

WAIROA

FLOOD MITIGATION

PROJECT

Today's agenda

- Today's hui
- What's happened so far?
- The process to date
- Shared kaupapa
- Flood mitigation options
 - Most technically viable options
 - Other options considered
- Where to from here?
- Questions

Today's hui

- Introductions
- Purpose
- Acknowledgements

What's happened so far?

- \$70 million central Govt. funding ring-fenced for flood mitigation for Wairoa following Cyclone Gabrielle
- Tripartite working together with Stakeholder Group, mana whenua, river engineers and technical experts to develop technically viable flood mitigation solutions
- Crown Manager, Lawrence Yule, appointed in August 2024
- Conversations with potentially impacted whānau and property owners commenced in mid-October

The process to date

- From **June 2023** – community kōrero held
- **October 2023** – Wairoa Flood Mitigations Scheme Stakeholder Group established by the Tripartite partners
- From **November 2023** – Stakeholder Group meets regularly with river engineers and technical experts to work through flood mitigation options
- **June 2024** – second flooding event occurs, scope of Project broadened to include Kopu Road
- **October 2024** – the Tripartite partners support commencement of early engagement with potentially impacted whānau and property owners
- **November 2024** – broader community engagement on all previously considered flood mitigation options commences

Shared kaupapa

- Best possible technical solution *that also*
- Minimises negative impacts on whānau, their land and homes *and*
- Protects marae, urupā and cultural taonga in the process.

This is about carefully balancing the fact that some land and people will be impacted, against the need to find a technically viable flood mitigation solution to help ensure the safety of the Wairoa community for generations to come.

Flood mitigation options

- Following the community kōrero, a long list of potential flood mitigation options was developed.
- These options were evaluated further through a multi-criteria analysis, and a short-list was developed.
- Some short-listed options were also further refined, to reduce negative impacts to marae, urupā, sites of cultural significance, houses, Māori whenua and general title land.
- Independent river engineer, Gary Williams, also provided a peer review of the short-listed options, and proposed some further refined options for consideration.

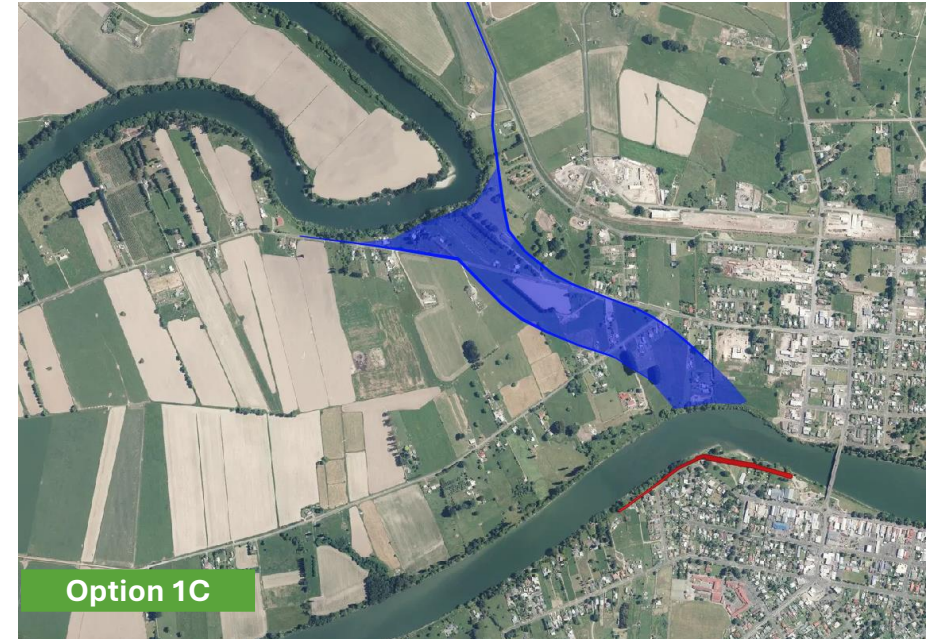
Most technically viable options

- Right now, two of the most technically viable flood mitigation options need further consideration and feedback from the community.
- **These are options 1C and 1D.**



Option 1C

- Involves a **170m wide** and **2m deep** floodway
- Enclosed by small stopbanks averaging **1.2m high** on both sides.
- Impacts 16 houses, 6 ha. of whenua Māori and 18 ha. general title land
- Protects 46 ha. of whenua Māori and 298 ha. general title land



Option 1D

- Involves a **250m wide** floodway **averaging 0.9m deep**
- Enclosed by small stopbanks **averaging between 1.5m and 2m high** on both sides.
- Impacts 6 houses, 18.4 ha. of whenua Māori and 26.6 ha. general title land
- Protects 30 ha. of whenua Māori and 248 ha. general title land



Option 1C and 1D compared

Option comparison	Option 1C	Option 1D
Number of potentially impacted houses	16	6
Area of Māori whenua potentially impacted	6 ha	18.4 ha
Area of general title land potentially impacted	18 ha	26.6 ha
Total footprint / total area of land impacted	24 ha	45 ha
Area of Māori whenua protected	46 ha	30 ha
Area of general title land protected	298 ha	248 ha
Total area of land protected	344 ha	278 ha

Other options considered

- In addition to the two most technically viable options, a number of other flood mitigation options were also considered.
- **The following slides outline the other options previously considered, and their limitations.**



Option 1 – flood spillway

- Would only be used when river levels are high enough
- May need stopbanks and drains
- Limitations:
 - A small number of private properties potentially impacted
 - Alignment would require careful consideration to avoid negative cultural impacts



Option 2 - redirection

- Redirecting or changing the course of the river, shortening time it takes for water to reach the sea
- Limitations:
 - May increase water velocity
 - Does not increase capacity to allow higher volume flood levels
 - Impacts more properties than Opt. 1
 - Requires bridges for Ruataniwha and Waihirere Roads
 - Expensive to construct



Option 3 – flood storage detention

- Using old flood plains and historic oxbow lakes as flood storage detention
- Limitations:
 - Substantial earthworks required to create any additional capacity
 - Would require ongoing maintenance
 - Would create negative cultural impacts, with urupā and potential sites of cultural significance nearby



Option 4 – spillway

- Spillway to redirect flood waters around Wairoa and toward Awatere Stream
- Limitations:
 - Affects the railway and SH2
 - Would require four road crossings, including for SH2, and two railway crossings
 - Would impact more properties than Option 1



Option 5 – continuous stopbanks

- Construction of continuous stopbanks along the Wairoa River
- Limitations:
 - Can fail and cause a sudden rush of water
 - Needs to be continuous and reliant on land access
 - Impacts more properties than Opt. 1



Option 6 – spillway

- Spillway to redirect flood waters around the airport and North Clyde area
- Limitations:
 - Longer – and more expensive – than Option 4
 - Negatively impacts more infrastructure and property than Option 4
 - Would require two road crossings, including SH2, and one railway crossing



Option 7 – new river channel

- New river channel or spillway to move flood waters away from North Clyde area
- Limitations:
 - Short, and may not have the desired flood mitigation effect as it does not significantly increase flood carrying capacity of the river
 - Would create a 30 ha. island



Option 8 – new river channel

- New river channel or spillway to move flood waters away from North Clyde area
- Limitations:
 - Much longer, and therefore much more expensive, than Option 7
 - Would create a 65 ha. island



Option 9 – dams

- Series of small dams in upstream catches, or large in-river dams, to store water and slow peak rate
- Limitations:
 - Significant volume of storage needed to reduce flood flows
 - Substantial construction works
 - Risks associated with dam failure
 - Significant impacts on the mauri of the river



Above: example of the Patea Dam in Taranaki

Option 10 – native vegetation

- Planting native vegetation on currently grazed land to slow rate of run-off to the river
- Limitations:
 - Large areas of land would be retired
 - Native vegetation is slower to grow and establish, therefore careful plant consideration required
 - Only a small reduction in flooding likely



Option 11 – dredging

- Dredging the Wairoa River channel to increase flood carrying capacity
- Limitations:
 - Ongoing dredging required due to sediment redepositing
 - Negative ecological impacts by disturbing aquatic habitat
 - Extremely expensive, both short and long term



Option 12 – permanently open river mouth

- Creating a permanently open river mouth by creating engineered structures
- Limitations:
 - Unlikely to be physically feasible
 - Works required can only be undertaken in specific conditions
 - Minimal influence upstream of SH2
 - High ongoing costs



Above: example of the Opotiki River Bar

Option 13 – extending Ngamotu Lagoon

- Extending Ngamotu Lagoon near the river mouth to provide additional flood storage detention
- Limitations:
 - Storage volume will not create measurable reduction in flooding
 - Substantial earthworks required
 - Potential impacts on ecological habitats, including birds, fish, and collection of kaimoana



Option 14 – street-level protection

- Creating street-level protection through installation of structures to protect houses and buildings
- Limitations:
 - Unlikely to be effective in larger flood events
 - Reliant on buy-in of whole community
 - Can create additional risks for areas without secondary evacuation
 - Very expensive at the scale required



Above: example of street-level protection

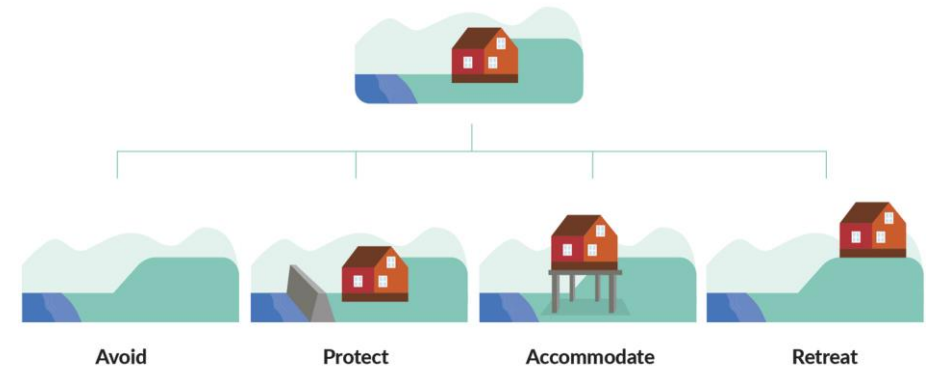
Option 15 – existing network maintenance

- Maintaining the existing drainage network throughout North Clyde and/or clearing out Awatere Stream
- Limitations:
 - Drainage clearance and maintenance not sufficient by itself
 - Widening Awatere Stream unlikely to be ecologically acceptable
 - Expensive relative to other options



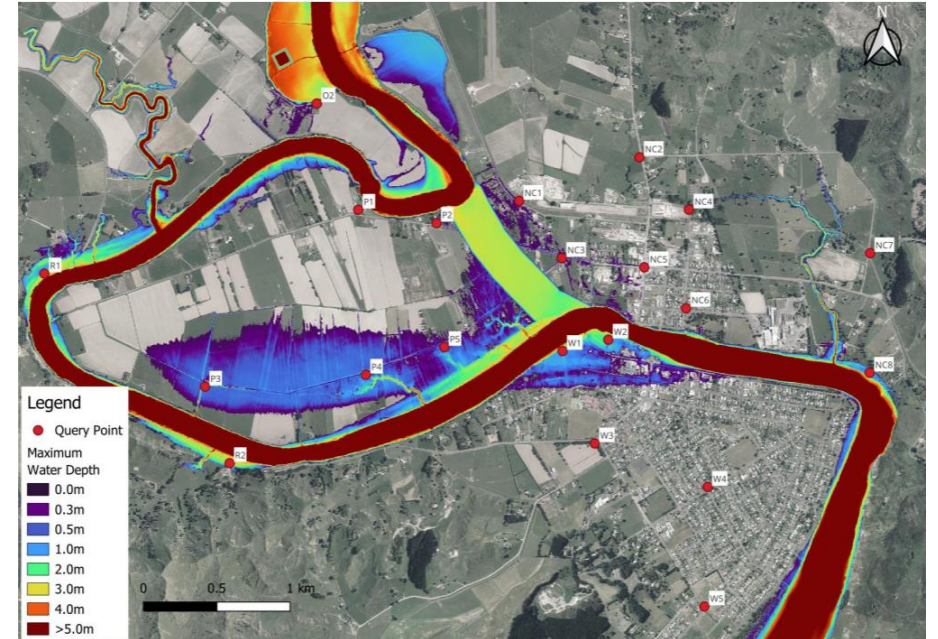
Option 16 – house raising

- Raising the finished floor level of houses to prevent flood damage
- Limitations:
 - Not all properties can be raised
 - No flood mitigation for marae, urupā or local businesses, which are unable to be raised
 - Very high costs
 - Government’s \$70 million specifically for community scale flood mitigation, not house raising



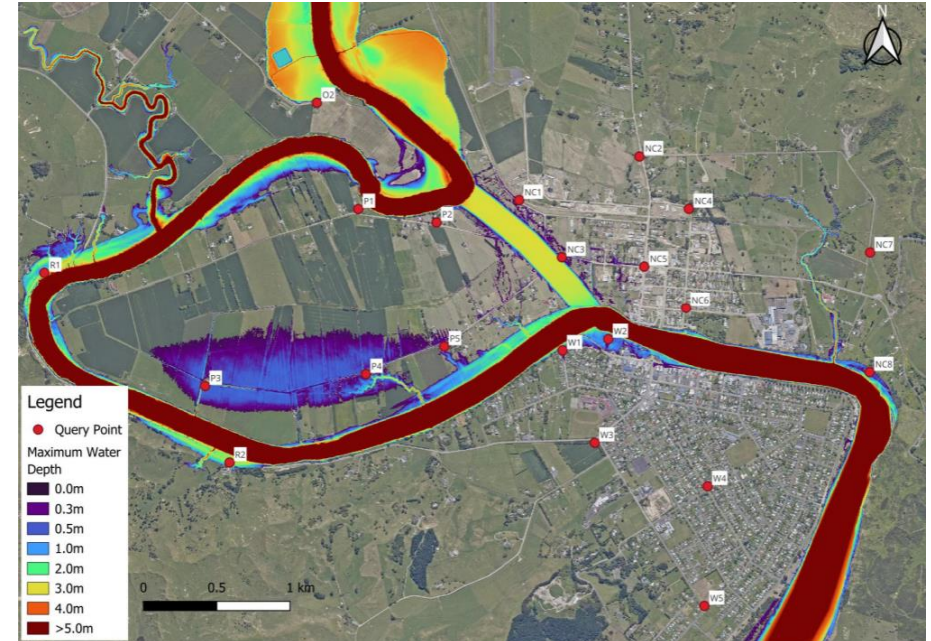
Option 1A

- A variation of Option 1 – 1km floodway measuring 250m wide and 2m deep with no stopbanks
- Limitations:
 - Negatively impacts town side of the river
 - Most expensive of the floodways
 - Requires relocation of Takitimu Marae
 - Previously rejected by Tripartite



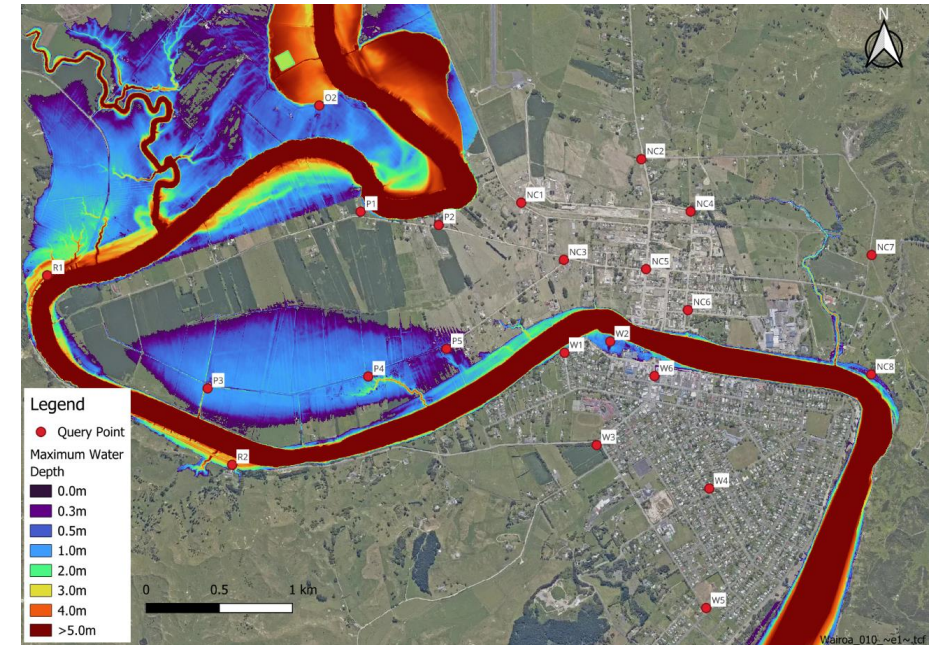
Option 1B

- A variation of Option 1 – 1km floodway measuring 170m wide and 2m deep, 1m high stopbanks
- Limitations:
 - Minor negative impact on town side of the river
 - Impacts 17 houses, 35 parcels and 6.6 ha. of whenua Māori
 - Requires relocation of Tawhiti-a-Marua Marae
 - Previously rejected by Tripartite



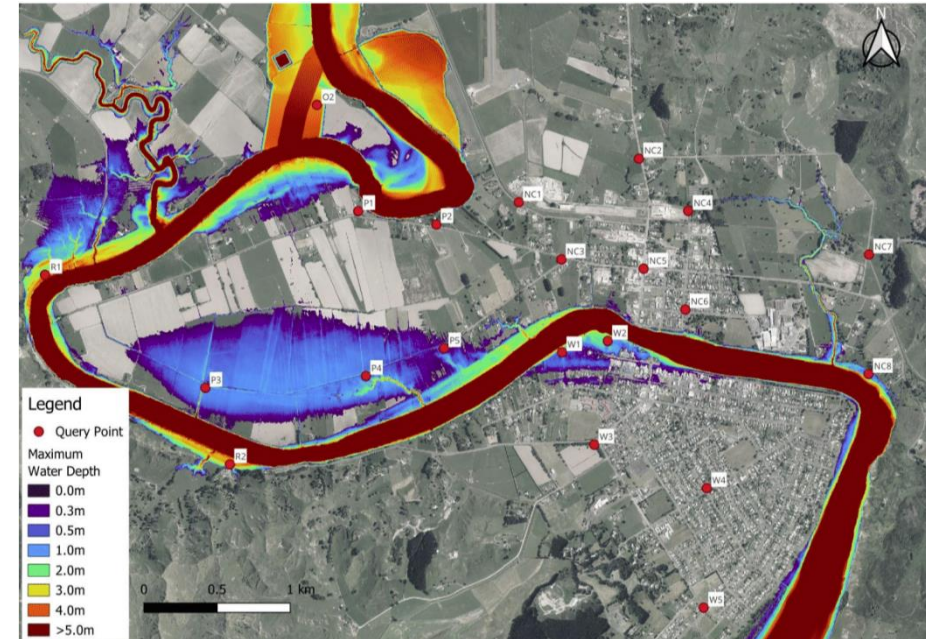
Option 5C

- A variation of Option 5 – 5.3km of stopbank around 2m in height, up to 4m in some places
- Limitations:
 - 930 ha of land negatively impacted (worse off as a result of option)
 - Impacts 2 houses, 31 parcels and 3.3 ha. of whenua Māori



Option 17 – Option 5 + Option 7

- A combination of the Option 5 stopbank and Option 7 which involves 600m long and 2-3m deep floodway
- Limitations:
 - Additional cost associated with the floodway
 - Still additional flooding in Huramua



Where to from here?

- Broader community engagement expected to run through to the new year
- Ideally have preferred flood mitigation solution confirmed, agreed and publicly communicated by **February 2025**.
- Government requires a confirmed flood mitigation solution, and a business case based on that preferred solution, by **31 March 2025**.
- Provided the above deadlines can be met, Government funding is confirmed, and consents and land access secured, construction works are expected to commence in **summer 2025-2026**.

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Questions?