If calling, please ask for Democratic Services

Civil Defence Emergency Management Group

Tuesday 31 May 2022, 12.30pm

Council Chamber, Porirua City Council, 16 Cobham Court, Porirua.

Members

Mayor Anita Baker (Chair)	Porirua City Council
Mayor Lyn Patterson (Deputy Chair)	Masterton District Council
Mayor Campbell Barry	Hutt City Council
Mayor Alex Beijen	South Wairarapa District Council
Mayor Andy Foster	Wellington City Council
Mayor Wayne Guppy	Upper Hutt City Council
Mayor K Gurunathan	Kāpiti Coast District Council
Mayor Greg Lang	Carterton District Council
Council Chair Daran Ponter	Greater Wellington Regional Council

Recommendations in reports are not to be construed as Council policy until adopted by Council

Civil Defence Emergency Management Group Committee

Tuesday 31 May 2022, 12.30pm

Council Chamber, Porirua City Council, 16 Cobham Court, Porirua

Public Business

Please note these minutes remain unconfirmed until the Wellington Civil Defence Emergency Management Group meeting on 31 May 2022.

Report 22.113

Public minutes of the Wellington Civil Defence Emergency Management Group meeting on Tuesday 22 March 2022

All members participating remotely via Microsoft Teams at 9am.

Members Present

Mayor Baker (Chair)	Porirua City Council
Mayor Patterson (Deputy Chair)	Masterton District Council
Mayor Barry	Hutt City Council
Mayor Beijen	South Wairarapa District Council
Mayor Foster	Wellington City Council
Mayor Guppy	Upper Hutt City Council
Mayor Lang	Carterton District Council
Council Chair Ponter	Greater Wellington Regional Council

All members participated at this meeting remotely and counted for the purpose of quorum in accordance with clause 25B of Schedule 7 of the Local Government Act 2002.

Public Business

1 Apologies

Moved: Mayor Baker / Mayor Beijen

That the Committee accepts the apology for absence from Mayor Gurunathan.

The motion was **carried**.

2 Declarations of conflicts of interest

There were no declarations of conflicts of interest.

3 Public participation

There was no public participation.

4 Confirmation of the Public minutes of the Wellington Civil Defence Emergency Management Group meeting on 3 December 2021 - Report 21.571

Moved: Mayor Baker / Mayor Patterson

That the Committee confirms the Public minutes of the Civil Defence Emergency Management Group meeting on 3 December 2021 - Report 21.571.

The motion was **carried**.

5 Update on Progress of Action Items from Previous Civil Defence Emergency Management Group Meetings – March 2022 – Report 22.27 [For Information]

6 COVID-19 and Regional Covid Coordination Centre Update – Oral Report

Dan Neely, Acting Regional Manager, WREMO, spoke to the report and tabled a presentation.

Mr Neely advised that case numbers were doubling roughly every two-three days. District Health Boards (DHB) are struggling with testing and tracing, with this compounded by staff shortages. DHBs are focusing on priority communities and high risk events.

As at 21 March 2022, there were approximately 1,800 new cases reported in the Wellington Region, with 15,000 active cases. Omicron infections are expected to peak mid-late March, with fatalities expected April 2022.

The Regional Covid Coordination Centre was established on 3 December 2021, and is supported by Upper Hutt City Council and Greater Wellington Regional Council. WREMO and Council officers are filling roles until the vacancies are filled.

7 Trifecta Update and Intended Next Steps – Oral Report

Dan Neely, Acting Regional Manager, WREMO, provided an update on the Trifecta review and tabled a presentation.

Mr Neely advised that the Minister for Emergency Management (Hon. Kiritapu Allan) met with Mayors and the Council Chair, and iwi representatives in February 2022, with feedback generally aligned with Group feedback.

The National Emergency Management Agency (NEMA) is now reviewing content of responses to its survey. The biggest concerns were engagement timeframes and section 17 of the Civil Defence Emergency Management Act 2002 roles and responsibilities. NEMA is reviewing the content of section 17 options, and the Minister has decided to delay the Bill engagement until after the local government elections in October 2022.

Noted: The Joint Committee asked that the invite to meet with the Minister be extended to all Group members.

8 WREMO Agreement – Oral Report

Dan Neely, Acting Regional Manager, WREMO, spoke to the report and tabled a presentation.

Mr Neely advised that the WREMO services agreement is due for renewal on 1 July 2022. Officers have been waiting for clarity from Trifecta, but this will not happen in time. It is proposed that the current Agreement is extended for a further 12 months under the existing terms to account for expected Trifecta changes.

9 Sector Strategy – Oral Report

Dan Neely, Acting Regional Manager, WREMO, spoke to the report, and tabled a presentation.

The Civil Defence Emergency Management (CDEM) Sector Strategy is a joint initiative between CDEM Group Managers and NEMA to work together more effectively. Its aim is to achieve greater alignment between NEMA and the 16 CDEM Groups. The Sector Strategy changed to a Partnership Charter in 2021 after the National Disaster Resilience Strategy was published in 2019, and work on Trifecta started in 2020.

The Charter will provide the basis for the development of a series of supporting protocols and practices, as well an integrated and prioritised work plan for the 17 entities.

10 Wellington Region Emergency Management Office Quarter Two Quarterly Report – 31 December – Report 22.109

Dan Neely, Acting Regional Manager, WREMO, spoke to the report.

Moved: Mayor Baker / Mayor Patterson

That the Joint Committee approves the Wellington Region Emergency Management Office's Quarter Two Quarterly Report – 31 December 2021 (Attachment 1) against the outputs identified in the draft WREMO Annual Business Plan 2021/22.

The motion was **carried**.

11 Wellington Civil Defence Emergency Management Group Appointments – Report 22.112

Dan Neely, Acting Regional Manager, WREMO, spoke to the report, and tabled updated recommendations.

Moved: Mayor Baker / Council Chair Ponter

That the Joint Committee:

1 Approves the removal of the following statutory appointees:

- a Mike Mendonca as Alternate Controller (Wellington City Council)
- b Jay Houpapa as Alternate Controller (Hutt City Council)
- c Kevin Currie as Alternate Controller (Kāpiti Coast District Council)
- d Rian van Schalkwyk as Alternate Controller (Kāpiti Coast District Council)
- e David Hopman as Controller (combined Wairarapa district councils)
- f Mike Mendonca as Recovery Manager (Wellington City Council)

2 Approves the addition of the following statutory appointees:

a Kym Fell as Alternate Controller (Wellington City Council)

b Nienke Itjeshorst as Alternate Controller (Kāpiti Coast District Council)

c Barry Vryenhoek as Alternate Controller (Hutt City Council)

d Steven May as Controller (combined Wairarapa district councils)

The motion was **carried**.

12 Capability Development, Targets and Training – Oral Report

Mark Duncan, Manager, Operational Readiness, WREMO, spoke to the report and tabled a presentation.

Mr Duncan advised that there were twelve events in 2021, covering almost the full spectrum of emergency events and hazards.

Due to attrition, many experienced staff have been lost and there is a need to fill these gaps. In the short-term, training opportunities have been moved to online venues, due to the COVID-19 restrictions, as well as further engagement to provide knowledge check reminders and May 2022 exercise, and support councils in recruitment of new staff. In the medium-long term a working group will be established to develop a strategy, policies and plans to ensure the Region's emergency management workforce is fit for purpose.

13 Welfare Capability Maturity Model and Intended Next Steps – Oral Report

Mark Duncan, Manager, Operational Readiness, WREMO, spoke to the report, and tabled a presentation.

The Welfare Capability Maturity Model (WCMM) was developed in consultation with local welfare managers, and was designed to measure the maturity across the welfare portfolio. It is intended to identify strengths, weaknesses and opportunities to guide work programmes and prioritisation. The average result was 4.2 (out of 10) and places the Region at the Basic level, where foundation policies, capabilities and practices are in place and repeatable, but are mainly reactive and inconsistent.

The review identified that iwi/Māori perspectives across the portfolio, and capability and capacity of the Region's welfare emergency management workforce are opportunities for development.

14 Annual Campaign Update – Oral Report

Dan Neely, Acting Regional Manager, WREMO, spoke to the report, and tabled a presentation.

Mr Neely advised that due to inflation and COVID-19 supply chain issues, the supplier of the Grab&Go Emergency Toilet is no longer able to meet the proposed price point.

Mr Neely also advised that due to the public's attention being on COVID-19 and other pressures, the annual campaign will be postponed to the next financial year (dates to be confirmed).

15 Recovery Operations Guide Update – Oral Report

Dan Neely, Acting Regional Manager, WREMO, spoke to the report, and tabled a presentation.

The Recovery Operations Guide provides an easy to use framework to improve the coordination and community outcomes for council and other recovery actors from response through to longer term recovery. It sets out the roles and responsibilities for recovery managers, and other key actors, including governance.

Noted: The Joint Committee requested a copy of the Recovery Operations Guide be provided to members.

The public meeting closed at 9.44am.

Mayor A Baker

Chair

Date:

Civil Defence Emergency Management Group
31 May 2022
Report 22.153

For Information

UPDATE ON PROGRESS OF ACTION ITEMS FROM PREVIOUS WELLINGTON CIVIL DEFENCE EMERGENCY MANAGEMENT GROUP MEETINGS – MAY 2022

Te take mō te pūrongo
Purpose

1. To update the Wellington Region Civil Defence Emergency Management (CDEM) Group on the progress of action items arising from previous CDEM Group meetings.

Te horopaki
Context

2. Items raised at CDEM Group meetings, that require actions from officers, are listed in the table of action items from previous CDEM Group meetings (**Attachment 1** – Action items from previous CDEM Group meetings – May 2022). All action items include an outline of the current status and a brief comment.

Ngā tūāoma e whai ake nei
Next steps

3. Completed items will be removed from the action items table for the next report. Items not completed will continue to be progressed and reported. Any new items will be added to the table following this CDEM Group meeting and circulated to the relevant business group/s for action.

Ngā āpitihanga
Attachment

Number	Title
1	Action items from previous CDEM Group meetings – May 2022

Ngā kaiwaitohu
Signatory

Writer	Jeremy Holmes – Regional Manager, WREMO

He whakarāpopoto i ngā huritaonga **Summary of considerations**
Fit with Council's roles or with Committee's terms of reference The action items are of an administrative nature and support the functioning of the CDEM Group.
Contribution to Annual Plan / Long Term Plan / Other key strategies and policies Action items contribute to the CDEM Group and WREMO's related strategies, policies and plans to the extent identified in **Attachment 1**.
Internal consultation There was no internal consultation.
Risks and impacts - legal / health and safety etc. There are no known risks.

Attachment 1 to Report 22.153

Action items from previous Wellington Civil Defence Emergency Management Group meetings

Meeting date	Action	Status and comment
22 March 2022	**Trifecta Update and Intended Next Steps – Oral Report** **Noted:** The Joint Committee asked that the invite to meet with the Minister be extended to all Group members.	**Status** Completed **Comment** The planned meeting with the Minister on 24 March was cancelled shortly after the 22 March Joint Committee meeting due to a severe weather event on the East Coast (the Minister's electorate). Rather than try to reconvene another meeting with the Minister, the Group submitted its feedback via email. The feedback was reviewed and approved by the Chair of both the Joint Committee and CEG before submission. Since then, NEMA have advised there will be other opportunities for Group members to engage with the Minister on this subject (the Trifecta) at a later date (dates to be advised in due course).
22 March 2022	**Recovery Operations Guide Update – Oral Report** **Noted:** The Joint Committee requested a copy of the Recovery Operations Guide be provided to members.	**Status** Completed **Comment** On 6 April 2022 Dan Neely provided Joint Commitee members with a copy of the Recovery Operations Guide and feedback form.

Civil Defence and Emergency Management Group
31 May 2022
Report 22.217

For Decision

IT'S OUR FAULT – STATEMENT OF WORK 2022/23

Te take mō te pūrongo
Purpose

1. To advise the Wellington Region Civil Defence Emergency Management Group (CDEM Group) with the Its Our Fault Statement of Work 2022/23 (IOF statement of work).

He tūtohu
Recommendation

That the Joint Committee **approves** the proposed milestones included in the It's Our Fault Statement of Work (Attachment 1).

Te tāhū kōrero
Background

3. Since 2006, the It's Our Fault (IOF) project has worked collaboratively with scientists, engineers and planners to yield high-quality and applicable research on the earthquakes in the Wellington region.
4. The attached Statement of Work (**Attachment 1**) is formulated under and governed by the terms and conditions of the It's Our Fault Research Programme Agreement, dated January 2020, between the Earthquake Commission (EQC), GNS Science, Wellington City Council and Wellington Region Civil Defence and the Emergency Management Office (Research Programme Agreement.)

Te tātaritanga
Analysis

5. CEG has approved the IOF statement of work, which proposes several workstreams and milestones for 2022-23, including items such as:
    a Assess tsunami impacts on coastal environments such as marinas;
    b Modelling subduction zone earthquakes;
    c Examining newly discovered active faults;

d Measuring unexpected ground movement;

e Reviewing TA policies and decisions on earthquakes to inform a common approach; and

f Hosting a science to practice workshop.

6. Full details are outlined in the Statement of Work **(Attachment 1).**

Ngā hua ahumoni
Financial implications

7. Costs for 2022-23 are estimated at a total of $433,800 shared by EQC (65.7 percent), Wellington City Council (17.2 percent), and WREMO (17.2 percent, to a maximum of $74,400). WREMO's portion is shared across all councils, excluding Wellington City Council. The budget and cost-sharing structure is detailed in **Attachment 1**.

Ngā Take e hāngai ana te iwi Māori
Implications for Māori

8. Engagement with iwi is detailed in the IOF statement of work, including engagement with Ngāti Kahungunu ki Wairarapa and Rangitāne o Wairarapa regarding on-site geological sampling of active faults in the Wairarapa. The statement also notes that findings are to be shared with relevant iwi, councils and other land owners.

Ngā tikanga whakatau
Decision-making process

9. The matter requiring decision in this report was considered by officers against the requirements of section 17 of the Civil Defence Emergency Management Act 2002 and the decision-making requirements of Part 6 of the Local Government Act 2002.

Te hiranga
Significance

10. Officers considered the significance (as defined by Part 6 of the Local Government Act 2002) of these matters, taking into account Greater Wellington Regional Council's *Significance and Engagement Policy* and *Decision-making Guidelines*. Officers recommend that this matter is of low significance, due to its administrative nature.

Te whakatūtakitaki
Engagement

11. Given the low significance of the matter for decision, no related engagement was required.

Ngā āpitihanga
Attachment

Number	Title
1	Draft - Its Our Fault Statement of Work 2022-23

Ngā kaiwaitohu
Signatories

Writer	Sam Ripley – Advisor, Business and Development, WREMO
Approver	Jess Hare – Manager, Business and Development, WREMO Jeremy Holmes – Regional Manager, WREMO

He whakarāpopoto i ngā huritaonga **Summary of considerations**
Fit with Council's roles or Committee's terms of reference
Under Section 17 of the CDEM Act 2002 the Joint Committee and each member is required to identify, assess, and manage relevant risks. This work programme helps identity and assess regional risks for management purposes. It is part of the Group Plan. The Joint Committee is responsible for implementing and monitoring the Group Plan.
Contribution to Annual Plan / Long term Plan / Other key strategies and policies
Research outputs may be applicable to long term planning, in particular strategies and policies pertaining to land use and infrastructural impacts from earthquakes.
Internal consultation
See paragraph 4.
Risks and impacts: legal / health and safety etc.
There are no known risks.

Attachment 1 to Report 22.217

DRAFT

IT'S OUR FAULT RESEARCH PROGRAMME

STATEMENT OF WORK FOR 2022–2023

DRAFT

IT'S OUR FAULT RESEARCH PROGRAMME
STATEMENT OF WORK

This Statement of Work sets out the Services and Deliverables to be provided by GNS Science to the Participants during a Financial Year of the It's Our Fault Research Programme.

This Statement of Work is formulated under and governed by the terms and conditions of the It's Our Fault Research Programme Agreement, dated January 2020, between the Earthquake Commission, GNS Science, Wellington City Council and Wellington Region Civil Defence and the Emergency Management Office (*Research Programme Agreement*).

Capitalised terms used in this Statement of Work have the meanings given to those terms in the Research Programme Agreement.

PART A – TO BE COMPLETED BY GNS Science

Relevant Financial Year: 2022–2023

General overview of Services and Deliverables:

In 2022–2023, five workstreams will be included in the It's Our Fault research programme.

The Tsunami Hazard and Vulnerability workstream will shift focus from impacts on coastal communities to impacts on natural and man-made environments (marinas).

The Hikurangi Subduction Hazard workstream will shift focus of fieldwork back to extending the record at Mataora–Wairau Lagoon and the modelling component to ground motions from subduction earthquakes.

The Northern Ohariu Fault workstream will be replaced by a new active fault paleoseismology workstream ground-truthing newly discovered active faults in the Wairarapa Region.

A new Ground Deformation workstream will be included, using fortnightly InSAR data and the SLIDE project findings to identify anomalous areas of ground movement in the western part of the Wellington Region.

The Planning and Policy workstream will focus on a rescope of a task from 2021-2022 on the NPS-UD requirements that was unable to be completed due to capacity issues. The work will document the criteria, decisions, and factors used by TAs to help inform a common framework for the region and consistency of approach. A Science to Practise workshop for Wellington City Council will also be held.

DRAFT

Detailed description of Services, Deliverables and Payment Milestones:

Specific milestones will provide the basis for invoicing. The milestones established for each workstream to be completed during 2022–2023, their associated costs and timeframes are as follows:

PROJECT MANAGEMENT AND PROJECT DEVELOPMENT ($80,000)

Milestone 1: Project management and Outreach. $17,500. Q1
Milestone 2: Project management and Outreach. $17,500. Q2
Milestone 3: Project management and Outreach. $17,500. Q3
Milestone 4: Project management and Outreach. $17,500. Q4

RESEARCH INTEGRATION WORKSHOPS ($10,000)

Milestone 1: Hold an online engagement meeting of the Wellington Co-lab (with QuakeCore, ECLab, AF8, Resilience Challenge, VUW Marsden and GNS Endeavour programmes). $2,500. Q1
Milestone 2: Hold a face-to-face meeting of the Wellington Co-lab (with QuakeCore, ECLab, AF8, Resilience Challenge, VUW Marsden and GNS Endeavour programmes). $2,500. Q2
Milestone 3: Task Integration Workshop. $2,500. Q3
Milestone 4: Hold an online engagement meeting of the Wellington Co-lab (with QuakeCore, ECLab, AF8, Resilience Challenge, VUW Marsden and GNS Endeavour programmes). $2,500. Q4

DRAFT

PLANNING AND POLICY ($10,000 for workshop)

For 2022–2023 the Planning and Policy workstream will focus on completing many of the delayed milestones from 2021–2022, with the addition of a Wellington City Council Science to Practice Workshop.

Task 1 comprises a rescope of the NPS-UD task from 2021-2022 to address the current needs of Wellington's Territorial Authorities (TA) around the NPS-UD requirements. Some TAs in the Wellington Region and Major Metros in NZ have proposed to use natural hazards as "qualifying matters" under the NPS-UD and therefore exceptions to the intensification requirements, in their draft district plans. The pace of adoption has meant each TA has developed its own criteria, weighting and balance of planning decisions in their draft district plans, so as to meet the notification requirements (WCC in July and others in the region in August 2022). Drawing on the various proposals in the draft district plans this project will document the criteria, decisions, and factors to help inform a common framework for the region and consistency of approach. This work will inform the Wellington Regional Growth framework, and those councils in the region who have not yet sought to apply the NPS-UD within their district plans.

The Science to Practice workshops previously run at GNS Science sought to capture all natural hazards, relevant planning practice and Councils across the Wellington Region. With Wellington City Council, we will adopt the model trialled in the Wairarapa by engaging with a single council, establish a relationship and understanding of the natural hazard planning challenges they face, and prepare and deliver a workshop to assist in addressing these. This delivery model will ensure that maximum value is able to be achieved for that council in the most efficient manner for participants. This is captured as Task 2 within the Planning and Policy Workstream.

The 2022–2023 milestones for this project are:

1. Develop a natural hazard risk evidence base to inform development directions.

These milestones from 2021–2022, are carried over from last year (no new funding requested) as follows:

Milestone 1.1: Review Wellington TA draft, proposed, operative district plans that have implemented NPS-UD requirements. ($40,000 from 2021–2022). Q2

Milestone 1.2: Complete draft report. ($30,000 from 2021–2022). Q3

Milestone 1.3: Present results / report in a format/forum(s) agreed with Steering Committee. ($10,000 from 2021–2022). Q4

2. Wellington City Council Science to Practice workshop

Milestone 2.1: Engage with Council representative. $1,000. Q1

Milestone 2.2: Establish Science to Practice needs. $1,000. Q2

Milestone 2.3: Deliver Workshop. $8,000. Q4

DRAFT

TSUNAMI HAZARD AND VULNERABILITY ($113,500)

Tsunami Evacuation and Coastal Impact Modelling

Past IOF tsunami tasks have been focused on tsunami hazard identification, tsunami arrival time estimates and evacuation modelling, emphasizing on the safety of at-risk coastal communities. In this financial year, we finalise the agent-based evacuation modelling for Kapiti Coast suburbs and start to investigate tsunami impacts on natural and man-made environments in the Greater Wellington Region. The research will be mainly focused on following aspects:

- agent-based evacuation modelling for Peka Peka, Te Horo Beach and Ōtaki Beach,
- tsunami impact on coastal habitats (e.g., endangered little blue penguin or banded dotterel), and current coastal vegetation restoration efforts (e.g., those managed by DOC, council, associations, etc.) in major tsunami events; and
- tsunami impact on manmade environments, such as tsunami-induced currents and wave amplifications (seiche-related phenomena) in marinas.

We choose Mana Marina (figure) in Porirua to start our pilot studies of tsunami impact on coastal environments. This marina experienced strong tsunami currents in recent (15 January 2022) Tonga tsunami event.

The project milestones for 2022–2023 are:

Milestone 1: ***Data collection and preparation.*** $8,000. Q1

Milestone 2: ***Tsunami impact on coastal habitats and coastal restorations evaluated.*** $9,000. Q2

Milestone 3: ***Agent-based evacuation model inputs prepared.*** $20,000. Q2

Milestone 4: ***Tsunami impact on man-made marinas analysed.*** $24,500. Q3

DRAFT

Milestone 5: ***Agent-based evacuation simulations calculated***. $20,000. Q3

Milestone 6: ***Interpretation and dissemination of results*** (reports or workshops). $32,000. Q4

DRAFT

HIKURANGI SUBDUCTION ZONE HAZARD ($80,000)

The southern Hikurangi subduction interface represents one of the most significant sources of seismic and tsunami hazard for the Wellington Region. IOF-funded research in recent years has yielded constraints on the timing of four inferred earthquakes during the past 2000 years. These earthquake ages represent a major constraint for hazard models, but overall the subduction zone is still poorly understood, especially when compared with other fast-slipping faults like the Alpine and Hope faults. It therefore remains important to carry out further work to understand the magnitude and recurrence of past subduction earthquakes and to separate their effects from those of upper-plate faults.

Coring investigations at Mataora-Wairau Lagoon

Cores at Mataora-Wairau Lagoon have been used to constrain the timing of two subduction earthquakes, at ~500 and ~800 years BP. Further coring in the lagoon represents the best opportunity to extend and improve the subduction earthquake record, and to provide more detail on two older earthquakes inferred from paleo-tsunami deposits at Kapara-te-hau Lake Grassmere.

We will collect vibracores from the top 5–7 m of sediment in the lagoon and use them to reconstruct the history of subsidence and uplift in Mataora-Wairau Lagoon. If there is evidence of paleo-earthquakes, we will constrain the likely subsidence in past earthquakes using paleo-ecological techniques. Bayesian age modelling of radiocarbon ages from the sediments will be used to further constrain the timing of past events, allowing comparisons with other paleo-earthquake ages from the Wellington Region and northern South Island. This project is a major undertaking; it will be led by Dr Kate Clark and co-funded by Understanding Zealandia (a SSIF project; ~$50,000).

Additional analysis will depend whether there is either new evidence for past earthquakes or a new constraint on the timing of or displacement during a previously inferred paleo-earthquake. If appropriate, we will use dislocation and tsunami modelling techniques to constrain likely characteristics of events that cause deformation at multiple sites.

Modelling ground motions from earthquakes on the subduction interface and upper-plate faults

In the Cook Strait area, it is often uncertain whether observed subsidence and especially uplift is due to: (1) a past subduction earthquake; or (2) rupture of a fault within the overriding Australian Plate. Difficulties distinguishing between these two types of earthquakes are probably the greatest source of uncertainty in the number and magnitude of past large earthquakes in the Wellington Region. Arguably the best way for future work to separate subduction and upper-plate earthquakes will be the use of off-fault proxies; such proxies include the distribution of landslides onshore and the distributions of earthquake-triggered turbidites in lakes and offshore canyons. We will run models to test whether off-fault proxies are likely to be useful for distinguishing between subduction and upper-plate earthquakes in the Wellington Region.

Earthquake ground motions are a major control on the occurrence of landslides and turbidity currents. Consequently, the feasibility of using off-fault proxies to identify subduction vs. upper-plate earthquakes depends on identifying areas where ground motions from these two categories of earthquake differ significantly. We will conduct scenario-based modelling of the spatial distributions of ground motions from a range of subduction and upper-plate earthquakes

and identify areas where the two distributions are most different. The modelled scenarios will encompass a range of fault geometries and will also include combined ruptures of the subduction interface with upper-plate faults. Modelling will mostly use empirical ground motions (OpenQuake) because the methodology is well suited for use in this setting. However, we hope to compare the empirical results against more detailed preliminary physics-based ground motion models from the RNC2 earthquake and tsunami theme. Our scenario-based approach will complement probabilistic estimates of ground shaking from the ongoing 2022 National Seismic Hazard Model revision.

The project milestones for 2022–2023 are:

Milestone 1: ***Collect sediment cores from Mataora-Wairau Lagoon.***
Conduct grain-size analyses of sediments and obtain radiocarbon dates to reconstruct the environmental history of the lagoon. Determine whether there is evidence for uplift or subsidence in past earthquakes. $30,000. Q2

Milestone 1a: (Contingent on completion of Milestone 1)
Constrain the timing of and displacement during any paleo-earthquakes. Carry out dislocation modelling to link events with events from other sites around Cook Strait (e.g. Palliser and Lake Grassmere). $10,000. Q3

Milestone 2: ***Model ground motions from subduction and upper-plate earthquakes,*** identifying any regions where predicted motions from the two categories of event differ significantly. Investigate the feasibility of using off-fault proxies to distinguish between subduction and upper-plate earthquakes. $30,000. Q3

Milestone 3: **Write up findings** as a science report. $10,000. Q4

DRAFT

ACTIVE FAULT PALEOSEISMOLOGY ($75,000)

Ground truthing newly discovered active faults in the Wairarapa Region

Recently, active fault mapping by Litchfield, Coffey and Morgenstern (2022) has identified several new active faults near townships in the Wairarapa region. These include: the Woodside fault, located in the outskirts of Greytown and trending towards the town; the Carters Line fault, to the southeast of Carterton; the Papawai fault, which extends southeast of Greytown and beneath the Papawai marae; and finally, the Ruamahanga fault just northeast of Masterton. These faults were identified from their expression in the landscape using Light Detecting and Ranging (LiDAR) data. However, in some cases they have broad gentle scarps and extend through areas that have been modified by humans or alluvial processes. Little is known about these faults and because of this, and their proximity through or near urban areas, they warrant further study to confirm whether they are active faults and which of these, if any, require further paleo-seismic investigation to elucidate earthquake properties such as recurrence interval and slip rate.

We will address this through the use of the non-invasive Ground Penetrating Radar (GPR) technique. GPR uses radar pulses to image the shallow subsurface providing a window which we can use to search for offset stratigraphy and interrogate these newly identified faults. Multiple transects will be ran across each fault, utilising GNS Science's newly acquired GPR, and the resulting profiles will be analysed to determine whether evidence of faulting is present. Alongside GPR surveying, a focused reconnaissance of these faults will be undertaken to 1) investigate the ages of terraces cut by faults and explore any implications this may have on fault activity, 2) identify suitable sites for future paleo-seismic investigation if warranted, and 3) liaise with iwi and landowners to develop relationships and obtain permissions for future trenching. By combining GPR with a detailed reconnaissance of these faults we can investigate more faults over a single year period, allowing us to learn more about the activity of these faults, including validation of desktop active fault mapping, as well as lay the groundwork for future paleo-seismic studies (e.g., trenching).

The project milestones for 2022–2023 are:

Milestone 1: ***Fieldwork planning and site selection***
Identification and planning of transects for GPR profiles, which will involve liaising with landowners to obtain permissions and ensure the absence of any man-made subsurface structures e.g. pipes. LiDAR data will be used to map terraces cut by the new faults and identify locations of interest for reconnaissance work. We will undertake initial iwi engagement with Wairarapa iwi (Ngāti Kahungunu ki Wairarapa, Rangitāne o Wairarapa). $9,000. Q2

Milestone 2: ***GPR and reconnaissance fieldwork***
GPR transects will be run on at least three of the new faults and processed after returning from the field. Reconnaissance fieldwork will be undertaken and involve investigation of outcrops, augering, and where possible sample collection for dating to gain an understanding on the age of faulted terraces. Continued iwi

engagement and a visit to Papawai marae if possible. Samples for dating will be submitted if collected. $35,000. Q3

Milestone 3: ***Data analysis and synthesis***

Age information for faulted terraces will be used to evaluate fault activity where possible (e.g. recurrence interval, slip rate, or time since the last surface rupturing earthquake). Findings will be synthesised in a report, which will be shared with relevant councils, landowners, and iwi. Advice on how our results directly pertain to application of the MfE Active Fault guidelines will be provided. $31,000. Q4

DRAFT

GROUND DEFORMATION - Wellington ($69,000)

The surface of Aotearoa is always on the move. Whether the result of tectonic (earthquakes, Slow Slip Events, Interseismic) and volcanic processes or more localised ground deformation caused by, for example, landslides, compaction/settlement, stream erosion and anthropogenic processes. Ground deformation can pose risk-to-life, property, and/or infrastructure. Landslides alone cost NZ >$250M / year and frequently cause the temporary closure of key infrastructure and climate change predictions suggest these events will increase in frequency in the future.

Traditional ground-based methods to detect and monitor ground movements over large urban areas are costly and provide limited spatial and temporal resolutions. InSAR provides an alternative method which can provide deformation data at building scale spatial resolutions with fortnightly updates. This proposed works aims to exploit high-resolution (3 x 14 m) InSAR data covering the Wellington region (Figure) following the 2016 Kaikōura earthquake to identify anomalous areas of ground movement, quantify the rate and temporal evolution, and classify the likely processes causing the movement.

In addition to a final report detailing the findings of our analysis, we will produce a geospatial 'anomaly' map identifying ground deformation areas classified based on the dominant process(s) causing the deformation. Such hotspots can then be overlain on infrastructure maps to identify potential hazardous ground deformation. For example, ongoing settlement of a fill slope at Priscilla Crescent in Wellington, likely led to its subsequent failure in 2013. Therefore, identifying similar locations – by bringing together the SLIDE project geomorphic maps with the InSAR ground deformations and infrastructure locations – would allow such hazards to be identified, monitored and if needed, mitigated.

DRAFT

The project milestones for 2022–2023 are:

Milestone 1: ***Ground Deformation Analysis***

Using regional GNSS data, we will apply a regional filter to remove long wavelength deformation signals associated with regional tectonics from each of the available InSAR datasets. Additionally, we will apply atmospheric corrections where required and perform a noise analysis to remove any noisy data points, leaving ground deformation signals associated with localised processes such as landslides and settlement. $18,500. Q1

Milestone 2: ***Data Transformation***

After applying the necessary corrections, using the different satellite look angles and the local topography we will deconvolve the InSAR data into the horizontal, vertical and down-slope components of the displacement vector. Using both the LOS (line-of-sight) and transformed datasets, we will perform a cluster analysis to identify and extract deformation anomalies. $20,000. Q2

Milestone 3: ***Ground deformation process classification (pilot area).***

Using the outputs from milestone 1, along with legacy 'geospatial' datasets (e.g., the outputs from the SLIDE project, lidar and other available datasets), we will attempt to classify the different types of ground deformation based on the dominant processes driving them (e.g., landslide, settlement, dynamic compaction, stream erosion, lateral spreading, filling and cutting etc.), within a small area of the pilot area to create a 'training' dataset. $15,500. Q3

Milestone 4: ***Model Validation and Testing***

Using the training dataset, we will train machine learning models to forecast where similar ground deformation processes may occur based on the transformed ground deformation and legacy datasets, across the wider pilot area (outside the training dataset). In a final step, we will Test /validate the efficacy of the machine learning models. $10,000. Q4

Milestone 5: ***Final report and production of anomaly map***

Report or journal article summarising the results of the analysis and generation of GIS map showing regions of anomalous movement.$5,000. Q4

**There is substantial overlap between this work and an Endeavour program currently under consideration. If funded, it will aim to apply similar techniques described here at a national scale and would require only nominal funding to support this focussed study over Wellington.

DRAFT

PART B – TO BE COMPLETED BY EQC

Participant share of the Charges (to be pro-rata according to relative Funding Commitments unless otherwise agreed):

- EQC – 65.7% (to a maximum of $285,000)
- WCC – 17.2% (to a maximum of $74,400)
- Wellington Region CDEM office – 17.2% (to a maximum of $74,400)

Signed for and on behalf of
Institute of Geological and Nuclear Sciences by:

_____
Authorised Signatory

Signed for and on behalf of
The Participants by Earthquake Commission

_____
Authorised Signatory

DRAFT

ANNEXURES

- *Budget*

Charges against each milestone have been indicated within the project descriptions above, along with anticipated timeframes for completion.

Table 1: Summary of charges against projects, by quarter, for 2022–2023.

	Q1	Q2	Q3	Q4	Full Year
Project Management and Outreach	$17,500	$17,500	$17,500	$17,500	**$70,000**
Research Integration Workshops	$2,500	$2,500	$2,500	$2,500	**$10,000**
Planning and Policy	$1,000	$1,000		$8,000	**$10,000**
Tsunami Hazard and Vulnerability	$8,000	$29,000	$44,500	$32,000	**$113,500**
Hikurangi Subduction Zone		$30,000	$40,000	$10,000	**$80,000**
Active Fault Paleoseismology		$9,000	$35,000	$31,000	**$75,000**
Ground Deformation	$18,500	$20,000	$15,500	$15,000	**$70,000**
Unallocated – project and milestones TBD				$6,300	**$6,300**
Totals	**$47,500**	**$109,000**	**$155,000**	**$122,300**	**$433,800**

Civil Defence and Emergency Management Group
31 May 2022
Report 22.218

For Decision

WELLINGTON REGION EMERGENCY MANAGEMENT OFFICE QUARTER THREE QUARTERLY REPORT – 31 MARCH 2022

Te take mō te pūrongo
Purpose

1. To advise the Wellington Civil Defence Emergency Management Group Joint Committee (the Joint Committee) of progress and achievements against the Wellington Region Emergency Management Office (WREMO) Annual Plan 2021/22.

He tūtohu
Recommendation

That the Joint Committee **accepts** the content of the WREMO Quarter Three Quarterly Report – 31 March 2022 (Attachment 1).

Te tāhū kōrero
Background

3. The WREMO Quarter 3 report (WREMO Q3 report) (Attachment 1) provides information on achievements and progress against the activities set out in the WREMO 2021/22 Annual Plan work programme, as well as additional areas of work identified by the WREMO leadership team.
4. The Coordinating Executive Group (CEG) has approved the report as a true and accurate record of the activities undertaken during the third quarter of FY 2021/22.

Te tātaritanga
Analysis

5. The WREMO Q3 report details progress made from 1 January to 31 March 2022 against the Key Performance Indicators (KPIs) in the WREMO 2021/22 Annual Plan. Noteworthy items include:
    a Impacts and adaptations resulting from Omicron outbreaks;
    b Launch of the Regional COVID-19 Coordination Centre (RCCC);

c Proactive changes to WREMO work programme priorities, to ensure preservation of response capability and staff wellbeing; and

d A small underspend in the budget due to staff vacancies, which are now filled.

Ngā hua ahumoni
Financial implications

6. There are no financial implications arising from the matter for decision.

Ngā Take e hāngai ana te iwi Māori
Implications for Māori

7. **Attachment 1** outlines activities undertaken during Quarter 3 that have implications for Māori, including outlining progress made on deliverables specific to iwi and Māori engagement.

Ngā tikanga whakatau
Decision-making process

8. The matter requiring decision in this report was considered by officers against the requirements of section 17 of the Civil Defence Emergency Management Act 2002 and the decision-making requirements of Part 6 of the Local Government Act 2002.

Te hiranga
Significance

9. Officers considered the significance (as defined by Part 6 of the Local Government Act 2002) of these matters, taking into account Greater Wellington Regional Council's *Significance and Engagement Policy* and *Decision-making Guidelines*. Officers recommend that this matter is of low significance, due to its administrative nature.

Te whakatūtakitaki
Engagement

10. Given the low significance of the matter for decision, no related engagement was required.

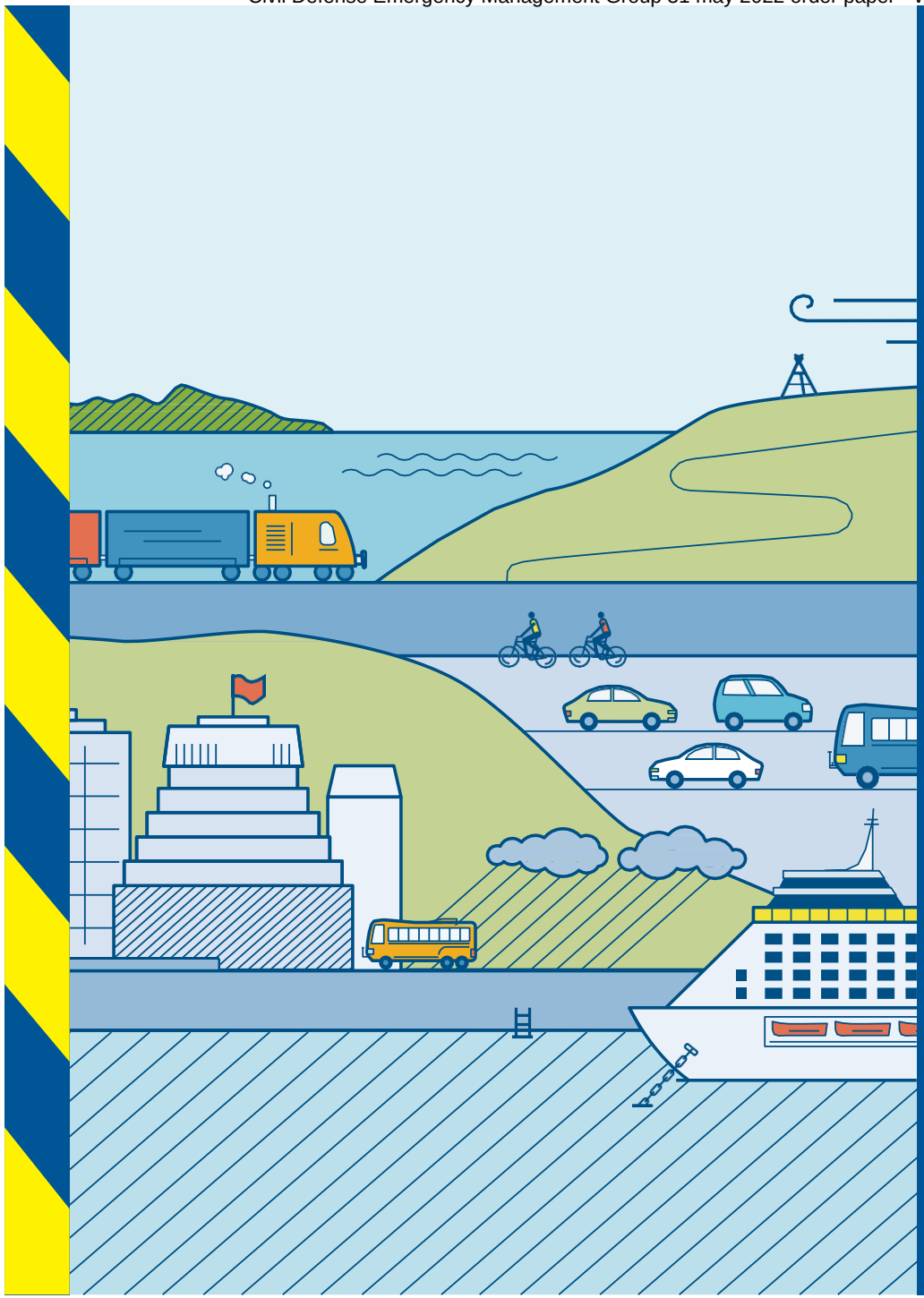
Ngā āpitihanga
Attachment

Number	Title
1	WREMO Quarter Three Quarterly Report – 31 March 2022

Ngā kaiwaitohu
Signatories

Writer	Sam Ripley – Advisor, Business and Development, WREMO
Approvers	Jess Hare – Manager, Business and Development, WREMO Jeremy Holmes – Regional Manager, WREMO

He whakarāpopoto i ngā huritaonga **Summary of considerations**
Fit with Council's roles or Committee's terms of reference
The Joint Committee reviews the work programme identified in the draft WREMO Annual Business Plan 2021/22, which is informed by the Wellington Region CDEM Group Plan. The Joint Committee is responsible for implementing and monitoring the Group Plan.
Contribution to Annual Plan / Long term Plan / Other key strategies and policies
The WREMO Q3 Report details progress against the priorities identified in the draft Annual Business Plan 2021/22. Changes in work programme priorities in response to Omicron outbreaks may result in work shifted to the next Annual Plan.
Internal consultation
See paragraph 4.
Risks and impacts: legal / health and safety etc.
There are no known risks.



Attachment 1 to Report 22.218

WELLINGTON REGION EMERGENCY MANAGEMENT OFFICE

Wellington Region
Emergency Management Office

Quarterly Report

1 January to 31 March 2022

Q3

Contents

Executive summary

Overview

Last year, we saw the arrival of the Delta variant of COVID-19. This year, it was the arrival of the Omicron variant. Because Omicron is much more infectious, regional COVID-19 partnerships and planning had to adapt to meet the new challenge. While we couldn't stop it completely, we could take steps to mitigate its impacts.

This being the case, one such step was to refine our regional approach and strengthen links with health and welfare partners. This included the launch of the Regional COVID-19 Coordination Centre (RCCC), a partnership between councils, DHBs and MSD. The RCCC positioned regional leaders to be better informed as the COVID-19 situation emerged so that the region could respond in a coordinated way.

In addition to better regional coordination, adapting to Omicron also required being clear on our priorities. WREMO's role is to lead and coordinate the effective delivery of CDEM services for the region. Looking after the wellbeing of our staff is fundamental to achieving that. As a result, some work was put on hold during the quarter to ensure we delivered higher priority tasks and ensure staff wellbeing.

While the arrival of this latest variant of COVID-19 has posed challenges and prompted a shift in priorities, I'm proud to say that our staff are still achieving and adapting. In addition to maintaining operational readiness to respond to other emergency events (such as Ex Topical Cyclone Cody, the Tongan volcanic eruption and tsunami, and severe weather in February) progress has also been made on regional welfare needs assessment planning, our regional alerting capability and building stronger relationships with iwi and Māori partners. I trust that you will find this short-format report to be informative about the work completed this quarter.

J Holmes

Jeremy Holmes, Regional Manager - Wellington Region CDEM Group

Wins

1

Win 1: A boost to regional COVID coordination

Begun in late 2021, the Regional COVID Coordination Centre (RCCC) was stood up by WREMO and handed over to a team of permanent staff to oversee the region's response to COVID-19 for the next 12-18 months. With the RCCC in place, the region as whole is better informed about COVID-19 impacts and able to better communicate and coordinate the efforts of regional partners.

2

Win 2: Clarifying priorities and prioiritising wellbeing

To mitigate the risk of Omicron, WREMO staff have had to work from home for extended periods. This has had impacted our staff and our planned work program. To ensure we are able to respond effectively to other emergency events, WREMO staff focused on the delivery of key priorities. Staff were empowered to pause other lower priority work and to make health and wellbeing a priority as much as any project or work programme.

3

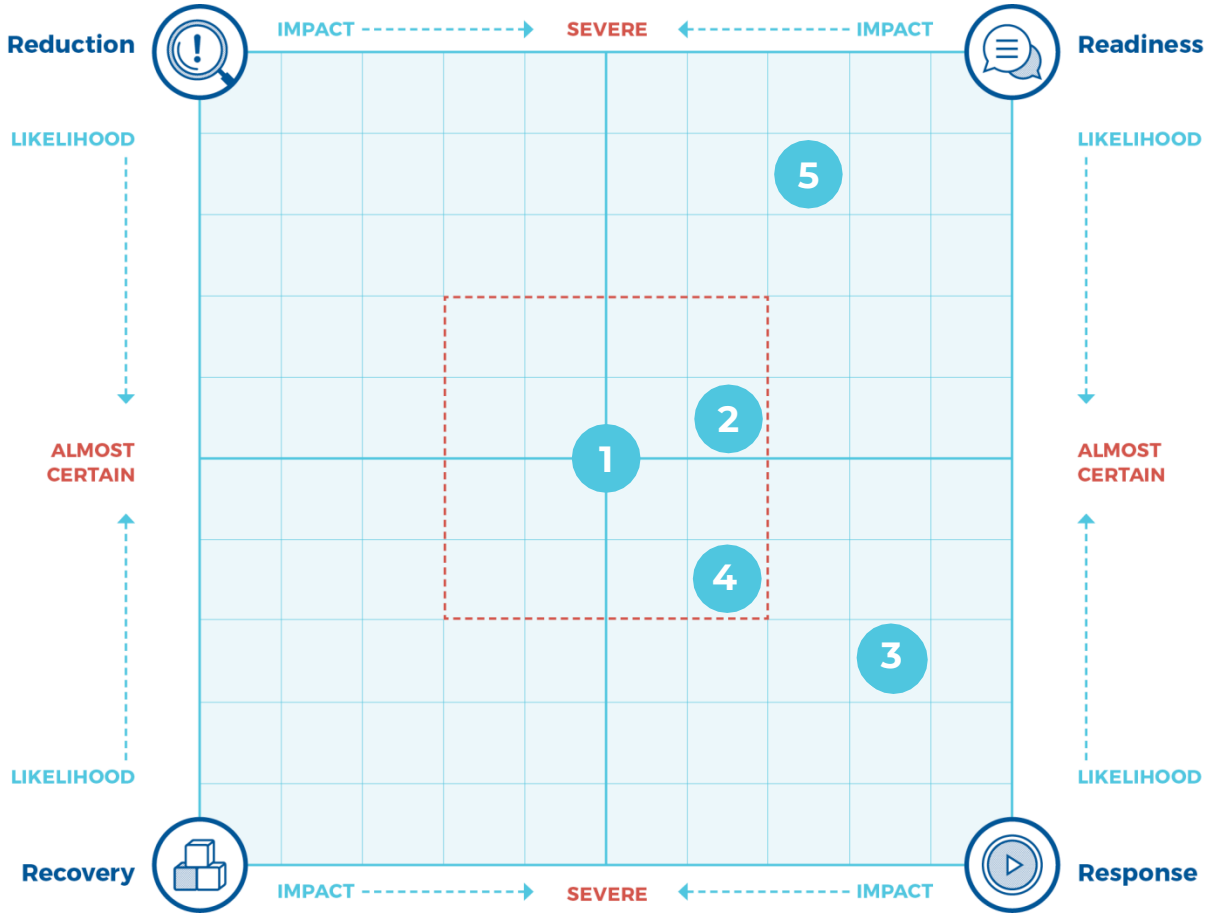
Win 3: Continuing to build capability in the face of COVID

Alongside COVID-19 challenges, staff have made progress in such areas as welfare needs assessment planning, better systems for contacting staff when emergencies occur, and significant strides have been made in building relations with our iwi and Māori partners.

Risk matrix

Risk matrix as at 31 March 2022:

1. Impacts of Omega variant of COVID-19
2. Health, safety and wellbeing of staff
3. Changes to national and regional COVID strategies
4. Numbers of council staff attending EOC/ECC training
5. Outcomes of revisions to the CDEM Act



Financial summary

WREMO Income Statement	YTD as at 31 March 2022 Actual $(000)	Budget $(000)	Variance $(000)	Full year Budget $(000)
Rates & levies	953.80	953.80	-	1,271.67
External revenue	1996.10	1961.1	35.00	2,614.85
Council reimbursement on charges				-
Internal revenue				-
Total income	2949.90	2914.90	35.00	**3,886.52**
Less:				
Personnel costs	2377.90	2526.8	149.9	3,369.00
Materials, supplies and services	162.10	369.40	207.30	492.52
Travel and transport costs	45.00	60.00	15.00	80.00
Contractor and consultants	191.40	60.00	(131.4)	80.00
Internal charges	-	-	-	-
Total direct expenditure	2,776.40	3,061.10	239.7	4,021.52
Corporate overhead costs	82.50	82.50	-	110.0
Depreciation	52.4	52.4	-	69.9
Total expenditure	2,911.30	3,151.1	239.80	**4201.42**
Operating surplus/(deficit)	(5.1)	(34.96)	**29.86**	**(69.9)**
Add back depreciation	41.90	34.95	6.95	69.9
Other non cash				-
Vehicles and other plant purchases				-
Net external investment movements	(210.00)			(60.00)
Net funding before debt and reserve movements				**-**
Debt additions / (decrease)				-
Council reimbursements				-
Reserve investments interest				-
Reserve investments transfer out	228.8	228.8		305.00
Net funding surplus (deficit)	**109.8**	**45.0**	**64.80**	**-**

Currently, the budget is tracking well with a small underspend of $109k. This underspend is due to the postponement of the annual campaign and the community survey which is conducted in the final quarter.

The underspend in personnel is due to a number of vacancies which are now filled.

BALANCE OF RESERVE AS AT 1 JULY 2021 $327,000**

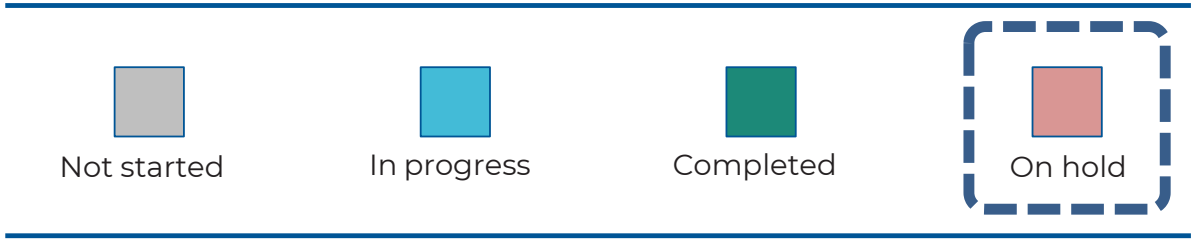
Of this total, $305,000 has been allocated for additional staff (Marketing and Communications Advisor and Senior Māori Integration Advisor ($190k), deferred projects ($115k).

KPI Summary

On hold KPIs

As Omicron has prompted changes to work priorities, an **On hold** status has been added to the legend for KPI progress.

Progress



Reduction
KPI Summary

Progress

Not started	In progress	Completed	On hold

DELIVERABLE

Lead the development and implementation of the CDEM Group Plan, and report on progress against the strategic outcomes identified in the Plan.

KPI	Q1	Q2	Q3	Q4	Completed YTD	Priority
Provide quarterly reports to the CEG Sub Committee, reporting on progress against the WREMO Annual Plan (2021-2022) activities.					3 / 4	HIGH
Develop the WREMO Annual Plan (2022–23) in alignment with council annual plan development timelines.						HIGH
Establish the Project Portfolio Management Office (PPMO) and provide an initial report to the CEG and Joint Committee to test the format and information requirements.						HIGH
Conduct the annual WREMO Regional Community Survey to identify trends and opportunities to increase resilience.						HIGH

DELIVERABLE

Coordinate the efforts of councils and other CDEM Group partners to align and enhance approaches to natural hazard risk reduction practices.

KPI	Q1	Q2	Q3	Q4	Completed YTD	Priority
Lead the Emergency Levels of Service project to ensure hazard risks to Lifeline Utility services are reduced.						MEDIUM
Reconvene the Natural Hazard Steering Group to assess progress occurring pre-COVID-19 and determine actions for the future.						LOW

Reduction
KPI Summary

Progress

Not started	In progress	Completed	On hold

DELIVERABLE

Provide administrative support, guidance and advice to CDEM governance groups.

KPI	Q1	Q2	Q3	Q4	Completed YTD	Priority
Perform secretariat duties for CDEM governance groups, including the Coordinating Executive Group (CEG), Sub-Committee and Regional Leadership Group (RLG) as required.						HIGH
Respond to relevant Local Government Official Information and Meetings Act (LGOIMA) requests in accordance with legislated time frames and procedures.						HIGH
Support Greater Wellington Regional Council (GWRC) Democratic Services with secretariat duties for the CDEM Joint Committee.						HIGH

Readiness
KPI Summary

Progress

Not started	In progress	Completed	On hold

DELIVERABLE

Lead the development and implementation of the Group Training and Exercises Plan in accordance with the Capability Development (Skilled People) Strategy.

KPI	Q1	Q2	Q3	Q4	Completed YTD	Priority
Develop and deliver professional development opportunities for the region's emergency management workforce in accordance with the Group Training and Exercise Plan 2021/22.						HIGH
Administer the Wellington Region's portion of the national CDEM training fund.						HIGH
Coordinate the Wellington Region's Response Teams to provide consistent training, deployment processes and legislative compliance.						HIGH
Manage the Group's Learning Management System (takatū) and incorporate national-level enhancements to the system as required.						MEDIUM
Support national level capability development advisory groups, programmes and initiatives.						LOW

Readiness
KPI Summary

Progress

Not started	In progress	Completed	On hold

DELIVERABLE

Lead the development and maintenance of equipment, systems and tools for WREMO, the ECC and EOCs.

KPI	Q1	Q2	Q3	Q4	Completed YTD	Priority
Complete monthly operational ICT and technical equipment checks across the region's ECC and EOCs and resolve issues as required.						HIGH
Implement online access to EOC and ECC systems to enable Bring Your Own Device (BYOD) use.						HIGH
Maintain IT security and platforms and explore opportunities for further development.						HIGH
Provide ICT guidance and advice to the EOCs/ECC using WREMO supported hardware and networks in preparation for an emergency.						HIGH
Maintain the regional radio network as an alternate communications system.						HIGH
Complete bi-monthly operational equipment and documentation checks and resolve issues as required.						HIGH
Complete an annual audit of all ECC and EOC operational documentation and resources to ensure that they are up to date and fit for purpose.					*Scheduled for Q4*	*HIGH*
Develop and implement customised EOC and ECC intranet and ICT tools.						MEDIUM

Readiness
KPI Summary

Progress

Not started	In progress	Completed	On hold

DELIVERABLE

Lead and coordinate a consistent approach to Public Information Management (PIM) across the region.

KPI	Q1	Q2	Q3	Q4	Completed YTD	Priority
Develop and refine Public Information Management (PIM) components of regional plans and processes.						HIGH
Hold 2 meetings annually for Public Information Managers in the Wellington CDEM Group to develop relationships and share information.					2 / 2	MEDIUM

DELIVERABLE

Lead and coordinate a consistent approach to Welfare across the region.

KPI	Q1	Q2	Q3	Q4	Completed YTD	Priority
Chair 3 Wellington Region Welfare Coordination Group meetings to enhance individual and collective agency capability and planning.					3 / 3	HIGH
Work with Local Welfare Managers to understand Needs Assessment capability, identify gaps and achieve consistency across the region.						HIGH
Implement the CDEM Group Welfare Plan.						HIGH
Work with Local Welfare Managers to understand Emergency Assistance Centre (EAC) capability, identify gaps and achieve consistency across the region.						MEDIUM

Readiness
KPI Summary

Progress

Not started | In progress | Completed | On hold

DELIVERABLE

Lead and coordinate the development, implementation and review of CDEM Group operational response plans and processes.

KPI	Q1	Q2	Q3	Q4	Completed YTD	Priority
Work with CDEM Group partners to identify and make improvements to the Wellington Region Earthquake Plan (WREP).						HIGH
Work with GWRC and territorial authorities to refine EOC and ECC flood response plans.						HIGH
Develop a Health, Safety and Wellbeing Plan to support WREMO staff both in preparation for and in response to an emergency.						HIGH
Refine the Wellington CDEM Group's operational processes and procedures.						HIGH
Work with CDEM Group partners to identify and make improvements to EOC and ECC tsunami response plans.						MEDIUM
Develop a CDEM Group Lessons Learned Framework.						MEDIUM

Readiness
KPI Summary

Progress

Not started | In progress | Completed | On hold

DELIVERABLE

Lead the development, implementation and review of CDEM Group and public alerting functions, including systems, tools, processes and personnel.

KPI	Q1	Q2	Q3	Q4	Completed YTD	Priority
Conduct a notification system pilot to assess the suitability of the Alert Media CDEM Group alerting and notification tool.						HIGH
Manage and refine the Duty Officer system to ensure that a CDEM Group Duty Officer is available 24/7 to alert CDEM Group partners to an emergency.						HIGH
Conduct monthly Emergency Mobile Alert training to strengthen the Group's capability and capacity.						HIGH
Participate in the Red Cross Hazard App Working Group and implement any required changes to CDEM procedures.						MEDIUM
Develop Emergency Mobile Alert predefined messaging for tsunami and flood events.						MEDIUM

DELIVERABLE

Develop and maintain effective relationships with CDEM Group partners, including the community, to ensure a timely and effective response to an emergency.

KPI	Q1	Q2	Q3	Q4	Completed YTD	Priority
Develop and maintain partnerships with iwi and marae to improve response capability.						HIGH
Establish a regional group to coordinate Community Resilience initiatives and share information across the region.						HIGH

Readiness
KPI Summary

Progress

Not started | In progress | Completed | On hold

DELIVERABLE

Develop and maintain effective relationships with CDEM Group partners, including the community, to ensure a timely and effective response to an emergency. (continued)

KPI	Q1	Q2	Q3	Q4	Completed YTD	Priority
Provide business as usual (BAU) media coordination, management and support to the Regional Manager, and the wider WREMO team as required.						HIGH
Facilitate 15 local Emergency Services Coordination Committee (ESCC) meetings.					**9 / 15**	MEDIUM
Facilitate 3 Regional Inter-Agency Planning Committee (RIAPC) meetings.					**2 / 3**	MEDIUM
Arrange direct engagement opportunities with technical experts like GNS and MetService to share information, develop plans and strengthen coordination arrangements.						MEDIUM
Engage with Lifeline Utilities stakeholders to share information, develop plans and strengthen coordination arrangements.						MEDIUM

DELIVERABLE

Lead the development and delivery of community engagement initiatives for specific groups to increase preparedness.

KPI	Q1	Q2	Q3	Q4	Completed YTD	Priority
Deliver 4 Business Continuity Planning workshops for businesses and organisations.					**2 / 4**	HIGH
Deliver 4 Emergency Planning workshops for Primary and Secondary schools.					**5 / 4**	HIGH

Readiness
KPI Summary

Progress

Not started | In progress | Completed | On hold

DELIVERABLE

Lead the development and delivery of community engagement initiatives for specific groups to increase preparedness. (continued)

KPI	Q1	Q2	Q3	Q4	Completed YTD	Priority
Produce a Quarterly Newsletter, sharing preparedness messaging and opportunities to engage for the community.					**3 / 4**	HIGH
Promote preparedness messaging and community connectedness through social media platforms.						HIGH
Partner with youth, agencies and organisations to deliver the Youth Leadership in Emergency Management programme across the region.						HIGH
Partner with local iwi, hapū, and Māori organisations to co-design preparedness messaging and initiatives for whānau.						HIGH
Partner with people with disabilities and organisations that support them to co-design inclusive and accessible preparedness messaging and initiatives.						HIGH
Lead and promote the Wellington Region's involvement in the Shakeout and Tsunami Hīkoi campaign to increase CDEM Group partner and community awareness and participation.						HIGH
Provide supplementary marketing and communications for Tsunami Hikoi to increase awareness of the long or strong, get gone message.						HIGH
Deliver 42 Household Earthquake Planning sessions to community groups, workplaces and households.					**23 / 42**	MEDIUM
Promote preparedness messaging with the community at 7 regional or local events.					**9 / 7**	MEDIUM
Implement the Central Business District (CBD) Engagement Plan, with a focus on tertiary students and apartment dwellers.						MEDIUM

Readiness
KPI Summary

Progress

Not started | In progress | Completed | On hold

DELIVERABLE

Support community and CDEM Group partner initiatives to increase social connectedness and preparedness.

KPI	Q1	Q2	Q3	Q4	Completed YTD	Priority
Investigate innovative and creative opportunities to promote hazard awareness and enable emergency reduction or readiness.						MEDIUM
Co-deliver 7 community initiatives with local council teams.					0 / 7	MEDIUM
Contribute to CDEM Group partner projects that improve hazard awareness and preparedness.						MEDIUM
Promote and attend community and CDEM Group partner initiatives.						LOW

DELIVERABLE

Establish and maintain communication channels to keep communities informed about hazards, impacts and preparedness actions.

KPI	Q1	Q2	Q3	Q4	Completed YTD	Priority
Review the function of the WREMO and Get Prepared websites and make structural and content changes as required.						HIGH
Develop and schedule radio and digital advertising that supports community resilience campaigns and general preparedness.						HIGH
Carry out a targeted media campaign based on areas of improvement identified in the annual Community Survey.						HIGH

Readiness
KPI Summary

Progress

Not started | In progress | Completed | On hold

DELIVERABLE

Establish and maintain communication channels to keep communities informed about hazards, impacts and preparedness actions.

KPI	Q1	Q2	Q3	Q4	Completed YTD	Priority
Review existing social media capability and develop a strategy to grow engagement and maintain consistency across all WREMO social media platforms.						HIGH
Ensure that WREMO and Get Prepared website content is up-to-date.						MEDIUM

DELIVERABLE

Lead planning efforts for a timely and effective community response to an emergency.

KPI	Q1	Q2	Q3	Q4	Completed YTD	Priority
Deliver 28 Earthquake Drills and work with participants to make updates to the relevant Community Emergency Hub Guides.					**5 / 28**	HIGH
Carry out annual audits for 128 Community Emergency Hubs.					**61 / 128**	HIGH
Coordinate and deliver 12 Community Emergency Hub awareness activities.					**5 / 12**	MEDIUM

Response
KPI Summary

Progress

Not started | In progress | Completed | On hold

DELIVERABLE

Provide a 24/7 CDEM Group and public alerting function.

KPI	Q1	Q2	Q3	Q4	YTD	Priority
Use the CDEM Group Duty System to notify response partners about emergency events.						ORGANISATIONAL PRIORITY
Send Emergency Mobile Alerts to the public at the regional or local level for emergency events which reach the threshold for an alert.						ORGANISATIONAL PRIORITY

DELIVERABLE

Provide leadership, support and advice to councils, EOCs, the ECC and other CDEM Group partners in an emergency.

KPI	Q1	Q2	Q3	Q4	YTD	Priority
Provide professional emergency management staff to support any response to a CDEM emergency in our region.						ORGANISATIONAL PRIORITY
Provide the primary and alternate Regional Manager and Group Controller roles to the CDEM Group.						ORGANISATIONAL PRIORITY
Provide hazard advice on the potential regional impacts of a National Tsunami Advisory/Warning to supplement advice from the National Tsunami Expert Panel.						ORGANISATIONAL PRIORITY
Provide the primary Group Public Information Manager (PIM) to manage and coordinate regional PIM in a CDEM response.						ORGANISATIONAL PRIORITY
Provide the primary Group Welfare Manager to manage and coordinate Welfare in a CDEM response.						ORGANISATIONAL PRIORITY

Response
KPI Summary

Progress

Not started	In progress	Completed	On hold

DELIVERABLE

Provide leadership, support and advice to councils, EOCs, the ECC and other CDEM Group partners in an emergency. (continued)

KPI	Q1	Q2	Q3	Q4	YTD	Priority
Provide guidance and advice to assist council ICT personnel with CDEM systems and tools in an emergency.						ORGANISATIONAL PRIORITY
Provide professional emergency management staff to support other CDEM Groups, NEMA and partner agencies in a response.						MEDIUM

DELIVERABLE

Manage WREMO staff health and wellbeing in a response.

KPI	Q1	Q2	Q3	Q4	YTD	Priority
Ensure that the Health, Safety and Wellbeing of WREMO staff is supported to sustain an effective response.						ORGANISATIONAL PRIORITY

DELIVERABLE

Lead the implementation of a CDEM Group Lessons Learned framework.

KPI	Q1	Q2	Q3	Q4	YTD	Priority
Facilitate an after action review process following a CDEM response.						ORGANISATIONAL PRIORITY

Recovery
KPI Summary

Progress

Not started | In progress | Completed | On hold

DELIVERABLE

Provide leadership, support and advice to councils and other CDEM Group partners in recovery.

KPI	Q1	Q2	Q3	Q4	YTD	Priority
Provide professional emergency management staff to support any recovery from a CDEM emergency in the Wellington Region.						ORGANISATIONAL PRIORITY
Provide the primary Recovery Manager role to the CDEM Group.						ORGANISATIONAL PRIORITY
Maintain the COVID-19 Dashboard and Community Sentiment Survey for as long as required.						HIGH

DELIVERABLE

Lead and coordinate recovery engagement opportunities to develop capability, share information and strengthen relationships.

KPI	Q1	Q2	Q3	Q4	YTD	Priority
Develop and deliver a Group Recovery Exercise.						HIGH
Establish Sector Groups for each Recovery environment.						HIGH
Host a forum for Recovery Managers to develop knowledge and capability.						MEDIUM
Produce two Recovery Newsletters for relevant stakeholders.						LOW

Recovery
KPI Summary

Progress

Not started	In progress	Completed	On hold

DELIVERABLE

Lead the development, implementation and review of regional recovery plans, resources and indicators.

KPI	Q1	Q2	Q3	Q4	YTD	Priority
Refine the Recovery Framework and develop operational documents and supporting templates.						HIGH
Support the development of a national set of recovery indicators.						MEDIUM
Conduct an environmental scan of strategic Recovery planning initiatives around the country.						LOW

Civil Defence and Emergency Management Group
31 May 2022
Report 22.219

For Decision

WELLINGTON REGION EMERGENCY MANAGEMENT OFFICE ANNUAL PLAN 2022/23

Te take mō te pūrongo
Purpose

1. To advise the Wellington Civil Defence Emergency Management Group (CDEM Group) of the Wellington Region Emergenyc Management Office (WREMO) draft Annual Plan for the 2022/23 financial year.

He tūtohu
Recommendation

That the Joint Committee:

1 **Approves** the content of the Wellington Region Emergency Management Office 2022/23 Annual Plan.

Te tāhū kōrero
Background

2. Under the terms of the Agreement on Joint Civil Defence and Emergency Management Services signed by the nine councils in the Wellington Region on 27 June 2012, WREMO is required to prepare a comprehensive annual business plan commencing 1 July.
3. The Coordinating Executive Group (CEG) and the CEG Sub Committee have recommended the approval of the draft WREMO 2022/23 Annual Plan.

Te tātaritanga
Analysis

4. WREMO's draft Annual Plan 2022/23 outlines the work programme and additional areas of work identified by the WREMO Leadership Team against the strategic outcomes identified in the current CDEM Group Plan (2019-2024). Noteworthy items include:

    a The intent to build on the lessons of the past year with COVID-19 and work with our regional partners in a more integrated manner to prepare for, manage and recover from other emergencies;

b To consolidate the roles and functions that have been stood up over the past year;

c To look critically at what additional capabilities are going to be required to meet the needs and expectations of our communities and central government going forward;

d To ensure that our staff have the necessary tools (including mental health skills) to be able to operate effectively in the future operating environment;

e To review the way in which we deliver training and other CDEM services to the Region;

f To have tough conversations around resourcing and task prioritisation; and

g To continue to be agile and flexible to meet whatever demands are placed upon us and look after the wellbeing of our staff when doing so.

Ngā hua ahumoni
Financial implications

5. There are no financial implications arising from the matter for decision.

Ngā Take e hāngai ana te iwi Māori
Implications for Māori

6. Engagement with Māori is a priority in the draft WREMO 2022/23 Annual Plan, including an ongoing focus on building relationships with regional iwi/Māori partners.

Ngā tikanga whakatau
Decision-making process

7. The matter requiring decision in this report was considered by officers against the requirements of section 17 of the Civil Defence Emergency Management Act 2002 and the decision-making requirements of Part 6 of the Local Government Act 2002.

Te hiranga
Significance

8. Officers considered the significance (as defined by Part 6 of the Local Government Act 2002) of these matters, taking into account Greater Wellington Regional Council's *Significance and Engagement Policy* and *Decision-making Guidelines*. Officers recommend that this matter is of low significance, due to its administrative nature.

Te whakatūtakitaki
Engagement

9. Given the low significance of the matter for decision, no related engagement was required.

Ngā āpitihanga
Attachment

Number	Title
1	Draft WREMO 2022/23 Annual Plan

Ngā kaiwaitohu
Signatories

Writer	Sam Ripley – Advisor, Business and Development, WREMO
Approvers	Jess Hare – Manager, Business and Development, WREMO Jeremy Holmes – Regional Manager, WREMO

He whakarāpopoto i ngā huritaonga **Summary of considerations**
Fit with Council's roles or Committee's terms of reference
The Joint Committee reviews the work programme identified in the draft WREMO Annual Business Plan 2022/23, which is informed by the Wellington Region CDEM Group Plan. The Joint Committee is responsible for implementing and monitoring the Group Plan.
Contribution to Annual Plan / Long term Plan / Other key strategies and policies
The draft WREMO 2022/23 Annual Plan contributes to implementation of the Group Plan by setting yearly priorities in relation to the Group Plan's 5-year strategic outcomes.
Internal consultation
See paragraph 4.
Risks and impacts: legal / health and safety etc.
There are no known risks.

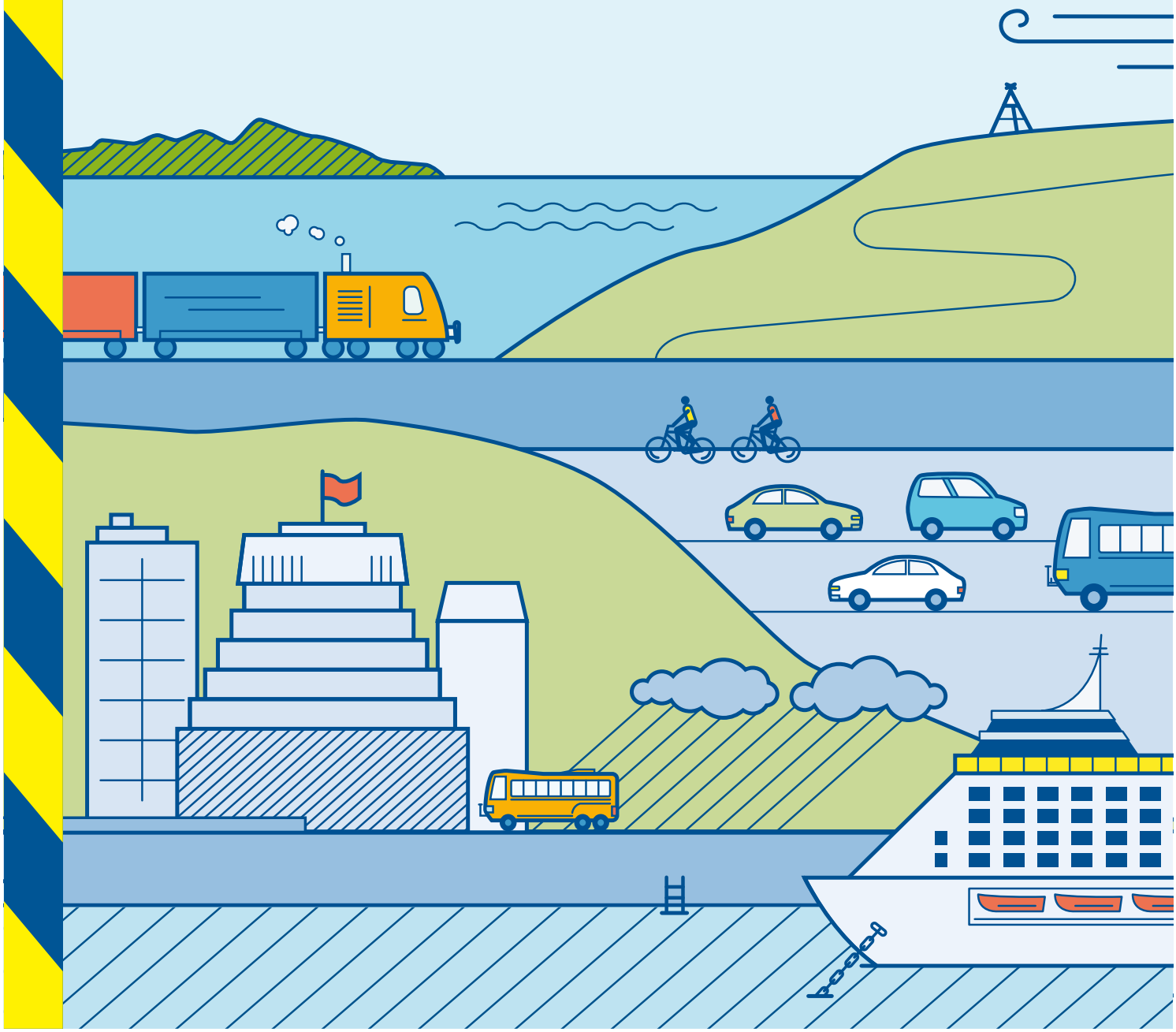
Attachment 1 to Report 22.219

WELLINGTON REGION EMERGENCY MANAGEMENT OFFICE

Wellington Region
Emergency Management Office

Annual Plan

1 July 2022 – 30 June 2023



Attachment 1 to Report 22.219

Wellington Region Emergency Management Office (WREMO)
Annual Plan

1 July 2022 | Version 1.0

Authority
This Annual Plan has been developed by the Wellington Region Emergency Management Office, approved by the CEG, and is effective from 1 July 2022.

The document should be read in conjunction with the Wellington Region CDEM Group Plan.

Contents

Foreword

The past year has been another busy year for Civil Defence Emergency Management (CDEM) as we first adjusted to the arrival of the Delta variant of COVID-19 and then to the arrival of Omicron. Whilst we were largely able to keep the Delta variant under control, the increased level of infectiousness of Omicron meant that this was no longer going to be possible going forward and we needed to change the way in which we responded as both a country and a region.

What his led to in the Wellington region was the re-activation of the Regional Leadership Group (the entity formed after the first outbreak of COVID-19 in 2020) and the standing up of the Regional Covid-19 Coordination Centre (RCCC) with dedicated staff to oversee the region's response to COVID for the next 12-18 months as we adjust to living with COVID-19 in our community on an enduring basis. This is so that we are also able to respond effectively to the increasing number of other emergency events that we are experiencing concurrently due to the impacts of climate change.

Whilst this transition to living with COVID-19 has not been without its challenges, such as the need to adjust the way in which we live and work with COVID-19 on a more enduring basis (as opposed to a temporary one) and the need to do more work to address those areas where the impacts of COVID-19 has been more strongly felt (in our more deprived parts of society in particular), a lot of positives have also come out of the experience. These include: the increased resilience of people and businesses to live and work remotely, the increased ability of businesses to prioritise work and manage business continuity interruptions, the increased willingness and connectedness of CDEM Group members to collaboratively tackle more urgent and complex issues that require a more integrated and coordinated response, and the increased awareness of the importance of mental health and the need to address less visible areas of impact in emergency response and recovery too.

What this means for WREMO and the wider CDEM Group is that we now have an enhanced network of Group partners with knowledge and experience of how we can all work together in a more integrated manner to prepare for, manage and recover from emergencies. To capitalise on this and ensure that we continue to build on the lessons and experiences of the past year, we now need to consolidate the roles and functions that we have stood up over the past year, look critically at what additional capabilities are going to be needed to meet the needs and expectations of our communities and central government going forward, and ensure our staff have the necessary tools (including mental health skills) to be able to operate effectively in this future operating environment.

In some cases, this will involve reviewing the way in which we deliver training and other CDEM services to Group members. In others, it will require having tough conversations around resourcing and task prioritisation. All of this will be done over the next 12 months as we review the content of our

current services agreement with councils which is due for renewal at the start of the 2023/24 financial year.

Over the next 12 months we expect COVID-19 to continue to be present in our region and to continue to make its presence felt from time to time as new variants or outbreaks occur. What this means is that we will also need to continue to be agile (to adapt to whatever new challenges it presents) and flexible (to be able to adjust work programs according to staff availability and other higher priority tasks), all the while remaining mindful of the need to continue to serve our communities to the best of our collective ability and look after the wellbeing of our staff when doing do. After all, looking after the wellbeing of our staff continues to be fundamental to being able to perform the functions our communities and government expected of us.

Through this approach we will continue to ensure that our focus remains on what is most important:

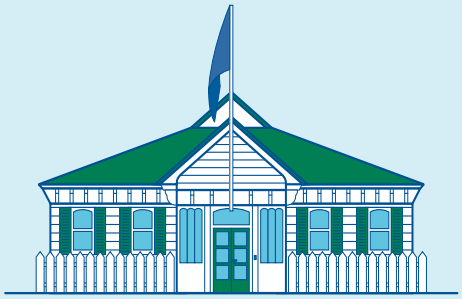
He aha te mea nui o te ao?

What is the most important thing in the world?

He tangata, he tangata, he tangata

It is the people, it is the people, it is the people

Jeremy Holmes
Regional Manager
Wellington Region Emergency Management Office (WREMO)



Our values

Tika

We have the courage to **do the right thing.**

We act with integrity.

We build trust through honesty, authenticity and transparency.

We are accountable for our actions.

Whanaungatanga

We work together to create a sense of **family and belonging.**

We are one team working together for a common purpose.

We build relationships and collaborate to get the best out of each other.

We partner with mana whenua and Māori, to honour our obligations under Te Tiriti o Waitangi.

Attachment 1 to Report 22.219

Manaakitanga

We show **respect and care for others** and ourselves.

We actively listen and respect the views and opinions of others.

We are inclusive and embrace diversity.

We work to make a positive difference for people and communities.

Pūkenga

We are professional and **strive for excellence.**

We set ambitious and meaningful goals and work hard to achieve them.

We are proactive, agile and responsive to change.

We learn, and reflect, to continually improve what we do.

Introduction

Attachment 1 to Report 22.219

About the Wellington Region Emergency Management Office

The Wellington Region Emergency Management Office (WREMO) was established in 2012 when Wellington's regional and local authorities amalgamated their Civil Defence Emergency Management (CDEM) departments to form a regional office to achieve more coordinated CDEM service delivery.

In 2018, after a review of its first five years, the role of WREMO was clarified as follows:

- To lead and coordinate the effective delivery of CDEM across the 4Rs of comprehensive emergency management (reduction, readiness, response and recovery) for the Wellington Region;
- To integrate national and local CDEM planning and activity through the alignment of local planning with the national strategy and national planning; and
- To coordinate planning, programmes and activities relating to CDEM across the 4Rs and encourage cooperation and joint action.

WREMO's role is to lead the development and delivery of effective emergency management for the region by working collaboratively with local authorities and partners across the 4Rs.

This will be achieved by:

- **Coordinating –** Leading through alignment and establishing common ground for agreement.
- **Collaborating–** Creating win-win relationships, products and services and working together across the 4Rs.
- **Promoting –** Increasing awareness, generating interest and encouraging joint action within the emergency management sector.

The Annual Plan

The Wellington Region Emergency Management Office (WREMO) Annual Plan (this document) sets out the key outputs, measures and associated budget for WREMO for the 2022/2023 financial year.

This Plan is aligned with the content of the latest 2019-2024 Wellington CDEM Group Plan, as well as all guidance produced by the National Emergency Management Agency (NEMA).

This document has been written from an organisational point of view, acknowledging that all WREMO staff work together to achieve the outputs identified in this Plan. It outlines the following:

- How WREMO's deliverables contribute to the wider CDEM Group outcomes
- Which WREMO team leads the delivery of each Key Performance Indicator (KPI) and how it will be prioritised should an emergency event occur that requires a coordinated response from the CDEM Group

A breakdown of the WREMO team structure is provided in *Appendix 1: WREMO structure*, and a breakdown of KPIs is provided in *Appendix 2*.

To achieve a higher level of clarity in WREMO's reporting processes, this 2022/2023 Annual Plan identifies WREMO's core deliverables, developed from the following sources:

- The agreed role of WREMO following the 2018 review of its first five years.
- The strategic outcomes identified in the current CDEM Group Plan (2019-2024).
- The core areas of work for each of WREMO's teams.

In addition to the considerations above, WREMO's deliverables represent the outcome of a continual feedback loop from CDEM Governance groups and response partners on how WREMO can continue to add value to the Wellington CDEM Group across the 4Rs of emergency management.

Prioritisation of the Work Programme

Taking into account the past 18 months where COVID and the increased number of responses has meant the tempo and workload has been significant, the following three areas will be our priority areas of work :

1. To safeguard the health and wellbeing of staff.
2. Ensure readiness to be able to effectively respond to an event.
3. Develop and enhance relationships with partners and stakeholders.

Each KPI in this Annual Plan is assigned one of three priority levels:

High Priority - Critical to being able to respond effectively. Related to the three priority areas of work.

Medium Priority - Will likely further enhance the ability to respond to events or an identified area for further development.

Low Priority - Identified an area for future development and part of a general work programme.

Assigning priority levels ensures that we take a measured and agreed approach to decisions around reducing delivery of KPIs to respond to emergency events that affect our region.

If a response to an emergency event is required, it is intended that KPIs will be deferred in order of priority (lowest to highest) as required to prioritise the response.

Note: *Appendix 2 provides a full list of KPIs under each WREMO deliverable, in order of priority.*

Long-term impacts of COVID-19

In the 21/22 financial year the Wellington CDEM Group remained focused on COVID-19 while managing other emergency events and starting to get back to its core business of helping to build community preparedness. Response planning for COVID-19 was improved through a series of workshops, and resources were also committed to identify and track emerging themes during the recovery process. Common themes that emerged were: high levels of pressure on emergency housing, large numbers of people requiring job seeker support, people struggling to put food on the table and increased pressure on mental health services.

These circumstances illustrate the pressure that many CDEM Group members now face: having to help the region recover from the impacts of COVID-19 whilst also working to improve their level of response if there should be another outbreak; and having to do this additional work on COVID-19 as well as their normal (business as usual) function.

Community preparedness

The arrival of COVID-19 in New Zealand had a profound effect on our region's level of emergency preparedness. In June 2020, a number of significant changes were seen, such as increased emergency supply storage, business continuity plans and household emergency plans. The survey was conducted again in June 2021 after the community had been at Alert Level 1 for a period of time, and was living with COVID in their daily lives .

Emergency supply storage

2019: 23.4%
2020: 31.2%
2021: 29.2%

↓ 2.0%

Business continuity plan

2019: 36.3%
2020: 47.5%
2021: 44.3%

↓ 3.2%

Household emergency plan

2019: 50.1%
2020: 55.0%
2021: 46.1%

↓ 8.9%

In comparison with 2020, the 2021 survey showed small decreases in the number of respondents who reported having emergency supplies stored at home (including food, water and medication), and having a business continuity plan. There was a significant decrease in those that had a household emergency plan.

Expectation of a text alert for a tsunami after a long or strong earthquake

2019: 37.9%
2020: 47.5%
2021: 46.9%

↓ 0.6%

Expectation that Civil Defence will open and operate a Community Emergency Hub

2019: 52.5%
2020: 57.7%
2021: 55.0%

↓ 2.7%

The survey also showed a small decrease (not statistically signifincant) in expectation of official support and information in an emergency. While this reflects a high level of confidence in the relevant government agencies from the community, it also provides cause for concern in situations where people may need to take immediate and decisive protective action, such as self-evacuating from coastal areas following a long or strong earthquake. The results also reinforce the trend that people tend to take more preparedness actions when emergencies are imminent or just occurred - like after the first COVID lockdown in 2020 - and then the level of preparedness drops over time.

Working to address priorities identified in the Community Survey

Planned areas of work to advance preparedness outcomes which are expected to continue into the 22/23 financial year include:

- Raising awareness of the risk to wastewater disruption after an earthquake and the need to have an Emergency Toilet.
- Reinforcing the Long, Strong, Get Gone message for tsunami.
- Promoting Community Emergency Hubs as a form of local support in your community after a large earthquake.

Strategic direction

Vision and goal

The vision of the Wellington Region CDEM Group is:

VISION

A resilient[1] community: ready, capable and connected

GOAL

The goal of this Plan is for all individuals and households, businesses and organisations, communities, cities and districts in the region to be **ready, capable and connected** in accordance with the following definitions:

Ready

Being well informed of risks and pro-actively taking steps to prevent or mitigate their impacts, enabling us to be **ready** to respond to and recover quickly and effectively from emergencies.

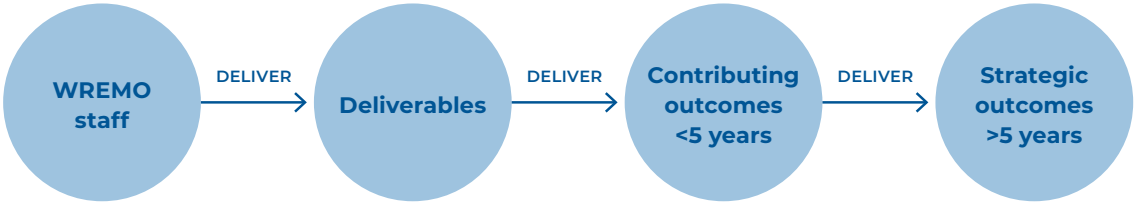
Capable

Working together to develop the capability and interoperability to ensure we are **capable** of responding effectively to emergencies and recovering quickly afterwards.

Connected

Working with communities to increase **connected**ness, enabling communities to support each other before, during and after emergencies.

This will be achieved through the delivery of WREMO outputs to achieve strategic outcomes in the community. Strategic outcomes are outcomes that are expected to take longer than five years to achieve. To help focus the delivery of the outputs, contributing outcomes have been identified that are expected to be achieved in the next five years.



[1] Resilience is defined as the ability to adapt well to change, overcome adversity and recover quickly after an event

Strategic outcomes

The following section identifies the strategic outcomes for the Wellington CDEM Group across the 4Rs. Each of WREMO's Key Performance Indicators contributes to one of these strategic outcomes, which will be outlined in a subsequent section of this Plan.

Reduction

Ready

- Increased understanding and management of regional risks (including hazards, vulnerability and ways to prevent and mitigate).

Capable

- Increased identification of risks and steps taken to eliminate or reduce them
- Increased investment in buildings taking into account long-term stressors and changes, so they are able to withstand hazards and are safe to occupy post-event according to their level of importance
- Increased investment in infrastructure taking into account long-term stressors and changes, to strengthen and retain functionality post-event, or have viable emergency plans including viable alternate infrastructure.

Readiness

Capable

- Increased number of household, business and community emergency plans that are understood and practised on a regular basis
- Integrated and comprehensive official response plans at the local and regional level that are understood and practised on a regular basis
- Integrated and comprehensive strategic recovery plans at both the local and regional level that are understood and practised on a regular basis
- Integrated and comprehensive capability development strategy is implemented to increase both the capacity and capability of the Group to respond to and recover from emergency events.

Connected

- Increased knowledge of Community Emergency Hubs, where they are located and participation in Hub exercises
- Increased knowledge of the role of Marae and other community facilities in helping support emergency response and recovery.

Response

Capable

- Prompt activation of local Emergency Operations Centres (EOCs) and regional Emergency Coordination Centre (ECC) to effectively manage and coordinate response efforts by response agencies to assist communities
- Prompt restoration of lifeline utility infrastructure services to emergency levels of service.

Connected

- Communities self-organise and take appropriate actions, such as evacuating and/or activating their Community Emergency Hubs
- Formal assistance is readily available and accessible to impacted communities.

Recovery

Ready

- Investment in long-term resilience programmes that benefit future recovery outcomes is adopted by Group, private and community sector partners.

Capable

- Recovery Managers, teams and strategic partners have the capacity and capability to effectively meet the needs of communities throughout a recovery
- Integrated and comprehensive strategic recovery planning at both the local and regional level is embedded and practised on a regular basis
- Central government and the Group effectively and cooperatively manage recovery.

Connected

- Effective implementation of Group recovery plans to ensure recovery efforts are coordinated and meet the needs of communities.

High-level metrics

The following high-level metrics are tracked over time to measure WREMO's level of performance. More detailed contributions for each of WREMO's outputs are included across each of the 4Rs later in this Plan.

Store emergency supplies

2019: 23.4%
2020: 31.2%
2021: 29.2%
↓ 2.0%

Measure One: Households have sufficient provisions (7 days) stored in case of an emergency.

Measure: Annual Community Survey

WREMO Deliverables which support this outcome:

- Lead the development and delivery of community engagement initiatives for specific groups to increase preparedness.
- Establish and maintain communication channels to keep communities informed about hazards, impacts and preparedness actions.
  TARGET 2022/23: 30.0%*

Know your neighbours

2019: 25%
2020: 25.8%
2021: 26.5%
↑ 0.7%

Measure Two: People know the first names of five neighbours in their street.

Measure: Annual Community Survey

WREMO Deliverables which support this outcome:

- Support community and CDEM Group partner initiatives to increase social connectedness and preparedness.
  TARGET 2022/23: 27.0%*

ECC/EOC Activation Tests

19/20: 100%
20/21: 100%
21/22: 100%

Measure Three: EOCs/ECC are fit for purpose. Response and recovery systems are able to be activated within one hour of any incident or notification of a likely threat.

Measure: EOC/ECC activation tests and exercises

WREMO Deliverables which support this outcome:

- Lead the development and maintenance of equipment, systems and tools for WREMO, the ECC and EOCs.
- Lead the development, implementation and review of CDEM Group and public alerting functions, including systems, tools, processes and personnel.
  TARGET 2022/23: 100.0%

Community Response Plans

19/20: 90%
20/21: 100%
21/22: 100%

Measure Four: Community Response Plans are developed covering the communities of each territorial authority.

Measure: Percentage of published Community Response Plans

WREMO Deliverables which support this outcome:

- Lead planning efforts for a timely and effective community response to an emergency.
  TARGET 2022/23: 100.0%

*Results of the 2022 survey are expected in July 2022.

Monitoring and evaluation

Progress towards WREMO's outputs and the associated KPIs will be monitored in number of ways:

- Quarterly reporting to the Coordinating Executive Group (CEG) Sub Committee on progress against the deliverables.
- Regular reporting to the CEG on progress against the strategic outcomes through the Group Programme Portfolio Management Office (PPMO) as part of the wider CDEM Group.
- Annual survey of 2000 people in the Wellington Region to determine preparedness levels over time.*
- External monitoring and evaluation by the National Emergency Management Agency (NEMA).

*Results from the 2021/22 survey are expected in July 2022. This section of the Annual Plan will be updated with the final results once available, and a report of the findings provided to CEG and CEG Sub Committee.

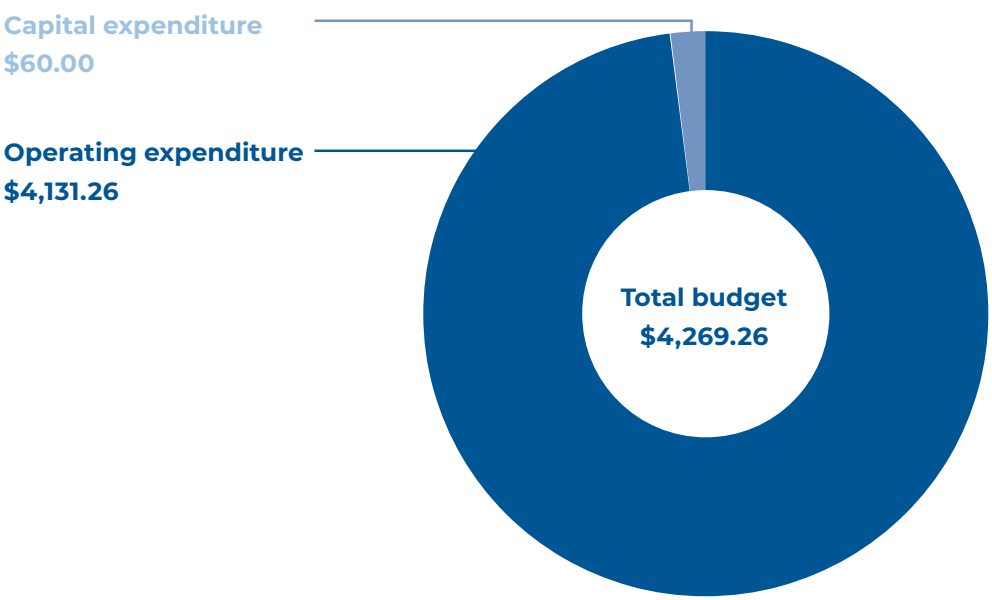
Governance

WREMO is funded by the nine councils across the Wellington Region. Oversight and approval of WREMO's annual work programme is provided by the chief executives of these nine councils. The implementation of WREMO's work programme and day-to-day engagement is delivered through the CEG Sub Committee.

The CDEM Joint Committee is the governing authority for the Wellington CDEM Group. As part of its role to lead and coordinate the effective delivery of CDEM across the 4Rs of comprehensive emergency management for the CDEM Group, WREMO provides reports to the Joint Committee on progress against the Group Plan (2019-2024).

Budget 2022/2023

Budget contributions ($000)



The budget for the 2022/23 year is as follows:

WREMO Budget 2022/2023	$(000)
Total budget	**4269.26**
Sources of operational funding	
Rates & levies	3964.26
Reserve	305.00
Total operating funding	**4269.26**
Operating expenditure	
Personnel costs	3,370.00
Materials and supplies	529.26
Travel and transport	100.00
Contractor and consultants	120.00
Corporate charges	110.00
Total operating expenditure	**4229.26**
Capital expenditure	
Vehicle purchases	40.00
Total capital expenditure	**40.00**
Net funding surplus/(deficit)	**–**

Council contributions	% contribution	$(000)
Greater Wellington Regional Council	32.7%	1,297.105
Wellington City Council	27.3%	1,080.657
Hutt City Council	14%	555.789
Porirua City Council	7.4%	292.562
Kāpiti Coast District Council	7%	277.894
Upper Hutt City Council	5.7%	227.548
Masterton District Council	3.3%	132.009
South Wairarapa District Council	1.3%	53.913
Carterton District Council	1.2%	46.778
Total		**3964.26**

How to interpret the Annual Plan

The following tables in this plan show how the WREMO Annual Plan directly aligns with the Wellington Region CDEM Group Plan and how each of WREMO's teams contribute to the achievement of the strategic outcomes identified in the Group Plan.

At the operational level, each deliverable is contributed to by a number of Key Performance Indicators (KPIs) delivered by each of WREMO's teams *(see Appendix 2 for a full list of KPIs)*.

4Rs goal component *(Reduction, Readiness, Response or Recovery)*

Description of the 4Rs goal component

The following table outlines WREMO's role in improving outcomes on behalf of the Wellington CDEM Group.

Deliverables	Success indicator(s)	Strategic Outcome
Identifies the WREMO deliverable.	Identifies what success of the deliverable looks like for the CDEM Group and the wider community.	Identifies the CDEM Group Plan strategic outcome the deliverable contributes to.

The WREMO team responsible for the deliverable

- Community Resilience and Recovery
- Business Development
- Operational Readiness and Response
- All three of WREMO's teams contribute directly to this deliverable

The deliverables outline WREMO's direct contribution to the CDEM Group Plan (2019-2024) strategic outcomes, and how WREMO assists the Group to achieve these outcomes over time.

Reduction

Reduction involves identifying and analysing risks to life and property from hazards, taking steps to eliminate those risks if practicable and, if not, reducing their impact and likelihood to an acceptable level.

The following table outlines WREMO's role in improving Reduction outcomes on behalf of the Wellington CDEM Group.

Deliverables	Success indicator(s)	Strategic Outcome
Lead the development and implementation of the CDEM Group Plan, and report on progress against the strategic outcomes identified in the Plan.	Priorities identified in the Group Plan are consistently applied across Civil Defence Emergency Management (CDEM) Group partners.	Increased understanding and management of regional risks (including hazards, vulnerability and ways to prevent and mitigate).
Coordinate the efforts of councils and other CDEM Group partners to align and enhance approaches to natural hazard risk reduction practices.	Hazard-specific objectives and policy statements are commonly applied across the region. The built environment is resilient to the impacts of natural hazards.	
Provide administrative support, guidance and advice to CDEM governance groups.	Governance groups understand the risks to the region and actively participate in Civil Defence Emergency Management (CDEM) to reduce the impacts of hazards on the community.	

Readiness

Readiness involves developing operational systems and capabilities before an emergency happens, including self-help response and recovery programmes for the general public and specific programmes for emergency services, lifeline utilities, and other agencies.

The following table outlines WREMO's role in improving Readiness outcomes on behalf of the Wellington CDEM Group.

Deliverables	Success indicator(s)	Strategic Outcome
Lead and coordinate the delivery of professional development initiatives for the region's emergency management workforce to enhance capability and capacity.	The CDEM Group has a sufficient number of staff trained to respond effectively to an emergency.	Integrated and comprehensive capability development strategy is implemented to increase both the capacity and capability of the Group to respond to and recover from emergency events.
Lead and coordinate a consistent approach to Public Information Management (PIM) across the region. Lead and coordinate initiatives to enhance welfare capability and capacity across the region.	There is a high level of coordination, integration and interoperability between Wellington CDEM Group stakeholders.	
Lead the development and maintenance of equipment, systems and tools for WREMO, the ECC and EOCs.	Operational facilities, equipment, systems and tools are fit for purpose to ensure that the CDEM Group is able to respond effectively to an emergency.	

Readiness *(continued)*

Readiness involves developing operational systems and capabilities before an emergency happens, including self-help response and recovery programmes for the general public and specific programmes for emergency services, lifeline utilities, and other agencies.

The following table (continued) outlines WREMO's role in improving Readiness outcomes on behalf of the Wellington CDEM Group.

Deliverables	Success indicator(s)	Strategic Outcome
Lead and coordinate the development, implementation and review of CDEM Group operational response plans and processes.	Operational response plans and procedures are up to date, fit for purpose and understood by response partners to guide a timely and effective response to an emergency.	Integrated and comprehensive official response plans at the local and regional level that are understood and practised on a regular basis.
Lead the development, implementation and review of CDEM Group and public alerting functions, including systems, tools, processes and personnel.	The CDEM Group alerting system is robust, with 24/7 coverage, to ensure a timely and effective initial response to an emergency.	
Develop and maintain effective relationships with CDEM Group partners, including the community, to ensure a timely and effective response to an emergency.	CDEM Group partners have a comprehensive shared understanding of the Group's ability to respond in an emergency. WREMO staff are competent and confident to engage with iwi partners.	

Readiness *(continued)*

Readiness involves developing operational systems and capabilities before an emergency happens, including self-help response and recovery programmes for the general public and specific programmes for emergency services, lifeline utilities, and other agencies.

The following table (continued) outlines WREMO's role in improving Readiness outcomes on behalf of the Wellington CDEM Group.

Deliverables	Success indicator(s)	Strategic Outcome
Lead the development and delivery of community engagement initiatives for specific groups to increase preparedness. Support community and CDEM Group partner initiatives to increase social connectedness and preparedness. Establish and maintain communication channels to keep communities informed about hazards, impacts and preparedness actions.	Individuals and households report increased levels of preparedness for an emergency. The Annual Community Survey shows improvement in preparedness outcomes for the areas and audiences which have been targeted with direct engagement.	Increased number of household, business and community emergency plans that are understood and practised on a regular basis.
Lead planning efforts for a timely and effective community response to an emergency.	Communities are aware of and contribute to local Community Response Planning.	Increased knowledge of Community Emergency Hubs, where they are located and participation in Hub exercises.

Response

Response involves actions taken immediately before, during or directly after an emergency, to save lives and property, and to help communities recover.

The following table outlines WREMO's role in improving Response outcomes on behalf of the Wellington CDEM Group.

Deliverables	Success indicator(s)	Strategic Outcome
Provide leadership, support and advice to councils, EOCs, the ECC and other CDEM Group partners in an emergency.	Professional, timely and effective emergency management leadership, support and advice is provided to members of the Wellington CDEM Group in a CDEM emergency. Formal assistance is readily available and accessible to impacted communities.	Prompt activation of local Emergency Operations Centres (EOCs) and regional Emergency Coordination Centre (ECC) to effectively manage and coordinate response efforts by response agencies to assist communities.
Manage WREMO staff health and wellbeing in a response.		
Provide a 24/7 CDEM Group and public alerting function.	The CDEM Group and community are provided with initial public information and alerts about any CDEM emergencies in our region.	
Lead the implementation of a CDEM Group Lessons Learned framework.	Response capability undergoes continuous improvement based on lessons learned from previous events.	

Recovery

Recovery involves the coordinated efforts and processes used to bring about the immediate, medium-term, and long-term holistic regeneration and enhancement of a community following an emergency.

The following table outlines WREMO's role in improving Recovery outcomes on behalf of the Wellington CDEM Group.

Deliverables	Success indicator(s)	Strategic Outcome
Provide leadership, support and advice to councils and other CDEM Group partners in recovery.	Recovery is coordinated regionally to meet the needs of the community.	Effective implementation of Group recovery plans to ensure recovery efforts are coordinated and meet the needs of communities.
Lead and coordinate recovery engagement opportunities to develop capability, share information and strengthen relationships.	Recovery partners have the capacity and capability to effectively carry out recovery activities. Recovery partners have a comprehensive shared understanding of the Group's ability to recover from an emergency.	Recovery Managers, teams and strategic partners have the capacity and capability to effectively meet the needs of communities throughout a recovery.
Lead the development, implementation and review of regional recovery plans, resources and indicators.	Recovery resources are fit for purpose and meet the needs of councils and communities.	Integrated and comprehensive strategic recovery planning at both the local and regional level is embedded in and practised on a regular basis.

Appendices

Attachment 1 to Report 22.219

Appendix 1: WREMO structure

WREMO team responsibilities:

Community Resilience and Recovery	Operational Readiness and Response	Business and Development
• Community empowerment • Preparedness enablers • Community networks • Public education • Vulnerable communities • Business continuity planning • Volunteer management • Community based response • Recovery planning and coordination • Social media • Reduction coordination	• People – emergency management workforce • Partnerships – official response networks • Response planning and procedures • Response platforms – facilities and equipment • Welfare planning and coordination • Lifelines planning and coordination • Response Team coordination • Duty Officer system management • Learning Management System (takatū) management and administration	• CDEM marketing • Risk and consequence management • EOC asset management • Information management systems • Strategy, planning and policy • Reporting, monitoring and evaluation • Organisational philosophy • Organisational capability development • Hazard research • Human resources • IT and communications • Project Management Office • Project Portfolio Management Office • Organisational marketing • Administration and finance • Organisational asset management

The above responsibilities are listed according to the team with the overall portfolio responsibility, recognising that all WREMO staff work together to achieve outputs within these portfolios.

Appendix 2: List of WREMO KPIs by core deliverable

Reduction

Team	KPI	Priority
Lead the development and implementation of the CDEM Group Plan, and report on progress against the strategic outcomes identified in the Plan.		
	Develop the WREMO Service Agreement for approval by CEG for implementation 1 July 2023.	HIGH
	Develop the WREMO Annual Plan (2023–24) in alignment with council annual plan development time lines.	HIGH
	Establish the Project Portfolio Management Office (PPMO) and provide an initial report to the CEG and Joint Committee to test the format and information requirements.	MEDIUM
	Conduct the annual WREMO Regional Community Survey to identify trends and opportunities to increase resilience.	MEDIUM
	Provide quarterly reports to the CEG Sub Committee, reporting on progress against the WREMO Annual Plan (2022-2023) activities.	MEDIUM
Coordinate the efforts of councils and other CDEM Group partners to align and enhance approaches to natural hazard risk reduction practices.		
	Lead the Emergency Levels of Service project to ensure hazard risks to Lifeline Utility services are reduced.	LOW
Provide administrative support, guidance and advice to CDEM governance groups.		
	Perform the required secretariat duties for CDEM governance groups, including the Coordinating Executive Group (CEG) and Sub-Committee.	HIGH
	Respond to relevant Local Government Official Information and Meetings Act (LGOIMA) requests in accordance with legislated time frames and procedures.	HIGH

Readiness

Team	KPI	Priority
Lead and coordinate the delivery of professional development opportunities for the region's emergency management workforce to enhance capability and capacity.		
	Develop and deliver professional development opportunities for the region's emergency management workforce in accordance with the Group Training and Exercise Plan 2022/23.	HIGH
	Administer the Wellington Region's portion of the national CDEM training fund.	LOW
	Coordinate and enhance the Wellington Region's Response Teams capability and capacity..	
	Manage the Group's Learning Management System (takatū) and incorporate national-level enhancements to the system as required.	
	Support national level capability development advisory groups, programmes and initiatives.	
Lead the development and maintenance of equipment, systems and tools for WREMO, the ECC and EOCs.		
	Complete monthly operational ICT and technical equipment checks across the region's ECC and EOCs and resolve issues as required.	HIGH
	Complete six readiness checks of the region's ECC and EOCs to ensure they are ready to respond to an emergency.	
	Maintain IT security and platforms and explore opportunities for further development.	
	Provide ICT guidance and advice to the EOCs/ECC using WREMO supported hardware and networks in preparation for an emergency.	
	Maintain the regional radio network as an alternate communications system.	

Readiness *(continued)*

Team	KPI	Priority
Lead and coordinate a consistent approach to Public Information Management (PIM) across the region.		
	Develop and refine Public Information Management (PIM) components of regional plans and processes.	MEDIUM
	Hold two meetings annually for Public Information Managers in the Wellington CDEM Group to develop relationships and share information.	
Lead and coordinate initiatives to enhance welfare capability across the region.		
	Chair four Wellington Region Welfare Coordination Group meetings to enhance individual and collective agency capability and planning.	HIGH
	Strengthen Needs Assessment capability and capacity in the region.	
	Implement the CDEM Group Welfare Plan work programme guided by the Welfare Capability Maturity Model.	
	Strengthen Emergency Assistance Centre (EAC) capability and capacity in the region.	MEDIUM
	Develop regional guidance to support the provision of Emergency Shelter and Accommodation and Household Goods and Services in an emergency.	

Readiness *(continued)*

Team	KPI	Priority
Lead and coordinate the development, implementation and review of CDEM Group operational response plans and processes.		
	Develop a Health, Safety and Wellbeing Plan to support WREMO staff both in preparation for and in response to an emergency.	HIGH
	Work with GWRC and territorial authorities to refine EOC and ECC flood response plans.	MEDIUM
	Work with CDEM Group partners to make further improvements to the Wellington Region Emergency Response Plan.	LOW
	Develop Regional Response Guidelines to support the primary CIMS functions in an emergency.	LOW
Lead the development, implementation and review of CDEM Group and public alerting functions, including systems, tools, processes and personnel.		
	Maintain Alert Media platform as an alerting and notification tool and contribute to the national (alerting) work group.	HIGH
	Manage and refine the Duty Officer system to ensure that a CDEM Group Duty Officer is available 24/7 to alert CDEM Group partners to an emergency.	
	Conduct monthly Emergency Mobile Alert training to strengthen the Group's capability and capacity.	
	Develop and refine Emergency Mobile Alert predefined messaging.	
	Conduct social media training for Duty Officers.	

Readiness *(continued)*

Team	KPI	Priority
Develop and maintain effective relationships with CDEM Group partners, including the community, to ensure a timely and effective response to an emergency.		
	Develop and maintain partnerships with iwi and marae to strengthen response capability.	HIGH
	Establish a regional group to coordinate Community Resilience initiatives and share information across the region.	
	Provide business as usual (BAU) media coordination, management and support to the Regional Manager, and the wider WREMO team as required.	
	Facilitate 15 local Emergency Services Coordination Committee (ESCC) meetings.	MEDIUM
	Facilitate three Regional Inter-Agency Planning Committee (RIAPC) meetings.	
	Arrange direct engagement opportunities with key response partners such as technical experts and critical infrastructure providers to share information, develop plans and strengthen coordination arrangements.	

Readiness *(continued)*

Team	KPI	Priority
Lead the development and delivery of community engagement initiatives for specific groups to increase preparedness.		
	Partner with local iwi, hapū, and Māori organisations to co-design preparedness messaging and initiatives for whānau.	HIGH
	Lead and promote the Wellington Region's involvement in the Shakeout and Tsunami Hīkoi campaign to increase CDEM Group partner and community awareness and participation.	
	Deliver Household Earthquake Planning sessions to community groups, workplaces and households.	MEDIUM
	Deliver Business Continuity Planning workshops for businesses, not-for-profit organisations and government agencies.	
	Deliver Emergency Planning sessions to schools and early childhood centres.	
	Deliver Youth Leadership in Emergency Management programme at universities.	
	Implement the next phase of the Central Business District (CBD) Engagement Plan, with a focus on tertiary students and apartment dwellers.	
	Partner with people with disabilities and organisations that support them to co-design inclusive and accessible preparedness messaging and initiatives.	
	Produce a Quarterly Newsletter, sharing preparedness messaging and opportunities to engage the community.	
	Promote preparedness messaging with the community at regional or local events.	LOW

Readiness *(continued)*

Team	KPI	Priority
Lead the development and delivery of community engagement initiatives for specific groups to increase preparedness. (continued)		
	Promote preparedness messaging and community connectedness through social media platforms.	MEDIUM
	Deliver customised services or products depending on the community or council need (Blue Lines Coastal Preparedness, CALD communities, Water Tanks, Decision Making Under Pressure, etc.)	
Support community and CDEM Group partner initiatives to increase social connectedness and preparedness.		
	Support and promote opportunities with partners that increase social capital and preparedness.	MEDIUM
Establish and maintain communication channels to keep communities informed about hazards, impacts and preparedness actions.		
	Integrate the WREMO and Get Prepared websites.	HIGH
	Develop and schedule radio and digital advertising that supports community resilience campaigns and general preparedness.	
	Carry out a targeted media campaign based on areas of improvement identified in the annual Community Survey.	
	Develop a Social Media Strategy and Plan.	

Readiness *(continued)*

Team	KPI	Priority
Establish and maintain communication channels to keep communities informed about hazards, impacts and preparedness actions. (continued)		
	Review existing social media capability and develop a strategy to grow engagement and maintain consistency across all WREMO social media platforms.	HIGH
	Ensure that WREMO and Get Prepared website content is up-to-date.	MEDIUM
Lead planning efforts for a timely and effective community response to an emergency.		
	Carry out annual audits for 128 Community Emergency Hubs.	HIGH
	Deliver 28 Earthquake Drills and work with participants to make updates to the relevant Community Emergency Hub Guides.	MEDIUM
	Coordinate and deliver 12 Community Emergency Hub awareness activities.	

Response

Team	KPI	Priority
Provide a 24/7 CDEM Group and public alerting function.		
	Use the CDEM Group Duty System to notify response partners about emergency events.	HIGH
	Send Emergency Mobile Alerts to the public at the regional or local level for emergency events which reach the threshold for an alert.	
Provide leadership, support and advice to councils, EOCs, the ECC and other CDEM Group partners in an emergency.		
	Provide professional emergency management staff to support any response to a CDEM emergency in our region.	HIGH
	Provide the primary and alternate Regional Manager and Group Controller roles to the CDEM Group.	
	Provide hazard advice on the potential regional impacts of a National Tsunami Advisory/Warning to supplement advice from the National Tsunami Expert Panel.	
	Provide the primary Group Public Information Manager (PIM) to manage and coordinate regional PIM in a CDEM response.	
	Provide the primary Group Welfare Manager to manage and coordinate Welfare in a CDEM response.	

Response *(continued)*

Team	KPI	Priority
Provide leadership, support and advice to councils, EOCs, the ECC and other CDEM Group partners in an emergency. (continued)		
	Provide guidance and advice to assist council ICT personnel with CDEM systems and tools in an emergency.	HIGH
	Provide professional emergency management staff to support other CDEM Groups, NEMA and partner agencies in a response.	MEDIUM
Manage WREMO staff health and wellbeing in a response.		
	Ensure that the Health, Safety and Wellbeing of WREMO staff is supported to sustain an effective response.	HIGH
Lead the development and implementation of a CDEM Group Lessons Learned framework.		
	Facilitate an after action review process following a CDEM response.	MEDIUM

Recovery

Team	KPI	Priority
Provide leadership, support and advice to councils and other CDEM Group partners in recovery.		
	Provide professional emergency management staff to support any recovery from a CDEM emergency in the Wellington Region.	HIGH
	Provide the primary Recovery Manager role to the CDEM Group.	
Lead and coordinate recovery engagement opportunities to develop capability, share information and strengthen relationships.		
	Commence the establishment of Sector Groups for each Recovery environment.	MEDIUM
	Host a forum for Recovery Managers to develop knowledge and capability.	

Recovery *(continued)*

Team	KPI	Priority
Lead the development, implementation and review of regional recovery guidance and resources.		
	Refine the Recovery Framework and develop operational documents and supporting templates.	MEDIUM
	Develop and Introduction to Recovery video for usen in an activation.	
	Begin developing short recovery training modules.	
	Commence Strategic Recovery Planning based on NEMA guidance	LOW

Attachment 1 to Report 22.219

Attachment 1 to Report 22.219

WELLINGTON REGION EMERGENCY MANAGEMENT OFFICE

Civil Defence and Emergency Management Group
31 May 2022
Report 22.220

For Decision

FIRE FOLLOWING AN EARTHQUAKE IN WELLINGTON CITY – BUSINESS CASE

Te take mō te pūrongo
Purpose

1. To advise the Wellington Civil Defence Emergency Management (CDEM) Group of the Fire Following and Earthquake – Programme Business Case (FFE Business Case).

He tūtohu
Recommendation

That the Joint Committee

1 **Notes** the recommendations made in the Fire Following Earthquake Business Case.

2 **Notes** the decisions made by the Coordinating Executive Group.

Te tāhū kōrero
Background

2. In addition to inherent earthquake risk, Wellington City has areas of high fire risk. Consequences from a major earthquake such as ruptured gas pipes and a lack of water for fire suppression severely increases the probability and impact of Fire Following Earthquake (FFE) hazards.
3. The FFE Business Case (**Attachment 1**) recommends options for managing the risk of FFE in Wellington City, with a particular focus on the first few days after an event. Options include measures to prevent fire, mitigating actions to be taken if fire occurs, and ways to coordinate efforts between Wellington CDEM Group partners.
4. The Regional Manager will provide a summary of the business case (**Attachment 2**) at the CDEM Group meeting on 31 May 2022.

Te tātaritanga
Analysis

5. The CEG reviewed the recommendations outlined in the FFE Business Case and decided to approve the following recommendations:

Recommendation 1

6. That CEG agrees that validating the physical risk attributes and identifying the social risk attributes for each high-risk community is a priority and recommends to FENZ that it undertakes this community characterisation for Wellington City as a pilot through their national risk assessment work programme.

Recommendation 2

7. That CEG agrees to investigate updating of the Risk Modelling to better quantify the physical risks for each community based on the physical risk validation, and to investigate the value of reduction options.

Recommendation 3

8. That CEG agrees to investigate options to model or further assess the risk treatment attributable to mitigation options.

Recommendation 4

9. That CEG agrees to prioritise investigations and investment into reducing the risks associated with Fire Following Earthquake according to the Sendai framework.

Recommendation 5

10. That CEG approves the appointment of a FFE Programme Manager to set up and oversee an implementation programme for addressing FFE (cost and funding to be determined).

Ngā hua ahumoni
Financial implications

11. Costs associated with implementing the above recommendations are yet to be determined. Once identified, they will be brought back to Group members for decisions on funding levels, duration and coast allocation.

Ngā Take e hāngai ana te iwi Māori
Implications for Māori

12. No direct implications for Māori have been identified at this point. However, it is expected that Māori will be impacted by the mitigation measures that are eventually implemented (e.g. public messaging, water availability, community response plans etc) and will be included in work to develop these various aspects in due course.

13. Iwi will be included in the programme of work, once the general approach has been identified.

Ngā tikanga whakatau
Decision-making process

14. The matter requiring decision in this report was considered by officers against the requirements of section 17 of the Civil Defence Emergency Management Act 2002 and the decision-making requirements of Part 6 of the Local Government Act 2002.

Te hiranga
Significance

15. Officers considered the significance (as defined by Part 6 of the Local Government Act 2002) of these matters, taking into account Greater Wellington Regional Council's *Significance and Engagement Policy* and *Decision-making Guidelines*. Officers recommend that this matter is of low significance, due to its administrative nature.

Te whakatūtakitaki
Engagement

16. Given the low significance of the matter for decision, no related engagement was required.

Ngā tūāoma e whai ake nei
Next steps

17. No further action is required.

Ngā āpitihanga
Attachment

Number	Title
1	Fire Following an Earthquake in Wellington City business case
2	Fire Following an Earthquake presentation

Ngā kaiwaitohu
Signatories

Writer	Sam Ripley – Advisor, Business and Development, WREMO
Approvers	Jess Hare – Manager, Business and Development, WREMO Jeremy Holmes – Regional Manage, WREMO

He whakarāpopoto i ngā huritaonga **Summary of considerations**
Fit with Council's roles or Committee's terms of reference Under Section 17 of the CDEM Act 2002 the Joint Committee and each member is required to identify, assess, and manage relevant risks. This business case helps identity and assess the risk of Fire Following Earthquake (FFE) and identifies ways to manage it. It is part of the Group Plan. The Joint Committee is responsible for implementing and monitoring the Group Plan.
Contribution to Annual Plan / Long term Plan / Other key strategies and policies The decisions to pursue recommendations from the FFE Business Case may be included in future Annual Plan development. Additionally, the recommendations in the case would contribute to various reduction, readiness, response, and recovery outcomes described in the Group Plan.
Internal consultation See paragraph 4 -9.
Risks and impacts: legal / health and safety etc. There are no known risks.

Attachment 1 to Report 22.220

WELLINGTON REGION EMERGENCY MANAGEMENT GROUP

Fire Following Earthquake in Wellington City

Tregaskis Brown for The Wellington Region Civil Defence Emergency Management Group

Programme Business Case

Prepared by:	Tregaskis Brown Limited
Prepared for:	Wellington Region Civil Defence Emergency Management Group
Date:	4 May 2022
Version:	1.0
Status:	Final draft

Attachment 1 to Report 22.220

The Wellington Region Civil Defence Emergency Management Group Fire Following Earthquake in Wellington City Programme Business Case

Document control

Document information

Document owner	Wellington Regional Emergency Management Office (WREMO)
Issue date	4 May 2022
Filename	FFE Programme Business Case v1.0
Prepared by	Tregaskis Brown for WREMO

Document history

Version	Issue date	Changes
1.0	4 May 2022	Final draft for CEG approval.

Document review

Role	Name
Regional Manager, WREMO	Jeremy Holmes
Manager Community Resilience & Group Recovery Manager, WREMO	Dan Neely (reviewed options only)
Civil Defence Controller, WCC	Derek Baxter
Acting Wellington District Manager, FENZ	Brett Lockyer
Senior Advisor Community Readiness and Recovery, FENZ	Mirren Allan
Chief Advisor, Service Planning, WWL	Robert Blakemore
Project Manager, WeLG	Richard Mowll
Risk Specialist, GNS	Finn Scheele
Engineering Manager, Building Performance and Engineering, MBIE	Timothy Farrant
Senior Regional Emergency Management Advisor, NEMA	Ian Wilson (reviewed options only)

Document sign-off

Role	Name	Sign-off Date
Regional Manager, WREMO	Jeremy Holmes	4 May 2022

Document approval

Role	Names	Sign-off Date
Sub Coordinating Executive Group, Wellington Region CDEM Group	[TBC]	[TBC]
Coordinating Executive Group, Wellington Region CDEM Group	[TBC]	[TBC]

Disclaimers

Figure 3 in this document was included in a report with the following disclaimer:

- This report has been prepared by the Institute of Geological and Nuclear Sciences Limited (GNS Science) exclusively for and under contract to Greater Wellington Regional Council (GWRC) for the purpose of delivery of a Programme Business Case to Treasury which identifies the vulnerabilities of the Wellington Region's utility networks and the economic costs and benefits of increasing resilience. Unless otherwise agreed in writing by GNS Science, GNS Science accepts no responsibility for any use of or reliance on any contents of this report by any person other than GWRC and Treasury and shall not be liable to any person other than GWRC, on any ground, for any loss, damage or expense arising from such use or reliance.
- **Reference:** Grace, E., compiler. (2018). *Wellington Resilience Programme Business Case: Lifelines Outage Modelling* (GNS Science consultancy report 2017/236). GNS Science.

This document includes multiple references to the latest modelling of fire following earthquake for multiple scenarios affecting Wellington City (July 2020). This GNS report contained the following disclaimer:

- The Institute of Geological and Nuclear Sciences Limited (GNS Science) and its funders give no warranties of any kind concerning the accuracy, completeness, timeliness or fitness for purpose of the contents of this report. GNS Science accepts no responsibility for any actions taken based on, or reliance placed on the contents of this report and GNS Science and its funders exclude to the full extent permitted by law liability for any loss, damage or expense, direct or indirect, and however caused, whether through negligence or otherwise, resulting from any person's or organisation's use of, or reliance on, the contents of this report.
- **Reference:** Scheele, FR., Lukovic, B., Moratalla, J., Dunant, A., Horspool, NA. (2020). *Modelling fire following earthquake for multiple scenarios affecting Wellington City* (GNS Science report 2020/12). GNS Science. Doi: 10.21420/H7PX-XD46.

Fire Following Earthquake in Wellington City Programme Business Case

Contents

List of figures

List of tables

Glossary of key terms

The majority of definitions provided below have been drawn from the Wellington Region Civil Defence Emergency Management Group Plan 2019 – 2024.

Term	Definition
Conflagration	A large fire that causes extensive damage.
Emergency	A situation that causes or may cause loss of life, injury, illness, distress, or endangers the safety of the public and property that cannot be dealt with by the emergency services or requires a significant and coordinated response under the CDEM Act 2002.
Emergency response services	The NZ Police, Fire and Emergency New Zealand, hospital and providers of health and disability services.
Hazard	Something that may cause, or contribute substantially to, an emergency. Typically defined as either natural or human made.
Lead agency	The organisation with the legislative or agreed authority for control of an emergency.
Readiness	Activities carried out to prepare the community or emergency management agencies for response.
Recovery	The time taken after an emergency to bring about the immediate, medium-term and long-term regeneration of a community. Recovery may take months or years.
Reduction	Activities carried out to reduce the likelihood of a hazard or the consequence of a hazard when it occurs.
Resilience	The ability to adapt well to change, overcome adversity and recovery quicky afterwards.
Response	Actions taken immediately before, during or directly after an emergency to save lives and protect property, and help communities recover.

Key acronyms

Acronyms	Meaning
4Rs	The New Zealand integrated approach to civil defence emergency management which is described by the four areas of activity, known as the '4 Rs' (reduction, readiness, response and recovery).
CDEM	Civil Defence Emergency Management
CDEM Act	Civil Defence Emergency Management Act 2002
CDEM Group	Civil Defence Emergency Management Group
CSF	Critical success factor

Fire Following Earthquake in Wellington City Programme Business Case

Acronyms	Meaning
ECC	Emergency Coordination Centre
EMSR	Emergency Management System Reform
EOC	Emergency Operation Centre
FENZ	Fire and Emergency New Zealand
FFE	Fire following earthquake
GRWC	Greater Wellington Regional Council
ILM	Investment Logic Map
IO	Investment objective
LGNZ	Local Government New Zealand
MBIE	Ministry of Business, Innovation and Employment
MHUD	Ministry for Housing and Urban Development
NEMA	National Emergency Management Agency
NZFS	New Zealand Fire Service
RMA	Resource Management Act
UN	United Nations
WeLG	Wellington Lifelines Group
WREMO	Wellington Regional Emergency Management Office
WWL	Wellington Water Ltd

Introduction

Purpose of the Business Case

Wellington City contains many localities with densely packed wooden buildings, some surrounded by dense vegetation. Add a major earthquake, some ruptured gas pipelines, electrical sparks, cooking fires, and no reticulated water supply, and an already disastrous event could become catastrophic.

Are Wellington communities ready to deal with fire following earthquake (FFE)? What happens when emergency services are stretched or can't reach them immediately following a major earthquake?

The purpose of this Programme Business Case is to identify and recommend a suite of options for managing the risk of FFE in Wellington City, with a particular focus on the first few days after an event. This includes both preventative measures that that will reduce the likelihood of fire occurring, and mitigating measures that will reduce the likely consequences of fire to people and property when it occurs.

The recommended suite of options has been developed by relevant agencies from the Wellington Region Civil Defence Emergency Management Group (the Wellington CDEM Group). This has required agencies to think about how they can work together to help reduce costs and coordinate effort across the 4 R's of comprehensive emergency management (reduction, readiness, response, recovery) to reduce the likelihood and consequence of FFE most effectively.

What this Case does

This is a Programme Business Case and is deliberately high-level. It pulls together into one document thinking from across a range of agencies that deal with hazards and emergency management and provides framing for work to further develop options to reduce the likelihood of fire outbreak following a major earthquake and to improve how Wellington communities respond in the event that outbreaks occur.

What this Case doesn't do

This case has been run as a 'Light Business Case' and as such does not provide specific options or recommendations for decisions on implementation.

While this case comments on social conditions that contribute to FFE, it does not provide analysis or specific recommendations for how these conditions might be addressed.

Recommendations

Recommendation 1

That CEG agrees that validating the physical risk attributes and identifying the social risk attributes for each high-risk community is a priority and recommends to FENZ that it undertakes this community characterisation for Wellington City as a pilot through their national risk assessment work programme.

Recommendation 2

That CEG agrees to investigate updating of the Risk Modelling to better quantify the physical risks for each community based on the physical risk validation, and to investigate the value of reduction options.

Recommendation 3

That CEG agrees to investigate options to model or further assess the risk treatment attributable to mitigation options.

Recommendation 4

That CEG agrees to prioritise investigations and investment into reducing the risks associated with Fire Following Earthquake according to the Sendai framework.

Recommendation 5

That CEG approves the appointment of a FFE Programme Manager to set up and oversee an implementation programme for addressing FFE (cost and funding to be determined).

Structure of this document

This Programme Business Case follows the Better Business Cases process and is organised around the five-case model to systematically ascertain that the investment proposal:

- Is supported by a robust case for change - the Strategic Case.
- Optimises value for money - the Economic Case.
- Is commercially viable - the Commercial Case.
- Is financially affordable - the Financial Case.
- Is achievable - the Management Case.

Scope of the Business Case

In scope

The scope of the Business Case is deliberately narrow and is intended as a pilot.

Fire following earthquake

The scope of the Business Case relates to how the various agencies can work together to mitigate the risks associated with FFE.

Communities

All communities that have been identified as being at high risk. Communities within the at-risk area include residents, businesses and the general public.

Geographic area

All geographical areas encompassed within the Wellington City boundary (as defined by the Wellington City Council).

Time horizon

There are two parameters relating to the time horizon scope:

Time horizon for FFE

This case is focused on the risk of fire in the periods immediately following an earthquake, when communities may well be on their own, as damage to access and other infrastructure, and competing issues mean that emergency services are unable to provide services. The risk periods have been identified as the hour immediately following an earthquake when immediate outbreaks may occur, the next 23 hours when outbreaks may occur due to build-up of flammable material and/or ignitions from infrastructure or human activity, and the next 9 days when risks of ignition are still relatively high and emergency services may not be available to manage outbreaks (Scheele et al., 2020).

This time horizon may also include periods following aftershocks if they are of sufficient magnitude or impact to set back recovery efforts and delay resumption of services.

Time horizon for assessing future hazards and risks

A 50 – 100-year view has been adopted to ensure that future FFE hazards and risks are taken into account.

Out of scope

This case is limited to managing the risk of FFE in Wellington City. The following is out of scope of this Case:

- How to manage other natural hazard events that may occur following an earthquake e.g. tsunami.
- How to manage general fire risk in Wellington City (although it is likely that some interventions identified through this Business Case will mitigate this risk).
- How to manage general earthquake risk in Wellington City.

Organisational overview

Managing the risks associated with FFE in Wellington City requires cooperation between a number of agencies within the Wellington CDEM Group.

The Wellington CDEM Group

The Wellington CDEM Group is made up of a number of agencies and partners who work together to provide civil defence emergency management to the region. The Group includes the region's nine councils, emergency services, lifeline utilities, WREMO and other entities with civil defence emergency management responsibilities.

Who specifically is involved in this Business Case?

This key stakeholders within the Wellington CDEM Group who are involved in supporting the development of this Business Case and providing expert opinion are:

Wellington Regional Emergency Management Office (WREMO)

Fire and Emergency New Zealand (FENZ)

Wellington City Council (WCC)

Institute of Geological and Nuclear Science, Te Pū Ao (GNS)

The National Emergency Management Agency (NEMA)

Wellington Lifelines Group (WeLG)

Wellington Water Ltd (WWL)

The Ministry for Business Innovation and Employment (MBIE) is also involved in supporting the development of this Case due to their role in both the building and energy regulatory systems.

Strategic Case

The Strategic Case outlines the strategic context for the investment proposal and makes a robust and compelling case for change.

Background to this Business Case

Modelling for FFE (GNS)

GNS Science has been carrying out research and modelling to look more closely at the factors involved in FFE events and how their findings can inform emergency planning. This research is part of the wider 'It's Our Fault' programme, a comprehensive multi-year study of Wellington Region's earthquake hazard, risk and resilience. A full list of FFE model reports produced by GNS is provided in *Appendix A*.

The most recent modelling report was published in July 2020. It detailed ignition and fire spread modelling for multiple fault sources affecting Wellington City, to identify high risk areas. The modelling also took into account the effects of suppression, but at this stage this is only based on availability of mains water and road access (i.e. if there is no water, and no access for fire crews, the risks rise from around 10% loss to 80% loss) (Scheele et al., 2020).

The current model is not sufficiently sensitive to take into account all major risk factors (including proximity of vegetation) or take into account the impact of all reduction measures (such as change in building materials) and suppression (alternative water sources), which means this Business Case is unable to undertake any quantitative assessment of options to understand what impact they will have in managing the likelihood and consequence of FFE.

Reticulation and Water Transfer Project (FENZ)

Wellington Water has previously identified that post a significant event in the Wellington area, people within Wellington City could be without a reticulated water supply for more than 100 days. In response the New Zealand Fire Service (NZFS now FENZ) initiated a Reticulation and Water Transfer Project to get a better understanding of the current water reticulation capability in Wellington City and the problems facing it. The thinking was that this would support the identification of options to deliver any alternative capability through a Business Case. However, the project did not progress beyond the Business Case phase.

FFE Case on a page (Wellington CDEM Group)

In 2019/20, WREMO led an initial piece of work with some of the agencies within the Wellington CDEM Group to develop a Strategic Case 'on a page' for managing the risk of FFE in Wellington City.

This Strategic Case on a page was presented to the Coordinating Executive Group (CEG) in March 2020 and forms the basis of this Programme Business Case.

Why does the Wellington CDEM Group need to act now?

The risks of FFE are becoming more of a priority to address given:

- There is a greater understanding and awareness of the risks that earthquakes pose to Wellington City (both generally and in terms of FFE) through the "It's our Fault" research programme.
- Approaches to managing FFE are changing due to challenges facing the availability of water for firefighting following an earthquake.
- The risk profile for FFE is changing due to increased urban densification.
- The demographic of household ownership and occupancy is changing in susceptible areas.
- The findings of the 2017 Ministerial Review (Delivering Better Responses to Natural Disasters and Other Emergencies) and the Government's response to its recommendations – which identified various areas where improvements needed to be made.

It is therefore timely that the Wellington CDEM Group is reviewing options for managing the risks of FFE in Wellington City.

Strategic context

Wellington City has many characteristics that make it susceptible to FFE, including the potential for fires that spread over a large area (known as a conflagration) leading to significant losses (e.g. property, infrastructure and casualties) (Scheele et al., 2020).

Below are some natural characteristics that exacerbate FFE risk in Wellington. Other factors that are within the control of the Wellington CDEM Group are described in *The key problems to be resolved* section.

Wellington's seismic risk

Wellington is in a zone of high seismic hazard. Several fault lines in and around the region can potentially generate large damaging earthquakes, including the Wellington Hutt Valley fault segment, the Wairarapa and Wairau faults, and the Hikurangi subduction zone's interface fault (Scheele et al., 2020). GNS notes that the largest contributing source of seismic hazard for Wellington is the Wellington Hutt Valley fault segment, which has an approximate 10% chance of rupturing within the next 100 years (Rhoades et al., 2011) with an earthquake of magnitude Mw 7.5.

However, it is also worth noting that the risk of an Alpine fault rupture, which could also produce significant shaking in Wellington City. The Alpine fault rupture is now reported to have an approximate 75% chance of rupturing before 2068, with an 82% chance that such an earthquake will be magnitude 8 or higher (Radio New Zealand, 2021).

Wellington's weather

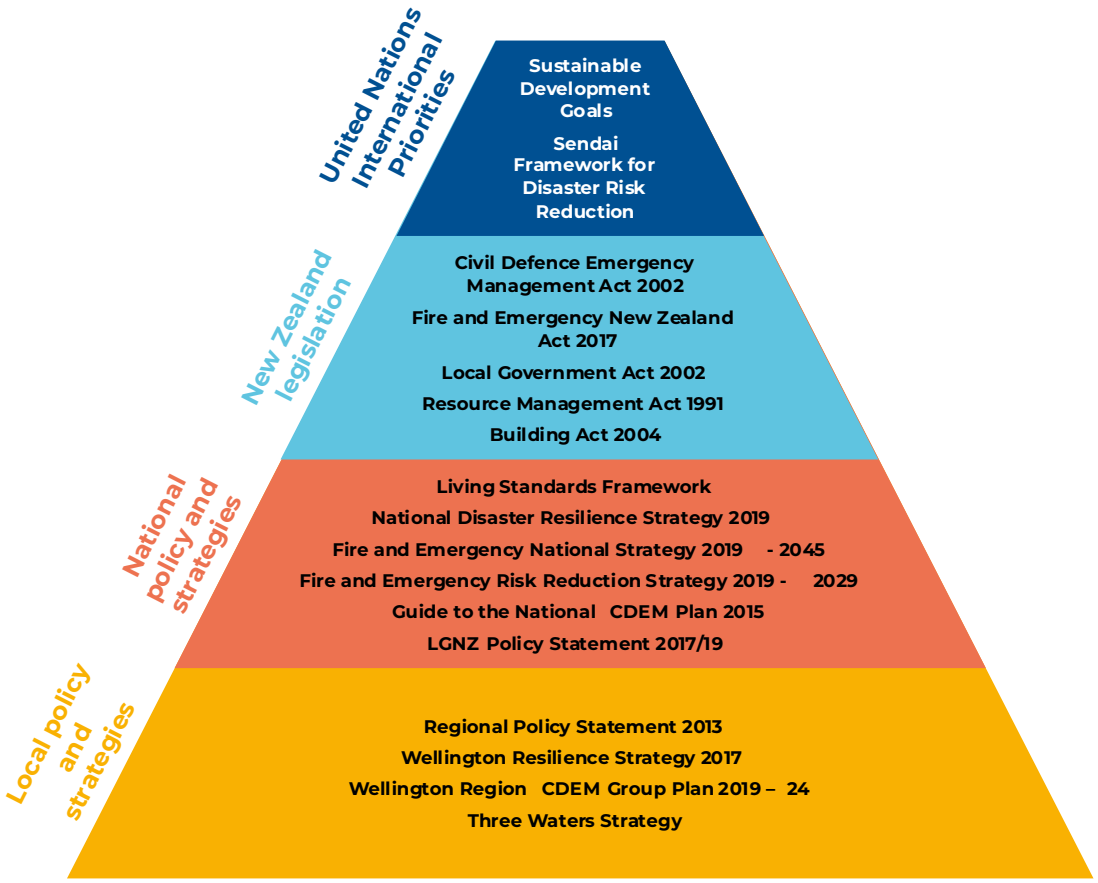
Wind is a critical factor in increasing FFE risk (Ministry of Civil Defence & Emergency, 2015) and GNS modelling demonstrates that higher losses are clearly associated with higher wind speeds (Scheele et al., 2020). Wellington had the highest average daily maximum wind gusts (averaging 65 km/hr from 2010 to 2019), much higher than the second windiest location, Invercargill, at 47 km/hr (Stats NZ, 2020 a).

The impacts of climate change, with more frequent and more severe wind events, will only increase the risk of FFE over time.

Strategic alignment

Figure 1 below identifies the key existing legislation, strategies and policies that this Business Case needs to respond to. Further details about these documents are included in *Appendix B*.

Figure 1: Existing legislation, strategies and policies that align to this Business Case.



The legislative and organisational strategic frameworks provide a clear mandate for identifying assessing and managing risks in order to achieve sustainable management of hazards like FFE. The frameworks also encourage and empower communities to take action to reduce risks to acceptable levels. Given the purpose of this Case is to identify a suite of options to manage the identified risks and consequences of FFE in Wellington City, it is consistent with the expectations set out in these various documents.

Emergency Management System Reform (EMSR) work programme

On 30 August 2018, the Civil Defence Minister released the Government's response to a Technical Advisory Group's (TAG) report into how New Zealand responds to natural disasters and emergencies. The Government's response sets out a multi-year work programme that will

deliver extensive change to New Zealand's emergency response system. This will improve how New Zealand responds to natural disasters and other emergencies in five key areas:

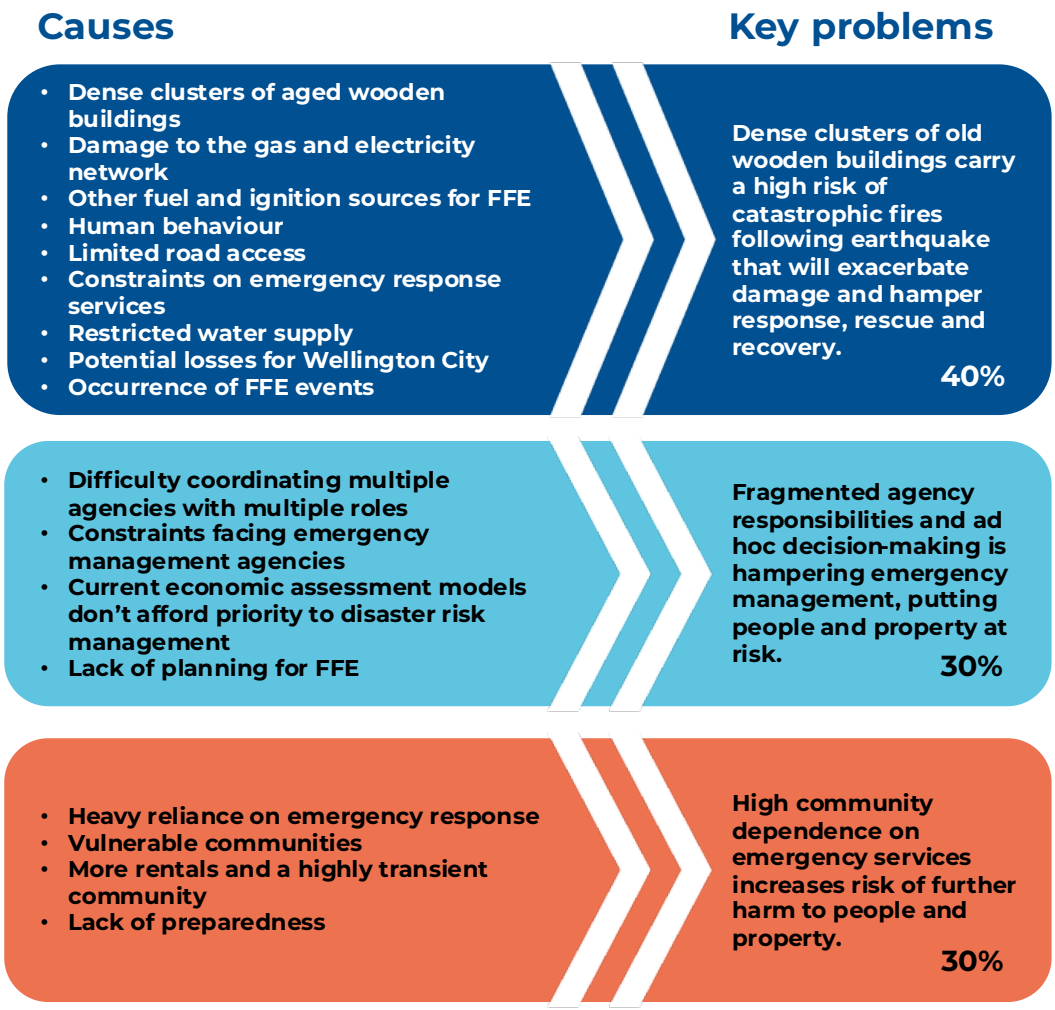
- Putting the safety and wellbeing of people at the heart of the emergency response system.
- Strengthening the national leadership of the emergency management system.
- Making it clear who is responsible for what, nationally and regionally.
- Building the capability and capability of the emergency management workforce.
- Improving the information and intelligence system that supports decision making in emergencies.

This Business Case is strongly aligned to this national work programme as it seeks to address some of the same issues identified by the TAG in the context of FFE events.

The key problems to be resolved

This section describes the key problems to be resolved regarding FFE in Wellington City. These problem statements were first identified at a workshop held on 6 November 2019 with representatives from the agencies involved in development of this Business Case. The problem statements were then refreshed in a workshop on 4 August 2021. An overview of the key problem and root causes is shown in *Figure 2.*

Figure 2: Overview of problem statements (percentages represent relative weightings).



The Investment Logic Map is attached as *Appendix C.*

Problem statement one

Dense clusters of old wooden buildings carry a high risk[1] of catastrophic fires following earthquake that will exacerbate damage and hamper response, rescue and recovery.

Dense clusters of aged wooden buildings

Wellington has a high proportion of aged wooden buildings which are packed close together throughout the city. 2018 Census data found around half the houses in Wellington Region were clad in timber weatherboards. This is the highest proportion in the country (Stats NZ, 2020 b). This, in conjunction with steep topography, high wind zones and vegetation as a potential fuel source, exacerbate the risk of fire spread following an earthquake in Wellington City (Scheele et al., 2020). There are various examples in Wellington where dense clusters of aged wooden buildings have contributed to increased fire risk (see *Case Study: Hanson Street fire, 2021*).

A contributing factor for the high proportion of aged wooden buildings in Wellington is the number of buildings and precincts which have heritage status and are therefore protected from redevelopment under the Resource Management Act (RMA). The current District Plan heritage schedule includes 547 listings for buildings (or approx. 570 individual buildings) and 35 heritage areas (which include up to 590 buildings, objects or features, some of which are also individually listed). During recent public engagement on its Planning for Growth and Draft Spatial Plan, WCC received strong feedback to continue to protect significant heritage resources (Wellington City Council, 2021). This presents challenges from an FFE perspective as new buildings in Wellington City are required to comply with modern building compliance standards which minimises the risk of FFE and fire more generally.

Damage to the gas and electricity network

Earthquake-generated shaking damage and secondary hazards such as liquification and landslides can also cause widespread ignitions, particularly if they cause damage to reticulated gas pipes and/or electrical networks (WREMO, n.d. a). There are multiple examples of FFE events across the globe which have been caused by the ignition of leaking gas from pipes ruptured by ground shaking, and from fallen power lines (Ministry of Civil Defence & Emergency, 2015) (see *Occurrence of FFE events*).

Above: A gas main ruptures in the 1994 Northridge earthquake.

After the February 2011 Christchurch earthquake Contact Energy closed its LPG gas lines (New Zealand Herald, 2011) and Police advised people to stay off the roads and avoid the central city after reports were received of gas leaks (New Zealand Herald, 2019). Although no ignitions occurred in this case, it is clear that there was fuel for ignition. This issue is likely to be more prominent in Wellington as the gas lines cannot be automatically shut off. Unlike the water and electricity networks, there are only manual ways to isolate the system and limited ability to drain gas lines after an event.

[1] In this context, risk is used in its common meaning as opposed to the technical definition of risk as a product of likelihood and consequence.

Damaged power lines, electrical wiring or household appliances can also ignite wood, gas and other combustibles (WREMO, n.d. a). Most electricity in Wellington City will be shut off within seconds of an earthquake but the risk of fire can heighten as utility services are restored following an earthquake. After the February 2011 Christchurch earthquake, the NZFS attended four fires caused by power being restored to buildings (Stuff, 2011). The Chief Executive of Orion Energy Company commented that if power was restored to a damaged plant, there was a risk of setting fire to nearby houses that had gas leaks (Radio New Zealand, 2011).

Other fuel and ignition sources for FFE

There are also a number of other fuel and ignition sources which increase the risk of FFE:

- When objects collide in an earthquake, the friction between the objects can create sparks.
- Some chemical substances held in buildings can combust when they are mixed.
- Damage to buildings can expose flammable materials, which can keep fires burning.
- Debris can fall into gaps between buildings and help a fire to spread more easily (WREMO, n.d. a).

Human behaviour

In the absence of a networked power or gas supply, people may resort to alternative cooking and heating practices following an earthquake which may be unsafe (e.g. the use of open fires, unsafe fireplaces in dwellings, or camp stoves). The use of cooking and heating appliances during or following an earthquake may create sparks that could ignite leaking gas or debris and cause an explosion and/or fire. It is worth noting that the U.S. Geological Survey provides advice against using matches, camp

Case study: Hanson Street fire, 2021

Above: Aftermath of the fire at Hanson Street.

In June 2021 there was a structural fire on Hanson Street in Wellington City. Although it was not an FFE event, it demonstrated the risks associated with ignition and spread in Wellington City.

An independent operational review into the incident described Hanson Street as being an area typical of many older residential streets where houses are very close to one another without adequate fire protection in place to prevent rapid fire spread. The review concluded that a fire which started in one wooden property, quickly spread to three other properties of a similar nature. The fire was also highly challenging to manage due to weather conditions, the close proximity of buildings affected, and the inability to get a clear initial understanding of the entire site due to access issues. Firefighters also had difficulty accessing adequate initial water supplies from nearby hydrants, due to the fact some were inoperable.

The building where the fire started and two of the other properties affected were also unoccupied (abandoned) and in a poor state of repair, which presented an increased fire risk. Access to the rear of the property where the fire began was also difficult due to overgrown vegetation, creating challenges for firefighters.

The operational review also revealed the fire was a situation where FENZ had to operate under an assumed mandate, by using the FENZ Act 2017 to hasten recovery activities. This was to ensure the building was safe and the nearby road was closed, when WCC actually has the lead responsibility for both of these activities. This led to a number of complications which ultimately led to a finding that all road closure requests must go through the relevant authority responsible for the road.

Case study and image reference: Fire and Emergency New Zealand. (2021). Operational review: Structure Fire 125 Hanson Street Wellington 13 June 2021 (FENZ Operational Review #F3263295).

stoves or barbecues, electrical equipment and appliances until there is certainty there are no gas leaks (U.S. Geological Survey, n.d.).

57% of people sampled in Wellington City for the WREMO 2020 preparedness survey indicated they have a BBQ, camp stove or wood burner which they could use in an emergency. This highlights the potential risk that use of these systems could present following an earthquake (WREMO, 2020 a).

Limited road access

Earthquakes can damage and block roads, which restricts access and can hamper the emergency response (WREMO, n.d. a). Modelling undertaken by GNS in 2017 suggests that following a Mw 7.5 Wellington Fault earthquake event, Wellington City's road network would experience the following outages (measured in days) before reasonable road access could be restored for emergency services (see *Figure 3*).

Figure 3: Road zone outage times (days) for response.

	Tawa CBD	Johnsonville CBD	WLG Western Suburbs	Karori	WLG RORO & CBD	Newtown	WLG Southern Suburbs	WLG Airport	Miramar
Tawa 'CBD'									
Johnsonville CBD	7								
WLG Western Suburbs	7	3							
Karori	13	13	13						
WLG RORO & CBD	10	10	10	13					
Newtown	14	14	14	14	14				
WLG Southern Suburbs	10	10	10	13	14	14			
WLG Airport	14	14	14	14	14	12	14		
Miramar	14	14	14	14	14	14	14	14	

Outage times to restore road access to the general public are likely to be even longer, with some parts of Wellington City (such as the southern and eastern suburbs) likely to take in excess of 100 days to restore access following an earthquake (adapted from (Grace, 2018)).

Since this modelling was undertaken, critical routes in Wellington City have been strengthened. While this will reduce the times listed above to restore reasonable access for some roads (see *Appendix F*) there are still likely to be delays in restoring access to many parts of the city.

Constraints on emergency response services

Emergency services may be delayed or unable to respond to FFE events due to limited resources, damage to response infrastructure (e.g. fire stations) or restrictions on access to key supporting services. In a major emergency, emergency response services will also be stretched to the point where they must prioritise the most urgent callouts (particularly if rescues are required) and areas of greatest risk (WREMO, n.d. and FENZ, personal comms 2018).

The challenge with FFE is the risk that emergency response services will be faced with: multiple versions of the Hanson Street fires occurring concurrently. Under normal circumstances one of these is challenging to manage. If there are multiple fires, with constrained access, some of these fires may be left to burn unchecked, leading to conflagrations and major risks to the community.

Restricted water supply

Water supply to households and commercial buildings is likely to be restricted following a major earthquake, leaving limited water for firefighting. The Wellington water network has automatic shut off valves which will activate following a major earthquake to conserve drinking water. Earthquake-generated shaking and liquefaction will likely cause damage to water infrastructure, including pipes. Both of these factors will hamper emergency response and potentially limit the effectiveness of fixed fire systems (e.g. sprinklers) which rely on local water sources to operate (WREMO, n.d. a). Both the 2011 Christchurch and 2016 Kaikōura earthquakes caused extensive damage to water networks which led to water shortages (EERI, 2011 and Dangerfield, 2016).

WWL has previously identified that after a significant event in the Wellington area, people within Wellington City will be without a reticulated water supply for more than 100 days.

Potential losses for Wellington City

There is the potential for significant losses to Wellington City. GNS modelling (Scheele et al., 2020) predicts the following loss estimates caused by FFE for Wellington City (taking the impact of fire suppression into account):

- The Hikurangi subduction zone interface fault source will result in the highest mean losses at around $3 billion from fires alone.
- The Wellington Hutt Valley fault segment and Wairarapa fault have similar mean losses from fire of around $2 billion.
- The Wairau fault has the lowest predicted mean losses from fire of around $0.3 billion.

Although the loss estimates from a rupture of the Alpine fault has not been modelled, the losses are potentially comparable to those of the Hikurangi subduction zone or the Wellington Hutt Valley fault segment.

Occurrence of FFE events

FFE is considered a High Impact Low Probability event. Although relatively rare, there have been a number of FFE events within the last century or so internationally, some of which have

resulted in devastating consequences (see *Table 1* below). These include the 1906 San Francisco, US event in which much of the city was destroyed by fire, the 1923 Tokyo, Japan event which resulted in mass causalities and major loss of residential buildings, and the 1931 Napier, NZ event in which fire destroyed the central business district. In modern contexts, FFE remains a significant hazard as witnessed by the large number of ignitions in US earthquake events (especially the 1994 Northridge earthquake) the extensive damage in the 1995 Kobe, Japan FFE event and the many ignitions following the 2011 Tohoku, Japan earthquake and tsunami.

Table 1: Summary of significant FFE events adapted from Khorasani and Garlock (2017); Scawthorn et al. (2005).

Event	No. of ignitions	Earthquake Magnitude (Mw)	Impact
Tōhoku, Japan (2011)	293	9.0 – 9.1	Fires due to both earthquake and tsunami.
Kobe, Japan (1995)	108	6.9	5000 buildings destroyed.
Northridge, USA (1994)	110	6.7	Majority of fires confined to building of origin.
Napier, NZ (1931)	>10	7.8	Central business district destroyed, 116,000m^2 pf burnt area.
Tokyo, Japan (1923)	277	7.9	447,000 houses destroyed, 38.3km^2 of burnt area, 140,000 fatalities.
San Francisco, USA (1906)	52	7.8 – 8.3	28,000 buildings destroyed, 12.2km^2 of burnt area, 3,000 fatalities.

Problem statement two

Fragmented agency responsibilities and ad hoc decision-making is hampering emergency management, putting people and property at risk.

Difficulty coordinating multiple agencies with multiple roles

There are multiple agencies with multiple responsibilities in emergencies, ranging from those responsible for emergency response to those responsible for the provision of utility services. In an event with cascading risks, such as an earthquake with follow-on risks such as tsunami and fire, this complicates an already challenging situation and can create conflicting priorities. In the TAG's report into how New Zealand responds to natural disasters and emergencies, the TAG found that the responsibilities and authority of lead agencies (responsible for leading response to an event caused by a hazard) were unclear resulting in duplication of effort, confusion, frustration, contradictions and ultimately a poorer emergency response. The TAG also found that emergency response agencies need to improve how they synthesise vital information into a comprehensive common operating picture for decision makers, so they have the information they need, when they need it (New Zealand Government, 2018).

There are also complex legal interdependencies between different emergency response services and the mandate they have to manage the likelihood and consequences of emergency

events. This challenge is exacerbated by the different mechanisms available to agencies in different emergencies (e.g. national or local). The TAG found that the authority to act, or the authority to task someone, either doesn't exist or is not clear in CDEM legislation (Technical Advisory Group, 2017). In some cases, this has meant emergency response services have had to operate under an assumed mandate which can get in the way of agencies acting in the best interest of the community (see *Case Study: Hanson Street fire, 2021*). The TAG report also noted that there are inherent challenges with a collaborative approach to emergency management, in that not all authorities necessarily accept a group approach, hampering the impact and reach that CDEM Groups can have in supporting a capable emergency response system (New Zealand Government, 2018).

Although coordination between emergency response agencies remains an issue, there are signs of improvement. The COVID-19 response has provided a unique platform for the development of CDEM capability across the Wellington CDEM Group and has been a valuable opportunity to strengthen relationships between partner agencies (WREMO, 2020 b).

Constraints facing emergency management agencies

WREMO is a small coordinating agency reliant on its nine parent councils for funding and delivery. It is required to cover multiple hazards, with a small number of staff and a small budget. Managing the risks of FFE in isolation could come at the opportunity cost of managing other hazards.

The issue of unclear accountabilities, roles and responsibilities compounds this challenge when it comes to acquiring resources, funding or taking ownership of options that seek to manage hazards. For example, WeLG identified some responses to manage the risk of FFE in Wellington City through the Wellington Resilience Programme Business Case but attempts to identify an 'owner' of FFE issues did not produce satisfactory results. This is because there is no coherent allocation of responsibilities regarding FFE between emergency response agencies, or an understanding of which organisation has the mandate to invest in preventative and mitigative assets.

Current economic assessment models don't afford priority to disaster risk management

NEMA recognises that traditional methods of appraising investments present challenges when it comes to hazard risk management. In some cases, this means the true costs of an emergency event are not factored into the investment decision-making process, leading to undervalued benefits associated with creating resilience.

This is linked to the perception that investing in disaster risk management would only yield benefits once disaster strikes. NEMA also recognises that the full costs of hazard events are often not completely visible, particularly the cost of indirect and intangible impacts including the wider environment, social and cultural impacts (NEMA, 2019).

Lack of planning for FFE

Although the risks associated with earthquakes and fires as distinct hazards are generally well understood for Wellington City, the cascade effects of major hazards are not. Until now, work to manage the risk of FFE has been undertaken by emergency response agencies in relative isolation. It has also not been done comprehensively across each of the 4Rs. Other local, regional and national partners have not yet participated in discussions on specifics of risk reduction.

As noted above, there are also a number of competing hazards for which emergency response agencies must plan for. While low frequency events can often have the greatest consequences, they are often de-prioritised in favour of more immediate issues. It is difficult for local authorities

to prioritise an investment to protect against an event that might happen at some stage in the future in the face of significant community pressure to fund something else more immediate, or to keep rates down. The consequence of this is that when an event does occur, preventative or mitigating measures are not in place, and more pressure is put on emergency funding in the response phase. The need to respond to such events has been an ongoing challenge in recent years given recent earthquakes, cyclones and the global COVID-19 pandemic, all of which have diverted funds into response and recovery operations at the expense of long-term reduction and readiness planning.

Problem statement three

High community dependence on emergency services increases risk of further harm to people and property.

Heavy reliance on emergency response

New Zealand communities expect to have a national emergency management system that can be relied on to work well when needed (Technical Advisory Group, 2017). These expectations have increased in recent years. However, these expectations can be unrealistic (NEMA, 2019). In the 2020 WREMO preparedness survey[2] 64% of people thought that either government welfare staff or Civil Defence staff would open and operate Community Emergency Hubs, when these facilities are in fact entirely run by and made available for community members to use in an emergency (WREMO, 2020 a).

This is a trend observed globally. Interviews undertaken with senior emergency service personnel in Australia highlighted that communities and elected representatives have 'increasingly unrealistic' expectations that emergency management services will manage any event well, regardless of scale. Interviewees also expressed that in some communities resilience has declined, placing greater pressure on emergency services when emergencies occur (Owen et al., 2013).

People are also increasingly reliant on government warning systems to inform them what to do in an emergency and often only act when and if they are provided with information at the time. Indeed, in the 2020 WREMO preparedness survey, there was a significant increase in the number of people who expected a text warning for an earthquake in comparison to the 2019 survey (WREMO, 2020 a). This was after NEMA introduced Emergency Mobile Alert technology to be able to contact individual mobile phone users in an emergency if needs be.

Vulnerable communities

With a high number of suburbs spread out across the Wellington City area, it is likely that emergency services will be directed to the area or areas of greatest need, meaning that even if services can get access to these areas, there is unlikely to be sufficient person-power to handle all emergency situations. Couple this with the issues relating to restricted water supply, limited road access and other constraints, and it is clear some communities will become isolated and reliant on the resources that they themselves can draw upon to protect people and property from harm.

There are a number of issues with communities becoming isolated from emergency response agencies. They include:

[2] Survey sample is from people across the Greater Wellington Region, with roughly 40% of the sample coming from Wellington City.

- Limited ability for some communities to prepare for such events.
- Lack of local fire suppression systems in some communities.
- Preparedness levels of individuals is dependent on their individual priorities and having the means to prepare for an emergency event. This highly variable level of individual preparedness means that some are more likely to be reliant on others.
- Some communities suffer considerable poverty, social deprivation, and/or health issues that limits their level of resilience (NEMA, 2019).

The consequence of all this is that some communities will be exposed to the risk of fire and, if emergency services are unable to reach them, some fires will be left to burn.

Case Study: Kobe Earthquake, 1995

Right: Fires following the 1995 Kobe earthquake.

The 1995 Kobe Earthquake and subsequent fires devastated the densely populated port city, killing 6,400 people, destroying 5,000 buildings, damaging critical infrastructure and leaving more than 320,000 residents homeless. Although the earthquake affected much of the city and the event remains one of the largest economic disasters in Japanese history, responses to the earthquake varied tremendously across different neighbourhoods.

Professional city fire departments and the Japanese Self Defence Forces mobilised slowly in response to the event, due to blocked roads, collapsed bridges and a lack of electric power. In many cases this meant neighbours and residents were the first to encounter and respond to the fires.

Surveys showed that in some neighbourhoods, 99% of the original residents returned following the event, while in other neighbourhoods the return rate was as low as 42%. In interviews, many respondents argued that the quality of their connections to fellow residents (or absence thereof) were critical in both the response and recovery phase after the earthquake first struck. Case studies of two similar neighbourhoods, Mano and Mikura, illuminate the role of social capital in accelerating and facilitating post-disaster recovery.

In the neighbourhood of Mano, (which was well known for its connected community) local residents spontaneously formed a bucket brigade using the equipment available to them to successfully stop the spread of fires that ignited followed the earthquake. After the shaking and fires had subsided, residents also worked together to set up a series of not-for-profit organisations to organise their demands on city authorities, lobbied for new housing for the elderly, set up cooperative housing units and built and ran a day care centre.

In contrast, in the neighbourhood of Mikura, (next to Mano and known for much lower levels of social capital) residents simply watched the fires engulf their homes and businesses. Also, following the event, residents only managed to create a single organisation to work on reconstruction, failing to coordinate on a number of critical issues.

Case study reference: Aldrich, DP. (2012). Building Resilience: Social Capital in Post-Disaster Recovery. The University of Chicago Press.

Image reference: https://www.japantimes.co.jp/news/2020/01/16/national/25-years-after-kobe-quake/

More rentals and a highly transient community

In 2018, the Wellington Region had the fourth highest proportion (35%) of renting households in New Zealand only behind Gisborne, Auckland and Waikato. Most of these households tended to be rented privately. This proportion was expected to increase as home ownership in Wellington becomes unattainable for first home buyers, as the population continues to grow, and as pressure on housing increases.

The 2018 Census data also shows signs that communities are becoming increasingly transient with renters of all ages being consistently less likely to be living at the same address as the previous year. The highest proportion (over 50%) was those in the 20 – 24 age bracket.

Recent research from FENZ shows that people living in a rented property are likely to have different attitudes and behaviours towards emergency preparedness than those living in owned homes. Research shows that renters are often disengaged from fire safety and preparedness, often believing that the risk will be managed by someone else such as a landlord or other tenant. Renters are also much less likely to have working smoke alarms or to have a detailed escape plan. A recent FENZ quarterly report shows that 76% of renters in NZ have working smoke alarms, compared to 87% of all New Zealanders, indicating that renters are less prepared generally when it comes to fire safety (FENZ, 2022).

Results from WREMO's 2020 Community Survey also show that 18 – 34-year-olds generally have a low interest in emergency preparedness and have fewer social connections with their neighbours. This combined with the other factors mentioned above can hamper community response to FFE and increase community reliance on emergency services (WREMO, 2020 a).

Lack of preparedness

NEMA recognises that the level of preparedness for emergencies and resilience of individuals, households, businesses and organisations is not as high as it should be given the risks New Zealand faces. This can put communities at risk of loss of service, losses in the economy and potentially loss of life when severe disruption occurs (NEMA, 2019).

This is very much the case for FFE in Wellington, given communities have a low awareness and understanding of the risk FFE presents to the city and how they can respond to it. Results from WREMO's 2020 Community Survey show that:

- While the majority of those surveyed in the wider Wellington Region know how to turn their electricity and water off (84% and 73% respectively) only 50% knew how to turn the gas off at their home, which is a major risk factor for FFE in Wellington.
- Only 36% of people surveyed in Wellington City had a fire extinguisher in their home.
- Only 40% of people surveyed in Wellington City knew where their local Community Emergency Hub was located.

Despite this, the survey does demonstrate that the impacts of COVID-19 have encouraged people to become more active in preparing for emergency events, with an increase in food storage, knowledge of a business continuity plan and using news websites to gather information (WREMO, 2020 a).

Managed communities (such as student accommodation, council properties and rental properties with property managers who have a good social license) tend to be better prepared.

What happens if the Wellington CDEM Group does nothing?

If the Wellington CDEM Group choses to do nothing to manage the risk associated with FFE:

- The risk of a catastrophic FFE event will not go away until high risk areas are redeveloped to modern building compliance standards. This is expected to take decades.
- Communities will continue to be heavily dependent on emergency services that may be overwhelmed or unable to respond to FFE events due to damaged or blocked roads and a lack of water for firefighting.
- Communities are likely to be left exposed and fires left to burn, leading to unnecessarily higher losses (property, infrastructure and casualties).
- Agencies may face increasing risk of litigation if they fail to act when provided technical advice on the FFE risk profile, as per the Whakaari-White Island eruption on 9 December 2019 (NEMA, n.d.).
- Community confidence may decrease in emergency response services.

What the Wellington CDEM Group is seeking to achieve through this Business Case

Investment objectives

This section describes what the Wellington CDEM Group is seeking to achieve through this Business Case. The investment objectives were derived from a workshop held with representatives of those agencies involved in development of this Business Case on 9 September 2021.

Table 2 below also provides an indication of what is currently happening now (existing arrangements) and where Wellington City needs to be in the future to achieve the investment objectives (business needs).

Table 2: The case for change for each investment objective.

Investment objective one	**By 2025 the Wellington community will have a good awareness of the risk of FFE and are incentivised to take steps to reduce risk, and disincentivised to increase risk**
Existing arrangements	The broader Wellington community is relatively aware of the risk of fire and earthquakes as distinct hazards, because of public messaging delivered by Wellington CDEM agencies (predominantly FENZ and WREMO). There is however a low awareness of the risks relating to FFE and how communities can reduce this risk, as messaging on the risk it is not comprehensively integrated into public communications. This low awareness is exacerbated for people in rental properties.
Business needs	The broader Wellington community is well aware of the risks posed by FFE and knows both what to do to reduce risk of ignition and spread, and what not to do.

Investment objective two	By 2030, at-risk communities have the capacity and capability to protect health and safety, and contain fire without external assistance
Existing arrangements	Following a major earthquake, communities may become isolated and left to respond to FFE events on their own. This presents a range of challenges and puts communities at risk of harm. This is because the community currently has a limited ability to prepare for and respond to FFE events.
Business needs	Communities that have been identified as being at risk of being isolated and at risk of FFE have the tools and knowledge at their disposal to keep people from harm in the event of a FFE, and to minimise property damage through fire spread to surrounding buildings and vegetation until such time as external assistance is available.

Investment objective three	By 2035, the emergency management system will have the capability and capacity to manage the residual risk of fire following an earthquake
Existing arrangements	Following an earthquake, emergency response agencies may be hampered from responding to an FFE event. This is due to a number of factors including restrictions on road access and constraints on resources, preventing them from responding to all emergencies. Even if the emergency response agencies can get to an FFE event, there are likely to be restrictions on water for firefighting purposes which can further hamper the response.
Business needs	Emergency response services will have access to support, or the means to aid affected communities once communities are no longer isolated (i.e. access or services are restored).

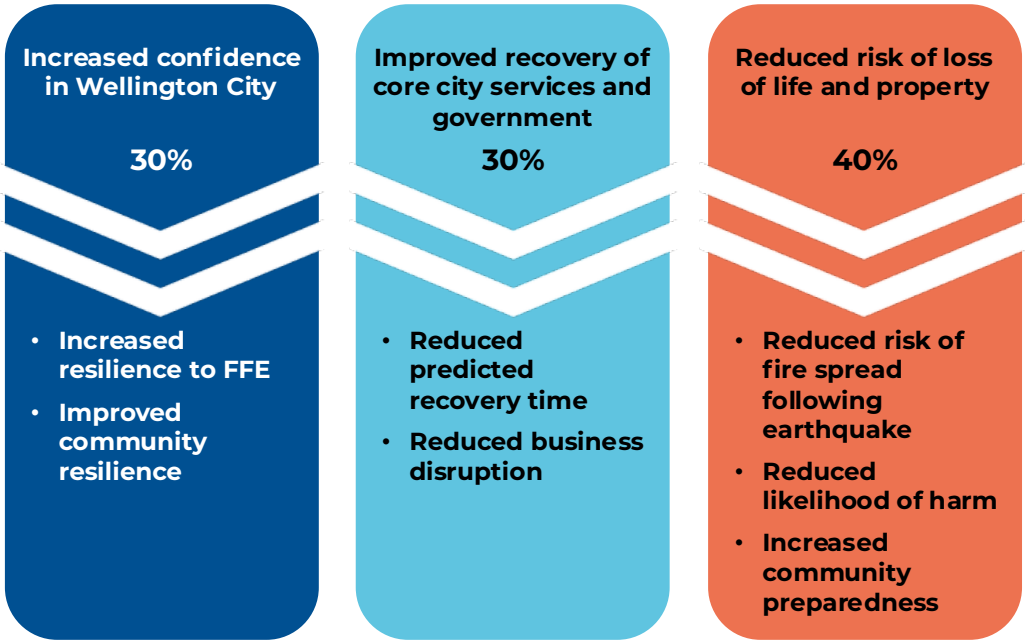
Investment objective four	By 2050 there will be a reduction in the predicted incidence and in the predicted consequence of fire following an earthquake
Existing arrangements	Some of Wellington's existing buildings are ageing and vulnerable to FFE. In most places these are being addressed by asset management plans, asset renewal programmes (including strengthening, conservation and restoration) and redevelopment, but these processes take time and resources to implement. Until these ageing vulnerable assets are addressed the risk and consequence of FFE will remain.
Business needs	There will be reduced the risk of fire occurring in Wellington and, if fire does occur, we will have reduced the risk of spread, thereby reducing the possible consequences to people and property from fire.

The main benefits this investment would deliver

This section describes the benefits to the Wellington City community from resolving the identified problem. Through achieving the investment objectives, the Wellington CDEM Group can expect to achieve the following benefits from managing the risk of FFE.

These benefits were first identified at a workshop held on 6 November 2019 with representatives of those agencies involved in development of this Business Case. The benefits were then refreshed in a workshop on 4 August 2021. An overview of the benefits and associated KPI's is shown in *Figure 4.*

Figure 4: Overview of benefits and KPI's (percentages represent relative weightings).



Benefit one: Increased confidence in Wellington City

Increased resilience to FFE

New Zealanders and Wellingtonians are confident in the viability of their capital city to withstand natural hazard events.

Improved community resilience

Communities within Wellington are more resilient and able to survive and thrive after an FFE event occurs. This means they have the ability to adapt well to change, overcome adversity and recover quickly after a FFE event.

Benefit two: Improved recovery of core city services and government

Reduced predicted recovery time

Communities are able to recover quickly following a FFE event and return to life as normal.

Reduced business disruption

There is limited disruption to government or business as a result of FFE events.

Benefit three: Reduced risk of loss of life and property

Reduced risk of fire spread following earthquake

Fires that occur following an earthquake will be managed through better avoidance and mitigation. This minimises the probability for fires to spread through high-risk areas in the event of FFE.

Reduced likelihood of harm

There are fewer fires that occur following an earthquake, and those that do occur will be suppressed. This minimises the harm caused by FFE events to both people and property.

Increased community preparedness

Communities are more prepared for a FFE event when it occurs. They will have plans in place which will enable them to respond effectively and ensure the safety of themselves and others.

Who will gain as a result of improvements, and what sort of benefits are they?

Benefits are not always experienced equally or universally. *Table 3 below* identifies what sort of benefits would be expected to be seen (i.e. can they be measured, do they result in financial benefits, and if so, to whom?).

Table 3: Benefit types.

Benefit	Benefit class	Direct / indirect	Beneficiary
Increased confidence in Wellington City	Qualitative	Indirect	Broader Wellington and local communities
Improved recovery of core city services and government	Quantifiable but not readily monetisable	Direct	Broader Wellington community
Reduced risk of loss of life and property	Quantifiable and monetisable	Direct	Broader Wellington and local communities

What are the main risks?

A workshop was held on 10 December 2021 attended by representatives of those agencies involved in development of this Business Case to identify the key risks that might prevent, degrade or delay the achievement of the investment objectives.

Table 4: Current risk analysis.

ID	Risk category	Risk description	Comments & risk management strategies (mitigations)
R1	Business risk	IF the impact of an option (in terms of the reduction it causes to the risk and/or consequence of FFE) cannot be quantified THEN decision makers may not commit to implementing it.	Further refinements to the FFE modelling for Wellington City is a recommendation of this Case.
R2	Business risk	IF the relativity of FFE events cannot be articulated against other competing hazards THEN it may not be regarded as a priority for action.	Further refinements to the FFE modelling for Wellington City is a recommendation of this Case.
R3	Business risk	IF clear and accountable owners cannot be identified for options, THEN it is unlikely they will be implemented effectively, or even implemented at all.	Establishment of an implementation programme *is a recommendation of this Case to address this risk.*
R4	Business risk	IF the community negatively react to the implementation of certain options, THEN this could potentially lead to adverse impacts and political challenge.	Further refinements to the FFE modelling for Wellington City is a recommendation of this Case which will provide a defendable and robust basis for choosing certain options.
R5	Business risk	IF communities become overloaded with information on readiness and preparation information relating to multiple hazards THEN this could overwhelm them and limit the ability to change behaviour.	Develop clear communication strategies and integrate messaging on FFE into existing hazard communications (i.e. on earthquakes or fire).

What are the key constraints, dependencies, uncertainties and assumptions?

Any option recommended through this Business Case is subject to the following constraints, dependencies, uncertainties and assumptions.

Key constraints

Constraints are limitations imposed on the proposed Programme from the outset. These can include any external conditions and agreed parameters within which the proposed Programme must be delivered.

Table 5: Key constraints.

ID	Constraint description
C1	Emergency service agencies have constrained resources and funding making it difficult to participate in activity to manage the likelihood and consequences of FFE.
C2	Limitations of model (as articulated in the GNS Report).

Key assumptions

Assumptions are factors related to the proposed Programme that are accepted as true or as certain to happen, without proof. If they are not certain to happen, they may be a risk.

Table 6: Key assumptions.

ID	Assumption description
A1	Agencies within the Wellington CDEM Group can make people available to further develop options included in this Case and implement the recommendations.
A2	Agencies within the Wellington CDEM Group can make people available to support the implementation of options to manage the likelihood and consequence of FFE in Wellington City.

Further assumptions will be detailed through development of the Economic and Financial Cases.

Key dependencies

Dependencies are external influences, which are outside the scope of the Business Case but can have an impact on the success of the proposed Programme. Other initiatives identified below may also depend on the outcome of the proposed Programme.

Table 7: Key dependencies.

ID	Organisation	Dependency description	Key dates
D1	National Emergency Management Agency	**Regulatory Framework Review ("Trifecta") Programme** The Programme will ensure the new Emergency Management Bill, Plan Order/Guide, and National Disaster Risk Strategy Roadmap are aligned in content and outcomes, as well as ensuring the projects are coordinated and aligned with other NEMA projects and workstreams.	Targeted engagement for the new Emergency Management Bill will occur in early 2022. Public submissions and the Parliamentary Select Committee will occur in late 2022 / early 2023. The review of the National CDEM Plan Order and Guide will start in early 2022 and continue throughout the year. Broader engagement to develop the Roadmap for the National Disaster Resilience Strategy has not yet been scheduled but is expected to start in 2023.
D2	Wellington Water (WWL) and Wellington City Council (WCC)	**Ongoing water network renewals programmes** The resilience of the water supply in Wellington City is improved through WCC's committed renewal programme and the ongoing project to construct the new 35 million litre Omāroro reservoir.	Ongoing.
D3	Wellington gas and electricity distributors	**Ongoing gas and electricity network renewal programmes** The resilience of the gas and electricity networks are improved through various renewal programmes that work through their entire networks, progressively renewing old pipes (for instance on a 50-year rolling basis).	Ongoing.
D4	Wellington City Council (WCC)	**District Plan review** WCC is currently revising their District Plan to deal with the major planning and environmental issues facing the city – including housing supply choice and affordability, protecting biodiversity, integrating growth and infrastructure, responding to climate change and managing the risk of natural hazards.	Statutory consultation of the Proposed District Plan will be taking place mid-2022.

ID	Organisation	Dependency description	Key dates
D5	GNS	**'It's Our Fault' programme** Ongoing modelling work programmes at GNS which relate to building data and population data that may be useful, either for future modelling or data overlays.	Review of existing modelling for mitigation strategies and recommendations for future work for Wellington City will be completed by 30 June 2022. The Steering Committee of It's Our Fault have not renewed the FFE project for next financial year but are still interested in FFE work.
D6	Ministry for the Environment (MfE)	**Response to theInāia tonu nei: a low emissions future for Aotearoa Report** The Government is currently in the process of developing its response to the Climate Change Commission's recommendations in theInāia tonu nei: a low emissions future for Aotearoa Report. One of the sub recommendations was "determining how to eliminate fossil gas use in residential, commercial and public buildings". MfE is leading the Government's response to this recommendation.	Consultation on the Government's response commenced in 2021 and is still likely some months away from being developed into any draft policy.
D7	Ministry for the Environment (MfE)	**Resource Management Reforms** The Government plans to repeal the Resource Management Act 1991(RMA) and replace it with three new pieces of legislation: • Natural and Built Environments Act • Strategic Planning Act • Climate Adaptation Act.	The Environment Select Committee is currently considering submissions on the exposure draft of the Natural and Built Environments Act to report back to Parliament. Any changes will be made before the full Bill is formally introduced in 2022, and then there is expected to be another round of public consultation as part of the standard legislative process (including another Select Committee review).

ID	Organisation	Dependency description	Key dates
D8	Department of Internal Affairs (DIA)	**The Future for Local Government** A review to identify how New Zealand's system of local democracy and governance needs to evolve over the next 30 years, to improve the wellbeing of New Zealand communities and the environment, and actively embody the Treaty partnership.	30 September 2022: Draft report and recommendations to be issued for public consultation. 30 April 2023: Review presents final report to the Minister and Local Government New Zealand.
D9	Department of Internal Affairs (DIA)	**Three Waters Reform Programme** Local government is facing significant challenges in managing drinking water, stormwater and wastewater services. To address this the New Zealand Government is progressing reforms so that three waters services will be provided by four publicly owned water service entities from July 2024.	Following consideration of the recommendations provided on the draft Water Services Entities Bill (by Working Group on Representation, Governance and Accountability) and Government decisions, the Bill is expected to be introduced to the House in mid-2022. People can make submissions on the Bill when it is referred to Select Committee shortly after.

Economic Case

The Economic Case explores the suite of options for managing the risk and consequence of FFE in Wellington City. The Case:

- Identifies the critical success factors.
- Identifies and assesses options for managing FFE risk against the investment objectives and critical success factors to identify a recommended suite of options for more detailed consideration.
- Outlines the recommended approach to developing a preferred programme of options that will deliver the best public value to the Wellington CDEM Group and wider community.

Critical success factors

This section describes the critical success factors that must be met if options are to be successful. The critical success factors were identified at a workshop held on 4 August 2021 with representatives of those agencies involved in development of this Business Case and have been derived using NZ Treasury guidance.

Strategic fit and business needs

- How well the option meets the agreed investment objectives and will align related to business needs and requirements.
- How well the option fits within the agency's strategies, programmes and projects.

Potential value for money

- How well the option optimises value for money (i.e. the optimal mix of potential benefits, costs and risks).

Supplier capacity and capability

- How readily the service can be purchased, and how well the service can be maintained in the long term.
- How well the potential option matches the capability and capacity of the community that will be required to deliver it over the long term.

Potential affordability

- How well the option can be met from likely available funding from the agency responsible or is affordable for the community where the costs can be reasonably attributed.

Potential achievability

- How well the option is likely to be delivered given the agency's or community's ability to respond to the changes required and matches the level of available skills required for successful delivery.

Environmentally acceptable

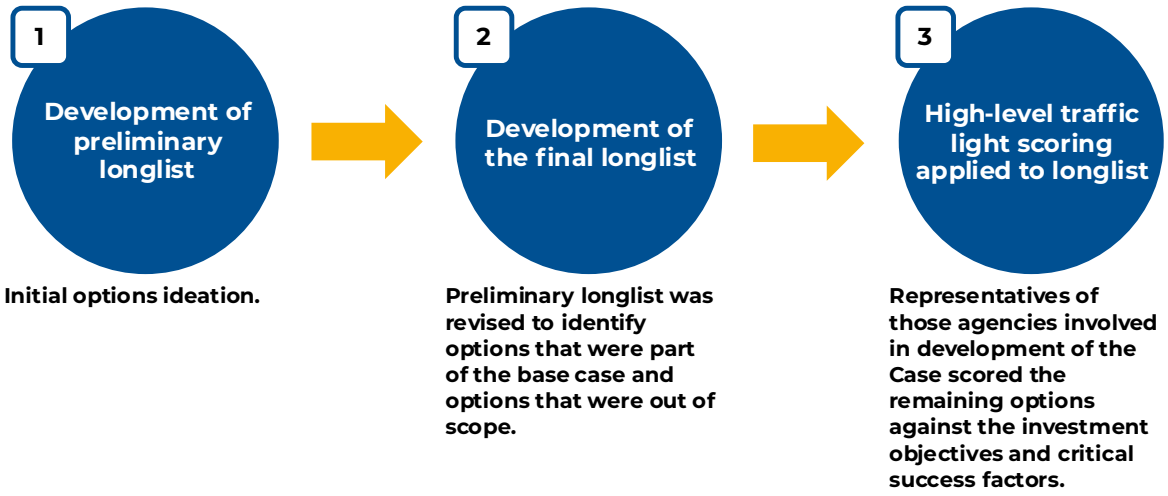
- How acceptable environmentally the option is likely to be both to the local community and from a regulatory perspective.

Identifying the options

The purpose of this section is to identify and assess a wide range of possible of options for managing the risks of FFE in Wellington City.

The final recommended suite of options have been developed using an iterative process, as outlined in *Figure 5* below.

Figure 5: Process to develop final suite of options.



Developing the longlist

A wide range of programme options were originally generated by representatives of those agencies involved in the development of this Business Case at a workshop on 18 December 2019. The options were then refreshed and updated in a workshop and in discussions with agencies from September – January 2022.

When generating the longlist, the CDEM 4Rs framework was used to ensure a robust suite of options was identified. The longlist may not be exhaustive and some further management options may be identified over time. These are, however, the main mitigations identified at the time of drafting the case.

Options removed as they form part of the base case

A number of options which were identified in the December 2019 workshop were removed from the longlist described in this Case because these options have already been, or are being, implemented by various agencies. These options are described in the *Appendix F*.

Options not developed in this Case but retained for future consideration

Eight options were also not developed in any detail as part of this Case as they were deemed a duplicate of other longlist options, or were deemed to be too generic (i.e. respond to general fire risk or cover emergency events more broadly) as opposed to being specific to FFE.

Some of these options are being further investigated in separate work programmes undertaken by agencies within the Wellington CDEM Group. All are retained for completeness and future consideration.

A full list of these options and the rationale for why they were not developed in any detail is included in *Appendix D*.

Final longlisted options

Table 8 below includes the titles and descriptions of the remaining longlisted options.

It is likely that these options will need to evolve over time, as physical risks of ignition and spread reduce as a result of urban renewal to modern standards occurs, and as communities grow and their needs change.

Table 8: Titles and descriptions of longlisted options.

Option #	Option title	Option description
H1	Increase water storage for firefighting purposes in all buildings.	Influence policy to require higher standards for water storage in buildings across Wellington. This could be achieved through an update to the code of practice for firefighting water supplies (which many Territorial Authorities adopt as part of their District Plan) so that it expressly considers FFE and requires building owners / landholders to increase their water supply.
H2	Improve fire management means in heritage properties.	Influence policy to reduce fuel availability by advocating to WCC and Heritage New Zealand Pouhere Taonga for the installation of improved fire management means within heritage properties.
H3	Inform property owners of FFE risk.	Identify communities (based on similar characteristics and FFE risk profile) and build triggers that inform property owners of the risks they face in regard to FFE and how they might prevent and respond to FFE (e.g. through Land Information Memoranda, District Plan, EQC risk reduction portal or other Council communication means such as hazard models).
H4	Require shut off mechanisms for the gas network.	Influence policy to reduce FFE ignition sources via changes to the Gas regulatory framework to improve the ability to shut off the gas network. There is a shortage of automatic cut off valves in the gas network (main auto control is how much gas is piped into system from Taranaki). Manual shut off values exist but are not overly effective and are scattered throughout the network.

Option #	Option title	Option description
H5	Enhance home safety visits to improve fire management in high-risk properties.	Enhance existing home fire safety visits (targeted at high-risk areas) to: • Ensure presence of working smoke alarms (early detection means) and provide smoke alarms to occupants if necessary. • Assess and recommend whether it is necessary for households to have improved fire management tools (e.g. fire blankets, extinguishing mediums, deluge systems). • Educate households on how to safely extinguish small fires with the right tools. • Raise household awareness around where property services are (i.e. water, gas, electricity) and how to shut these off. • Educate households on creating household escape plans.
H6	Public education campaigns.	Target communities with integrated public education campaigns which could either involve: • Adding information into existing Fire Safety talks in the community, existing public events or social media material, to raise community awareness of FFE and inform people what the risks are and what they can do in the event of FFE (FENZ). WREMO could also add questions regarding FFE into the annual preparedness survey. • Collaborating with other emergency response agencies to raise community awareness around the risks of FFE, what emergency agencies can and can't do in the event of FFE, and how communities can prevent or respond to FFE on their own. This could include holding specific community / public events, raising awareness through existing Neighbourhood Support groups or letter drops. The first step in preparing our communities is to make them aware of the potential problems with FFE.

Option #	Option title	Option description
H7	Adapt existing Community Emergency Hubs or establish new Community Fire Centres.	Adapt existing Community Emergency Hubs, or establish new Community Fire Centres where the community can go to help each other in a major emergency. This could include: Adapting existing Community Emergency Hubs by (WREMO led): • Updating existing Community Hub Guides to include information about FFE risk and how communities can respond to FFE events. Plans would be specific to each Hub area. • Make basic firefighting means available to communities either in Hubs or other means such as advertising bollards which is an idea currently being explored by WREMO. Establishing new Community Fire Centres (FENZ led): • These could be a garden shed, to provide equipment for formal Community Response Teams and community members. An ownership model would need to be adopted to ensure clear distinction between what equipment and responsibility lies with the trained Community Response Teams and general community members.
H8	Integrated plans for water management and FFE suppression post-earthquake event.	Develop an integrated plan which covers: • The water management decisions need to be made in the event of FFE (i.e. who authorises the release of shut of water and when) and what the implications of those decisions might be. • FFE suppression to enhance situational awareness (including establishing effective information flow channels) and ensure emergency response agency resources are deployed in a timely and appropriate manner to address FFE. This would involve identifying key roles from each agency who are required after an earthquake event to look at FFE and could be as simple as a review of existing FENZ Station Emergency Plans and WREMO response plans to integrate them as one plan.
H9	Integrated infrastructure response and recovery plans for FFE.	Develop a new integrated plan (or adapt existing plans) for infrastructure response and recovery following an earthquake to better account for FFE. Plans to restore lifeline utility services and improve the resilience of these services are an important component of this option (i.e. identifying priority roading routes that relate to FFE risk and having plans in place to restore access to better enable emergency response).

Option #	Option title	Option description
H10	Adapt the design of Wellington's existing water network to provide alternative local water sources and distribution networks.	Change the design of existing water infrastructure / network to provide alternative local water sources and distribution networks that can be used to manage FFE throughout Wellington. To identify what changes can be made, a review (e.g. a Business Case) of potential solutions should be undertaken to identify a preferred solution. This review should address costs, practicality of installation operational costs and operational responsibilities. Examples of solutions include: • Underground water bladders to be fed by storm water pipes. • Street-level localised storage and fire hydrants drawing from localised storage.
H11	Establish an alternative over land water reticulation capability.	Establish a new alternative water reticulation capability to create a more effective above ground FFE suppression system. This includes establishing new supply / storage of water, increasing capacity to pump water and/or increasing capacity to distribute water (source to pump). To identify what high volume hose capacity systems are required, a review (e.g. a Business Case) of potential solutions should be undertaken to identify a preferred solution. This review should address costs, practicality of installation operational costs and operational responsibilities. Examples of solutions include: • Creating a high-volume hose capacity system that could draw on the Wellington harbour as a water supply for firefighting purposes. This would require the supply of a number of high-volume pumps strategically located throughout the Wellington city and a large number of high diameter minimal friction hoses that would supply community reservoirs where firefighting teams were able to gain access to extinguish a fire. • Creating several smaller pump systems distributed around high-risk areas. • Developing new water reservoirs to increase firefighting capacity.

Option #	Option title	Option description
H12	Increase capability in local communities to provide support in the event of FFE.	Develop existing or build new capability in local communities to provide support in the event of FFE. This could include: • Collaborating with other emergency response agencies to run community training sessions. • Developing training programmes which could then be self-organised at Community Emergency Hubs to upskill community members. Training could be run by existing Community Response teams. • Growing formal capability in existing Community Response Teams (i.e. having specialist FFE advisors in community groups). These are groups of people who volunteer their time in emergencies to help when the emergency services are overwhelmed. • Upskilling the community to deliver administrative, logistics and equipment, welfare, communications, and recovery support (including first aid) in the event of FFE.

All longlisted options are described in more detail in *Appendix E.*

Assessment of the longlist

All longlisted options have been qualitatively scored against their ability to achieve both the investment objectives (IO's) and critical success factors (CSF's) ide involved in development of this Business Case in workshops and one on ones from September – February 2022.

Table 9: Longlist options assessment.

Option #	H1	H2	H3	H4	H5	H6	H7	H8	H9
Option title	Increased water storage for firefighting purposes in all buildings.	Improve fire management means in heritage properties.	Inform property owners of FFE risk.	Require shut off mechanisms for the gas network.	Enhance home safety visits to improve fire management in high-risk properties.	Public education campaigns.	Adapt existing Community Emergency Hubs or establish new Community Fire Centres.	Integrated plans for water management and FFE suppression post-earthquake event.	Inte infra resp reco for F
Lead agency	FENZ / WCC	FENZ	WCC	MBIE / WorkSafe NZ	FENZ	FENZ / WREMO	WREMO / FENZ	WCC	Wel CDE
By 2025 the Wellington community will have a good awareness of the risk of FFE and are incentivised to take steps to reduce risk, and disincentivised to increase risk	**No**	**No**	**Yes**	**No**	**Partial**	**Yes**	**Yes**	**Partial**	
By 2030, at-risk communities have the capacity and capability to protect health and safety, and contain fire without external assistance	**Partial**	**Partial**	**Partial**	**No**	**Yes**	**Partial**	**Yes**	**No**	
By 2035, the emergency management system will have the capability and capacity to manage the residual risk of fire following an earthquake	**Partial**	**Partial**	**Partial**	**Partial**	**Yes**	**Partial**	**Yes**	**Partial**	
By 2050 there will be a reduction in the predicted incidence and in the predicted consequence of fire following an earthquake	**Yes**	**Yes**	**Partial**	**Partial**	**Yes**	**Partial**	**Partial**	**Partial**	
Strategic fit and business needs	**Yes**	**Yes**	**Yes**	**Partial**	**Yes**	**Yes**	**Yes**	**Partial**	

Option #	H1	H2	H3	H4	H5	H6	H7	H8	H9
Potential value for money	Yes	Yes	Yes	No	Yes	Yes	Partial	Yes	
Supplier capacity and capability	Yes	Yes	Yes	Yes	Yes	Partial	Partial	Yes	
Potential affordability	Partial	Partial	Yes	No	Yes	Yes	Partial	Yes	
Potential achievability	Partial	Partial	Partial	No	Partial	Yes	Partial	Yes	
Environmentally acceptable	Partial	Partial	Partial	Yes	Yes	Yes	Yes	Yes	

While the initial high-level options assessment has been undertaken above, these assessments cannot be validated until further work has been completed to
managing the likelihood and consequence of FFE. For that reason, none of the final longlisted options have been discarded at this stage and all have been re

Developing the preferred programme

A preferred programme has not been identified in any detail. Further work is required to better understand what combinations of options will deliver the best public value for reducing the likelihood and consequence of FFE in different communities in Wellington City.

The section below outlines how the risk of FFE is being managed now and the recommended approach to developing a preferred programme of options.

How is the risk of FFE being managed now (the Base case)?

To date, work to manage the risk of FFE in Wellington City has been undertaken by agencies within the Wellington CDEM Group in relative isolation from each other and has not been considered across each of the 4Rs. It has also tended to focus on managing the risk of fire and earthquake as distinct hazards as opposed to related and cascading hazards.

This work does, and will have, an impact on managing the likelihood and consequence of FFE, however. It forms the base case against which the preferred programme can be tested. *Appendix F* sets out the contribution each agency is currently making towards managing FFE.

Risk is not static: the base case is evolving

Improvements in building stock as buildings are replaced or upgraded, coupled with improving awareness of the need to manage cascading risks and constantly evolving emergency management procedures over time means that the base case is not static. Over time, this means that the current level of risk being faced is expected to lessen, albeit slowly and over a much longer period than if the recommended interventions are made. During this period, Wellington communities will continue to be at a heightened risk from FFE.

Who is at risk?

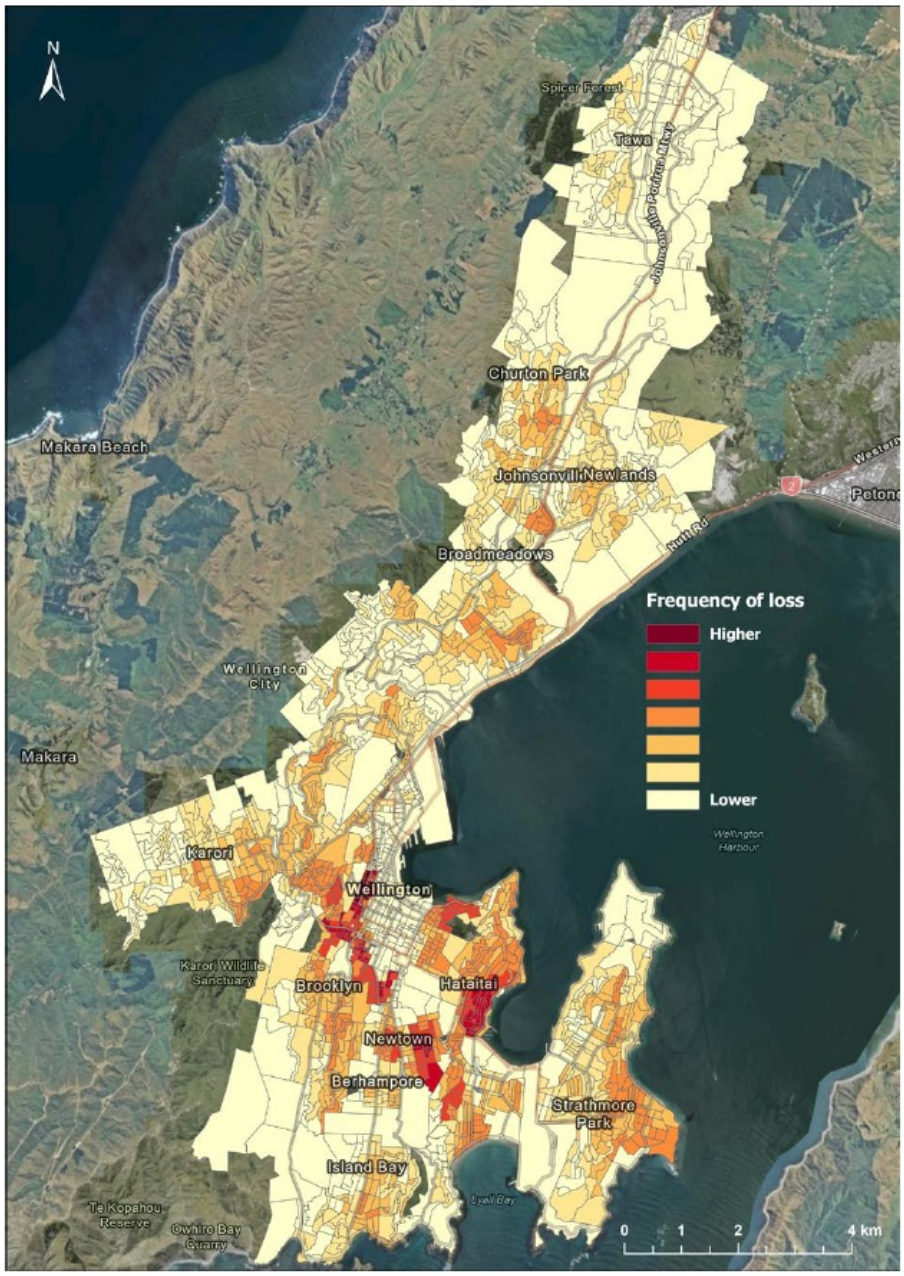
GNS modelling of FFE risk in Wellington City has identified areas of Wellington City that are at heightened risk of FFE and therefore exposed to potentially catastrophic losses. This is based on:

- Risk of ignition, which considers building footprint, population density and severity of shaking (referred to as peak ground acceleration). Building construction (wood, non-combustible or mobile home) was considered, however the assumption is that all buildings will burn to some extent, irrespective of construction, if an ignition starts in one.
- Risk of spread, which is sensitive to building construction (i.e. wooden buildings are combustible and fire is assumed to spread to other wooden buildings, whereas non-combustible buildings are assumed to not facilitate the spread of fire).

The model also takes into account some elements of suppression, being vehicular access and access to water (Scheele et al., 2020).

Figure 6 below provides a map that shows areas in Wellington that are at relatively high or low risk from FFE. Suburbs such as Hataitai, Newtown and fringe suburbs around the Central Business District (CBD) experience the most frequent modelled loss, due to relatively high population densities and closely spaced combustible buildings.

Figure 6: Map showing the areas of Wellington that are at relatively high or low risk from FFE.



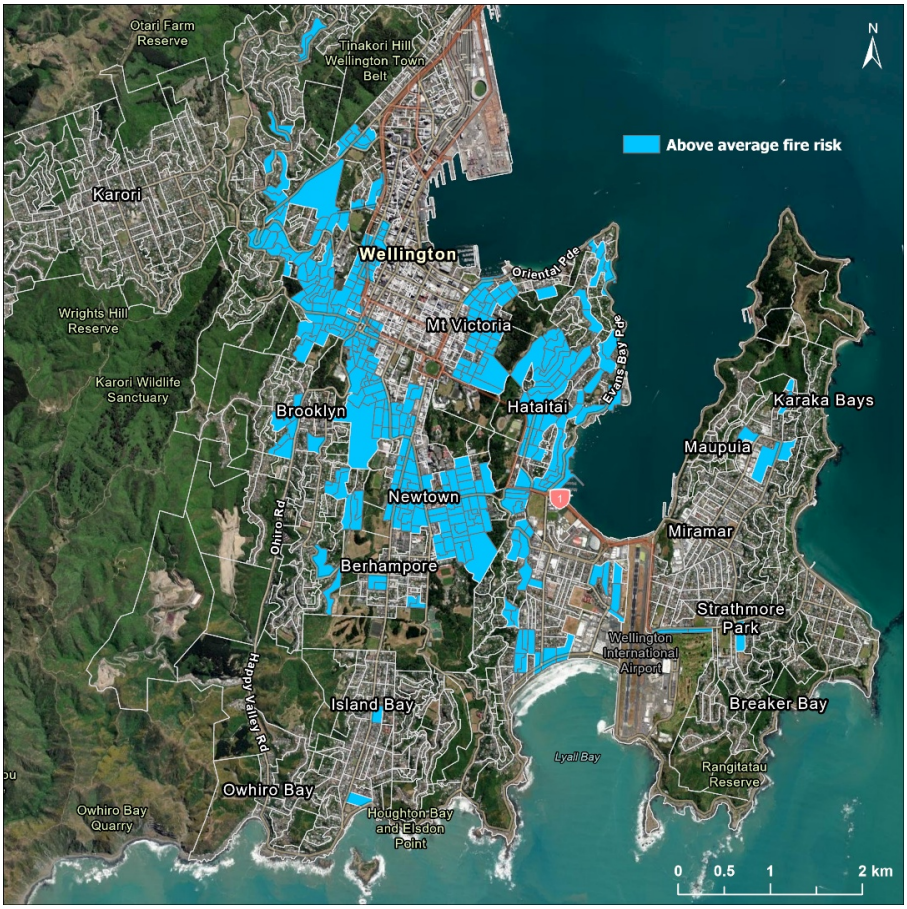
As noted above and in the *Background to this business case section*, this modelling is based on a limited number of physical attributes. There are a number of other attributes that contribute to or mitigate risk but are not currently modelled – such as vegetation proximity, or changes in building materials with upgrades. The reality within each community may be significantly less, or more.

FENZ has identified that there are social characteristics that influence susceptibility to fire. These characteristics are also applicable to FFE. These include whether residential buildings are owner-occupied, and the density of occupation (e.g. flats and people within flats) within a building. Wellington has a high proportion of transient tenants in some communities who are less likely to be prepared or resilient when confronted with a hazard event (see *Problem*

statement three). When data for the proportion of renters in an area (human element of fire risk) is overlayed with the FFE modelling risk, it highlights areas of heightened risk.

The blue areas shown in *Figure 7* identify areas where the proportion of renters is above average (compared to each area within Wellington City) and the average frequency of burning is also above average (according to the FFE modelling).

Figure 7: Map showing the areas where the proportion of renters and average frequency of burning is above average (according to the FFE modelling).



At this stage, however, there are difficulties in quantifying the actual risk faced by each community, as many of the characteristics are dependent on the nature of the community, which is not yet completely understood. These characteristics are also likely to change over time as demographics change, and areas redevelop.

There is value therefore in characterising the risks in each identified community, so that the nature and extent of the risk can be better understood, and potentially solutions identified that can either be applied generically across the community, or specific just to the risks and needs of that community.

This fits neatly with the Sendai Framework for Disaster Risk Reduction.

The Sendai Framework for Disaster Risk Reduction

In 2015 New Zealand became a signatory to the Sendai Framework for Disaster Risk Reduction 2015–2030 (the 'Sendai Framework'). This has resulted in a national shift away from emergency management (waiting for an event to happen and managing it) to disaster risk management

(identifying potential hazards and making a concerted effort to reduce their impact and/or likelihood before they occur).

The Sendai Framework provides a useful methodology for prioritising action for disaster risk management across four areas:

- Priority 1: Understanding disaster risk
- Priority 2: Strengthening disaster risk governance to manage disaster risk[3]
- Priority 3: Investing in disaster risk reduction for resilience
- Priority 4: Enhancing disaster preparedness for effective response, and to 'Build Back Better' in recovery, rehabilitation and reconstruction.

Applying this methodology to this Business Case provides the Wellington CDEM Group with a sequence of steps to manage the risk of FFE in Wellington City. This sequence is outlined below.

Step one: Characterising community risks (Priority 1)

As noted above there is value in characterising each of the high-risk communities in Wellington City, taking into account both the physical and environmental attributes, and the social characteristics of the community. This would enable the specific risks facing each community to be better identified.

It is anticipated that this characterisation would take the form of validating the physical building risks and identifying likely social characteristics that either contribute to risk (such as high transience and high density) or mitigate the risk (such as high owner-occupation and high levels of preparedness).

Packages of most effective options for each community can then be identified and applied. It is likely that some options (such as education campaigns) would be applied across all areas, whereas others may only be applicable to specific locations.

Recommendation 1

That CEG agrees that validating the physical risk attributes and identifying the social risk attributes for each high-risk community is a priority and recommends to FENZ that it undertakes this community characterisation for Wellington City as a pilot through their national risk assessment work programme.

Step two: Modelling risk reduction (Priority 1)

It is not currently possible to fully measure the level of risk faced by each community, nor the value of risk reduction activities, either in absolute or relative terms. For example, the current model does not yet factor in the impact of gas; yet gas has been a major contributor to conflagration in other FFE examples internationally. The removal of gas as a key reduction option cannot also therefore be quantified, nor the benefits assessed in any other than a qualitative form.

There is value therefore in refining the risk modelling so that the Wellington CDEM Group can better define the severity of risk. This will better support development of options that will reduce the level of potentially quantifiable risk and deliver the greatest public value.

[3] Note that this case in itself is addressing this priority in part.

Recommendation 2

That CEG agrees to investigate updating of the Risk Modelling to better quantify the physical risks for each community based on the physical risk validation, and to investigate the value of reduction options.

Current modelling also cannot assess the value of risk mitigation. The Kobe example gives insight into how different behaviours affected the outcomes for different communities. How to measure the value (quantitatively or qualitatively) of risk mitigation measures such as building capability within the community, education is a developing area. Without some form of assessment, it is difficult to determine the value of mitigations

Recommendation 3

That CEG agrees to investigate options to model or further assess the risk treatment attributable to mitigation options.

Step three: Prioritising the longlist of options (Priority 3 and 4)

While further work is required to identify the different communities at risk, this Case provides a matrix for the Wellington CDEM Group to prioritise the longlist of options.

The Sendai Framework prioritises investing in disaster risk reduction, before enhancing disaster preparedness and recovery. To apply this concept, the longlist, options have first been grouped against:

- Attributes that affect FFE risks.
- Likely fire hazards events resulting from an earthquake.

The risk attributes are conceptually based on the FENZ Building Risk Assessment process used for assessing fire risk for Wellington City, and the likely fire hazards are adapted from the most recent GNS modelling (2020). More information of what is considered is provided below.

FENZ Building Risk Assessment attributes

There are three risk attributes categories:

1. Physical characteristics include:
    a. Density
    b. Construction type
2. Behavioural characteristics include:
    a. Socio-economic status
    b. Crowding
    c. Relationship to premises (owned or rented)
3. Readiness characteristics include:
    a. Preparation for adverse events
    b. Awareness
    c. Actions taken to minimise damage and loss

Likely fire hazards resulting from an earthquake

There are three likely fire hazards resulting from an earthquake:

1. Ignition: The beginning of a fire, which may or may not spread.

2. Fire spread: The process of fire spreading from an ignition point, both within and between buildings.
3. Community harm: The community harm (loss of property, injuries, and loss of life) caused by the ignition and spread of an FFE.

Prioritisation Matrix

The groupings of longlisted against the risk attributes of FFE and the likely fire hazards are shown in the *Figure 8* below.

Applying the Sendai Framework means that the Wellington CDEM Group should:

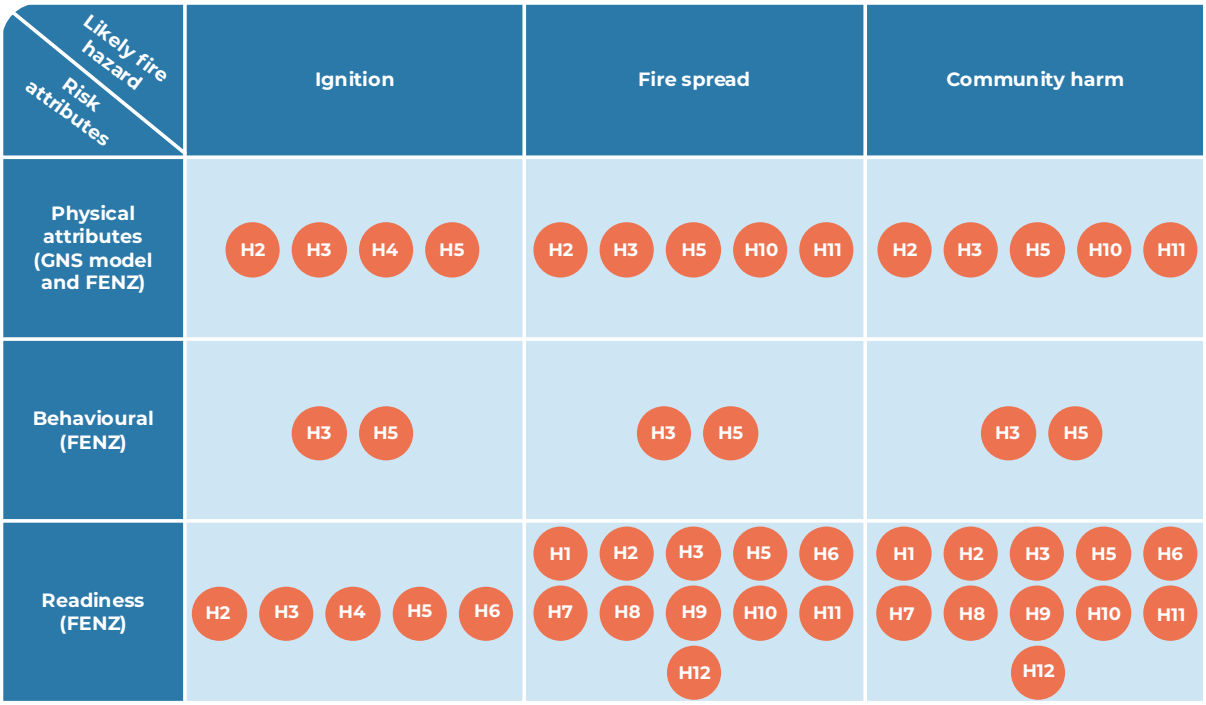
- First prioritise options which reduce or mitigate the risk of ignition.
- If this cannot be achieved, then prioritise options that will prevent or suppress spread.
- Finally, the community will bear any risk that remains, and thus preparedness for the event is the priority in the event that the risk cannot be avoided or suppressed.

Overseas advice identifies natural hazard mitigation has a Benefit/Cost ration of between 4:1 to 6:1 (FEMA, 2018). Further effort as indicated in Recommendations 2 and 3 will assist in providing verification of this level of benefit in the NZ context.

Recommendation 4

That CEG agrees to prioritise investigations and investment into reducing the risks associated with Fire Following Earthquake according to the Sendai framework.

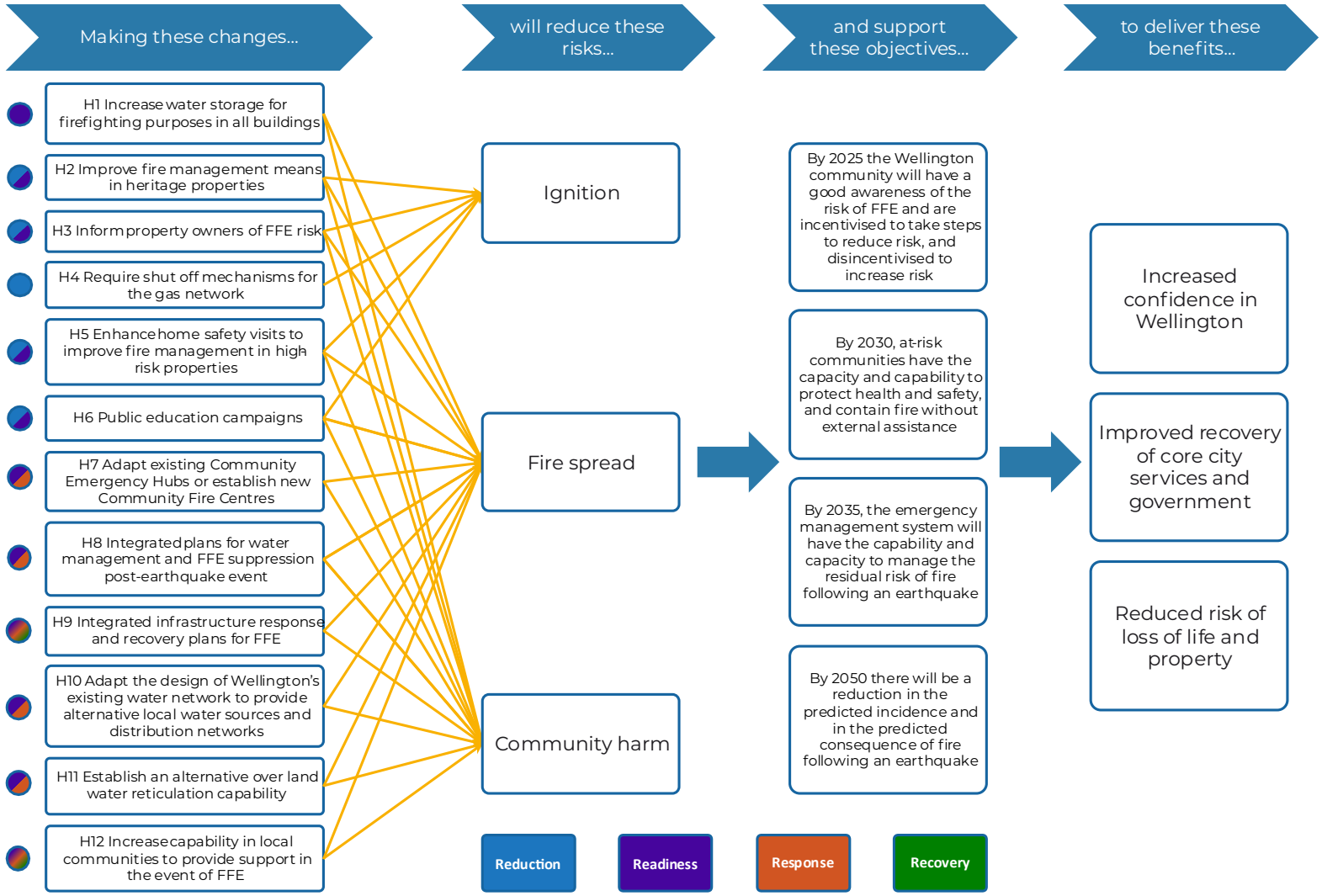
Figure 8: Prioritisation matrix for longlisted options (according to the Sendai Framework).



Defining the benefits

The intervention logic map set out in *Figure 9* below identifies how the various options proposed will address the risks identified, will support the outcomes sought (investment objectives) and deliver the benefits of this Business Case.

Figure 9: Intervention logic map for longlisted options.



Commercial Case

In a Programme Business Case, it is customary to outline in the Commercial Case what broad services would be required and how they would be procured. In this instance, it does not make sense to do this due to the range of options identified across the various responsible organisations. For the Wellington CDEM Group too, the identified options represent changes within an existing work programme to integrate FFE thinking into the Group Plan and subordinate plans, protocols and procedures.

It will be up to each responsible lead agency to further develop how any particular option will be procured.

Financial Case

The Financial Case provides a high-level assessment of the potential costs of programme options to manage the likelihood and consequences of FFE. It does not provide definitive costs as these will need to be assessed on a community-by-community basis. As described in the Economic Case, this list provides a menu.

The complete list of recommended options with their indicative costs supplied to date and their owner(s) is presented in *Table 10* below.

Table 10: Financial case information for longlisted options.

Option #	Option title	Lead agency	Indicative cost	Funding option
H1	Increase water storage for firefighting purposes in all buildings.	FENZ / WCC	($$): $10,000 - $100,000 for total costs to update the code. ($$$$): > $1,000,000 for total actual infrastructure costs (total for all buildings).	Baseline of agency responsible.
H2	Improve fire management means in heritage properties.	FENZ	($): < $10,000 for total costs to implement the policy. ($$$$): > $1,000,000 for total actual infrastructure costs (total for all buildings).	Baseline of agency responsible to implement the policy. Installation of improved fire management means will have to be funded by existing owners of heritage properties.
H3	Inform property owners of FFE risk.	WCC	($): < $10,000 for total costs of option.	Baseline of agency responsible.
H4	Require shut off mechanisms for the gas network.	MBIE / WorkSafe NZ	($$): $10,000 - $100,000 for total costs to implement the policy. ($$$$): > $1,000,000 for total actual infrastructure costs (total for all buildings).	Baseline of agency responsible to implement the policy. Installation of shutoff valves will have to be funded either through increased customer payments, or by the existing owners of the gas network.

Fire Following Earthquake in Wellington City Programme Business Case

Option #	Option title	Lead agency	Indicative cost	Funding option
H5	Enhance home safety visits to improve fire management in high-risk properties.	FENZ	($): < $10,000 per community.	Baseline of agency responsible
H6	Public education campaigns.	FENZ / WREMO	($$): $10,000 - $100,000 per community.	Joint agency funding (FENZ / WREMO)
H7	Adapt existing Community Emergency Hubs or establish new Community Fire Centres.	WREMO / FENZ	($$): $10,000 - $100,000 per community to adapt existing Hubs. Costs to establish new Community Fire Centres to be scoped.	Joint agency funding (WREMO / FENZ)
H8	Integrated plans for water management and FFE suppression post-earthquake event.	WCC	($$): $10,000 - $100,000 for total costs to develop the plans.	Joint agency funding (WCC and FENZ)
H9	Integrated infrastructure response and recovery plans for FFE.	Wellington CDEM Group	($$): $10,000 - $100,000 for total costs to develop the plans.	Joint agency funding
H10	Adapt the design of Wellington's existing water network to provide alternative local water sources and distribution networks.	WCC	($$$) $100,000 - $1,000,000 to develop the Business Case. ($$$$): > $1,000,000 for total actual infrastructure costs.	Joint agency funding to develop the Business Case and a Budget bid for infrastructure investment.

Option #	Option title	Lead agency	Indicative cost	Funding option
H11	Establish an alternative over land water reticulation capability.	FENZ	($$$) $100,000 - $1,000,000 to develop the Business Case. ($$$$): > $1,000,000 for total actual infrastructure costs.	Joint agency funding to develop the Business Case and a Budget bid for infrastructure investment.
H12	Increase capability in local communities to provide support in the event of FFE.	WREMO / FENZ	($$): $10,000 - $100,000 per community.	Joint agency funding (WREMO / FENZ)

At this stage, the case only identifies potential costs of implementing some of these options. It is likely that a refinement of the options will further refine these costs, leading to a reassessment of the overall economic value of any particular option.

In addition, it is unlikely that all options will be applied in all communities. Indeed, some or none of the options may be applied once more detailed consideration of each option is complete. This being the case, full quantification of costs is not yet possible.

Management Case

The Management Case identifies what governance, structures, and management and reporting will be required in order to realise the benefits identified in the case. At a high level, this Case covers off:

- Programme roles and responsibilities.
- Management strategies.
- Reporting.

Programme roles and responsibilities

The delivery of the responses set out in this Programme Business Case will be incorporated into the Group Plan, drawing on the existing roles and responsibilities. The roles and responsibilities for the ongoing programme governance, delivery and management of this Case through the Group Plan are as outlined in *Table 11* below.

Table 11: Roles and responsibilities for ongoing programme governance, delivery and management of this Case.

Role	Name	Responsibilities
Governance Group (CEG)	CEG members (including co-opted members), Programme Sponsor, Programme Manager	To hold the vision of the programme, ensure that any component projects deliver on the programme objectives, and integrate it within the Group Plan.
Programme Management Team	Programme Manager, Workstream Leads, Comms lead, Project Manager (if required)	To develop and implement the programme – to identify community risk profiles and needs, and design, shape and deliver the appropriate mixture of reduction measures and mitigations within agreed timeframes and budgets. It is anticipated that many of the activities in this programme will be incorporated into the existing Group Plan and managed by the relevant agencies. Provide Programme Status Reports to the Governance Group, with a current view of the programme status considering: • Overall Programme Health • Key Programme Metrics • Programme Progress • Roadblocks / Issues • Programme Change
Community of Interest	1-2 representatives from each agency	To develop, assist & co-ordinate activities, and share/ champion info and issues across the agencies.

Management Strategies

This section describes how the Wellington CDEM Group will manage the options identified to reduce or mitigate risk in communities in this case, including:

- Establishment of an Implementation Programme.
- Validation and characterisation of specific risks facing high-risk communities.
- Changes to the Group Plan and protocols to better manage FFE risk (Integrate agency planning to manage risk).
- Further development of reduction options that will most effectively reduce the current levels of risk each community is exposed to.
- Further development of specific mitigation options that will enable each community to be more resilient in the event of FFE.
- Further development of the risk models to better measure risk and the value of reduction and mitigation options.

The options outlined in the Economic Case are inter-related and are necessary if the benefits identified are to be achieved. The detail of all longlisted options is set out in *Appendix E.*

Establishment of an Implementation Programme

It is the Programme Manager's responsibility to develop an Implementation Programme for FFE to be agreed by the Governance Group and the relevant agencies who will be required to undertake work to implement the appropriate options. This programme should include:

- Programme vision.
- Programme structure.
- A timetable of anticipated actions (including further investigations).
- A budget for the Implementation Programme.
- Identification and assignation of workstream leads.
- Monitoring and reporting.
- How benefits will be realised and captured.

All actions set out below shall form part of the Implementation Programme.

> **Recommendation 5**
>
> That CEG approves the appointment of a FFE Programme Manager to set up and oversee an implementation programme for addressing FFE (cost and funding to be determined).

Validation and characterisation of specific risks facing high-risk communities

As a prior step to establishing which options are the most appropriate to apply to any community, the risks that each community faces must be validated, and each community should be characterised by different attributes applicable to that community. This will guide the selection of the most appropriate reduction and mitigation options to be applied.

It is the Programme Manager's responsibility to ensure that validation of risks and characterisation of communities is undertaken by the workstream lead (FENZ) in the timelines established by the Implementation Programme.

Changes to the Group Plan and protocols

This category includes the following:

- H8: Integrated plans for water management and FFE suppression post-earthquake event.
- H9: Integrated infrastructure response and recovery plans for FFE.

It is the Programme Manager's responsibility to:

- Further develop these options (developing procedures and protocols) in conjunction with the affected agencies to ensure they can be implemented.
- Update the Group Plan (scheduled to commence 2022) accordingly to ensure that these procedures and protocols are reflected in the Group Plan.

Reduction options

This category includes the following:

- H2: Improve fire management means in heritage properties.
- H3: Inform property owners of FFE risk.
- H4: Require shut off mechanisms for the gas network.
- H5: Enhance home safety visits to improve fire management in high-risk properties.
- H6: Public education campaigns.

The Programme Manager will need to develop a workstream and work with a range of agencies to identify the viability and practicality of these measures given the likely benefits. The likely workstream leads are FENZ, WCC, MBIE and WREMO.

Mitigation options

This category includes the following:

- H1: Increased water storage for firefighting purposes in all buildings.
- H7: Adapt existing Community Emergency Hubs or establish new Community Fire Centres.
- H10: Adapt the design of Wellington's existing water network to provide alternative local water sources and distribution networks.
- H11: Establish an alternative over land water reticulation capability.
- H12: Increase capability in local communities to provide support in the event of FFE.

The Programme Manager will need to develop workstreams and work with a range of agencies to identify the viability and practicality of these measures given the likely benefits. Likely workstream leads are FENZ, WREMO and WCC.

Further develop the existing GNS model for FFE risk in Wellington

It is the Programme Manager's responsibility to work with GNS to investigate further development of the model or other appropriate risk assessment mechanism. This can then be used as an input to assist with the ranking of reduction and mitigation options if possible, and to quantify the benefits anticipated as follows:

- Hazards relating to FFE can be better quantified and be presented relative to and alongside other risks that people face.

- The models applied for Wellington City are further assessed and adjusted to ensure appropriateness for the local context (e.g. ignition models developed using overseas data).
- The human element of fire risk (generally, and post-earthquake) is integrated into the risk profile.
- The model can help identify the impact / value that any option will deliver in terms of reducing the risk of ignition or spread, suppress fire or reduce risk to life. This impact could be determined quantitatively (i.e. form part of the modelling) or qualitatively (i.e. a framework could be developed which provides guidance on options drawing on social sciences). This will be particularly useful for higher cost options.

Dependency management

Dependency management strategies and registers will need to be developed to record these and ensure they will be regularly monitored and managed once the implementation programme is established.

Reporting

The Programme Manager is responsible for agreeing with the Programme Sponsor and the Governance Group in terms of reporting requirements, including frequency of Governance Group meeting and content of quarterly reports.

References

Aldrich, DP. (2012). *Building Resilience: Social Capital in Post-Disaster Recovery*. The University of Chicago Press.

Dangerfield, E. (2016, December 7). Basic infrastructure restored in Kaikōura but full recovery will be a long road. *Stuff*. https://www.stuff.co.nz/national/nz-earthquake/87052505/basic-infrastructure-restored-in-kaikoura-but-full-recovery-will-be-a-long-road

Earthquake Engineering Research Institute (EERI). (2011). *Learning from Earthquakes: The M 6.3 Christchurch, New Zealand, Earthquake of February 22, 2011* (EERI Special Earthquake Report – May 2011). https://www.eeri.org/site/images/eeri_newsletter/2011_pdf/EERI_NewZealand_EQRpt_web.pdf

Federal Emergency Management Agency (FEMA). (2018). *Natural Hazard Mitigation Saves Interim Report* (Federal Insurance and Mitigation Administration Fact Sheet).

Fire and Emergency New Zealand. (2022). *FENZ Audience Segmentation Study Results. FENZ* Audience Segmentation Study.

Fire and Emergency New Zealand. (2021). *Operational review: Structure Fire 125 Hanson Street Wellington 13 June 2021 (FENZ Operational Review #F3263295).*

Grace, E., compiler. (2018). Wellington Resilience Programme Business Case: Lifelines Outage Modelling (GNS Science consultancy report 2017/236). GNS Science.

Khorasani, N., & Garlock, MEM. (2017). Overview of fire following earthquake: historical events and community responses. *International Journal of Disaster Resilience in the Built Environment*. 8(2): 158 – 174. Doi:10.1108/IJDRBE-02-2015-0005.

Ministry of Civil Defence and Emergency Management (now National Emergency Management Agency). (2019). *National Disaster Resilience Strategy*. https://www.civildefence.govt.nz/cdem-sector/plans-and-strategies/national-disaster-resilience-strategy/

Ministry of Civil Defence & Emergency. (2015, June). *Working from the same page, consistent messages for CDEM, Part B: Hazard-specific information Earthquakes*. https://www.civildefence.govt.nz/assets/Uploads/publications/CM-01.1-earthquakes-June-2015-v2.pdf

National Emergency Management Agency. (n.d.). *Whakaari-White Island investigation – Worksafe charges*. https://www.civildefence.govt.nz/resources/news-and-events/news/whakaari-white-island-investigation-worksafe-charges/

New Zealand Government. (2018). *Delivering better responses to natural disasters and other emergencies* (Government response to the Technical Advisory Group's recommendations).

New Zealand Herald. (2011, February 22). *Christchurch quake: 65 dead*. https://www.nzherald.co.nz/nz/christchurch-quake-65-dead/MSKFSJFQRI4OS6UWEENFZPCZD4/

New Zealand Herald. (2019, September 4). *Looters hitting Christchurch following quake*. https://www.nzherald.co.nz/nz/looters-hitting-christchurch-following-quake/SIHUN5YFFVXG6X76BAAVGG4NZQ/

Owen, C., Bosomworth, K., Berman, C., Brooks, B., Fogarty, L., & G Conway. (2013). *Politics, Policies and Paradigms: Challenges of Change in Future Emergency Management*. https://www.bushfirecrc.com/sites/default/files/managed/resource/the-challenges-of-change-in-future-emergency-management-politics-policies-and-paradigms.pdf

Radio New Zealand. (2021, April 20). *Alpine Fault: Probability of damaging quake higher than previously thought*. https://www.rnz.co.nz/news/national/440834/alpine-fault-probability-of-damaging-quake-higher-than-previously-thought

Radio New Zealand. (2011, February 26). *Power out in most of Christchurch*. https://www.rnz.co.nz/news/canterbury-earthquake/69229/power-out-in-most-of-christchurch

Rhoades, Da., Van Dissen, RJ., Langridge, RM., Little, TA., Ninis, D., Smith, EGC., Robinson, R. (2011). Re-evaluation of conditional probability of rupture of the Wellington-Hutt Valley segment of the Wellington fault. *Bulletin of the New Zealand Society for Earthquake Engineering,* 44(2), 77 – 86.

Scawthorn, C., Eidinger, JM., Schiff, AJ., & editors. (2005). *Fire following earthquake* (Technical Council on Lifeline Earthquake Engineering monograph). American Society of Civil Engineers.

Scheele, FR., Lukovic, B., Moratalla, J., Dunant, A., Horspool, NA. (2020). *Modelling fire following earthquake for multiple scenarios affecting Wellington City* (GNS Science report 2020/12). GNS Science. Doi: 10.21420/H7PX-XD46.

Stats NZ. (2020, October 25). *Extreme wind*. https://www.stats.govt.nz/indicators/extreme-wind#:~:text=Wellington%20had%20the%20highest%20average,annual%20average%20of%207%20days

Stats NZ. (2020). *Housing in Aotearoa*. https://www.stats.govt.nz/assets/Uploads/Reports/Housing-in-Aotearoa-2020/Download-data/housing-in-aotearoa-2020.pdf

Stuff. (2011, February 26). *Fire risk as power restored.* http://www.stuff.co.nz/national/christchurch-earthquake/what-you-need-to-know/4707070/Fire-risk-as-power-restored

Technical Advisory Group. (2017). *Better Responses to Natural Disasters and Other Emergences.* (Report back to Minister of Civil Defence https://dpmc.govt.nz/sites/default/files/2018-01/ministerial-review-better-responses-natural-disaster-other-emergencies.pdf)

U.S. Geological Survey. (n.d.). *What should I NOT do during an earthquake?* https://www.usgs.gov/faqs/what-should-i-not-do-during-earthquake

Wellington City Council. (2021). *Heritage Places and Objects*. https://planningforgrowth.wellington.govt.nz/about/heritage-places-and-objects

Wellington Region Emergency Management Office (WREMO). (2020). *Annual Report 1 July 2019 – 30 June 2020.*

Wellington Region Emergency Management Office (WREMO). (n.d.) *Fire Following Earthquake*. https://www.wremo.nz/hazards/fire/fire-following-earthquake/

Wellington Region Emergency Management Office (WREMO). (n.d.). *What is a Community Emergency Hub?* https://www.getprepared.nz/my-community/what-is-a-community-emergency-hub/

Wellington Region Emergency Management Office (WREMO). (2020). *WREMO Community Survey Results*. Annual WREMO Community Survey.

Appendices

Appendix A: Modelling reports for FFE (GNS)

Modelling reports relating to FFE, which are part of the wider 'It's Our Fault' programme include:

- Estimating Risks from Fire Following Earthquake, Jan 2002, Cousins et al.
- Modelling the Spread of Post-earthquake Fire, 2003, Cousins et al.
- Modelling Fires Following Earthquakes in New Zealand, 2008, Thomas et al.
- Probabilistic Modelling of Post-Earthquake Fire in Wellington, New Zealand, 2012, Cousins et al.
- Modelling and Estimating Post-Earthquake Fire Spread, 2012, Thomas et al.
- Modelling fire following earthquake in Wellington: a review of globally available methodologies, 2018, Scheele, Horspool
- Revisiting Fire Following Earthquake Modelling for Wellington City, July 2019, Scheele, Horspool, Lukovic.
- Modelling fire following earthquake for multiple scenarios affecting Wellington City, July 2020, Scheele et al.

The 'It's Out Fault' programme is funded by the Earthquake Commission (EQC), Wellington City Council (WCC) and Wellington Region Emergency Management Office (WREMO). The project also has frequent input from Fire and Emergency New Zealand (FENZ), Wellington Lifelines Group (WeLG) and Wellington Water Limited (WWL).

Appendix B: Strategic alignment documents

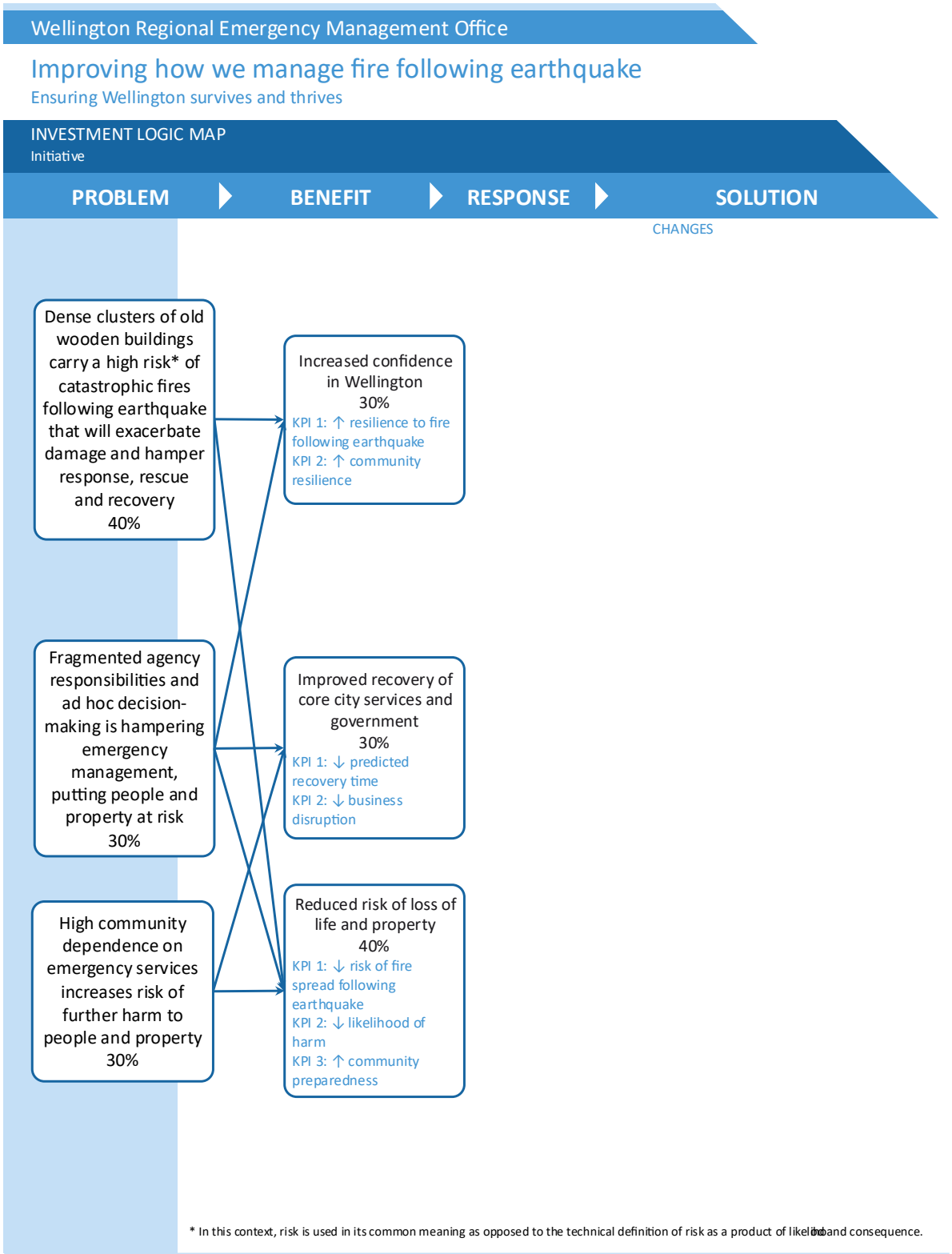
Alignment document	Relevant element(s)
United Nations international priorities	
Sustainable Development Goals (UN)	Goal 11: Sustainable cities and communities. Target 11B: By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards … resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015-2030, holistic disaster risk management at all levels.
	Goal 13: Climate Action. Target 13.1: Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.
Sendai Framework for Disaster Risk Reduction 2015 – 2030 (UN)	The purpose of this framework is to substantially reduce disaster risk (including natural hazards) and losses in lives, livelihoods and health in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries. Priorities of the Sendai Framework include; understanding disaster risk, strengthening disaster risk governance to manage disaster risk, investing in disaster risk reduction for resilience and enhancing disaster preparedness for effective response and to “Build Back Better” in recovery, rehabilitation and reconstruction.
New Zealand legislation	
Civil Defence Emergency Management Act 2002	The purpose of the Act is to: promote sustainable management of hazards, encourage and enable communities to achieve acceptable levels of risk, provide for planning and preparation for emergencies, and for response and recovery require local authorities to coordinate planning and activities and provide a basis for the integration of national and local civil defence emergency management. Encourage coordination across a wide range of agencies, recognising that emergencies are multi-agency events.
Fire and Emergency New Zealand Act 2017	The Act outlines FENZ’s principal objectives, which are to reduce the incidence of unwanted fire, and associated risks to life and property. Also, in relation to the main functions of FENZ, protect and preserve life, prevent or limit injury, prevent or limit damage to property and land, prevent or limit damage to the environment. The Act also outlines the main function of FENZ which include: promoting fire safety and providing fire prevention, response and suppression services.
Local Government Act 2002	The Act outlines the responsibilities of local government and has requirements to provide for the resilience of infrastructure assets by identifying and managing risks relating to natural hazards and by making appropriate financial provision for those risks.

Alignment document	Relevant element(s)
Resource Management Act 1991	The Act sets out matters of national importance that decision-makers must recognise and provide for in various circumstances. An explicit mandate was introduced in the 2017 Amendment including "the management of significant risks from all natural hazards" as a matter of national importance.
Building Act 2004	The Act promotes the accountability of owners, designers, builders, and building consent authorities who have responsibilities for ensuring that building work complies with the building code. There are six Building Code clauses related to protecting people in and around buildings, limiting fire spread, and helping firefighting and rescue. There are also various clauses relating to managing earthquake risk and there is a system in place for managing earthquake prone buildings.
National policy and strategies	
Living Standards Framework (The Treasury)	Natural hazard events impact all four capitals of the LSF in a profound and costly way. This impacts the inter-generational wellbeing of New Zealanders. The LSF recognises that risk management and resilience are critical for the intergenerational wellbeing of New Zealanders.
National Disaster Resilience Strategy 2019 (NEMA)	Priority 1: Managing risks: what we can do to minimise the risks we face and limit the impacts to be managed if hazards occur.
	Priority 2: Effective response to and recovery from emergencies: building our capability and capacity to manage emergencies when they do happen.
	Priority 3: Enabling, empowering, and supporting community resilience: building a culture of resilience in New Zealand so that everyone can participate in and contribute to communities' – and the nation's – resilience.
Fire and Emergency National Strategy 2019 – 2045 (FENZ)	Outcome 1: Communities prepare for, respond to and recover well from emergencies. Building resilient communities is also now a long-term strategic priority for FENZ.
	Outcome 3: Social, economic and environmental impacts from emergencies are minimised.
Fire and Emergency Risk Reduction Strategy 2019 – 2029	Priority 1: Leading the development of risk management best practice.
	Priority 3: Safer people, communities and environments.

Alignment document	Relevant element(s)
Guide to the National CDEM Plan 2015 (NEMA)	Section 2.2: Determining acceptable levels of risk, and how best to achieve this across the 4Rs, (reduction, readiness, response and recovery[4]) requires integrated and coordinated approaches to CDEM and hazard management planning. Identifying risks and the best means to manage them across the 4Rs is part of a risk management process.
LGNZ Policy Statement 2017/19 (LGNZ)	Policy Priority 2 Risk and Resilience: Understanding and addressing risks from natural hazards and other events – both for infrastructure and to support resilience in the economy and our communities.
Local policy and strategies	
Regional Policy Statement 2013 (GWRC)	Objective 19: The risks and consequences to people, communities, their businesses, property and infrastructure from natural hazards and climate change effects are reduced.
	Objective 21: Communities are more resilient to natural hazards, including the impacts of climate change, and people are better prepared for the consequences of natural hazard events.
Wellington Resilience Strategy 2017	Goal 1: People are connected, empowered and feel part of a community.
	Goal 2: Decision making at all levels is integrated and well informed.
	Goal 3: Our homes and natural and built environments are healthy and robust.
Group Plan 2019 – 24 (Wellington CDEM Group)	Goal 1 Ready: Being well informed of risks and proactively taking steps to prevent or mitigate their impacts, enabling us to be ready to respond to and recover quickly and effectively from emergencies.
	Goal 2 Capable: Working together to develop the capability and interoperability to ensure we are capable of responding effectively to emergencies and recovering quickly afterwards.
	Goal 3 Connected: Working with communities to increase connectedness, enabling communities to support each other before, during and after emergencies.
Three Waters Strategy (WWL)	Customer Outcome 1 Safe and healthy water: WWL will provide an appropriate region-wide firefighting water supply to maintain public safety. This means the design of water supply networks must have adequate water pressures and flows and sufficient water storage in case supply to networks become unavailable. WWL recognizes that the water supply networks are generally adequate for firefighting purposes. However, there are localised areas where water pressure and available flows could be improved.

[4] Definitions for each of the 4R's are included in the glossary.

Appendix C: Investment Logic Map



Investor: Jeremy Holmes
Facilitator: Sue Powell
Accredited Facilitator: Yes

Version no: 1.1
Initial Workshop: 06/11/2019
Last modified by: Sue Powell 04/08/2021
Template version: 6.0

Appendix D: Options not developed in this Case but retained for future consideration

Option title	Rationale for removal
Influence policy to reduce fuel availability (Healthy Homes): Removal of gas heating and open fires.	Gas heating and open fires are deemed to be a general fire risk as opposed to being specific to FFE. Some work has also commenced in this space. Under the new Healthy Homes Standards all private rentals must have one or more fixed heaters that can directly heat the main living room and these heaters must not be an open fire or an un-flued combustion heater, (e.g. portable LPG bottle heaters)[5].
Influence policy to reduce ignition sources (Infrastructure): Batteries / electric vehicle storage.	Batteries / electric vehicle storage are deemed to be a general fire risk as opposed to being specific to FFE. FENZ has also commenced investigations into risk. In January 2020, the FENZ National Headquarters released a report aimed to understand how lithium battery technologies contribute to fire risk and what can be done to mitigate this[6].
Influence policy to reduce ignition sources (Code of Practice): Decommission the natural gas network.	Decommissioning the natural gas network is deemed too generic and is not specific to FFE. This is supported by the fact: • The option was around developing policy that aligns to the Climate Change Commission's recommendation for the Government to determine how to eliminate fossil gas use in residential, commercial and public buildings; and • This recommendation is actually part of a wider recommendation to decarbonise the energy system and ensure the electricity sector is ready to meet future needs and makes no mention of FFE. The Ministry for the Environment (MfE) is also currently leading the Government's response to this recommendation in consultation with other relevant Government agencies (see *Key dependencies*). One alternative option that was not explored as part of this Business Case, but could be explored through future work, is whether gas could be decommissioned in high-risk areas of Wellington only.

[5] https://www.tenancy.govt.nz/healthy-homes/heating-standard/

[6] https://www.fireandemergency.nz/assets/Documents/Files/Report_174_Lithium_Batteries_Whats_the_problem.pdf

Option title	Rationale for removal
Shared platform for all emergency response agencies to use in emergency situations.	A shared platform for all emergency response agencies to use in emergency situations is deemed to cover emergency events more broadly as opposed to being specific to FFE. This option would better be justified and implemented for use across the whole emergency management system.
Develop plans for managing flare-ups and displacement.	Managing displacement is a consequence of both fire and earthquakes more generally, as opposed to being specific to FFE. The inspection of properties to assess habitability is the responsibility of CDEM and urban Search and Rescue (USAR) in the first instance and there are already plans in place for managing displacement across a number of emergency events. Develop plans to prevent flare ups is a sub-option of the *Integrated plans for water management and FFE suppression post-earthquake event* option so the two were merged.
Establish high volume hose capacity systems to create a more effective above ground FFE suppression system.	This option is a sub-option of the *Establish an alternative over land water reticulation capability* option so the two were merged.
Improve road access.	Improving road access is deemed too generic and is not specific to FFE. What remains in the longlist however is *Integrated infrastructure response and recovery plans for FFE* which is proposed to cover off plans to restore / improve road access to areas of Wellington at high risk. There is a priority route restoration plan in place for Wellington in the event of an earthquake – but at this stage it doesn't encompass FFE.
Establishing a fourth water (non-potable) for the purposes of firefighting.	Establishing a fourth water for the purposes of firefighting is deemed to cover fire more generally as opposed to being specific to FFE. This option would better be justified and implemented for use across the whole fire emergency management system.

Appendix E: Longlisted option briefs

This page is intentionally left blank.

Longlist option brief			
4R category	Readiness		
Strategic response category	1. Align policy to minimise risks		
Option title	Increased water storage for firefighting purposes in all buildings.	**Code**	H1
Description of option including how it will address FFE	Influence policy to require higher standards for water storage in buildings across Wellington. This could be achieved through an update to the code of practice for firefighting water supplies (which many Territorial Authorities adopt as part of their District Plan) so that it expressly considers FFE and requires building owners / landholders to increase their water supply.		
Timing of implementation	This option will be more appropriate to implement in the future once hazards relating to FFE can be better quantified and be presented relative to other risks that people face.		
Who will be responsible for implementation of the option	Lead: FENZ / WCC Support: NEMA / WREMO	**Frequency of action (once, periodically, annually)**	Once to update code. Installation of increased water storage will be periodic.
How will the option be funded	Baseline of agency responsible	**Indicative cost**	($$): $10,000 - $100,000 for total costs to update the code. ($$$$): > $1,000,000 for total actual infrastructure costs (total for all buildings).
Advantages	• Provides accessible on-site sources of water which is independent of the main water supply. • Provides emergency services with access to increased water supply for the purposes of firefighting more generally. • Water for firefighting does not need to be potable (so a wider range of options available).		
Disadvantages	• This water supply may be insufficient to deal with anything more than minor or initial fire outbreaks. • Costs of installing water storage. • On-going costs and maintenance costs will need to be considered.		

Longlist option brief	
Relation to Business Case benefits	1. Increased confidence in Wellington City. 2. Improved recovery of core city services and government. 3. Reduced risk of loss of life and property.
Constraints, dependencies and linkages	• This plan would need to align to or build on the existing 2019 FENZ Major Earthquake Response Plan (linkage). • Information on risk is currently generic and the model is not sufficiently sensitive to take into account means of reduction / suppression. This option would be strengthened if recommendations 1 – 3 of this Business Case are agreed and implemented as these will provide more robust information on FFE risk and enable quantification of the impact that potential changes to existing water infrastructure could have in managing FFE risk (dependency). • Requires an adequate case being built for submission to District Plan (dependency).
Risks associated with option	• May be in conflict with densification aspirations depending on the scale of water storage needed to be effective. • There is no legal obligation for Territorial Authorities to adopt this code of practice.
Notes	• The costs of implementing this option for property owners needs to be better understood (impacts the feasibility of the option).

Longlist option brief			
4R category	Reduction / Readiness		
Strategic response category	1. Align policy to minimise risks		
Option title	Improve fire management means in heritage properties.	**Code**	H2
Description of option including how it will address FFE	Influence policy to reduce fuel availability by advocating to WCC and Heritage New Zealand Pouhere Taonga for the installation of improved fire management means within heritage properties.		
Timing of implementation	This option will be more appropriate to implement in the future once hazards relating to FFE can be better quantified and be presented relative to other risks that people face.		
Who will be responsible for implementation of the option	Lead: FENZ Support: WREMO / WCC / Heritage New Zealand Pouhere Taonga	**Frequency of action (once, periodically, annually)**	Once to implement policy. Installation of improved fire management means will be periodic.
How will the option be funded	Baseline of agency responsible to implement the policy. Installation of improved fire management means will have to be funded by existing owners of heritage properties.	**Indicative cost**	($): < $10,000 for total costs to implement the policy. ($$$$): > $1,000,000 for total actual infrastructure costs (total for all buildings).
Advantages	• Many dwellings that either have heritage status, or may qualify, are in high-risk places and contribute to the risk of FFE. Protective heritage provisions limit modifications or replacement that prevents them from being replaced by buildings built to the new Building Code. A key mitigation is to seek improved fire management systems in these properties.		
Disadvantages	• Costs of installing improved fire management systems.		
Relation to Business Case benefits	1. Increased confidence in Wellington City. 3. Reduced risk of loss of life and property.		

Longlist option brief	
Constraints, dependencies and linkages	• Information on risk is currently generic. This option would be strengthened if recommendations 1 & 2 of this Business Case are agreed and implemented as these will provide more robust information on risk (dependency).
Risks associated with option	• Fire sprinkler systems may be damaged in an earthquake leading to leakage or failure.
Notes	• EQC recently submitted into the current Draft District Planning process demonstrating the potential value of this option.

Longlist option brief			
4R category	Reduction / Readiness		
Strategic response category	1. Align policy to minimise risks		
Option title	Inform property owners of FFE risk.	**Code**	H3
Description of option including how it will address FFE	Identify communities (based on similar characteristics and FFE risk profile) and build triggers that inform property owners of the risks they face in regard to FFE and how they might prevent and respond to FFE (e.g. through Land Information Memoranda, District Plan, EQC risk reduction portal or other Council communication means such as hazard models).		
Timing of implementation	This option will be more appropriate to implement in the future once hazards relating to FFE can be better quantified and be presented relative to other risks that people face.		
Who will be responsible for implementation of the option	Lead: WCC Support: GNS	**Frequency of action (once, periodically, annually)**	Periodically update information.
How will the option be funded	Baseline of agency responsible	**Indicative cost**	($): < $10,000 for total costs of option.
Advantages	• Communities are more aware of FFE risk and how they can respond. • The option may assist the decision-making processes of both Council and property owners in regard to subdivisions, building consents, district planning etc. by ensuring that the risk to people and buildings are assessed. However, this is dependent on the information being sufficiently robust.		
Disadvantages	• The information in the most recent GNS modelling of FFE risk is not yet sufficiently robust. • Ongoing requirements to maintain and updates maps and answer property owner questions.		
Relation to Business Case benefits	1. Increased confidence in Wellington City. 3. Reduced risk of loss of life and property.		
Constraints, dependencies and linkages	• Information on risk is currently generic. This option would be strengthened if recommendations 1 & 2 of this Business Case are agreed and implemented as these will provide more robust information on FFE risk (dependency).		
Risks associated with option	• Placing hazard information which is not sufficiently robust in the public arena carries litigation risks with property owners.		

Longlist option brief	
Notes	• This option may need legal review to establish a workable mechanism. Publishing the most recent GNS report may be adequate. • Further work is required to identify how best to communicate this information. • Awareness of FFE may also cause insurers to increase premiums.

Longlist option brief			
4R category	Reduction		
Strategic response category	1. Align policy to minimise risks		
Option title	Require shut off mechanisms for the gas network.	**Code**	H4
Description of option including how it will address FFE	• Influence policy to reduce FFE ignition sources via changes to the Gas regulatory framework to improve the ability to shut off the gas network. There is a shortage of automatic cut off valves in the gas network (main auto control is how much gas is piped into system from Taranaki). Manual shut off values exist but are not overly effective and are scattered throughout the network. • It is possible that this option would not need to implemented everywhere in Wellington City.		
Timing of implementation	• 5 years to implement the policy • Installation of auto-shut-off valves on the gas network could be implemented within 20 - 40 years.		
Who will be responsible for implementation of the option	Lead: MBIE / WorkSafe NZ Support: Gas network owners in Wellington (e.g. Powerco) / NEMA / FENZ.	**Frequency of action (once, periodically, annually)**	Once to implement policy. Installation of shut off mechanisms will be periodic.
How will the option be funded	Baseline of agency responsible to implement policy. Installation of shutoff valves will have to be funded either through increased customer payments, (if acceptable through Commerce Commission frameworks) or by the existing owners of the gas network.	**Indicative cost**	($$): $10,000 - $100,000 for total costs to implement the policy. ($$$$): > $1,000,000 for total actual infrastructure costs (total for all buildings).
Advantages	• Installation of shut-off valves on the gas network would minimise the quantity of gas that is discharged in the event of rupture, and the length of time taken to vent remnant gases.		
Disadvantages	• Installation of shut off valves in the gas network is costly and even more costly if it's automated.		

Longlist option brief	
	• Automation (i.e. remote opening and closing of valves) would require telecommunications connectivity, which would be unlikely to be available following a major earthquake. • Some gas would always remain beyond shut-off valves, meaning that there will 'always' be some gas fuel available for fires while reticulated gas networks exist. • Enabling the gas network to be shut off in an emergency event may compromise energy supply (for example to Wellington Hospital) at a time when maintaining its operation would be critical.
Relation to Business Case benefits	1. Increased confidence in Wellington City. 3. Reduced risk of loss of life and property.
Constraints, dependencies and linkages	• This option needs to align and work with existing WorkSafe gas safety regulation programmes and the existing gas safety standards contained in the Gas Act 1992 and the Gas Safety and Measurement Regulations 2010 (linkage). • Information on risk is currently generic and the model is not sufficiently sensitive to take into account means of reduction / suppression. This option would be strengthened if recommendations 1 – 3 of this Business Case are agreed and implemented as these will provide more robust information on FFE risk and enable quantification of the impact that potential shut off mechanisms could have in managing FFE risk (dependency). • Powerco (gas network owner) has an ongoing work programme to segment their gas reticulation network to manage network resilience e.g. better enabling them to manually reduce supply or shutdown parts of the network that may be impacted in a major event (dependency).
Risks associated with option	• Not all of the gas network can be isolated, so not all risk can be mitigated. • For valves that are controlled remotely via a telecommunications network, the functioning of telecommunications would be required (unlikely following a major earthquake).
Notes	• WorkSafe have advised that when developing this option, it would be useful to: o Assess whether the existing safety requirements are sufficient enough to manage the risk of FFE to see where the gaps are. o Consult the Commerce Commission as they have a role in overseeing revenue of, and investment in, monopoly networks (including gas networks). This includes how the assets are managed from an economic perspective. • WeLG is not an implementing agency, or responsible for any operational matters but can provide contacts to conversations and point at previous reports to support this option.

Longlist option brief			
4R category	Reduction / Readiness		
Strategic response category	3. Enable community preparedness		
Option title	Enhance home safety visits to improve fire management in high-risk properties.	**Code**	H5
Description of option including how it will address FFE	• Enhance existing home fire safety visits (targeted at high-risk areas) to: o Ensure presence of working smoke alarms (early detection means) and provide smoke alarms to occupants if necessary. o Assess and recommend whether it is necessary for households to have improved fire management tools (e.g. fire blankets, extinguishing mediums, deluge systems). o Educate households on how to safely extinguish small fires with the right tools. o Raise household awareness around where property services are (i.e. water, gas, electricity) and how to shut these off. o Educate households on creating household escape plans.		
Timing of implementation	• Updates to verbal messaging that are part of Home Fire Safety Visits would take 3 – 6 months. • FENZ NHQ also periodically updates the national Home Fire Safety Visit programme so updates to collateral could be built into future updates. There are no planned updates at the time of drafting this Business Case.		
Who will be responsible for implementation of the option	Lead: FENZ Support: External fire safety / training company.	**Frequency of action (once, periodically, annually)**	Periodically
How will the option be funded	Baseline of agency responsible	**Indicative cost**	($): < $10,000 per community (see notes). Costs of fire management tools (excluding smoke alarms) are borne by households.
Advantages	• Households have increased knowledge of fire management means and would become more prepared to manage fires in their own or surrounding households (when emergency services are unavailable). This can lead to: o A reduction in the response workload / requirements on emergency services in event of a natural disaster or emergency		

Longlist option brief	
	○ Households having an increased awareness of property services saving time and property damage during response • Home Fire Safety visits are already part of FENZ's BAU work programme so FENZ has trained staff who can undertake home fire safety visits. • Improved fire management means would mean communities could extinguish any small fire prior to developing into a full exposure fire. • A deluge system would reduce the likelihood of fire spreading between neighbouring properties. • Relatively low cost of option
Disadvantages	• Deluge systems costs for households are unknown.
Relation to Business Case benefits	1. Increased confidence in Wellington City. 3. Reduced risk of loss of life and property.
Constraints, dependencies and linkages	• Adjustments may need to be made to FENZ NHQ communications to support this option (dependency).
Risks associated with option	• Fire sprinkler systems may be damaged in an earthquake leading to leakage or failure.
Notes	• There are certain thresholds in apartment buildings which require suppression systems to be installed. Retrofits of existing buildings (e.g. conversions to apartments from existing residential use can be difficult. • Costs and feasibility of installing home fire sprinklers is unrealistic so option has been focused on other fire management means other than as a last resort. • Note costs are per community – the number of communities that this option is implemented in will be determined once communities have been characterised.

Longlist option brief			
4R category	Reduction / Readiness		
Strategic response category	2. Integrate agency planning to minimise risks 3. Enable community preparedness.		
Option title	Public education campaigns.	**Code**	H6
Description of option including how it will address FFE	• Target communities with integrated public education campaigns which could either involve: 1. Adding information into existing Fire Safety talks in the community, existing public events or social media material, to raise community awareness of FFE and inform people what the risks are and what they can do in the event of FFE (FENZ). WREMO could also add questions regarding FFE into the annual preparedness survey. 2. Collaborating with other emergency response agencies to raise community awareness around the risks of FFE, what emergency agencies can and can't do in the event of FFE, and how communities can prevent or respond to FFE on their own. This could include holding specific community / public events, raising awareness through existing Neighbourhood Support groups or letter drops. The first step in preparing our communities is to make them aware of the potential problems with FFE.		
Timing of implementation	1. Updating FENZ and WREMO's current educational material would take 1 – 3 months. 2. 3 years to develop new targeted community initiatives.		
Who will be responsible for implementation of the option	Lead: FENZ / WREMO	**Frequency of action (once, periodically, annually)**	Periodically
How will the option be funded	Joint agency funding	**Indicative cost**	1. ($): < $10,000 per community (see notes). ($3,000 for joint materials per community) 2. ($$): $10,000 - $100,000 per community (see notes). (Joint campaigns could cost $30K - $40k per community. Once developed costs would reduce to $5k)

Longlist option brief	
Advantages	• Communities are more aware of FFE risk and how they can respond. • Relatively low-cost option. • Educational material already exists so this would be a matter of customising or updating materials.
Disadvantages	• Overloading the specific audience with too many key messages, particularly as more agencies get involved in the community resilience game. Some community members may feel overwhelmed by awareness of another hazard – particularly after COVID when resilience levels are low. • May lead certain communities to express concern and exert pressure for more interventions to reduce FFE risk. • May not necessarily enable communities to better respond to FFE events.
Relation to Business Case benefits	1. Increased confidence in Wellington. 3. Reduced risk of loss of life and property.
Constraints, dependencies and linkages	• Requires access to FENZ and WREMO staff and funding which are already constrained (constraint). • Education campaigns need to be aligned (i.e. mutually supporting) and preferably integrated (dependency). • Adjustments may need to be made to FENZ NHQ communications to support this option (dependency).
Risks associated with option	• Because WREMO only has limited staff and a small budget, and a requirement to cover multiple hazards, FFE may be competing with other hazard awareness and mitigation campaigns.
Notes	• Awareness of FFE may also cause insurers to increase premiums. • Note costs are per community – the number of communities that this option is implemented in will be determined once communities have been characterised.

Longlist option brief			
4R category	Readiness / Response		
Strategic response category	3. Enable community preparedness		
Option title	Adapt existing Community Emergency Hubs or establish new Community Fire Centres.	**Code**	H7
Description of option including how it will address FFE	• Adapt existing Community Emergency Hubs or establish new Community Fire Centres where the community can go to help each other in a major emergency. This could include: 1. Adapting existing Community Emergency Hubs by: ○ Updating existing Community Hub Guides to include information about FFE risk and how communities can respond to FFE events. Plans would be specific to each Hub area. ○ Make basic firefighting means available to communities either in Hubs or other means such as advertising bollards which is an idea currently being explored by WREMO. 2. Establishing new Community Fire Centres: ○ These could be a garden shed, to provide equipment for formal Community Response Teams and community members. An ownership model would need to be adopted to ensure clear distinction between what equipment and responsibility lies with the trained Community Response Teams and general community members.		
Timing of implementation	1. 6 – 12 months 2. 5 years		
Who will be responsible for implementation of the option	Lead: 1. WREMO 2. FENZ	**Frequency of action (once, periodically, annually)**	Periodically
How will the option be funded	Joint agency funding	**Indicative cost**	1. ($$): $10,000 - $100,000 per community if adapting existing Hubs (see notes). 2. Costs to establish new Community Fire Centres to be scoped.
Advantages	• Increased resilience in communities to manage the risks of FFE when emergency response agencies may be unable to reach some communities following a major earthquake.		

Longlist option brief	
	• Does not require a formal volunteer structure or system but enables community groups to form part of the response in supportive roles.
Disadvantages	• Equipment may not be cared for and/or returned. • If there is no formal ownership structure to community groups, this may create confusion / disagreement in FFE response.
Relation to Business Case benefits	1. Increased confidence in Wellington City. 2. Improved recovery of core city services and government. 3. Reduced risk of loss of life and property.
Constraints, dependencies and linkages	• This option would be strengthened if the options *Adapt the design of Wellington's existing water network to provide alternative local water sources and distribution networks* and *Establish an alternative over land water reticulation capability* are also implemented. This is because these solutions seek to create alternative fire suppression means to enable communities to better manage FFE events (dependency). • This option would also be strengthened if the option *Increase capability in local communities to provide support in the event of FFE* was also implemented (dependency). • Financial implications for the initial set up and on-going financial commitments (constraint).
Risks associated with option	• Risks to the public and services if people take action without proper training. This risk can be mitigated however if Hubs / Centres have an effective ownership model in place with clear health and safety guidelines. • Lack of leadership in community groups leading to ineffective response and actions.
Notes	• WREMO have advised that when developing this option, it would be useful to: o Further develop the intended purpose of the existing Community Emergency Hubs or new Community Fire Centres. o Understand how these facilities interact with the existing official and unofficial emergency management ecosystem. o Understand what community members (who are not formally trained) will be expected to do in an emergency event (i.e. is it a human bucket brigade or something more complex). • 38 Community Emergency Hubs already exist in Wellington (although some areas don't have one). • There are 2 registered Community Response teams in the Wellington City area, so trained capability already exists in some communities. • Note costs are per community – the number of communities that this option is implemented in will be determined once communities have been characterised.

Longlist option brief			
4R category	Readiness / Response		
Strategic response category	2. Integrate agency planning to manage risks		
Option title	Integrated plans for water management and FFE suppression post-earthquake event.	**Code**	H8

Description of option including how it will address FFE	• Develop an integrated plan which covers:
	  ○ The water management decisions need to be made in the event of FFE (i.e. who authorises the release of shut of water and when) and what the implications of those decisions might be.
	  ○ FFE suppression to enhance situational awareness (including establishing effective information flow channels) and ensure emergency response agency resources are deployed in a timely and appropriate manner to address FFE. This would involve identifying key roles from each agency who are required after an earthquake event to look at FFE and could be as simple as a review of existing FENZ Station Emergency Plans and WREMO response plans to integrate them as one plan.
	• An integrated plan of this nature doesn't currently exist (although FENZ do have their own 2019 FENZ Major Earthquake Response Plan and each station has their own independent Station Emergency Plans relevant to each station location and associated risks).		

Timing of implementation	6 – 12 months of workshops and collaborative working groups.		
Who will be responsible for implementation of the option	Lead: WCC as the owner of the water infrastructure. Support: FENZ as the customer / WWL as the designer of the network.	**Frequency of action (once, periodically, annually)**	Once then update on a similar dynamic to other plans i.e. update every 3 - 5 years in line with the councils' long term planning processes.
How will the option be funded	Joint agency funding (WCC and FENZ)	**Indicative cost**	($$): $10,000 - $100,000 for total costs to develop the plans. ($100k for consultancy cost for 12 months to develop and complete the plan).

Longlist option brief	
Advantages	• These changes will help establish clear plans to be in place to help resolve tension between emergency response agencies post-earthquake event. Having a plan that outlines agency mandate and overall decision-making authority is critical to this. • Will improve situational awareness which is key for emergency response agencies to deploy resources to the most appropriate communities in the event of FFE.
Disadvantages	• Competing demands for the same water (particularly drinking versus firefighting).
Relation to Business Case benefits	1. Increased confidence in Wellington City. 2. Improved recovery of core city services and government. 3. Reduced risk of loss of life and property.
Constraints, dependencies and linkages	• Currently FENZ and WREMO have an understanding for FENZ to respond to an executive officer or ECC when obtaining situational awareness and priority responses (linkage). • Establishing effective information flows is key to this option to ensure situational awareness can be achieved (dependency). • The Three Waters Reform Programme and Local Government Reform may change the lead agency responsible for implementing this option (dependency). • This plan would need to align to or build on the existing plans including (linkages): o 2019 FENZ Major Earthquake Response Plan o FENZ Station Emergency Plans for stations in Wellington City o 2018 NEMA Wellington Earthquake National Initial Response Plan o 2018 Wellington Region Earthquake Plan o 2019 – 2024 Wellington Region CDEM Group Plan o WWL's existing response plan for the 8 – 30-day period following an earthquake. • This option would be strengthened if the options *Adapt the design of Wellington's existing water network to provide alternative local water sources and distribution networks* and *Establish an alternative over land water reticulation capability* are also implemented. This is because these options seek to create alternative fire suppression means to enable communities to manage FFE events (dependency).
Risks associated with option	• Establishing a plan or approach may mean water can be made available, but this may have limited effectiveness if firefighting resources cannot reach or attend any particular incident. • Competing needs for water following an emergency event may make it difficult to create an integrated plan between agencies involved. • If the ownership of water infrastructure changes under the current Three Waters Reform Programme, or Local Government Reform this will become the issue of a much larger entity. This may result

Longlist option brief	
	in the solution being deprioritised or delayed because of competing and more immediate issues which the new entity will have to manage.
Notes	• Only integrated plan for FFE suppression that currently exists is for the use of a helicopter to address FFE (2018 Wellington Earthquake National Initial Response Plan). • Wellington Water will be involved in these plans so long as they relate to existing infrastructure and so long as they don't change WWL's 80-30-80 strategy, where 80% of customers get 80% of their needs within 30 days. This strategy says that for the first 7 days people are self-sufficient and in the 8–30-day period WWL are restoring the network and providing limited water to people (20 l/hd/day) through micro plants, water held back in reservoirs and bladders located in the network for people to walk to. • Decisions will have to be made (as part of this plan) as to how any water supply system that remains intact following a major earthquake is used for human consumption and for firefighting. • Per current guidelines a CDEM controller has the overall responsibility to release water for firefighting purposes in an emergency event. However, there are also a number of other organisations who need to be consulted. Taumata Arowai (the new water services regulator) have the power to declare a water emergency regarding drinking water and FENZ have the power to declare a water emergency for firefighting. Therefore, any decision that the Controller makes will have to be informed by a discussion with the EMS agencies regarding the event issues and requirements. • WeLG is not an implementing agency, or responsible for any operational matters but can provide contacts to conversations and point at previous reports to support this option.

Longlist option brief			
4R category	Readiness / Response / Recovery		
Strategic response category	2. Integrate agency planning to manage risks		
Option title	Integrated infrastructure response and recovery plans for FFE.	**Code**	H9
Description of option including how it will address FFE	• Develop a new integrated plan (or adapt existing plans) for infrastructure response and recovery following an earthquake to better account for FFE. • Plans to restore lifeline utility services and improve the resilience of these services are an important component of this option (i.e. identifying priority roading routes that relate to FFE risk and having plans in place to restore access to better enable emergency response).		
Timing of implementation	12 months		
Who will be responsible for implementation of the option	Lead: Wellington CDEM Group Support: WCC / FENZ / Waka Kotahi / Powerco (gas) / First Gas / Nova Energy / Wellington Electricity / WREMO / WWL	**Frequency of action (once, periodically, annually)**	Once then update on a similar dynamic to other plans i.e. update every 3 - 5 years in line with the councils' long term planning processes.
How will the option be funded	Joint agency funding Each element of the infrastructure response plan will be funded by the agency responsible for the infrastructure (i.e. Wellington Electricity for the electrical network).	**Indicative cost**	($$): $10,000 - $100,000 for total costs to develop the plans. ($100k for consultancy cost for 12 months to develop and complete the plan).
Advantages	• Ability for communities to recover following a major earthquake will be improved. • These changes will help establish clear plans to be in place to help resolve tension between emergency response agencies post-earthquake event. Having a plan that outlines agency mandate and overall decision-making authority is critical to this. • The existing topography of the region means that total mitigation will not be possible for this item, however, key vulnerabilities may be mitigated, making it possible for FENZ response crews to be		

Longlist option brief	
	able to at least drive between suburbs to respond, even if not to all residential streets.
Disadvantages	• It will be possible to mitigate key road vulnerabilities, but not all road vulnerabilities in the Wellington City area. Therefore, this can only be a partially successful strategy. • Even following mitigations, access cannot be guaranteed to all areas, due to the potential for trees, power lines, and parts of buildings to fall on, and block, road access. Further, some parts of the road network will 'always' be vulnerable to landslip or liquefaction, due to the topography of the region. • May be difficult to get all agencies to sign up to a plan, when there are so many unknowns (may prevent agencies committing). • Competing demands for the infrastructure response.
Relation to Business Case benefits	1. Increased confidence in Wellington City. 2. Improved recovery of core city services and government. 3. Reduced risk of loss of life and property.

Constraints, dependencies and linkages	• This plan would need to align to existing plans including (linkages):
	  ○ 2019 FENZ Major Earthquake Response Plan
	  ○ 2018 NEMA Wellington Earthquake National Initial Response Plan
	  ○ 2018 Wellington Region Earthquake Plan
	  ○ 2019 – 2024 Wellington Region CDEM Group Plan
	  ○ Existing response and recovery plans for lifeline utility providers (e.g. Wellington Electricity's line restoration plans)
	• There is also a priority route restoration plan in place for Wellington, but this is limited to main thoroughfares (opportunity to extend this to other local routes) (dependency).

Risks associated with option	• Plethora of plans relating to infrastructure response adds to complexity of incident management. • Competing needs for different lifeline utilities following an emergency event may make it difficult to create an integrated plan between agencies involved.
Notes	• https://wellington.govt.nz/have-your-say/public-inputs/consultations/closed/priority-buildings • WeLG is not an implementing agency, or responsible for any operational matters but can provide contacts to conversations and point at previous reports to support this option.

Longlist option brief			
4R category	Readiness / Response		
Strategic response category	4. Improve water access and distribution after an earthquake		
Option title	Adapt the design of Wellington's existing water network to provide alternative local water sources and distribution networks.	**Code**	H10

Description of option including how it will address FFE	• Change the design of existing water infrastructure / network to provide alternative local water sources and distribution networks that can be used to manage FFE throughout Wellington.
	• To identify what changes can be made, a review (e.g. a Business Case) of potential solutions should be undertaken to identify a preferred solution. This review should address costs, practicality of installation operational costs and operational responsibilities.
	• Examples of solutions include:
	  ○ Underground water bladders to be fed by storm water pipes.
	  ○ Street-level localised storage and fire hydrants drawing from localised storage.		

Timing of implementation	• 2 years to undertake analysis of options. • 2 - 3 years to implement if funding was approved.		
Who will be responsible for implementation of the option	Lead: WCC as the owner of the water infrastructure. Support: FENZ as the customer / WWL as the designer of the network.	**Frequency of action (once, periodically, annually)**	Once to develop the Business Case.
How will the option be funded	Joint agency funding to develop the Business Case and a Budget bid for infrastructure investment.	**Indicative cost**	($$$): $100,000 - $1,000,000 to develop the Business Case ($300K to develop Business Case). ($$$$): > $1,000,000 for total actual infrastructure costs.
Advantages	• Provides emergency services with access to increased water supply for the purposes of firefighting more generally. • Water for firefighting does not need to be potable (so a wider range of options available).		

Longlist option brief	
Disadvantages	• May only be feasible to implement in communities which have limited options to manage FFE due to cost of adapting existing infrastructure. • Changes to existing infrastructure would require capability and capacity to maintain a water source that may not otherwise be used for anything other than FFE – (although can likely support firefighting more generally). • The initial cost of installing such systems would be very high. • On-going costs and maintenance costs will need to be considered. • On-going maintenance and testing will be required.
Relation to Business Case benefits	1. Increased confidence in Wellington City. 2. Improved recovery of core city services and government. 3. Reduced risk of loss of life and property.

Constraints, dependencies and linkages	• The Three Waters Reform Programme and Local Government Reform may change the lead agency responsible for implementing this option (dependency).
	• This plan would need to align to existing plans including (linkages):
	  ○ FENZ Major Earthquake Response Plan.
	  ○ WWL's existing response plan for the 8 – 30-day period following an earthquake.
	• Information on risk is currently generic and the model is not sufficiently sensitive to take into account means of reduction / suppression. This option would be strengthened if recommendations 1 – 3 of this Business Case are agreed and implemented as these will provide more robust information on FFE risk and enable quantification of the impact that potential changes to existing water infrastructure could have in managing FFE risk (dependency).

Risks associated with option	• Competing infrastructure needs in an emergency. • If the ownership of water infrastructure changes under the current Three Waters Reform Programme, this will become the issue of a much larger entity. This may result in the solution being deprioritised or delayed because of competing and more immediate issues which the new entity will have to manage.
Notes	• Wellington Water will be involved in these plans so long as they relate to existing infrastructure and so long as they don't change WWL's 80-30-80 strategy, where 80% of customers get 80% of their needs within 30 days. This strategy says that for the first 7 days people are self-sufficient and in the 8–30-day period WWL are restoring the network and providing limited water to people (20 l/hd/day) through micro plants, water held back in reservoirs and bladders located in the network for people to walk to. • Decisions will have to be made (as part of this solution) as to how any water supply system that remains intact following a major earthquake is used for human consumption and for firefighting.

Fire Following Earthquake in Wellington City Programme Business Case

Longlist option brief	
	• WeLG is not an implementing agency, or responsible for any operational matters but can provide contacts to conversations and point at previous reports to support this option.

Longlist option brief			
4R category	Readiness / Response		
Strategic response category	4. Improve water access and distribution after an earthquake		
Option title	Establish an alternative over land water reticulation capability.	**Code**	H11

Description of option including how it will address FFE	• Establish a new alternative water reticulation capability to create a more effective above ground FFE suppression system. This includes establishing new supply / storage of water, increasing capacity to pump water and/or increasing capacity to distribute water (source to pump).
	• To identify what high volume hose capacity systems are required, a review (e.g. a Business Case) of potential solutions should be undertaken to identify a preferred solution. This review should address costs, practicality of installation operational costs and operational responsibilities.
	• Examples of solutions include:
	  ○ Creating a high-volume hose capacity system that could draw on the Wellington harbour as a water supply for firefighting purposes. This would require the supply of a number of high-volume pumps strategically located throughout the Wellington city and a large number of high diameter minimal friction hoses that would supply community reservoirs where firefighting teams were able to gain access to extinguish a fire.
	  ○ Creating several smaller pump systems distributed around high-risk areas.
	  ○ Developing new water reservoirs to increase firefighting capacity.		

Timing of implementation	• 2 years to undertake analysis of options. • 2 - 3 years to implement if funding was approved.		
Who will be responsible for implementation of the option	Lead: FENZ Support: WCC / WWL / NEMA / WREMO	**Frequency of action (once, periodically, annually)**	Once to develop the Business Case.
How will the option be funded	Joint agency funding to develop the Business Case and a Budget bid for infrastructure investment.	**Indicative cost**	($$$): $100,000 - $1,000,000 to develop the Business Case ($300K to develop Business Case). ($$$$): > $1,000,000 For actual infrastructure costs.

Longlist option brief	
Advantages	• In the event of a major earthquake emergency services and the community in some localities would potentially have access to an unlimited supply of water for firefighting purposes. • Provides accessible on-site sources of water which is independent of the main water supply. • Provides emergency services with access to improved fire suppression systems for the purposes of firefighting more generally. • Water for firefighting does not need to be potable (so a wider range of options available). • Pumping systems could be used to manage other natural hazards (i.e. flooding).
Disadvantages	• New infrastructure would require capability and capacity to maintain a water source that may not otherwise be used for anything other than FFE – (although can likely support firefighting more generally). • The initial cost of installing such systems would be very high. • On-going costs and maintenance costs will need to be considered. • On-going maintenance and testing will be required.
Relation to Business Case benefits	1. Increased confidence in Wellington City. 2. Improved recovery of core city services and government. 3. Reduced risk of loss of life and property.
Constraints, dependencies and linkages	• This plan would need to align to or build on the existing 2019 FENZ Major Earthquake Response Plan (linkage). • Information on risk is currently generic and the model is not sufficiently sensitive to take into account means of reduction / suppression. This option would be strengthened if recommendations 1 – 3 of this Business Case are agreed and implemented as these will provide more robust information on FFE risk and enable quantification of the impact that potential new water infrastructure solutions could have in managing FFE risk (dependency).
Risks associated with option	• N/A
Notes	• Decisions will have to be made (as part of this solution) as to how any water supply system that remains intact following a major earthquake is used for human consumption and for firefighting.

Longlist option brief			
4R category	Readiness / Response / Recovery		
Strategic response category	3. Enable community preparedness		
Option title	Increase capability in local communities to provide support in the event of FFE.	**Code**	H12
Description of option including how it will address FFE	• Develop existing or build new capability in local communities to provide support in the event of FFE. This could include: o Collaborating with other emergency response agencies to run community training sessions. o Developing training programmes which could then be self-organised at Community Emergency Hubs to upskill community members. Training could be run by existing Community Response teams. o Growing formal capability in existing Community Response Teams (i.e. having specialist FFE advisors in community groups). These are groups of people who volunteer their time in emergencies to help when the emergency services are overwhelmed. o Upskilling the community to deliver administrative, logistics and equipment, welfare, communications, and recovery support (including first aid) in the event of FFE.		
Timing of implementation	3 – 5 years to develop community programmes.		
Who will be responsible for implementation of the option	Lead: WREMO / FENZ	**Frequency of action (once, periodically, annually)**	Periodically
How will the option be funded	Joint agency funding	**Indicative cost**	($$): $10,000 - $100,000 per community (see notes) ($50,000 per community)
Advantages	• Increased resilience in communities to manage the risks of FFE when emergency response agencies may be unable to reach some communities following a major earthquake. • Does not require a formal volunteer structure or system but enables community groups to form part of the response in supportive roles. • Having trained community responders will provide an ownership model and generate greater engagement from the public.		

Longlist option brief	
	• Having more Community Response Teams will provide an immediate, trained response to any emergency caused by FFE. • Community Response teams are often funded by other organisations (e.g. Victoria University) which spreads the cost of this option. • The complexity and degree of training required is likely scalable across different communities, dependent on their needs. Some communities may only require guidance on how they can apply their existing skillsets to respond to an FFE event, whereas other less prepared groups may require more training.
Disadvantages	• Maintaining the skill and training will be an ongoing responsibility as communities change and people move on. • If there is no formal ownership structure to community groups, this may create confusion / disagreement in FFE response.
Relation to Business Case benefits	1. Increased confidence in Wellington City. 2. Improved recovery of core city services and government. 3. Reduced risk of loss of life and property.
Constraints, dependencies and linkages	• Requires access to FENZ and WREMO staff and funding which are already constrained (constraint). • Finding the volunteers and maintaining the skills set in Community Response Teams (constraint). • Reliance on congoing training/exercises for Community Response Teams (constraint). • This option would be strengthened if the option *Adapt existing Community Emergency Hubs or establish new Community Fire Centres* was also implemented (dependency). • This option would also be strengthened if the options *Adapt the design of Wellington's existing water network to provide alternative local water sources and distribution networks* and *Establish an alternative over land water reticulation capability* are also implemented. This is because these solutions seek to create alternative fire suppression means to enable communities to manage FFE events (dependency).
Risks associated with option	• Because WREMO only has limited staff and a small budget, and a requirement to cover multiple hazards, FFE may be competing with other hazard awareness and mitigation campaigns. • Risks to the public and services if people take action without proper training. This risk can be mitigated however if Hubs / Centres have an effective ownership model in place with clear health and safety guidelines. • Lack of leadership in community groups leading to ineffective response and actions. • Attracting people in the first instance will also be a challenge.
Notes	• WREMO have advised that when developing this option it would be useful to:

Longlist option brief	
	○ Further develop the intended purpose of the training programmes. ○ Understand how these training programmes interact with the existing official and unofficial emergency management ecosystem. ○ Understand what community members (who are not formally trained) will be expected to do in an emergency event (i.e. is it a human bucket brigade or something more complex). • There are 2 registered Community Response teams in the Wellington City area, so capability already exists in some communities. • Note costs are per community – the number of communities that this option is implemented in will be determined once communities have been characterised.

Appendix F: Current management of likelihood and consequence (the Base case)

Wellington CDEM Group

The Wellington CDEM Group has developed new plans to better coordinate emergency response across all response agencies. For example, in the Group Plan, there are improvements identified around better integrating lifeline utility agencies into Emergency Operation Centres (EOC) and Emergency Coordination Centre (ECC) processes.

WREMO

WREMO has released guidance on their website about FFE and provided tips on how to stay safe and help prevent FFE (before and after an event). WREMO has also developed the WREMO Earthquake Guide.

FENZ

FENZ has released guidance on its website on keeping your home fire safe, including checklists for reviewing fire safety, tips for creating an escape plan, things to look for both inside and outside the home, and information on smoke alarms and other fire safety devices. FENZ also undertakes general public messaging and home safety fire visits for general fire risk (these do not currently address FFE).

FENZ has also assumed responsibility for influencing removal and management of high-risk vegetation on urban, rural fringes, which goes towards reducing the fuel availability for FFE.

With regard to emergency response, FENZ has developed the 2019 Major Earthquake Response Plan, which provides a strategy for firefighting water supplies in the event of a major emergency within Wellington CBD, where the reticulated water supply has been compromised. FENZ also has a supply of firefighting foam in Wellington City. Each FENZ station also has a Station Emergency Plan. However these don't currently account for FFE.

GNS

GNS has ongoing work programmes to further refine the FFE modelling for Wellington. These are focused around integrating improved building and population data.

NEMA

With regard to emergency response NEMA has the 2018 Wellington Earthquake National Initial Response Plan (WENIRP) which does consider FFE, but in a limited capacity.

NEMA has also established the Regulatory Framework Review ("Trifecta") Programme, which seeks to improve the national emergency management system by (amongst other things):

- Improving the clarity of roles and responsibilities across the emergency management system;
- Maximising the opportunity of legislative and regulatory change to update and improve the CDEM Act and National CDEM Plan Order, so they are fit for purpose;

- Providing advice on regulatory, legislative and policy options to ensure that the emergency management system is responsive, inclusive and effective and recognises the role of Māori as Treaty partners; and
- Improving locally led emergency management, including by continuing to implement the Government's response to the Technical Advisory Group.

Wellington Lifelines Group (WeLG)

All utilities have renewal programmes that apply through their entire networks, to progressively renew old infrastructure. For example, the gas network has been progressively renewed over time so that the majority of it is either steel (strong material) or HDPE (plastic), which is fairly strong and flexible.

Lifeline providers also have various response plans in the event of a major emergency (i.e. Wellington Electricity has a response plan in place to check, inspect and reconnect power to the network following an earthquake).

Wellington Water Ltd (WWL)

WWL is currently constructing the 35 million litre Omāroro Reservoir which will more than double Wellington City's current water storage, making the water supply more resilient to disaster and disruption. However, the shut off of water for drinking purposes is still expected to be an issue.

Ministry of Business, Innovation and Employment (MBIE)

MBIE has recently implemented various changes to the compliance documents that accompany the Building Code, which contribute to improving fire safety for new buildings. These changes include higher standards for:

- Acceptable materials;
- Fire cell design; and
- Fire safety in buildings.

Over time as the existing legacy housing stock in Wellington is altered (to a certain level) or replaced with new buildings, the risk of FFE should reduce, due to these higher standards. The new requirements will apply to altered buildings on a nearly as is reasonably practicable basis, depending on the size of building alterations.

Introduction of the new Healthy Homes standards are also reducing the risk of FFE for rental properties.

Ministry of Housing and Urban Development (MHUD)

The National Policy Statement for Urban Development (NPS-UD) is set to require increased densification of buildings in cities, which contributes to reducing the risk of FFE. This is because densification promotes construction of new buildings which will have to comply with the new building compliance standards (and new fire safety standards).

The Government has paired this with the new Medium Density Residential Standards (MDRS), which must be incorporated into District Plans. The standards would permit 3 dwellings of up to 3 storeys in many areas of Wellington City without any need for resource consent from August 2022.

Wellington City Council (WCC)

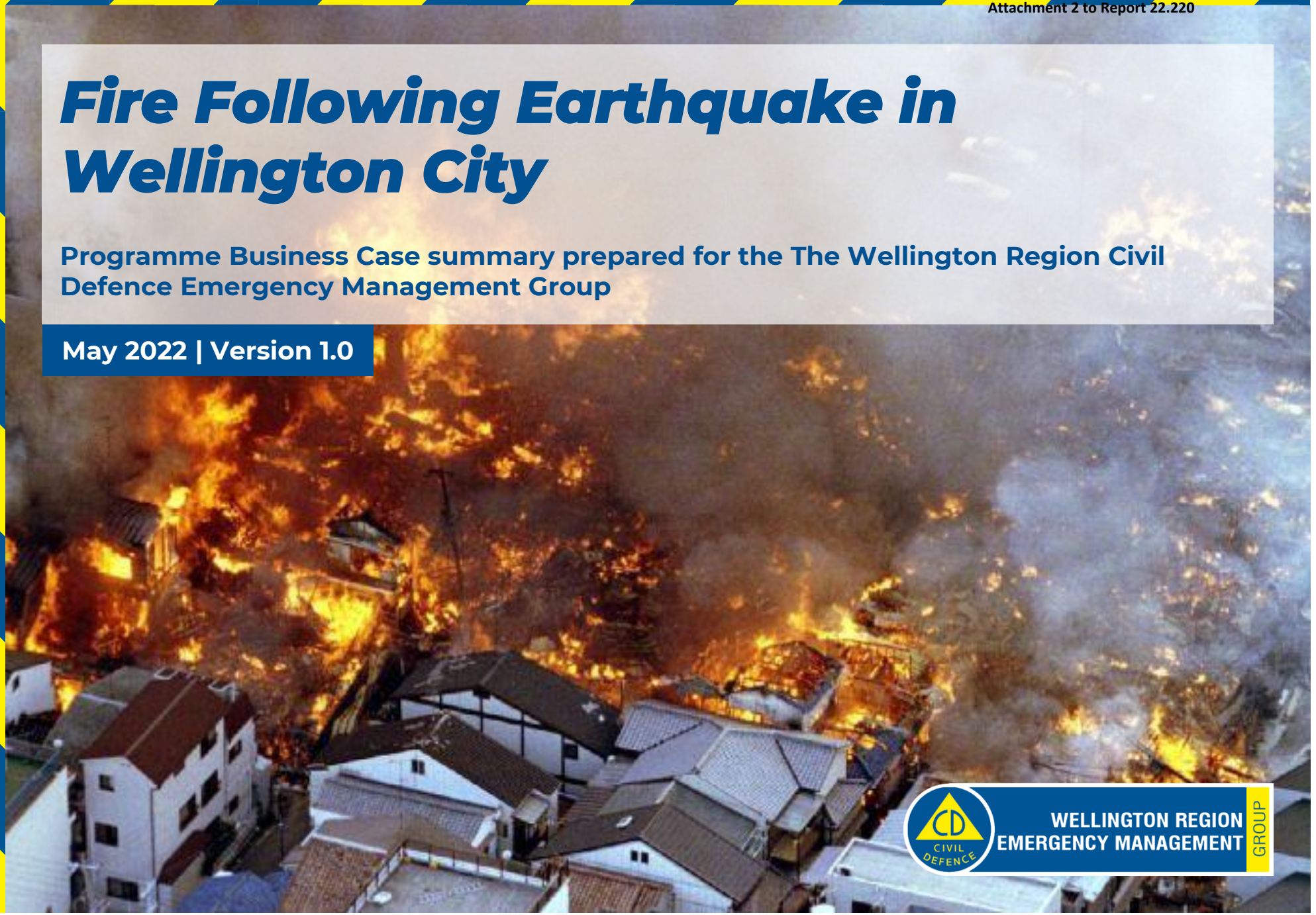
WCC has various restrictions in place to ensure no hazardous substances are stored in high-risk areas for FFE. The Council also has various ongoing vegetation management programmes (i.e. gorse and pine removal) throughout Wellington City which goes towards reducing fuel availability for FFE, particularly in high-risk areas. WCC is also planning for increased densification in the review of the District Plan which, as mentioned above, will contribute to reducing the risk of FFE.

WCC has been working to strengthen the resilience of 'priority routes' in Wellington City to reduce the time required to restore reasonable access to key parts of the city following a major emergency.

Fire Following Earthquake in Wellington City

Programme Business Case summary prepared for the The Wellington Region Civil Defence Emergency Management Group

May 2022 | Version 1.0



WELLINGTON REGION EMERGENCY MANAGEMENT GROUP

What is fire following earthquake?

Wellington City contains many localities with densely packed wooden buildings, some surrounded by dense vegetation. Add a major earthquake, some ruptured gas pipelines, electrical sparks, cooking fires, and no reticulated water supply, and an already disastrous event could become catastrophic.

Are Wellington communities ready to deal with fire following earthquake (FFE)? What happens when emergency services are stretched or can't reach them immediately following a major earthquake?

Above: A gas main ruptures in the 1994 Northridge earthquake, USA.

Purpose of this Business Case

The purpose of this Programme Business Case is to identify and recommend a suite of options for managing the risk of FFE in Wellington City, with a particular focus on the first few days after an event. This includes both preventative measures that that will reduce the likelihood of fire occurring, and mitigating measures that will reduce the likely consequences of fire to people and property when it occurs.

The recommended suite of options has been developed by relevant agencies from the Wellington Region Civil Defence Emergency Management Group.

Agencies involved

Wellington Region Emergency Management Office

Fire Emergency New Zealand

Absolutely Positively Wellington City Council
Me Heke Ki Pōneke

GNS Science Te Pū Ao

National Emergency Management Agency
Te Rākau Whakamarumaru

Wellington Lifelines Group

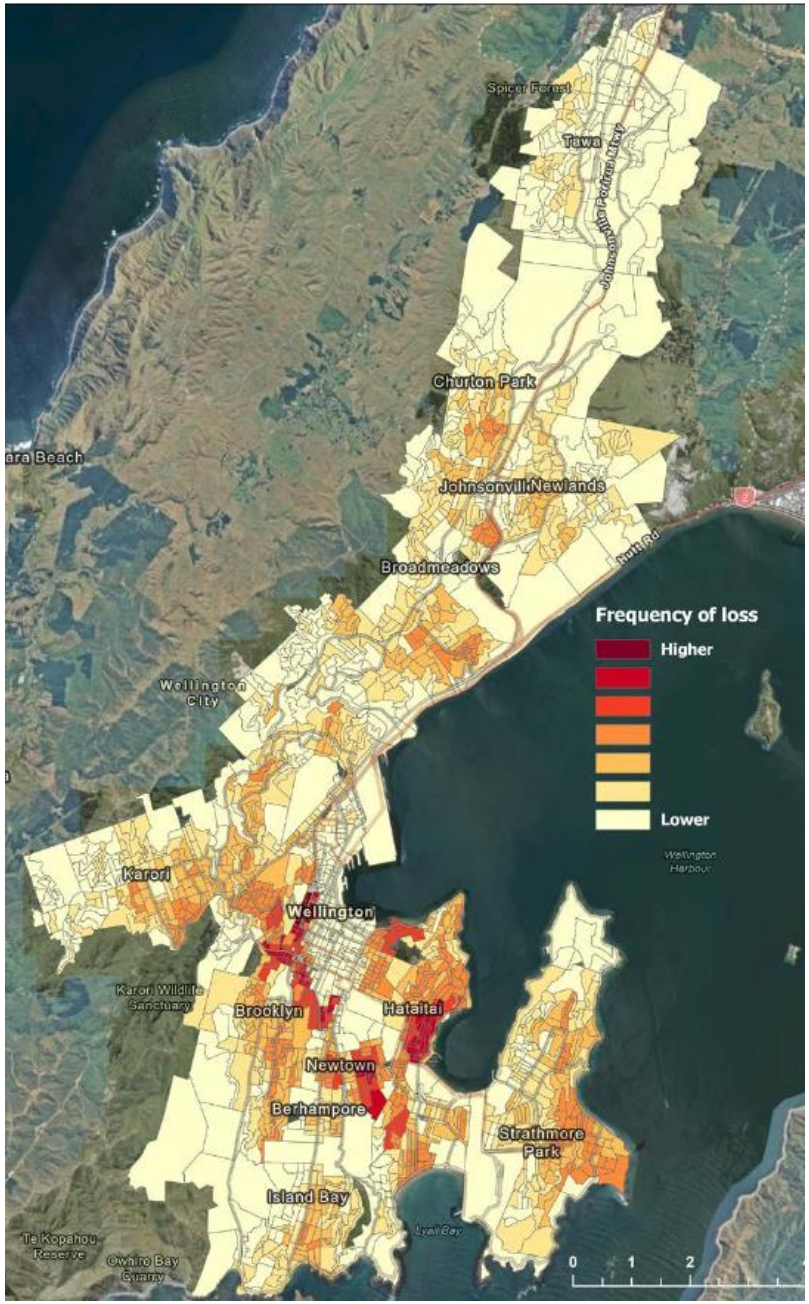
Wellington Water

Risk modelling for FFE (GNS)

GNS Science has been carrying out research and modelling to look more closely at the factors involved in FFE events and how their findings can inform emergency planning.

The most recent modelling report was published in July 2020. It detailed ignition and fire spread modelling for multiple fault sources affecting Wellington City, to identify high risk areas. The modelling also took into account the effects of suppression, but at this stage this is only based on availability of mains water and road access (Scheele et al., 2020).

Right: Map showing the areas of Wellington that are at relatively high or low risk from FFE.



Risk modelling for FFE (GNS) continued

The modelling predicts the following loss estimates caused by FFE for Wellington City (taking the impact of fire suppression into account):

- The Hikurangi subduction zone interface fault source will result in the highest mean losses at around $3 billion from fires alone.
- The Wellington Hutt Valley fault segment and Wairarapa fault have similar mean losses from fire of around $2 billion.
- The Wairau fault has the lowest predicted mean losses from fire of around $0.3 billion.

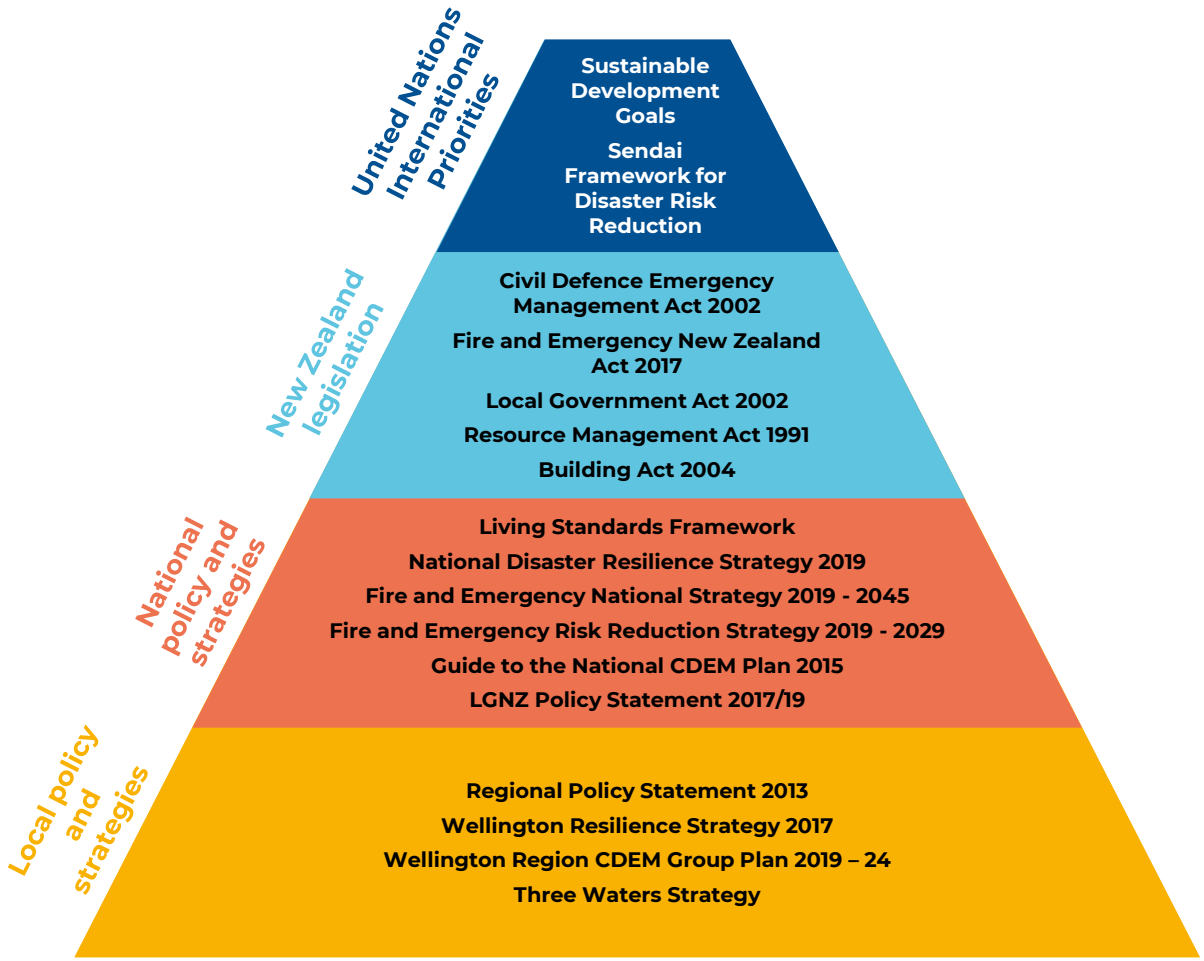
Above: Fire following the 1996 Kobe earthquake, Japan.

Why does the Wellington CDEM Group need to act now?

The risks of FFE are becoming more of a priority to address given:

- There is a greater understanding and awareness of the risks that earthquakes pose to Wellington City (both generally and in terms of FFE) through the “It’s our Fault” research programme.
- Approaches to managing FFE are changing due to challenges facing the availability of water for firefighting following an earthquake.
- The risk profile for FFE is changing due to increased urban densification.
- The demographic of household ownership and occupancy is changing in susceptible areas.
- The findings of the 2017 Ministerial Review (Delivering Better Responses to Natural Disasters and Other Emergencies) and the Government’s response to its recommendations. This identified areas where improvements needed to be made.

How does this work fit with our hazard management frameworks?



The legislative and organisational strategic frameworks provide a clear mandate for identifying assessing and managing risks in order to achieve sustainable management of hazards like FFE.

Right: Existing legislation, strategies and policies that this Business Case aligns to.

What problems are we solving?

What happens if the Wellington CDEM Group does nothing?

If the Wellington CDEM Group chooses to do nothing to manage the risk associated with FFE:

- The risk of a catastrophic FFE event will not go away until high risk areas are redeveloped to modern building compliance standards. This is expected to take decades.
- Communities will continue to be heavily dependent on emergency services that may be overwhelmed or unable to respond to FFE events due to damaged or blocked roads and a lack of water for firefighting.
- Communities are likely to be left exposed and fires left to burn, leading to unnecessarily higher losses (property, infrastructure and casualties).
- Agencies may face increasing risk of confidence failure or worse, if they fail to act when provided technical advice on the FFE risk profile.

The benefits would investment deliver?

Increased confidence in Wellington City

- Increased resilience to FFE
- Improved community resilience

Improved recovery of core city services and government

- Reduced predicted recovery time
- Reduced business disruption

Reduced risk of loss of life and property

- Reduced risk of fire spread following earthquake
- Reduced likelihood of harm
- Increased community preparedness

Economic Case: Identifying and assessing options for managing FFE risk

Initial options ideation.

Preliminary longlist was revised to identify options that were part of the base case and options that were out of scope.

Representatives of those agencies involved in development of the Case scored the remaining options against the investment objectives and critical success factors.

Above: Process to develop final suit of options for the Business Case.

Assessment framework

The assessment framework below was developed in order to assess the longlist of potential reduction & mitigation options.

Investment objectives

1. By 2025 the Wellington community will have a good awareness of the risk of FFE and are incentivised to take steps to reduce risk, and disincentivised to increase risk.
2. By 2030, at-risk communities have the capacity and capability to protect health and safety, and contain fire without external assistance.
3. By 2035, the emergency management system will have the capability and capacity to manage the residual risk of fire following an earthquake.
4. By 2050 there will be a reduction in the predicted incidence and in the predicted consequence of fire following an earthquake.

Critical success factors

1. Strategic fit and business needs:
   - How well the option meets the agreed investment objectives and will align related to business needs and requirements.
   - How well the option fits within the agency's strategies, programmes and projects.
2. Potential value for money
   - How well the option optimises value for money (i.e. the optimal mix of potential benefits, costs and risks).
3. Supplier capacity and capability
   - How readily the service can be purchased, and how well the service can be maintained in the long term.
   - How well the potential option matches the capability and capacity of the community that will be required to deliver it over the long term.
4. Potential affordability
   - How well the option can be met from likely available funding from the agency responsible or is affordable for the community where the costs can be reasonably attributed.
5. Potential achievability
   - How well the option is likely to be delivered given the agency's or community's ability to respond to the changes required and matches the level of available skills required for successful delivery.
6. Environmentally acceptable
   - How acceptable environmentally the option is likely to be both to the local community and from a regulatory perspective.

Description of final longlisted options

H1 Increase water storage for firefighting purposes in all buildings	H5 Enhance home safety visits to improve fire management in high-risk properties	H9 Integrated infrastructure response and recovery plans for FFE
H2 Improve fire management means in heritage properties	H6 Public education campaigns	H10 Adapt the design of Wellington's existing water network to provide alternative local water sources and distribution networks
H3 Inform property owners of FFE risk	H7 Adapt existing Community Emergency Hubs or establish new Community Fire Centres	H11 Establish an alternative over land water reticulation capability
H4 Require shut off mechanisms for the gas network	H8 Integrated plans for water management and FFE suppression post-earthquake event	H12 Increase capability in local communities to provide support in the event of FFE

Reduction | Readiness | Response | Recovery

Assessment of the longlist

The table below shows how the longlisted options have been qualitatively scored against their ability to achieve the investment objectives (IO's) and critical success factors (CSF's).

Option #	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	H12
Lead agency	FENZ / WCC	FENZ	WCC	MBIE / WorkSafe NZ	FENZ	FENZ / WREMO	WREMO / FENZ	WCC	Well CDEM Group	WCC	FENZ	WREMO / FENZ
IO 1	**No**	**No**	**Yes**	**No**	**Partial**	**Yes**	**Yes**	**Partial**	**Partial**	**Partial**	**No**	**Yes**
IO 2	**Partial**	**Partial**	**Partial**	**No**	**Yes**	**Partial**	**Yes**	**No**	**No**	**Partial**	**No**	**Yes**
IO 3	**Partial**	**Partial**	**Partial**	**Partial**	**Yes**	**Partial**	**Yes**	**Partial**	**Partial**	**Yes**	**Yes**	**Partial**
IO 4	**Yes**	**Yes**	**Partial**	**Partial**	**Yes**	**Partial**	**Partial**	**Partial**	**Partial**	**Yes**	**Yes**	**Yes**
CSF 1	**Yes**	**Yes**	**Yes**	**Partial**	**Yes**	**Yes**	**Yes**	**Partial**	**Yes**	**Yes**	**Yes**	**Yes**
CSF 2	**Yes**	**Yes**	**Yes**	**No**	**Yes**	**Yes**	**Partial**	**Yes**	**Yes**	**Partial**	**Partial**	**Partial**
CSF 3	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Partial**	**Partial**	**Yes**	**Yes**	**Yes**	**Yes**	**Partial**
CSF 4	**Partial**	**Partial**	**Yes**	**No**	**Yes**	**Yes**	**Partial**	**Yes**	**Yes**	**No**	**No**	**Partial**
CSF 5	**Partial**	**Partial**	**Partial**	**No**	**Partial**	**Yes**	**Partial**	**Yes**	**Yes**	**Yes**	**Yes**	**Partial**
CSF 6	**Partial**	**Partial**	**Partial**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**

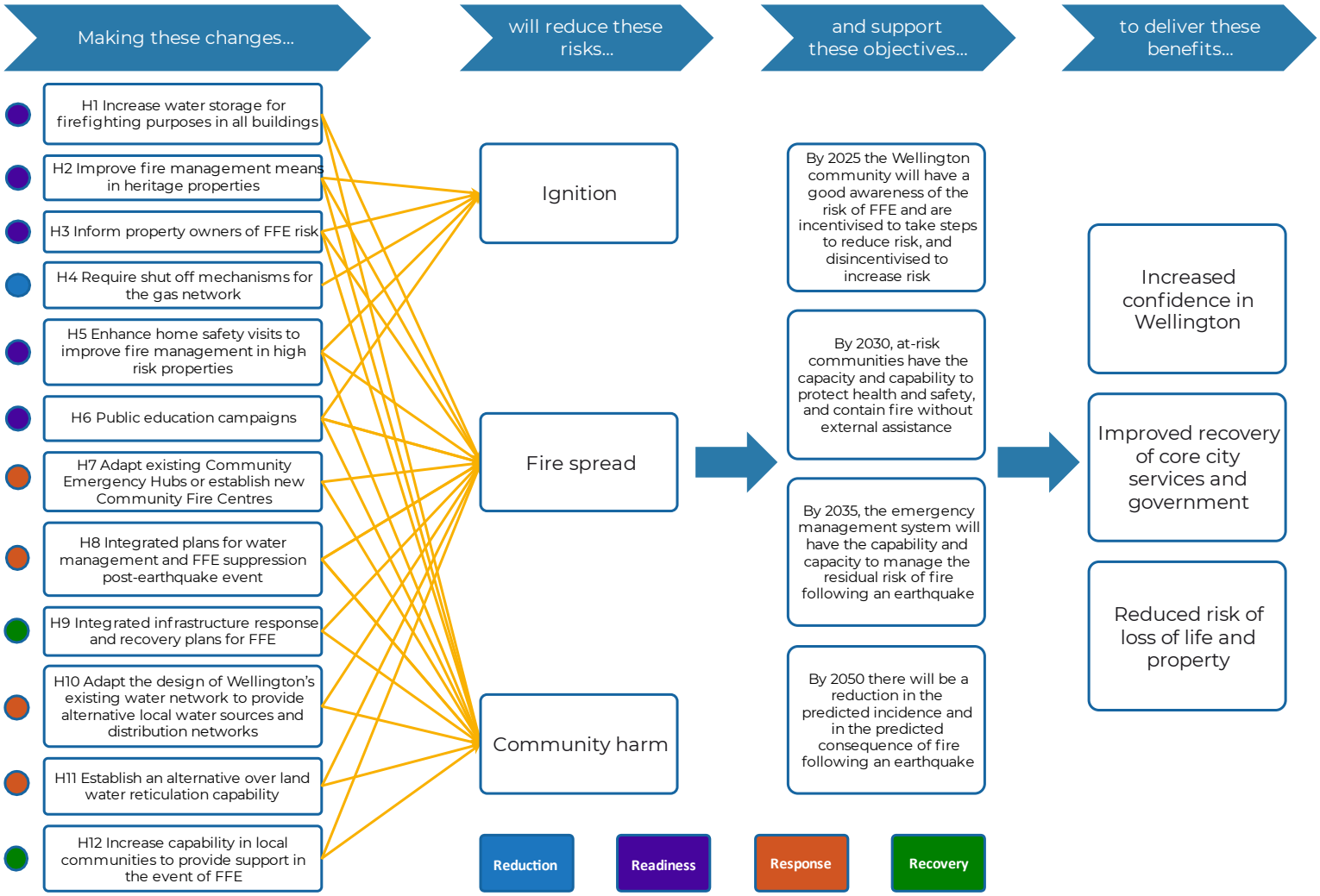
Developing the preferred programme

Likely fire hazard / Risk attributes	Ignition	Fire spread	Community harm
Physical attributes (GNS model and FENZ)	H2 H3 H4 H5	H2 H3 H5 H10 H11	H2 H3 H5 H10 H11
Behavioural (FENZ)	H3 H5	H3 H5	H3 H5
Readiness (FENZ)	H2 H3 H4 H5 H6	H1 H2 H3 H5 H6 H7 H8 H9 H10 H11 H12	H1 H2 H3 H5 H6 H7 H8 H9 H10 H11 H12

The figure above groups the longlisted options against the risk attributes of FFE and the likely fire hazards.

Applying the Sendai Framework to this matrix means that the Wellington CDEM Group should first prioritise options which reduce or mitigate the risk of ignition. If this cannot be achieved, then prioritise options that will prevent or suppress spread. Finally, the community will bear any risk that remains, and thus preparedness for the event is the priority in the event that the risk cannot be avoided or suppressed.

Which options deliver which benefits?



This intervention logic map identifies how the various options proposed will address the risks identified, will support the outcomes sought (investment objectives) and deliver the benefits of this Business Case.

Recommendations

Step one characterising community risks: Each high risk community is likely to be different and require different treatment. This step identifies the characteristics of the risks faced by each of those communities.

Recommendation 1

That CEG agrees that validating the physical risk attributes and identifying the social risk attributes for each high-risk community is a priority and recommends to FENZ that it undertakes this community characterisation for Wellington City as a pilot through their national risk assessment work programme.

Step two modelling risk reduction: Improve modelling to better predict physical risk faced by communities and enable quantification of risk **reduction** measures, and identify how we might assess the value of risk **mitigation** activities.

Recommendation 2

That CEG agrees to investigate updating of the Risk Modelling to better quantify the physical risks for each community based on the physical risk validation, and to investigate the value of reduction options.

Recommendation 3

That CEG agrees to investigate options to model or further assess the risk treatment attributable to mitigation options.

Recommendations continued

Step three prioritising the longlist of options: Measures to reduce or mitigate risks need to be appropriately prioritised and sequenced to deliver the best value for the community.

Recommendation 4

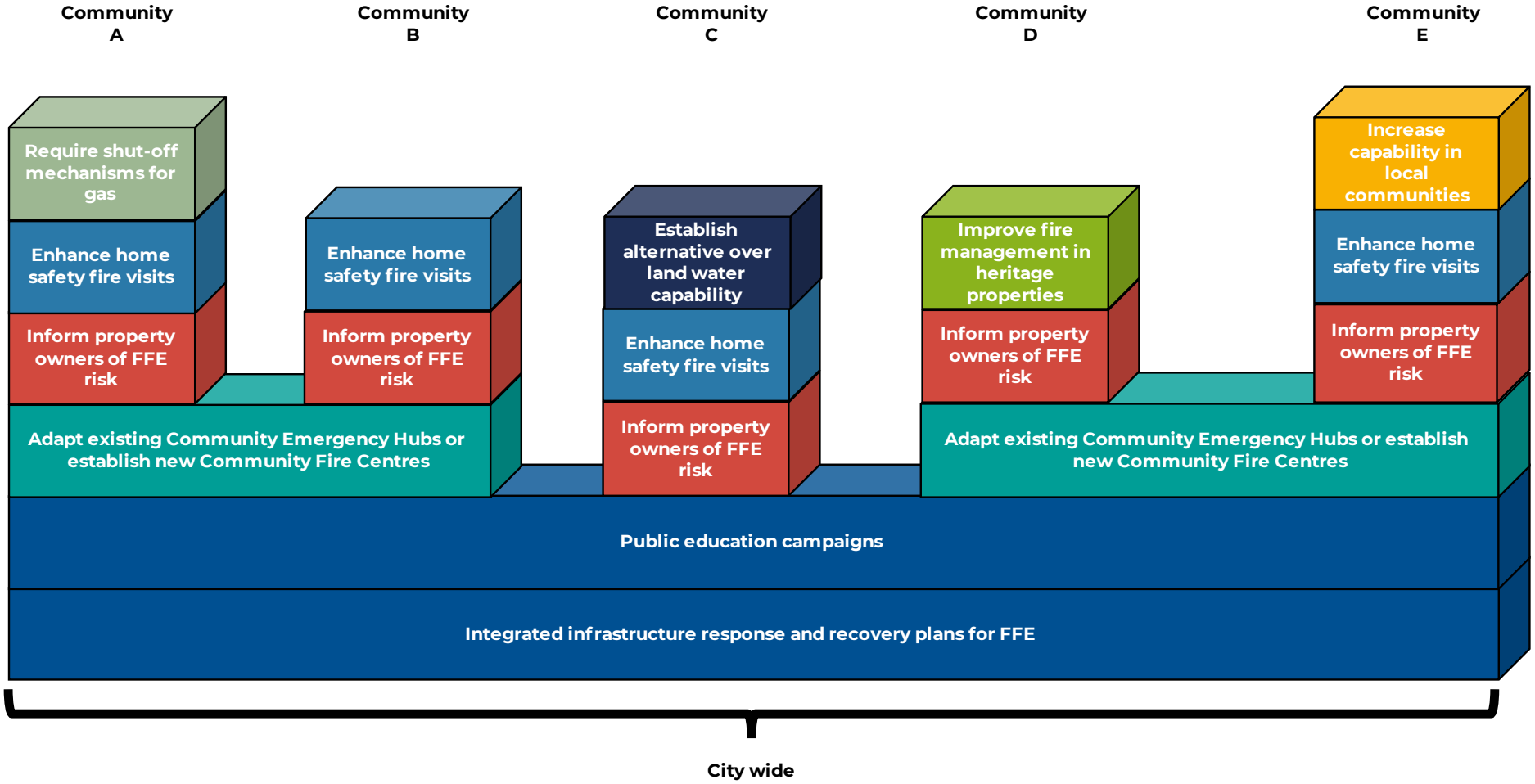
That CEG agrees to prioritise investigations and investment into reducing the risks associated with Fire Following Earthquake according to the Sendai framework.

Step four establish an implementation programme: A programme should be developed to ensure that actions are undertaken to reduce the risks of FFE and integrate those actions into the work programme.

Recommendation 5

That CEG approves the appointment of a FFE Programme Manager to set up and oversee an implementation programme for addressing FFE (cost and funding to be determined).

How might we apply different options to different communities (concept only)?




CIVIL DEFENCE
WELLINGTON REGION
EMERGENCY MANAGEMENT
GROUP

Civil Defence and Emergency Management Group
31 May 2022
Report 22.221

For Decision

FINALISATION OF THE IMPLEMENTATION PHASE OF THE WATER COMMUNITY INFRASTRUCTURE RESILIENCE PROJECT

Te take mō te pūrongo
Purpose

1. To inform the Joint Committee of the decisions made by the Coordinating Executives Group regarding the Water Community Infrastructure Resilience (CIR) Project and recommended next steps.

He tūtohu
Recommendation

That the Joint Committee **approves** the project finalisation memo to the Department of Internal Affairs (Attachment 1), who are a partial funder of the project.

Te tāhū kōrero
Background

2. The Water CIR Project commenced in 2017 as an agreement between:
    a. Wellington Water (WW);
    b. The Department of Internal Affairs (DIA);
    c. Hutt City Council;
    d. Porirua City Council;
    e. Upper Hutt City Council; and
    f. Wellington City Council.

4. The outcome of this project was to "[deliver] the CIR Programme so that the level of service of delivering 20 litres per person per day of drinking water as soon as possible after a major shock is achieved".

Te tātaritanga
Analysis

5. The CEG approved that the Water CIR Project's implementation phase is now complete, which means that programme partners can move to engagement and preparation for operational tasks (tasks agreed previously in July 2021)
6. Moving to the operational phase of the project means there is now an opportunity to engage with communities to socialise plans and promote reasonable expectations.
7. The CEG has recommended that the Joint Committee requests a project finalisation memo be sent from Wellington Water to the Department of Internal Affairs. A draft memo is attached (**Attachment 1**). The draft memo includes an edit recommended by CEG to thank DIA for the involvement in the project.

Ngā hua ahumoni
Financial implications

8. There are no financial implications arising from the matter for decision.

Ngā Take e hāngai ana te iwi Māori
Implications for Māori

9. The Water CIR Project includes recommendations for councils to consider water provision to marae, and an associated need for engagement with iwi and marae.

Ngā tikanga whakatau
Decision-making process

10. The matter requiring decision in this report was considered by officers against the requirements of section 17 of the Civil Defence Emergency Management Act 2002 and the decision-making requirements of Part 6 of the Local Government Act 2002.

Te hiranga
Significance

11. Officers considered the significance (as defined by Part 6 of the Local Government Act 2002) of these matters, taking into account Greater Wellington Regional Council's *Significance and Engagement Policy* and *Decision-making Guidelines*. Officers recommend that this matter is of low significance, due to its administrative nature.

Te whakatūtakitaki
Engagement

12. Given the low significance of the matter for decision, no related engagement was required.

Ngā tūāoma e whai ake nei
Next steps

13. After completing the implementation phase of the CIR Project, there are a number of operational tasks that now need to be completed (previously finalised.) A summary of these tasks can be circulated upon request. Any matters for decision will be considered for future Joint Committee meetings.

Ngā āpitihanga
Attachment

Number	Title
1	Draft Wellington Water Memo to DIA

Ngā kaiwaitohu
Signatories

Writer	Sam Ripley – Advisor, Business and Development, WREMO
Approvers	Jess Hare – Manager, Business and Development, WREMO Jeremy Holmes – Regional Manager, WREMO

He whakarāpopoto i ngā huritaonga **Summary of considerations**
Fit with Council's roles or Committee's terms of reference Under Section 17 of the CDEM Act 2002 the Joint Committee and each member is required to identify, assess, and manage relevant risks. This project is the result of an assessment of the expected outage times for the regional water supply after a major earthquake. The project identifies a way of managing this risk. It is part of the Group Plan. The Joint Committee is responsible for implementing and monitoring the Group Plan.
Contribution to Annual Plan / Long term Plan / Other key strategies and policies The Water CIR Project contributes to Group Plan strategic outcomes associated with reducing hazard impacts, and outcomes associated with increasing resilience of infrastructure services.
Internal consultation See paragraph 4.
Risks and impacts: legal / health and safety etc. There are no known risks.

Attachment 1 to Report 22.221

Wellington Water

DRAFT MEMO

TO Rowan Burns

COPIED TO Tonia Haskell, Julie Alexander, Derek Baxter, Geoff Swainson, Anthony Robinson, Sam Bishop

FROM Sam Lister

DATE TBC

FOR YOUR INFORMATION

Community Infrastructure Resilience (CIR) Programme Funding

Project Close Out

The purpose of the Memorandum is to advise the Department of Internal Affairs that Wellington Water has purchased, installed and commissioned the alternative supplies component (Project) of the CIR Programme, as detailed in the Memorandum of Understanding of 15 August 2017, and completed all associated operationalisation tasks to the satisfaction of the Councils and WREMO.

The assets purchased, installed and commissioned are:

Asset Type	MOU Number	Actual Number	Comments
Wellington City Council			
Bore Hole	5		
Bore Infrastructure	8	8	Aro Valley Hanson Street Berhampore Nusery Glenside Huntleigh Park Truscott Ave Linden Park Tawa Fire station
Surface Infrastructure	3	3	Karori (Fitzgerald Place) Khandallah Takapu

5000L Bladders	88	140	10 - transportable 49 - pillow (static) 81 - drum (static)
1000L Bladders	27	51	Transportable
Hoses	176	485	All hoses including: 64mm Flexi Hose 64mm Lay Flat Raw Water hose 64mm Lay Flat Potable Water hose 50mm Lay Flat hose 64mm/50mm Hose Adaptor 50mm Lay Flat hose 13m length 75mm Lay Flat Hose 75mm Flexi Hose 8m length 75mm Flexi Hose 5m length 50mm Custom Intake Hose 3m 50mm Custom Intake Hose 2m 50mm Lay Flat hose 2.5m length 32mm Transfer Pump Hose 50mm Lay Flat hose 12m length 64mm Lay Flat hose
Pumps	15	24	
Manifolds	134	124	
Hutt City Council			
Bore Hole	0		
Bore Infrastructure	0		
Surface Infrastructure	4	4	Cheviot Road Williams Park Korokoro Wainuiomata
5000L Bladders	54	93	8 - transportable 32 - pillow (static) 53 - drum (static)
1000L Bladders	11	31	Transportable

Hoses	68	276	All hoses including: 75mm Lay Flat Hose 75mm Flexi Hose 8m length 75mm Flexi Hose 5m length 64mm Flexi Hose 64mm Lay Flat Raw Water hose 64mm Lay Flat Potable Water hose 32mm Transfer Pump Hose
Pumps	2	15	
Manifolds	55	91	
Upper Hutt City Council			
Bore Hole	0	0	
Bore Infrastructure	0	0	
Surface Infrastructure	4	3	Rimutaka Prison Akatarawa River Stream Whakatikei Stream (Riverstone Terraces)
5000L Bladders	18	28	3 - transportable 9 - pillow (static) 16 - drum (static)
1000L Bladders	4	9	Transportable
Hoses	23	147	All hoses including: 75mm Lay Flat Hose 75mm Flexi Hose 8m length 75mm Flexi Hose 5m length 64mm Flexi hose 64mm Lay Flat Raw Water hose 64mm Lay Flat Potable Water hose 64mm Lay Flat hose 32mm Transfer Pump Hose
Pumps	1	2	
Manifolds	18	30	
Porirua City Council			
Bore Hole	2		
Bore Infrastructure	3	1	Postgate Park Bores
Surface Infrastructure	0	2	Pauatahanui Stream Takapuwahia Stream

5000L Bladders	21	67	1 - transportable 10 - pillow (static) 56 - drum (static)
1000L Bladders	15	31	Transportable
Hoses	101	161	All hoses including: 75mm Lay Flat Hose 75mm Flexi Hose 8m length 75mm Flexi Hose 5m length 64mm Flexi hose 64mm Lay Flat Raw Water hose 64mm Lay Flat Potable Water hose 32mm Transfer Pump Hose 50mm Lay Flat hose 5m length 50mm Lay Flat hose
Pumps	13	14	
Manifolds	73	33	

All assets identified in the table above are now stored within the Wellington Region. The equipment has been moved to storage locations as agreed with the Councils to within their respective Council areas.

In addition to procuring the assets, Wellington Water has produced the following supporting documentation:

- Water Station Operation and Maintenance Manuals
- Role descriptions for key CIR roles
- “How to” Guides for water transportation and water station set up and operation, and
- Implementation Plans and posters for each Island.

A workshop with key stakeholders from the Councils and facilitated by WREMO was held on the 16th of April 2021 to determine the outstanding tasks for CIR operationalisation. The aforementioned documents were provided to all parties prior to this meeting for review. A follow-up meeting was held on the 25th of February 2022 where it was agreed by all stakeholders that Wellington Water had completed all outstanding tasks.

Wellington Water therefore considers all tasks related the MoU to be complete and are requesting that the project be formally finalised. With all of the assets now available in the region, Wellington Water will continue to work alongside each of the Council’s EOC’s to improve the operationalisation readiness.

On behalf of Wellington Regional Emergency Management Office (WREMO) and our four participating City Councils, Hutt City, Upper Hutt City, Porirua City and Wellington City, we would like to thank the Department of Internal Affairs for the funding contribution to the regional Community Infrastructure Resilience (CIR) programme and opportunity to establish an emergency water supply infrastructure resource that has enabled a step change in our post major event resilience and emergency response level of service.

Nga mihi maioha

S**am Lister**

Network Controller
Ph: 021 998 553

Sam.Lister@wellingtonwater.co.nz

Civil Defence and Emergency Management Group
31 May 2022
Report 22.222

For Decision

CIVIL DEFENCE EMERGENCY MANAGEMENT GROUP APPOINTMENTS – MAY 2022

Te take mō te pūrongo
Purpose

1. To propose to the Wellington Civil Defence Emergency Management (CDEM) Group Joint Committee (the Joint Committee) a number of statutory appointments for the CDEM Group.

He tūtohu
Recommendation

That the Wellington Civil Defence Emergency Management Group:

1 **Approves** the removal of the following statutory appointees:
   a Lester Piggott as Primary Controller (Hutt City Council)
   b Barry Vryenhoek as Alternate Controller (Hutt City Council)
   c Jay Houpapa as Alternate Controller (Hutt City Council)
   d Richard Harbord as Alternate Controller (Upper Hutt City Council)
   e Tim Langley as Alternate Controller (combined Wairarapa councils)
   f Mike Mendonca as Primary Recovery Manager (Wellington City Council)
   g Dave Gittings as Primary Recovery Manager (Carterton District Council)

2 **Approves** the addition of the following statutory appointees:
   a Sam Bishop as Alternate Controller (Porirua City Council)
   b Olivia Dovey as Alternate Controller (Porirua City Council)
   c Barry Vryenhoek as Primary Controller (Hutt City Council)
   d Lester Piggott as Alternate Controller (Hutt City Council)
   e Matthew Boggs as Alternate Controller (Hutt City Council)
   f Kara Puketapu-Dentice as Alternate Controller (Hutt City Council)
   g Paul Gardner as Alternate Controller (Combined area of the district councils in the Wairarapa)

h Kym Fell as Primary Recovery Manager (Wellington City Council)

i Olivia Dovey as Alternate Recovery Manager (Porirua City Council)

j Johannes Ferreira as Primary Recovery Manager (combined Carterton District Council)

Te tāhū kōrero
Background

2. Sections 26 and 29 of the CDEM Act 2002 require a CDEM Group to appoint, either by name or by reference to the holder of an office, a suitably qualified and experienced person to be the:

   a Group Controller for its area; and

   b Group Recovery Manager for its area.

3. The CDEM Group is also required to appoint, either by name or by reference to the holder of an office, at least one suitably qualified and experienced person to perform the functions and duties, and exercise the powers of the Group Controller and the Group Recovery Manager respectively if there is a vacancy in office or an absence from duty for any reason.

4. Sections 27 and 30 of the CDEM Act 2002 also states that a CDEM Group may appoint one or more persons to be:

   a A Local Controller; and

   b A Local Recovery Manager.

Civil Defence Emergency Management Group appointments

5. The following key is used in the table below:

   Bold – New appointee

   ~~Strikethrough~~ - Removed appointee

   Standard – Current appointee

Group Controllers and alternates

6. The following table proposes an updated list of statutory appointees for the Group Controllers (and alternates and supplementaries):

Area to which appointed	Appointee name and designation
CDEM Group	Mark Duncan (Group Controller) Jessica Hare (alternate) Jeremy Holmes (alternate) Dan Neely (alternate) Bruce Pepperell (alternate) Derek Baxter (alternate)

	Lester Piggott (alternate) Phil Becker (alternate)
Wellington City Council	Derek Baxter (Primary) Phil Becker (alternate) Sarah Murray (alternate) Moana Mackey (alternate)
Porirua City Council	Jerry Wrenn (Primary) **Sam Bishop (alternate)** **Olivia Dovey (alternate)** Alison Wiley (alternate) Bruce Pepperell (alternate)
Kāpiti Coast District Council	James Jefferson (Primary) Nienke Itjeshorst (alternate) Steve Cody (alternate) Paul Busing (alternate) Scott Dray (supplementary)
Hutt City Council	**Barry Vryenhoek (Primary)** ~~Lester Piggott (primary)~~ **Lester Piggott (alternate)** **Matthew Boggs (alternate)** **Kara Puketapu-Dentice (alternate)** ~~Barry Vryenhoek (alternate)~~ ~~Jay Houpapa (alternate)~~ Craig Cottrill (alternate) Anthony Robinson (alternate)
Upper Hutt City Council	Geoff Swainson (Primary) ~~Richard Harbord (alternate)~~ Craig Cottrill (alternate) Liezel Jahnke (alternate) Jessica Hare (supplementary)
Combined areas of the district councils in the Wairarapa	Steven May (Primary) Jonathan Hooker (alternate) **Paul Gardner (alternate)** ~~Tim Langley (alternate)~~ Murray Johnston (alternate) Solitaire Robertson (alternate) Darryl McCurdy (supplementary)

Group and Local Recovery Managers and alternates

7. The following table proposes an updated list of statutory appointees for the Group Recovery Managers (and alternates):

Area to which appointed	Appointee name and designation
CDEM Group	Dan Neely (Group Recovery Manager) Luke Troy (alternate) Grant Fletcher (alternate) Scott Dray (alternate)
Wellington City Council	~~Mike Mendonca (Recovery Manager)~~ **Kym Fell (Primary)** Paul Andrews (alternate) Danny McComb (alternate)
Porirua City Council	**Primary to be appointed** Andrew Dalziel (alternate) **Olivia Dovey (alternate)**
Kāpiti Coast District Council	Natasha Tod (Recovery Manager) Angela Bell (alternate)
Hutt City Council	Andrea Bradshaw (Recovery Manager) Helen Oram (alternate)
Upper Hutt City Council	Liezel Jahnke (Recovery Manager) Geoff Swainson (alternate)
Combined areas of the district councils in the Wairarapa	~~Dave Gittings (Carterton)~~ **Johannes Ferreira (Carterton)** Nigel Carter (South Wairarapa) Ben Jessep (Masterton)

Non statutory appointments

8. There is no change to the appointment to the Lifelines Co-ordination Manager and Group Welfare Manager.

Area to which appointed	Appointee name and designation
CDEM Group	Richard Mowll (Lifelines Utility Co-ordination Manager) Jennifer Rizzi (Welfare Manager)

Ngā hua ahumoni
Financial implications

9. There no financial implications arising from the matters for decision. Any associated costs are covered by the respective councils according to their individual agreements.

Ngā Take e hāngai ana te iwi Māori
Implications for Māori

10. There are no known implications for Māori.

Ngā tikanga whakatau
Decision-making process

11. The matters requiring decision in this report were considered by officers against the decision-making requirements of the CDEM Act 2002 (see paragraphs 2 to 4) and of Part 6 of the Local Government Act 2002.

Te hiranga
Significance

12. Officers considered the significance (as defined by Part 6 of the Local Government Act 2002) of these matters, taking into account Council's *Significance and Engagement Policy* and *Decision-making Guidelines*. Officers recommend that the matters are of low significance, given their administrative nature.

Te whakatūtakitaki
Engagement

13. Due to the low significance of these decisions, no engagement on these matters was undertaken.

Ngā tūāoma e whai ake nei
Next steps

14. No further external communication is required.

Ngā kaiwaitohu
Signatories

Writer	Sam Ripley – Advisor, Business and Capability Development, WREMO
Approver	Jess Hare – Manager, Business and Capability Development, WREMO Jeremy Holmes – Regional Manager, WREMO

He whakarāpopoto i ngā huritaonga **Summary of considerations**
Fit with Council's roles or Committee's terms of reference The CDEM Group makes these appointments and removals under sections 26 to 30 of the CDEM Act 2002 (see paragraphs 2 to 4).
Contribution to Annual Plan / Long term Plan / Other key strategies and policies There are no known implications for Council's strategies, policies or plans.
Internal consultation All local authority chief executives were engaged and support the proposed appointees.
Risks and impacts: legal / health and safety etc. While there is no significant legal or health and safety risk, it is important that all Controllers, Recovery Managers and Group Welfare appointments are appropriately contracted to the council for which they hold the appointment. Each council is responsible for managing their own appointments and advises the CDEM Group of any changes to statutory appointments.