



**Resilient Organisations  
Research Report 2011/03**

**Post-Disaster Organisational Recovery  
in a Central Business District Context:  
The 2010 & 2011 Canterbury Earthquakes**

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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](http://www.resorgs.org.nz)

## EXECUTIVE SUMMARY

This report presents the findings from two studies on organisational resilience following the 4 September 2010 earthquake in Canterbury, New Zealand to answer three core research questions related to the recovery of organisations within the context of a Central Business District:

- *How did the damage to and decisions of organisations and their neighbours within a Central Business District influence the recovery of an individual business?*
- *To what extent did pre-event characteristics of the CBD, and pre-existing plans for how the CBD would evolve into the future, influence the individual organisations' resilience and the recovery process within the CBD as a whole?*
- *How do policies and plans implemented to manage recovery at the CBD level influence individual organisations' recovery?*

The first study surveyed organisations from across Canterbury in the aftermath of the 4 September earthquake, collecting data from 366 organisations about initial impacts, disruptions, and challenges faced by organisations, as well as information about organisational attributes, relationships and strategies that may have helped mitigate the impacts of the earthquake. A cross-section of geographic areas and industry sectors were strategically selected to take part in this survey to reflect various elements of the Canterbury economy.

The results from this survey showed that organisations located in the Christchurch and Kaiapoi CBDs were more likely to close for a period of time following the disaster and stay closed for more days than organisations in other sectors. CBD organisations were also more likely to be disrupted by structural damage and more likely to relocate all or part of their organisations than most other sectors. Similarly, organisations in the two CBDs were more likely to experience revenue decreases following disasters.

These findings suggest that CBD organisations face a different set of risks and may require additional support during the response and recovery phase and better mitigation and planning prior to an event. For example, CBD organisations had more issues with site access following a disaster, therefore they should emphasize backing up critical information in multiple locations and where possible plan for and facilitate staff relocation or the ability to work from home.

The second study focused particularly on the progress of recovery for the Kaiapoi CBD since the earthquake. Although Kaiapoi suffered significantly from the 4 September earthquake, it did not experience a large amount of additional damage as a result of the 22 February 2011 earthquake. As a result, Kaiapoi is an interesting example of a recovering community in a unique position to revitalise and develop economic and organisational capacity. While recovery progress is difficult to quantify precisely, at the time of writing Kaiapoi was clearly further along in the recovery process than Christchurch. As such, Kaiapoi can potentially provide useful lessons to guide the recovery of Christchurch and other disaster-affected areas.

This study used semi-structured interviews with twelve key informants identified as having a significant influence in shaping the post-disaster environment for Kaiapoi businesses. The data from these interviews provided information about the local context for organisational recovery. Understanding the local context around organisational recovery helps to clarify the decisions and

justifications that shape plans, regulations, and social, economic factors that ultimately influence how organisations recover.

Four key themes emerged during these interviews as having a significantly influence on the recovery environment within the Kaiapoi CBD, these were:

- Competition and collaboration
- Leadership, engagement and communication
- Drivers and temporal influences on recovery
- Preparing for reconstruction.

Recognising and maximising opportunities in crisis is one of the central tenets of resilience. The Canterbury earthquakes have presented organisations in Kaiapoi and throughout Canterbury with an opportunity to reinvent themselves, capture new markets, and form new partnerships. Much of the dialogue in the interviews depicted a departure from “survival-of-the-fittest” business models to one that emphasised collaboration and mutual benefit.

Within a CBD environment, organisations can work together forming economic clusters for co-promotion and support or to share resources in order to decrease the impacts and improve business post-disaster. Thus, while organisations are at risk from other organisations in close proximity and the impacts of restricted access following a disaster, they can reduce risk by forming partnerships and networks with other organisations.

An important area for further research is to investigate the nature of collaborative relationships and how they are being formed prior to and following disasters. Understanding the way organisational networks are utilised during disaster recovery, can also help identify ways these collaborations can be fostered and managed as part of mitigation and response activities.

Recovery is a complex process with many interested and interacting parties; it is therefore difficult to interpret who the “leaders” of recovery are at any point in time. There was a general acknowledgement that for recovery to be successful decisions needed to be made by working together and maintaining constant communication between government, non-government organisations (for-profit and not-for-profit), and the community. It is clear from the interviews that the Waimakariri District Council (WDC) has emerged as an influential, widely acknowledged entity in the recovery. The WDC has made efforts to engage residents and businesses in planning and decision making processes, although there were conflicting reports on the level and success of engagement with businesses.

Urban plans developed prior to the disaster are definitely playing a part in the way Kaiapoi redevelopment is being pursued, both positively and negatively. Plans had been developed and community consultation done prior to the earthquakes, planners had a head start in the aftermath of the disaster. The disaster acted as a catalyst for plans that had been made but were “sitting on the shelf” because of a lack of political and economic will. However, the pre-established plans can also be viewed as a hindrance because organisations may view the consulting process post-disaster a matter of getting buy-in to something they may or may not have had previous input on. Whilst some reported that engagement has been so extensive that community members were feeling fatigued with the process and WDC should just finalise plans and begin recovery work, others indicated that businesses were frustrated with both the engagement process and the plan put forth by the Council.

In response a business advocate group was formed to develop an alternative plan for the town centre (which was eventually adopted by the WDC).

Important questions that surfaced during the analysis of these interviews were: What is the most appropriate model for business engagement in planning and recovery decision making? and; Should councils and Government move away from a “public meeting” type format towards creating collaborative partnerships with businesses and developers.

Effects of disasters differ depending on the different phases of the recovery cycle. Goods and services demanded in the response phase might not be the same (in type and quality) as those demanded in the recovery phase. Consequently, some organisations might do well immediately after, leading to a sense that they have recovered, only to experience delayed effects or the influence of a changed market months following the initial disruption. External factors that individual organisations cannot control including insurance payouts, ongoing aftershocks, and policy changes can make future planning and decision making post-earthquake particularly problematic.

Acknowledging these difficulties several respondents argued that having timeframes and a recovery program with defined goals were essential to the recovery process. Realistic timeframes and setting goals as part of a recovery programme allow people to plan, make needed arrangements, and keep the recovery process moving forward.

Significant concern was also expressed about the potential impacts of the reconstruction process on Kaiapoi organisations. If we can understand more about the way reconstruction efforts influence organisations, organisations may be able to adapt their behaviours to maximise the benefits of the environmental changes. For example, reconstruction efforts will necessarily bring many construction workers who need temporary accommodation, services, food and entertainment. How can organisations plan to adapt their marketing or product to this new demographic?

This concept of planning for the anticipated impacts of reconstruction ties in with several other themes emerging from the interviews. For example, many respondents discussed the importance of having a recovery programme that gives an indication of timelines. With approximate timelines, organisations can plan for when they will need to relocate or consider what they might do to minimise noise and vibration disruptions caused by heavy machinery. Similarly, organisations may be able to develop collaborative relationships with competitors, co-located organisations, or those providing complementary services to aid each other during the reconstruction period.

With the massive demolition and reconstruction process that will occur in Canterbury over at least the next decade, understanding how reconstruction may affect organisations or disrupt their operations will inform planning and business support decisions. Additionally, investigating and developing ways organisations can find opportunities in the reconstruction period will help Canterbury organisations recover more successfully.

The two studies discussed in this report are part of a broader longitudinal study of the resilience and recovery of organisations following the 2010 and 2011 Canterbury earthquakes. A second survey is currently underway to assess organisational impacts, planning, and mitigation information following the 22 February earthquake. More in-depth research into the challenges and opportunities emerging for different sectors is also in process. As they become available, additional research results will be released onto our website: [www.resorgs.org.nz](http://www.resorgs.org.nz).

## **ACKNOWLEDGEMENTS**

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# 1. RESEARCH CONTEXT

This report presents results from two studies conducted by Resilient Organisations and the University of Canterbury on organisational<sup>1</sup> recovery following the following the 4 September 2010 earthquake in Canterbury, New Zealand. This report focuses on organisational recovery within the context of a Central Business District and particularly on the recovery of organisations within two Central Business Districts (CBDs), Christchurch and Kaiapoi. Christchurch is Canterbury's largest city and economic centre, and Kaiapoi is a smaller town 20km north of Christchurch which was heavily impacted by liquefaction and lateral spreading following the 4 September earthquake.

This research aims to develop a more complex understanding of business recovery in CBDs, which recognises the linkages among organisations and their social, economic and physical environments. Studies examining organisational recovery and resilience often focus on organisations as isolated units. However, this fails to recognize the interconnections between organisations and their spatial context<sup>[1]</sup>. A CBD is more than a collection of buildings and organisations; it is characterised by physical, social, political and economic networks that are constantly evolving and influence recovery from disasters. The extended cordoning of the Christchurch CBD and the need to close nearby organisations during building demolitions in the weeks following both the 4 September 2010 and 22 February 2011 earthquakes highlights some of the unique challenges faced by organisations located within central business districts.

Alesch et al.<sup>[2]</sup> argue that a return to the *status quo ex ante* or the exact same conditions as before the disaster event is impossible. A more accurate depiction of recovery from a systems perspective means a reestablishment of a “dynamic homeostasis approximating conditions and relationships” (p. 14) that existed prior to the disaster. Organisational recovery literature recognises that readjustment to a new and different post-disaster environment is necessary for organisational recovery to succeed. In situations where the economic conditions have changed, a decreased level of profitability could be the new “norm” that a recovered business adjusts to<sup>[1, 3, 4]</sup>.

The United Nations International Strategy for Disaster Reduction (UNISDR) definition of recovery incorporates the concept of improvement as an essential part of the process:

Recovery is, “The restoration and improvement where appropriate, of facilities, livelihoods, and living conditions of disaster-affected communities, including efforts to reduce disaster risk factors,”<sup>[5, p.14]</sup>.

For this research, we define organisational recovery as: *“the re-establishment and improvement where appropriate of an organisation’s core functions, adjusted to the new post-disaster environment. This includes efforts to increase organisational resilience and reduce future risk”*. Resilience is a broad concept reflecting an organisation’s ability to not only survive but to be able to thrive through times of adversity<sup>[6]</sup>.

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<sup>1</sup> In this study “organisation” refers to for-profit and not-for-profit including businesses, churches, educational and medical institutions of any size. Organisation and business will be used interchangeably.

## 1.1 Environmental Context in Organisational Recovery

Factors that affect an organisation's recovery go beyond physical damage to structures, possessions, and infrastructure. Recovery research needs to account for the influence of the pre- and post-disaster social, economic, and networked context in which an organisation exists.

In their discussion of socio-political ecology and disasters, Peacock and Ragsdale <sup>[7]</sup> argue that to understand disaster recovery, researchers must consider the policies and actions of public and private organisations and the processes of capital re-accumulation <sup>[8]</sup>. The recovery of businesses post-disaster is a critical driver of household recovery and vice versa. Households purchase and consume from businesses; businesses provide jobs, services, and recreation for households <sup>[9]</sup>.

Since the late 1980s a number of studies have focused on the recovery of organisations following disasters, identifying what makes businesses vulnerable, how they are impacted and what challenges they face during recovery. Most of these studies focus on the disaster experiences of small business and a few have focused on disaster impacts and recovery differences between industry sectors. Kroll et al <sup>[10]</sup> found that following the Loma Prieta (California) earthquake in 1989, small businesses and particularly single location retail organisations, business services such as finance and real estate organisations, and service sector organisations experienced more difficulty recovering due to a lack of resources and lower customer numbers. Following the 2007 Gisborne (New Zealand) earthquake, Powell and Harding <sup>[11]</sup> found that a business's own "poor managerial decisions" (p.52), such as underinsuring the business or delaying strengthening the property to the current building code predicted business impacts.

Pre-disaster business health and the disaster's impact on demand for an organisation's service (e.g. a cafe that relied on a few nearby offices that have relocated) were important predictors for business failure following the 1994 Northridge earthquake <sup>[12]</sup>. In a series of comparative studies tracking business recovery conducted by Tierney, Dahlhamer, and Webb following the 1992 Hurricane Andrew, 1993 U.S. Midwestern floods, and the 1989 and 1994 Loma Prieta and Northridge earthquakes, it was found that businesses which rented rather than owned their premises were more vulnerable to the negative impacts of disaster. They also found that organisations which had critical infrastructure (lifelines) interruptions (such as loss of electricity or water), and/or which reported supply chain disruptions were less likely to recover. Conversely, the length of business interruption and building damage were found not to be strong predictors of business recovery <sup>[13-16]</sup>.

Several other studies have focused on sectoral, regional, and national economic modelling of disaster impacts and recovery <sup>[17, 18]</sup>. Okuyama <sup>[19]</sup> applied a combination of economic and engineering models to understand the inter-regional economic impacts of the Great Hanshin earthquake (Kobe, Japan 1994), demonstrating methods that can minimise system-wide supply constraints that slow recovery. Johnston et al. <sup>[20]</sup> reported major regional losses (approximately NZ\$100 million) in the alpine tourism sector as a result closure of ski fields caused by the 1995-96 eruption of Mt. Ruapehu in the North Island of New Zealand.

Considering an organisation's physical environment and surroundings is an important, but often neglected, aspect of the disaster recovery literature. Physical context includes the location of the business (e.g. in a CBD, a rural area, a small town) as well as the pre-existing trends and plans that have shaped the area's evolution prior to the disaster. For example, Chang and Nojima <sup>[21]</sup> showed that urban areas that experienced decentralisation before a disaster will often see acceleration of

this trend during recovery. Similarly, it has been found that locally oriented businesses, especially those in retail, which rely heavily on foot-traffic, tend to recover more slowly <sup>[1, 10, 12]</sup>. Also businesses that reopen in areas that had experienced higher levels of damage tend to recover slower or fail because customer populations may still be disrupted, the perception of shopping in a heavily damaged area is off-putting to customers, and there is less draw from nearby businesses <sup>[1]</sup>.

Even if businesses have not experienced physical damage, critical service (lifeline) disruptions can have significant negative impacts on organisations <sup>[14, 22]</sup>. Dahlhamer <sup>[14]</sup> demonstrated that physically undamaged businesses experiences greater difficulty recovering if they are located in hard hit areas, while Tierney <sup>[23]</sup> discussed the destabilising impact on small-businesses of losing a nearby “anchor business” or business that acts as a draw to the area.

## 2. RESEARCH OBJECTIVES

This study was designed to answer three core research questions.

The first question asked: *How did the damage to and decisions of organisations and their neighbours within a Central Business District influence the recovery of an individual business?* Organisations within a CBD are closer to a larger number of organisations than in suburban and rural areas. Retail and hospitality organisations which congregate in CBDs are more reliant on foot traffic than other organisation types <sup>[24]</sup>, and organisations within the CBD have often chosen their location due to its accessibility to customers. Following a disaster, organisations within a CBD are more vulnerable to “neighbourhood effects”. Even if an organisation’s building is not damaged, neighbourhood effects, including damage to surrounding areas and the perception of an area being off-limits, have been shown to have a large influence on the level of impacts organisations experience post-disaster <sup>[1]</sup>. Other organisations also make decisions prior to and following disasters that affect other organisations within a CBD. For example, if a building owner chooses not to do building upgrades damage sustained as a result will often affect neighbours or if a nearby business chooses to relocate or not reopen it can cause a gap that negatively influences how the area is perceived. Research question one considers physical implications of proximity to other damaged buildings and the influence on organisational recovery.

The second question considered: *To what extent did pre-event characteristics of the CBD, and pre-existing plans for how the CBD would evolve into the future, influence the individual organisations’ resilience and the recovery process within the CBD as a whole?* This question zooms-out to examine CBD recovery from a more strategic viewpoint. Prior to the earthquakes, Christchurch and Canterbury outlined strategies for growth and development. One part of the strategy, for example, was to attract major businesses and skilled labour from overseas to aid the growth and development of the economy. Another part of the strategy was to develop retail, arts, events, and recreational activities to create more vibrant urban environments <sup>[25]</sup>. The strategies, conceptions, and visions for Canterbury’s urban areas will influence the approach to recovery taken by decision makers and planners.

The third question asked: *How do policies and plans implemented to manage recovery at the CBD level influence individual organisations’ recovery?* This question builds on the concepts in the previous research question, moving from pre-existing plans and strategies, to those implemented

post-disaster. This question aims to understand the relationship between strategic CBD-level actions, decisions and initiatives on individual organisational recovery.

A quantitative questionnaire and qualitative interviews were used to capture the data for this report. In this report results from both the questionnaire and qualitative interviews are presented as separate studies, but in the discussion and conclusions these datasets are brought together to paint a broad picture that answers each research question.

So far, *Sections 1* and *2* of this report have provided the context and justification for this research, and explained the research questions and objectives. *Section 3* provides a broad overview of the earthquake events and the study areas. *Section 4* presents the structured questionnaire portion of the research providing information about how organisations were impacted by the 4 September, 2010 earthquake and highlighting differences between organisations in the CBD samples and organisations in other areas around Canterbury. *Section 5* presents the major themes and concepts emerging from the qualitative analysis, providing contextual information about the recovery thus far of Kaiapoi CBD. *Section 6* revisits and discusses each of the research questions in the context of the results shown. Finally, *Section 7* outlines future work that is planned or required to advance the concepts presented here.

### **3. EVENTS AND STUDY AREA**

An  $M_w$  7.1 earthquake struck 40km west of Christchurch at 4:35am on September 4<sup>th</sup>, 2010 at a depth of 10km. Prior to this event, Canterbury had experienced a period of relatively low seismic activity, with only three minor earthquakes in the previous 40 years<sup>[26]</sup>. Areas near the fault rupture experienced ground accelerations that were 1.26 times the acceleration due to gravity<sup>[26]</sup>. The September earthquake caused a large amount of shaking damage and serious but localised liquefaction damage. While the quake was damaging across large areas of Canterbury, there were no fatalities.

Approximately six months following the 4 September earthquake, a separate fault ruptured in Canterbury, leading to a much different set of impacts. At 12:51pm on 22 February, Canterbury experienced an  $M_w$  6.3 earthquake centred approximately 10 km south-east of the Christchurch CBD<sup>[27]</sup>. Some areas of Christchurch experience ground accelerations that were more than 2.2 times the acceleration due to gravity<sup>[28]</sup>.

The two CBDs that are the focal point of this study were impacted differently by the 4 September and 22 February earthquakes. Christchurch is New Zealand's second largest city, and the economic driver of the South Island. The Christchurch CBD suffered damage in both earthquakes, but damage was much more extensive from the February earthquake. During the September event about 26 per cent of buildings in the Christchurch CBD received either red-tags (unsafe for use) or yellow-tags (restricted access) as part of the initial structural assessment<sup>[25, 29]</sup>. Following the February earthquake, 57 per cent of buildings in the Christchurch CBD received red-tags or yellow-tags<sup>[27]</sup>. For this study, the Christchurch CBD is defined as the area bound by the four avenues (Bealey Ave., Fitzgerald Ave., Deans Ave., and Moorehouse Ave).

Kaiapoi is a small town of approximately 11,000 people located in the Waimakariri District of Canterbury. Kaiapoi was built on filled land over a historic channel of the Waimakariri River, and as

a result was one of the most extreme examples of liquefaction and lateral spread damage in Canterbury following the 4 September earthquake. A staggering 75 per cent of businesses in Kaiapoi were either red or yellow tagged and had either no or limited access to their premises following the September 4th earthquake <sup>[30]</sup>. Kaiapoi escaped with relatively little additional damage following the 22 February earthquake, aside from the worsening of pre-existing damage.

Prior to the earthquake, Kaiapoi had experienced a number of economic challenges. The town had suffered a series of economic crises in the 1970s and 80s with the closure of the Freezing Works and Woollen Mills, two of the district's major employers. Before the 4 September 2010 earthquake, approximately 60-70 per cent of Kaiapoi's working population commuted to Christchurch for work. Kaiapoi has struggled for years with losing retail and service trade to northern parts of Christchurch and the neighbouring town of Rangiora <sup>[30]</sup>.

Kaiapoi was selected as the study area for the qualitative portion of this research primarily because, although it suffered significantly from the 4 September earthquake, it did not experience a large amount of additional damage as a result of the 22 February 2011 earthquake. As a result, Kaiapoi is an interesting example of a recovering community in a unique position to revitalise and recapture organisational benefits. In theory, Kaiapoi is approximately 6 months ahead of Christchurch in its recovery. While recovery progress is difficult to quantify precisely, at the time of writing Kaiapoi was clearly further along in the recovery process than Christchurch. As such, Kaiapoi can potentially provide useful lessons to guide the recovery of Christchurch and other disaster-affected areas.

## **4. ORGANISATIONAL IMPACTS & RECOVERY PROGRESS (STUDY 1)**

This section of the report presents an outline of the methods used to capture data from individual organisations affected by the 4 September earthquake. This data was collected using a questionnaire composed primarily of quantitative questions. The questionnaire was designed to collect data about initial impacts, disruptions, and challenges faced by organisations, as well as information about organisational attributes, relationships and strategies that may have helped mitigate the impacts of the earthquake.

All information from the quantitative portion of this report was collected before the 22 February earthquake. Information is currently being collected on the impacts to and responses of organisations following the  $M_w$  6.3 February earthquake but is not included in this report. A nation-wide moratorium on social earthquake research was in place between February and May 2011 to respect organisations' and individuals' needs to focus on response activities.

The lessons learned and data gathered following the 4 September earthquake provide valuable understanding of how organisations in Canterbury prepare for, are impacted by, and respond to disasters. This will help to interpret and better manage the impacts of the February earthquake.

### **4.1 Questionnaire Sample & Methodology**

The distribution of the questionnaire was initiated November 17th, 2010 and data collection closed February 18<sup>th</sup>, 2011. Questionnaires were mailed to organisations. This was followed by a telephone call where organisations were given the option of completing the survey by phone or in a personal

visit with a member of the research team, using an online survey tool or returning it by post or e-mail. The multi-media approach was designed to cater for those organisations that might have relocated, closed, or were too busy to complete the telephone survey during work hours. The final response rate was greatly improved by the flexible format approach to data collection.

A cross-section of industry sectors was strategically selected for this study to reflect various elements of the Canterbury economy. The sample was divided into two portions. The geographically selected samples were selected based on both on their importance to the economy, but also on their spatial characteristics to exemplify the importance of environmental context on organisational recovery. More broadly, several industry sectors were selected based on various criteria that justified their importance to the Canterbury economy or relevance as indicators of recovery. Within each of these areas and sectors, organisations were randomly selected to be invited to take part in the study.

The geographically selected samples included were:

- Christchurch CBD (CHCH CBD) – represents an important retail and service hub in the Canterbury region. Both CBDs represent an aggregation of organisations in one locality, and allow analysis of challenges faced by organisations that are part of this spatial and economic unit.
- Kaiapoi CBD – a smaller retail and service centre hub that was severely affected by liquefaction and lateral spread following the 4 September earthquake.
- Rural farm - organisations proximal to the fault trace in and around Darfield (Selwyn District) and also a high-growth sector part of Canterbury's regional economic plan
- Rural non-farm –rural farm support organisations and were also selected on the basis of proximity to the fault trace.

The industry sectors included were:

- Information and Communication Technology (ICT) – a high-growth sector identified as a key component of Canterbury's regional economic plan
- Critical infrastructure (lifelines) – for provision of services vital to recovery
- Hospitality (cafes, restaurants and bars) – to analyse recovery through consumer discretionary spend
- Fast moving consumer goods (FMCG) – including product producers, supermarkets, dairies, and petrol stations to analyse recovery through consumer non-discretionary spending
- Trucking – important part of supply chain for many industry sectors and
- Building Suppliers – for their involvement in the rebuilding process.

As the Canterbury-based industry sectors were selected randomly, several of those organisations fell within the confines of the Christchurch CBD and two organisations from the industry sector samples fell within the Kaiapoi CBD. As seen in Table 1, 69 per cent of the hospitality sample was located in the Christchurch CBD. This aggregation is reflective of the actual distribution of hospitality including restaurants, bars, and cafes in the Canterbury region. Similarly, many of the critical infrastructure (lifeline) organisations had their main offices in the Christchurch CBD. About a quarter of ICT organisations were also located within the Christchurch CBD.

**Table 1: Location of industry sectors within the geographic CBD boundaries**

Sampling Categories	Located in the CHCH CBD	% in the CHCH CBD	Located in the Kaiapoi CBD	% in the Kaiapoi CBD	NOT located in a CBD	% NOT in a CBD
Building Supplies	3	10%	0	0%	27	90%
FMCG	2	5%	1	2%	39	93%
Hospitality	22	69%	0	0%	10	31%
ICT	14	25%	0	0%	41	75%
Critical Infrastructure	7	29%	0	0%	17	71%
Rural Farm	0	0%	0	0%	30	100%
Rural Town	0	0%	0	0%	42	100%
Trucking	1	3%	0	0%	36	97%
<b>CHCH CBD</b>	<b>33</b>	<b>100%</b>	<b>0</b>	<b>0%</b>	<b>0</b>	<b>0%</b>
<b>Kaiapoi CBD</b>	<b>0</b>	<b>0%</b>	<b>41</b>	<b>100%</b>	<b>0</b>	<b>0%</b>
<b>Total</b>	<b>82</b>	<b>22%</b>	<b>42</b>	<b>11%</b>	<b>242</b>	<b>66%</b>

The results are presented by sampling category (i.e. the categories shows in Table 1) in order to highlight the differences between organisations within specific industry sectors and organisations selected based on their location. A majority of all organisations in the industry sectors, aside from hospitality, are not located in the Christchurch or Kaiapoi CBDs.

Table 2 shows the breakdown of organisation type in the sampled CBDs. The CBD samples differ by their organisation composition. As mentioned above, given that much of the hospitality sector was in the Christchurch CBD, we excluded additional selection of hospitality organisations from the CHCH CBD sample. However, it is notable that 67 per cent of the CHCH CBD sample consists of retail trade, while the Kaiapoi CBD is highly service oriented.

**Table 2: Organisation type breakdown of the CBD samples**

Organisation Type	CHCH CBD Sample	Kaiapoi CBD Sample
Accommodation, cafes and restaurants	0%	10%
Business services sector	0%	3%
Construction	3%	3%
Cultural and recreational services	0%	5%
Education	0%	5%
Finance and insurance	0%	3%
FMCG	3%	3%
Health and community services	3%	18%
Manufacturing	6%	3%
Personal and other services (e.g. hair salons)	15%	13%
Property and business services	3%	18%
Rental, Hiring and Real Estate Services	0%	3%
Retail trade	67%	13%
Transport and storage	0%	5%

Despite the different organisational composition of the two CBDs, organisations in Christchurch and Kaiapoi CBDs experienced more similarity of impacts than any other sector. This suggests that location within the CBD has as much, if not more, influence on organisational impacts as organisation type. Similarly, as the hospitality sample had many organisations within the Christchurch CBD, the results from that sector are often very similar to the CBD samples, again suggesting that location is a critical factor in the level and type of earthquake impacts organisations experienced.

Locating an organisation within the CBD offers the benefit of increased access to infrastructure, customers and other organisations, while increasing the exposure to damages from neighbouring structures and the likelihood to be located within a cordoned area. Workers and shoppers may also be put off by the perceived risk of multi-story building collapse in a future earthquake. There is a greater density of organisations within CBD areas which often have a higher proportion of older, historic buildings which are more vulnerable to earthquake damage<sup>[1]</sup>. All of these factors contribute to the differential effects felt by organisations within the CBDs affected by the 4 September earthquake.

## 4.2 Sectoral Results

The following section presents the results, by sector, from the questionnaire distributed to organisations in Canterbury between November 2010 and February 2011.



#### 4.2.1 Demographic data

In total 869 organisations were contacted for the survey; 366 usable responses were returned, giving an overall response rate of 42 per cent. The industry sectors with the highest response rates, by percentage, were ICT and critical infrastructure while that with the lowest was rural farm. Figure 1 shows the response rates for all the sectors sampled.

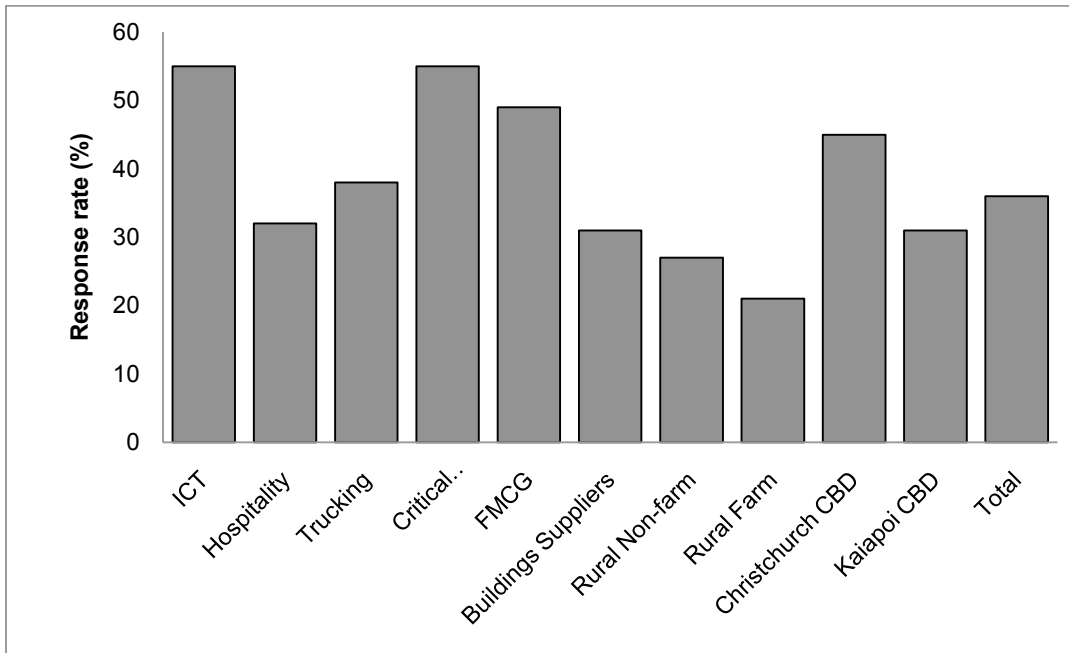


Figure 1: Survey response rate, by sector

As seen in Figure 2, respondents were distributed throughout the Canterbury region. The figure also shows the level of shaking intensity that was likely experienced by each of the organisations.

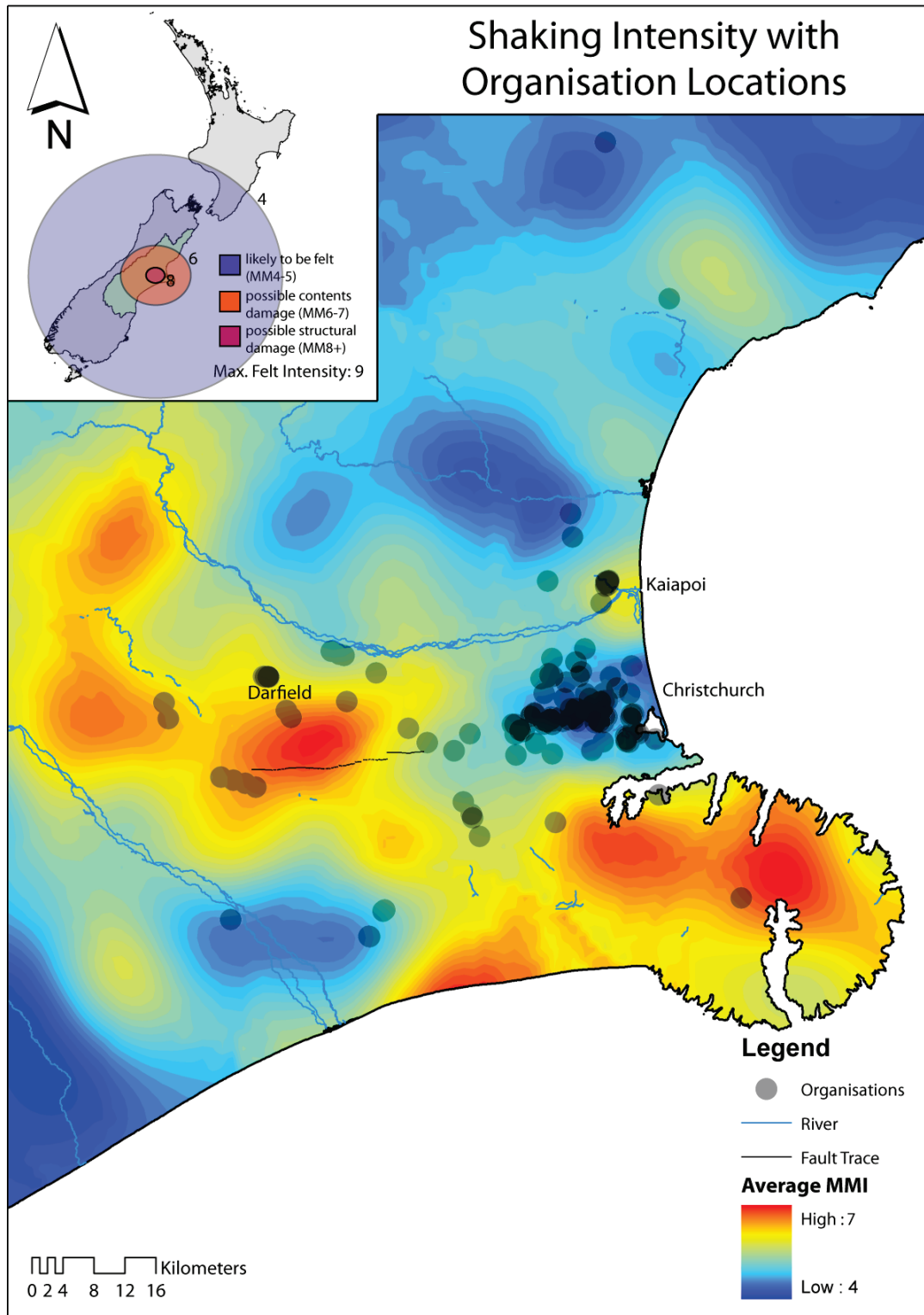


Figure 2: Location of sampled organisations in relation to MMI intensities<sup>2</sup> [26].

<sup>2</sup> This map is derived from GeoNet felt reports. The isoseismal projection in the inset is derived from GeoNet. Map by Zachary Whitman, Department of Geology, University of Canterbury.

The average and median number of employees for the organisations surveyed are included in Table 3. The distribution of organisation size in this study is generally reflective of the size of organisations throughout Canterbury<sup>[31]</sup>.

A large proportion (77%) of organisations sampled had fewer than 20 full-time employees, with a majority (51%) of the total sample employing fewer than five full-time staff. Organisations with greater than 100 full-time employees comprised ten per cent of the sample. A complete breakdown of sector attributes can be seen in Table 3. On average, organisations in the Kaiapoi CBD had fewer employees than the Christchurch CBD.

**Table 3: Basic organisational demographics**

Sector	Number of Employees						Years Operating		Years Operating at Location		Property Owner
	Full-time		Part-time		Temporary		Mean	Median	Mean	Median	%
	Mean	Median	Mean	Median	Mean	Median					
ICT	18	6	2	2	3	1	15	11	9	5	24%
Hospitality	9	5	18	7	1	1	13	10	11	7	9%
Trucking	31	10	9	2	1	1	33	24	17	13	45%
Critical Infrastructure	233	112	41	13	192	4	80	100	48	28	54%
FMCG	154	75	63	52	4	0	38	24	20	11	24%
Buildings Suppliers	11	7	2	1	1	1	25	20	11	8	40%
Rural non-farm	9	2	3	2	11	2	25	11	17	8	57%
Rural Farm	35	2	2	2	1	1	34	28	26	19	93%
CHCH CBD	15	3	29	3	2	2	35	30	16	12	6%
Kaiapoi CBD	5	3	4	2	1	1	35	20	21	13	13%
Total	46	5	17	3	26	1	31	19	18	10	35%

Overall organisations in the CBDs were more likely to have fewer employees and rent rather than own the premises from which they operate. Both of these factors have been shown in the literature to increase vulnerability to disasters. Organisations in the hospitality sector, many of which are located in the Christchurch CBD, were also more likely to rent than own their premises.

#### 4.2.2 Physical impacts of the earthquake

Early in the questionnaire organisations were asked whether or not they were affected by the earthquake. If they were unaffected they were directed to the end of the survey. Thus, all of the information about impacts is from organisations that felt they had been affected in some way by the earthquake. As seen in Table 4, 90 per cent of the organisations in the Christchurch and Kaiapoi CBDs were affected by the earthquake. Even more hospitality (94%) and critical infrastructure (92%) organisations were affected.

**Table 4: Closed and affected organisations**

Sector	% Affected	Closure - Affected Organisations		Duration of closure (days)	
		N	% Closed	Mean	Median
ICT	56	17	55	3	2
Hospitality	94	28	93	8	7
Trucking	71	8	30	11	2
Critical infrastructure	92	9	41	4	3
FMCG	88	29	78	2	1
Buildings	70	11	50	3	2
Suppliers	70	11	50	3	2
Rural non-farm	88	23	62	5	4
Rural Farm	67	1	5	2	2
CHCH CBD	<b>90</b>	<b>29</b>	<b>97</b>	<b>9</b>	<b>7</b>
Kaiapoi CBD	<b>90</b>	<b>31</b>	<b>86</b>	<b>11</b>	<b>7</b>
<b>Total</b>	80	186	64	7	4

Of those affected organisations, 64 per cent in total closed for some period of time following the earthquake. However, closure results differ by sector. A majority of organisations in the Christchurch CBD (97%), Kaiapoi CBD (86%), and hospitality sector (93%) closed for some period of time. These organisations also tended to close for longer periods of time on average than other sectors. While organisations are closed they lose income, but closure may also negatively influence the perception customers have about access to the area. The fact that organisations in the CBDs and hospitality sector were more likely to close and remain closed for longer may have implications for how those organisations recover relative to other organisation types.

Organisations were also asked to indicate what factors contributed to their closing; the results are presented in Table 5. Nearly a quarter of all responding organisations, regardless of sector, indicated that waiting for their building to be structurally assessed contributed to closing. The next most important factor for the sample as a whole was the need to “clear damage to the interior”.

**Table 5: Reasons for closure**

	Building waiting to be structurally assessed	Building declared unsafe	Clear damage to interior	Building waiting to be repaired	Clear damage to exterior	Machinery loss or damage	Stock loss or damage	Office equip loss or damage	Damage to immediate locality	Could not obtain replacement supplies or materials	Could not deliver supplies/services	Employees unable to get to work	Owner or mgr had family or other commitments	Other reason
<b>ICT</b>	20%	0%	13%	4%	0%	2%	2%	2%	7%	0%	5%	11%	4%	5%
<b>Hospitality</b>	53%	16%	25%	16%	19%	3%	38%	3%	41%	3%	16%	19%	0%	22%
<b>Trucking</b>	8%	0%	8%	3%	3%	0%	3%	0%	3%	3%	5%	3%	0%	5%
<b>Critical Infrastructure</b>	13%	0%	17%	4%	4%	0%	8%	13%	8%	0%	8%	8%	0%	0%
<b>FMCG</b>	24%	2%	48%	10%	10%	10%	48%	2%	5%	14%	26%	21%	0%	10%
<b>Buildings Suppliers</b>	10%	0%	20%	7%	10%	7%	13%	3%	0%	7%	13%	7%	7%	3%
<b>Rural Non-farm</b>	19%	2%	36%	2%	7%	12%	26%	12%	2%	10%	21%	2%	2%	7%
<b>Rural Farm</b>	0%	0%	3%	0%	3%	3%	0%	3%	3%	0%	0%	3%	0%	3%
<b>CHCH CBD</b>	<b>61%</b>	<b>21%</b>	<b>15%</b>	<b>12%</b>	<b>9%</b>	<b>0%</b>	<b>12%</b>	<b>9%</b>	<b>48%</b>	<b>3%</b>	<b>30%</b>	<b>27%</b>	<b>0%</b>	<b>9%</b>
<b>Kaiapoi CBD</b>	<b>35%</b>	<b>33%</b>	<b>18%</b>	<b>20%</b>	<b>13%</b>	<b>5%</b>	<b>15%</b>	<b>5%</b>	<b>38%</b>	<b>10%</b>	<b>13%</b>	<b>18%</b>	<b>3%</b>	<b>8%</b>
<b>Total</b>	24%	7%	21%	8%	7%	4%	17%	5%	15%	5%	14%	12%	2%	7%

Notably, Christchurch (48%) and Kaiapoi (38%) CBDs and hospitality (41%) were by far the most likely to indicate that they closed due to “damage to the immediate locality”. Critical infrastructure was the next highest sector, with only 8 per cent of organisations indicating this factor contributed to closing. Similarly, organisations in the Christchurch (21%) and Kaiapoi (33%) CBDs and hospitality (16%) were more likely to indicate that they had to close due to their building being declared unsafe. Several CBD organisations indicated in an additional comments section that buildings had been declared unsafe due to proximity to other unsafe buildings rather than direct damage to their building. Obviously, neighbourhood impacts played a major part in the necessity to close for a period of time following the earthquake for organisations in the CBDs.

While business interruption caused by closure is a major impact following a disaster, there are several other factors that disrupt an organisation’s ability to do business. Thus, organisations were also asked “how disruptive were the following on your ability to do business?” and provided with a list of potentially disruptive factors. The degree to which a factor was disruptive to an organisation was quantified using a 4-point Likert scale. The organisations were asked to rank earthquake-related disruption effects on a scale of “not at all disruptive” (assigned a score of 0) to “very disruptive” (assigned a score of 3). These scores were averaged across each sector, and then divided by the maximum score of 3 to calculate the severity of the disruption item for each sector. The results are presented in Table 6.

The severity of disruption types differed greatly by sector and area. Organisations in the Kaiapoi CBD reported higher overall disruption across all items. The most disruptive item for Kaiapoi organisations proved to be “damage to or the closure of nearby organisations”. This was also the most disruptive item for organisations in the Christchurch CBD and the third most disruptive item for the hospitality sector. Organisations within the Kaiapoi and Christchurch CBDs, and hospitality sector also found the inability to access their site to be very disruptive on their ability to do business. These factors were cited as being more disruptive than “structural damage to building”. Interestingly, structural damage did not prove to be the most disruptive item for any sectors sampled, though certain sectors indicated receiving more structural damage than others, as can be seen in Table 6.

Many organisations in the Christchurch and Kaiapoi CBDs and some of the organisations in the hospitality sector were located inside areas cordoned-off for several days and in some cases weeks following the 4 September earthquake. Organisations noted that even when they did not suffer any structural damages, they were forced to close due to their proximity to unsafe buildings or due to their location in areas that were officially cordoned-off. This was not a significant issue for the majority of organisations outside of the CBD.

Urban organisations found that “damage to or closure of nearby organisations” was disruptive, and possibly as a result of this they did not find the relationships with their neighbours to be as helpful in mitigating the effects of the disaster. Conversely, farm and non-farm rural organisations were not as affected by the closure of or damage to nearby organisations and they found their relationships with neighbours to be very helpful in mitigating the effects of the earthquake.

Table 6: Average organisational disruption scores broken down by item and sector

Sector	Structural damage to building(s)	Non-structural damage	Damage to equipment	Damage to computers	Damage to inventory or stock	Water supply disruption	Sewage or effluent disruption	Communications disruption	Damage to ground surface	Damage to or closure of adjacent organisations or buildings	Damage to or closure of nearby organisations	Unable to access site	Injury to employees	Other damage	Electricity disruption
ICT	17%	29%	17%	13%	12%	24%	11%	40%	10%	30%	32%	38%	0%	14%	40%
Hospitality	16%	22%	22%	5%	46%	36%	15%	16%	2%	51%	52%	55%	0%	4%	48%
Trucking	15%	15%	16%	7%	26%	11%	7%	23%	10%	6%	12%	4%	0%	7%	21%
Lifelines	23%	29%	24%	15%	16%	24%	18%	18%	18%	22%	15%	11%	0%	11%	30%
FMCG	21%	41%	26%	10%	70%	28%	18%	30%	11%	18%	31%	8%	4%	12%	39%
Buildings Suppliers	25%	22%	12%	8%	35%	6%	0%	13%	11%	13%	13%	6%	0%	11%	22%
Rural non-farm	23%	42%	34%	20%	42%	28%	10%	37%	8%	24%	25%	8%	2%	14%	51%
Rural Farm	38%	47%	47%	28%	28%	58%	27%	38%	22%	18%	17%	3%	0%	11%	63%
CHCH CBD	31%	31%	15%	9%	16%	17%	8%	33%	6%	62%	64%	70%	0%	17%	34%
Kaiapoi CBD	46%	26%	25%	13%	35%	77%	69%	53%	53%	78%	83%	63%	3%	20%	63%
All Groups	25%	31%	24%	13%	35%	32%	19%	31%	16%	34%	37%	28%	1%	12%	42%

Highlighted figures indicate moderately to very disruptive items

Organisations were also asked to report whether their organisation was relocated as a result of the earthquake. At the time of surveying, only 8 per cent of all affected organisations had relocated. The disruptive effect of structural damage to organisations was highest in the Kaiapoi CBD sample, which also had the highest rate of relocation among any sample (18% of organisations in Kaiapoi had relocated). Organisations in the ICT sector differed from this trend however in that the majority of relocations were not related to structural damage, but instead were related to site access and non-structural damage. Overall, the majority of organisations were not significantly impacted by structural damage, which may also explain why relatively few organisations had relocated their entire organisation at the time of sampling. Table 7 shows the percentage of organisations that relocated their business following the September earthquake.

**Table 7: Organisations relocating all or part of their business**

<b>Sector</b>	<b>% Relocating whole organisation</b>	<b>% Relocating elements of organisation</b>
<b>ICT</b>	9%	18%
<b>Hospitality</b>	0%	13%
<b>Trucking</b>	3%	8%
<b>Lifelines</b>	0%	33%
<b>FMCG</b>	5%	21%
<b>Buildings Suppliers</b>	0%	7%
<b>Rural non-farm</b>	2%	5%
<b>Rural Farm</b>	7%	7%
<b>CHCH CBD</b>	9%	33%
<b>Kaiapoi CBD</b>	18%	35%
<b>Total</b>	6%	18%

Table 7 also shows the percentage of organisations that relocated only parts of their organisation. This is not often considered in post-disaster recovery literature; however a number of organisations were required to find alternate locations for elements of their operation such as staff and warehousing.

#### **4.2.3 Impacts on revenue & redundancies**

At the time of sampling 44 per cent of all organisations indicated no change to their overall revenue, whilst 42 per cent reported a decrease in revenue. Approximately 14% of organisations indicated an increase in revenue (Table 8).

The Christchurch CBD, Kaiapoi CBD and hospitality sector had the greatest number of organisations reporting revenue loss. This could be for several reasons including a drop in discretionary spending following the earthquake (affecting hospitality and some retail) and business interruption caused by damage to buildings, cordons restricting access, and specifically in Kaiapoi extended disruption to critical infrastructure, and cordons restricting access.



**Table 8: Organisational revenue change after 4 September**

Sector	Revenue Change		
	Organisations indicating increase	Organisations indicating decrease	Organisations indicating no change
ICT	10%	19%	71%
Hospitality	17%	63%	20%
Trucking	15%	38%	46%
Critical Infrastructure	25%	20%	55%
FMCG	20%	17%	63%
Buildings Suppliers	15%	60%	25%
Rural Non-farm	22%	43%	35%
Rural Farm	0%	5%	95%
CHCH CBD	3%	77%	20%
Kaiapoi CBD	8%	67%	25%
Total	14%	42%	44%

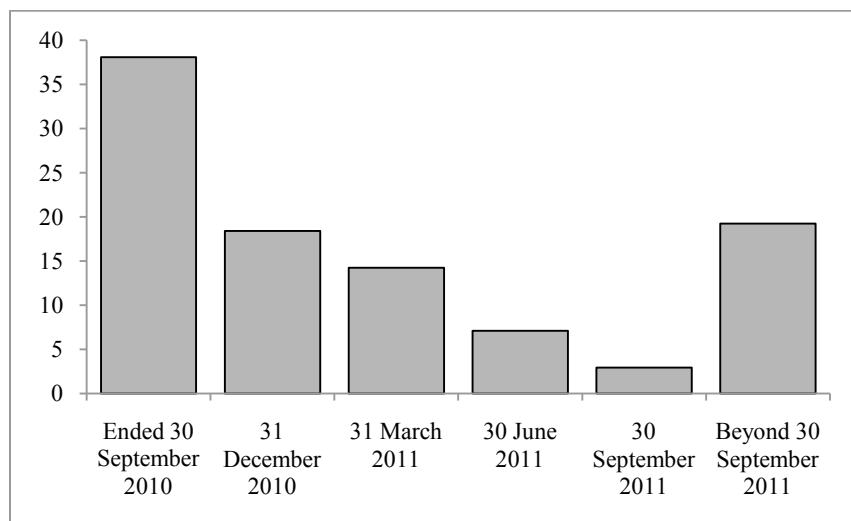
Table 9 shows the estimated amount of revenue change experienced by organisations who reported increased or decreased revenue following the September earthquake. Overall, the organisations reporting the greatest per cent drop in revenue are within the Christchurch CBD, the Kaiapoi CBD and rural non-farm. The rural farm, lifelines, and producers reported modest gains in revenue. The majority of sample groups that reported changes in revenue experienced losses.

**Table 9: Estimated revenue change by sector**

Sector	Revenue Decreases			Revenue Increases		
	<i>N</i>	<i>Mean Decrease</i>	<i>Stdev</i>	<i>N</i>	<i>Mean Increase</i>	<i>Stdev</i>
ICT	6	30%	13%	2	20%	14%
Hospitality	18	28%	12%	5	13%	4%
Trucking	9	25%	15%	4	22%	7%
Critical Infrastructure	1	35%	0%	3	23%	23%
FMCG	5	7%	8%	5	19%	12%
Buildings Suppliers	11	30%	20%	2	30%	14%
Rural Non-farm	14	40%	27%	3	75%	109%
Rural Farm	1	2%	0%	7	17%	10%
CHCH CBD	21	37%	22%	1	15%	0%
Kaiapoi CBD	22	40%	31%	3	18%	4%
All Groups	108	33%	23%	33	23%	33%

Organisations were also asked to report how long they expected revenue changes to last. Nearly 40 per cent of organisations had experienced only very brief impacts on their revenue. As seen in Figure 3, more than half of the organisations expected the effect of the earthquake on revenue to

have ceased by the end of 2010, whilst 18% expected these impacts to extend beyond September 2011.



**Figure 3: Forecast of end of change in revenue**

Another indicator of organisation health post-disaster is whether organisations are able to retain staff. Affected organisations were asked to report whether they fired (made redundant) or hired staff in the aftermath of the earthquake. Staff numbers were largely unaffected by the earthquake, however, more organisations hired staff than fired staff at the time of surveying as seen in Table 10. Several organisations that reported redundancies identified the reasons for the decisions were not due to the earthquake. The FMCG retail and critical infrastructure sectors took on the largest number of additional staff, which is most likely due to the heavy demand placed on these sectors in the aftermath of the earthquake.

**Table 10: Employee hiring and firing**

Sector	Fired Staff	Hired Staff
ICT	6%	26%
Hospitality	10%	33%
Trucking	8%	31%
Critical Infrastructure	0%	45%
FMCG	0%	32%
Buildings Suppliers	5%	19%
Rural non-farm	8%	16%
Rural Farm	0%	10%
CHCH CBD	10%	24%
Kaiapoi CBD	6%	11%
Total	6%	25%

Organisations were asked to report their biggest challenges following the earthquake. Across all the sectors the majority of respondents cited managing staff wellbeing as a major challenge following the 4 September earthquake. All other major challenges cited by organisations are broken down by sector in Table 11.

**Table 11: Summary of each sector's biggest challenges in the aftermath of the 4 September earthquake**

<b>Sector</b>	<b>Biggest Challenges</b>
<b>ICT</b>	<ul style="list-style-type: none"> <li>• Increased demand for services</li> <li>• Relocations and access issues</li> <li>• Difficult to access customers in city</li> </ul>
<b>Hospitality</b>	<ul style="list-style-type: none"> <li>• Staff availability</li> <li>• Cash flow &amp; supply chain &amp; decrease in customer numbers</li> <li>• Customers not spending</li> <li>• Access to sites</li> </ul>
<b>Trucking</b>	<ul style="list-style-type: none"> <li>• Forecasting demand</li> <li>• Preparedness, planning for crisis</li> <li>• Logistics (especially storage) &amp; lower sales</li> </ul>
<b>Critical infrastructure</b>	<ul style="list-style-type: none"> <li>• Inspection of equipment</li> <li>• Continuing work started before EQ</li> <li>• Shutdown/restarting operations</li> <li>• Increase in demand</li> </ul>
<b>FMCG (Dairies/Petrol Stations/Producers/Supermarkets)</b>	<ul style="list-style-type: none"> <li>• Stocking issues</li> <li>• Supply Chain</li> <li>• Non/structural damage</li> </ul>
<b>Building suppliers</b>	<ul style="list-style-type: none"> <li>• Forecasting demand</li> <li>• Sales down from waiting for rebuilding work to start</li> <li>• Lack of customers</li> </ul>
<b>Rural non-farm</b>	<ul style="list-style-type: none"> <li>• Cash flow &amp; drop in revenue</li> <li>• Lower customer number &amp; Customers spending less</li> <li>• Supply chain &amp; Logistics</li> </ul>
<b>Rural farm</b>	<ul style="list-style-type: none"> <li>• Lifelines disruption</li> <li>• Structural repairs</li> </ul>
<b>CHCH CBD</b>	<ul style="list-style-type: none"> <li>• Customers' perceptions of Christchurch CBD as not open</li> <li>• Accessing site</li> <li>• Customer spending, cash-flow, revenue</li> </ul>
<b>Kaiapoi CBD</b>	<ul style="list-style-type: none"> <li>• Lack of customers/ customers not spending</li> <li>• Relocation</li> <li>• Access to site &amp; Structural damage</li> </ul>

A lack of customers and income was a major challenge faced in many sectors including the CBDs, hospitality, and building suppliers. Many organisations believed that lower customer numbers were in part caused by a perception that the CBD was completely off-limits, even when organisations were fully operational. Organisations also believed that damage to nearby organisations scared away potential customers.

Site access was also a major concern for organisations affected by cordons and damaged buildings, particularly in Christchurch and Kaiapoi CBDs and the hospitality sector, but also the ICT sector that had difficulty accessing customers in the CBD.

In the Kaiapoi CBD, organisations also cited decreased productivity due to customers occupying staff time telling stories about their experiences. One organisation wrote that their biggest challenge was, *“the amount of time spent with customers and staff talking and counselling about the effects of the earthquake on them. Some people want to talk about it a lot.”*

#### 4.2.4 Organisational preparedness, recovery finance, & mitigation

Part of organisational resilience to disasters is adequately preparing for a range of disruptions and being able to access adequate resources following a disaster to aid recovery. Private insurance is one of the main sources of recovery funding for organisations affected by disaster. Organisations were asked to report the types of insurance they had. These results are broken down in Table 12. Less than 3 per cent of the affected organisations did not list any insurance.

**Table 12: Percentage of organisations with the different insurance types**

Sector	Cash flow, income protection and business interruption	Property and buildings	Organisation assets and equipment	Motor Vehicles	Public liability	Commodities and goods	Other
ICT	24%	27%	49%	31%	44%	20%	15%
Hospitality	78%	47%	75%	44%	69%	63%	0%
Trucking	37%	45%	50%	47%	50%	24%	16%
Critical Infrastructure	38%	54%	50%	54%	67%	33%	42%
FMCG	62%	57%	62%	62%	64%	60%	21%
Buildings Suppliers	43%	43%	57%	57%	63%	50%	10%
Rural Non-farm	43%	76%	69%	57%	69%	50%	2%
Rural Farm	23%	63%	33%	63%	47%	33%	7%
CHCH CBD	<b>70%</b>	<b>48%</b>	<b>73%</b>	<b>55%</b>	<b>64%</b>	<b>70%</b>	<b>12%</b>
Kaiapoi CBD	<b>45%</b>	<b>40%</b>	<b>68%</b>	<b>38%</b>	<b>68%</b>	<b>35%</b>	<b>13%</b>
Total	45%	49%	59%	49%	60%	43%	13%

Organisations were also asked about their relationships with their insurer, their banker and also how satisfied they were with their insurance package on a scale from “very dissatisfied” to “very satisfied”. The results of this analysis are shown in Table 13. From the overall sample, approximately 19 percent of organisations reported feeling “very satisfied” with their insurer while 29 per cent were “satisfied”. Twenty-four per cent of all sampled organisations were “very satisfied” with their banker and 25 per cent were “satisfied.” More organisations in the Christchurch and Kaiapoi CBDs and the hospitality sector indicated that they were “dissatisfied” with their insurer than other sectors. Similarly, organisations in the Christchurch CBD, Kaiapoi CBD were more likely to be “dissatisfied” or “very dissatisfied” with their insurance package. It is unclear from these results why organisations were dissatisfied.

**Table 13: Degree of satisfaction with insurer, insurance package and banker**

Sector	INSURER					INSURANCE PACKAGE					BANKER				
	Very Satisfied	Satisfied	Neutral	Dissatisfied	Dissatisfied	Very Satisfied	Satisfied	Neutral	Dissatisfied	Dissatisfied	Very Satisfied	Satisfied	Neutral	Dissatisfied	Dissatisfied
<b>ICT</b>	7%	18%	27%	2%	0%	4%	11%	29%	7%	0%	11%	20%	22%	0%	2%
<b>Hospitality</b>	9%	38%	25%	13%	0%	13%	38%	22%	9%	3%	31%	25%	25%	3%	0%
<b>Trucking</b>	18%	21%	16%	3%	3%	16%	18%	21%	0%	0%	18%	29%	13%	0%	0%
<b>Critical Infrastructure</b>	29%	29%	21%	0%	0%	17%	17%	38%	0%	0%	13%	33%	25%	0%	0%
<b>FMCG</b>	36%	24%	19%	0%	0%	33%	21%	26%	0%	0%	38%	14%	19%	0%	0%
<b>Buildings Suppliers</b>	10%	37%	13%	3%	7%	10%	17%	20%	10%	10%	23%	17%	20%	0%	3%
<b>Rural non-farm</b>	29%	33%	21%	5%	0%	17%	31%	33%	5%	2%	26%	33%	29%	0%	0%
<b>Rural Farm</b>	23%	37%	7%	0%	0%	23%	13%	23%	3%	3%	20%	30%	13%	3%	0%
<b>CHCH CBD</b>	12%	33%	27%	9%	3%	6%	27%	24%	15%	3%	21%	36%	18%	3%	3%
<b>Kaiapoi CBD</b>	15%	33%	20%	10%	5%	13%	25%	28%	5%	10%	35%	23%	18%	3%	3%
<b>Total</b>	19%	29%	20%	4%	2%	15%	22%	26%	5%	3%	24%	25%	20%	1%	1%

Organisations were also asked how they planned to finance recovery. Organisations were given a list of options and asked to select all that applied. The sectoral results can be seen in Table 14. A majority (69%) of organisations from all sectors indicated that they would fund recovery, at least in part, with organisational cash flow.

Bank loans and credit cards were more likely to be selected as recovery finance options by hospitality, building supplies, and the Christchurch and Kaiapoi CBDs. This in part is reflective of organisations that were smaller in size and had largely negative impacts on their revenue immediately following the September earthquake.

**Table 14: Recovery finance options**

Sector	Organisational cash flow	Savings	Money borrowed from family or friends	Bank loan	Credit cards	Insurance claim	Earthquake wage subsidy	Other
ICT	92%	8%	4%	8%	4%	13%	21%	13%
Hospitality	64%	21%	11%	25%	11%	68%	29%	4%
Trucking	76%	0%	0%	6%	0%	29%	12%	24%
Critical Infrastructure	81%	10%	0%	5%	0%	19%	0%	14%
FMCG	59%	26%	4%	0%	0%	48%	4%	15%
Building Supplies	90%	20%	10%	25%	15%	15%	10%	10%
Rural Farm	60%	35%	0%	5%	0%	70%	5%	5%
Rural non-farm	58%	31%	6%	8%	3%	42%	8%	14%
CHCH CBD	<b>59%</b>	<b>34%</b>	<b>10%</b>	<b>24%</b>	<b>14%</b>	<b>45%</b>	<b>38%</b>	<b>10%</b>
Kaiapoi CBD	<b>54%</b>	<b>37%</b>	<b>9%</b>	<b>23%</b>	<b>6%</b>	<b>46%</b>	<b>23%</b>	<b>17%</b>
<b>Total</b>	69%	22%	5%	13%	5%	40%	15%	13%

Mitigation is the reduction of frequency, exposure, or magnitude of risk. Mitigation is intended to minimise business interruption, damage, and losses thereby increasing an organisation’s resilience to disasters. Organisations were given a list of 14 potential factors that helped contribute to mitigating disruption to operations. Using a scale ranging from “not at all” to “very helpful”, organisations were asked to identify each factor’s usefulness. Each mitigation factor was then averaged at the sectoral level and divided by the total possible score to calculate a sector mitigation factor score that ranged from 0-100 per cent (0 per cent indicating that all organisations found the factor to be “not at all” helpful in mitigating the effects of the earthquake and 100 per cent indicating that all organisations found the factor to be very helpful). The full sectoral results can be seen in Table 15.

The factors that organisations found most helpful in mitigating disruption to operations were (in order of reported helpfulness in mitigating the effects of the earthquake):

- Well designed and well-built buildings;
- Relationship with staff; and
- Critical lifeline services being restored quickly or were not interrupted.

Organisations cited these three factors most frequently as moderately to very helpful in the aftermath of the 4 September earthquake and subsequent aftershocks. The two most important factors to the majority of sectors were either well designed and well-built buildings or the relationship with staff. All sectors listed the design and build of the buildings to be the most helpful factor in mitigating disruptions. The lifelines, FMCG, and Kaiapoi CBD identified “relationship with staff” to be the most important mitigating factor. Farm and non-farm rural organisations indicated that their relationships with neighbours were helpful in mitigating the effects of the earthquake, while other sectors found this to be less important to their mitigation strategy. Complete sectoral results of the mitigating factors are shown in Table 15.

Table 15: Sectoral results of the mitigation factor scores per item

Sector	Backup/alternatives to critical lifelines	Critical lifelines were restored quickly or not interrupted	Relationship with staff	Relationship with banks or lenders	Relationship with our neighbours	Available cash or credit	Spare resources (e.g. equipment or extra people)	Insurance	Business continuity, emergency management or disaster preparedness plan	Backup or alternative site	Practiced response to a disaster	Emergency kit	Well designed and well-built buildings	Other (please specify)
ICT	24%	64%	68%	21%	24%	43%	18%	13%	40%	29%	33%	18%	71%	33%
Hospitality	17%	60%	75%	51%	49%	60%	27%	54%	20%	8%	5%	7%	81%	44%
Trucking	14%	52%	60%	27%	24%	31%	33%	36%	24%	13%	19%	21%	65%	29%
Lifelines	55%	76%	87%	11%	22%	35%	64%	33%	83%	33%	79%	53%	83%	100%
FMCG	23%	60%	82%	30%	24%	43%	47%	51%	61%	29%	52%	32%	75%	40%
Buildings Suppliers	18%	47%	63%	32%	19%	35%	11%	26%	18%	9%	16%	16%	77%	0%
Rural Non-farm	41%	69%	67%	41%	67%	52%	43%	51%	32%	9%	29%	32%	78%	52%
Rural Farm	52%	67%	42%	32%	63%	53%	55%	65%	35%	17%	28%	52%	85%	10%
CHCH CBD	18%	47%	69%	32%	45%	55%	26%	40%	37%	27%	24%	21%	69%	67%
Kaiapoi CBD	41%	49%	72%	52%	50%	60%	39%	47%	39%	34%	24%	17%	59%	0%
All Groups	30%	59%	69%	34%	40%	47%	36%	42%	39%	21%	31%	26%	74%	32%

Highlighted figures indicate moderately to very helpful items

## 5. CONTEXTUAL OVERVIEW OF CBD RECOVERY IN KAIAPOI (STUDY 2)

This section of the report presents preliminary findings from qualitative interviews conducted with key informants in the earthquake recovery of Kaiapoi, New Zealand. The interviews focused specifically on organisational and town centre<sup>3</sup> (CBD) recovery.

Organisations' long-term functioning and success are in part influenced by the decisions of planners, developers, and regulators who are helping shape the post-disaster environment <sup>[32, 33]</sup>. Interviews were undertaken with 12 key informants identified as having significant influence in shaping the post-disaster environment for Kaiapoi businesses. The data from these interviews provided information about the local context for organisational recovery. Understanding the local context around organisational recovery helps to clarify the decisions and justifications that shape plans, regulations, and social, economic factors that ultimately influence how organisations recover.

Twelve semi-structured in-depth interviews were conducted with key informants in Kaiapoi between 23 May and 3 June 2011. Each interview lasted between 45-90 minutes. Key Informants were selected for their ability to provide a strategic overview of organisational recovery in the Kaiapoi CBD or "town centre" context.

The primary purpose of the contextual qualitative interviews was to explore the ideas, discussions, and other factors that are influencing the interactions and decisions made by key stakeholders in Kaiapoi's recovery. Often these are concepts that researchers and decision makers have not predicted.

The questions were designed with several objectives that were intended to advance the understanding of the planning, decision making, and perceptual processes referred to in the research questions. These objectives include documenting and analysing:

- The perceptions and visions of planners and decision makers involved in CBD recovery,
- The evolution of strategies and plans being administered to guide CBD recovery,
- The actual and potential impacts of these strategies and plans on individual organisations,
- The challenges faced during this evolution, and
- Reflections on the success and failures of these strategies and plans in achieving their intended goals.

### 5.1 Interview Sample & Methodology

The sample was selected using a theoretical sampling technique. Individuals were identified who fit certain desired attributes or who were best situated to advance the data gathering and knowledge generation objectives <sup>[34]</sup>. Non-probability snowball sampling, where participants are asked to recommend others who may contribute to the study, was employed to expand the sample <sup>[35]</sup>. A shortcoming of this sampling technique was that it might omit individuals who were not well known or

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<sup>3</sup> Most people in Kaiapoi refer to central Kaiapoi (the main area along Williams St. Hilton St., and Raven Quay) as the "town centre" rather than the CBD.



did not have a public profile. However, the purpose of the interviews was to generate a fuller understanding of the local context in which organisations were operating. Individuals who were active and interacting in the business community were able to provide a broad overview and sense of the trajectory of recovery.

A series of open-ended questions guided the interviews. The semi-structured format allowed the interviewer to rephrase and reorder questions and to develop follow-up questions during the interview. The resulting interviews therefore included elements of exploratory conversation, but a core set of questions was used to guide the interviews to assure comparability between respondents. The interview question guide is included in Appendix A.

All interviews were digitally recorded. The digital recordings were supplemented by researcher field notes which document unrecorded discussions, researcher observations, and speculative reflections directly following the interviews<sup>[36]</sup>. A research assistant transcribed all the interviews for analysis.

Content analysis was used to extract and interpret themes emerging from the interview data. Themes emerging from the interviews were compared and contrasted to assess the contradictions, motivations, and the participants' emotional "construction" of their worlds<sup>[37]</sup>. Given the difficulty of understanding all of the processes simultaneously occurring following a disaster, this method was helpful for interpreting what planning and strategic decisions were being made that might affect an organisation's operating environment, how these decisions were being made and why.

## **5.2 Discussion of Major Themes from the Interviews**

Although the research questions and objectives were used to develop the interview guide, the nature of bottom-up qualitative research is inherently exploratory. Additional results and concepts that emerge from the data are often far more interesting and insightful than the results the researcher was intending to find. This proved to be so for the interviews conducted in Kaiapoi. Therefore the results are organised and discussed under several meta-themes that emerged from the data.

Several facets of recovery are discussed here including reconstruction and redevelopment. Reconstruction refers to the physical repairs, rebuilding, and required new construction of buildings and infrastructure that occurs post-disaster. Redevelopment refers to a broader concept which includes the reconstruction process, but emphasizes hazard mitigation and social, economic, and physical community improvement<sup>[38]</sup>.

### **5.2.1 Competition & collaboration**

Recognising and maximising opportunities in crisis is one of the central tenets of resilience. The Canterbury earthquakes have presented organisations in Kaiapoi and throughout Canterbury with an opportunity to reinvent themselves, capture new markets, and form new partnerships. Much of the dialogue in the interviews depicted a departure from "survival-of-the-fittest" business models to one that emphasised collaboration and mutual benefit.

Organisation theory is moving away from a model that considers discrete transactions in a version of the "free market" to one that considers the role of relationships and networks in enabling organisations to conduct business and solve problems<sup>[39, 40]</sup>. In a disaster context, it is becoming

apparent that organisational collaboration and networks are critical for not only the initial emergency response, but also for an efficient and economic reconstruction and recovery<sup>[41, 42]</sup>. However, very few studies outline how organisations can develop these cooperative relationships post-disaster.

In Kaiapoi, many themes point towards development of collaborations between organisations, but it is unclear how widespread this emergent modus operandi is, or how well developed these relationships are. For example, several interviewees characterised Kaiapoi as a competitive entity in relation to other centres, stating that “*Kaiapoi will never have another opportunity to drag white collar employees out to a town like this if it hadn't been for the second earthquake,*” and “*Kaiapoi needs to find a way to differentiate itself from Rangiora to attract shoppers*”. Kaiapoi Promotion Association<sup>4</sup> and Enterprise North Canterbury<sup>5</sup> are managing and developing part of this co-promotion or locational marketing to some extent.

Efforts are underway in Kaiapoi to help organisations network; this is taking the form of ‘mingling’ and ‘meet and greets’ and is to a limited extent enabling collaborative clusters of traditional competitors.

*“They’re setting up clusters – they’re looking at automotive clusters, because the thing about Kaiapoi is, and I ... am not saying anything that isn’t already known – it’s not a retail destination. It’s a service town, right. So ... it’s actually identifying those service clusters. And one’s automotive, one might be the building trade, one might be the car trade, I’ve no idea. And [business recovery coordinator has] already had this group of businesses come to him and said we’d like to work closer together. So you know, working with them, bringing in an external specialist in that line. Because it won’t necessarily be marketing. I mean it could be cross referring each other, building each other’s businesses, working closer together, collaborative.”*

There is some evidence that organisations are forming these relationships organically, however it is unclear how extensive these collaborations are or their functionality.

Future collaborations and cooperation will help optimise reconstruction potential as well. As explained by one respondent.

*“So in that mall alone, there’d be at least 10 owners in there. Not one, ten. So they all get paid out and have to make their decision and are they going to rebuild and how are they going to rebuild a mall like that again? Because individually they can’t do it”*

Individual organisations may not have adequate insurance cover to rebuild and relocate. However, organisations can work each other and with developers to either collectively rebuild or sell together and determine where they would relocate. If an individual organisation in a mall made the decision to sell while others held out it would slow the reconstruction process.

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<sup>4</sup> Kaiapoi Promotions Association (KPA) is a membership based business association in Kaiapoi tasked with promoting the town, advocating for businesses, organising events and activities to enhance social and cultural engagement in the town.

<sup>5</sup> Enterprise North Canterbury (ENT) is an economic development organisation established by the Waimakariri and Hurunui District Councils as a non-profit trust. ENT supports and promotes business growth and development in these districts as well as more broadly promotes the area to tourists, potential residents, and investors.

An important area for further research is to investigate the nature of these collaborative relationships, including the way organisations utilise organisational networks during disaster recovery. Similarly, if a greater understanding of how collaborations can be fostered and managed post-disaster, this could be worked into pre-disaster planning and mitigation.

### 5.2.2 Leadership, engagement & communication

Recovery is a complex process with many interested and interacting parties; it is therefore difficult to interpret who the “leaders” of recovery are at any point in time. In the interviews the concept of leadership was often closely linked with evaluations of how the identified leader was engaging and communicating with organisations and the public. There was a general acknowledgement from most respondents that for recovery to be successful decisions needed to be made by working together and maintaining constant communication between government, non-government organisations (for-profit and not-for-profit), and the community.

It is clear from the interviews that the Waimakariri District Council (WDC) has emerged as an influential, widely acknowledged entity in the recovery. In response to the question “Which individuals or agencies do you think are currently influencing recovery of the Kaiapoi CBD?” every respondent stated the WDC was influencing recovery, though there were differing opinions on the success WDC was having in this role.

In a general analysis of the number of times a group was mentioned in all the interviews, the results of which are show in Figure 4, the WDC far outweighed any other organisation. While this analysis is potentially biased, it indicates that the WDC is far more present in dialogue about Kaiapoi’s recovery than national Government Ministries<sup>6</sup>.

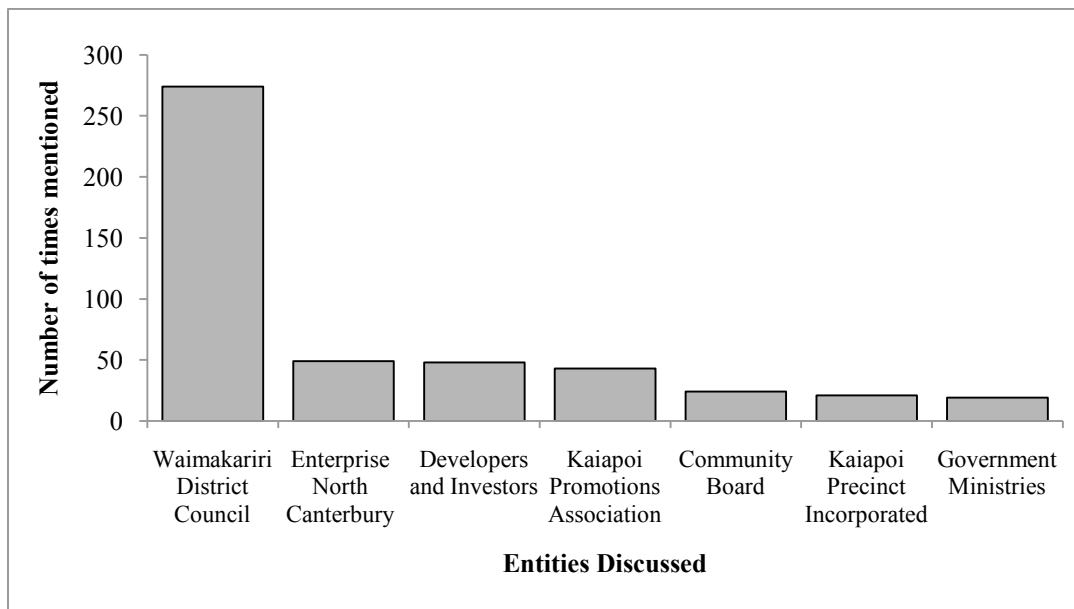


Figure 4: Number of times the entity was referred to during the interviews

<sup>6</sup> Only two national Government Ministries were mentioned during the interviews. These are the Ministry of Social Development and the Ministry of Economic Development.

The WDC has made efforts to engage residents and businesses in planning and decision making processes. There were conflicting reports on the level and success of engagement with businesses. Some reported that engagement has been so extensive that community members were feeling fatigued with the process and just want the WDC to finalise plans and begin recovery work.

Conflicting ideas about involvement also emerged from the interviews. On one side some felt that a lack of involvement was due to an individual's decision not to participate in the planning processes. Community members and businesses had been invited to several public meetings and were communicated with by email. As exemplified in the quote below from a planning official:

*"The people [who] have been involved [in the planning process] are those people that have wanted to be involved. So you can't make them be involved. So there are some people that we might've wanted to be involved but have shown just no interest whatsoever – getting on with their own business just fine."*

Whereas, a business group representative argued that it the WDC did not accommodate the needs of businesses during the planning process, making it difficult for many businesses owners to be involved. The respondent felt that the public meetings were being held too early in the evening, so businesses that were staying open extra hours in order to survive were unable to attend. Some of those businesses were frustrated with both the engagement process and the plan put forth by the council and in response formed a business advocate group called the Kaiapoi Precinct Inc (KPI). KPI hired its own planning consultants and submitted an alternative plan for the town centre which was eventually adopted by the WDC. The businesses in the KPI believed that the Council's role was to, *"support the community and it had to be co-operative with the community and the council and the business owners and property owners,"* rather than making decisions and then working to get people on-side.

An important question surfaced during the analysis of these interviews: What is the appropriate model for business engagement in planning and recovery decision making? Should councils and Government move away from the "public meeting" format and toward creating collaborative partnerships with businesses and developers?

Developing partnerships or closer relationships between councils, Government and business (for-profit and non-profit) could both allow businesses and developers who are investing financially in a town to feel heard, as well as help Council planners who are trying to achieve a common vision for redevelopment. As noted by a planning official, it is difficult to get businesses who are struggling with their own recovery and *"looking inwards from their boundaries"* to think about the bigger picture. However, if businesses feel like they are having a say and that it will benefit them in the medium to long-term, they may be more likely to participate.

Several respondents referred to the concept of establishing public-private partnerships, to overcome these challenges. A local government authority like the WDC cannot play the role of "developer", but they can work with developers and investors on projects that will mutually benefit the organisations. Similarly, the Council can draw urban plans, but they have no means of enforcing these plans on private land. The Council therefore needs to work directly with the landowners and businesses to bring plans to fruition. This level of engagement must extend beyond the community meetings and business mentoring, to encompass wider collaborative economic development principles.

One respondent very clearly voiced concern about the current conception of business support:

*So the lens, through which the whole recovery programme is being mounted... is a welfare, not an economic development lens. And one of the barriers for that is the mantra of government, "Leave it to the market, the market with the wonderful invisible hands will come down". There's always an element into that creative destruction ... and we've had a lot of destruction lately and there will be a lot of creation out of it. However, the impact is so large that you just can't leave it to the market and then ambulance chase. You're actually going to have roll your sleeves up and get involved in terms of first principles of economic development... This mentality which is we'll just do confidence and training and work on [businesses'] heads and it will all be all right... Well it's not. It ain't going to cut the mustard.*

More needs to be done to redevelop the economy holistically as part of a greater community initiative that incorporates local government, future developers and the businesses and non-profits, rather than addressing organisational goals separately and then retrospectively trying to get buy-in. If local and regional authorities engage meaningfully and frequently with organisations they can reduce conflict and avoid time-consuming processes such as litigation.

### **5.2.3 Drivers & temporal influences on recovery**

It is difficult to predict the progression of recovery and how the different stages of recovery will influence the economy and individual organisations. As seen in Section 4.2.3 one of the challenges faced by organisations is predicting demand following the earthquakes. Effects of disasters differ depending on the different phases of the recovery cycle. Goods and services demanded in the response phase might not be the same (in type and quality) as those demanded in the recovery phase. Consequently, some organisations might do well immediately after, leading to a sense that they have recovered only to experience delayed effects or the influence of a changed market months following the initial disruption.

External factors that individual organisations cannot control including insurance payouts, ongoing aftershocks, and policy changes can make future planning and decision making post-earthquake particularly problematic. These new challenges are often on top of pre-existing hurdles. As one respondent noted the best advice he could give to a recovering community was, *"be patient and nothing's going to happen any faster than it has in the past really. It's probably going to take longer."*

Acknowledging these difficulties several respondents argued that having timeframes and a recovery program with defined goals were essential to the recovery process. A WDC official noted that public authorities are often disinclined to commit to timeframes because they are *"risk-averse"* and want to avoid being accused of not delivering on promises or misleading patrons. However, this respondent also emphasised repeatedly that despite the risks, realistic timeframes and setting goals as part of a recovery programme allow people to plan, make needed arrangements, and keep the recovery process moving forward.

### **5.2.4 Preparing for reconstruction**

Dynes and Quarantelli <sup>[43]</sup> have argued that reconstruction should be understood as a social process which shapes and is shaped by the larger context of recovery. They contend that a failure to recognise the interdependence of reconstruction and wider community and economic recovery is likely to lead to a failed reconstruction.

In a disaster context, there is a very limited body of knowledge discussing reconstruction planning for organisations. For example, Cho et al. <sup>[44]</sup> developed a model which demonstrates that the sequencing of transport infrastructure reconstruction following an earthquake can impact the total cost of the disaster (e.g. by optimising bridge reconstruction, organisations can decrease business interruption caused by transport issues). Comerio <sup>[45]</sup> discussed the role of Stanford University's Surge programme in managing reconstruction impacts. Following the Loma Prieta earthquake Stanford created plans for relocation from damaged buildings to other spaces before and during construction to minimise or compensate for downtime.

Interview respondents in this study expressed concern about the potential impacts of the reconstruction process on Kaiapoi organisations. One respondent discussed the uncertainties about the "second order" impacts of the reconstruction (the "first order" impacts refer to damage and disruption from the earthquakes themselves).

*"And what this doesn't address particularly is over the next three years until...December 2014; we are going to really mess this place up. So a third of the catchment is going to be severely disrupted, people coming, people going, potentially shopping here, there and everywhere, using services in different locations. So it's the second order effects of the recovery on business."*

Another respondent felt that if reconstruction was commenced quickly then further economic damage could be done to businesses who were trying to re-establish.

*"One of the things in [the town centre plan] is about new footpaths and those types of things that pretty the place up and make it, hopefully, better for developers to invest...One of the basic questions is, when is the time to widen those footpaths and narrow the road and do all that work? Is it now, while the retailers are on their knees? Or do we wait, do we get them back up and running as best as possible, and then, well in my opinion, bring them back to their knees by starting the work to redevelop the town?"*

Understanding the impacts of reconstruction is an important area to research. If we can understand more about the way reconstruction efforts influence organisations, organisations may be able to devise strategies to stay in front of potential and forthcoming issues, adapting their behaviours to maximise the benefits of the environmental changes. For example, reconstruction efforts will necessarily bring many construction workers who need temporary accommodation, services, food and entertainment. How can organisations plan to adapt their marketing or product to this new demographic?

This concept of planning for the anticipated impacts of reconstruction ties in with several other themes emerging from the interviews. For example, many respondents discussed the importance of having a recovery programme that gives an indication of timelines. With approximate timelines, organisations can plan for when they will need to relocate, for example, or consider what they might do to minimise noise and vibration disruptions caused by heavy machinery.

Similarly, organisations may be able to develop collaborative relationships with competitors, co-located organisations, or those providing complementary services to aid each other during the reconstruction period. Drawing again on the example of the Stanford University Surge programme <sup>[45]</sup>, the University planned to vacate their buildings for a planned program of repairs and retrofitting.

However, small organisations that only have one building may not have this option. Can they collaborate with competitors to relocate all or part of their organisation as needed during planned repairs?

With the massive demolition and reconstruction process that will occur in Canterbury over at least the next decade, understanding how reconstruction may affect organisations or disrupt their operations will inform planning and business support decisions. Additionally, investigating and developing ways organisations can find opportunities in the reconstruction period will help Canterbury organisations recover more successfully.

## **6. CONCLUSIONS - RESEARCH QUESTIONS REVISITED**

This report presented the findings from two studies on organisational resilience conducted by researchers from Resilient Organisations and the University of Canterbury following the 4 September 2010 earthquake. The results from the questionnaire showed that organisations located in the two Central Business Districts were more likely to close for a period of time following the disaster and stay closed for more days than organisations in other sectors. Organisations in Christchurch and Kaiapoi CBDs were more likely to be disrupted by structural damage and more likely to relocate all or part of their organisations than most other sectors. Similarly, organisations in the two CBDs were more likely to experience revenue decreases following disasters.

These and other findings are not to suggest that CBDs are inherently risky places that should be abandoned, but they do show that CBD organisations face a different set of risks and may require additional support from the government and other organisation during the response and recovery phase and better mitigation and planning prior to an event. For example, CBD organisations had more issues with site access following a disaster, therefore they should emphasize backing up critical information in multiple locations and where possible plan for and facilitate staff relocation or the ability to work from home.

In order to assess the fulfilment of the project goals, the research questions are briefly addressed below.

*How did the damage to and decisions of organisations and their neighbours within a Central Business District influence the recovery of an individual business?*

Many organisations in the Christchurch and Kaiapoi CBDs and some of the organisations in the hospitality sector were located inside cordoned-off areas for several days and in some cases weeks following the 4 September earthquake. Organisations noted that even when they did not suffer any structural damages they were forced to close due to their proximity to unsafe buildings or due to their location in areas that were officially cordoned-off. This was not a significant issue for the majority of organisations outside of the CBD.

The interviews however suggest that organisations can work together, forming economic clusters for co-promotion and support or share resources in order to decrease the impacts and improve business post-disaster. Thus, while organisations are at risk from close proximity to other organisations and the impacts of restricted access following a disaster, they can reduce their

individual vulnerability and increase collaborative resources by forming partnerships and networks with other organisations.

*To what extent did pre-event characteristics of the CBD, and pre-existing plans for how the CBD would evolve into the future, influence individual organisations' resilience and the recovery process within the CBD as a whole?*

Many pre-event physical characteristics, such as having a large number of unreinforced masonry buildings, had negative effects on an individual organisations ability to withstand the impacts of the earthquake and pursue recovery in the aftermath. The struggling economy in Kaiapoi before the September earthquakes meant many organisations were at a disadvantage before the earthquake 4 and had lower reserves for response and recovery. However, the sense of community and establishment and involvement of groups such as Enterprise North Canterbury and Kaiapoi Promotions Association prior to the 22 February earthquake has influenced the way Kaiapoi organisations are pursuing recovery. Many key informants characterised Kaiapoi as a competitive entity, which can work to seize opportunities created by the loss of competition in Christchurch and some of the northern suburbs.

Urban plans developed prior to the disaster are definitely playing a part in the way Kaiapoi redevelopment is being pursued, both positively and negatively. Plans had been developed and community consultation done prior to the earthquakes, planners had a head start in the aftermath of the disaster. The disaster acted as a catalyst for plans that had been made but were "sitting on the shelf" because of a lack of political and economic will. However, the pre-established plans can also be viewed as a hindrance because organisations may view the consulting process post-disaster a matter of getting buy-in to something they may or may not have had previous input on.

*How do policies and plans implemented to manage recovery at the CBD level influence individual organisations' recovery?*

It is difficult to gauge the level of impact policies and plans are having on individual organisations at this stage in the recovery. However, it is clear that the way authorities and interact with and engage organisations strongly influences the way individual organisations participate in the process. Building partnerships and avoiding processes which exclude businesses will help avoid conflict and disengagement which slows the recovery process and leads to sub-optimal outcomes.

## **7. FUTURE WORK**

This initial investigation will inform ongoing research. The contextual interviews are intended to supplement quantitative data being collected from individual organisations through a series of survey questionnaires. More interviews will be conducted in the Christchurch CBD as well as Lyttelton CBD which was heavily damaged by the 22 February earthquake.

A second questionnaire has been issued to organisations to assess organisational impacts, planning, and mitigation information following the 22 February earthquake. The questionnaires also collect information about organisations' resilience characteristics.



More research needs to be done on how collaboration and support among organisations is emerging organically following these earthquakes, and how it can be developed and managed in the aftermath of this disaster. Similarly, the concept of public-private partnerships post-disaster needs to be investigated more thoroughly in order to develop mutually beneficial redevelopment options for the whole community.

The two studies discussed in this report are part of a broader longitudinal study of the resilience and recovery of organisations following the 2010 and 2011 Canterbury earthquakes. As they become available, additional research results will be released onto our website: [www.resorgs.org.nz](http://www.resorgs.org.nz).

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# APPENDIX A: SEMI-STRUCTURED INTERVIEW GUIDE

## Kaiapoi CBD Interview Schedule

- 1) Background – your current position, what role have you played in the recovery of Kaiapoi to this point
- 2) What will “recovery” of the Kaiapoi CBD look like? How will you know when Kaiapoi has recovered?
- 3) Does Kaiapoi need a CBD? Why?
- 4) Why are businesses in Kaiapoi in the first place?
- 5) How has Kaiapoi’s identity shifted from before the earthquake, to after September, and now after February?
- 6) Which individuals or agencies do you think are currently influencing recovery of the Kaiapoi CBD? Which individuals or agencies do you believe could beneficially influence recovery of your business / CBD, if different from those already mentioned?
- 7) What resources and information are available to organisations (businesses) to help them recover? Why? Who is providing these resources? What's the reception been like?
- 8) Were there pre-existing (prior to September 2010) plans or visions for the CBD? What were they?
  - Have these plans and visions changed and evolved since 4 September and did you have an input into those changes? How?
- 9) Are some businesses or sections of the CBD recovering faster than others? Why?
- 10) Can you think of some examples where an organisation's neighbours have affected each other's recovery positively or negatively?
- 11) What are the biggest uncertainties that you face? What are the biggest uncertainties of concern to you?
- 12) Drawing on your experience to this point, what advice would you give to Christchurch or another small town dealing with recovery in the future? What lessons have you learned about CBD recovery up to this point? What has worked well/ what hasn't worked?
- 13) Is there anything I've missed that you think I should know?