

# Establishing an initiative for climate resilient public housing



Josh Richardson

Senior Climate Risk and Resilience Advisor  
Sustainability and Climate Strategy Team



## Our Public Housing Customers

**186,000+**

People live in  
our homes

Which is 4% of New Zealand's  
5.0m population

**69,800**

Children live in  
our homes

35,900 are between the ages  
of 10 and 18



**40%**

of our customer  
base are single  
parent households



**12,850**

Customers are aged  
55+ and are living alone



**18,129**

People in our homes are  
over 65 years



# Growing the number of public homes in Aotearoa

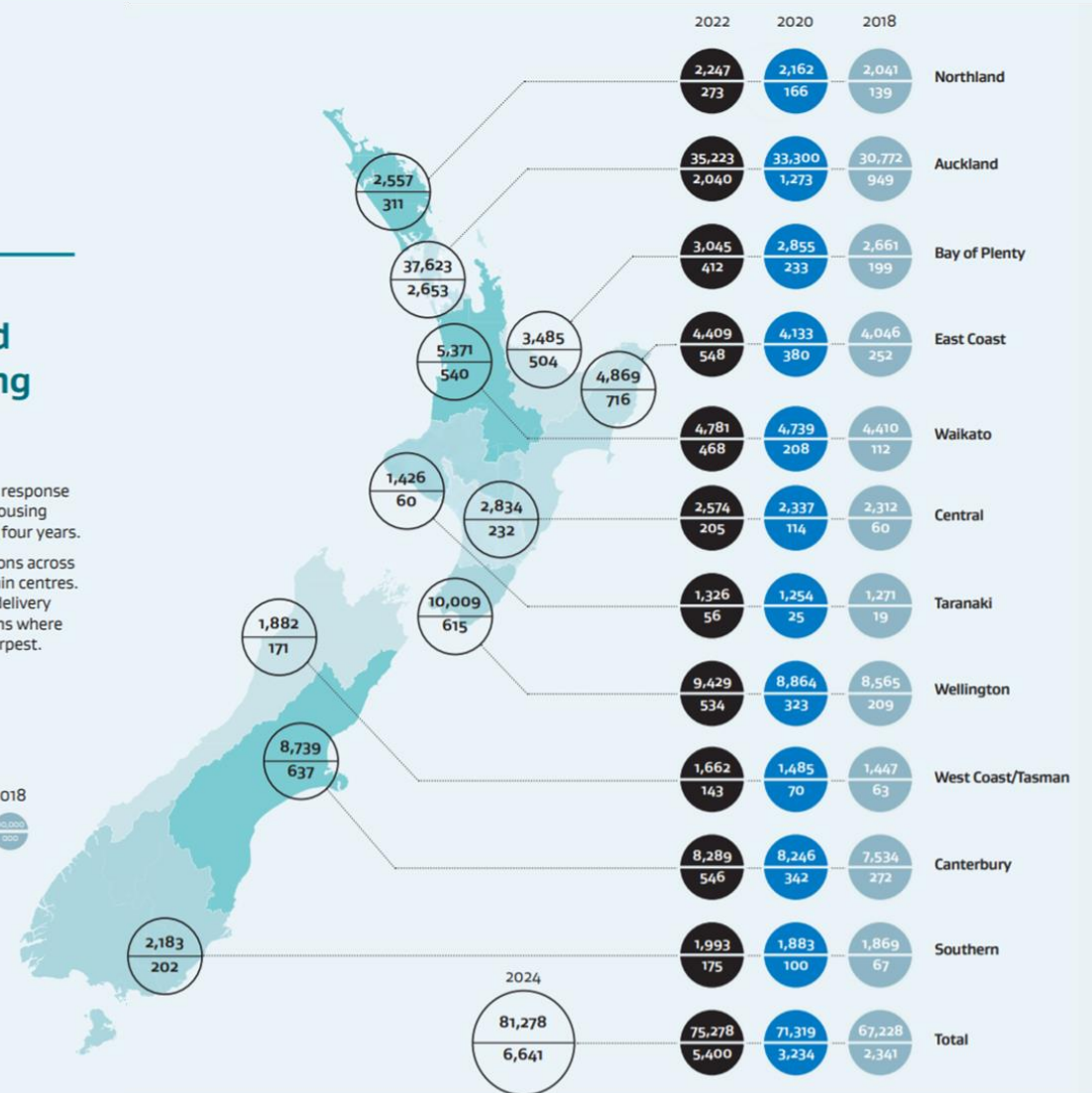
- The Public Housing Plan sets out the Government’s public housing supply intentions for 2021-2024. Budget 2020 delivered funding for an additional 6,000 public and 2,000 transitional homes.
- Kāinga Ora’s build pipeline will play an integral role in the Government achieving these numbers.



## Overview of the current and planned housing supply

This plan is the Government’s key response to increasing demand for public housing across New Zealand over the next four years.

Supply is needed at scale in locations across regional New Zealand, not just main centres. This will require a step change in delivery in some regional centres and towns where housing need is being felt the sharpest.



# Portfolio snapshot: our homes require capital reinvestment to become warm, safe and dry

## Programmes of work

Some 52,000 homes of public and supported housing, will require significant capital reinvestment in the next 30 years.

Our Asset Management Strategy sets out a framework for determining the appropriate renewal response:

- Retrofit
- Redevelop
- Replace

	Pre 1936	1937-49	1950-65	1966-85	1986-1999	2000+
						
<b>Owned homes (number)</b>	483	8,710	14,447	18,780	9,908	15,840
<b>Owned homes (percentage)</b>	1%	13%	21%	28%	14%	23%
<b>Description</b>	Villa & Californian Bungalow	Brick Weatherboard Native timber	Brick Weatherboard Native timber	Innovative Lightweight, low cost materials	Pre-modern	Modern code & specifications
<b>Expected life (years)</b>	80-100	70-90	70-90	40-50	50	50
<b>Tenant concerns</b>	Cold & drafty	Cold & drafty	Cold & drafty	Cold & damp	Damp	Few
<b>Operating costs</b>	High	High	High	Moderate	Moderate	Low



## Urban Development Large-Scale Projects

- These seven large-scale projects will produce over 40,000 homes in the next 15-20 years
- Generally intensifying areas where Kāinga Ora already owns a large amount of housing.
- Mt Roskill for example will turn 3,000 homes into approx. 10,000.
- Also deliver or support delivery of the infrastructure to support that intensification.



We need to think harder about how we grow our towns and cities...

Bentheimplein Watersquare



urban amenity and community building



Parque de Ciglar Marani, Prague



accessibility and mobility

New Lynn, Auckland



infrastructure resilience

Bosco Verticale, Milan



urban greenspace



Organic Market Kitchen, Auckland

...and how we use our increasingly precious and under-pressure space



*What is Kāinga Ora doing in the sustainability space?*



# Sustainability at Kāinga Ora

The Kāinga Ora Environment Strategy sets out four key environmental outcomes:

1. Avoid producing emissions
2. Use resources effectively and efficiently
3. Enhance the natural environment
4. Mitigate climate change risks



## Environment Strategy

Enhancing the wellbeing of our existing and future customers, communities and neighbourhoods.

25 OCTOBER 2022





# Sustainability at Kāinga Ora

To deliver on the outcomes, the strategy sets out 10 key moves:

## Organisational

1. Embed climate change risk management into decision making
2. Embed climate change mitigation into decision making
3. Emissions inventories and reduction plans

## Housing

4. Carbon neutral housing
5. Renewable energy
6. Construction and site clearance waste minimisation

## Urban Development

7. Low carbon urban development and infrastructure
8. Transport mode shift
9. Ngahere in urban environments
10. Restoring mauri of awa



## Environment Strategy

Enhancing the wellbeing of our existing and future customers, communities and neighbourhoods.

25 OCTOBER 2022





*Embed climate change risk management into decision-making*

# Climate change risk and resilience at Kāinga Ora

## Legislative and Policy Drivers:

- Kāinga Ora Homes and Communities Act 2020
  - “operating in a manner that recognises the need to mitigate and adapt to climate change.”



# Climate change risk and resilience at Kāinga Ora

## Legislative and Policy Drivers:

- Kāinga Ora Homes and Communities Act 2020
  - “operating in a manner that recognises the need to mitigate and adapt to climate change.”
- Government Policy Statement – Housing and Urban Development
  - Expectations for Kāinga Ora – “Consider climate change and natural hazard risks and how to adapt and respond when making investment decisions.”

# Climate change risk and resilience at Kāinga Ora

## Legislative and Policy Drivers:

- Kāinga Ora Homes and Communities Act 2020
  - “operating in a manner that recognises the need to mitigate and adapt to climate change.”
- Government Policy Statement – Housing and Urban Development
  - Expectations for Kāinga Ora – “Consider climate change and natural hazard risks and how to adapt and respond when making investment decisions.”
- National Adaptation Plan
  - “Establish an initiative for resilient public housing.”

# Climate change risk and resilience at Kāinga Ora

## Legislative and Policy Drivers:

- Kāinga Ora Homes and Communities Act 2020
  - “operating in a manner that recognises the need to mitigate and adapt to climate change.”
- Government Policy Statement – Housing and Urban Development
  - Expectations for Kāinga Ora – “Consider climate change and natural hazard risks and how to adapt and respond when making investment decisions.”
- National Adaptation Plan
  - “Establish an initiative for resilient public housing.”
- Financial Sector Amendment Act 2021 – Climate-related disclosures



# Climate change risk and resilience at Kāinga Ora

## Climate-related disclosures (FY 22)

Physical risks		
Risk	Timeframe	Coverage in this disclosure
Increased frequency and intensity of flooding events will affect our customers and assets	Short	Detailed
Increased frequency, duration and intensity of heatwaves will impact our customers and assets	Medium	Detailed
Periodic drought results in water shortages, which could impact our customers	Medium	Summarised
Climate change impacts could result in supply chain issues and shortages, increasing costs and reducing certainty in the Kāinga Ora construction and maintenance pipeline	Medium	Summarised
Kāinga Ora may be expected to provide homes for people displaced by climate change	Long	Summarised

Transition risks		
Risk	Timeframe	Coverage in this disclosure
Kāinga Ora could fail to meet climate mitigation or adaptation obligations set out in our governing legislation, resulting in litigation or impact on license to operate	Short	Detailed
Kāinga Ora could be subject to litigation or reputational damage for enabling housing to be developed in areas that are exposed to climate risks	Medium	Summarised
Investment decisions could be subject to litigation for not adequately reducing emissions	Short	Summarised
Increased cost of carbon in upstream activities, or changes in product availability could increase development and maintenance costs	Short	Summarised
Supply or industry/authority acceptance of alternative products could be limited, impacting our ability to use low carbon alternatives	Short	Summarised

Mandatory disclosure from 30 June 2024

Timeframe	Definition	Justification
Short	Three years	This represents one political cycle in New Zealand
Medium	Up to 30 years	This is the timeframe considered in the Kāinga Ora Area Development Strategies
Long	Up to 60 years	This represents the expected useful life of our dwellings before significant renewal activities are required

# Climate change risk and resilience at Kāinga Ora

## Neighbourhood level climate change risk assessments

**Risk Statement:** The risk to customer health and well-being from indoor overheating as a result of more frequent and intense heatwaves.

Present	Mid-century RCP4.5	Mid-century RCP8.5	End of century RCP4.5	End of century RCP8.5	Sensitivity	Adaptive Capacity	Vulnerability	Present	Mid-century RCP4.5	Mid-century RCP8.5	End of century RCP4.5	End of century RCP8.5	Consequence
Moderate	High	High	High	Extreme	Moderate	High	Moderate	Moderate	High	High	High	High	Major
Exposure					Vulnerability <small>(Sensitivity x Adaptive Capacity)</small>			Risk Rating <small>(Exposure x Vulnerability)</small>					Consequence

Utilises MfE's guidance for local climate change risk assessments

# Climate change risk and resilience at Kāinga Ora

## Neighbourhood level climate change risk assessments

Risk Description	Exposure					Vulnerability					Risk					Consequence			
	Ex- Pres	Ex-Mid 205 RCP	Ex-Mid 205 RCP	Ex-Loag 205 RCP	Ex-Loag 210 RCP	Ex-commts	Seas-Rat	Sensitivity Commts	AdCap- Rating	Adaptive Capacity Commts	Val-Rati	Val-commts	Risk- Pres	Risk-Mid 205 RCP4	Risk-Mid 205 RCP8	Risk- Loag 210	Risk- Loag 210	Coaseq- rating	Coaseq-comma
<p>An existing issue with complaints from tenants coming from those living in the aging starblocks. These are old buildings with a lack of air conditioning and ventilation. A large proportion of the tenants in Ōraki are elderly, may be more susceptible to extreme heat, and approximately 20% of them are living alone.</p> <p>Importantly, an increasing reliance on air conditioning and mechanical ventilation may not reduce the risk of overheating as many tenants choose not to run these devices in order to save money on power. For those that do, there will be an increasing operational cost that will put additional strain on household income.</p> <p>With hot days projected to nearly double between now and 2050 even under RCP4.5, the risk becomes high within the assets lifespan and should be considered in building/development planning and design.</p>	Moderate	High	High	High	Extreme		High		Moderate				Moderate	High	High	High	High	4.Major	
<p>Tamaki Drive has recently had sections built up to reduce exposure to coastal inundation but future projections in sea-level rise put both this and the railway south at risk. As many of the residents are elderly the consequence of disruption to the transport network is less prohibitive than it would be if there were large numbers of workers need to commute to the city centre or to southern Auckland suburbs.</p> <p>Many of the residents will stick around the local area and utilize walking as a mode of transport. This places greater consequence on risk ora.3 (risk of hot days to active transport users).</p> <p>It's also important to note that demographics of tenants may change and a greater reliance on key transport routes and public services may occur over time.</p>	Moderate	High	High	High	Extreme		Moderate		Moderate				Moderate	High	High	High	High	3.Moderate	
<p>Impacts to public and environmental health. Watercare have renewed a lot of pipes. Pump station down at Ōkahu reserve overflows every now and again. Illegal connections.</p>	Moderate	Moderate	Moderate	Moderate	High		Moderate		Moderate				Moderate	Moderate	Moderate	Moderate	High	3.Moderate	
<p>Noting that this risk is focussed on Ōkahu Reserve as a significant place of recreation for the Ōraki community.</p>	Moderate	Moderate	Moderate	Moderate	High	Rating is for Ōkahu Reserve	Moderate		Low				Moderate	Moderate	Moderate	Moderate	High	3.Moderate	
<p>Risk is pronounced for housing occupants with restricted mobility or limited transport options that are required to evacuate during extreme weather events.</p>	Low	Moderate	Moderate	Moderate	High		High		Moderate				Low	Moderate	Moderate	Moderate	High	4.Major	

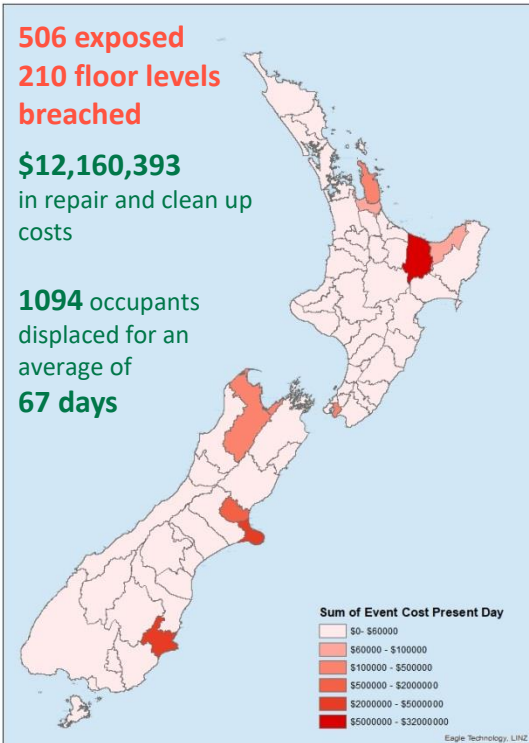


# Climate change risk and resilience at Kāinga Ora

**Present Day**

(0.0m SLR)

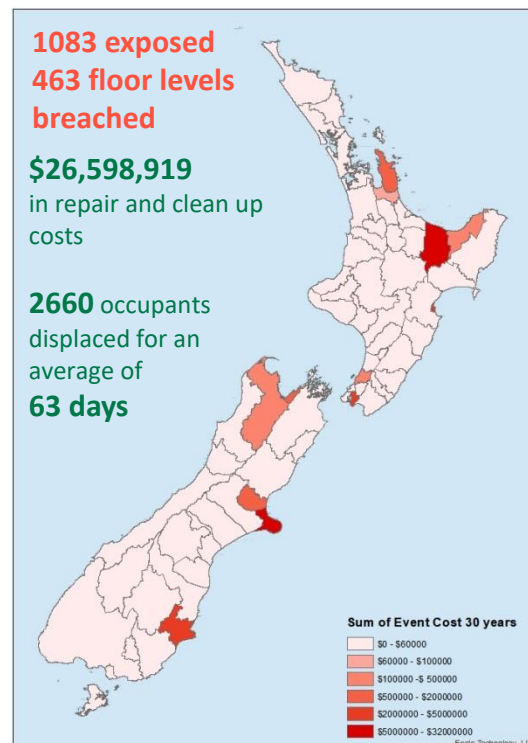
Exposes 0.8% of our housing portfolio



**2050**

(0.3m SLR)

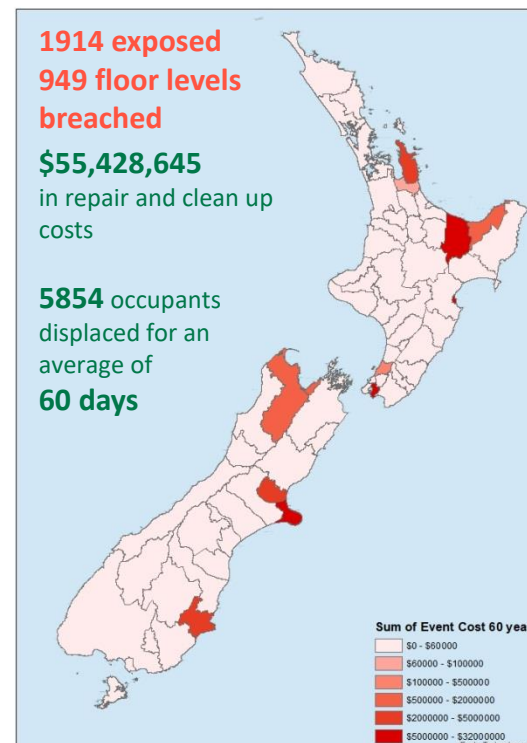
Exposes 1.6% of our housing portfolio



**2080**

(0.6m SLR)

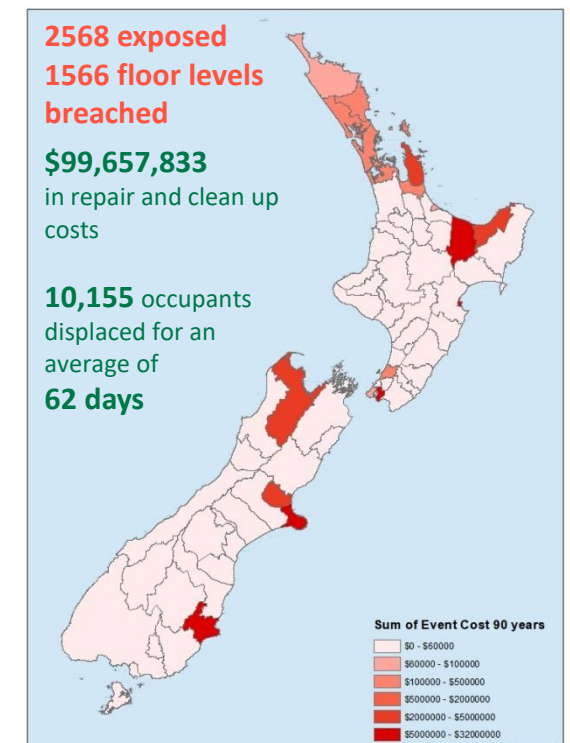
Exposes 2.9% of our housing portfolio



**2110**

(0.9m SLR)

Exposes 3.9% of our housing portfolio



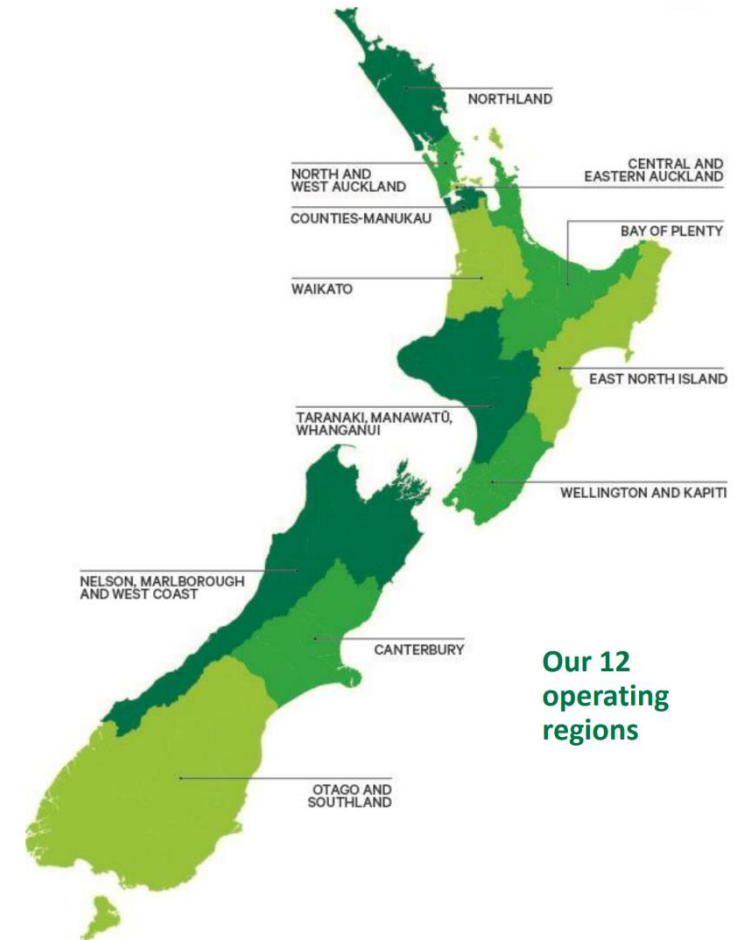
# Climate change risk and resilience at Kāinga Ora

## Regional Plans:

Kāinga Ora has 12 operating Regions and each Region has its own plan which sets out its ten-year investment intentions reflecting community aspirations and priorities.

These plans are reviewed every three years, and updated annually as required.

These plans are informed by a range of analytics and indicators including flood risk which presently utilizes the Munich Re Natural Hazard dataset.





*Our focus is on developing a nationally consistent approach to flood-risk decision-making that is integrated within our existing planning, investment, and development processes.*

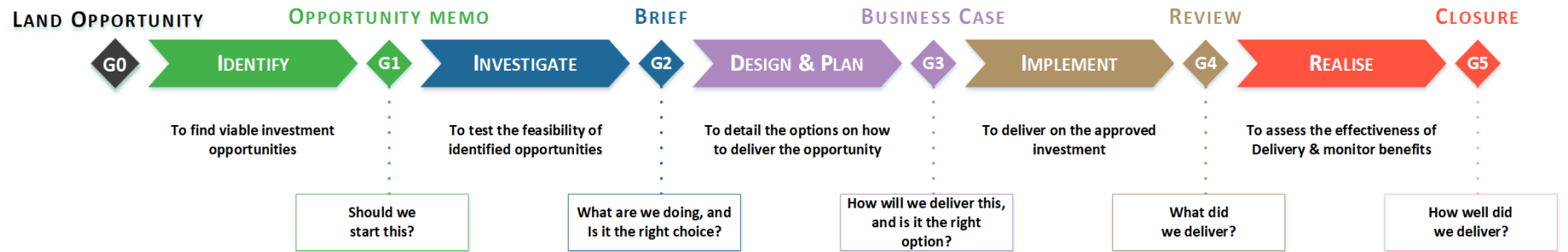


# Climate change and flood risk work programme

## INVESTMENT MANAGEMENT LIFECYCLE

### PHASES & PHASE GATES

Early Planning & Strategy



# Climate change and flood risk work programme

## Area Development Strategies

A place-based document that guides a one strategic direction for Kāinga Ora in partnership and collaboration with others, in the short term, medium term (4-10 years) and the long term (10years +).

We worked with T+T to develop a matrix to “traffic-light” flood constraint within local areas.

These are not available for all areas.



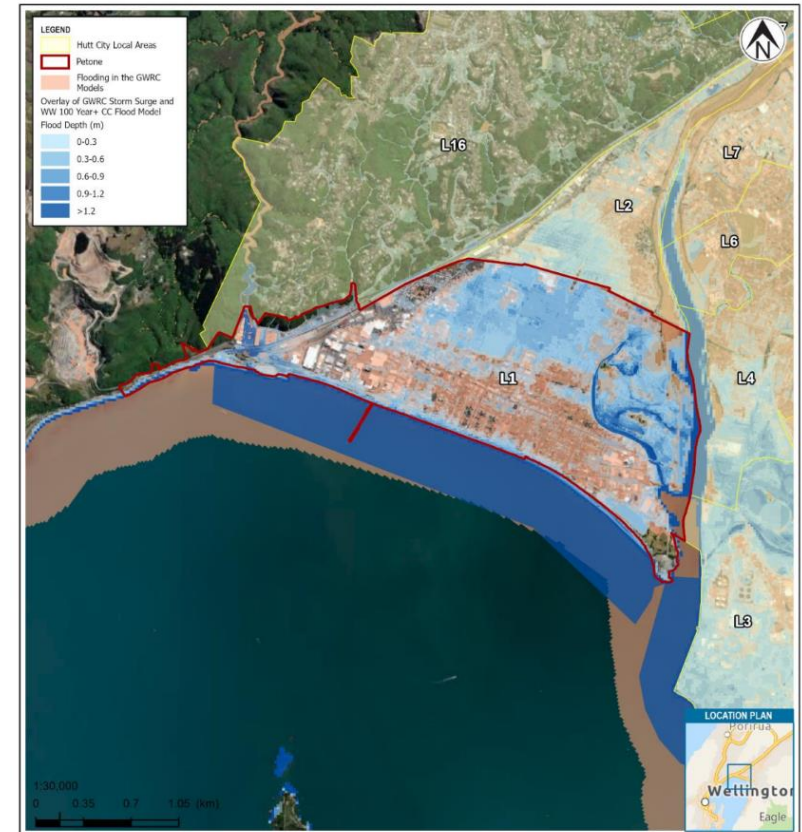
Table 3.1: Flood confidence and impacts matrix

Modelling Confidence	Potential flood impacts on local area		
	High (H)	Medium (M)	Low (L)
High confidence (1)	1H	1M	1L
Low confidence (2)	2H	2M	2L



Table 1.1: Local Area (LA) information for potential development constraints related to flooding

LA name	LA number	LA area (km <sup>2</sup> )	Constraint rating
Petone	L1	3.9	1H
Alicetown-Melling	L2	1.3	1H
Gracefield	L3	3.6	1H
Moera/Waiwetū/ Woburn	L4	2.9	1H
Waterloo	L5	1.8	1M
Hutt Central South	L6	1.3	2M
Hutt Central North	L7	1.1	2M
Epuni	L8	2.0	1M
Naenae	L9	5.2	1M
Boulcott	L10	1.6	2M
Avalon	L11	2.0	2M
Taitā	L12	4.5	2M
Stokes Valley/ Manuka/Delaney	L13	9.7	1M
Manor Park	L14	1.6	2H
Arakura/Glendale/ Wainuiomata/Homedale	L15	13	2M
Maungaraki/ Normandale	L16	5.4	1L
Tirohanga/Belmont/ Kelston	L17	8.9	2L
Eastern Bays/ Eastbourne	L18	3.9	2L



Petone		
1H	Flood depth information	
	Flood depths	Area exposed (km <sup>2</sup> )
Located on the coastal waterfront, significant flooding shown in both WW and GWRC model outputs. WW has 1.7 km <sup>2</sup> of flooding and GWRC has 3.2 km <sup>2</sup> of flooding in 3.9 km <sup>2</sup> total area, equivalent to 44% and 82% area flooded respectively. A lot of flooded areas are to depths greater than 0.3 m. The storm surge modelling also shows significant flooding in the area, with 2.2 km <sup>2</sup> of flooding in the area.	0 - 0.3 m	1.0
	0.3 - 0.6 m	0.5
	0.6 - 0.9 m	0.1
	0.9 - 1.2 m	0.1
	>1.2 m	0.1
<b>Total flooding (m)</b>		<b>1.7</b>

# Climate change and flood risk work programme

## Key Deliverables:

- Provide data standards, modelling guidelines, and reporting templates to ensure consistency in how Kāinga Ora consumes, commissions, and communicates flood risk.

# Climate change and flood risk work programme

## Key Deliverables:

- Provide data standards, modelling guidelines, and reporting templates to ensure consistency in how Kāinga Ora consumes, commissions, and communicates flood risk
- A national flood data directory that summarises the known flood information for a given area, and provides quick access to council maps and key contacts for planning and development teams.

# Climate change and flood risk work programme

## Key Deliverables:

- Provide data standards, modelling guidelines, and reporting templates to ensure consistency in how Kāinga Ora consumes, commissions, and communicates flood risk
- A national flood data directory that summarises the known flood information for a given area, and provides quick access to council maps and key contacts for planning and development teams.
- Support area-level flood hazard assessments (South Waikato, Wellington City, Auckland, West Coast/Nelson/Marlborough).



# Climate change and flood risk work programme

## Key Deliverables:

- Provide data standards, modelling guidelines, and reporting templates to ensure consistency in how Kāinga Ora consumes, commissions, and communicates flood risk
- A national flood data directory that summarises the known flood information for a given area, and provides quick access to council maps and key contacts for planning and development teams.
- Support flood hazard assessments for areas of high risk (Auckland, West Coast/Nelson/Marlborough).
- Exploring flood risk appetite and potentially developing tolerance thresholds for our different activities.

# Climate change and flood risk work programme

## Key Deliverables:

- Provide data standards, modelling guidelines, and reporting templates to ensure consistency in how Kāinga Ora consumes, commissions, and communicates flood risk
- A national flood data directory that summarises the known flood information for a given area, and provides quick access to council maps and key contacts for planning and development teams.
- Support flood hazard assessments for areas of high risk (Auckland, West Coast/Nelson/Marlborough).
- Exploring flood risk appetite and potentially developing tolerance thresholds for our different activities.
- Drawing the above deliverables together into a flood risk decision-making framework and integrating this approach into planning and investment processes (IMF, ADS, Regional Plans).

# Climate change and flood risk work programme

## Key Deliverables:

- Provide data standards, modelling guidelines, and reporting templates to ensure consistency in how Kāinga Ora consumes, commissions, and communicates flood risk
- A national flood data directory that summarises the known flood information for a given area, and provides quick access to council maps and key contacts for planning and development teams.
- Support flood hazard assessments for areas of high risk (Auckland, West Coast/Nelson/Marlborough).
- Exploring flood risk appetite and potentially developing tolerance thresholds for our different activities.
- Drawing the above deliverables together into a flood risk decision-making framework and integrating this approach into planning and investment processes (IMF, ADS, Regional Plans).
- Identifying existing properties with the highest exposure to flooding and prioritising these for more detailed risk assessment and adaptation action.

# Climate change and flood risk work programme

**Tools**  
*Our deliverables*

- Area-level flood hazard assessments (ADS)
- Metadata standards
- Flood data directory
- Flood risk reporting template
- Flood modelling guidelines
- Risk appetite
- Adaptation guidance

**Opportunity Memo**

**Is there a flood hazard present?**

- Check the ADS to understand data availability, confidence and flood impact for the local area.

# Climate change and flood risk work programme

<b>Tools</b> <i>Our deliverables</i>
Area-level flood hazard assessments (ADS)
<b>Metadata standards</b>
<b>Flood data directory</b>
Flood risk reporting template
Flood modelling guidelines
Risk appetite
Adaptation guidance

<b>Opportunity Memo</b>
<b>Is there a flood hazard present?</b>
<ul style="list-style-type: none"><li>• Check the ADS to understand data availability and confidence and flood impact for the local area.</li><li>• Engage with Council and review flood maps/modelling to identify if there is a flood hazard for the opportunity.</li></ul>

# Climate change and flood risk work programme

## Tools

*Our deliverables*

Area-level flood hazard assessments (ADS)

Metadata standards

Flood data directory

**Flood risk reporting template**

Flood modelling guidelines

Risk appetite

Adaptation guidance

## Opportunity Memo

### Is there a flood hazard present?

- Check the ADS to understand data availability and confidence and flood impact for the local area.
- Check Council flood maps/modelling to identify if there is a flood hazard for the opportunity.
- If there is a flood hazard, get a flood risk assessment done (incl. high level adaptation options).



# Climate change and flood risk work programme

<b>Tools</b> <i>Our deliverables</i>
Area-level flood hazard assessments (ADS)
Metadata standards
Flood data directory
Flood risk reporting template
<b>Flood modelling guidelines</b>
Risk appetite
Adaptation guidance

<b>Opportunity Memo</b>
<b>Is there a flood hazard present?</b>
<ul style="list-style-type: none"><li>• Check the ADS to understand data availability and confidence and flood impact for the local area.</li><li>• Check Council flood maps/modelling to identify if there is a flood hazard for the opportunity.</li><li>• If there is a flood hazard, get a flood risk assessment done (incl. high level adaptation options).</li><li>• Is there an absence of flood modelling or low confidence in what is available? Commission modelling.</li></ul>

# Climate change and flood risk work programme

<b>Tools</b> <i>Our deliverables</i>
Area-level flood hazard assessments (ADS)
Metadata standards
Flood data directory
Flood risk reporting template
Flood modelling guidelines
<b>Risk appetite</b>
<b>Adaptation guidance</b>

<b>Opportunity Memo</b>
<b>Is there a flood hazard present?</b>
<ul style="list-style-type: none"><li>• Check the ADS to understand data availability and confidence and flood impact for the local area.</li><li>• Check Council flood maps/modelling to identify if there is a flood hazard for the opportunity.</li><li>• If there is a flood hazard, get a flood risk assessment done (incl. high level adaptation options).</li><li>• If there is no modelling available and there is reason to believe the location might be exposed to flooding, commission flood modelling.</li></ul>

<b>Decision</b> <i>Should we start this?</i>
<b>Manage</b>
<b>Defer</b>
<b>Avoid</b>

**Thank you**

Josh Richardson

Senior Climate Risk and Resilience Advisor

[josh.Richardson@kaingaora.govt.nz](mailto:josh.Richardson@kaingaora.govt.nz)

