increased compliance, decreased construction cycle periods, lower costs and – most importantly, measured progress toward more resilience in the Westport community.

[89] This was developed with support from Waugh Infrastructure Ltd for the Rivers Special Interest Group comprising river managers from across New Zealand's regional and district councils. The river managers sought a framework that would assess the overall performance of flood protection assets in a consistent manner across the country.

A Programme Manager will be appointed. Their role will be to regularly report to the Steering Group on progress on the projects falling within the program, including the basic elements of feasibility, planning, design, construction, risk, and closeout. Each project will be managed both individually and separately from projects in the same group.

We envisage a few of areas requiring specific focus. The Steering Group intends to give additional attention to these areas. They include:

- **Health and safety:** These are the responsibility of both Councils. This will be a standing agenda item for the Steering Group. It will cover mental well-being as well as physical safety. It will likely extend beyond the program itself and into the community.
- **Communications and engagement:** These are a very public-facing programme. At key times there will be a need for a concerted effort with landowner and members of the public. The Steering Group has already recognised this, and the Councils are resourcing this area.
- **Procurement:** The Programme Manager will be accountable for oversight of good procurement practice, ensuring that public sector processes are adopted and followed.

More generally, WCRC and BDC are currently investing in building the capability and capacity of their staff to ensure that programme management is adequate, strongly supported and enduring for the life of the resilience programme. WCRC is in the process of standing up a project delivery team that will resource key projects as required.

Procurement Strategy

The West Coast is challenged by current market conditions just like everyone else. We are experiencing a shortage of professional services, physical works delivery labour and there are delays and cost increases across key supply chains. Perversely, the Government's approach to Covid recovery gave rise to economic stimulation through investment in infrastructure projects. We are not alone in noting this has placed pressure on an already tight market.

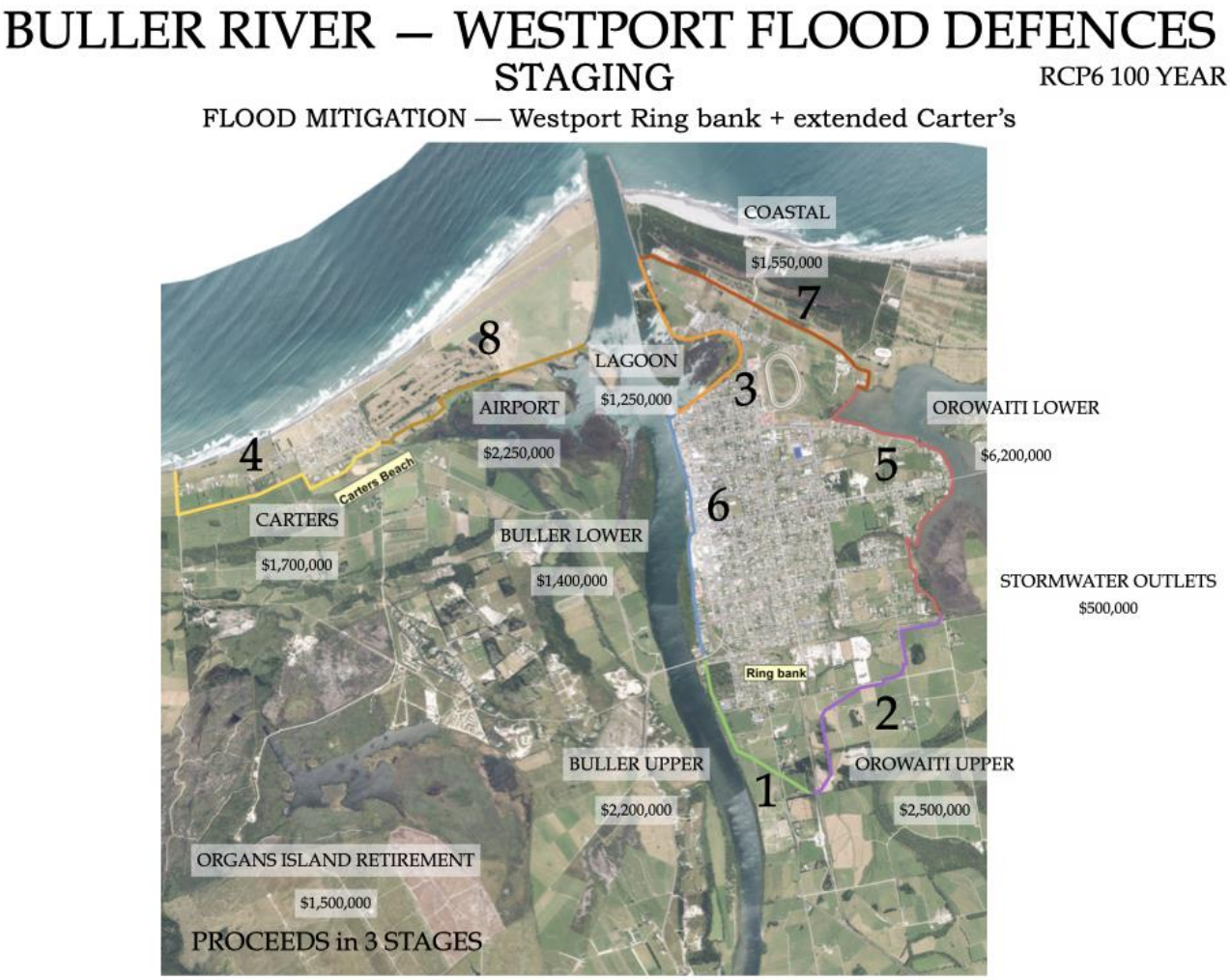
While we have used robust engineering estimates for structural works, there is still a high degree of uncertainty. This in turn has driven our intention to take a proactive approach to procurement practices, program management and contract management to increase our ability to deliver.
In an ideal world we would use a traditional two-tier tender process to secure a construction partner. We have not found this to be a very successful methodology in the current market. Today's abundance of work has discouraged businesses from entering expensive and sometimes protracted competitive tendering processes.

We are therefore proposing to use an early contractor engagement model. This involves us partnering with suppliers such as engineers, designers, consultants and physical works contractors. We will enter into contracts that allow for greater sharing of risk, and as described above we are already building internal capability to plan and deliver projects.

Phasing / staging of proposed construction

Thinking has already commenced around procurement for the ring embankment. We are proposing eight packages of work to be completed over three years:

Figure 31 – Staging of proposed construction



A report[90] commissioned into concept designs also outlined a preliminary sequencing proposal for construction of the flood defences. This was based on the application of a qualitative assessment risk matrix. This matrix is made up of the variables such as: likelihood of flood occurrence; consequences of flood occurrence; constructability (relative ease of construction); and consent-ability.

With this risk matrix in mind, we are of the view that the first stage of construction should be focused on the inland portion of the scheme. The proposed embankment structure next to the Buller River is the number one priority. The 'phased' construction of the full proposed Westport flood risk mitigation scheme is expected to take three years.

Before construction can commence, we know there are many 'process' matters to be resolved. These include securing appropriate project management skills, confirming funding (including a decision from

[90] G & E Williams Consulting Ltd

Cabinet about our desired level of 'co-investment'), consultation with affected parties and landowners, acquiring resource consents, securing property access rights, confirming 'rights' for land occupation by scheme structures, completing final design, and tendering for the supply of services and materials. These processes may take 8-12 months.

Conclusion

We began developing this proposal with an honest conversation about the flood risks for Westport, and our ability to pay to mitigate them. We designed and followed a process that set out to satisfy the Better Business Case framework.

We convened a Steering Group that shepherded a work programme through that process to settle on the recommended package of options we have presented. The Steering Group ensured that our process had integrity, and assured buy-in from key stakeholders.

We have applied the PARA framework. The components of this framework are interdependent strategic packages of initiatives. Many of these initiatives have already been discussed with the people of Westport but have not previously been formally collated and articulated in this way.

The package does not all need to happen at the same time. But some work cannot wait. The Buller riverbank rock protection and the ring-bank cannot wait. If we wait, the cost of damage to buildings alone is likely to be $400m. To us, this part of our proposal seems an obvious candidate for fast-tracking. The Crown itself has $1bn of assets in Westport, many of these are at risk.

We acknowledge that the risk cannot be eliminated. There will always be a degree of residual risk. The ring-bank does buy us valuable time so that we can deploy some of the *Avoid* and *Retreat / Relocate* strategic initiatives.

We feel that these initiatives are all strategically aligned with the Government's direction of travel, and we are pleased to be able to work alongside you as a case study.

On the following page we have summarised how our proposal aligns with the Better Business Case framework.[91] We are comfortable that we have managed to bridge Local and Central Government processes. We think that local and central collaboration is essential if we are to successfully rise to the challenge of climate adaptation, and we are happy to be at the forefront of thinking and action.

Finally Minister, we wish to conclude by thanking you again for your support and the support of your officials to date. They have been superb to work alongside.

[91] Framework provided by Morrison and Low.

Indicative Business Case

Strategic Case:

Need to Invest

- *Westport is situated on a floodplain, between two rivers and the sea. It is one the most flood prone communities in New Zealand.*
- *In July 2021 and February 2022 Westport experienced two very large flood events. The community will struggle to sustain another event, social-psychologically and financially.*
- *Westport also has a very low rating base and one of the highest levels of deprivation in New Zealand. Without government co-investment the community can not afford future-proof flood protection measures*
- *There is strong community agreement that 'doing nothing' is not an option*

Strategic Context

- *'PARA' framework – international framework developed for climate change adaptation planning*
- *Buller DC and WCRC Long Term Plans*
- *Local Government Act 2002*
- *RMA reform*
- *CDEM Act 2002*
- *Three Waters reform*

Investment Objectives and Case for Change

Objective 1:	***Reduce the extent, frequency and consequences of flooding from severe weather events on the Westport community***
Existing arrangements	*Flooding has occurred throughout Westport's history and the district is at risk of further flooding events. Climate change will substantially increase the severity and frequency of the risk of Westport flooding.*
Business Needs	*Our aim is to reduce the probability of flooding causing damage and disruption to people and property in Westport and its surrounds, taking into account what is needed to adapt to the effects of climate change.*
Objective 2:	**To Improve the ability of the Westport community to prepare for, continue functioning during and after, and recover quickly from flooding events**
Existing arrangements	*The community is fatigued by recent flooding events and frustrated with the lack of direct action taken to mitigate future risk.*
Business Needs	*To make sure the Westport community is more resilient and prepared, recognising that 'absolute protection' is not possible and that there will be some level of residual risk of flooding.*
Objective 3:	**To Reduce undue long-term financial burden on the community**
Existing arrangements	*Westport's low ratepayer base cannot afford a future-proofed flood protection scheme.*
Business Needs	*The cost of building and operating flood interventions and of flood response strategies is financially sustainable for both current and future residents.*

Economic Case:

Initial Options Analysis

NIWA analysis confirmed that significant cost benefits would arise from the investment into the proposed Westport flood risk mitigation scheme…

Model Scenario	Buildings: Sum of Building $Loss ($NZ)	Roads: Sum of Exposure Costs ($NZ)	Rails: Sum of Exposure Costs ($NZ)	Scenario Total ($NZ)	Description of Flood Hazard Model Scenario
Base_ARI100_RCP6 (Status quo / no protection)	$404,927,949	$77,426,220	$113,254,863	$595,609,033	Future Climate, 100-year ARI event (RCP6 2100)
OpB_ARI100_RCP6 (Preferred option)	$15,490,025	$66,665,094	$26,956,520	$109,111,640	Future Climate, 100-year ARI event (RCP6 2100)

Infometrics calculated the discounted costs (investment cost plus residual loss) compared to Do Nothing, which further validated NIWA's findings…

Action	No Climate Change ($m)	RCP6 Climate Change ($m)
Do nothing	169	213
Preferred Option	36	50

The Preferred Way Forward: *Our proposal combines a mix of structural solutions and adaptive pathways. The former provides Westport some security in the short-term, whilst buying some time for preparation of adaptive solutions over the longer-term, such as moving to higher ground.*

Commercial Case:

The Potential Deal: *Our intention is to take a proactive approach to procurement practices, program management and contract management in order to increase our ability to deliver.*

We are proposing to use an early contractor engagement model. This involves us partnering with suppliers such as engineers, designers, consultants and physical works contractors. We will enter into contracts that allow for greater sharing of risk, and we are already building internal capability to plan and deliver projects.

Financial Case:

Indicative Costs

	Total Cost	Govt Co-Investment
Opex	$8.3m	$7.35 m
Capex	$39.1 m	$29.9 m
Total	**$47.4 m**	**$37.3 m**

Affordability and Funding: *Investment in flood protection can be expensive, but not investing in flood protection can be much more expensive, as evidenced by NIWA and Infometrics' analysis.*

Ratepayers are willing to fund a fair proportion of the required works but the full costs are too big a burden for Westport, especially given its low ratepayer base and deprivation status.

Management Case:

2022 → 2023

- Proposal delivered to central government — **June 2022**
- Response from central government [working assumption] — **September 2022**
- Consultation with local community — **Early 2023**
- Ring bank planning and construction — **Mid 2023**

Achievability: *Given the size and complexity of the work programme described in our Business Case, we are adopting a program management approach. This will enable a road map of all the PARA projects to be created with each area grouped into tranches and each able to be processed in tandem. Using this method we expect increased compliance, decreased construction cycle periods, lower costs and measured progress towards more resilience in the Westport community.*

Appendices

Appendix one: Correspondence from the Minister of Local Government

Office of Hon Nanaia Mahuta
MP for Hauraki-Waikato
Minister of Foreign Affairs
Minister of Local Government
Associate Minister for Māori Development

17 February 2022

Allan Birchfield
Chair, West Coast Regional Council
allan.birchfield@wcrc.govt.nz

Jamie Cleine
Mayor, Buller District Council
jamie.cleine@bdc.govt.nz

Tēnā kōruā

Building the resilience of the Buller district to future flooding

I am writing to offer my support to the work your councils are doing to improve the resilience of Buller to future flooding and to set out my expectations for the next phase of work.

I firstly want to acknowledge and thank you for your work to date to support the Buller community recover from the July 2021 flooding and your management of the recent severe weather events. These events demonstrate the challenges and urgency you face in protecting the community from future flooding.

My officials have provided regular updates on the recovery work since the July 2021 flood event. I am pleased to hear of the collaboration that the Buller Recovery Steering Group has achieved working with your two Councils, Ngāti Waewae and the Government agencies. I support the use of the Steering Group to develop options to increase the resilience of the Buller district to future flood events, as well as continuing to oversee the allocation of funding approved by Cabinet last year to support the recovery effort.

Ministers have agreed that options should be developed in order that the Government can consider co-investment in flood protection as part of a set of solutions to enhance the flood resilience of the Buller District. It is important that the Steering Group oversee the development of an integrated package to provide longer term flood resilience recognising the different contributions that the two Councils might play.

Developing a proposal for co-investment

I request that you present a proposal for co-investment in June 2022 as I recognise your community will need certainty as to the scale and nature of any central government support as soon as possible. I will work with other Ministerial colleagues to consider your proposals, which, if supported, will be taken to Cabinet in mid-2022.

Private Bag 18041, Parliament Buildings, Wellington 6160, New Zealand
+64 4 817 8711 | n.mahuta@ministers.govt.nz | beehive.govt.nz

It is important to note, however, that I cannot guarantee Crown funding or financing for any co-investment proposal. The Minister of Finance's expectation is that proposals with financial implications should generally be consideration in a Budget process, unless there is a compelling case for urgency. As such, for the co-investment proposal to be successful it should be well-developed, demonstrate value for money, be robustly costed and accompanied by detailed next steps.

So that I can present the strongest case to Cabinet it would be helpful if the proposal could set out:

- why current policy and funding levers are insufficient to result in the best long-run risk reduction package for the community. This means the proposal should be clear about what Crown support can achieve over-and-above what is possible given your respective financial capacities;
- what makes Buller an urgent and compelling case, given the number of other communities in New Zealand that are exposed to natural hazards that would also benefit from central government support;
- how the proposal supports the government's broader policy goals in areas such as climate adaptation, community resilience, and resource management reform. Department officials can support you to identify these goals and contribute their knowledge on relevant Government policy and directions.

I have asked my officials to support you in developing the broad set of options for future flood resilience but I note the development of the co-investment proposal will need to be driven by your respective councils according to your existing roles and responsibilities.

I look forward to reviewing your proposal in due course.

Nāku noa

Hon Nanaia Mahuta
Minister of Local Government

Copies to:

Hon Kiritapu Allan, Minister for Emergency Management, k.allan@ministers.govt.nz

Francois Tumahai, Chairman Ngāti Waewae Arahura, francois@ngatiwaewae.org.nz

Heather Mabin, Chief Executive of West Coast Regional Council, heather.mabin@wcrc.govt.nz

Sharon Mason, Chief Executive Buller District Council, sharon.mason@bdc.govt.nz

Richard Kempthorne, Independent Chair, Buller Recovery Steering Group, kempthorne.randj@outlook.com

Paul Barker, Partnership Director, Department of Internal Affairs, Paul.Barker@dia.govt.nz

Appendix two: Buller Recovery Steering Group Terms of Reference

Terms of Reference for the Buller Recovery Steering Group

Background

On 23 August 2021 the Government agreed to provide additional assistance of $8 million in 2021/22 to enable the Buller District Council to meet its immediate operating shortfalls and start a recovery programme of works following the July 2021 flooding event. It was noted that the National Emergency Management Agency (NEMA) and the Department of Internal Affairs (DIA) would develop a governance structure in consultation with local government to oversee and monitor the Buller District Council's (BDC) use of available funding, inform regular reporting to the Minister of Finance, Minister of Local Government and Minister for Emergency Management and seek draw down of funds in monthly instalments.

A Steering Group was established in September 2021 comprising BDC, the West Coast Regional Council, iwi, DIA and NEMA chaired by an independent Chairperson. The Steering Group has overseen the allocation of most of the $8 million appropriation to support the BDC's flood recovery activities. A Funding Agreement has been established between the BDC, DIA and NEMA which provides the specific arrangements for payment of Crown funding to support the BDC's recovery efforts.

Given the progress achieved with the immediate response and recovery led by the BDC, a review of the focus and operation of the Steering Group was undertaken at the end of 2021 to consider:

- The increasing shift of focus from flood response and immediate recovery to longer term flood resilience for the Buller district;
- The need to review representation from the West Coast Regional Council given the increased focus on flood protection measures as part of the longer-term flood resilience work; and
- The need to continue the role of the Steering Group to provide assurance to Ministers for the remaining allocation of the $8 million appropriation as well as to provide advice on further funding assistance that may be needed.

Accordingly, the Buller Recovery Steering Group's focus and membership have been amended and supersede previous terms of reference.

Purpose and Term

The Purpose of the Steering Group is to:

- provide effective guidance and oversight of the financial assistance appropriated by Cabinet in August 2021 to support the Buller Recovery including related matters set out in the Funding Agreement between BDC and DIA and NEMA;
- identify and recommend longer term flood recovery priorities for the Buller District including options to increase resilience to future flood events;
- provide advice to the Crown[1] and elected Council's members on future funding that may be sought from the Government to support the Buller flood recovery and increase resilience to future flood events.

The Group will continue to meet until 30 June 2022 when its role and purpose will be reviewed.

---

[1] Noting that NEMA and DIA officials will absent themselves from decisions for funding requests to the Crown

Membership and Chair

Membership of the Steering Group will include:

- The Chief Executive and Deputy Chief Executive of the Buller District Council
- The Mayor and Deputy Mayor of the Buller District Council
- The Chief Executive and a designated member of the Executive of the West Coast Regional Council
- Two elected representatives from the West Coast Regional Council
- A representative of iwi
- A representative of the Department of Internal Affairs (DIA)
- A representative of the National Emergency Management Agency (NEMA)
- An independent Chair

- Each organisation shall nominate a specified alternate to the permanent appointee being a person who is mandated to speak on their behalf.
- A quorum for a Steering Group meeting shall be five members (or their alternates).
- The Chair will be nominated by the Government representatives in consultation with the Steering Group. This position will be funded by the Department of Internal Affairs.
- The Steering Group may invite other organisations or individuals to attend meetings as appropriate.

Role of the Steering Group

The Steering Group will:

- Provide oversight and guidance of work streams needed to give effect to the funding appropriated by Cabinet.
- Approve (or agree on) the work programme priorities and key milestones noting that a work programme and work streams will be developed alongside these terms of reference.
- Provide advice on key components of the workstreams including where financial assistance is sought from central government.
- Provide recommendations to the Chief Executives of the Buller District Council and the West Coast Regional Council in respect of findings and conclusions arising from the work programme noting authority rests with the Chief Executive and ultimately the Council.
- Support work stream leaders.
- Provide assurance over the progress of the work programme to the Mayor/Chair and Councils, iwi and, through Government department representatives, to the Minister(s).
- Monitor performance and report progress to the Council (via the Chief Executives), Iwi and the Crown (via Government Department representatives) on:
  - Risks and issues
  - Progress against budget
  - Progress against time lines
  - Performance against quality standards
  - Cashflow.

- Initiate and manage any independent audits or reviews requested.

- Assess and support the effective working relationship with key parties with interests in the work streams, including iwi and local stakeholders.

Steering Group Undertakings

Members of the Steering Group undertake to:

- work in a collaborative 'no surprises' way, and strive for consensus on desired outcomes for and projects to achieve them and related matters in order to achieve a 'best for recovery/work stream' outcome;
- create a high trust environment based on respect for each other and the agencies represented;
- support the respective organisations to achieve the best outcomes for the people of the Buller District affected by the July 2021 flood event; and
- ensure that public information and communications enable consistent and timely information on progress and agency roles and responsibilities. The Chair is responsible for all media releases.

Steering Group Administration

- The agendas for the Steering Group will be approved by the Chair, in consultation with the Chief Executives of the Buller District Council and the West Coast Regional Council.
- The Steering Group will collectively determine the meeting frequency, although the Chair may schedule additional meetings of the Steering Group, if required.
- A Secretariat will support the Steering Group by preparing papers and supporting analysis/documentation.

Approved by Steering Group 3rd March 2022

Appendix three: Flood Risk Management Legislative Framework

Legislation	Relevant Flood risk management purpose	Agencies/local authorities responsible
Resource Management Act 1991	• Management of significant risks from natural hazards (including floods) • Identification of hazards and control of land use and subdivision	• Ministry for the Environment • Regional councils • Territorial authorities
Building Act 2004 (and Building Code)	• Manages natural hazards in relation to construction and modification of buildings • Restricts building on land subject to natural hazards • Allows councils to set finished floor levels in relation to flood risk	• Ministry of Business, Innovation and Employment • Regional councils • Territorial authorities
Local Government Act 2002	• Local Government is responsible for the avoidance and mitigation of natural hazards • Long term plans provide for natural hazard management activities, flood protection and urban stormwater infrastructure.	• Department of Internal Affairs • Regional councils • Territorial authorities
Land Drainage Act 1908	• Allows land to be drained, contributing to modifying flood events • Powers to take and maintain land for drainage • Powers for new drains across private land	• Regional councils • Territorial authorities
Soil Conservation and Rivers Control Act 1941	• Powers to prevent flooding and soil erosion • Powers for general maintenance and works to water courses to avoid flooding/erosion	• Regional councils
Rivers Board Act 1908	• Control of rivers and powers to carry out works to prevent or lessen flood damage.	• Regional councils
Civil Defence and Emergency Management Act 2002	• Manages hazards across the 4Rs – reduction, readiness, response and recovery • Responsible for local level hazard management	• National Emergency Management Agency • Regional councils • Territorial authorities
Earthquake Commission Act 1993	• Provides insurance for land damage from flooding (if an insurance policy with fire cover is held) • Can decline a claim if the property has a s74 Building Act notice on it and the listed hazard occurs	• Earthquake Commission

Climate Change Response (Zero Carbon) Amendment Act 2019	• Requires preparation of a National Climate Risk Assessment and a National Adaptation Plan • Provides for reporting requirements on climate change adaptation	• Ministry for the Environment
Public Works Act 1981	• Enables compulsory acquisition of land for flood management schemes	• Land Information New Zealand
Local Government Official Information and Meetings Act 1987	• Provides for natural hazard information (including flood hazard) to be included on Land Information Memoranda	• Department of Internal Affairs • Territorial authorities
Taumata Arowai – the Water Services Regulator Act 2020	• Functions relating to establishing benchmarks for environmental performance of stormwater networks	• Taumata Arowai
Three Waters service delivery Reform (proposed)	• Will contribute to resilience and crisis response to proactively minimise the risk of flooding ahead of forecast events (e.g. hot-spot maintenance) and work with Regional Councils to co-ordinate CDEM response to flood events. New water service entities will be lifeline utilities.	• New water entities will be established under three waters service delivery reform

Appendix four: Better Business Case Framework

In preparing this report we have we have embraced the principles of Treasury's Better Business Case (BBC) framework. However, given the unique nature of this project, we have chosen to structure this report in a way that provides more narrative than the traditional BBC structure allows for. The table below outlines the requirements of the BBC framework and where in this work they have been considered. The final table of the report (page 85) summarises the core content of the Better Business Case elements of this proposal.

Strategic Case		
Strategic Context Pg 8 Context – big picture Pg 11 About Westport Pg 16 Flooding and Westport Pg 21 Strategic alignment Pg 27 The Story so Far	*Investment Objectives* Pg 27 Matters addressed	*Exploring the preferred way forward* Pg 33 Our Proposal – the PARA model Attached Report: *Real Options Analysis of Strategies to Manage Risks to Westport from Climate Change,* Infometrics, May 2022
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Appendix five – Options not favoured by the TAG

Dredging of the Buller River

Some of our residents suggested that flood risks to Westport could be mitigated by carrying out more extensive dredging of the bed of the lower Buller River. This option has been investigated.[92] Our experts have reported, based on their review of decades of experience in managing gravel riverbeds, that:

- The Buller River has the power, in large flood events, to determine its own bed levels and bed profile. It will scour and deposit the considerable volume of bed material available within the catchment to suit its very high magnitude sediment transport capacity. Even comparatively small river floods could replace extracted gravel overnight.
- The Buller River channel, along its lower reaches and extending out to the river mouth bar, has been dredged for harbour development and for maintenance purposes for many years. This work has had little effect on the bar or on channel depths compared to that created by the power of the river.
- Dredging / gravel extraction is costly. There is no substantial commercial demand for aggregate in the Buller. Dredging will therefore come at significant ongoing cost.

With the above points in mind, we do not believe dredging can contribute to flood risk mitigation solutions in Westport.

Direct cut to the sea from the Orowaiti Estuary

An 'overflow cut' option was put forward for our consideration. The proposed cut was suggested as best located where the Orowaiti Estuary bends to the east. The cut was envisaged as allowing flow to go directly out to the sea, through the spit[93] thereby preventing higher than wanted ponding of upriver flood water flows.

The advice[94] received was that the long length of a cut between the estuary and the current coastline, and the lack of hydraulic grade at this location, would make any overflow cut option inefficient. Further:

- The cut would have to be wide and shallow to have sufficient capacity while still fitting the level limitations of the estuary and sea.[95]
- Maintenance of the cut would need to be relatively constant, with associated costs.
- An opening in this area would increase the risk of sea surge and tsunami hazards to residents of Westport.

Flood risk mitigation structures at Snodgrass

We fully explored the option of providing flood mitigation structures at Snodgrass. After deep consideration and despite having notified an initial intent to construct flood risk mitigation walls at Snodgrass,[96] we reluctantly no longer see favour in this option (Figure 19). Our reasons are that the:

[92] 'Buller River Gravel Extraction Recommendations,' Matthew Gardner 2020.

[93] The changes in the profile of the coastline and in the Orowaiti estuary over time, because of the coastal protrusion of the harbour moles, were demonstrated in slides presented by Matthew Gardner at the Councillor briefing held on 26 May 2022. The complexity of Orowaiti 'cut' options are summarised in a report commissioned by WCRC in 2015.

[94] G & E Williams Consulting Ltd.

[95] The tidal range i.e. the difference between the height of the water in the estuary and the sea level at MHWS at this location, gives rise to a small useable height range across the spit.

[96] This was in the WCRC 2021-31 LTP.

- Construction of flood risk mitigation structures at Snodgrass would significantly increase water levels for upstream properties over a length of 6km.[97] This would require higher structures for the Westport ring-bank on the other side of the Orowaiti estuary, as well as increasing flood depths on land within the (unprotected) Orowaiti overflow area upstream.[98] The higher structures would have further adverse amenity impacts on affected landowners, and it may be difficult to gain resource consent.[99]
- Snodgrass area is inherently vulnerable, under present climatic conditions – and even more so, under climate change-induced sea level rise and groundwater inflow conditions. Coastal flooding and groundwater ponding are likely to occur more frequently in the future even if flood risk mitigation structures were to be put in place.
- Cost benefit of investment is not as attractive as the investments in the Westport 'ring-bank' or at Carters Beach.[100]
- Resource consents for structural solutions may be difficult to obtain because the:
    - Toe of many parts of the embankment would extend into the estuary.
    - Public access would become increasingly constrained.
    - Structures may need to be of significant height thus creating unwanted amenity impacts for residents and visitors to this area.
- There are likely significant constructability issues which are yet to be investigated in detail, including complex road crossings.

Figure 34 - Location of proposed Snodgrass bank flood risk mitigation structures

[97] We note that one of the objectives set by the Steering Group was 'avoiding the transfer of any negative effects both downstream and upstream'

[98] These structures would need to be around 0.6m higher because of the constriction created by the construction of the Snodgrass walls.

[99] Landmark Lile Ltd Report

[100] The cost of the structures at Snodgrass has been estimated to be $2.3m (1:100). The capital value of the 34 properties at Snodgrass has been calculated to be close to $13m.

Excavating a causeway on the Snodgrass peninsula

Through the TAG, the effects of constructing a floodway along the lowest lying area of land in the Snodgrass area were investigated. The idea explored was whether this would provide relief from flood flows upstream of the State Highway 67 causeway. More particularly, we explored whether excavation of the causeway could eliminate the road flooding on the embankment access road to the State Highway, and whether an excavation could lower upstream flood levels, and hence lower the cost of flood defences at other locations.

Despite these potential benefits, this option would be difficult to operationalise. The reasons for this include the:

- Benefits in terms of lower flood levels in the Orowaiti are relatively small.
- Costs would be high because:
    - Bridging or constructing a set of box culverts would be required for floodwaters to pass under the State Highway.
    - There is a substantial area immediately downstream of the State Highway that has been filled. This fill would have to be removed at considerable cost.
    - There are several homes located on or near the proposed causeway and these would need to be relocated at considerable expense.

Constructing culverts at the Railway embankment at Stephen Road

The railway embankment across the Orowaiti river at Stephen Road is viewed by some residents as a weir control on overland flood flows. This railway embankment was severely damaged by flood flows in the recent flood events. In addition, existing bridge/culvert openings are small compared to the length of the embankment restriction.

Despite these factors, constructing culverts at the railway embankment at Stephen Road should not be an integral part of Westport's flood protection scheme. This is because:

- Flood impacts of the small existing openings are localised due to the poor hydraulic linkage across Stephen Road to the low wetland area below the railway line.
- An enlarged waterway capacity could have significant long-term benefits for KiwiRail, but they would neither hinder nor significantly benefit broader flood risk management.
- KiwiRail may see fit to apply, at its own discretion, for a resource consent to enlarge the opening at Stephen Road sometime in the future.

Despite these findings, we think that further discussions should take place with KiwiRail about the net benefit of the weir-type role played by the embankment. The question to address is whether joint investment should be made to enhance the resilience of this embankment.[101]

[101] At this stage, the costs of adding resilience to this structure have not been provided.

Constructing culverts on the embankment adjacent to the Orowaiti State Highway bridge

The possibility of removing the hydraulic restriction caused by the Orowaiti embankment was assessed by the TAG. We agree with the TAG's recommendation that this should not be pursued. This is because it would:

- Have little flood mitigation effect as the causeway was mostly 'drowned-out' in large flood events.
- Not generate sufficient cost / benefit.
- Need to take place in a sensitive area of estuarine mud flats thereby likely making resource consent for this work difficult to acquire.