



**Resilient Organisations
Research Report 2012/08**

Learning from Christchurch: Technical Decisions and Societal Consequences in Post-Earthquake Recovery

Preliminary Research Findings August 2012

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ABOUT THE RESILIENT ORGANISATIONS RESEARCH PROGRAMME

“Building more resilient organisations, able to survive and thrive in a world of uncertainty, through research and practice”

We live in an increasingly complex world dealing with a broad spectrum of crises arising from both natural and man-made causes. Resilient organisations are those that are able to survive and thrive in this world of uncertainty. Resilience integrates the concepts of Risk, Crisis Management, Business Continuity Planning and Organisational Leadership to provide a platform for developing more robust and agile organisations.

Who we are:

The Resilient Organisations Research Group (ResOrgs) is a multi-disciplinary team of 17 researchers and practitioners that is New Zealand based and with global reach. A collaboration between top New Zealand research Universities and key industry players, including the University of Canterbury and the University of Auckland, ResOrgs is funded by the Ministry for Science and Innovation through the Natural Hazards Research Platform and supported by a diverse group of industry partners and advisors. The research group represents a synthesis of engineering disciplines and business leadership aimed at transforming NZ organisations into those that both survive major events and thrive in the aftermath.

We are committed to making New Zealand organisations more resilient in the face of major hazards in the natural, built and economic environments. Resilient organisations are able to rebound from disaster and find opportunity in times of distress. They are better employers, contribute to community resilience and foster a culture of self reliance and effective collaboration.

What we do:

The ResOrgs programme of public good research is aimed at effective capability building through research activities with significant impacts on policy and practice. Activities and outputs of the group, in existence since 2004, include informing and focusing debate in areas such as Civil Defence Emergency Management, post-disaster recovery, and the resilience of critical infrastructure sectors, in addition to core activities in relation to organisation resilience capability building and benchmarking. We have produced practical frameworks and guides and helped organisations to develop and implement practical resilience strategies suitable to their environment.

Why we do it:

In an increasingly volatile and uncertain world, one of the greatest assets an organisation can have is the agility to survive unexpected crisis and to find opportunity to thrive in the face of potentially terminal events. We believe such resilience makes the most of the human capital that characterises the modern organisation and offers one of the greatest prospects for differentiating the successful organisation on the world stage. This resilience is typified by 20/20 situation awareness, effective vulnerability management, agile adaptive capacity and world class organisational culture and leadership. More resilient organisations lead to more resilient communities and provide the honed human capital to address some of our most intractable societal challenges. For more information see our website: www.resorgs.org.nz

EXECUTIVE SUMMARY

The Canterbury earthquakes have presented decision-makers in New Zealand with difficult choices. The scale of the impacts relative to the national economy and the number of earthquakes have created challenges that are being felt nationally, and the disruption to Canterbury is expected to be long-term. During the response and recovery, different levels of Government have made decisions, often in uncharted waters, under tight time frames, and with significant consequences.

This report presents preliminary findings from research on recovery-related decision-making. The objectives are to identify major decisions that have been made since February 2011 and to gain insights into which of those have been most important in the early recovery of Christchurch. The eventual goal is to share the experience of those in Christchurch with decision-makers in other earthquake-prone areas around the world.

Data was gathered from 23 key-informant interviews conducted in Christchurch and Wellington in May 2012. Interviews were conducted with knowledgeable representatives of government organisations, non-governmental organisations, community groups, and the insurance/reinsurance sector. Interview questions focused on four areas: recovery progress, critical decisions, challenges going forward, and lessons learned.

Interviewees were first asked for their perspective on how well recovery was progressing. On a 7-point scale (where 1= “extremely poorly” and 7= “extremely well”), the mean response (4.1) was near the midpoint of the scale. From the data, it appears that respondents who were involved with or provided input to decision-making generally rated progress more highly than those who were less involved in the process.

Secondly, the interviews focused on identifying critical decisions to-date in the recovery. The decision to establish a recovery agency, the Canterbury Earthquake Recovery Authority (CERA), emerged as by far the most important decision so far in the recovery. The decision to buy out residential properties in the Eastern Suburbs was identified as another key decision with significant implications for those in the affected areas. The management of the Cordon around the heavily damaged Central Business District, and the decision to maintain it for an extended period of time, was highlighted as the third most important decision.

Interviewees were also asked to identify the central challenges going forward. Several themes emerged, including capital flight, uncertainty regarding insurance and social dislocation created by the earthquakes. Respondents also cited several areas for lessons learned, including the importance of creating an inclusive recovery, and of balancing local and external voices.

ACKNOWLEDGEMENTS

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1. THE CANTERBURY EARTHQUAKES AND RECOVERY MILESTONES

Beginning in September 2010, Canterbury has been struck by a sequence of over 10,000 earthquakes, including several major events, the most severe of which was a magnitude 6.3 earthquake on 22 February 2011 within 10 km of the centre of Christchurch. The February event took the lives of 182 people, and the sequence overall has been estimated as the third most expensive disaster in history, in terms of insurable losses^[1]. This section provides context, with a brief overview of the earthquake sequence starting in September 2010 and milestones reached in the recovery up to May 2012.

4 September 2010

The first major event was on 4 September 2010, when a 7.1 magnitude earthquake struck 35 km west of Christchurch at 4:35am. While no fatalities were caused by the event, a large number of unreinforced masonry buildings in the Central Business District (CBD) were heavily damaged leading to the declaration of a state of emergency and large areas of the CBD were cordoned off for public safety reasons. Building safety evaluations were conducted under guidelines established by the New Zealand Society for Earthquake Engineering^[2]. City Council Staff had reduced the Cordon to individual buildings and isolated areas within approximately one week (see section 4.3 below). The Central Government also initiated an immediate Earthquake Support Subsidy which provided funding to businesses to pay their employees for six weeks after the earthquake.

Similar to all territorial authorities in New Zealand, Christchurch City Council maintained an earthquake-prone building policy in accordance with the requirements of the Building Act (see Appendix C). Following the September earthquake, Christchurch City Council changed the earthquake-prone building policy so that the target for building strengthening was 67% of the new building standard. This was a target, rather than a requirement, and has since created uncertainty in settling insurance claims.

On 14 September 2010, the Central Government passed the Canterbury Earthquake Response and Recovery (CERR) Act 2010, which established the Canterbury Earthquake Recovery Commission. The seven-member body consisted of the mayors of each of the three territorial authorities (Christchurch, Waimakariri, and Selwyn) as well as four Government appointees, including one representative from Environment Canterbury. The commission was created to advise the Government and to channel information between central and local Government. The Act also enabled Orders in Council, which allowed the Government to “grant an exemption from, or modify, or extend any provision, of any enactment”^[3].

The Earthquake Commission (EQC), covers New Zealand residential property owners for some damage caused by earthquake, natural landslip, volcanic eruption, hydrothermal activity, tsunami; in the case of residential land, a storm or flood; or fire caused by any of these events. EQC is responsible for damages up to 100,000 NZD for housing damage (the EQC ‘cap’), and 20,000 NZD for contents per event. Early on, EQC made a decision to manage a large number of the repairs that were under the cap as opposed to cash settling. EQC entered into a contractual agreement with Fletcher Construction, and began to deploy assessors and contractors across Canterbury. By February of 2011, EQC was approximately 6-8 weeks short of completing all the assessments from the 4 September earthquake.

26 December 2010

On Boxing Day, a series of aftershocks struck within 2 km of the CBD, with the strongest occurring at 10:30am, just at the beginning of New Zealand’s most important shopping day. The City Council chose not to declare a local state of emergency, which impacted resourcing the response, and the indemnity of engineers conducting building assessments. As a result, post-earthquake assessment placards were not issued during the response to the Boxing Day earthquake, but Section 124 notices, identifying “dangerous buildings” as defined by the Building Act, were used. The aftershock had a significant impact on retail businesses, and the businesses community organised a successful “Boxing Day Replay” sale that took place on the 12th of February, 2011.

22 February 2011

The earthquake on 22 February was the most severe of all the events in the Canterbury Earthquake sequence, taking the lives of 182 people, and causing significant damage across the city. This included further liquefaction damage, particularly in the Eastern Suburbs, and significant land damage in the Port Hills. A national State of Emergency was declared and handling of response was transferred to Civil Defence. Immediately following the earthquake, a Cordon was established for public safety reasons around the four avenues bordering the CBD (see Section 4.3 below); while urban search and rescue activities were undertaken and engineering resources were triaged into different operations for building evaluation. The Earthquake Support Subsidy program for affected businesses was re-instated for an additional six weeks, and was extended further for some businesses.

In April 2011, the Central Government passed the Canterbury Earthquake Recovery (CER) Act 2011. The CER Act created a new government department, the Canterbury Earthquake Recovery Authority (CERA) which was empowered to “enable an effective, timely, and co-ordinated rebuilding and recovery effort”^[4]. CERA took over from Civil Defence in May 2011 as the state of emergency ended and became the main agency driving the recovery.

The CER Act divided up responsibilities between CERA and Christchurch City Council by charging CERA with developing an overall recovery strategy and City Council with developing

a recovery plan for the central city to fit within that strategy. Christchurch City Council went on to develop a recovery plan, with input from the “Share an Idea” campaign which attracted over 100,000 submissions, and was submitted to CERA in December of 2011.

13 June 2011

Another major aftershock occurred on 13 June, and the remaining CBD Cordon was sealed for several days while CERA engineers evaluated additional building damage. The June earthquake did cause significant damage in the CBD including the collapse of some previously damaged buildings, and strengthened the argument that the Cordon was still needed for safety reasons.

In June 2011, CERA also announced a system of zoning for all residential properties in Christchurch. The city was divided into red, green, orange, and white zones. Five thousand properties were initially zoned red, indicating that the land was deemed too damaged for immediate reconstruction^[5]. This land required multi-property land remediation, and the Government initiated a buy-out program with two options for properties in the red zone. The first option was based on the value of the land, buildings, and fixtures with the crown taking over all insurance claims. The second option was based on only the land, allowing the homeowner to negotiate with the insurer for damages to buildings and fixtures. According to CERA, as of 7 August 2012, 86% of households which have received a Crown letter have signed a sale or purchase agreement, while others remain in the red zone, assessing their options and negotiating with the Government and their insurers. Orange zone properties required further geotechnical work to determine their ultimate classification, and portions of the Port Hills area was zoned white while additional land assessments, including for rockfall hazards, were carried out. By May 2012, the last of the decisions about orange-zoned properties had been made (Figure 1).

The vast majority of residential properties, or over 100,000, were zoned green, meaning they could be repaired and rebuilt^[6]. However, in October of 2011, the Department of Building and Housing announced a new series of technical sub-categories for the green zone. The purpose of these technical categories was to indicate the different levels of geotechnical investigation required, and the likely foundation requirements. This sub-categorization has created clarity for some, but further uncertainty for others.

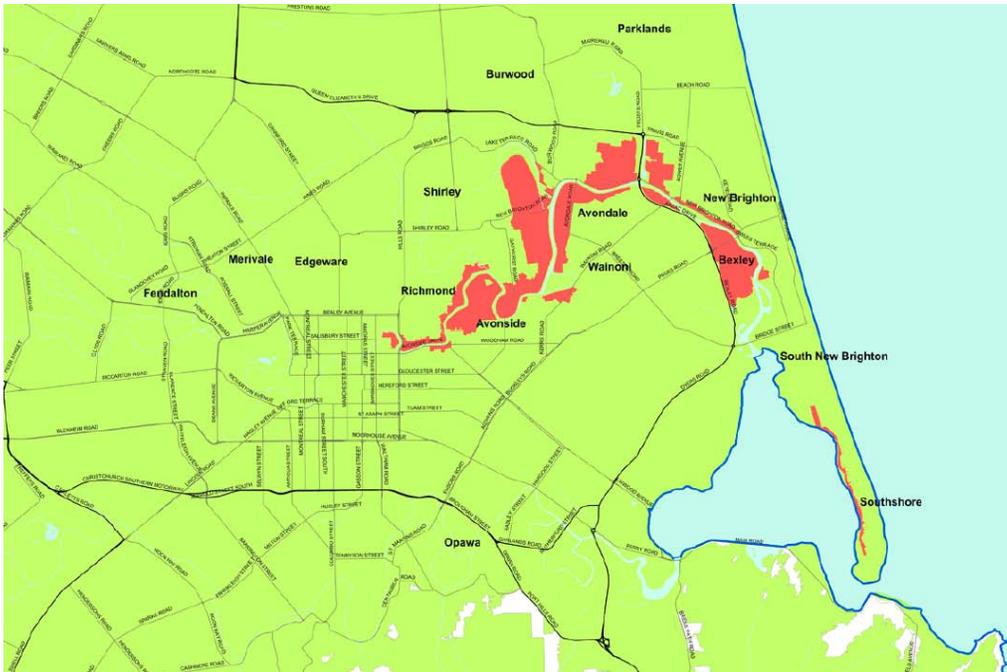


Figure 1: Residential Red Zones as of May 2012^[7]

In September of 2011, New Zealand’s High Court issued a declaratory judgement stating that each major earthquake constituted a separate event, and that EQC was liable, up to its cap, for each event separately. While creating some clarity for insurers and reinsurers as to their total liabilities, this has further complicated the claims process, and created the need to apportion damage to each event. The costs of recapitalising EQC, and paying for the necessary reinsurance in the interim, is expected to be significant.

The rebuild of Christchurch’s infrastructure (roads and water networks) is being coordinated through SCIRT (Stronger Christchurch Infrastructure Rebuild Team), a specialised contractual agreement or ‘alliance’ between CERA, City Council, the NZ Transport Agency, and several contractors. The agreement was formalised in September 2011 and the infrastructure rebuild plan was announced in December of 2011, with an estimated cost of \$2.2 Billion NZD.

At the time of writing, the CBD Cordon has been reduced significantly, but a large core of the CBD remains closed. Demolitions are expected to take a further 12-18 months, and many businesses have relocated around the city. On 2 March 2012, it was announced that the Cathedral would be demolished to a height of 2-3 meters. A large number of heritage buildings have been demolished in the CBD and across the city. In April 2011, CERA announced the creation of the Christchurch Central Development Unit (CCDU), tasked with laying out a blueprint for the CBD within 100 days, with the aim of creating confidence in the rebuild of the downtown.

The population of Christchurch has stayed relatively stable, and it remains unclear how much of this is from people choosing not to leave, or new people coming in^[8]. Despite the tremendous impacts, the vast majority of Christchurch's businesses continue to operate around the city and economic activity has stayed consistent with other areas of New Zealand. The geographic impact of the earthquakes has varied widely, and recovery is proceeding at different rates across the city^[9].

2. OBJECTIVE AND APPROACH

This research project focused on key decisions made since February 2011 that have affected the recovery of Christchurch. At the outset, the project sought to answer three central questions:

- 1) What major decisions were made in the recovery process?
- 2) Which of these were most important in influencing the recovery of Christchurch?
- 3) What lessons can be learned regarding effective recovery-related decision-making?

The project was a collaborative effort between researchers at the University of British Columbia (UBC) in Canada, and Resilient Organisations in New Zealand. The research team at UBC consisted of Dr. Stephanie Chang, professor of Community and Regional Planning, Dr. Ken Elwood, associate professor of Civil Engineering, and Josh Taylor, graduate student in the School of Community and Regional Planning. Members of the New Zealand-based research team included Dr. Erica Seville (an adjunct senior fellow at the University of Canterbury) and David Brunson (Kestrel Group) from the Resilient Organisations research programme.

A total of 23 semi-structured, in-person interviews were conducted from May 4 to May 11 in Christchurch and Wellington, New Zealand.¹ Most interviewees were selected because they had been and/or continued to be involved in recovery-related decision-making, including providing input to decision-making processes. Other interviewees were selected because they represented groups affected by the decision-making, or because they could provide important complementary perspectives. Interviewees included representatives of government organisations, businesses and community representatives, individuals associated with the insurance industry, and researchers. In almost all cases, the interviews were conducted by at least two members of the research team with the most relevant background to the interviewee, and involved a New Zealand team member whenever possible. The interviews were typically 60-90 minutes in length and were used to gather information and insights on context, the rationale for decisions, and their impacts.

All respondents were asked to identify the three decisions that they considered to be the most important in influencing the overall recovery of Christchurch. Decision-makers with a particular area of involvement were then asked to identify the three most important decisions in their area. Decisions were organised into four main areas:

¹ One interview was conducted on May 30th in Vancouver, Canada.

- The Central Businesses District (CBD), especially the establishment and management of the Cordon.
- Residential zoning and technical categories.
- Building Standards, including the building code, earthquake-prone building policy, and building evaluation.
- Insurance, including the Earthquake Commission (EQC) and reinsurance.

This report summarises the results of the interviews and some of the initial findings of the research. Section 3 summarises key findings in terms of how well respondents believed the overall recovery was proceeding, and Section 4 provides an overview of the most important decisions identified in the recovery to date. Section 5 discusses key challenges to recovery as identified by the respondents, and section six summarizes some of the main lessons learned from the disaster that were highlighted in the interviews. This report is an initial account of the content raised in the interviews, and does not constitute a full analysis of the data. A full account of the data will be published later this year through the Resilient Organisations Research Program.

3. HOW WELL IS CHRISTCHURCH’S RECOVERY PROCEEDING?

Interviewees were asked to rate how well Christchurch’s recovery was proceeding overall on a scale of 1-7, with 1 being “extremely poor” and 7 being “extremely well”. The average score was a 4.2, and most interviewees stressed that they believed the recovery was proceeding as well as it could, given the size of the event relative to the Gross Domestic Product (GDP) of New Zealand, and the number of earthquakes. Several respondents highlighted the uneven impact of the earthquakes geographically, and suggested that how well recovery is proceeding “depends on where you live”.

For purposes of analysis, interviewees were grouped into four categories (“decision groups”) by their proximity to decision-making: (1) those who were directly involved in making decisions, (2) those who were involved primarily through implementing those decisions, and (3) community and business groups who were affected by the decisions but not involved in either decision-making or implementation. Interviewees from the insurance sector were classified as a fourth group, in view of the unique role of insurance in the recovery. (See Appendix A for the list of interviewees by group.)

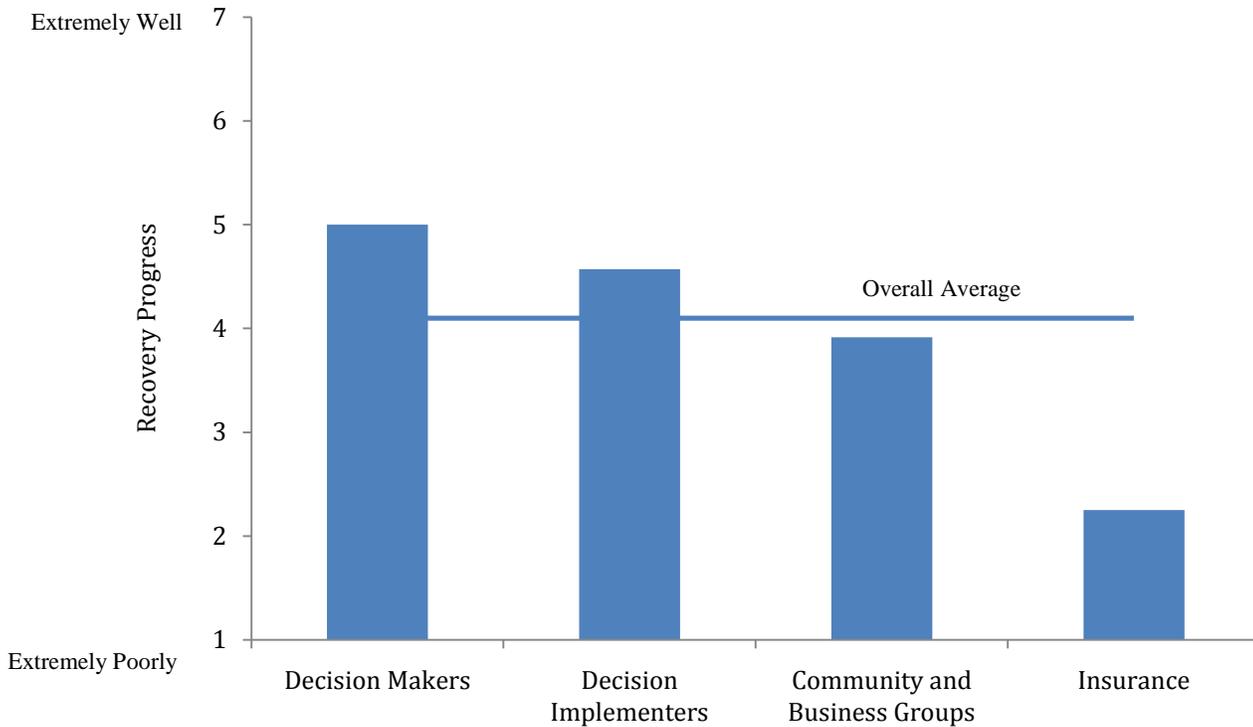


Figure 2: Interviewees’ Rating of Recovery Progress, Mean by Decision Group

In the first three groups, interviewees closer to decision-making ranked progress higher. The average response from decision-makers was a 5.0 out of seven, while the implementers ranked an average score of 4.5, and community and business groups reported an average score of 3.9. Interviewees speaking from the perspective of the insurance sector ranked progress as lower, when benchmarking to other international examples. Insurance interviewees cited several unique features to the event which have affected the insurance industry, including the number of earthquakes, pre-existing complexities built into insurance contracts, and the dual EQC-private insurer model.

4. THE MOST IMPORTANT DECISIONS FOR RECOVERY

Interviewees were asked to identify the three most important decisions overall, not limited to their specific area of expertise, in the recovery of Christchurch. Across the interviews, the decisions that were most often cited were the establishment of CERA (mentioned by 80%, or 18 of 23 interviews), the residential zoning (9 interviewees), and the CBD Cordon (5 interviewees). Sections 4.1-4.3 provide an overview of these decisions, along with their context and aspects of their significance raised by interviewees. Section 4.4 identifies other significant decisions which

were raised but were not in the top three. (For interview data on major decisions, see Appendices D and E.)

Because interviewees were not given a list of decisions to choose from, and what constituted a decision was interpreted quite broadly, there was a wide range of other decisions cited as being critical in the recovery. Some of these can be considered sub-decisions within the top three, and others are listed separately in section 4.4.

4.1 Establishing CERA

The decision to establish CERA, or a new government department to manage the recovery, was the most cited decision in terms of importance to recovery. As listed below, specific aspects of the structure of CERA and its powers from the CER Act were also identified as critical.

Appointing a Minister to lead CERA

Appointing a senior cabinet minister to lead the new department was generally seen as a strong signal from Central Government that it was committed to the recovery of Christchurch. A number of interviewees did raise questions about the structure of CERA, and alternative models have been suggested; for example, including a layer of governance, such as a board of directors, between the Minister and the Chief Executive.

Empowering CERA to demolish buildings

Under the CER Act, CERA was empowered to require the demolition of buildings deemed dangerous³. The ability of CERA to “actually get out there and demolish buildings” was seen as important given experiences after the September earthquake around the complexity and time required to demolish a single large building (Manchester Courts), and the implications of the delays for surrounding buildings and businesses. CERA was also empowered to require a building owner to provide a demolition or strengthening plan within 10 days, with no right of appeal. Additionally, CERA is able to act as contractor or project manager for demolitions, whether the demolition is required for a building deemed by CERA to be dangerous or the demolition is selected as the most economical alternative. Several interviewees stressed that in their opinion; this has facilitated demolitions by giving building owners the option of handing the management of the demolition over to CERA, and has also helped to create consistency in the pricing and quality of demolition work.

Establishing the Christchurch Central Development Unit (CCDU) within CERA

Under Section 18 of the CER Act, Christchurch City Council was initially charged with developing a Central City Recovery Plan, to fit within the recovery strategy developed by CERA³. This plan was developed, in part through the ‘Share an Idea campaign’ and was

submitted to CERA in December 2011^[10]. In April 2012, CERA created the Christchurch Central Development Unit (CCDU), a new unit tasked with laying out a plan for the CBD in 100 days^[11]. Many respondents viewed the creation of the CCDU positively and saw it as necessary to overcome the number of small land titles and the complexities of existing use-rights, as well as to create confidence in the CBD through the siting of major public projects. However, concerns were raised that the CCDU should have been a joint-venture between Christchurch City Council and CERA.

4.2 Residential Zoning

The decision to buy out a large number of homes in the Eastern Suburbs also emerged as one of the most important decisions in the recovery of Christchurch. The red zone decisions were based on the extent of damage to the land and infrastructure, and the principle driver was consideration of the time, cost, and interruption required to remediate the land. In general, land in the red zone required remediation work beyond the scale of a single property, and was estimated to require several years. While the decision to buy out households in the worst affected land created certainty for people in the red zone, it also led to conflicts over the purchase offer, divided communities, and challenges for those who did not want to leave.

Creating certainty for people in the Red Zone

The decision removed a high degree of uncertainty for those living in the most impacted land, and was largely seen as a positive act of leadership from the Government. For many, the red zone offer was extremely important in allowing them to exit destroyed homes, and enabled them to continue on with their lives.

Issues with the purchase offer

Government offers to homeowners were based on the value of houses from the rateable 2007 government valuation, justified by the fact that on average, home prices peaked in 2007 and have declined by 5% since then. However, issues have arisen as to the accuracy of government valuations to reflect the true value of a property and house. Home prices continue to fluctuate in Christchurch, and several interviewees stressed that in certain cases, the government offer will not be sufficient to purchase a new house, particularly for retired individuals.

Divided Communities

Zoning did produce impacts on existing suburbs where some areas were zoned red and others green. In some cases, zone boundary decisions resulted in houses on one side a street being green and on the other side being red, despite what residents perceived as potentially similar damage to housing. Some residents who wanted to leave were zoned green, and others who wanted to stay were zoned red and forced to leave straining neighbourhood support networks. Many families

working through the red zone offer have continued to live in damaged houses, with no sewer service for over a year at the time of this writing.

Those who do not want to leave

Not all the houses in the red zone were subject to significant levels of damage, and there are residents who do not wish to move or to accept the purchase offer. The outcome of this remains uncertain. Christchurch City Council will not restore or install new services into the red zones. CERA does reserve the power to force property owners to sell their property at its current (post-earthquake) market value, but this measure has not been used to date^[12].

Orange and White Zones

When the first red zone buyouts were announced, orange zones were also created to designate areas that were still being studied to determine their ultimate classification. Initially, there were 10,000 homes in the orange zone. The re-classification of these zones into red or green took longer than was originally anticipated and created significant uncertainty for households remaining in the orange zones. In May 2012, the final 401 properties were classified out of the orange zone, with 198 going red and 203 going green.

The area around the Port Hills was classified as a ‘white-zone’ while geotechnical work continued to assess land damage and rockfall risk. Similar to the red zone, land damage issues in the white zone may involve remediation works beyond the scale of single property. Furthermore, rockfall risk in the white zone necessitated the consideration of life-safety, a different problem than had been considered with liquefaction risk in the red zone. At the time of writing, a large number of the white zone properties had been zoned red or green, while 166 are still awaiting a decision^[13].

Households in both the orange and white zones, while awaiting final decisions on their land status, were effectively put into a holding pattern. This caused significant stress to those living in the zones and prevented individuals from making their own decisions in the recovery.

Green Zone Technical Categories

Green Zone Technical Categories were originally created by the Department of Building and Housing (DBH) as a mechanism to triage engineering resources, provide guidance to engineers, and create consistency in the assessment of land. Land classified as Technical Category 1 (TC1) or Technical Category 2 (TC2) was generally at lower risk of liquefaction damage in future earthquakes, and land classified as Technical Category 3 (TC3) was considered to be at a higher risk of damage from liquefaction in future earthquakes, requiring site-specific geotechnical investigations¹⁴. During the third quarter of 2011, it was seen that some insurance companies were already beginning to assess the spectrum of land damage and risk within the green zone, in addition to Christchurch City Council indicating geographical criteria for consenting, and that

further clarification within the green zone was required. The Technical Categories were announced in October 2011, four months after the original residential zoning (red, orange, green) announcements. Once again, while the creation of the Technical Categories created certainty for a large portion of the city (those in TC1 and TC2), approximately 80% of properties within the green zone, it did create further uncertainty for those living in TC3 areas.

4.3 Maintaining the Cordon around the CBD

Following the September earthquake a Cordon was established around the CBD on the basis of life safety. It was reduced significantly by 7 September 2010, and then reduced to isolated buildings on September 10 (Figure 3)^[15]. Following the February 2011 earthquake, another Cordon was established on the basis of life safety, and was seen as critical in the context of uncertainty regarding future aftershocks.

The Cordon after the February event was much larger, and was reduced much more slowly (Figure 4). Controlling access into the Cordon became a significant issue initially, and pre-event planning for the management of a cordon in general was highlighted as one of the key lessons from the earthquake for other regions.

Prior to the earthquakes, there were 6,000 businesses employing 50,000 people in the CBD, and following the establishment of the Cordon there was immediate pressure by businesses to retrieve stock and information critical to the functioning of their business. The Cordon was gradually reduced over time (Figure 4), and pressure to remove it or loosen access rules has largely subsided, although a significant portion of the CBD remains closed to the public 15 months after the February event. Maintaining the Cordon has had several impacts, as described below, which were highlighted during several of the interviews.

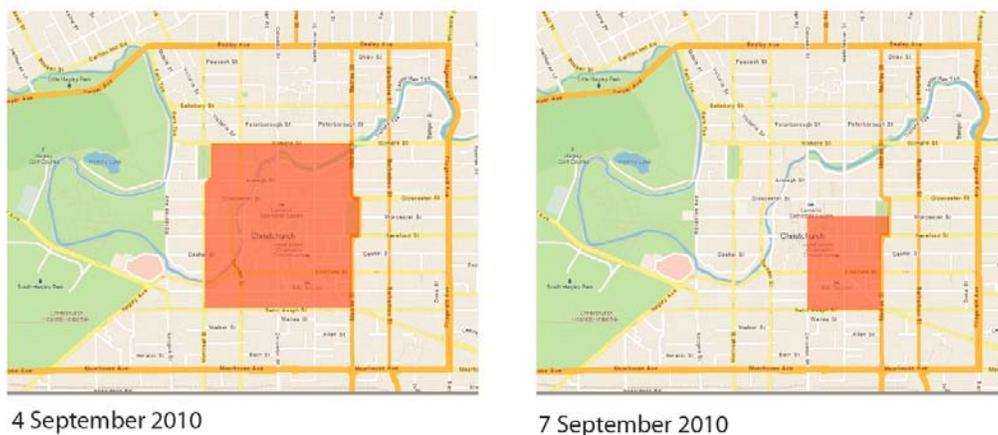
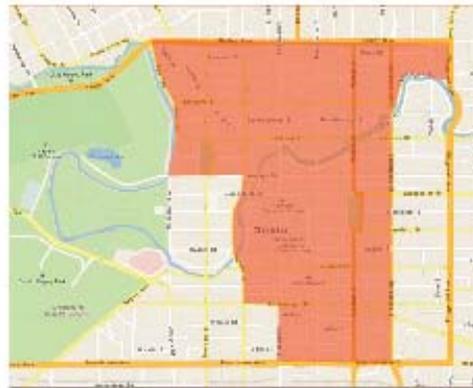


Figure 3: September 2010 CBD Cordon Reduction Sequence: Cordon reduced to individual buildings on 10 September 2010¹⁵



22 February 2011



10 March 2011



14 March 2011



11 April 2011



27 May 2011



16 March 2012

Figure 4: February 2011 CBD Cordon Reduction Sequence^[16]

Life Safety

The Cordon was initially established out of concern for life safety, and for a number of reasons, the area inside of the Cordon remains a dangerous place for the public. The clearest risk is from ongoing aftershocks, and during the 13 June 2011 aftershock, a number of contractors, engineers, and CERA staff were put at significant risk while working inside the Cordon. At the same time, the Cordon has been controversial in terms of who gains access, and when individuals should be able to assume the risk of entering the CBD.

Facilitation of demolitions

Buildings inside of the Cordon are effectively within a construction site, and this has made it significantly faster and cheaper to demolish buildings. For example, a demolition contractor does not have to produce traffic management plans, or pay compensation to adjacent buildings which normally might have to be temporarily evacuated. For this reason, some buildings owners have requested that their buildings stay within the Cordon, to facilitate demolitions.

Impact on the CBD

The long-term impacts of the CBD Cordon are yet to be seen. Many of the businesses that had existed in the CBD have since relocated around the city, and the extent of the challenges associated with bringing traffic back into the CBD remains uncertain. Furthermore, uncertainty around insurance and building standards could make it harder to attract capital into the downtown, at least in the near-term.

Numerous respondents reported that the CBD was in decline before the earthquakes, with significant amounts of under-utilised commercial space and too large a footprint for retail. The earthquake has destroyed many of Christchurch's heritage buildings, but it has also created the opportunity for Christchurch to revitalise the downtown core and update building stock. The ReStart Mall has been highlighted as playing an important role in attracting traffic back into the downtown. ReStart was initiated by private enterprise, but received significant Government support in reducing the Cordon to make way for the mall, which was seen as important to boosting confidence in the rebuilding on the CBD. CERA Staff and contractors worked "twenty-four seven" to complete building demolitions and reduce the Cordon for the scheduled opening.

4.4 Other Significant Decisions

A number of other decisions were identified as having a major impact on the recovery to date, and into the future. Some of the decisions affected a smaller stakeholder group, or their implications have yet to fully play out. This section reviews some of the more critical or interesting decisions raised by interviewees beyond the top three listed in the previous section.

Decision to Change the Earthquake Prone Building Policy

Following the September earthquake, Christchurch City Council changed its earthquake prone building policy such that the target strengthening level for any building being repaired after the earthquake was raised from 33% of the new building standard to 67% (see Appendix C for background on earthquake-prone buildings). Since the 67% target is a policy, and not the law, the new policy has created uncertainty as to whether insurance companies are liable to pay for repairs that strengthen a new building to 67% rather than 33%. While some parties saw insurance companies as being responsible for replacing like for like, in terms of having a building which is considered safe, other parties saw this as a retroactive change which was not accounted for in underwriting prior to the earthquake. The Royal Commission is expected to make some recommendations in relation to earthquake prone building issues, and a review of the earthquake prone building elements of the Building Act is separately underway. The impacts in the short-term for insurance markets are uncertain.

Dividing Building Evaluations into Different Operations Following the February Earthquake

Following the February earthquake, safety evaluation of buildings was divided into different operations to improve the efficiency of allocating engineering resources. For example, “Operation Shops” was given a high priority to get supermarkets and other essential retail outlets open across the city. Meanwhile, “Operation Suburbs” consisted of teams with at least a building inspector and a welfare agent to visit houses in damaged areas, and volunteer teams to check on residents in every home in Christchurch. Finally, the “Critical Buildings Project” brought together experienced engineers to evaluate the tallest and most damaged buildings in the CBD. Numerous interviewees noted that the division of building evaluation into these specific projects allowed for an effective triaging of limited engineering resources.

Use of ‘Indicator Buildings’

The ongoing aftershocks created uncertainty as to the severity of damage from each event and whether a new round of building evaluations was necessary in each aftershock. After the February earthquake, a collection of ‘indicator buildings’ was created. Indicator buildings were

selected by their location and building type to act as a representative sample for the city. Monitoring these buildings after each aftershock removed some of the subjectivity of determining the extent of damage, allowing engineers more readily justify any decision to re-evaluate damaged buildings and helping to build public confidence.

Requiring Detailed Engineering Evaluations of All Commercial Buildings

Section 51 of the CER Act required all commercial buildings to have a detailed engineering evaluation. The outcome of the inspections was not intended to be binding, but was meant to provide information to building owners, allowing them to make a decision regarding actions to take on their properties. Of the approximately 7,000 commercial building inspections required, roughly 300 had been completed as of May 2012. Of those inspected, roughly one-third had been closed a result of the inspection, by decision of the building owner.

Decision to Bypass Normal Procedures for Heritage Consideration

The CER act empowered CERA to bypass the Resource Management Act, and allowed for heritage buildings to be demolished without the process normally used for heritage consideration. This was seen as important by some interviewees for expediting the recovery and allowing the rebuild to move forward as fast as possible. However, this has resulted in the demolition of a large number of heritage buildings across Christchurch – buildings which previously had contributed to the city’s character and tourist trade.

Decision to Provide the Earthquake Support Subsidy

Immediately following the September earthquake, the Central Government initiated a 6-week wage subsidy program. The program was extremely successful, and was re-initiated after the February event with a partial extension beyond the 6 weeks. This allowed businesses to continue to pay their employees, and was cited as an important factor in keeping businesses open and in the city. Without the subsidy, many employers would have had to lay off staff for them to be eligible for unemployment benefits. The program gave employers time to decide how viable their business was after the earthquake and to find alternative locations in the city.

EQC’s Decision to Manage Repairs Rather than Cash Settle, and the Declaratory Judgement from High Court on the Number of Payouts

Following the September earthquake, a decision was made for EQC to manage the bulk of claims below the cap, rather than cash settle. EQC was approximately 6-8 weeks short of completing assessments before the February event, but the repair program meant that a large number of contractors were already in place and deployed. Secondly, the Declaratory Judgement on whether EQC was liable for multiple cap events across the earthquake sequence has had a significant impact on the insurance industry and on the process of settling claims. Specifically,

the need to apportion claims, or assign a dollar value of damage to each particular earthquake, has further complicated and slowed the process.

5. CHALLENGES GOING FORWARD

Respondents were asked to identify what they saw as the most important challenges to the recovery of Christchurch going forward. Responses represented a mix of professional and personal opinions on different aspects of the recovery. Within the wide range of challenges identified, the three most dominant themes were associated with uncertainty around the viability of the central city and capital flight, uncertainty around insurance, and social dislocation created by the earthquakes.

Capital Flight

Capital flight was highlighted as a significant risk for Christchurch, although several respondents pointed out that capital moves all the time and what is important is where it “lands”. The high degree of insurance penetration meant that many commercial buildings owners have the option of cashing out their buildings, and moving their money elsewhere in New Zealand or around the world. The creation of the CCDU was seen as critical, both in creating certainty regarding the location of new major public structures and in creating an investment-friendly central city. In the near-term, generating competitive returns for capital invested in the Christchurch CBD was seen as a significant challenge.

Insurance

The complexity and time associated with settling insurance claims, as well as uncertainty around the future affordability of insurance, were cited as significant challenges going forward. The number of earthquakes, and the interaction between EQC and private insurers has added to the complexity and length of settling claims.

The affordability and feasibility of insurance as a risk management mechanism going forward also remain uncertain.. Many organisations, for example the University of Canterbury, have seen their premiums and deductibles rise significantly. There is also ongoing uncertainty regarding the cost of insurance for homeowners in TC3 classified land and for new high-rise buildings built in the CBD.

It was highlighted that property owners in Christchurch were paying too little for insurance before the earthquakes, that insurance markets can be dysfunctional following a major disaster, and that it will take some time for the new market to establish itself.

Risk Tolerance

The earthquake sequence has raised many questions regarding appropriate risk tolerance. The Royal Commission in particular has raised the profile of the responsibility of building owners, as well as focused attention on the engineering community. Several of the interviewees suggested that while too much risk was accepted before the earthquakes, it was now necessary to make sure the recovery did not become too risk averse.

Balancing risk with speed of recovery emerged in several areas, especially in regards to future building strengthening and the continued CBD Cordon. Finding the appropriate level of risk, and balancing risk with other priorities, emerged as a continued challenge in the recovery going forward.

Social Dislocation

The impact of the earthquakes has been dramatically disparate for different areas Christchurch. While some people have lived in damaged homes for over a year with no functioning toilet, unsure as to their future, others homes have been relatively untouched by the earthquakes. Some businesses have been significantly disrupted and have closed or been forced into temporary locations, while others have thrived in the less-damaged areas of Christchurch^[17].

Residential damage was heaviest in the Eastern suburbs, and it is expected that housing repairs foundation retrofits could take several years to be completely finished. The long-term impacts for families and children growing up in these areas was cited as a significant challenge going forward.

Attracting and retaining families in general was also highlighted. Several of Christchurch's schools are in temporary locations, and many public amenities such as pools are closed. The city is also expecting a large influx of temporary workers to rebuild the city. Accommodation is also emerging as a key determinant of the overall recovery process, both for incoming workers and for those displaced while their homes are repaired^[18].

6. LESSONS FOR DECISION MAKERS

As a final question, interviewees were asked what lessons they believed this disaster provided in terms of recovery-related decision-making for others earthquake-prone regions around the world. This section of the interview was less structured, and responses varied from higher level philosophical questions to specific advice for governments in earthquake-prone jurisdictions.

One of the broad themes repeatedly identified was the challenge of involving citizens in decision-making, and how to build inclusive recovery momentum. Striking this balance was

identified as critical by a number of interviewees, especially given the difficult decisions that must be made, and the significant impacts they have on people's lives.

A second broad theme that was identified was balancing the participation and voice of local citizens with those of external people. While local citizens have a right to participate, and will have to live with the outcome, several interviewees considered it important to also involve external people with experience in recovery, and who may be able to bring a more objective perspective. There was not a consensus among interviewees on where this balance should be, or how it was unfolding in the recovery.

The transition from a state of emergency, or the response, into a more normalized recovery process was also highlighted as key issue to consider for other jurisdictions. The establishment of CERA was highlighted as being crucial in retaining many of the people who had been involved during the response, and helping to maintain institutional memory.

7. CONCLUSION

This report provides an initial summary of information from 23 key-informant interviews conducted in May 2011. This analysis of the data is preliminary, but suggests that several key decisions are emerging as the most critical in the recovery of Christchurch:

1. Creation of CERA
2. Creation of residential red-zones
3. Maintaining of the Cordon around the CBD

While the full impacts of the decisions have yet to play out, this report has reviewed some of the key impacts to date, as well as highlighted other major decisions which have impacted the recovery. Interviewees were also asked to rate how well recovery was progressing, and on average interviewees more closely involved in decision-making rated progress higher.

The complexity of recovery emerged as a dominant theme in the interviews. This complexity was exacerbated by factors unique to the Canterbury earthquakes, specifically the number of seismic events and the structure of residential insurance contracts. Many interviewees stressed that they believed the recovery was proceeding as well as it could given these complexities, but that significant challenges still remain.

The recovery of Christchurch is still in its early stages, and this report is a preliminary analysis of the data collected. Further work is necessary to address these complexities, and better understand how decision-makers can learn from the Christchurch experience.

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APPENDIX A- LIST OF STUDY PARTICIPANTS

Decision Makers

John Hamilton, National Controller and Director: Ministry of Civil Defence and Emergency Management

Steve McCarthy, Regulatory Services Manager: Christchurch City Council

Roger Sutton, Chief Executive: CERA

Diane Turner, General Manager- Strategy, Planning and Policy: CERA

Decision Implementers

Kelvin Berryman, Manager: Natural Hazards Research Platform, GNS Science

Paul Campbell, Team Leader Engineers: CERA

Carl Devereux, Lead Engineer, Significant Buildings Unit: CERA

John Hare, Principal Engineering Advisor: CERA; President: Structural Engineering Society NZ

David Hopkins, Consulting Engineer, Wellington. Member of Canterbury Earthquake Recovery Commission

Jan Kupec, Chief Geotechnical Engineer: CERA

Kelvin Newman, Department Manager Building Inspections: Christchurch City Council

Mike Stannard, Chief Engineer: Department of Building and Housing

Business and Community Groups

Lianne Dalziel, Member of Parliament for Christchurch East

Jeff Field, Registrar: University of Canterbury

Paul Lonsdale, ReStart the Heart Trust Manager & Manager: Central City Business Association

Dave Margetts, Heritage Advisor Architecture & Conservation: New Zealand Historic Places Trust

Brian Parker, Communications Manager: CANCERN

Peter Townsend, Chief Executive: Canterbury Employers' Chamber of Commerce

John Vargo, Co-leader: Resilient Organisations Research Programme

Francis Wevers, Executive Director: Future Canterbury Network

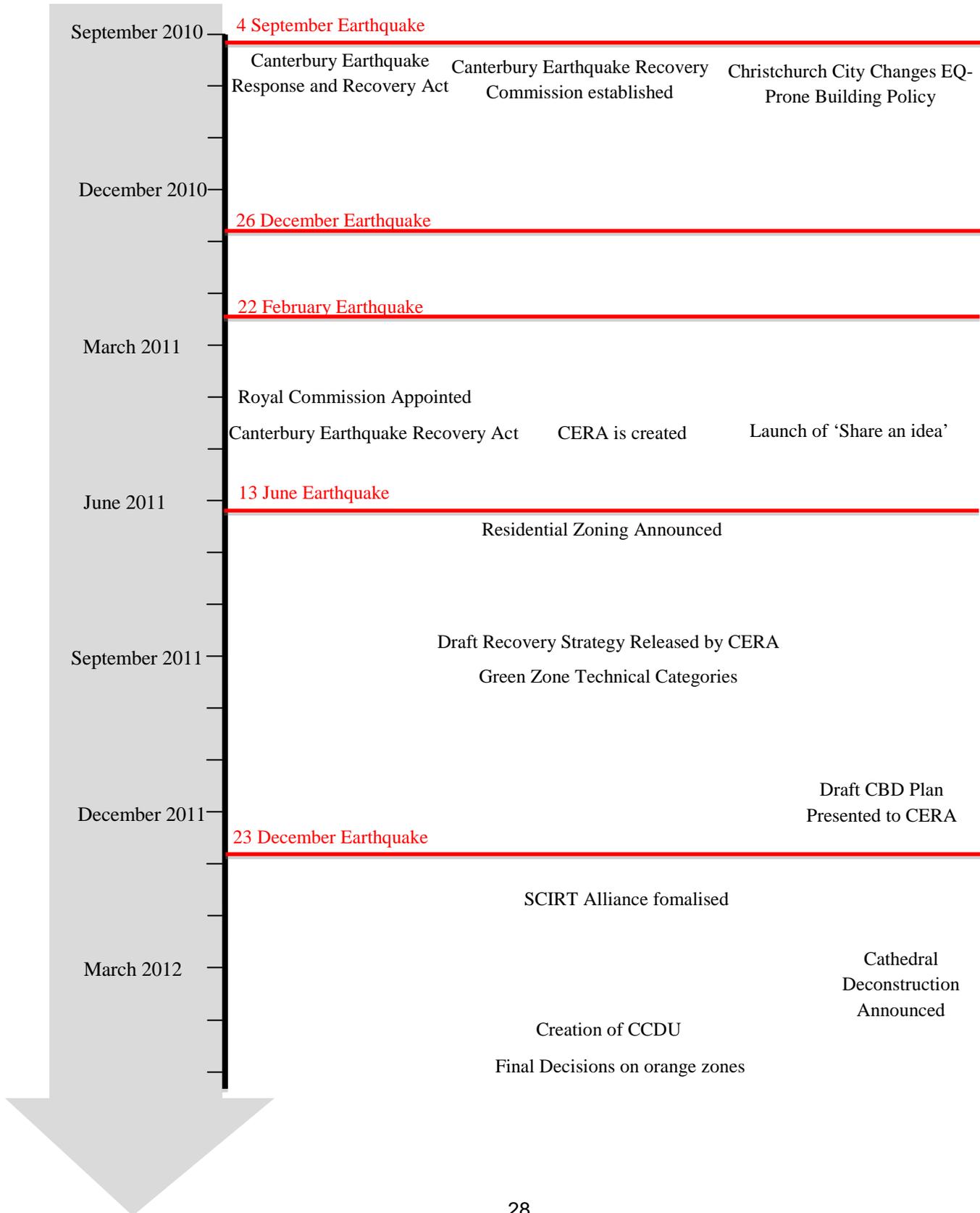
Insurance

Hugh Cowan, General Manager Research and Education: EQC

Martin Kreft, Regional Manager: MunichRe

John Lucas, Insurance Manager: Insurance Council of New Zealand

APPENDIX B: TIMELINE OF EVENTS



APPENDIX C- BUILDING CODE IN NEW ZEALAND

Several unique aspects of New Zealand building standards, particularly related to existing buildings, have impacted the recovery of Christchurch. New Zealand has historically taken a proactive approach to identifying existing buildings vulnerable to damage in strong earthquakes, with first legislation being introduced in 1968². The Building Act 2004 defines an earthquake-prone building as a building that is likely to suffer collapse, causing injury or death, in a moderate earthquake (defined as an earthquake producing shaking that is one-third as strong as the shaking intensity considered in the design of new buildings). The Act requires Territorial Authorities (e.g. local governments) to develop a policy on the identification and strengthening of earthquake-prone buildings. Prior to the 2010 September earthquake, the Christchurch City Council had adopted a passive approach to earthquake strengthening (i.e. earthquake-prone buildings were identified but retrofits would typically only be required with a change of use or significant modifications) and a building could be deemed not earthquake-prone by raising the lateral strength above the 33% limit. The legal limit of 33% NBS was generally considered too low as a strengthening level. The New Zealand Society for Earthquake Engineering had previously recommended a minimum strengthening level of 67% NBS³ and many informed owners opted to retrofit to higher than the minimum 33% NBS.

After the September earthquake, the Christchurch City Council changed the earthquake-prone building policy such that the target strengthening level was explicitly stated to be 67% NBS⁴. This applied to all earthquake-prone buildings, damaged or undamaged by the September earthquake, and hence applied to all structural repairs following the earthquake. Any damage from the earthquake was intended to be considered in the assessment of whether the building satisfied the 33% NBS limit, but without specific guidelines it was unclear how this damage was considered in determining the residual strength of the building. The new policy set 67% NBS a “target” rather than a “requirement” to avoid unnecessary demolition of buildings where the owners considered it impractical to achieve the 67% NBS limit. Christchurch City Council has indicated (CCC 2010) that they will consider cost of strengthening, building use, building size, and extent of repairs required in determining if the 67% strengthening target will be enforced or will allow something lower. It is also noteworthy that the Canterbury Earthquake (Building Act) Order 2010⁵ changed the definition of a “dangerous” building to include earthquake-prone

² Parliament of New Zealand (1968) *Amendment 301A Local Municipal Corporations Act 1968*. New Zealand Statute.

³ New Zealand Society for Earthquake Engineering. 2006. *Assessment and Improvement of the Structural performance of Buildings in Earthquakes*. New Zealand Society for Earthquake Engineering.

⁴ Christchurch City Council (2010) *Earthquake-Prone Dangerous and Insanitary Buildings Policy 2010*

⁵ Parliament of New Zealand (2010) *Canterbury Earthquake (Building Act) Order 2010: Order in Council*, Wellington, New Zealand.

buildings (i.e. <33% NBS); thereby giving City Council greater powers to enforce the strengthening of earthquake-prone buildings.

After the February 2011 earthquake, it was assessed that the Canterbury region would likely see an increased level of seismicity over an extended period of approximately 50 years. To address this increased risk, the Department of Building and Housing made an ‘urgent compliance update’ to the Building Act in May 2011 to raise the seismic hazard factor for the Canterbury region from 0.22 to 0.3, effectively raising seismic design forces by 35%. The basis for the change was the assessment of the long-term seismic hazard by GNS considering the new knowledge of faults in the region and the long-term increase in seismic activity. Note that the seismic hazard factor was not adjusted to account for short-term increases in seismic activity due to aftershocks, as a higher level of exposure was accepted during this transition period. Interviewees in the current study noted that the drivers for the decision to raise the seismic hazard factor also included political motivation to ensure Christchurch was “just as safe as Wellington” (widely considered the city with the highest seismic hazard in New Zealand). Initial calculation of the new seismic hazard factor was higher than 0.3, however the selected limit was considered to provide “a balance between ensuring the safety of the buildings while keeping them economical to build”⁶. The change in the seismic hazard factor not only affected the design of new buildings, but also increased the requirements for existing buildings since these requirements are tied to the NBS. Figure 5 illustrates the changes impacting existing buildings. These “changing goal-posts” from the change to the earthquake prone building policy and the seismic hazard factor also complicated insurance settlements. Some owners wanted insurance to cover repairs to damaged buildings that would bring the building in compliance with the new earthquake-prone building policy (including the change to the seismic hazard factor), but insurance companies have objected since the 67% NBS target strengthening level was not in place at the time the policy was enacted.

⁶ Social Services Committee (2011) “2011/12 Estimates for Vote Housing: Report of the Social Services Committee”, New Zealand House of Representatives.

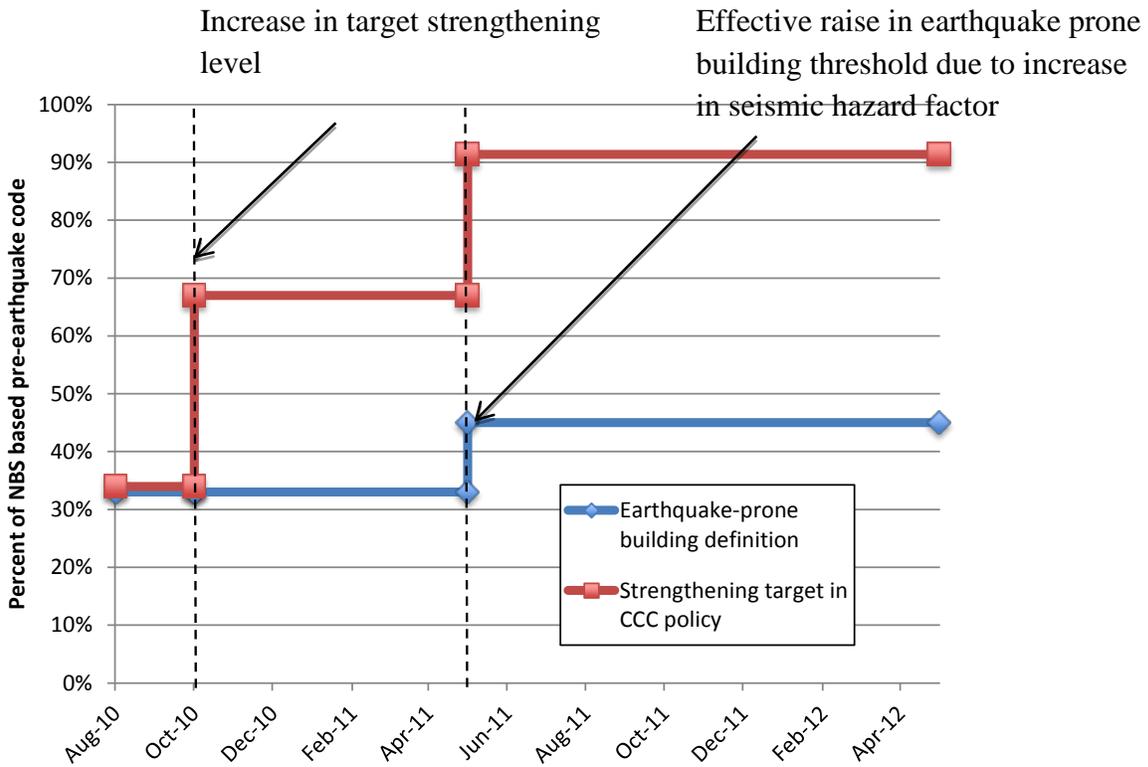


Figure 5. Changes impacting earthquake-prone building definition and strengthening target

In an effort to provide a strong sense of safety for building occupants, ensure all earthquake damage had been identified, and assess the extent of vulnerability in Christchurch, CERA has required all non-residential and multi-unit residential buildings to be subjected to a detailed evaluation of the seismic capacity. For damaged buildings, this requires an assessment of residual capacity for which there is little guidance available. This has necessitated the development of a new Detailed Engineering Evaluation (DEE) procedure by the Department of Building and Housing. The DEEs, combined with the changes to the definition of a “dangerous” building and an increasingly risk adverse engineering community, have led to numerous building closures even for structures which have survived the earthquakes with little or no damage.

APPENDIX D. TOP OVERALL DECISIONS

The following tables group interviewees into the decision-making groups, and summarises responses from interviewees when asked the question:

“Overall, if you were to pick the three most important decisions influencing the recovery of Christchurch, made since February 2011, what would they be? *Example decisions might include: establishing CERA, land buyouts in Eastern Suburbs, not saving the Cathedral, etc.*”

Decision Makers

Interviewee	Decision 1	Decision 2	Decision 3
1	Establish CERA	Having an overall recovery strategy	Having a minister in charge
2	Establish CERA and the CER Act	Maintain the CBD Cordon	Residential zoning
3	Residential zoning	Working with the insurance companies to keep them in Christchurch	Establish CERA
4	Establish CERA	Empowering CERA with the responsibility to manage demolitions within the CBD	Residential zoning- specifically orange and white zones

Decision Implementers

Interviewee	Decision 1	Decision 2	Decision 3
1	Establish CERA	CERA did not decide to use its powers to coordinate claims	Central Government not taking a bigger role by requiring departments to populate CERA
2	Establish CERA	Residential zoning	Establish the CCDU
3	Establish CERA	Powers given under the CER Act, specifically demolitions	How CERA was established and structured
4	Establish CERA	Maintain CBD Cordon	Standing decision not to impose retrofits, passive policy
5	Residential zoning	Decisions to demolish or rehabilitate buildings	x
6	Establish CERA	Central Government becoming heavily involved	Establish SCIRT
7	CERA legislation requiring plan from CCC by December	Establish the CCDU	Residential Zoning
8	Establish CERA	Residential zoning	Establish SCIRT

Business and Community Groups

Interviewee	Decision 1	Decision 2	Decision 3
1	Residential zoning	Lack of communication	Lack of engagement
2	Establish CERA	Building standards, insurance impacts	x
3	Establish CERA	Maintain CBD Cordon	Create the CCDU
4	Establish CERA	Central City Plan developed by Council	Decision in CER to expedite treatment of heritage buildings, and to bypass the Resources Management Act
5	Allowing EQC to lead	Establish CERA	Agencies not communicating with residents
6	Establish CERA	Appoint a minister	Commitment of government
7	Maintain CBD Cordon	Immediate wage subsidy for business	Establish CERA
8	Not engaging with the Central City Plan	Restoration of services after the earthquake	Focus attention on the Central City

Insurance

Interviewee	Decision 1	Decision 2	Decision 3
1	Declaratory Judgement on EQC	Establish CERA	x
2	Residential zoning	Maintain CBD Cordon	Decisions on EQC cover
3	Residential zoning	EQC manage repairs rather than cash settle	Establish CERA

APPENDIX E. TOP DECISIONS WITHIN FOCUS AREAS

The following tables group decision-makers and implementers into their specific areas (CBD management, building standards and evaluation, or residential zoning), and summarises responses from interviewees when asked the question:

“Specifically in terms of (CBD management, building standards and evaluation, or residential zoning) if you were to pick the three most important government decisions in the recovery of Christchurch, made since February 2011, what would they be? Please tell us a little more about each of these decisions: when they were made; what organisation made them; what was the basis for these decisions; if they were guided by any specific pre-planning (from either before the September 2010 earthquake, or the period between September 2010 and February 2011), if the outcomes were as anticipated; what alternatives were considered, etc.”

CBD Management

Interviewee	Decision 1	Decision 2	Decision 3
1	Cordon management	Government Backing of ReStart	CERA acting as a contractor for demolitions
2	Setting up a team to do building assessments and for CERA to act unilaterally	Maintain the Cordon	Getting demolition process underway early

Building Standards and Evaluation

Interviewee	Decision 1	Decision 2	Decision 3
1	Existing Building Policy- delegate earthquake prone building policy to local government	Building design for life safety and not functionality	Building evaluation not included in the building code
2	Detailed Engineering Assessments of all commercial buildings	CERA being empowered to demolish buildings	The establishment of the CCDU
3	Increase seismic hazard factor by approximately 35%	Green Zone Technical Categories from DBH	Detailed Engineering Assessments of all commercial buildings
4	Increase the seismic loading standard	The Royal Commission focusing attention on the responsibility of building owners	Dealing with URM buildings

Residential Zoning

Interviewee	Decision 1	Decision 2	Decision 3
1	Red Zone Purchase Offer	The Minister used his power to make the Greater Christchurch urban development strategy operable	Leaving some areas in a holding pattern, orange and white zones
2	Establishing the residential red zone	Establishing the residential white zone	Not moving the City Centre
3	Establishing the residential red zone	Green Zone Technical Categories from DBH	CERA taking the lead on residential red zones