
Wellington Resilience Strategy

March 2017



PIONEERED BY THE
ROCKEFELLER FOUNDATION

100 RESILIENT CITIES



Absolutely Positively
Wellington City Council
Me Heke Ki Pōneke

Contents

Foreword	4
Resilient Wellington - a strategy	7
100 Resilient Cities	10
Reading this strategy	13
Our resilience story	
Chapter 1 - Looking back	17
Chapter 2 - 2020s: Our society is transforming	22
Chapter 3 - 2030s: The earth is moving	28
Chapter 4 - 2040s: The sea is rising	34
Our goals and programmes	
Goal 1 - Connected and empowered communities	40
Everyone thrives	42
Community resilience	48
Economic resilience	56
Goal 2 - Integrated and informed decision making	60
Governance	62
Information	68
Adaptation	72
Recovery	76
Goal 3 - Healthy and robust homes, built and natural environment	80
Homes and telecommunication	82
Water and natural environment	90
Transport and energy	98
Implementing Wellington's Resilience Strategy	104
References	106
Acknowledgements	108

Foreword



Justin Lester
Mayor of Wellington

Around the world, cities like ours are becoming the economic, social and cultural backbone of our countries. This represents an opportunity to lead the way like never before - but it also comes with challenges.

Here in New Zealand's capital we've had our fair share, and we know that our future holds more.

Some - like earthquakes and sea level rise - have a measure of predictability. While we don't know when they might happen, we do know what the effects will look and feel like. We've seen them before, often very close to home. For example, I believe we owe it to the people of Christchurch to take what we can from what their city has been through over the last 6 years.

But along with the more predictable challenges, there are shocks and stresses we don't yet know about.

What we do know is that resilient communities will pull together in times of adversity, while also having better lives each and every day.

We also know there are things we can do today that will pay back exponentially when the time comes. Some things are simple, like getting to know your neighbours, but others are more complex, like investing in housing and transport frameworks to make them efficient and robust. By preparing now, we're making sure we can rise to meet the challenges in the future.

This strategy lays out a coherent blueprint for dealing with future shocks and stresses. Some of the plans we have are short term and tactical; others are longer term and more strategic in nature. All of them have people at the centre.

He aha te mea nui o te ao? He tangata, he tangata, he tangata.¹

In recent years climate experts, disaster responders and sustainability proponents have come into rare alignment. They agree we have a once-in-a-lifetime opportunity to develop and invest in a future for Wellington that ensures we will not only survive shocks and stresses, but also thrive afterwards.

On behalf of Wellingtonians, present and especially future, I would like to thank 100 Resilient Cities - Pioneered by The Rockefeller Foundation, for their support, and I would like to thank the many people who contributed to the development of this document.

I'm privileged to be able to launch Wellington's inaugural Resilience Strategy.

Tū whare ora.

¹ What is the most important thing in the world? It is the people, it is the people, it is the people



Michael Berkowitz
President
100 Resilient Cities

Kia ora,

On behalf of the entire 100 Resilient Cities family, I want to congratulate Mayor Lester and the city of Wellington on the release of your Resilience Strategy. This is a major milestone for the city and 100RC's partnership with "the world's coolest little capital".

Wellingtonians have had a long history of resilient determination, whether as warriors, or pioneers, creating strong communities in this beautiful but sometimes harsh harbour at the southern tip of the North Island. Potentially destructive earthquakes, rising seas, and the city's famous winds have kept Wellingtonians acutely aware of their vulnerability and helped hone their famous Kiwi ingenuity.

With the strategy, Wellington continues the serious work of ensuring that the city becomes resilient not only to the shocks of earthquakes but also the daily stresses that can be equally destructive, such as social and economic inequality, the physical integrity of the city's houses, and issues of mental health and addiction that plague too many.

Wellington is changing; its population is growing and becoming more diverse. It is also getting older, and as the city welcomes newcomers who will enrich the city and ensure its vibrant future, this strategy provides for programmes for their employment and integration. As Wellington evolves, it must foster collaboration between its communities, provide access to information and services to all, and ensure meaningful involvement in decision making. This strategy emphasises that trust and collaboration are key - without them, true resilience that takes into account all of Wellington's voices and concerns cannot be achieved. The ancient Māori legend of Ngake and Whātaimai beautifully illustrates the kind of inclusivity and resourcefulness that will support Wellington's resilience journey in the coming years and beyond.

Late last year the Kaikoura earthquake drove home the urgency of building this kind of resilience. It also highlighted a major reason why Wellington will undoubtedly be able to do so: Chief Resilience Officer Mike Mendonça. Mike's work on the recovery after the earthquake shows he and his team have already begun the work of embedding resilience thinking into how the city manages its shocks and stresses. Rather than trying to defy nature, the Wellington Resilience Strategy seeks to live in tandem with it, using the challenges it poses as opportunities to become even stronger.

This document is just the beginning, of course. As the capital city of a progressive nation, we're looking to you to lead the way nationally and internationally; you've already begun to lead by example, and we've come to expect nothing less.



Mike Mendonça was appointed Wellington’s Chief Resilience Officer in December 2015 to lead development of this strategy. He now also manages the recovery efforts in Wellington following the Kaikoura earthquake and will oversee the implementation of this strategy.



Resilient Wellington

- a strategy

Fifty years ago, Wellington looked completely different to the way it looks today. It's unlikely that Wellingtonians of the 1960s could have dreamed of how connected their children and grandchildren would be to each other and the rest of the world - virtually, through massive advances in technology and telecommunications, and physically, through a bustling international airport.

They probably wouldn't have thought that our population would be 13 percent Māori, 8 percent Pasifika and 8 percent Asian, with more than 80 ethnic groups and dozens of languages spoken on the streets. Nor would they have thought that Wellington could be transformed from a government town into "the coolest little capital in the world".

While they might have expected earthquakes to be an ongoing worry, they would not have foreseen traffic congestion, people living rough in the central city, or that the climate would have changed to the point that we need to adapt our city to rising sea levels, and to more intense and frequent flash floods and high winds.

In another few decades, people will reflect on our time and wonder at the change that will have occurred between 2017 and 2050.

This strategy sets out a blueprint to enable Wellingtonians to better prepare for, respond to, and recover from disruptions. It is designed to maintain and build on the resilience momentum that has been generated to date. It outlines accountabilities and actions for change - its purpose is to make a positive difference. **It is our vision that as Wellington moves and changes, everyone here will survive and thrive.**

Three goals will support this vision: **that people are connected, empowered and feel part of a community; decision making is integrated and well informed; and our homes, natural and built environment are healthy and robust.** These goals will drive a series of strategic projects designed to shape our future city. Each of the projects signals a need to change from the status quo, such as preparing Wellington to adapt itself to the effects of sea level rise, and integrating recovery planning for the earthquake that we know will strike Wellington.

In developing this strategy, 200 people including infrastructure managers, researchers, community members, businesses and council staff from across the Wellington region imagined themselves in the shoes of their children and grandchildren in 35 years' time. What will be the shocks and stresses they are likely to encounter, and what can we do today so that their lives - and ours - can be improved? How can we be Resilient Wellington?

To help bring these likely experiences to life, we developed a 'resilience story' through a series of stakeholder workshops. The story follows a fictional family as they grapple with life in Wellington over the coming decades.

The story provided an inspiration and a test environment for a series of accelerated design workshops, where the actions that form this strategy have been developed, building on Wellington's strengths.

We developed the strategy using four principles: to co-design wherever possible, to accelerate design, to use a strengths based approach, and to use story telling to communicate the resilience agenda.



Co-design - To maximise involvement of the wide group of stakeholders and experts, covering all city resilience dimensions, the strategy content is primarily driven by the outputs of a series of design workshops.



Strength based approach - Specific focus to build on Wellington strengths has been applied during the appreciative enquiry workshops and led to development of our resilience graphic novel as well opportunities that were designed into resilience projects.

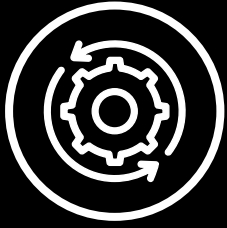


Accelerated design - Projects underpinning this strategy were developed at the Action Workshop modelled on a hackathon methodology and building on ideas generated through appreciative enquiry and story telling.



Story telling - This approach has been integrated into the strategy development from early stages to ensure that the strategy inspires and captures Wellingtonians' imagination. Story telling was a focus of the Story Workshop and led to the development of our graphic novel.

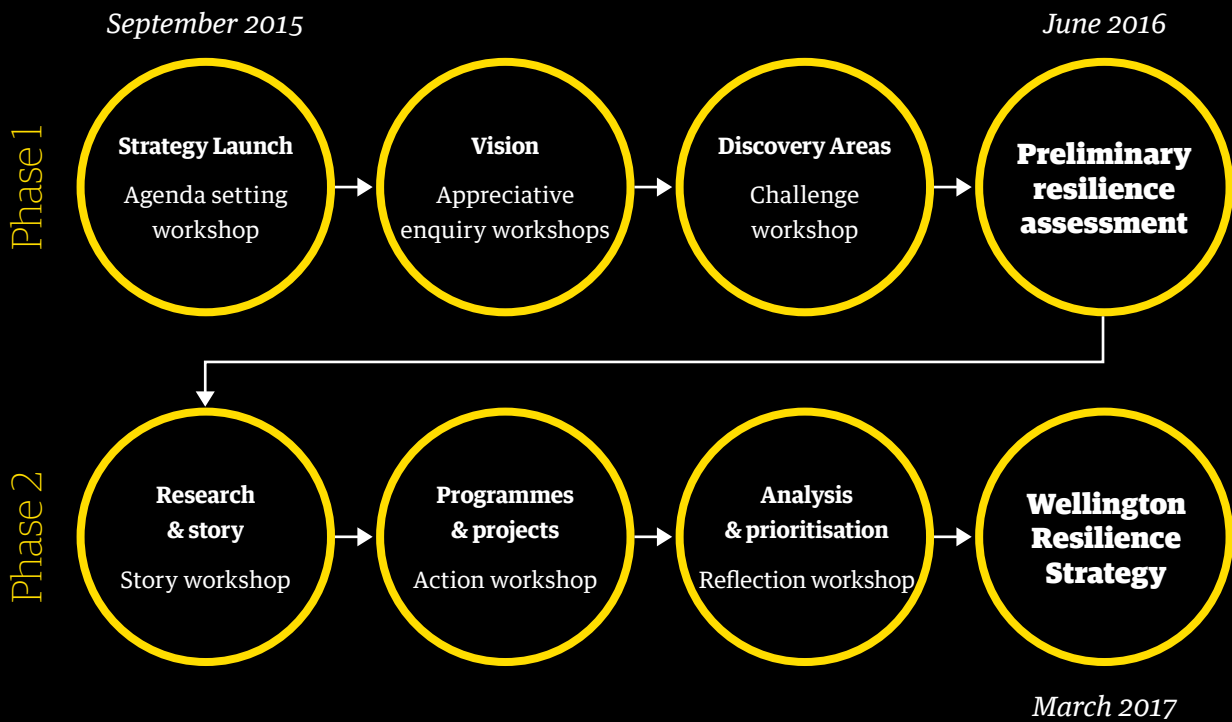




This strategy heralds change - change that will require broad collaboration, strong leadership and tenacity supported by compelling evidence.

Wellington isn't just Wellington City. The Wellington region features a complex series of systems and relationships covered by nine different council areas. Shocks and stresses don't respect the boundaries between these areas and nor does this strategy. While its primary focus is Wellington City, we have

looked at it in the context of the wider region, especially the urban areas of Porirua and Hutt Valley. We have indicated where projects have a regional scope. In the middle of all this, the Kaikoura earthquake on 14 November 2016 gave Wellingtonians a stark reminder of what an earthquake can do to a city.

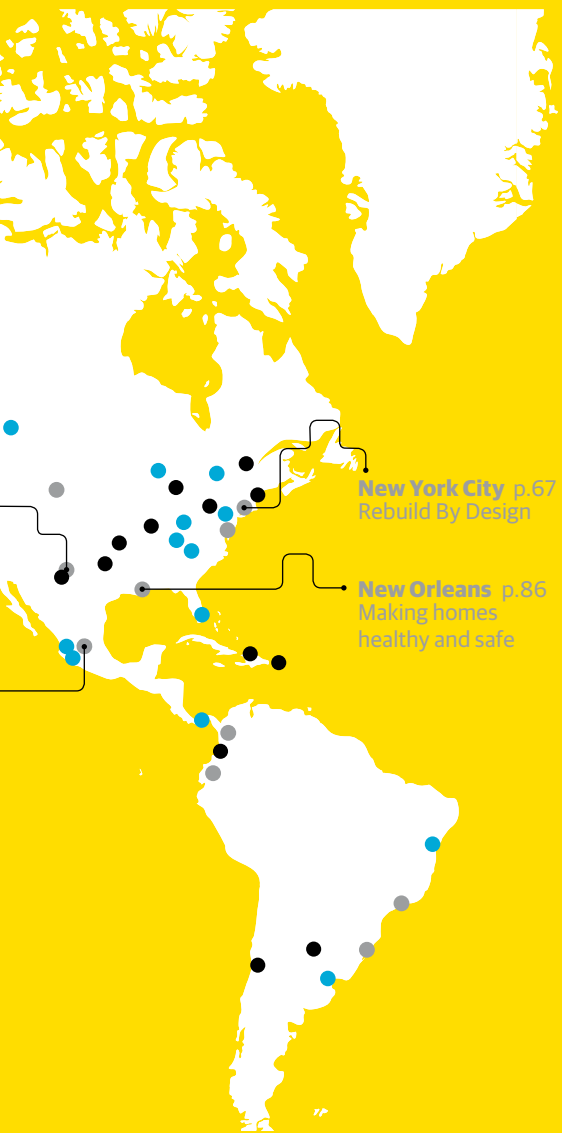


100 RESILIENT CITIES



In 2014 Wellington joined 100 Resilient Cities (100RC) - Pioneered by The Rockefeller Foundation. 100RC helps cities around the world become more resilient to the physical, social, and economic challenges that are a growing part of life in the 21st century. 100RC provides this assistance through funding for a Chief Resilience

Officer in each member city to lead resilience efforts; resources for drafting a resilience strategy, including extensive reports from our Strategy Partner AECOM; membership in a global network of peer cities to share best practices and challenges, and access to a variety of resilience tools.



- ROUND ONE CITIES
- ROUND TWO CITIES
- ROUND THREE CITIES



100RC has brought valuable experience, resources and connections to Wellington.

Participation in the global network of cities developing their resilience strategies enabled us to exchange experiences, and Wellington has been an active member of the network. We shared knowledge and experience with cities facing similar challenges, including Boulder, Rotterdam, Singapore and Melbourne. Some of the ideas we came across are outlined in this strategy.

We are also working with a range of 100RC Platform Partners - a group of leading service providers who offer in-kind support to member cities. Among these are Veolia and The Nature Conservancy.

100RC supports a view of resilience that includes not just the shocks (such as earthquakes, fires, and floods), but also chronic stresses that weaken the fabric of a city on a day-to-day or cyclical basis. This view of resilience is not only about how to maintain a functioning city in emergency situations, but also how to contribute to a higher quality of life by enhancing economic, environmental and social outcomes during good times.

We used 100RC tools such as the City Resilience Framework (CRF) to ensure all of our projects generate resilience co-benefits. Instead of focussing on individual hazards we have focussed on actions that will build qualities such as flexibility, robustness, integration, resourcefulness, inclusivity and continuous learning into all of the city systems - our regulation, communities, infrastructure, and knowledge networks - so Wellington can survive and thrive no matter what shocks or stresses occur.

At the action workshop we came up with 600 ideas to improve Wellington's resilience. Using the CRF as a guide we then developed "power initiatives" that generate the most benefits across multiple resilience drivers, engage a broad range of people, and generate equitable outcomes in the short and long term. We have settled on 30 projects that complement each other and apply across multiple goals and programmes.

The process allowed Wellingtonians to define resilience for their own city, and to come up with the most important areas for investment. This was no easy task, as it quickly became clear that the word resilience means different things to different people. It was very important to build

on experiences around the world and to understand what resilience means for Wellington. Once there was a common understanding, it became much easier to challenge the status quo, and to focus on the areas and initiatives that could really make a difference.

City Resilience Framework

The City Resilience Framework (CRF), developed by Arup and The Rockefeller Foundation, identifies 12 drivers of resilient cities across the areas of health and wellbeing, economy and society, infrastructure and environment, and leadership and strategy. We used this tool to assess the completeness of our current initiatives and understand various city systems' ability to cope with shocks and stresses. We also used it to ensure we had a representative sample of people and organisations contributing to the development of the strategy. The tool enabled us to broaden thinking in Wellington beyond disaster preparedness and recovery and ensure that the initiatives identified will make the best ongoing contribution to building the city's resilience.



Reading this strategy

This strategy is about change. Current and future changes to the ocean, land and our society will drive our decisions.

This strategy is divided in two parts

Our resilience story

Our resilience story tells how we coped with challenges in the past and how we hope to in the future, and sets the vision for Resilient Wellington.

Chapter 1

Looking back.

Chapter 2

2020s - Our society is transforming.

Chapter 3

2030s - The earth is moving.

Chapter 4

2040s - The sea is rising.

Our goals and programmes

We also provide further detail on our goals and individual programmes, the challenges they aim to address, and the specific actions we are planning.

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.

Many of the events in the story are the drivers behind our three goals and the actions contained in this strategy. Look out for our characters in the goals and programmes sections to see how the story and actions connect. Relevant project numbers are highlighted throughout the story.

Our Resilient Wellington vision is that:

As Wellington changes,
everyone here will
survive and thrive.

Wellington's resilience challenges originate from three big systems on the move.

Our society is transforming.

Wellington's population is growing. It is getting older, more diverse and less equitable. Some of our homes, instead of being a source of resilience, are cold, wet and unaffordable. New people are arriving - some will struggle to develop skills and find jobs. Some of our citizens are disconnected from society, living on the streets at the mercy of their mental health issues or substance addictions. Communities and the public and private sectors must share information, trust one another, and work together more effectively to develop a better resilience culture.

The earth is moving in Wellington.

A significant seismic event is inevitable. Current efforts are focussed on saving lives but our buildings will be damaged and it will take time before we can use them again. The energy, transport, water and telecommunications infrastructure that serves our communities, our Government and our business sectors are centralised and vulnerable. Central Wellington generates eight percent of national GDP and 48 percent of regional GDP. If the robustness and integration of knowledge, planning and governance in Wellington isn't improved, the consequences could be socially and economically significant.

The sea is rising.

Extreme weather is already affecting our coastline and low-lying parts of the city, damaging seawalls and flooding homes. More intense rain and wind will cause more flooding in our streets, land slips on our hills, damage natural and built assets, and increase maintenance costs. We are yet to understand climate change's physical, financial, cultural and social implications, and how we should adapt. We have many strengths - including a stunning natural environment and insights from Māori culture on integrating human activities with nature - but we must collaborate within Wellington, New Zealand and even globally to find long-term solutions.





Goal 1
p.40

People are connected, empowered and feel part of a community.

Programme 1.1
Everyone thrives p. 42

We will enable all Wellingtonians to have an opportunity to enhance wellbeing for themselves and their communities.

- 1 Improve access to household resilience items
- 2 Prepare for an ageing population
- 3 Reduce homelessness

Programme 1.2
Community resilience p. 48

We will build on existing strengths to develop innovative programmes that connect and empower communities to improve their wellbeing.

- 4 Help communities build resilience
- 5 Support community spaces in taking on wellbeing and post-disaster roles
- 6 Develop sustainable food networks
- 7 Develop disaster risk management plans for heritage areas

Programme 1.3
Economic resilience p. 56

We will support our business community to improve preparedness and strengthen our economic activity.

- 8 Increase economic resilience of central city and outside hubs
- 9 Help improve business continuity planning
- 10 Improve understanding of workforce trends



Goal 2
p.60

Decision making at all levels is integrated and well informed.

Programme 2.1
Governance p. 62

We will ensure that resilience is integrated into our governance.

- 11 Introduce regulatory tools for resilience
- 12 Review Wellington Lifelines Group
- 13 Maintain monitoring and evaluation of resilience goals

Programme 2.2
Information p. 68

We will make information on all aspects of living in Wellington easily accessible.

- 14 Give Wellingtonians information they need to make decisions
- 15 Develop a virtual reality model of the central city built environment

Programme 2.3
Adaptation p. 72

We will raise awareness about the potential effects of climate change and sea level rise to better emphasise the need for decisions to be made.

- 16 Develop a communications and engagement strategy for the Adaptation Plan
- 17 Encourage climate adaptation actions

Programme 2.4
Recovery p. 76

We will develop a framework for successful recovery from any disruption.

- 18 Undertake recovery planning for the Wellington region
- 19 Carry out post-earthquake housing study



Goal 3
p.80

Our homes and natural and built environments are healthy and robust.

Programme 3.1
Homes and telecommunication p. 82

We will support initiatives that contribute to Wellington homes forming the cornerstone of the city's resilience.

- 20 Help make homes warm, safe and dry
- 21 Support insurance literacy campaign
- 22 Understand the scale of the non-weather-tight homes problem
- 23 Assess the capacity for large-scale remote working

Programme 3.2
Water and natural environment p. 90

We will ensure that Wellingtonians always have access to water services, in a way that enhances our natural environment.

- 24 Improve water systems through ecological interventions
- 25 Explore options for sewage sludge disposal
- 26 Ensure emergency water supply for Wellington Hospital
- 27 Invest in water and wastewater resilience and awareness

Programme 3.3
Transport and energy p. 98

We will work with infrastructure owners to ensure flexibility and robustness of transport and energy services in Wellington.

- 28 Support flexible energy supply
- 29 Support widespread adoption of electric vehicles
- 30 Leverage transportation investment to improve Wellington's resilience

An aerial photograph of a coastal city, likely Auckland, New Zealand. The city is densely packed with residential and commercial buildings, interspersed with green spaces and parks. The city is situated on a peninsula or a narrow strip of land, with a large, deep bay to the north and east. In the background, there are rolling hills and mountains under a clear blue sky with a few wispy clouds. A vertical dashed red line runs down the center of the image, possibly indicating a split-screen or a comparison point. The overall scene is bright and clear, suggesting a sunny day.

To achieve this vision we have committed to three goals and 10 interrelated programmes, each implemented through a series of projects.

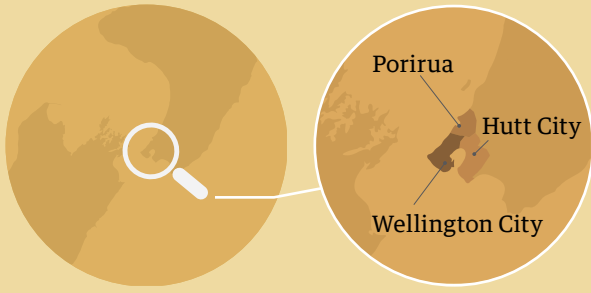


Chapter 1

Looking back

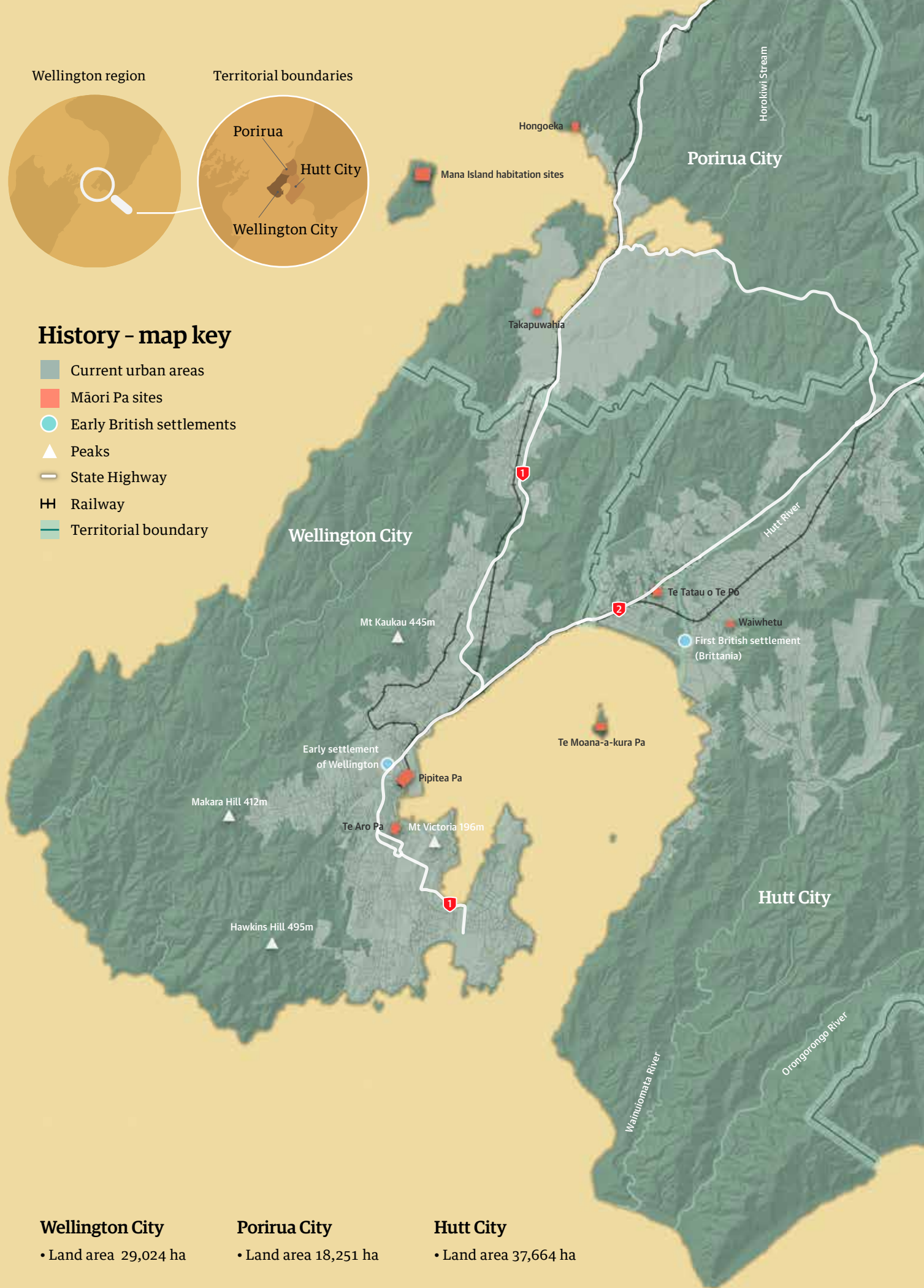
Wellington region

Territorial boundaries



History - map key

- Current urban areas
- Māori Pa sites
- Early British settlements
- Peaks
- State Highway
- Railway
- Territorial boundary



Wellington City

• Land area 29,024 ha

Porirua City

• Land area 18,251 ha

Hutt City

• Land area 37,664 ha

CHAPTER ONE

In Māori mythology, we live on the head of a great fish hooked up from the ocean by the hero Māui. Our rocky harbour entrance and mountain ranges were shaped by restless taniwha.



Modern science tells a different story, but it's no less dramatic.

RUMBLE

We know about upheaval, and we know about survival.



My name is Tania Smith.

My tūpuna came to Wellington with the great Ngāti Toa chief Te Rauparaha.



He'd seen the area's potential as a trading route, but creating a new life wasn't easy.



The first European settlers built a makeshift community in Petone.



Then the river flooded and it was swept away.



They moved across the harbour to where the city stands now, but there was conflict with the local iwi over land.



This shaky start was followed by an earthquake in 1855 so strong that it lifted parts of the seafront and drained the Basin Lake.



It also gave us the chance to rebuild better and stronger.

After Wellington became New Zealand's capital in 1865, our little town's population ballooned by 700%.



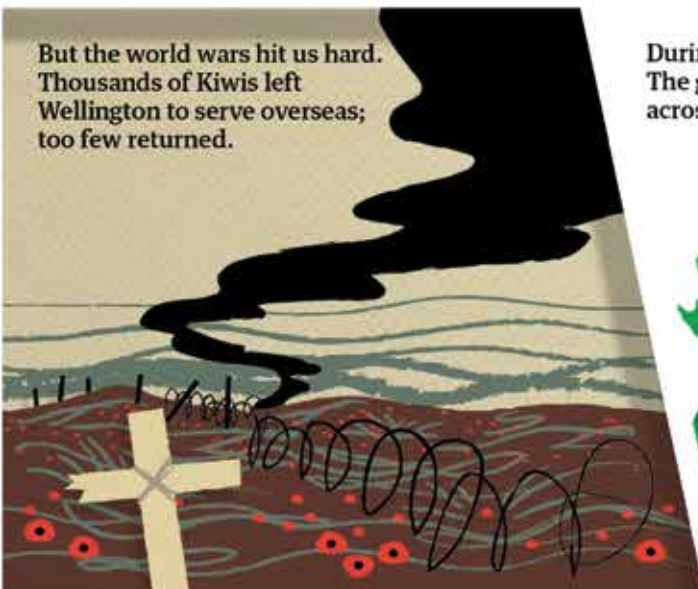
Roads and railways brought people closer, while power, water and sewerage systems made life easier... and cleaner!



In good times, industry thrived.



But the world wars hit us hard. Thousands of Kiwis left Wellington to serve overseas; too few returned.



During the Great Depression, the capital still grew and changed. The government put unemployed men to work on building sites across the city.



Like our war memorial.

Post-war refugees from Europe helped grow our suburbs and our economy, and our workforce was strengthened by a wave of Pacific migrants.



Wellington was spreading out, but new suburban rail lines and motorways made it easy to stay connected.



From the late 1960s, major economic, social and cultural changes transformed the way we saw ourselves. Many businesses left Wellington, and unemployment soared.



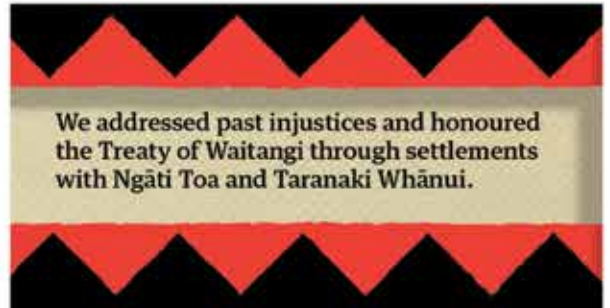
By the 1990s, the capital was making a comeback as "Absolutely Positively Wellington". Workers adapted into service-based and creative industries.



We got behind environmental and social issues, and invested in sewage treatment and waste recycling.



We addressed past injustices and honoured the Treaty of Waitangi through settlements with Ngāti Toa and Taranaki Whānui.



By the turn of the century, Wellington had become truly cosmopolitan. *Lonely Planet* called it "the coolest little capital in the world".

And we want to keep it this way, which is why in 2014 we joined the 100 Resilient Cities programme - Pioneered by The Rockefeller Foundation.



Chapter 2

2020s –
Our society
is transforming

Related projects

Goal 1 - People are connected, empowered and feel part of a community **p. 40**

Programme 1.1 - **Everyone thrives**

- | | |
|------------------------------------|-----------------------|
| 2 Prepare for an ageing population | 3 Reduce homelessness |
|------------------------------------|-----------------------|

Programme 1.2 - **Community resilience**

- | | |
|-------------------------------------|-------------------------------------|
| 4 Help communities build resilience | 6 Develop sustainable food networks |
|-------------------------------------|-------------------------------------|

Programme 1.3 - **Economic resilience**

- | |
|---|
| 8 Increase economic resilience of central city and outside hubs |
|---|

Goal 3 - Our homes and natural and built environments are healthy and robust **p. 80**

Programme 3.1 - **Homes and telecommunication**

- | | |
|---------------------------------------|---|
| 20 Help make homes warm, safe and dry | 22 Understand the scale of the non-weathertight homes problem |
|---------------------------------------|---|

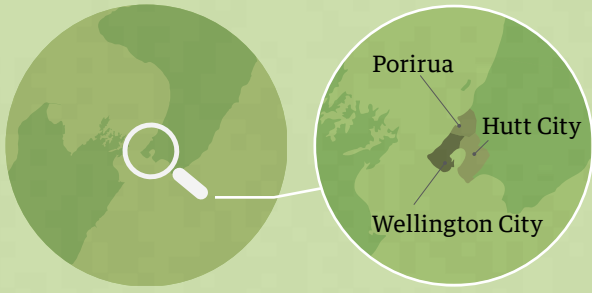
Programme 3.3- **Transport and energy**

- | | |
|-----------------------------------|---|
| 28 Support flexible energy supply | 29 Support widespread adoption of electric vehicles |
|-----------------------------------|---|

- | |
|--|
| 30 Leverage transportation investment to improve Wellington's resilience |
|--|

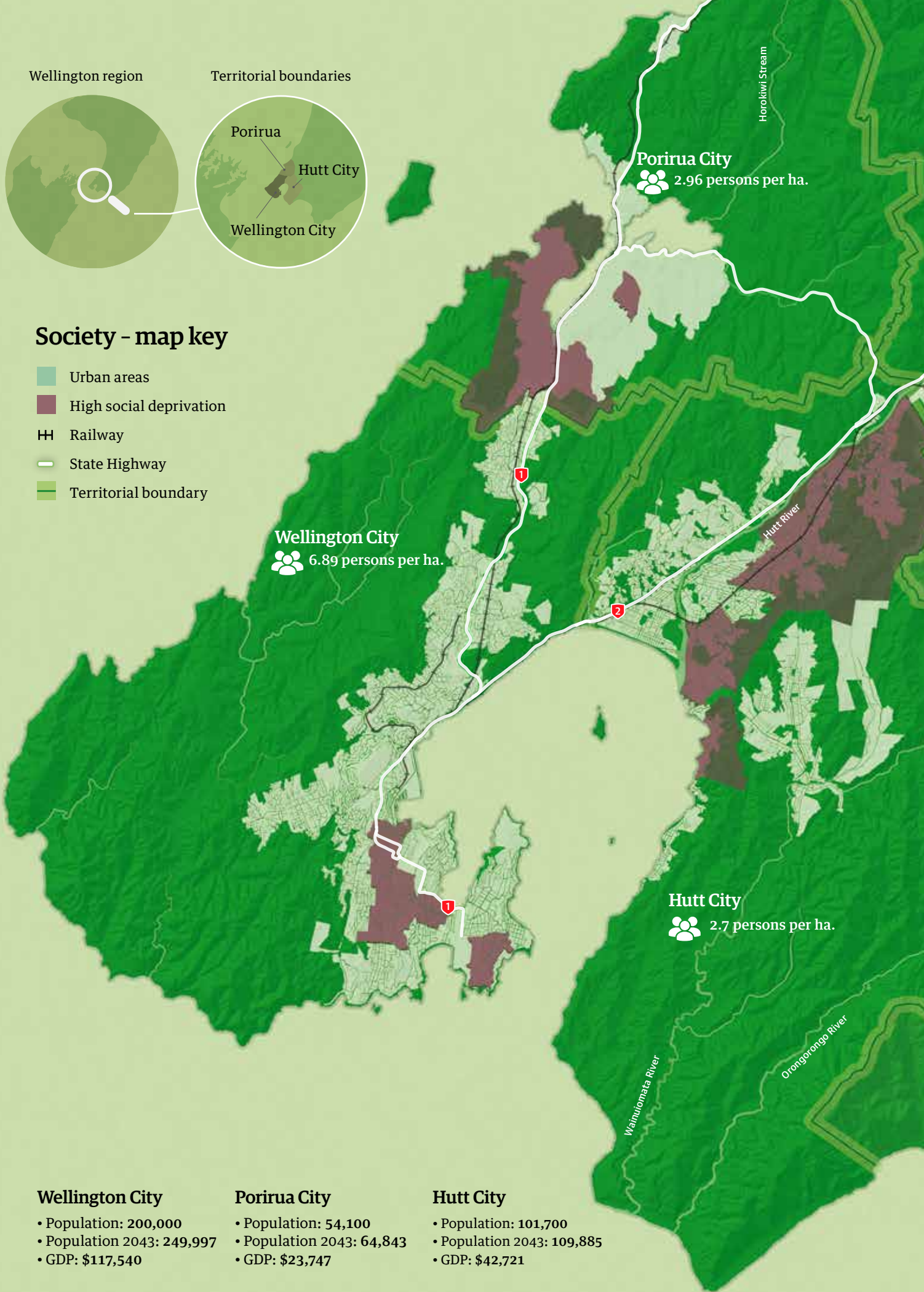
Wellington region

Territorial boundaries



Society - map key

- Urban areas
- High social deprivation
- Railway
- State Highway
- Territorial boundary



Wellington City
 6.89 persons per ha.

Porirua City
 2.96 persons per ha.

Hutt City
 2.7 persons per ha.

Wellington City

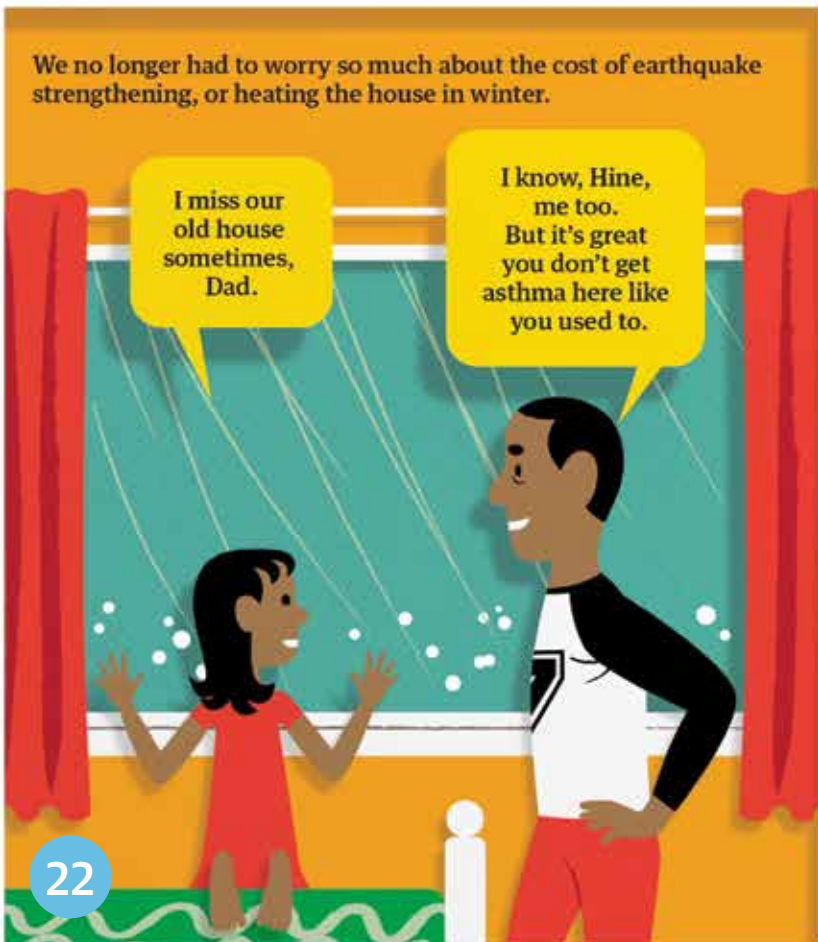
- Population: 200,000
- Population 2043: 249,997
- GDP: \$117,540

Porirua City

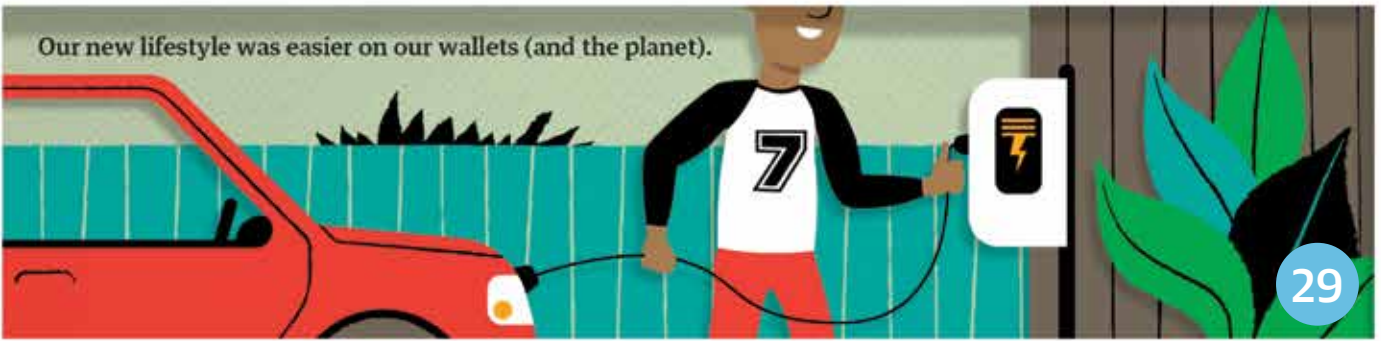
- Population: 54,100
- Population 2043: 64,843
- GDP: \$23,747

Hutt City

- Population: 101,700
- Population 2043: 109,885
- GDP: \$42,721



Our new lifestyle was easier on our wallets (and the planet).



29

While Tama studied law, he set up a mentoring programme for troubled kids.



3

Hine got a part-time job working with the silver surfers.

Great - I've never thought about it that way before!



2

David and I took the plunge and started our own business.

Whatever you don't use, you can sell back to the power company.



When Tama moved out, we thought about using his room as a home office, but decided to rent it out instead.

Wow, you're a writer? Can you help me with my essays?



20

Instead we found a great co-working space in Johnsonville.

There's a residents' association meeting here on Saturday, so I'm shifting my open studio to Sunday.

8



30

...some say we're leading the way

And we've still got the smallest carbon footprint of all Australasian cities!



28

Mostly we just want to make sure everyone gets the chance to thrive.

Mum! Check out my pumpkin!

6



Chapter 3

2030s –

The earth is moving

Related projects

Goal 1 - People are connected, empowered and feel part of a community **p. 40**

Programme 1.1 - **Everyone thrives**

1 Improve access to household resilience items

Programme 1.2 - **Community resilience**

5 Support community spaces in taking on wellbeing and post-disaster roles

Programme 1.3 - **Economic resilience**

9 Help improve business continuity planning

Goal 2 - Decision making at all levels is integrated and well informed **p. 60**

Programme 2.1 - **Governance**

12 Review Wellington Lifelines Group

13 Maintain monitoring and evaluation of resilience goals

Programme 2.2 - **Information**

14 Give Wellingtonians information they need to make decisions

15 Develop a virtual reality model of the central city built environment

Programme 2.4 - **Recovery**

18 Undertake recovery planning for the Wellington region

19 Carry out post-earthquake housing study

Goal 3 - Our homes and natural and built environments are healthy and robust **p. 80**

Programme 3.1 - **Homes and telecommunication**

21 Support insurance literacy campaign

23 Assess the capacity for large-scale remote working

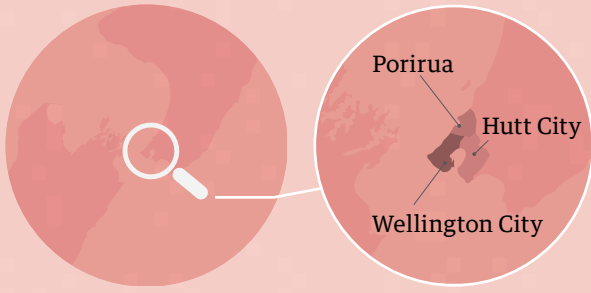
Programme 3.2 - **Water and natural environment**

26 Ensure emergency water supply for Wellington Hospital

27 Invest in water and wastewater resilience and awareness

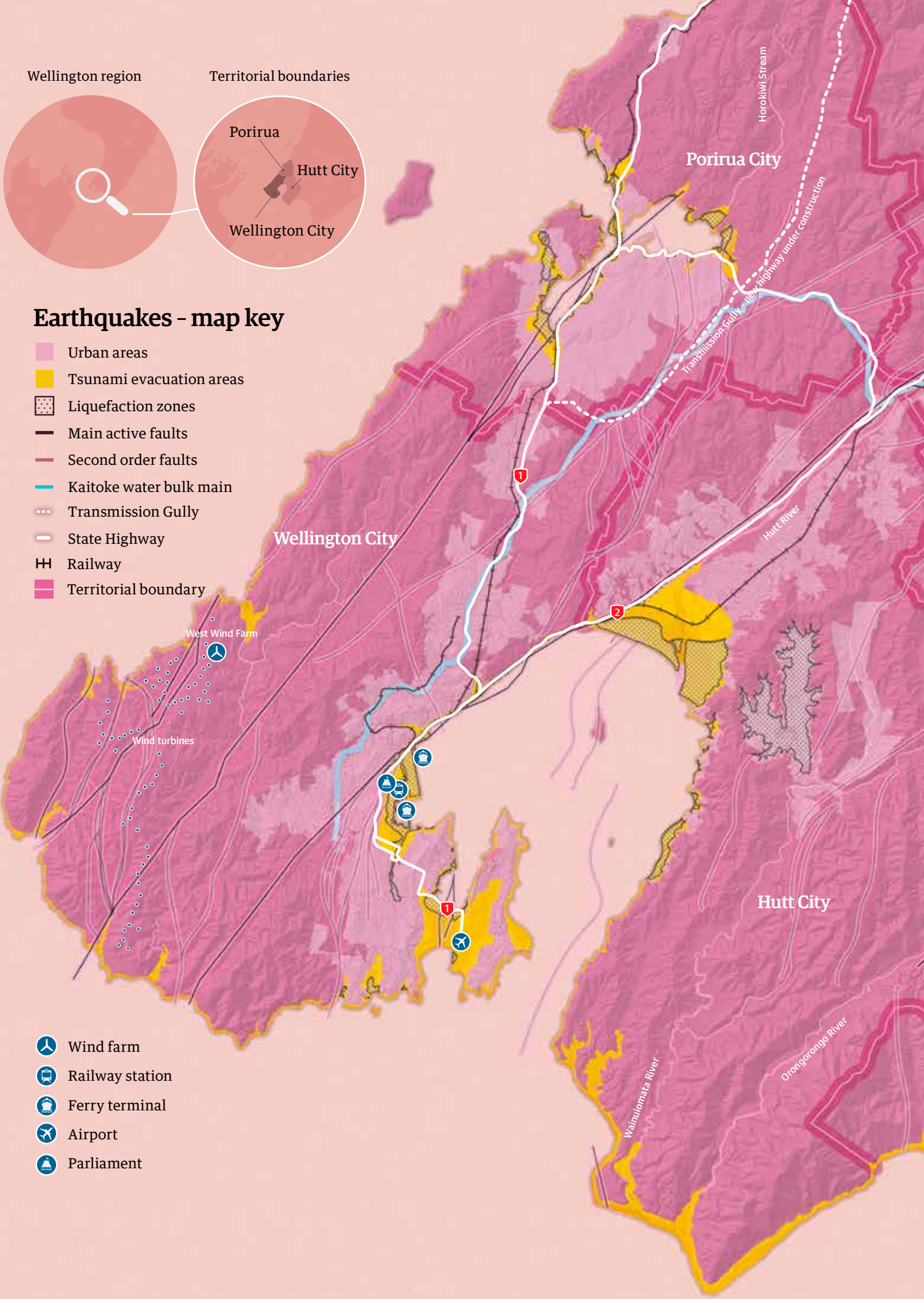
Wellington region

Territorial boundaries



Earthquakes - map key

- Urban areas
- Tsunami evacuation areas
- Liquefaction zones
- Main active faults
- Second order faults
- Kaitoke water bulk main
- Transmission Gully
- State Highway
- Railway
- Territorial boundary



- ⚙ Wind farm
- 🚂 Railway station
- 🚢 Ferry terminal
- ✈ Airport
- 🏛 Parliament

CHAPTER THREE

The 2030s began as good years for Wellington, but it will be remembered as the decade of the earthquake.



It was a terrible experience but we were prepared.



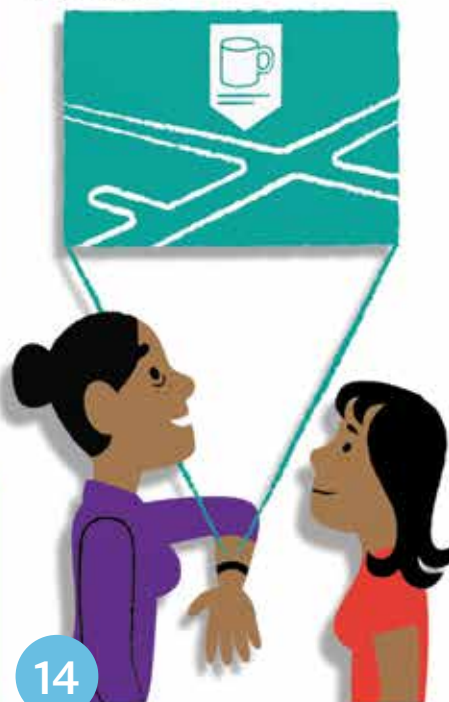
18

We all pulled together to share food...



1

knowledge...



14

...and experiences.

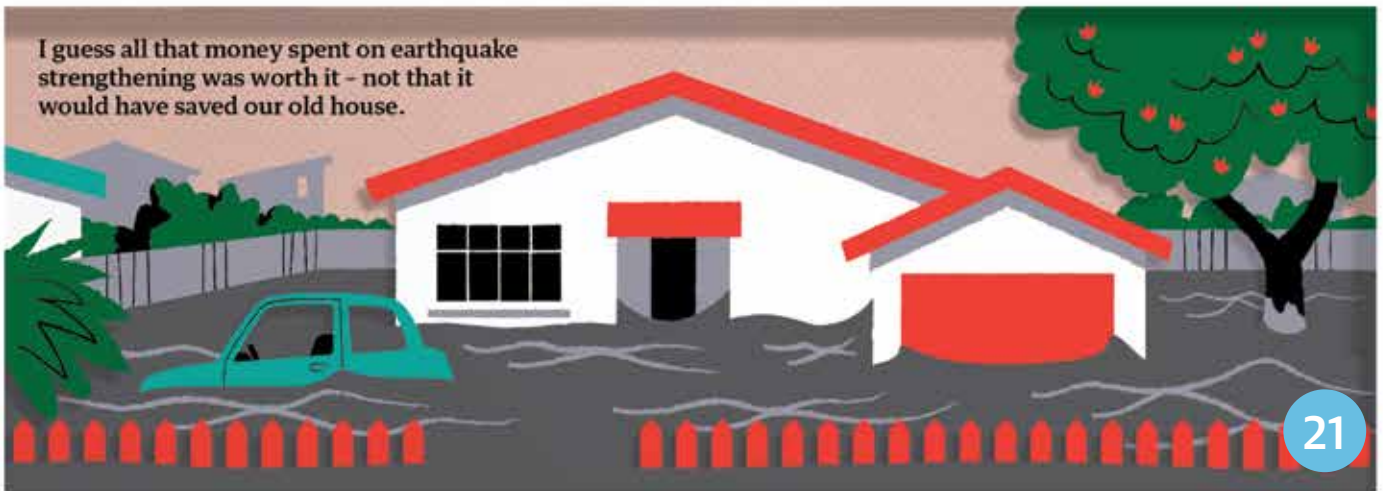


It was incredible more people didn't die in the inner city, and that most of the buildings survived.

It's warm inside - and you can charge your phones.



I guess all that money spent on earthquake strengthening was worth it - not that it would have saved our old house.



It took a bit of flexibility - and decent broadband - but most people were able to carry on working from home.

There's a message here from Sonia - they need their panel reconnected.



Some of our friends had to find temporary accommodation, but at least the councils had already thought about this.



Thankfully we have agreed how we will work together in advance...

12

13



The water pipes failed, but that was no surprise, and we were able to keep the water flowing.



And the money kept flowing too, thanks to our resilience insurance policy.

Yeah, we'll be all right, Mum - all the work on business continuity planning is paying off.

9



Access to a 3D model of Wellington and virtual reality technology meant new business ideas could still get off the ground.

We can operate the drone remotely to recover people's belongings from the red zone.

15



It's been almost 10 years since the quake, and Wellingtonians have shown what they're made of. We didn't just rebuild - we made the city even better than before.

26



Chapter 4

2040s –

The sea is rising

Related projects

Goal 1 - People are connected, empowered and feel part of a community **p. 40**

Programme 1.2 - **Community resilience**

7 Develop disaster risk management plans for heritage areas

Programme 1.3 - **Economic resilience**

10 Improve understanding of workforce trends

Goal 2 - Decision making at all levels is integrated and well informed **p. 60**

Programme 2.1 - **Governance**

11 Introduce regulatory tools (including enforcement) for resilience

Programme 2.3 - **Adaptation**

16 Develop a communications and engagement strategy for the Adaptation Plan

17 Encourage climate adaptation actions

Goal 3 - Our homes and natural and built environments are healthy and robust **p. 80**

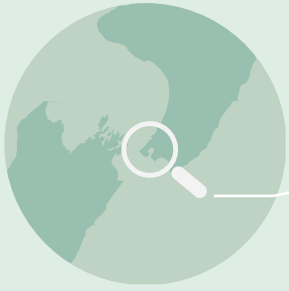
Programme 3.2 - **Water and natural environment**

24 Improve water systems through ecological interventions

25 Explore options for sewage sludge disposal

Wellington region

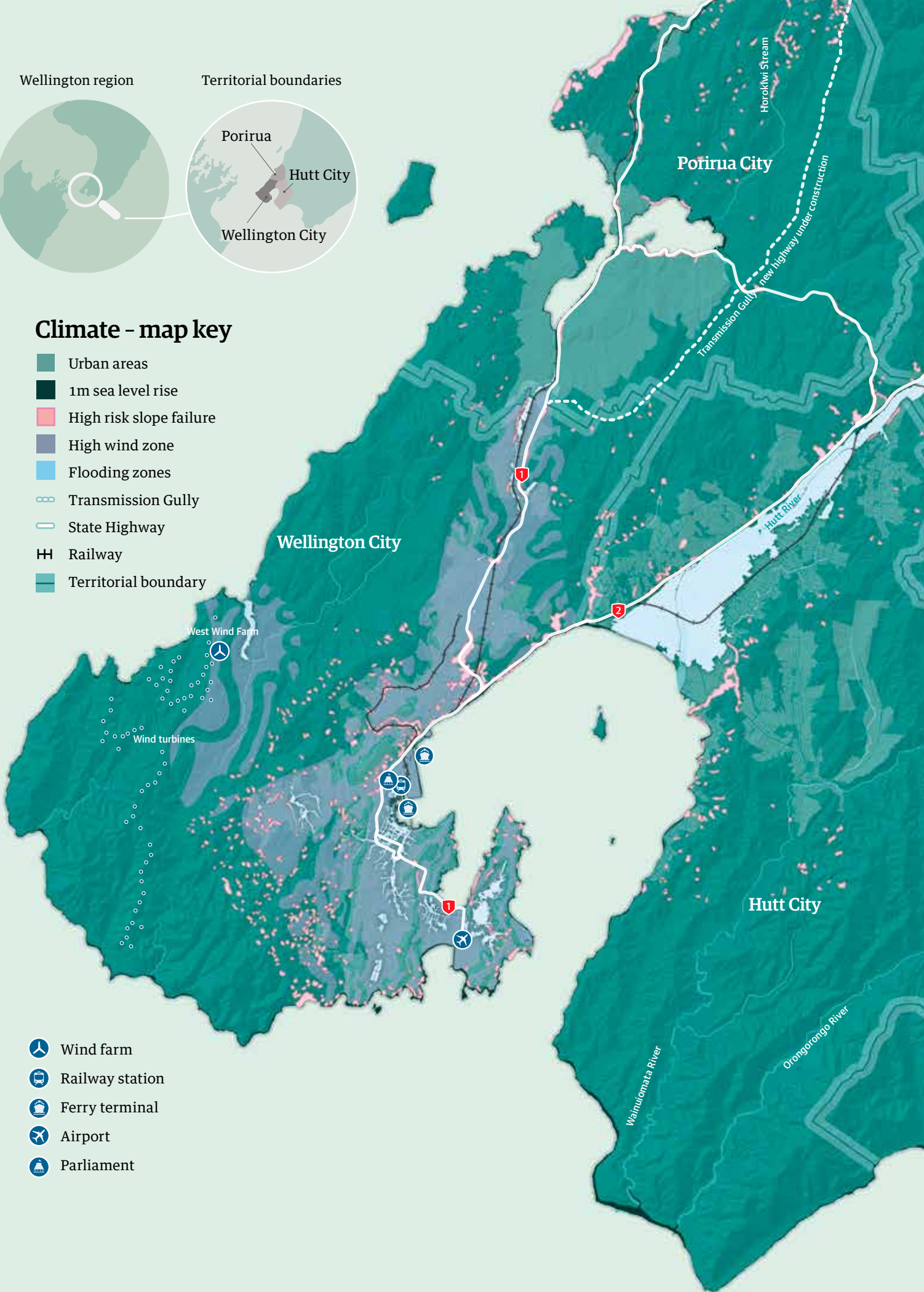
Territorial boundaries



Climate - map key

- Urban areas
- 1m sea level rise
- High risk slope failure
- High wind zone
- Flooding zones
- Transmission Gully
- State Highway
- Railway
- Territorial boundary

- Wind farm
- Railway station
- Ferry terminal
- Airport
- Parliament



CHAPTER FOUR

Note: Blue numbers relate to projects in this strategy

We all knew sea-level rise was happening, but it wasn't until some Pacific atolls went under that it really hit home.



Their people had to go somewhere, and many came to New Zealand. “Climate refugees” is what the media called them. The Niuean couple we hosted were soon more like family.



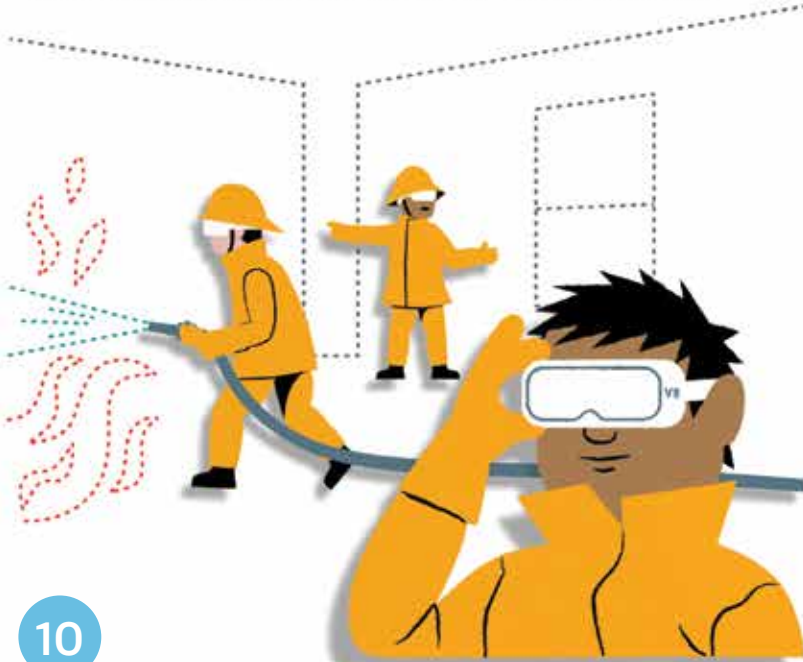
It wasn't just the sea, of course - the weather was changing too, and roads were being washed away. It was time to adapt.



We had help from experts in New Orleans, New York and Rotterdam, who'd already been through it. The work we did on the coast gave people a lot of hope.



Wellywood used to help people escape reality, now it's immersing them in virtual worlds so they can learn to survive reality at its worst.



It's still true what they say: you can't beat Wellington on a good day. But you can't beat it on a bad day either, because it's a city that can deal with whatever gets thrown at it.



10

My granddaughter found a photo of our old house the other day. It made me realise how much has changed since Wellington set its three resilience goals...



11

...and also how much has stayed the same. Wellington's still the world's coolest little capital, and Absolutely Positively Resilient.



7



Goal 1

People are connected, empowered and feel part of a community

Our connections in the community provide us with informal support and shared resources, such as locally grown food, car pooling options, and opportunities to socialise. As our city grows and our systems are stretched, people in communities that are cohesive and empowered will be better able to support each other through disasters, as well as thrive in the face of everyday challenges.

Programme 1.1 **Everyone thrives** **p. 42**

We will enable all Wellingtonians to have an opportunity to enhance wellbeing for themselves and their communities.

Programme 1.2 **Community resilience** **p. 48**

We will build on existing strengths to develop innovative programmes that connect and empower communities to improve their wellbeing.

Programme 1.3 **Economic resilience** **p. 56**

We will support our business community to improve preparedness and strengthen our economic activity.



Programme 1.1

Everyone thrives

We will enable all Wellingtonians to have an opportunity to enhance wellbeing for themselves and their communities.

While most Wellingtonians have high levels of education and income, there are pockets of severe deprivation with high support needs and more limited access to services. Māori, Pasifika and refugee populations are over-represented in these areas. We are also not comfortable with the number of people living rough on our streets in recent years.

This sort of inequality can be a self-fulfilling cycle that entrenches existing disadvantage. Due to increasing pressures on housing affordability, people on lower incomes often have to settle for cold and damp housing in areas with limited access to public transport and other essential services. These factors can contribute to poorer health, reinforcing existing economic

deprivation and social isolation through reduced ability to work, and lower capacity to be prepared for disruptive events.

Wellington's population is also ageing - by 2030 the number of people over 65 will double. This will place increased pressure on our healthcare system and aged care support services, and there will be a smaller percentage of working aged people to fund these services through taxes. We need to reassess how our infrastructure, including housing and our transport system, supports the needs of older residents. Employers will need to prepare for a higher percentage of older workers. Wellington's ethnic mix and skills pool are also changing but we have even less information on that.

Wellington is in an area prone to a range of acute shocks. Our essential services are vulnerable to disruption, meaning that Wellingtonians need to take greater responsibility for their preparedness and ability to ensure their basic needs are met. At present, many Wellingtonians may be unable to access household items and services that can improve their resilience. Some may not be able to afford them, while others may not have access to them due to lack of awareness, physical isolation, or language barriers.

1980

2011

Between 1980 and 2011, New Zealand was in the top five OECD countries in terms of income inequality, with the increasing divide believed to be a significant handbrake on overall economic growth; nationally, income inequality is estimated to have reduced economic growth by almost 15 percent over the last 20 years.

(OECD, 2014)

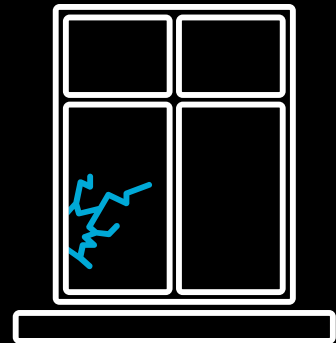


Māori and Pasifika were twice as likely as others to be admitted to hospital for an avoidable condition in the Hutt Valley DHB area, with Māori 70 percent more likely in the Central and Coast DHB area (which takes in Wellington City, Porirua, Tawa and the Kāpiti Coast).

(CCDHB, 2015)

29 percent of Māori and almost half of Pasifika were living in the most deprived neighbourhoods.

(CCDHB, 2015)



1

Improve access to household resilience items

Lead

WCC and WREMO

Scaling up existing regional project

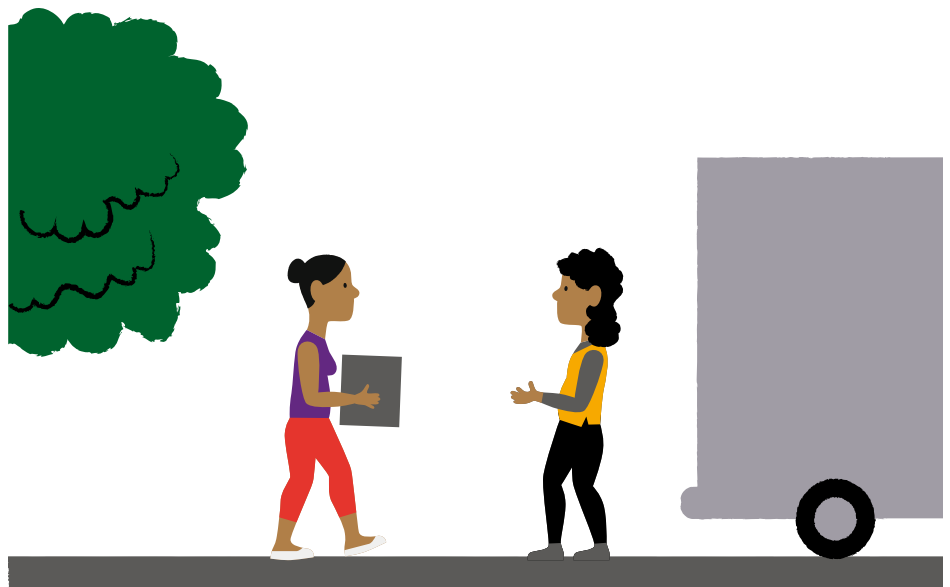
We will improve access to household items that enhance preparedness and recovery, ensuring that all Wellingtonians can survive in their own home for at least the first 7 days after a major shock event.

Action

This project will promote and scale up existing education programmes, services and products such as household water tanks, items for urban agriculture and Grab&Go bags. In addition, we will explore partnership opportunities with the private sector around new, affordable products that improve personal preparedness for shock events and improve day-to-day wellbeing, such as home kits to secure house foundations, and partnerships with nurseries to supply fruit trees and other produce that can be grown at home. The project will also investigate how to reduce cost barriers to access these products through subsidisation and private sector involvement. Other barriers will be considered too - we will partner with local trusted networks (for example, community groups and elders) to broaden the reach into more communities.

Resilience co-benefits

This project will build the capacity of vulnerable Wellingtonians to support themselves in the event of a shock (Project 18). Resilience resources will increase community confidence and also benefit Wellingtonians outside times of shock, improving social cohesiveness and reducing inequality (Project 4).



2

Prepare for an ageing population

Lead

WCC

New Wellington City project

We will plan our transport, housing, health system and social spaces to enable our ageing population to fully participate and contribute to the economic and social life of our city.

Key partners

WREMO, Universities, Office for Seniors

Action

The Council will host a symposium to discuss and share existing local efforts and international best practice in approaches to catering for ageing populations. It will bring together people from a wide range of backgrounds including senior and youth associations, health sector, sport and aged care industry, as well as architects, transport and urban planners. Topics will include examples from other 100RC cities and the WHO Global Network of Age Friendly Cities and Communities.

The symposium will be followed by a research project and spatial mapping of existing services for seniors and a loneliness index. The project will provide recommendations for changes required to prepare for a larger aged population. A multiagency steering group is proposed to oversee the project.

Resilience co-benefits

As a result of this project, our aged population will, over time, have access to more suitable housing, mobility options and healthcare. The project will focus on enabling this growing subset of our community to contribute actively to the economic (Projects 8, 10) and social life (Projects 4, 5) of our city, thus generating benefits for us all. Applying universal design principles will make our housing and open spaces more flexible and inclusive (Project 20). This will also ensure seniors are able to cope in an emergency as well as to provide support for others.



By better integrating seniors into society we will enhance their ability to cope in an emergency as well as provide support for others.



Bristol

Inspiration from the 100RC Network - Homes4Bristol

Rather than searching for the elusive ‘silver bullet’ solution to homelessness, Bristol has settled on a mature and realistic mix of approaches to combat what is invariably a complex problem.

Bristol is building on already successful programmes (such as better use of otherwise empty homes) to combat homelessness.

The city is now investing in early intervention and better co-ordinated social services to prevent homelessness in the first place, with a particular focus on youth. At the same time, Bristol deals assertively with the existing problem. This is supported by analysis that reinforces co-benefits to healthcare and other policy areas if homelessness can be prevented in the first place. There is further focus on making it easy for people to move on as soon as they are ready, and to prevent repeat homelessness.

Wellington will continue to look to Bristol and other parts of the 100RC network to combat homelessness.

3

Reduce homelessness

Lead

WCC

Scaling up existing city project

We will reduce street homelessness in Wellington and integrate the most vulnerable people into society by enabling access to housing and partnering with health, social services and other support agencies.

Key partners

Housing New Zealand, Te Whakamura Ai te Ahi

Action

Te Mahana is a community driven strategy to reduce homelessness in Wellington. Given that Māori are over-represented in those experiencing homelessness, the strategy has been built with strong Māori input, providing a cultural perspective on homelessness, which is essential to changing outcomes for Māori in this area.

The work of Resilient Wellington has identified that the additional success of this strategy will require greater investment and focus. The programme will be expanded so that frontline staff can work one-on-one with homeless people - this project will provide funding and training for these staff.

Resilience co-benefits

As well as building greater awareness of the challenge posed by homelessness in Wellington, this project will give more of our citizens a chance to be self-sufficient and an opportunity to contribute meaningfully to our communities (Projects 4, 10, 18).



Preventing homelessness should start with looking after our mental health.

Programme 1.2

Community resilience

We will build on existing strengths to develop innovative programmes that connect and empower communities to improve their wellbeing.

Resilient cities are integrated and resourceful. They harness connections between systems and institutions to generate multiple benefits, seeking better ways to use existing resources. At the core of these principles is sharing - something most Wellingtonians do regularly. We have a number of start-ups related to car sharing and communal gardens, and we have realised the benefits of shared spaces for innovative thinking through initiatives such as the BizDojo community space and Urban Agriculture programme.

This idea of sharing is nothing new to Māori, for whom manaakitanga² and papakāinga³ are traditional values. These values came to the fore in the response and recovery phases of the Canterbury earthquakes. Marae

facilities around the country, including Wellington, were opened up to the whole community for accommodation, catering and support. Māori communities were among the hardest hit by the earthquakes, and marae became a central hub for the Māori response and recovery.

Following the earthquakes, the marae network wasn't just about buildings and facilities. It was as much about leadership and governance - leaders with the autonomy to act quickly within an existing chain of command. These same attributes will be critical in addressing Wellington's next major shock and chronic stresses.

Wellington's changing size and demographics require us to think differently about how we design and use

our urban areas and common spaces. A key part of this will be multi-purpose places that enable safe gathering during or immediately after a shock, drive social connections and innovation every day, and provide a location for shared and distributed infrastructure. If these spaces are to meet the needs of our communities, we'll need to forge meaningful partnerships to understand their diverse and evolving needs, ensuring they are actively involved in decisions around new spaces and infrastructure. While neighbourhoods will always be important, it's also about engaging with communities of interest, as well as virtual communities who connect online.

2 Hospitality, kindness, generosity, support - the process of showing respect, generosity and care for others

3 Original home, home base, village, communal Māori land

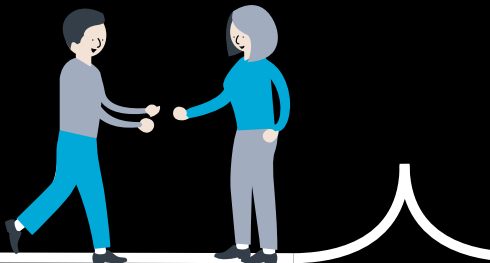


Currently, 90 percent of Wellingtonians feel they have someone to rely on for help if faced with physical injury or illness, or if in need of support during an emotionally difficult time.

(WCC, 2015a)



Ten percent do not. That's not acceptable. We are working to develop 'zero tolerance to loneliness' in Wellington.



We are looking at how we can expand successful ideas in our #wellynextdoor programme such as Neighbours Day Aotearoa and Growing Neighbourhoods.

Neighbours Day Aotearoa's purpose is to build community resilience, stronger neighbourhoods and to encourage neighbours to get to know each other because in emergencies they're likely to be the first to help.

Growing Neighbourhoods connects people with food and is a great way to increase social interaction.

Existing efforts to build our resilience - Strathmore 44

Strathmore 44 is an example of a programme where challenges including poor urban design, aged social housing and high levels of deprivation were addressed with a community-led process. A community priority is the need for an innovative space that delivers services, social interaction, and meets cultural needs, ensuring a resilient, collaborative community. This grows trust, pride and collaboration.



In July 2012, the nine councils of the Wellington region amalgamated their respective Civil Defence Emergency Management functions. The resulting organisation, WREMO, is a semi-autonomous organisation with a small core of staff that draws on the resources of the region's councils, as well as the benefits of modern technology. The organisation has been structured

with more than one-third of its resources dedicated to working with and empowering communities to build resilience to an emergency event.

This approach includes heavy investment in community development and participation, placing a strong emphasis on end-user perspectives and fostering robust social networks that help people address the challenges in their day-to-day lives, as well as those that occur following a major shock event.

With the Joint Centre for Disaster Research, WREMO is a founder of the International Centre of Excellence for Community Resilience.

4

Help communities build resilience

Lead

WCC, WREMO

Key partners

**Communities, Neighbours Day Aotearoa, NZ
Red Cross, NZ Post**

Scaling up existing regional and Wellington City projects

We will develop and grow innovative programmes that empower communities to increase people's wellbeing and emergency preparedness, connecting them to each other and their city.

Action

This project builds on existing engaged and connected communities, as well as current community resilience programmes. It will be run in two streams coordinated by the Council and WREMO.

The Council will expand the #wellynextdoor programme and, with the community, develop a series of events in streets and apartment buildings. It will also expand the existing participatory, place-based, co-design approach to community planning used in Strathmore Park and Newtown to develop similar projects in other communities in the future. The team will identify opportunities to develop new community spaces, such as community dojos, where a range of people and organisations can use the space to increase social connection and cohesion. All of these places need to be included in disaster planning as alternative shelter and work spaces. We will explore options to make funding accessible to groups and organisations that may not be legal entities.

WREMO will scale up its community response and resilience planning with councils throughout the region to expand opportunities to address community vulnerabilities and incorporate urban planning at the neighbourhood level. They will work with local leaders to build on their existing strengths and develop tailored community-led initiatives. WREMO, with support from key partners, will be offering emergency preparedness training and community preparedness workshops with schools, businesses, NGOs and residents. This will include a new Community Leadership module that will focus on helping local leaders direct their communities through change and times of stress.

The two streams of work are complementary, and a collaborative, participative approach to their design and delivery activities will be taken. They will also link the initiatives with wider planning frameworks.





Resilience co-benefits

Engaged and empowered communities are at the heart of Wellington’s resilience. This project builds further opportunities for neighbours to meet and make changes to their community that improve their day-to-day wellbeing, while at the same time developing connections and collaboration skills that are essential in emergencies.

The project will support flexible and inclusive local initiatives with specialist knowledge and resources. The Council and WREMO will ensure the initiatives are coordinated at a regional level and are well connected to urban planning and other city functions.

Increased community investment in neighbourhoods will lead to healthier and safer communities, generating education and employment opportunities and improving day-to-day wellbeing.

This project relates strongly to action on household resilience (Project 1), community spaces (Project 5), new economic hubs (Project 8) and climate action (Project 17).

Helping communities to become resilient is not just about disaster preparedness. Increased community investment in neighbourhoods will lead to healthier and safer communities, generating education and employment opportunities and improving day-to-day wellbeing.





5

Support community spaces in taking on wellbeing and post-disaster roles

Lead

WCC,WREMO

Key partners

Communities, Victoria University School of Architecture and Design

Scaling up a Wellington City project

We will optimise new and existing multi-purpose spaces where communities can interact in good times, as well as after emergency events.

Action

Drawing on WREMO's community response planning and the Council's urban development process, the project team will work with land use planners, infrastructure owners, iwi and businesses to draw greater benefits from multi-purpose spaces in Wellington.

The project team will build on existing work by Victoria University of Wellington School of Architecture and Design to expand their research on the city's open space network for post-disaster housing, economic continuity, education and healthcare provision. The team will undertake an assessment to identify the potential for new and existing spaces such as parks, gardens, community dojos, offices and cultural venues to be developed or redeveloped to incorporate a disaster resilience component (such as water sources, food production, electricity, shelter and so on) while enhancing them to maximise their contribution to community wellbeing. A special focus will be given to providing space for volunteers. Ensuring these spaces are accessible to vulnerable Wellingtonians, such as the elderly, ill and recent arrivals, will be a key consideration in this process. Enabling local communities to be part of the design/redesign of those spaces is also critical to ensure they meet evolving needs.

These places will be the key locations for back-up power and water supply as well as for storage of maintenance and emergency supplies.

Resilience co-benefits

All Wellingtonians have the opportunity to benefit from this project. Rethinking our existing open and community spaces so they can serve multiple purposes supports the quality of resourcefulness - seeking to do more with what we have, sometimes at little additional cost (Project 6 and 24). When well designed, those new or redeveloped spaces will provide people with enhanced opportunities to connect and collaborate in good times (Project 4), build valuable knowledge and networks (Project 8) (like skills or resources to help recovery), as well as enable people to self-organise more easily in the event of a major disaster.

Those spaces will play a major role in ensuring people have access to basic services - food, water, shelter, warmth and so on - soon after a major disruptive event (Project 18).

6

Develop sustainable food networks

Lead

WCC

Scaling up a Wellington City project

We will develop a sustainable food network building on current initiatives and creating new programmes that meet social and health needs as well as ensuring a robust food distribution network post emergency event.

Key partners

Food distribution network, Sustainability Trust

Action

The Council will expand its current urban agriculture programme to map and connect existing community food projects. We will identify partnership opportunities with groups targeting child obesity, type 2 diabetes, families in need, marae, mental health, seniors, refugees, and prisons to develop new community gardening projects. We will also identify communities in need and establish coordinators there to run community garden programmes.

We will support the establishment and growth of local food businesses through the Good Food educational and mentoring programme and community funding. We will also explore food distribution models to develop a plan for Wellington in the event of a shock.

Resilience co-benefits

This project will teach potentially vulnerable Wellingtonians how to grow food for their own use and to establish small businesses. This can support their physical and mental health, wellbeing and provide a new source of income (Projects 1, 2, 10). The project provides an opportunity for refugees, aged or other people disconnected from the wider society to integrate back into their neighbourhoods (Project 3).

It also makes more local food available in an event where Wellington has reduced connection with the rest of the country (Project 18).

Urban agriculture can support physical and mental health, wellbeing and provide a new source of income.



7

Develop disaster risk management plans for heritage areas

A sense of place - of who we are and what we stand for - is a big part of resilience. We need to protect it.

Lead

WCC

Scaling up a Wellington City project

We will develop risk management plans for selected heritage areas to guide pre-disaster investment.

Key partners

Building owners, MBIE

Action

This initiative sets out to identify the most highly valued heritage areas, and to formally plan to invest in their resilience.

The Government has recognised that unreinforced masonry facades and parapets in Wellington present a risk to public safety, and has allocated funding to mitigate the risk. Many of the relevant buildings are in heritage areas. The Council will use a risk management framework to work with relevant agencies and building owners to better secure these heritage assets.

Wellington is already strengthening earthquake-prone buildings; this initiative will provide prioritisation for funding and the development of guidance for post-event decision making. It will also consider ways disaster resilience investment can improve the use of heritage places.

Resilience co-benefits

Pre-event preparedness will allow robust and considered post-event action, enabling us to better protect our sense of who we are and what we stand for. This project will enable more inclusive management of our heritage. It will be incorporated into wider community resilience building work (Project 4, 5, 14).





Byblos

Inspiration from 100RC network - Byblos's approach to managing their heritage

Byblos has dedicated a pillar of its Resilience Strategy to the protection and celebration of its natural and cultural heritage as a catalyst for improved economic development, community engagement, participation and social cohesion. The city worked with Platform Partner Swiss Re to conduct a tsunami simulation on the Old Port after it was damaged by storm Zina in January 2015. Old Port and some older religious buildings have been confirmed to be at risk from coastal flooding. It is predicted that the largest tsunami could create a 6-metre wave in the port area; this type of event has a return period of around 2000 years, while a smaller tsunami of 1-3 metres may re-occur every 300-1000 years. Following the work undertaken, Byblos is developing measures, guidelines and frameworks to protect the city's historic assets, including developing affordable restoration techniques for property owners to carry out. Training and implementation is being incentivised by loans and tax deductions.

Programme 1.3

Economic resilience

We will support our business community to improve preparedness and strengthen our economic activity.

Over recent years, Wellington has experienced significant growth in the numbers of people working, living and playing in the central city. This has helped enhance Wellington's compact urban form, with more people living close to where they work, with easy access to essential services and little need to own a car. A major challenge will be continuing to provide access to quality services as the residential population of the central city more than doubles by 2043.



As home to New Zealand's Parliament and Government, higher skilled services and public governance services contribute about two-thirds of Wellington City's GDP. This leaves us vulnerable to disruptive events such as earthquakes and terrorist attacks. As large tracts of the central city are also vulnerable to inundation in a future affected by sea level rise, there is a strong case to be made for spreading the risk by strengthening our central city at the same time as other commercial centres.

Our central city currently provides

77%

of total GDP for Wellington City

48%

for the Wellington region

8% of national GDP

(Infometrics, 2015a)

1-2%

A significant earthquake in Wellington could result in New Zealand losing about 1-2% of its current GDP per year.



The Net Present Value of such a loss over time would be about

\$30-\$40 billion

(BERL, 2015)

Over 90 percent of businesses in Wellington have nine or fewer employees. While small can mean agile, small-to-medium enterprises (SMEs) can also be especially vulnerable to disruptions to their supply chain and essential services, particularly if they have not planned ahead (Grow Wellington Ltd, 2011). Over the last year, WREMO has run free business continuity planning

workshops attended by 120 Wellington businesses. However, this is only a fraction of all businesses in Wellington - among many SMEs there is still limited understanding and uptake of business continuity planning.

But building Wellington's economic resilience is not just about being prepared for disruptive events - it also means better understanding

what segments of our economy will grow and provide future employment. An important element of this work will be partnering with our educational institutions and the private sector to ensure we have the right mix of skills for future industries. This will mean providing opportunities for workers to retrain and upskill for the jobs of the future.

8

Increase economic resilience of central city and outside hubs

Lead

WCC

New regional project

We will reduce the vulnerability of the central city and improve the capacity of outside hubs to carry out more economic activity.

Key partners

Chambers of Commerce

Action

The Council, in partnership with other councils, business and community groups, will assess the economic resilience of the central city, Karori, Johnsonville, Tawa, Lower Hutt, Upper Hutt and Porirua. The product will be a set of recommendations on how to reduce vulnerability in the central city and generate economic opportunities in the hubs.

Resilience co-benefits

The central city is both the most productive and the most vulnerable part of Wellington. This project sets out to involve interested parties in a structured way, ensuring inclusiveness with broad consultation and communication; and learning from the positives and negatives from Wellington's story so far, as well as from Christchurch and overseas (Project 18).

The project will improve Wellington's resilience to major disasters by building economic redundancy throughout the region, but it will also generate an opportunity to diversify our economy and prepare it for future demands and a changing workforce (Projects 8, 5, 10).

The central city is both the most productive and the most vulnerable part of Wellington. This project aims to build economic redundancy targeting new areas and new industries.



9

Help improve business continuity planning

Lead

Chambers of Commerce

Key partners

WCC, WREMO

Scaling up existing regional project

We will improve the level of business continuity planning by small-to-medium enterprises (SMEs) in Wellington.

Action

Currently, around 100 SMEs per annum participate in the existing WREMO business continuity programme. At little or no cost to businesses, this project aims to improve the reach of the existing WREMO programme by enlisting the support of other agencies, such as the Chambers of Commerce, the Wellington Region Economic Development Agency and the Earthquake Commission, to promote the programme and other opportunities for planning, with a view to 1,000 SMEs per annum participating. The intent is to develop an SME culture where continuity planning, including insurance, even at a rudimentary level, is part of normal business in Wellington. The mode of delivery will be active, with positive engagement on business locations, as well as the current offering.

Resilience co-benefits

Wellington’s business community will be better prepared to face shocks and quickly resume operations following a major disruptive event, such as an earthquake. This will help keep Wellington’s economy ticking over, as well as provide Wellingtonians with access to the services they need.

Business continuity planning will also help SMEs reduce the impact of minor disruptive events (such as equipment failures). The benefits also go beyond preparedness - business continuity planning requires organisations to examine their business process, which can identify opportunities to make operational improvements that increase overall competitiveness and efficiency as well as engagement within the business. This also relates to recovery planning (Project 18), connective capacity for working from home (Project 23) and insurance literacy (Project 21).



In a disaster it is critical that SMEs can quickly resume their operations. By investing to resilience SMEs will also improve their competitiveness and efficiency.

10

Improve understanding of workforce trends

Lead

WCC

New Wellington City project

We will work with a range of partners to undertake a study to better understand future workforce trends and investigate ways to prepare for them.

Key partners

Chambers of Commerce

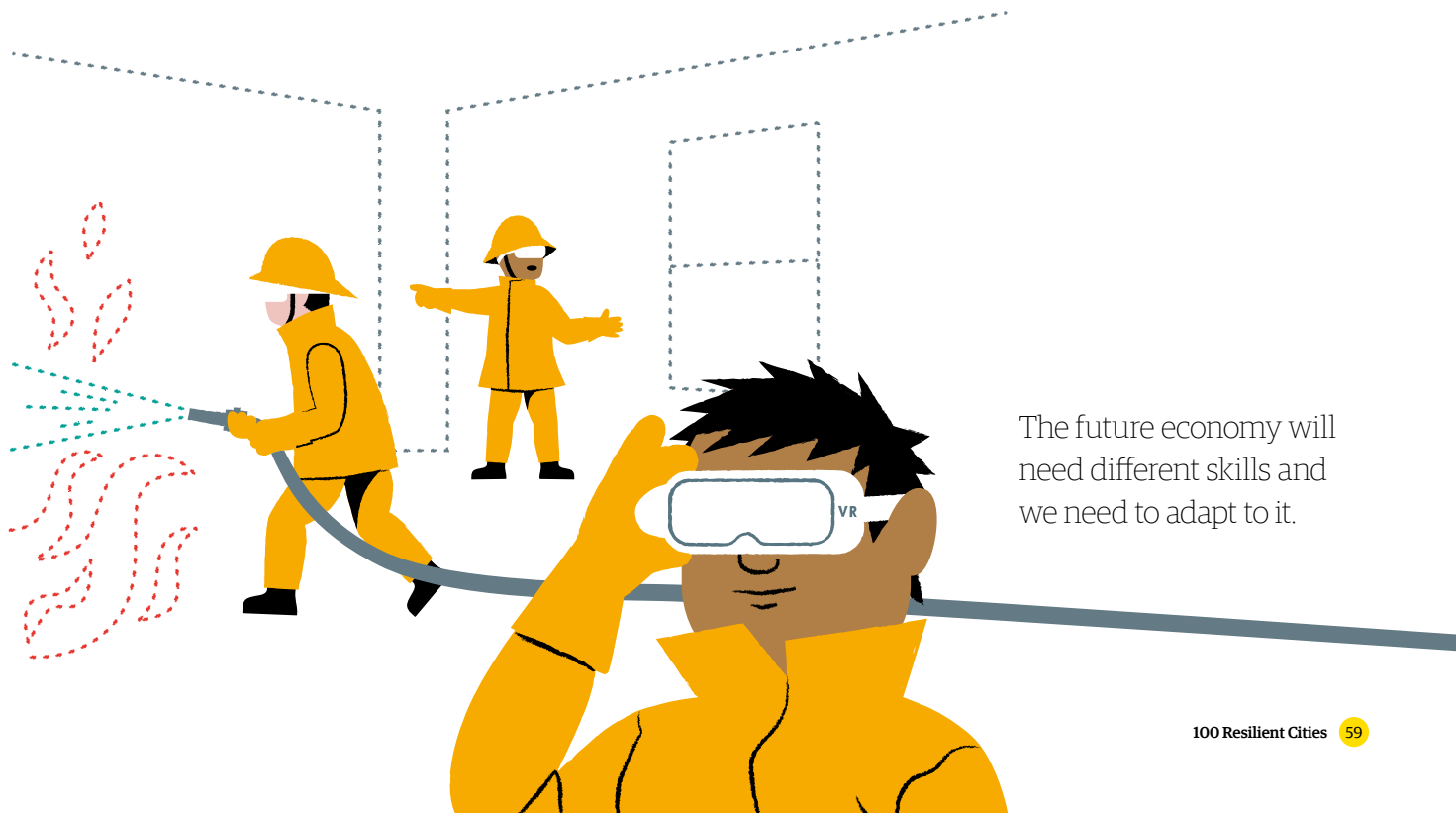
Action

We recognise a resilience challenge for Wellington in relation to changing workforce requirements. The future economy will need different skills and we need to adapt to it. We will undertake a study to better understand this challenge and how we can respond to it. This will include an analysis of short to medium-term economic predictions, the offerings of existing tertiary learning institutions throughout the region, and how existing resources can be better harnessed to capitalise on future opportunities.

Resilience co-benefits

Changes in the economy and the way products and services are developed are transforming the way we work. This project aims to reduce Wellington's overreliance on government services and allow the city to take opportunities to diversify the economy. There are clear links with our work on ageing population (Project 2) and economic hubs outside of central city (Project 8).

The future economy will need different skills and we need to adapt to it.





Goal 2

Decision making at all levels is integrated and well informed

.....

While we can't predict the future, we can help people make more informed decisions that take into account not only the shocks we are likely to face, such as earthquakes, but also the slow-burning trends and stresses that undermine our quality of life. The result will be a well-prepared city with the services and facilities that support the evolving needs of our communities.

Programme 2.1 **Governance** **p. 62**

We will ensure that resilience is integrated into our governance.

Programme 2.2 **Information** **p. 68**

We will make information on all aspects of living in Wellington easily accessible.

Programme 2.3 **Adaptation** **p. 72**

We will raise awareness about the potential effects of climate change and sea level rise, and develop an adaptation plan that emphasises the need for future decisions and actions.

Programme 2.4 **Recovery** **p. 76**

We will develop a framework for successful recovery from any disruption.

Programme 2.1

Governance

We will ensure that resilience is integrated into our governance.

Many Wellington organisations and institutions are implementing programmes aimed at improving the resilience

of the city and region. While it is important for grassroots programmes to be allowed to flourish without unnecessary administrative burdens,

there is a risk that we will miss opportunities for collaboration and co-benefits without appropriate coordination and governance.

There is a clear business case for investing now to improve the resilience of our critical infrastructure.

The seismic strengthening done by Orion Energy, a utility provider in Christchurch, is a prime example of how good investments pay off.

Approximately **\$6 million** was spent before the earthquakes on increasing the resilience of their network



which is estimated to have saved Orion

\$30-\$50 million

in direct asset replacement costs. This does not take into account the broader social and economic benefits.

(Kestrel Group Ltd., 2011).

Despite this benefit, our current governance models and methods of prioritising investment - which may be based on relatively short payback periods - don't often encourage this kind of proactive approach.

Prioritisation will be different for each asset, and we will need to consider how different assets depend on each other. For energy, this requires strategic engagement with the Government regarding the regulatory framework, supported by economic analysis. For transport and water, asset owners need to be explicitly aware of the costs and risks of investing in resilience, and the costs and risks to the community if choosing not to invest. Ultimately, it is communities that will pay for resilient infrastructure, and they must be able to make conscious choices with the best information available.

The expected growth in our central city will require innovative thinking around service provision. Achieving this will also require innovative governance - rather than thinking first about

infrastructure, we will need to support businesses and retailers in talking directly with communities. This will help them to better understand the vulnerability of services and infrastructure that is needed in mainly

apartment-based living, and a service-based economy, as well as coordinate the physical risk management activities of Wellington utility and transport service providers.



Wellington Lifelines Group (WeLG) brings together in-depth technical knowledge of the risks and management of Wellington's key assets. The challenge is to use this knowledge to stimulate effective action.

Following a major shock, we need to ensure the basic needs of Wellingtonians can be met. The best time to do this is before a shock rather than during or following an event.

Convincing communities to invest can be difficult when there is no immediate need. If investment in resilience can somehow improve people's daily lives, then this becomes easier.

Combining traditional infrastructure solutions with decentralised and natural approaches will require new skills and take time, meaning our current lifelines remain extremely important. Thinking about resilience during the planning, construction and operation of our key infrastructure assets and other future projects provides an opportunity to achieve more balanced outcomes. By taking a more inclusive and integrated approach aimed at understanding the specific needs of end users, we can better prioritise future investment in assets and recovery planning. For example, an electric fleet of buses could be used as mobile generators in an emergency.

11

Introduce regulatory tools (including enforcement) for resilience

Lead

WCC

New Wellington City project

We will assess regulatory options to mitigate future liabilities of liquefaction, flooding, sea level rise and other hazards, and to build resilience into our city's decision making.

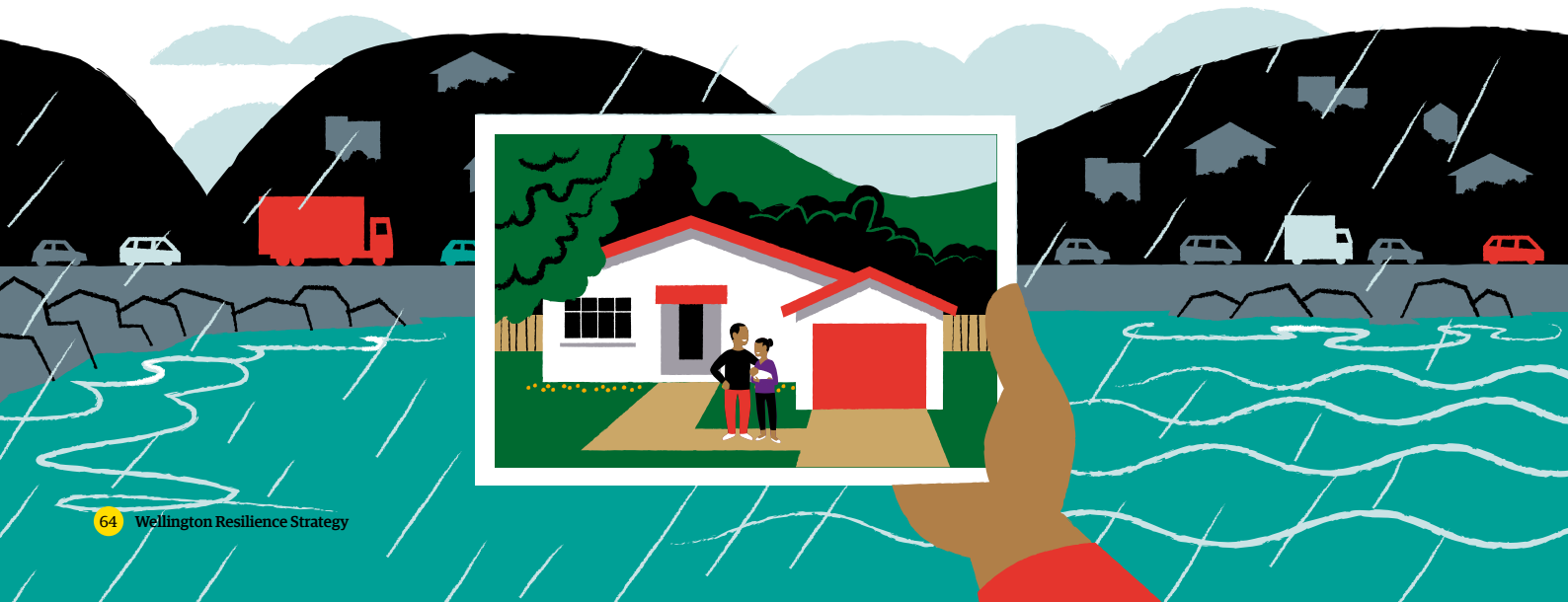
Action

The Council will assess possible regulatory responses to improve resilience to the impacts of sea level rise, earthquake, liquefaction, and tsunami, including options to amend land use through the District Plan, building regulation and non-regulatory options to require residents to secure their homes (including chimneys, joists and verandahs), and emergency water storage requirements. Options for supporting wider resilience through regulation will also be explored. The project will include assessment of the economic impact of regulating and not regulating.

Resilience co-benefits

This project seeks to reflect on the lessons learned from the Christchurch earthquakes and make sure they inform Wellington's planning. It will prepare the city for both response to and recovery from natural disasters (Project 18), but will also ensure the city continues to learn and innovate during quiet times (Project 5, 20, 24).

Wellington City has a number of regulatory tools at its disposal. We need to use them well.



Lead**Wellington Lifelines Group***Existing regional project*

In partnership with the Wellington Lifelines Group (WeLG), we will better communicate the vulnerabilities of our city's lifelines to leaders and decision makers in order to prompt and prioritise action.

Key partners**Wellington City, Porirua, Lower Hutt councils****Action**

WeLG will coordinate a programme to ensure asset owners are making Wellington's decision makers aware of the effect on communities of vulnerabilities in lifelines (power, water, telecommunications and transport in particular), and that the interdependencies of these lifelines is a key focus. This programme will centre on what is required to ensure community needs (such as clean water, sanitation, energy, and communications) are met under all circumstances, which will then inform decision making about infrastructure.

The programme will bring Transpower, WWL, WE* and NZTA together with Wellington, Porirua and Lower Hutt councils to assess the vulnerabilities associated with local authorities in our region.

The programme will also include analysis of all Wellington infrastructure to provide a clear understanding of the benefits and costs of investing and failing to invest appropriately. It is expected the existing Measuring the Economics of Resilient Infrastructure (MERIT) tool will be used as it is well understood by Treasury, who will be a key player in future investment decisions, but other approaches will also be investigated.

Resilience co-benefits

This project will help set expectations for decisions makers, while strengthening key relationships with partners. It will help to communicate the risks of living in Wellington and lead to formal commitment from key players. More reflective collaboration and action will in turn lead to more resilient approaches to meeting community needs, including more robust networks. This will result in water, energy, telecommunication and transport services able to withstand significant shocks while enabling communities and economy to thrive every day.

The Resilient Wellington initiative has revealed that we do not fully understand the likely economic impacts of a major shock to Wellington. Results from the MERIT study would greatly enhance our understanding of where to focus investment to maximise benefits for disaster resilience. The analysis will also outline the costs and consequences of inaction and failure to invest in resilient homes and infrastructure. WLG will be an essential partner in the recovery planning (Project 18).

13

Maintain monitoring and evaluation of resilience goals

We will maintain momentum generated in the strategy phase to empower various stakeholders to build resilience into their projects, facilitating ongoing learning and collaboration with the 100RC network.



Lead

WCC

New Wellington City project

We will maintain the momentum generated by the strategy development process through a formal governance structure to oversee the implementation and review of the strategy.

Key partners

Resilient Wellington Steering Group

Action

The Resilient Wellington Steering Group brought together for the development of this strategy will remain in place to oversee strategy implementation and to coordinate resilience efforts across the city.

Steering Group members will be expected to contribute to robust and constructive discussion to ensure implementation of the strategy is a success. They will consider the progress of each project in regards to timeliness, budget, outcomes and barriers to implementation. Members will also have a public role, acting as champions of Wellington's resilience and celebrating key achievements with the community and media. The Steering Group is expected to formally report to the Wellington City, Lower Hutt and Porirua councils annually in February. We will link the project to other Wellington governance bodies such as the Joint Committee and the Coordinating Executive Group to ensure integration, good governance and strategic overview.

In 2019 the Steering Group will be asked to make recommendations on improvements to the strategy to the Council, including recommendations for adding or removing projects, objectives, shocks and stresses, and other recommendations as members see fit. This is an opportunity to revise the strategy's approach in light of progress and changes to the local, regional, national and international situation.

The Chief Resilience Officer will manage the implementation of the strategy as set out in the Implementation Plan. This will maintain momentum generated in the strategy phase and empower various stakeholders to build resilience into their projects, facilitating ongoing learning and collaboration with the 100RC network.

Resilience co-benefits

The Resilient Wellington Steering Group acting as Wellington resilience champions will ensure the strategy is implemented in an efficient and collaborative way, and will ensure that resilience efforts continue in the future.

This project will hold key people to account for the resilience tasks they have been allocated. This in turn will provide elected officials and others with the assurance and transparency required for good governance.



New York City

Inspiration from the 100RC network - New York Rebuild By Design

Following Superstorm Sandy, the city of New York realised that a shift in thinking was required. A shift away from simply responding to disasters, and towards investing in planning, preparing and designing the City to deal with the disruptions that will be part of the next century.

The Rockefeller Foundation and the Department of Housing and Urban Development used the Rebuild By Design competition to achieve a collaborative approach to build resilience into future New York. The process focussed strongly and deliberately on collaboration, engagement and understanding challenges before starting to contemplate potential solutions. This avoided the temptation to leap to conclusions, and ensured the groundwork was properly completed.

The approach was a popular success, and Rebuild By Design is now its own organisation, using its design approach to help cities to invest before disasters strike. Mexico City, San Francisco, Rotterdam and others now use the approach for specific planning challenges in their own environments, using ecological and landscape design techniques to address climate related challenges.

As Wellington works to understand and respond to vulnerabilities like sea level rise and flooding, we will take heed of Rebuild By Design's collaborative and visionary approach.

Wellington is not in the business of waiting for disasters and responding to them. Like Rebuild By Design, Wellington is in the business of coming together with communities to invest in smart interventions that benefit people - today and tomorrow.

Programme 2.2

Information

We will make information on all aspects of living in Wellington easily accessible.

We hold tremendous amounts of data about our city, but despite this, most Wellingtonians still find it hard to access reliable and easy-to-use information to inform key life decisions, such as the earthquake and climate risks of a property they are interested in. This sometimes means Wellingtonians make decisions that place them at heightened risk from disruptive events, which increases the burden on government and community organisations to provide support if this happens.

We have some difficult decisions to make, like the future of our coastal properties. We need to improve how we bring our economic, demographic, scientific and other information together to inform decision making and future investments. A key part of this will be using more open-source approaches that empower our residents to make well-informed decisions of their own.

As a knowledgeable and creative city, we also have the resources at our disposal to build our resilience in more innovative ways. We can combine these strengths to cater for a range of different audiences and learning styles. For example, creating virtual reality environments to help visualise the impacts of natural hazards and collaborate on solutions, or devising art installations, films and events that encourage creativity and steer action around adaptation and preparedness.

44%

of Wellington City's workforce holds a bachelor's degree or higher



We are also the film and creative capital of New Zealand

WE ARE HOME TO



3 Crown research institutes



3 universities

(Profile.id, 2016c).



Mexico City

Inspiration from 100RC network - The Great Model in Mexico

Mexico City is developing an interactive city model, La Gran Maqueta de la Ciudad de México, which represents a technological leap toward sustainable urban planning for the city. The model allows experts, citizens and the private sector to have a visual and manageable representation of city data, past and present. “The Great Model” is accompanied by a technological display that explores the complexity of the Mexican capital, its origins, its emotions and its urban evolution. There are also multimedia installations, most of which are interactive and participative; a consultation room; a large format audio-visual installation; the latest generation touch screens; maps; plans; and hundreds of photographs, giving visitors an experience for all the senses. Mexico City is the only city in the country to be a member of C40, so alongside the 100 Resilient Cities programme, they are ahead of the majority with the formation of databases and high regulatory benchmarks aligned to international standards.

14

Give Wellingtonians information they need to make decisions

Lead

WCC

Existing Wellington City project

We will bring together a wide range of data on Wellington and make it available so that citizens, researchers, investors and visitors can use it to make their own decisions and plans.

Key partners

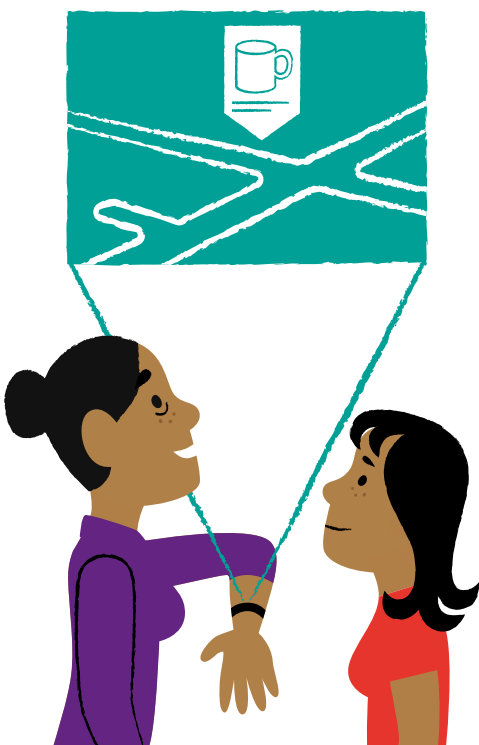
NEC

Action

Working closely with end users and partners, the Council will develop an online information hub to connect citizens with available information about all aspects of living in Wellington. In the first instance this will involve developing an intelligence system to support post-earthquake building inspections - this will draw on emerging sensor technology to better inform decision making. The hub will also include information around hazards such as sea level rise, liquefaction, tsunami, ground shaking, as well as opportunities like volunteering, social support, funding and shared community resources. This will be a virtual collaboration space building on and connecting existing services like #wellynextdoor, Neighbourly and the Community Resilience Map. It will be based on open source data and informed by real-time sensors around the city. The hub will be robust and designed to be accessible during a major shock event.

Resilience co-benefits

The project enables responders, citizens, researchers, investors and visitors to better participate in decision making. While the project will enable people to better understand the types of natural disasters they might encounter (Project 18), it will also provide for more engaged and connected communities (Project 4). People will be able to make their own decisions in light of the available data.



15

Develop a virtual reality model of the central city built environment

Lead

WCC

New Wellington City project

We will develop a model of Wellington’s central city that uses 3D, virtual reality (VR) and augmented reality (AR) techniques to better communicate information about Wellington and its hazards.

Key partners

NEC

Action

Technology plays an increasingly important role in how Wellingtonians communicate and engage with information. We have an opportunity to draw on our gaming and tech sectors to improve awareness of Wellington’s hazards by developing a 3D/VR model of the central city and simulations of how it could be affected by events such as earthquakes and sea level rise. This could be used by emergency management agencies and first responders, as well as the general public.

Resilience co-benefits

This project will increase awareness and preparedness among groups in Wellington that may otherwise be unprepared (Project 18), as well as continuing to build capacity within our technology and academic sectors (Project 10). It will also be a mechanism for further public conversations and engagement across levels of government.



We will draw on our gaming and tech sectors to inspire action on resilience.

Programme 2.3

Adaptation

We will raise awareness about the potential effects of climate change and sea level rise, and develop an adaptation plan that emphasises the need for future decisions to be made.

Climate change presents some extremely difficult decisions around the future of existing infrastructure. As we operate, maintain and rebuild our assets,

we have an opportunity to build resilience qualities, including preparedness for climate change and earthquakes, into much of the infrastructure that will service

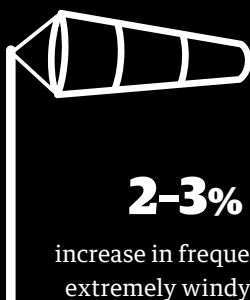
Wellingtonians for decades to come. Achieving this requires climate adaptation to be embedded into the decision making of our governments, utilities and businesses.

By 2090, Wellington is projected to have:



30%

waves in Wellington could be approximately 30% higher



2-3%

increase in frequency of extremely windy days



0.6-1.5m

sea level rise between 0.6 - 1.5 m



6 to 40

extra days per year where maximum temperatures exceed 25°C



rainfall

More frequent and intense heavy rainfall events

However, this won't be easy. In a city where most people live within three kilometres of the coastline, we face some challenging discussions about future land use. One of the most difficult aspects of rising sea levels is the impact on people's homes, which for many are not just their homes but also their financial security now and for their grandchildren. While coastal property owners are increasingly seeking to protect their property, some measures

may conflict with the wider public and environmental values of preserving natural coastal character, amenity, and public access. There is also a wider community conflict of who pays, and who gets to make decisions.

In Wellington we have an opportunity with National Institute of Water and Atmospheric Research (NIWA) to develop a participatory approach to discussions with coastal communities about coastal adaptation issues, including supporting tools and information.

Our Māori communities have been here the longest; they have recovered from more shocks and stresses than most, and have evolved a network and knowledge that is pivotal for Wellington's resilience. The concept of kaitiakitanga⁴, guardianship of the natural environment, will remain prominent.



A truly forward-looking resilience strategy must spare more than a thought for our Pacific Island neighbours such as Cook Islands, Tokelau and Niue. The Intergovernmental Panel on Climate Change (IPCC) has identified these small island states as being the most vulnerable countries in terms of adverse climate change impacts. Not only are we geographically close to many of these nations, but we share strong cultural ties. Today, eight percent of Wellington's population is Pasifika - many of these Wellingtonians have people they know and love who will look to them for support in a future affected by rising sea levels.

(Profile.id, 2016b).

In partnership with Central Government and aid agencies, we will need to be prepared for a likely future where a large number of climate refugees seek new homes in our region. This means ensuring we can continue to meet the needs of our residents while also meeting international obligations and maintaining Wellington's reputation as a welcoming and compassionate city. This means providing adequate support services to allow new arrivals to flourish and contribute meaningfully, such as English language lessons and vocational training.



4 Guardianship, stewardship, trusteeship, trustee

Develop a communications and engagement strategy for the Adaptation Plan

The project will prepare us for difficult decisions concerning sea level rise.

Lead

WCC

New Wellington City project

We will raise awareness among coastal communities about the potential effects of sea level rise to better emphasise the need for decisions to be made in this area and prepare ground for the future Adaptation Plan.

Key partners

Hutt City Council

Action

This project is a preliminary step to prepare communities for the likelihood that decisions will need to be taken in the future to adapt to the effect of changing sea levels and behaviours.

We will talk with coastal communities to decide how we will plan for sea level rise. Engagement could be through a series of formally constituted community representative groups/panels, including elected officials, iwi, schools and other educational facilities to co-design approaches for dealing with sea level rise.

The project will look for ways to preserve our natural coastal environment and its ecosystem services.

Resilience co-benefits

The project will start conversations with communities about climate change and especially sea level rise to make the process of developing our Adaptation Plan more inclusive and reflective (using good experiences from our other community resilience work - Project 4).

The project will maximise the use of natural infrastructure to protect the coast from storm damage and preserve our beaches and dunes, which are essential to Wellington's quality of life (Project 24).



17

Encourage climate adaptation actions

Lead

WCC

Existing Wellington City project

We will encourage action on climate adaptation by providing funding for innovative projects and increasing awareness of the issues.

Key partners

Research and education, arts and sports sectors

Action

We will work with the education, arts and sports sectors to develop new, creative and engaging ways of communicating about climate change and take every opportunity to communicate about sea level rise.

We will also modify the Low Carbon Challenge to include climate change adaptation initiatives that promote environmental restoration and community cohesion. Finally, we will introduce a Wellington climate change adaptation fund to help cover the future costs of infrastructure redevelopment and other works required to deal with the effects of sea level rise.

We will work with climate entrepreneurs in other 100RC cities such as New Orleans, New York and Rotterdam to forge new links and inspire new ideas.

Resilience co-benefits

By using co-design principles and allocating funding to grassroots initiatives we will generate an opportunity to build stronger and more engaged communities (Project 4) by empowering people to make informed decisions about their future.

By collaborating with people around the world, using co-design principles, and allocating funding to grassroots initiatives we will turn climate threat into an opportunity.



Programme 2.4

Recovery

We will develop a framework for successful recovery from any disruption.

While the Wellington region includes eight Territorial Authorities (TAs) and a regional authority - each with its own jurisdiction - our cities and districts are inseparable. Many of us live in one city or district and work in another, and much of our critical infrastructure serves multiple parts of the region. Large-scale shock events - such as big earthquakes, water contamination incidents or major storms - have no regard for jurisdictional boundaries. One issue we already know to be a challenge for our recovery across

the Wellington region is temporary housing. We lack good information on what percentage of homes would be uninhabitable in the event of a major natural disaster, although the number is expected to be significant.

At present, the Wellington region has limited arrangements and plans in place to deal with regional scale coordination after a major shock event felt across the region. The Kaikoura earthquake tested those systems and we now have a better idea of what is needed. By having

tough discussions now about post-event leadership and governance, we can strengthen partnerships and improve coordination for when disaster strikes, as well as building more cohesive communities in good times. This will need to include all TAs in our region, Central Government, lifelines, private sector organisations, and communities themselves. This increased coordination may also help find solutions to other problems, such as growing inequality and housing affordability constraints.



Christchurch

Inspiration from 100RC network - Learning from our sibling, Christchurch

As Christchurch has recovered from the trauma of the earthquakes, people have rightly been focussed on future promise rather than past trauma. For Wellington, that past contains some valuable pieces of information given the seismic profile of the capital, and given the Kaikoura earthquake experience. While Wellington and Christchurch do not share exactly the same geography, they have similar governance and decision-making environments, infrastructure networks and cultures.

The 100RC network has given Wellington extra impetus and resource to allow the lessons from Christchurch and Kaikoura, good and bad, to be considered and, where appropriate, included in Wellington's planning and business.

We are working closely with the Department of the Prime Minister and Cabinet and the Canterbury Earthquake Recovery entities, analysing information around governance, collaboration with Central Government, effects of liquefaction and vulnerability of centralised infrastructure. Some of the examples especially relevant for Wellington include the following.

- **Recovery planning:** Clear recovery expectations, roles and responsibilities are often discussed but rarely actioned. There is no reason not to plan for post-shock Wellington and to be open about who will be expected to do what.
- **Focus on small business:** Generally, corporates can take care of themselves. But SMEs are a large part of Wellington's economy. There are some simple things SMEs could have done in Christchurch to reduce the trauma. Wellington SMEs have the opportunity to do these things pre-event.
- **Your home is your castle:** Without a safe haven, people are emotionally vulnerable. There are simple things we can do in our homes so they can be the social, emotional and economic mainstay of our personal and collective resilience.

Undertake recovery planning for the Wellington region

While preparing the city for recovery from a major disaster, this planning process will also help strengthen relationships between key stakeholders.

Lead

WREMO

New regional project

We will develop a Pre-disaster Recovery Framework and facilitated process to guide post-event decision making.

Key partners

Wellington, Hutt and Porirua councils,
Wellington Chamber of Commerce, Wellington
Regional Economic Development Agency

Action

WREMO will develop a recovery framework addressing all types of shocks and stresses to “prepare the region to partner” by addressing the varied interests of local councils, the region as a whole, the private and community sectors as well as central government. The framework will be developed to inform resilience investments across the built, social, economic, natural and cultural environments.

We will facilitate a planning process with key stakeholders in the private, community and government sectors to develop a shared recovery vision and provide greater clarity of governance arrangements, roles and responsibilities, decision-making frameworks and clear linkages to resilience related investments. Ultimately, it will aim to create the right conditions for a positive recovery by preparing the region’s many diverse stakeholders to partner effectively through a shared recovery framework.

The framework will embody the lessons learned from the Kaikoura and Canterbury earthquakes. We will explore the balance of life safety and earthquake damage. The project will link closely to other resilience projects such as Wellington Lifelines (Project 12) and Info Hub (Project 14).

Resilience co-benefits

The planning process will help to communicate the risks of living in Wellington and get formal commitment from key players that would be needed to work towards a shared recovery vision in a post-event environment. While preparing the city for recovery from a major disaster, this planning process will also help strengthen relationships between key stakeholders. It will allow us to continue mitigating risks and improve Wellington’s resilience to ongoing stresses.



19

Carry out post-earthquake housing study

Lead

WREMO

New regional project

We will undertake a study to understand the constraints and opportunities for providing shelter and housing through the response and recovery phases after a significant seismic event or other shock affecting property.

Key partners

Wellington, Hutt and Porirua councils

Action

WREMO will undertake a temporary housing study to understand options for emergency response and recovery planning. It will address emergency and transitional shelter options, temporary housing options, live-in-place and repair options, alternative uses for existing open spaces, as well as potential finance assistance models for housing recovery. This project will examine options for various earthquake and flooding scenarios where temporary accommodation might be required, and will outline any gaps in capacity, with recommendations for how this might be addressed.

Resilience co-benefits

This project will provide decision-makers with a clearer understanding of the capacity and capability for temporary accommodation, enabling this to be built into response and recovery planning (Project 18). While this is primarily focussed on earthquakes, as these are most likely to require large-scale temporary housing, the outcomes of this project could apply to other shocks as well. A co-benefit of this study will be identifying possible sources of temporary accommodation that could assist with the ongoing challenge of homelessness (Project 2) or temporary housing for climate refugees (Project 16).



While largely focussed on earthquake response, this study could assist with homelessness and temporary housing for refugees.



Goal 3

Our homes and natural and built environments are healthy and robust

Access to safe, warm, affordable and physically robust housing is a basic human right. Providing this for all Wellingtonians will boost quality of life across our city, supporting better health and education, particularly among our most vulnerable. Our homes will be supported by the right mix of assets and infrastructure - one in which natural and built assets work together in the face of a changing climate to sustainably meet Wellingtonians' basic needs, such as clean air, safe drinking water and energy.

Programme 3.1 **Homes and telecommunication** p. 82

We will support initiatives that contribute to Wellington homes forming the cornerstone of the city's resilience.

Programme 3.2 **Water and natural environment** p. 90

We will ensure that Wellingtonians always have access to water services, in a way that enhances our natural environment.

Programme 3.3 **Transport and energy** p. 98

We will work with infrastructure owners to ensure flexibility and robustness of transport and energy services in Wellington.



Programme 3.1

Homes and telecommunication

We will support initiatives that contribute to Wellington homes forming the cornerstone of the city's resilience.

Safe, warm housing is a basic human need, but meeting this need can be expensive in Wellington. Nationally, New Zealanders spend around 23 percent of their gross disposable income on housing (seventh among OECD countries - OECD, 2015), while in Wellington City housing is considered severely unaffordable due to median prices approaching six times the median household income. It is estimated the city will need an additional 21,400 houses by 2043 to meet demand (WCC, 2015b).

Despite the high prices, the standard of housing for many Wellingtonians is inadequate. Wellington's hilly terrain means some areas do not receive much

sun, and housing can be cold, damp and prone to mould and borer. It is well documented that poor quality housing drives significant health and energy costs across the country, although the scale of the problem is not well understood in Wellington. The greatest concerns about housing quality are most often about rental properties, which are the homes of our most vulnerable citizens including immigrants, students and young families. In many cases these homes are also the least resilient to earthquakes.

Improving the quality of these homes will not be cheap, and limited insurance literacy means that restoring homes following

a major shock event may prove difficult for many. This stems from recent changes to house insurance, where only a fixed sum is insured, rather than the total replacement cost. The result is that many Wellingtonians may not have sufficient cover to resume the same standard of living following a shock like a major earthquake. In addition, research by Massey University (2013) found that only 21 percent of New Zealanders had income protection or disability insurance, meaning most would have limited income if a major shock disrupted their place of employment.

Our homes should be spaces to feel safe and recover following a major seismic event, but at the moment many cannot serve this function. The central city could be compromised

and people might need to work from home at a large scale. At this point, we are not sure if our homes and telecommunications networks can support this.

The Mayoral Taskforce on Housing acknowledges our future challenges - as does the Future Central City project. These initiatives complement the Resilience Strategy and will be linked through the Resilience Steering Group.

If the central city was **significantly** damaged in a major shock event

107,000

people would need to work from another location.



for many of them, working from home is the next best option.

Wellington City Council has established an earthquake prone buildings programme.

Since it started

5,500

buildings have been assessed

720

have been deemed earthquake prone and in need of structural changes



Help make homes warm, safe and dry

Lead

WREMO

Key partners

BRANZ, Earthquake Commission, insurance sector

New Wellington City project

We will investigate options to improve the resilience of Wellington's new and existing housing stock so that homes can better withstand earthquakes and storms, and can be used post-event as workplaces.

Action

The Council will lead two work streams: new homes and existing homes.

We will investigate regulatory and non-regulatory options for improving the resilience of new homes. This will include the potential requirement for new homes to be constructed with emergency water tanks, collection of grey water, solar panels and for multi-unit buildings to have “connected” or “bumping” spaces where people can meet and work together.

We will also investigate regulatory and non-regulatory options and tools for existing homes. This will include the potential requirement for subfloor, foundation and roof bracing within structures to be secure, dry and adequately ventilated. In addition we will promote chimneys to be seismically secure and undertake analysis of the extent and risk of borer infestations. Existing homeowners will also be informed of other co-benefits linked to a variety of seismic strengthening options available, which will increase the resilience of their home. We will investigate opportunities to link earthquake strengthening to interventions improving the health of home environments through ventilation, insulation and double glazing.

Both work streams will work closely with the Mayoral Housing Taskforce. We will widely communicate the lessons learned from Christchurch. We will develop a housing warrant of fitness for owners to ensure they understand the level of maintenance needed to keep homes warm, resilient and dry. We will work with banks and insurers to explore incentives for home owners. This project will enable the Council to better evaluate the risk to the city of doing nothing. More widely, it will also improve guidance for working on older homes and develop training models on home renovations through the Building and Construction Industry Training Organisation.

This project is closely connected to the telecommunication sector assessment to enable large-scale working from home (Project 23) and improving access to household resilience items (Project 1).





Resilience co-benefits

The project will give home owners, tenants, insurers and planners confidence that housing stock can withstand a moderate level earthquake so that people can remain in their homes, and possibly work from home in the event that commercial buildings are compromised (Projects 18, 19, 23).

Improving the quality of our homes - making them warmer, safer and healthier - can also generate benefits in terms of productivity and education, becoming spaces where people can build their personal resilience to any shocks or stresses (Projects 1, 2). The project will also strengthen communities by providing an opportunity to design resilience into shared spaces (Project 5).

Our homes should be the
cornerstone of our resilience.





New Orleans

Inspiration from 100RC network

- Warm, safe and dry homes in New Orleans

We know that Wellington's homes leave a lot to be desired. We can deal with new homes through regulations, but most of our homes are already built, and are very difficult and expensive to retrofit to make warm, dry and safe to natural hazards. Typically, the people who are most vulnerable in their homes are those who can least afford to do anything about it.

Through its Resilience Strategy, New Orleans has developed ways to encourage and support home owners in vulnerable areas to modify their homes to the effects of flooding. In particular, we noted the financial incentives and levers New Orleans has successfully implemented to change home owners' behaviours, and we are keen to explore similar options to achieve warmer, drier and safer homes in Wellington.

Support insurance literacy campaign

Lead

WCC

New regional project

We will support home, business and asset owners to make informed decisions about their insurance cover.

Key partners

Insurance Council of New Zealand, Earthquake Commission (EQC), banks

Action

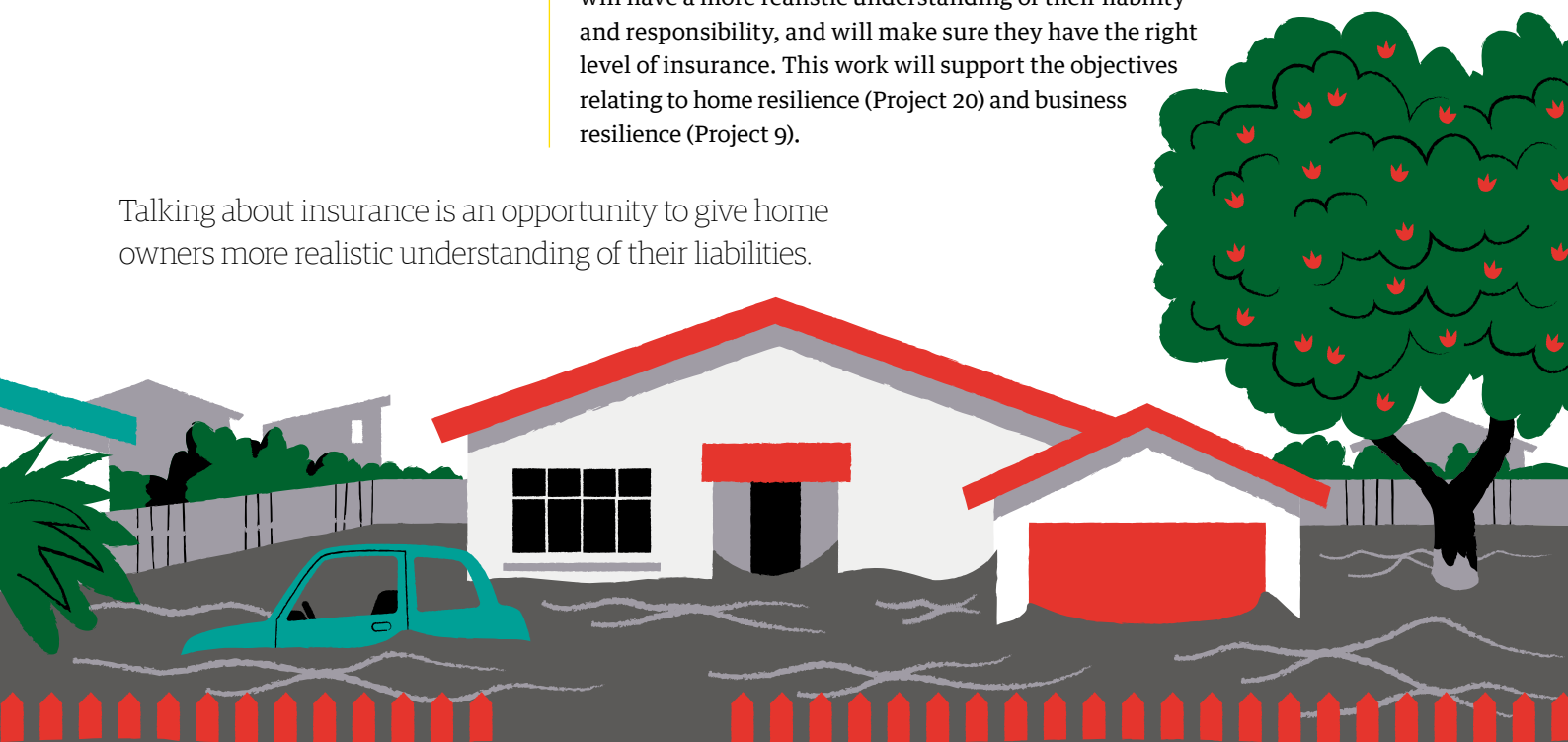
The Insurance Council of New Zealand (ICNZ) will conduct a survey to test the level of knowledge about insurance and better understand the social consequences of underinsurance. We will also assess people's ability to access insurance. Depending on survey results, ICNZ will undertake a targeted campaign to make home and asset owners aware of the gap between assumption and reality, with advice on where to find out more information, and what to consider when calculating the right level of insurance cover.

Resilience co-benefits

Reflecting on Canterbury, better information about insurance will allow systems to be integrated with response, recovery and risk reduction planning. It will open doors to debate on other tools to build resilience into Wellington's homes. EQC will be able to better communicate its role and responsibilities.

It is also an opportunity to engage with communities, and to connect them to key information and knowledge so they can make better decisions. Home owners will have a more realistic understanding of their liability and responsibility, and will make sure they have the right level of insurance. This work will support the objectives relating to home resilience (Project 20) and business resilience (Project 9).

Talking about insurance is an opportunity to give home owners more realistic understanding of their liabilities.



Understand the scale of the non-weather-tight homes problem

Lead

WCC

New Wellington City project

We will undertake a study of Wellington homes to assess the risk of water ingress in our new and existing housing leading to health issues resulting from cold, dampness and mould.

Key partners

Ministry of Business Innovation and Employment

Action

The Council will undertake a targeted analysis to determine the scale of weather-tightness issues in Wellington's housing stock. The project report will provide recommendations or actions required for home improvements, and be accompanied by guidance developed for home owners; promoting regular maintenance, adequate insulation and ventilation and outlining options for cost-effective repairs.

The project will provide information to support discussions with central government and the building sector to address this issue. It will also support a balanced public debate and provide an opportunity to talk with communities and offer them key information to make better decisions.

Resilience co-benefits

The project will improve the Council's understanding of the scale of the problem. This will enable decisions to be made around what, if any, action is required to ensure these homes can withstand future shocks from seismic and extreme weather events. Warmer and drier homes lead to better health and comfort for the occupants, improving their chances in regards to social, educational and economic outcomes. The outcomes of this project will inform our work on resilient homes (Project 20).



Assess the capacity for large-scale remote working

Lead

WCC

New regional project

We will assess the telecommunications sector's capability to support high numbers of people working from home after a seismic event or other significant shock. This initiative is undertaken in conjunction with Project 5 - supporting community spaces for wellbeing and post-disaster roles.

Key partners

Vodafone, Spark, Porirua and Hutt councils

Action

WCC and other councils will work with the asset owners to assess the telecommunications sector's ability to support remote working for a large number of Wellingtonians over a prolonged period, based on a common understanding of levels of service. The assessment will make recommendations on any gaps identified.

Resilience co-benefits

This project will help us understand the gaps we need to fill to ensure a large percentage of Wellington's workforce and economy can continue operating after a major shock. At the same time, this work could also see a reduced need for travel and encourage more flexibility in ways of working, even when not faced with a disruptive event. This could benefit employers and employees, potentially reducing an existing barrier to workforce participation; for example, by enabling more part-time work by those caring for children or returning from maternity leave, as well as older people or those with mobility constraints. This project is related to promotion of new economic hubs (Project 8) and development of community spaces for post-disaster roles (Project 5) and has relevance to work with ageing population (Project 3).

Well-connected homes provide more flexibility during disruptions and are more inclusive for people who can't or don't want to travel to work.



Programme 3.2

Water and natural environment

We will ensure that Wellingtonians always have access to water services, in a way that enhances our natural environment.

It is estimated that in the event of a significant earthquake, water supply in Wellington will not be restored for up to 70 days in some locations. Most Wellingtonians only store water for 3 days. Rainwater collection could significantly improve levels of self-sufficiency, but very few houses are equipped for this. This also represents a missed opportunity to future-proof our water supply from threats that may seem remote today, but could arise in an uncertain future, such as droughts.

Population growth will put further pressure on our wastewater infrastructure, which is already at capacity, posing a risk for human health and the environment. Wellingtonians are not prepared to manage their wastewater without reticulated wastewater infrastructure. Any disaster is likely to be compounded by health risks related to contamination of public spaces with untreated sewage.

Climate change is expected to bring more intense rainfall, which will put additional stress on our highly modified (by culverts, for example) urban water systems. Urban intensification in response to population growth in our city is also generating demand for available land, placing increased pressure on our natural assets, while increasing demand for fresh water and generating more wastewater and runoff.

WREMO recommends

people store a minimum of



7 days'

worth of emergency
drinking water,



20 litres

per person.

Wellington City has



4
botanic gardens



340
kilometres of walking
and mountain bike trails

Wellington region has

over **33,000^{ha}** of land
including



5
regional parks



water catchment areas



swimming holes

Areas managed by the Department of Conservation

include large tracts of intact indigenous forest, pest-free offshore islands and marine reserves

We depend on a healthy natural environment to provide a range of benefits known collectively as “ecosystem services”, which include water and air purification, recreation and wellbeing, and pollination. The biodiversity that contributes to these services exists in our reserves, parks, urban gardens, waterways, wetlands and coast. While some of this may be under increasing pressure, Wellington is fortunate to have abundant natural assets.

A key element in the City Resilience Framework used across the 100RC network is protecting and enhancing these natural assets. This is especially relevant for adapting to rising sea levels and increased storm surges - “soft” measures, such as dune nourishment and protecting natural kelp beds, can be highly effective for dissipating wave energy and reducing the extent and severity of erosion and inundation. From an urban resilience perspective, the

great advantage of these approaches is the opportunity for co-benefits - natural defences can provide recreational values, generate habitat for indigenous biodiversity, and make an area more attractive. They may also be combined with harder defences to provide flexible community spaces and active transport corridors along a raised shoreline.

Improve water systems through ecological interventions

We have an opportunity to improve the quality of our urban spaces, enhancing biodiversity and our wellbeing, while at the same time improving our city's ability to cope with heavy rainfall or earthquakes.

Lead

WCC

New Wellington City project

We will integrate ecological interventions into how we manage Wellington's water system to improve the quality of stormwater entering our streams and coast, improve resilience to flash floods and enhance urban biodiversity.

Key partners

The Nature Conservancy, Wellington Water

Action

The Council's urban ecology team will reduce the barriers to the uptake of water sensitive urban design (WSUD) by delivering a series of studies and demonstration projects in partnership with infrastructure managers and environmental groups.

Specifically, we will assess the costs and benefits of ecologically enhanced stormwater systems, investigate alternative financing instruments and map existing expertise. We will also develop a large-scale demonstration project in a number of hydrologically linked locations in urban settings and bigger open public spaces. The project will also include a series of training seminars delivered by international experts from The Nature Conservancy and other 100RC cities.

Resilience co-benefits

The project will improve understanding of the feasibility and value case for applying ecological interventions in fresh water management, including stream daylighting, developing wetlands, and other WSUD such as rain gardens, ponds and tanks, permeable pavements, and green walls and roofs. It will provide an opportunity for traditional water engineers and landscape designers to collectively develop effective, place-based approaches by learning from each other and international experts.

Effective WSUD slows down rainwater flow and improves its quality by capturing contaminants. As a result, it minimises damage associated with slips and erosion and reduces need for water treatment. This type of measure is likely to form part of our climate Adaptation Plan (Project 16). In addition, better capture of rainwater provides an efficient alternative to expensive infrastructure development and reduces impact on water sources in our regional parks. WSUD will also improve the quality of urban spaces for our communities (Project 5), enhancing our biodiversity and our wellbeing, as well as being increasing our robustness and resilience in a seismic event (Project 18).



Melbourne

Working with Platform Partners - Conserving nature with The Nature Conservancy

Wellingtonians love nature. As a port city, we especially acknowledge Tangaroa and te mana o te wai⁵. As the city grows and changes, we will need to work hard to retain and maybe enhance what we have for future generations.

The Nature Conservancy, one of the 100RC Platform Partners, will be an important partner in helping us improve water systems through ecological interventions.

The Nature Conservancy has a wealth of experience in this area, and we have looked to the work undertaken with the city of Melbourne in biodiversity to understand the strength of this opportunity. We are looking to make better use of Wellington's natural resources through initiatives such as transforming some stormwater pipes into open streams, enhancing the city's biodiversity and amenity while managing hydraulic flows.

Urban SOS

Victoria University students' future vision for a water sensitive Wellington has been shortlisted from 200 participants in a global competition, Urban SOS: Fair Share, which is run jointly by 100RC, AECOM and Van Alen Institute.

5 Tangaroa is the Māori god of the sea. The concept of te mana o te wai reflects the recognition of fresh water as a natural resource whose health is integral to the social, cultural, economic and environmental wellbeing of communities.

Explore options for sewage sludge disposal

Lead

WCC

New Wellington City project

We will reduce carbon and landfill liability related to sewage management.

Key partners

Veolia, Wellington Water

Action

The Council will undertake an options assessment for sewage sludge disposal to identify preferred options.

Resilience co-benefits

This project directly addresses the stress on infrastructure, and puts in place a suite of investment options that mitigate future capacity issues. At the same time, the city's financial exposure to carbon markets will be reduced.

Additionally, a better sludge disposal operation can be linked to energy production, making Wellington less dependent on external energy supply. Finally, the status quo is not consistent with how Wellington perceives itself environmentally. A better disposal option will bring Wellington's aspirations into alignment with what actually happens on the ground.

A city waste disposal system needs to be in line with its environmental aspirations.





Paris

Working with Platform Partners - Talking rubbish with Veolia

Wellington aspires to be an eco-city that is a leader in environmental practice. One of the biggest differences the city can make is to improve the way we dispose of organic waste - currently this makes up the largest proportion of the Council's carbon emissions inventory.

Facilitated by 100RC, Veolia and Wellington Water have come together to examine the opportunity to change the current practice, and are developing proposals to convert organic waste, and sewage sludge in particular, into energy. This would not only solve several complex waste management issues, but also build redundancy into Wellington's vulnerable energy supply chain.

Veolia is one of the 100RC platform partners. It works with hundreds of diverse cities around the world on water, energy, and waste management.

Ensure emergency water supply for Wellington Hospital

Lead

WCC

Existing Wellington City project

We will ensure robust emergency water supply for Wellington Hospital in Newtown.

Key partners

Capital and Coast District Health Board

Action

The Council will work with Wellington Water, the District Health Board and relevant Central Government agencies to agree on delivery methods and funding for the emergency water supply for Wellington Hospital and implement the project.

The project will investigate synergies related to restoration of existing watercourses and irrigation of urban agriculture projects in the neighbourhood.

Resilience co-benefits

This project improves the likelihood that Wellington Hospital will be able to function after an earthquake and may also identify water efficiency opportunities for the day-to-day operation of the hospital.

The project presents an opportunity to create a new amenity in Newtown, perhaps connecting with some of the local streams (Project 24) and providing irrigation for the local urban farm (Projects 5 and 6).

While creating emergency water storage we can also create new amenity and an irrigation system to support urban agriculture.



27

Invest in water and wastewater resilience and awareness

Lead

Wellington Water

Scaling up of existing regional project

We will accelerate investment in water resilience and promote emergency water and sewage preparedness options to citizens, businesses and institutions to encourage them to take action and be self-sufficient for at least 7 days following a disaster.

Key partners

WCC, WREMO

Action

Wellington Water will design and implement an accelerated investment programme supported by an initiative that reinforces the need for all individuals, communities and institutions to take responsibility for their own emergency water and sewage. This includes further promotion of household emergency water tanks and increased use of grey and rain water. The communication will also aim to grow awareness of the sewage disposal challenge if reticulation is unavailable.

Resilience co-benefits

The project will improve Wellington’s ability to cope with a shock, and the ability of Wellingtonians to withstand a water and a sewage network outage for longer periods of time. This will be beneficial in the immediate response during a disaster and recovery minimising health risks and contamination of the environment (Project 18).

At the same time, promotion of grey water use and rainwater retention measures will reduce demand for water from the mains network, reducing pressure on water supply, as well as reducing costs of water treatment and pumping. This will also have a beneficial effect for stormwater management (Project 24), slowing down the runoff during the flash floods expected as a consequence of climate change (Project 16).



Programme 3.3

Transport and energy

We will work with infrastructure owners to ensure flexibility and robustness of transport and energy services in Wellington.

The current and future prosperity of Wellington relies on mobility of people, goods and information. Despite higher levels of cycling and walking than most other parts of New Zealand, Wellington remains highly reliant on road transportation. Seventy-one percent of trips were made by car in the Wellington region between 2010 and 2014, and 70 percent of freight was moved by road in 2012.

The way our region's transport corridor is shaped means it can be easily disrupted. Around 27% of workers in Wellington use it each day, and if it is closed, even briefly as it was after the Kaikoura earthquake, traffic comes to a standstill. Projects like the Transmission Gully motorway are important for the robustness of our region's transport networks, but we also need to look at other approaches for generating

flexibility and relieving congestion. While Wellington Harbour is also important for inter-island transport between Aotea Quay and Picton, it is also the main backup point of entry should land access be compromised. The Kaikoura earthquake has highlighted the fact this is a significant vulnerability for Wellington.

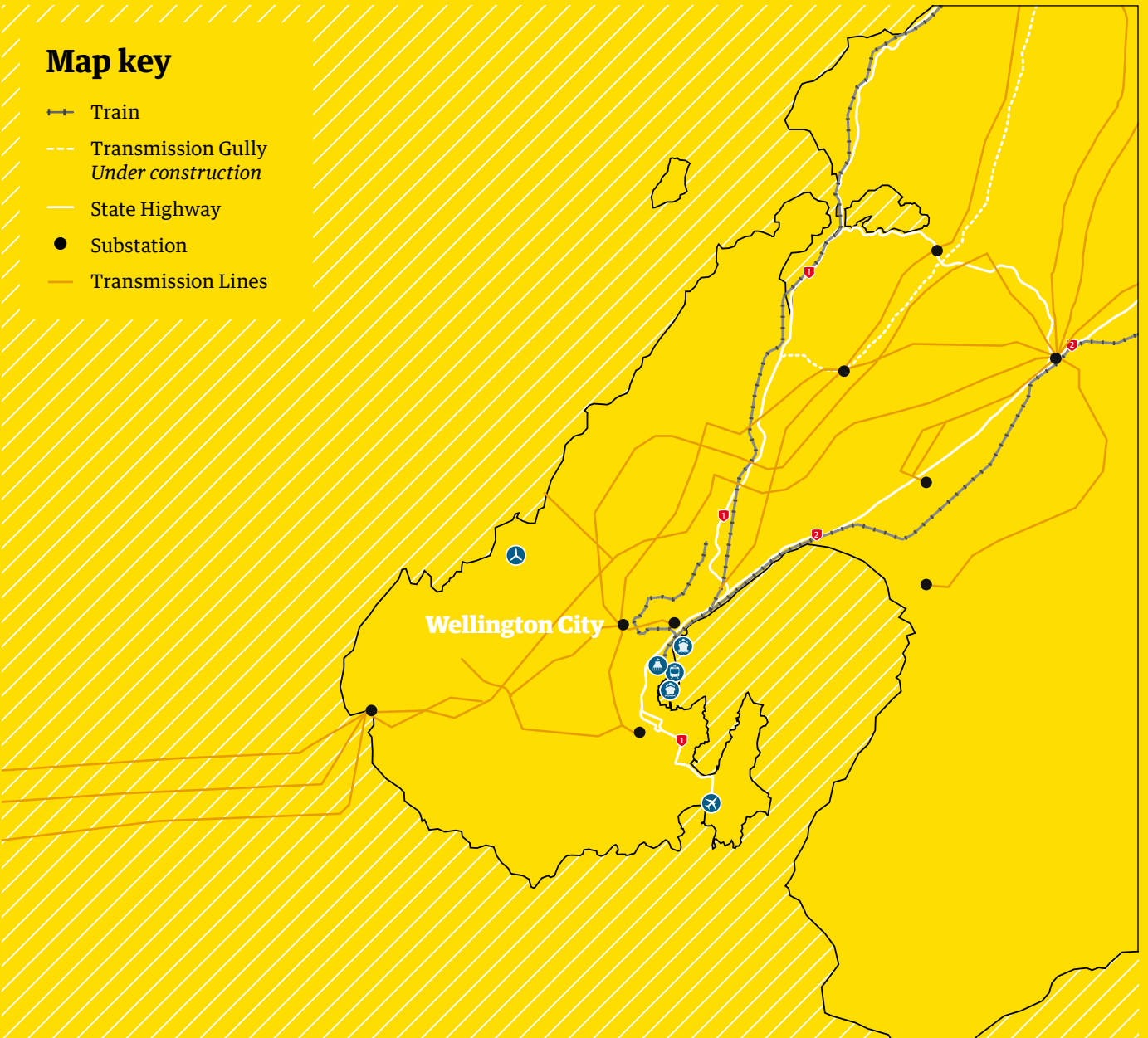
Wellington's public transport continues to improve, but it is likely that private vehicle travel will remain important in Wellington. There is a trend towards types of vehicle that are less reliant on our vulnerable fuel supply chains and also produce fewer emissions. As 82 percent (MBIE, 2016) of Wellington's electricity comes from renewable sources - chiefly from a windfarm located within the boundary of Wellington City - we are especially well positioned for use of electric vehicles.

Wellington's strong use of renewables is a great asset for our ability to cope with oil price shocks and breakdown in supply chains, but we know that our electricity distribution network is vulnerable to high winds, earthquake, fires and other natural and manmade hazards. Most citizens are unaware of the high degree of vulnerability, or of how reliant our economy is on its power supply. While we are currently looking to build robustness into the physical network, Wellingtonians are also increasingly discussing the idea of distributed infrastructure such as mini hydro, solar and wind generators. Distributed generation infrastructure builds our ability to cope with fuel and power supply disruptions following major shocks, and in the future may be able to help relieve the pressures on households from rising energy costs.



Map key

- +— Train
- - - Transmission Gully
Under construction
- State Highway
- Substation
- Transmission Lines



Support flexible energy supply

Lead

WCC

New regional project

We will work with Wellington's electricity sector to build in redundancy and flexibility into our energy supply.

Key partners

Wellington Electricity, Transpower

Action

The Council will work with Wellington Electricity and the Commerce Commission to make the network less vulnerable and perform to the agreed service levels. This will include investigation into incorporating network resilience in price setting mechanisms. We will also investigate options for incentivising uptake of technology that will build household energy independence, which could include microgeneration, battery packs, solar roofs, small-scale wind, tidal energy and neighbourhood microgrids.

Resilience co-benefits

The project seeks an energy network that is robust and flexible. A more decentralised network that includes multiple small-scale generation sources will perform better in an earthquake or a storm (Project 18), and will have an added benefit of reducing reliance on fossil fuels.

This approach can also generate economic opportunity, positioning Wellington as a leader in alternative technologies and building on our existing reputation as a low-carbon city (Projects 8,10).



A more decentralised network that includes multiple small-scale generation sources will perform better in an earthquake or a storm, and will have an added benefit of reducing reliance on fossil fuels.

Support widespread adoption of electric vehicles

Lead

WCC

New Wellington City project

We will enable widespread use of electric vehicles (EVs) in Wellington, reducing dependence on the vulnerable fuel supply chain, as well as our carbon footprint.

Key partners

Wellington Electricity

Action

This project will see the Council lead by example by switching its fleet to EVs as they become due for replacement. We will give priority to contractors that use EVs, including waste, recycling and street cleaning contractors.

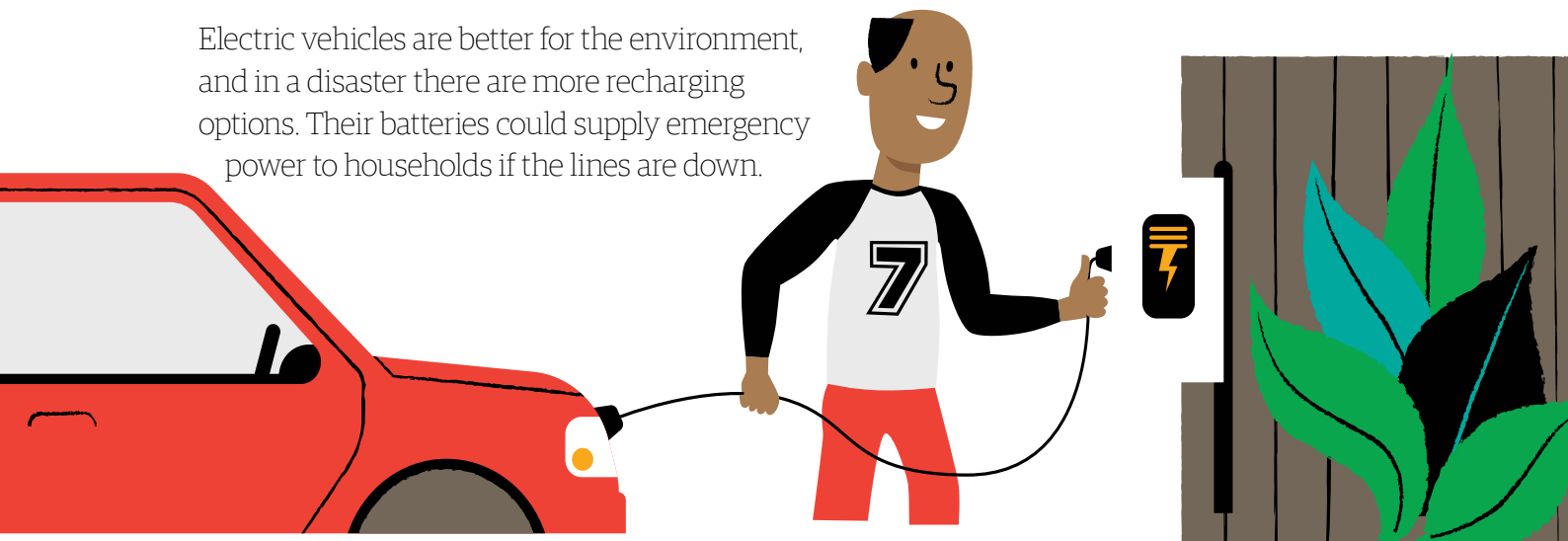
We will support use outside of the Council by investing in charging infrastructure across the city, as well as working with other regional councils to establish a broader charging network. Uptake of EVs will also be supported through the District Plan, particularly in regards to charging infrastructure for apartments and new homes.

Resilience co-benefits

A significant increase in electric vehicles will drive reductions in air pollution and noise, resulting in health benefits for all Wellingtonians. In the event of a major shock that disrupts fuel supply chains, EVs may provide ongoing mobility, particularly if they are able to be recharged through renewable and distributed sources of energy (Project 28). EV batteries may also be able to provide emergency household power sources in the event of a seismic emergency.

The project will also generate alternative income/business development opportunities in the clean technology industry (Project 8 and 10).

Electric vehicles are better for the environment, and in a disaster there are more recharging options. Their batteries could supply emergency power to households if the lines are down.





Mexico City

Inspiration from 100RC network - Mexico's integrated mobility system

Mexico's vision is to have an integrated mobility system that prioritises public transportation over private vehicles and provides a safe urban environment for pedestrians and cyclists.

Rather than accept traffic congestion, the city has decided to act decisively to promote an integrated mobility system to revitalise Mexico; discourage the use of private vehicles; create a safe and accessible city for pedestrians and cyclists; prepare the mobility system for the potential risks and effects of climate change, and promote the use of data to improve decision making on mobility.

Mexico City focusses on mobility, not cars, which resonates with many Wellingtonians, as does the explicit connection to climate change and revitalisation. Improved mobility also has a very real benefit in reducing air pollution and traffic congestion, with health and social co-benefits.

Leverage transportation investment to improve Wellington's resilience



Lead

New Zealand Transport Agency (NZTA)

Existing Wellington City project

We will work with NZTA to build and maintain resilient transport infrastructure for critical routes and all transport modes.

Key partners

WCC

Action

This project is effectively an advisory project, where the Council will be an active partner and resilience champion for the following projects:

- **Coastal cycleways:** improving cycle network and coastal defence
- **Petone to Ngauranga link:** addressing vulnerability of link between Hutt and central Wellington
- **Let's Get Wellington Moving:** reducing congestion in the central city
- **Future of the Port:** reducing vulnerability of the port

This will involve the Council strongly advocating for application of resilience principles in these projects. This could include greater inclusiveness through more meaningful engagement on end-user needs during project design and delivery, resourcefulness by encouraging infrastructure that serves multiple purposes, or robustness by ensuring that worst-case climate change projections are considered during project design phases.

Resilience co-benefits

As a group, these projects will improve access into the city for people and goods, as well as encouraging active lifestyles. All road users will benefit. It will provide redundancy in transport while improving everyday options. Advocating strongly for active use of resilience principles will ensure that co-benefits are maximised. Key projects that will connect with this initiative are encouraging adoption of electric vehicles (Project 29), undertaking recovery planning (Project 18) and developing a climate adaptation plan (Project 16).

A resilient transport network has inbuilt redundancy and flexibility to cope with disaster. It can also encourage an active lifestyle.

Implementing Wellington's Resilience Strategy

Producing a strategy is not the end of thinking about resilience – it's the beginning.

We are currently working on an Implementation Plan that will assign responsibilities, time frames and resources to ensure the projects are delivered and their resilience value realised. Collectively, the projects will begin the process of integrating resilience thinking into all decisions affecting the future of our city, including long-term planning. Many Wellingtonians have already put up their hand to join the project teams. We hope many more will join in as we start delivering our resilience projects.

A number of leaders have been identified and organised into a Resilience Steering Group that will empower key sectors to integrate and adapt resilience thinking into their work.

Steering Group members have been drawn from Central Government; the social and housing sectors; Wellington, Hutt City and Porirua City councils; Civil Defence; the insurance and commercial sectors; and academia.

As well as monitoring progress, the group will undertake a 3-year review early in 2020 to provide recommendations to further improve the strategy. This could include amending the project list in consideration of lessons learned, refining our goals and programmes, and reviewing our resilience challenges to ensure they remain relevant.

The Steering Group will formally report to Wellington, Porirua and Hutt City councils annually in February.



End notes

References

- **BERL (Sanderson, K., and Fareti, N.), (2015)**
Wellington - essential to NZ's Top Tier:
Its resilience is a national issue
BERL, December 2015, p.3
- **Capital and Coast DHB (CCDHB), (2015)**
2015: Health Needs Assessment for Wairarapa, Hutt Valley and Capital and Coast District Health Boards
www.ccdhb.org.nz/aboutus/Documents/3DHB%20Health%20Needs%20Assessment%202015_final.pdf
- **Forecast.id, (2016)**
Population forecasts
forecast.idnz.co.nz/wellington/population-summary
- **GNS Science: Te Pū Ao, (2016)**
Where do earthquakes happen in New Zealand?
gns.cri.nz/Home/Learning/Science-Topics/Earthquakes/New-Zealand-Earthquakes/Where-do-earthquakes-happen-in-NZ
- **Grow Wellington Ltd, (2011)**
The Wellington Regional Economy
Prepared by Freeth, A., p.7
[www.growwellington.co.nz/document/6-21/Wellington_Regional_Economy_Feb_2011_\(SP_edits\).pdf](http://www.growwellington.co.nz/document/6-21/Wellington_Regional_Economy_Feb_2011_(SP_edits).pdf)
- **Infometrics**
Wellington City at a Glance, (2015a)
ecoprofile.infometrics.co.nz/Wellington%2bCity/Infographics/Overview
Industry Diversity: Wellington City, (2015b)
ecoprofile.infometrics.co.nz/Wellington%2bCity/Gdp/IndustrialDiversity
- **Kestrel Group Ltd, (2011)**
Resilience Lessons: Orion's 2010 and 2011 Earthquake Experience: Independent Report. Kestrel Group Ltd, p.i
www.oriongroup.co.nz/assets/Customers/Kestrel-report-resilience-lessons.pdf
- **Massey University, (2013)**
Kiwis under-insured by \$650billion - new study.
www.massey.ac.nz/massey/about-massey/news/article.cfm?mnarticle_uid=2D84646C-D135-A24D-5271-47FBA32B4FOA
- **Ministry for Environment (MFE)**
Climate change projections for the Wellington and Wairarapa region (2016)
www.mfe.govt.nz/climate-change/how-climate-change-affects-nz/how-might-climate-change-affect-my-region/wellington

-
- Preparing New Zealand for rising seas: Certainty and Uncertainty; November 2015.
www.pce.parliament.nz/media/1380/preparing-nz-for-rising-seas-web-small.pdf
 - **National Business Review (NBR), (2016)**
 NZ's ageing workforce not being catered to
www.nbr.co.nz/article/nz-aging-workforce-not-being-catered-cg-p-190665?utm_source=newsletter&utm_medium=email&utm_campaign=NBR%252520Heads%252520Up
 - **NIWA, (2011)**
 Coastal adaptation to climate change
www.niwa.co.nz/climate/research-projects/coastal-adaptation-to-climate-change
 - **Organisation for Economic Cooperation and Development (OECD)**
 Perspectives on Global Development 2012: Social Cohesion in a Shifting World (2012)
OECD Publishing, Paris, 2011, p.17
 Better Life Index: Housing (2015)
www.oecdbetterlifeindex.org/topics/housing/
 - **Profile.id**
 Wellington City: Workforce industry sector of employment (2016a)
profile.idnz.co.nz/wellington/workforce-industries?BMID=30
 Wellington City: Ethnic groups (2016b)
profile.idnz.co.nz/wellington/ethnic-group
 Wellington City: Workforce highest qualification achieved (2016c)
profile.idnz.co.nz/wellington/workforce-level-of-qualifications
 - **Rockefeller Foundation, (2015)**
 Remarks by Dr. Judith Rodin at the Cities for Tomorrow Conference
www.rockefellerfoundation.org/about-us/news-media/remarks-by-dr-judith-rodin-at-the-cities-for-tomorrow-conference/
 - **Statistics New Zealand (Stats NZ), (2016)**
 Workers aged 55+ keen to stay working full-time
www.stats.govt.nz/browse_for_stats/income-and-work/employment_and_unemployment/workers-aged-55plus-article.aspx
 - **Wellington City Council (WCC)**
 Survey of Central City Dwellers: Final Report (2015a)
wellington.govt.nz/-/media/services/environment-and-waste/urban-development/files/survey-of-central-city-dwellers-final-report.pdf
 - **Wellington City Council (WCC)**
 Wellington Urban Growth Plan: Urban Development and Transport Strategy: 2014-2043 (2015b)
wellington.govt.nz/-/media/your-council/plans-policies-and-bylaws/plans-and-policies/a-to-z/wgtn-urban-growth/wgtn-urban-growth-plan2015.pdf
 - **Wellington Lifelines Group, (2012)**
 Lifeline Utilities Restoration Times for Metropolitan Wellington Following a Wellington Fault Earthquake: Report to the Wellington CDEM Group Joint Committee from the Wellington Lifelines Group, November 2012
www.gw.govt.nz/assets/Emergencies--Hazards/Emergency-Planning/12-11-13-WeLG-report-to-CDEM-Joint-Committee-restoration-times-FINAL.pdf
 - **Wellington Region Emergency Management Office (WREMO)**
 Annual Plan 1 July 2015- 30 June 2016 (2015)
www.getprepared.org.nz/sites/default/files/u75/2015-2016%20WREMO%20Annual%20Plan.pdf
 Group Plan 2013-2018 (2013)
www.getprepared.org.nz/sites/default/files/uploads/2013%20-%202018%20Group%20Plan.pdf
 - www.infrastructure.govt.nz/plan/2011implementation/ipifd-mar13.pdf

Acknowledgements

The development of the Resilience Wellington Strategy has been underpinned by the participation of numerous individuals and organisations that were willing to provide their expertise.

600

people received Resilient Wellington newsletters

170

people responded to the survey identifying Wellington's key resilience factors

160

people participated in the Agenda Setting Workshop

100

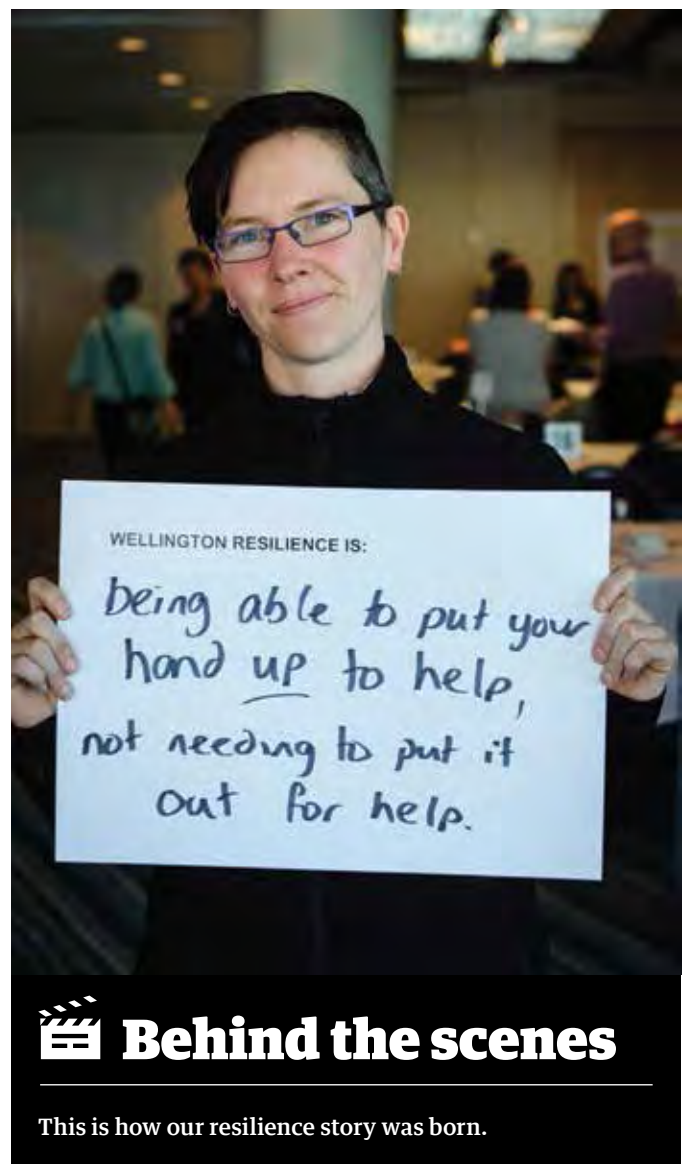
people discussed resilience with the CRO in one-on-one interviews

75

people participated in focus groups and workshops in Phase I

95

people participated in focus groups and workshops in Phase II



Chief Resilience Officer

Mike Mendonça

The Wellington Chief Resilience Officer would like to thank the following people and organisations for their contribution to the development of the Wellington 100 Resilient Cities Strategy:

100 Resilient Cities Relationship Managers

Sam Kernaghan and Nicola Thomson

Steering Group

Celia Wade-Brown

Mayor (2016), Wellington City Council

Justin Lester

Mayor (2017 onwards), Wellington City Council

Professor David Johnston

Director, Joint Centre for Disaster Research

Elizabeth McNaughton

Executive Director (CERLL),
Department of the Prime Minister and Cabinet

Jo Taite

Chief Executive Kaihautu,
Ngati Kahungunu Whanau Services

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Chief Executive, New Zealand Insurance Council

John Milford

Chief Executive, Wellington Chamber of Commerce

Bruce Pepperell

Manager, Wellington Region Emergency Management Office

Alison Cadman

Chief Executive, Dwell

Platform Partners

Christine Rodwell, Veolia

Michael Looker, The Nature Conservancy

Iwi Partners

Lee Rahina-August, Port Nicholson Block Settlement Trust

Leanna Barriball, Te Rūnanga o Toa Rangatira Incorporated

Strategy Partner: AECOM

Marta Karlik-Neale

Zoe Thompson

Kerry Griffiths

Kieran Power

Will Symons

Support Group

Rebecca Adams, WCC

Celestina Sumbly, WCC

Sean Audain, WCC

Boris Kirov, WCC

Alex Robertson, WCC

Stuart Bayly, WCC

Nicky Karu, WCC

Trevor Himona, WCC

Bart de Vries, Motif

League of Live Illustrators

Publication Design

Jacob Howard, WCC

Amanda McGlone, WCC


Solène Constant, WCC

Ben Crotty, WCC

Cass Hesom-Williams, WCC

Ned Wenlock, Oneedo Studio



 We shared the moments when Wellington made us proud. That's how our resilience vision was developed.

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Lorelei Schmitt, Opus International

Mike Frew, Abide


Monique Cornish, Tonkin & Taylor

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Stu Farrant, Morphum Environmental

Tom Pettit, WCC



 A story telling approach was integrated throughout. We were not afraid to be creative.

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Mark Kinvig, Wellington Water Limited

Paki Maaka, HCC

Project Manager

Mischa Hill and Sam Ripley, WREMO

Pam Johnston, MBIE

Raj Prasanna, JCDR, Massey University

Ray Hardie, Wellington Electricity

Richard Mowl, Wellington Lifelines Group

Richard Smith, EQC

Roger Fairclough, Treasury

Saarb Johal, Massey University

Sarah Jardine, DPMC

Selwyn Blackmore, Cardno


Simon Fleisher, WCC

SR Uma, GNS

Stephen Cody, WCC

Vanessa Tanner, WCC



 We looked at the challenges and built on our strengths.

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Discovery Group Members

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- Ayolt Wiertsema, WIAL
- Chris Wilkinson, FRG
- Colin Drew, GWRC
- Dylan Firth, Hospitality NZ
- Greg Thomas, WIAL
- James Bushell, MOTIF
- Jeremy Harding, WREDA
- John Clarke, WCC

Project Manager

Zoe Thompson, AECOM, and Lara Rapson, WCC

- Matt Paterson, Property Council
- Miles Crawford, Massey University
- Nancy Brown, JCDR, Massey University
- Neville Cherry, Westpac
- Philippa Howden-Chapman, CfSC
- Sam McKinnon, WECC
- Thomas Wutzler, Enterprise Miramar Peninsula Incorporated
- Tim Packer, NEC
- Wendy McGuinness, McGuinness Institute

Quality of Life

Project Lead

Jenny Rains, WCC

Discovery Group Members


- Andrea Boston, Regional Public Health
- Angela Rampton, WCC
- Ben Keat, YMCA
- Charlie Devenish, Community Networks Wellington
- Donna Wilson, WCC
- Jamie Shackleton, Red Cross
- Jonathan Moore, WCC

Project Manager

Carolyn Dick, WCC

- Julie Rushton, WCC
- Linda Weterman, YMCA
- Louise Parkin, Nikau Foundation
- Nick Moat, Athfield Architects
- Nigel Taptiklis, WCC
- Paula Comerford, The Property Group
- Robyn Steel, PCC
- Simon Tendeter, WCC




 In-depth analysis underpinned the softer story telling approach.


Other stakeholders consulted

- A**
- Abide
 - Accessibility Advisory Group
 - Accident Compensations Corporation
 - AECOM
 - Athfield Architects
 - ANZ Bank
 - Arts Access Aotearoa
 - Arts Wellington
 - Auckland Council
- B**
- Blaschke and Rutherford
 - Boffa Miskell
 - Brooklyn Community Association
 - Business NZ
- C**
- Cable Car Co
 - Canterbury Earthquake Recovery Authority
 - Cardno
 - CBRE New Zealand
 - Capital & Coast DHB
- D**
- Centreport
 - Chamber of Commerce
 - Chorus
 - Christchurch City Council
 - City of Melbourne
 - City of Sydney
 - Community Housing Aotearoa
 - Community Law
 - Community Networks Wellington
 - Community Patrols
 - Commonsense Organics
 - Common Unity Project
 - Compass Health
 - Countdown
- E**
- Eco Landscapes
 - EECA
 - EQC
 - Enterprise Miramar Peninsula Incorporated
 - Enspirial
 - Environmental Reference Group
- F**
- First Retail Group Ltd
 - Foodstuffs NZ
- G**
- Garden to Table Trust
 - Generosity NZ
 - GHD
 - GNS
 - Greater Wellington Regional Council
- H**
- Hack Miramar
 - Hospitality NZ
 - Housing NZ
 - Home of Compassion Soup Kitchen



 Six hundred ideas were generated at the Action Workshop.



 We took care of our personal resilience too.

Hutt City Council
 Hutt Valley Chamber of Commerce
 Hutt Valley DHB
 Hydra Environmental Consulting

I

IAG New Zealand Ltd.
 Insurance Council of New Zealand
 Inland Revenue Department
 Inner City Association
 Inspiring Communities
 IPENZ
 Isthmus

J

Joint Centre for Disaster Research

K

Kaibosh
 Kāpiti Coast Airport
 Kāpiti Coast District Council
 Kestrel Group
 Kiwi Community Assistance
 Kiwibank
 KiwiRail

L

Land Information New Zealand
 Lifehack
 Lions Club
 Local Government New Zealand
 Loomio

M

Maori Arts
 Massey University
 Ministry of Business, Innovation and Employment
 Ministry of Civil Defence and Emergency Management
 McGuinness Institute
 McKee Fehl Ltd
 McKenzie Higham
 Ministry of Education
 Ministry of Health
 Ministry of Social Development
 Miramar BID
 Morphem Environmental
 MOTIF

N

Natural Hazards Research Platform
 National Cyber Security Centre
 NEC
 Neighbourhood Support NZ
 Neighbours Day Aotearoa
 Ngāti Kahungunu ki Pōneke Community Services
 Nikau Foundation
 NIWA
 NZ Centre for Sustainable Cities
 NZ Fire Service
 NZ Institute of Architects

NZ Planning Institute
 NZ Police
 NZ Post Group
 NZ Recreation
 NZ Society of Earthquake Engineering
 NZ Transport Agency

O

Opus
 OraTairio: NZ Climate and Health Council
 Our Space

P

Pacific Advisory Group
 Palantir
 Parliamentary Services
 Philanthropy NZ
 PNBST/Ngati Toa
 Porirua City Council
 Property Council

R

RCA
 Red Cross
 Refugee Services
 Regional Public Health
 ResOrgs
 Resourceful Planning
 RMS
 Regional Public Health



 Many committed people gave their time and brain power to develop this strategy.

S

- Salvation Army
- School of Medicine (Otago)
- Skylight Trust
- Solity
- Stratum
- Storymaker Research Institute
- Stimpson and Co
- Sustainability Trust
- Sustainable Coastlines

T

- Te Awakairangi Health Network
- The Nature Conservancy
- The Property Group
- The Wellington Company
- Think Tank
- Timor-Leste Community Policing Programme
- Tonkin & Taylor
- Transpower
- Treasury
- Trimble
- Trinity Group
- TSA Oasis

U

- Urban Development Agency
- University of Auckland
- Upper Hutt City Council

V

- Veolia
- Viclink
- Victoria University
- Volunteer NZ
- Volunteer Wellington

W

- Warren and Mahoney Architects
- Wellington City Mission
- Wellington City Youth Council
- Wellington Civic Trust Inc
- Wellington Community Trust
- Wellington Electricity
- Wellington Employers Chamber of Commerce
- Wellington Free Ambulance
- Wellington International Airport
- Wellington Lifelines Group
- Wellington Māori Business Network Inc.

- Wellington Night Shelter
- Wellington Tenth Trust
- Wellington Timebank
- Wellington Water
- Wellington YMCA
- Wellington Zoo
- Weltec
- Westpac NZ
- WETA Workshop
- Wharton, University of Pennsylvania
- Whiterea Community Polytechnic
- WINTEC
- Wellington Regional Economic Development Agency
- Wellington Regional Emergency Management Office
- World Wildlife Fund
- Work and Age Trust NZ

Z

- Zeal Education Trust

