



# Goal 2

Decision making at all levels is integrated and well informed

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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.

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**We will ensure that resilience is integrated into our governance.**

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

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**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.

**M**any 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.

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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.

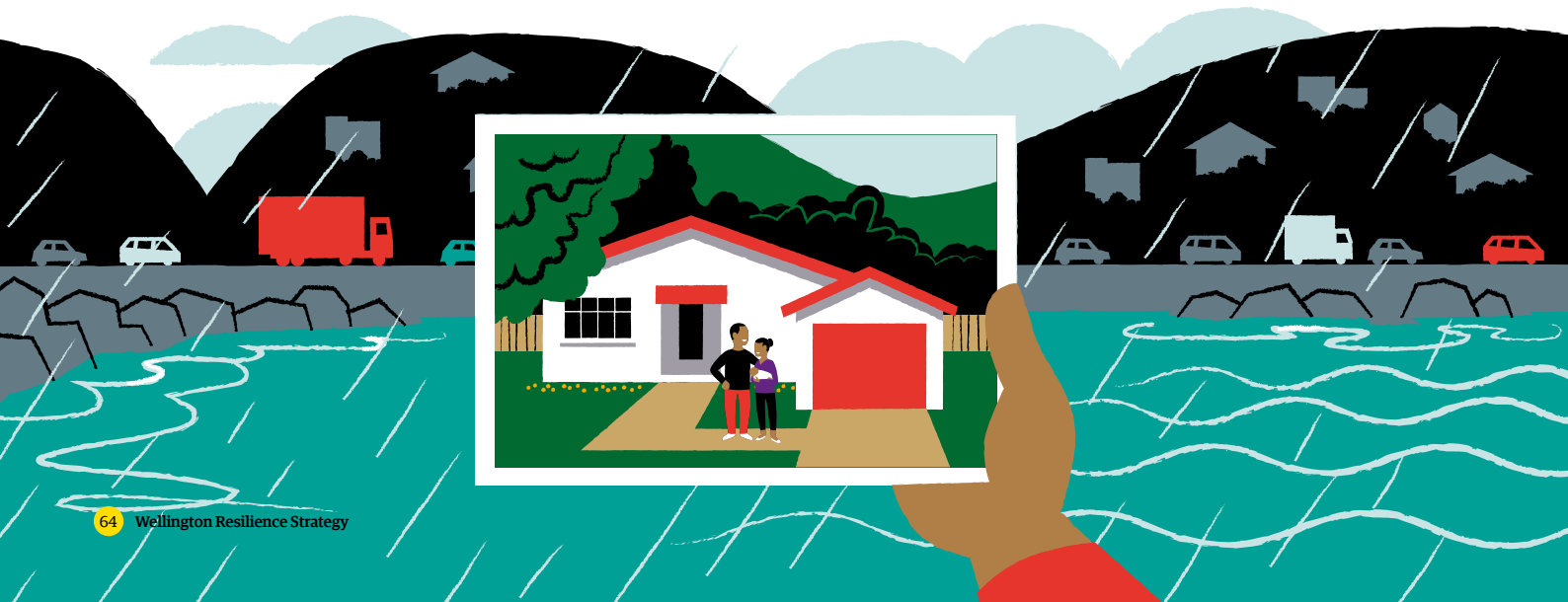
**Action**

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).

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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.

**W**e 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.

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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**

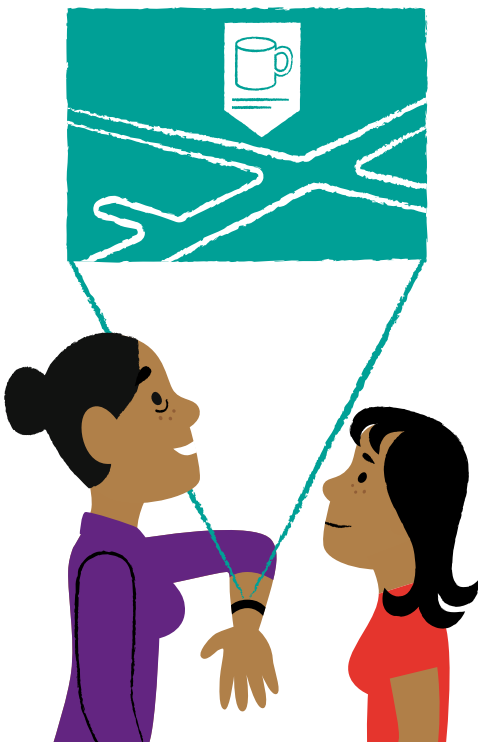
**NEC**

**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.



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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

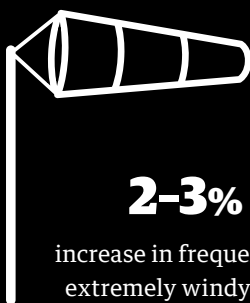
Wellingtonians for decades to come. Achieving this requires climate adaptation to be embedded into the decision making of our governments, utilities and businesses.

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

**H**owever, 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 *kaitiakitanga*<sup>4</sup>, 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).

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## 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

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

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**W**hile 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.



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## 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.