



The Canterbury Earthquake: Key Points and Forecasting

Released 05 November 2010

Caveat:

This document has been produced by the Canterbury District and Christchurch Central Intelligence Groups and contains data that is from dynamic and provisional databases, and is subject to change. The data has been selected for the purposes of intelligence analysis, not statistical/performance based measurement. Only a small time period has been analysed (three weeks) which does not generally allow for statistically significant trends to emerge. Furthermore, data quality is dependent on timely and accurate reporting and recording; as such, the data in this document should be considered as an indicator only, not as a precise measure of recorded offences/incidents. Data sources used in this document differ from those used to report on official statistics/monthly indicators, and hence comparisons should not be made.

This document has been disseminated selectively for the purposes of the earthquake recovery. All material contained in this document was correct as at 5 November 2010.

DISTRICT INTELLIGENCE CANTERBURY
INTELLIGENT POLICING, PROACTIVE SOLUTIONS
MĀTAKI ROKOHANGA – HE URUPŪ MĀHUKI

Handling Instructions

IN CONFIDENCE

All IN CONFIDENCE information (including data) should clearly identify the originating government agency and date.

Electronic Transmission	IN CONFIDENCE data can be transmitted across external or public networks but the level of information contained should be assessed before transmitting. Username/Password access control and/or encryption should be considered.
Manual Transmission	IN CONFIDENCE documents can be carried by ordinary postal services or commercial courier firms, provided the envelope/package is sealed. The envelope must clearly show a return address in case delivery is unsuccessful.
Storage and Disposal	IN CONFIDENCE documents can be secured using normal building security and door swipe card systems that aim to keep the public out of the administration areas. IN CONFIDENCE documents must be disposed of in a way that makes compromise highly unlikely.

Executive Summary

- Canterbury District was struck by a magnitude 7.1 (M7.1) earthquake on 04/09/2010 at 0435hrs, centred 40km west of Christchurch with its epicentre 10km south-east of Darfield. The quake lasted approximately 40 seconds and caused widespread damage and destruction; it has been described as miraculous that there was no direct loss of life (other than fatal heart attacks occurring post-earthquake).
- The quake has received significant national and international coverage, and has consumed considerable policing resources. Estimates indicate that damages may cost potentially up to NZ\$5 billion, making it the most expensive natural disaster for New Zealand on record.
- Over the three week period post earthquake, total crime decreased by -15% and calls for service increased by 28%. Other emergency services experienced either a decrease (Fire Service) or minimal changes (St John Ambulance) in calls for service. Family violence was the only type of offending that showed a marked increase over the earthquake period; an increase which has been sustained thus far. Burglary offences also increased, although to a lesser degree (18%).
- The most significant increases in dwelling burglary were recorded in the Christchurch Central and Christchurch South scene station areas although a small increase was also noted in Kaiapoi. It is important to note however that many burglary offences targeted copper/scrap metal, indicating they were not necessarily a direct result of the earthquake.
- Psychologically, the earthquake has already taken a significant toll on the residents of Canterbury, and police data shows an increase of 32 occurrences in suicide attempts over the earthquake period. Based on international experiences of natural disasters, it is probable that suicides may peak between 1 - 2 years, as stresses arising from the recovery phase take their toll.
- Overall, the capacity for individuals, families and communities to cope with the stress of the event, economic stress, damage to land and property, EQC/insurance provider issues and damage to infrastructure and systems have been identified as key risks relating to the earthquake.
- In response to the earthquake, various pieces of legislation have been passed, including the Canterbury Earthquake (Civil Defence Emergency Management Act) Order 2010 and the Canterbury Earthquake Response and Recovery Act 2010. In addition, a number of financial assistance grants, welfare recovery centres and several psycho-social support services have been established. It is anticipated that the social recovery aspect will be the most enduring, and is likely to take several years.
- Geographically, the landscape of Canterbury has altered considerably in some areas, with further reshaping likely to occur over the recovery phase. Summary information from the report has been obtained and indicates that 16 properties will not be rebuilt or reinstated, 1200 houses will be demolished, and 4800 houses require repair. Anecdotal information indicates a number of the 16 houses are in the higher income areas such as Fendalton. Other information received suggests that as many as 15,000 - 18,000 households are to be relocated. Due to the protracted and comprehensive process involved with land/house assessments, and the overall fluidity of the situation, it is likely that these numbers will alter significantly over time.

- Looking ahead, crime rates are likely to return to 'normal' over the next three months. Vacated properties are likely to be targeted in burglary/metal theft, arson and also used as 'dossing' houses. Although location specific information is not available, it is likely that the suburbs of Kaiapoi, Bexley, Brooklands and Avonside will be high risk areas.
- New Zealand research on natural disasters indicates there will be another increase in family violence incidents approximately six months after the actual event of the disaster. Given that December to February is already a high risk period for family violence; it is likely that stresses of the earthquake will compound this risk.
- Economists' consensus view is that the earthquake will cause the Reserve Bank of New Zealand to delay possible increases to the Official Cash Rate, which is the base rate from which market interest rates are derived. However, it is possible that rates will rise when the reconstruction phase is well underway in 2011 and 2012 (National Business Review, 13 Sept 2010).
- Many commentators believe that the medium term impact on employment will be negligible as demand for construction services rise during the reconstruction period. In this context, the postulated link between unemployment and increased crime levels (Trigg 1997 etc) is likely to be only temporary.
- Overall, the police response to the M7.1 was effective and received high levels of public support (89% rating police highly). However, if police do not provide adequate levels of high visibility/reassurance, it is almost certain support will decrease.
- Based on findings of this knowledge product, there are five over-arching issues as a result of the earthquake that should remain a priority for police: **community reassurance, burglary, family violence, fraud, and mental health** (suicides).



Document Production

	Originator	Reviewed by	Released by
Name	District Intel Traffic Analysts Christchurch Central Intel	Insp Doug Parker Insp John Price Annora Levermore	Insp Doug Parker
Role	Supervisor/Analyst/IO/ISO/ISA		
Extn	36579		
Date	05 November 2010		

Disclaimer

The interpretations and conclusions drawn in this report are made on the balance of probability on information available at the time of preparation. The information contained herein is not evidence and is intended to provide a basis for further investigation only.

Acknowledgements

This Knowledge Profile was developed and produced in collaboration with the following government departments and external agencies:

- Environment Canterbury (ECan)
- Civil Defence
- Earthquake Commission (EQC)
- Earthquake Recovery Group
- Ministry of Social Development (MSD)
- Department of Corrections Intel
- Legal Section
- Victoria Police
- Police staff
- Insurance Council
- AMI Insurance
- Chambers Commerce
- Waimakariri District Council
- Selwyn District Council
- Police library staff

Contents

Executive Summary	3
Introduction	8
Product Objectives	8
Methodology	8
Background	9
Earthquake Overview	9
International Context	9
Police Response: District Summary	10
Corrections Summary	12
Analysis	13
Crime and Crash	13
<i>Calls for Service and Total Crime</i>	13
<i>Family Violence</i>	13
<i>Car Crime and Crash</i>	14
<i>Burglary/Theft</i>	15
<i>Violence and Alcohol</i>	16
<i>Arson</i>	17
<i>Fraud</i>	17
<i>Sexual Offending</i>	18
Social	18
<i>Mental Health</i>	18
<i>Christchurch City Council</i>	19
<i>Waimakariri Council</i>	20
<i>Selwyn Council</i>	21
<i>Community Reassurance</i>	21
<i>Media</i>	22
<i>Elderly Community</i>	22
Economic	23
Legal	24
<i>Civil Defence Emergency Management Act 2002</i>	24
<i>Canterbury Earthquake (Civil Defence Emergency Management Act) Order 2010</i>	25
<i>Canterbury Earthquake Response and Recovery Act 2010</i>	25
Environmental and Geographical	26
<i>Liquefaction</i>	28
<i>Recovery and reconstruction</i>	29
Forecasts	30
Short Term Forecasts (October - December 2010) and Implications for Policing	30
<i>Crime and Crash</i>	30
<i>Geographical and Environmental</i>	31
<i>Social and Legal</i>	32
<i>Economic</i>	32
Medium Term Forecasts (December 2010 - June 2011) and Implications for Policing	33
<i>Crime and Crash</i>	33
<i>Geographical and Environmental</i>	34

<i>Social and Legal</i>	35
<i>Economic</i>	35
Long Term Forecasts (July 2011 - July 2012/2013) and Implications for Policing.....	36
<i>Crime and Crash</i>	36
<i>Geographical and Environmental</i>	37
<i>Social and Legal</i>	37
<i>Economic</i>	38
Reference List	40

Introduction

Product Objectives

- 1.1 This product has been requested by Superintendent Cliff, Inspector Price and Inspector Parker in the wake of the Canterbury earthquake, and aligns with the strategic priorities (i) Policing with Confidence and (ii) Community Reassurance.
- 1.2 The aim of this document is to provide an overview of the crime, crash, environmental, social, legal and logistical developments since the earthquake of 04/09/2010 up until 25/09/2010 (three weeks). This document will also outline the short (three months), medium (six months) and long (one to two years) term emerging risks, patterns and trends. A brief overview of the police response to the disaster is also provided.

Methodology

- 1.3 This document analyses data relating only to those police scene stations that were primarily affected by the earthquake: Christchurch Central, Christchurch Airport, Christchurch South, New Brighton, Papanui, Sumner, Lyttelton, Kaiapoi, Darfield, Leeston, Lincoln, Rangiora, Rolleston, and Hornby.
- 1.4 Data analysis contained in this report compares the earthquake period with the same days in the previous five years. It is important to note that the comparative data is not the same *dates* but rather the same *days* in the month as the earthquake period. The date specifications are as follows:
 - Earthquake period: 4 - 25 September 2010 (3 weeks)
 - Compared with:
 - 5 - 26 September 2009
 - 6 - 27 September 2008
 - 1 - 22 September 2007
 - 2 - 23 September 2006
 - 3 - 24 September 2005
- 1.5 Key crime and crash areas covered in this product include: family violence, burglary/theft, arson, violence/alcohol offending, car crime, fraud and mental health. The impact on calls for service (to police, Fire, and St John) is summarised.
- 1.6 Consideration is also given to the initial geographical, social and economic displacement and the subsequent reformation within the district, and the implications these processes might have for policing. This document is underpinned by a comprehensive review of international and national literature on key areas of criminality and policing responses that have arisen following natural disasters.
- 1.7 A variety of SANDA have been utilised for this product, all of which are named in the acknowledgements section. In addition, police data from PSDI/NIA and CARD was used for the quantitative analysis, while a comprehensive literature review and conversations with relevant stakeholders underpins much of the analysis and forecasting.
- 1.8 It should be noted that the data used in this product is provisional, uses a very short sample period (three weeks), and does not have any time series analysis applied. Furthermore, this data should not be compared to official statistics nor monthly indicators, as different data

sources have been used. With the above points in mind, the data in this report is indicative only and should not be considered as precise measures of crime.

- 1.9 This product has been lead by Abi Bloy, with contributions from Michelle Neeson, Michael McCosker, Lisa van Maanen, Nicky Barron, Constable Nicole Pickard, Constable Dale Paterson and Sergeant Steve Sharland. Intelligence support has been provided by Kathy-Lynne Scott and Jill MacLennan.

Background

Earthquake Overview

- 1.10 Canterbury District was struck by a magnitude 7.1 earthquake on 04/09/2010 at 0435hrs, centred 40km west of Christchurch with its epicentre 10km south-east of Darfield. The quake lasted approximately 40 seconds and caused widespread damage and destruction; it has been described as miraculous that there was no direct loss of life (other than fatal heart attacks occurring post-earthquake).
- 1.11 The quake has received significant national and international coverage, and has consumed considerable policing resources. Estimates have indicated it could potentially cost up to \$5billion worth of damage, making it the most expensive natural disaster on New Zealand record.
- 1.12 The Canterbury Civil Defence Emergency Management Group was the lead agency for the response phase, supported by local councils, New Zealand Defence, police and various other social and government agencies. Operation Earthquake was established on 04/09/2010 as the umbrella operation. Operation East also commenced on 04/09/2010 and was superseded by Operation Recovery (also referred to as Operation Reassurance and Operation Reassure) on 10/09/2010, which continued through to 27/09/2010.
- 1.13 The Canterbury Recovery Response Commission was established during the recovery phase, headed by Minister Gerry Brownlee. The Commission structure is designed to focus on the social, economic, infrastructure, built, rural and natural environments, and involves participation from relevant organisations as well as local councils.
- 1.14 Such a disruption in normal human activity can result in a rise in anti-social behaviours; however, provisional data suggests increases were only noted in family violence, burglary and calls for service. Psychologically, the earthquake has impacted on the district with increases showing in 1X (attempted suicide) and 1M (mental) incidents.
- 1.15 There has also been strong evidence of pro-social behaviour, both within police and externally. Community collegiality, alongside sound inter-agency collaboration, and support politically, nationally and internationally have also characterised the emergency response.

International Context

- 1.16 There has been no shortage of recent natural disasters which have ravaged the economical, social and geographical landscapes of countries including Haiti, Chile, Indonesia, Thailand, and China.
- 1.17 Although the Canterbury earthquake was significant in terms of its seismic magnitude, by comparison with other disasters, the consequences can be considered moderate. No direct

loss of life, the time the earthquake struck, a strong focus on housing infrastructure since the 1931 Hawkes Bay quake and a relatively robust economy have all positively impacted on how the earthquake was initially experienced, and the subsequent rebuild and recovery. Notwithstanding this however, there are a myriad of consequences for the people of Canterbury, many of which have relevance for police.

- 1.18 Internationally, natural disasters have had varying implications for policing which are largely correlative to the strength, timing and longevity of the disaster, the infrastructure and overall socio-economic and political status of the location. For example, looting and violence was evident in Port-au-Prince, which occurred in a vacuum of law and order, and also amidst a crippling economy (Waterfield, 2010).
- 1.19 Research focusing on the links between natural disasters and crime is often ambiguous and somewhat contradictory; however there is a degree of collective agreement that overall crime (with the exception of family violence) often tends to decrease during a natural disasters, and then gradually return to 'normal' levels.

Police Response: District Summary

- 1.20 The police response to emergency situations is governed by the Civil Defence Emergency Management Act (CDEM) 2010 (refer legal section for further detail).
- 1.21 In the case of the M7.1 quake, an Emergency Control Centre (ECC) was set up to cover Emergency Operation Centres (EOC) in Selwyn District, Waimakariri District and Christchurch City. Police in the respective areas worked in conjunction with their local authorities, with Christchurch city also providing extra staff in Kaiapoi.
- 1.22 Immediately after the earthquake, frontline officers already rostered were deployed to Operation Earthquake. These initial frontline staff were released back to their core role on 05/09/2010 and extra staff called in and deployed to earthquake related duties. These staff were called from all work groups not deemed frontline, including area management, crime services, traffic, inquest, Intel, photography and youth services. No area was excused. 'Business as usual' for sworn staff was put aside. The goal was to retain a frontline functionality, and deal with any extra requirements utilising all available resources.
- 1.23 In conjunction with ECC, EOC and police emergency base, areas requiring cordons were established and a roster of police and NZDF personnel was prepared. Police organised the cordons and staff, with NZDF supplying personnel and logistical support in the form of transport, accommodation and food. The following staff were brought in from other police districts:
 - 88 police staff from Auckland, arrived 04/09/2010, departed 06/09/2010
 - 30 police staff from Wellington, arrived 06/09/2010 departed 11/09/2010
 - 30 police staff from Waikato, arrived 11/09/2010 departed 16/09/2010
 - 30 police staff from Bay of Plenty, arrived 16/09/2010 departed 21/09/2010
 - 15 police staff from Central and Southern, arrived 21/09/2010, departed 26/09/2010
- 1.24 On and from 06/09/2010, 80 army personnel were deployed on cordons and joined police staff in mobile patrols. This number was reduced to 30 on 18/09/2010. Army personnel totally withdrew from the operation on 21/09/2010.
- 1.25 Although it cannot be stated with certainty, it is likely that the increased police and army personnel around the earthquake affected areas positively assisted with community

reassurance, and acted as a deterrent to criminal behaviour. Research has suggested that increased police presence has a negative effect on crime¹, although there can be issues of displacement (Tella & Schargrotsky, 2001). There is also the argument that increased police presence equates to increased detection of crime, thereby creating a bolstered crime rate which is based on changes in detection rather than on actual instances of crime.

- 1.26 Notwithstanding these points, a number of studies have found distinct causal relationships between the number of police deployed and crime rates. After the 7/7 London terrorist attacks, it was suggested that a 10% increase in police activity reduced crime by 3% (CentrePiece, 2006). An increase in police presence of 50% around the White House and Congress buildings due to potential terrorist threats, resulted in a statistically significant decrease in crime of between 12 - 16% (Klick & Tabarrock, 2004).

Christchurch City Summary

- 1.27 For Christchurch city, the initial response was primarily voluntary, with several police staff simply arriving at central station to assist where they could.
- 1.28 Operation Earthquake was prepared, detailing areas requiring police attention with the priority being protection from physical harm, such as falling debris, and protection of property. All CBD cordons were fenced and staff deployed to ensure public compliance.
- 1.29 A restricted access order was sought imposing restrictions on the CBD allowing a power of arrest of those failing to comply. Combined police and defence staff patrolled the cordons and mobile patrols were deployed in the worst affected areas until 30/09/2010. The necessity for cordons was assessed on a daily basis and reduced or removed as clean up/demolition work was completed. Surplus staff were then deployed to other earthquake related duties.

Selwyn District Summary

- 1.30 When the earthquake hit at 0435hrs on 04/09/2010, units who had finished work at 0200hrs were called back to work and the day shift units called to start earlier than rostered. The Acting Sergeant went directly to the Local Authority EQC.
- 1.31 Most Selwyn units have completed training in CDEM events, and therefore have a good understanding of what is required of them in the event of an emergency. This training has resulted in the development of close networks between police and the Local Authority.
- 1.32 Police staff were utilised to patrol areas and report damage to the EQC who dispatched the appropriate agency to deal with the issues. Police very quickly dropped back to their core role, conducting patrols in and around the areas with the worst damage. The rural communities of the area tended to know and look after each other requiring little police assistance and no noticeable increase in crime.
- 1.33 Even though the district had the epicentre of the M7.1 and some of the most spectacular damage to the land, the policing role returned to normal a lot sooner than in the other districts.

Waimakariri District Summary

- 1.34 Frontline police were working at the time of the earthquake, and initially carried on work as normal responding to Comms. A few members of police staff voluntarily turn up at the station and were tasked with high visibility patrols. A member was tasked to contact police

¹ 'Negative effect' is used in the sense to mean a decrease in crime.

staff in the area to check on welfare. A small number of civilians also arrived with fears of a tsunami.

- 1.35 By 0530hrs, the senior sergeant armed with a police radio was at the Waimakariri EOC, based at the Waimakariri District Council office. An NCO remained as part of the team at ECO until the end of 05/09/2010. After this time police attended the daily meetings and remained in contact via cell phone.
- 1.36 Kaiapoi rapidly surfaced as an area of major concern, with significant reports of homes and roads suffering extensive structural damage. Eight cordon points were established controlling entry to the worst hit areas in the township. Cordons remained staffed until 21/09/2010.
- 1.37 A roster was drawn up utilising all staff available in the North Canterbury Area, Rangiora, Hurunui, CVIU and Highway Patrol. The roster for North Canterbury staff was developed and maintained in the area and supplemented by police and army staff from Christchurch city.
- 1.38 Police staff were called to attend the Kaiapoi Welfare Centre on numerous occasions when the mayoral fund was distributed. Information was released reporting that up to NZ\$100,000 would be distributed and there were concerns that the fund would be targeted by criminal elements².

Corrections Summary

- 1.39 Shortly after the earthquake, prisoners from Christchurch's three prisons were sent to a variety of sites due to damage sustained during the earthquake, including damage to water systems. In total, 657 prisoners were moved (from both Christchurch Men's and Women's prisons) between 06 and 10 September.
- 1.40 The prisoners were sent to a variety of sites including Otago Corrections Facility, Springhill, Whanganui, Rimutaka and Waikeria prisons. Female prisoners all went to the Auckland Women's Regional Corrections Facility. The movement of so many prisoners was the biggest operation for Corrections of this nature and the department was ably assisted by NZDF and NZP. Despite the high risks associated with such an operation, overall the exercise was a smooth organisational feat.
- 1.41 The return of prisoners began the week of 20 September; with all female prisoners now back at the women's prison. Some prisoners are being returned to Christchurch Men's Prison each week (approximately 25 each week) - usually the ones who have court or parole board appearances. While Rolleston and Christchurch Women's prisons are business as usual, Christchurch Men's Prison is at a limited capacity of 559 (usual operating capacity is approximately 900)³.

² As yet, there has been no information received that the mayoral fund has been subject to fraudulent applications.

³ As at November 2010.

Analysis

Crime and Crash

Calls for Service and Total Crime

- 1.42 Overall, total recorded offences decreased by -15% over the earthquake period when compared with the previous five year average⁴. Trend data prior to the earthquake indicated that total crime had been steadily increasing, and hence the recorded decrease is likely to be attributable, at least in part, to the M7.1. International research on natural disasters also supports an overall reduction in crime during the response and recovery phases.
- 1.43 Overall, there was a 28% increase in calls for service to Police, and a 25% decrease in calls to Fire Service over the period of the earthquake, when compared to the previous five year average. St John Ambulance noted no significant difference over the earthquake period in terms of the volume of calls for service.
- 1.44 The vast majority of the increase in calls to police occurred on the actual day of the earthquake, and although calls continued to remain above average for the three week post-quake period, the volume did stabilise. Overall, 1286 calls were accepted on 04/09/2010, which compares to the daily average for the rest of the earthquake period of approximately 600 calls. The daily average for the comparative non-earthquake period was around 500 calls.
- 1.45 Of note is that the recent virtualisation of the police communication centres proved successful in addressing the significant volume of calls received over the earthquake. As evident in Comms data, Central and North Comms experienced notably higher call volume over the immediate earthquake period, which is attributable to the number of earthquake related calls received by these centres.
- 1.46 Conversely to police data trends, the Fire Service noted an initial decrease, with rates then returning to normal at the end of the three week period. While St John Ambulance did not experience a higher volume of calls, increases were noted in the time callers spent talking, the time staff spent travelling to sites, and the time spent at the site.
- 1.47 During the first three weeks post-earthquake, Police accepted 14,264 calls for service and Fire Service and the Urban Search and Rescue Organisation received approximately 7500 incidents. The exact number of calls received by St John Ambulance has not been made available.

Family Violence

- 1.48 Provisional data indicates there were substantial increases in both 1D events accepted by Comms and recorded family violence offences over the earthquake period. In total, there was a 47% increase in 1D events⁵.

⁴ 'Total crime' is used in this sense as the number of total recorded offences (INCOFF Recorded Offences) over the earthquake period compared to previous years. It should also be noted that there may be delayed reporting of offences to police due to the earthquake, and hence the number of offences recorded may not be a totally accurate picture of offending that occurred in this period.

⁵ '1D' stands for Domestic Dispute, and the data relates to the number of Domestic Dispute incidents reported to COMMS.

- 1.49 Although recorded family violence is in some ways expected to increase due to media campaigns, improved police reporting and societal changes, the increases noted in the period of the earthquake are above what might traditionally be expected for that period. Additionally, when reading through some narratives of 1D events, callers were making reference to the stresses of the earthquake as contributing factors for the violence.
- 1.50 Anecdotal evidence from police staff and refuge workers indicates the following initial trends emerge following natural disasters:
- Couples who have had a history of family violence, and who have not come to police attention for several months/years, have resumed their violent interactions due to the stress of the earthquake.
 - Couples who have previously separated have reunited after the earthquake to support each other, and have subsequently re-engaged in family violence.
 - In some situations, the violence between couples has increased in frequency and severity.
 - Several females have commented that if they 'can survive the earthquake' then they can 'survive the violent relationship' they are currently living in, thereby minimising the need to make efforts to break away from their violent partner.
 - A number of people who called police regarding family violence incidents post the earthquake were hesitant to give detailed information in the belief that they were 'interfering' with the 'real' work of the emergency worker.
 - There were a small number of new family violence situations that emerged following the earthquake, which had previously not come to police attention.
- 1.51 Of note is that many of these themes were also identified by the Family Violence Research Centre in Australia, following the 2009 bushfires in Victoria.
- 1.52 International experiences indicate that reports of family violence tend to increase following natural disasters; however, there are significant differences due to the type of disaster, the degree of displacement and the country's ability to respond and rebuild (Harper & Frailing, 2010).
- 1.53 Furthermore, caution should be exercised when placing emphasis on increased rates of family violence, due to the current climate where an increase is *expected*, at least to a certain degree. Although it is almost certain that the earthquake did impact on levels of family violence, it would be imprudent to attribute the entirety of the increase to the earthquake event.

Car Crime and Crash

- 1.54 Provisional data indicated a significant reduction in car crime in the earthquake zone during the initial three week period, with a 37% decrease in reported theft ex car offences, and a 20% decrease in reported car conversion offences.
- 1.55 Vehicle crashes (1V) and incidents (1U) reported to Comms over the earthquake period are comparable to the five year average, with less than a 1% increase in reported 1Vs, and an 8% increase in reported 1Us. In contrast, there was a 21% increase in reported 1Vs in the Canterbury area outside the earthquake zone, and a 25% increase in reported 1Us. It is likely the lower figures compared to the rest of the Canterbury District are reflective of the lower numbers of vehicles moving about the affected area in the initial post-quake period.
- 1.56 There is a notable drop in reported 1Us on 4 September, which is likely to reflect the lower numbers of vehicles on the roads immediately post-quake. After the first two days, 1Us

returned to pre-quake levels, however from 13 September onwards the number of 1Us has exceeded the five year average, possibly reflecting rubber necking and poor driver behaviour in response to route disruptions.

- 1.57 Waimakariri District Council is not aware of any complaints regarding Illegal Street Racing activity in Waimakariri since the earthquake and as at late October, 'rubber necking' has reportedly all but disappeared.
- 1.58 NZTA report that overall, the impact of the earthquake on state highways throughout Canterbury has been minimal. The damage cost is estimated to be a relatively insignificant amount compared to Christchurch city; perhaps in the order of NZ\$6 million.
- 1.59 In many cases, damaged roads will have only temporary repairs affected until there is a level of confidence that seismic activity has subsided to levels where further damage is unlikely. Notable examples are the state highway through Halswell and the approaches to the bridge over the Chaney's on ramp. It is anticipated that it may take up to two years before permanent repairs are completed in some areas.

Burglary/Theft

- 1.60 Provisional data indicates that over the earthquake period, recorded burglary offences increased by 18% (68 offences) in comparison to the previous five year average in affected areas. In comparison, recorded theft⁶ offences decreased by 35% (242 offences) when compared to the previous five year average with decreases most evident for shoplifting (-39%) and other theft (-28%).
- 1.61 Dwelling burglary accounted for the majority of the burglary increase with recorded offences almost 22% (58 offences) higher than the previous five year average while other burglary increased by almost 9% (nine offences).
- 1.62 The most significant increases in dwelling burglary were recorded in the Christchurch Central (105%, 48 offences) and Christchurch South (70%, 29 offences) scene station areas although an increase was also noted in Kaiapoi (five offences).
- 1.63 Overall, just over 13% of dwelling burglary offences were recorded as occurring in properties that had been damaged or vacated as a result of the earthquake and this accounts for a significant proportion of the increase observed, particularly within the Christchurch and Kaiapoi scene station areas.
- 1.64 However it should be noted that many of the offences, recorded as earthquake related, occurred in suburbs which were already considered to be at a high risk (such as Avonside and Linwood). The suburb of Bexley, which suffered substantial damage, recorded only one dwelling burglary following the earthquake. Furthermore the data indicates that suburbs with a high risk of burglary continued to be targeted in the period following the earthquake even where no substantial damage was sustained.
- 1.65 Immediately following the earthquake, police staff and army personnel were deployed to the affected areas. There is no conclusive evidence that this high visibility significantly impacted on burglary offending. Offending remained at a high level despite the high visibility in Avonside, while offending remained low or non-existent in areas such as Bexley, Brooklands and Spencerville.

⁶ Excludes theft ex car, theft of a motor vehicle and fraud offending.

- 1.66 In addition, it was noted that a high proportion of the dwelling burglaries committed during this period targeted vacant rental properties for hot water cylinders and scrap metal. This has been an ongoing increasing trend within the district. Therefore, it is possible that the increase in dwelling burglary reflects this trend rather than the earthquake per se. Although it cannot be discounted that properties vacated as a result of the earthquake will be targeted in the months to come, it is likely that they will be targeted for hot water cylinders and scrap metal.
- 1.67 The most significant increase in other burglary was noted in Rangiora with nine recorded offences in comparison to the previous five year average of three; however none of the offences were committed in the immediate aftermath of the earthquake.
- 1.68 Overall, 17 (15%) of the recorded other burglary offences were attributed as being a direct result of the earthquake. The majority of these occurred within the CBD area of Christchurch and appear to reflect opportunistic rather than premeditated offending. Given that the increase in other burglary has been statistically small, it is likely that the earthquake has had no significant impact.
- 1.69 International research is divided on the impact of natural disasters on rates of burglary. It is believed that crime generally decreases during the state of emergency (with the exception of family violence) as pro social forces emerge within the community (Tucker, 2001).
- 1.70 The impact of natural disaster on burglary or 'looting' is highly debated; not least because few police jurisdictions have a specific offence code for 'looting'. Analysis examining the aftermath of Hurricane Katrina indicates that looting of damaged or unoccupied homes is reported following all natural disasters (Brunsma et al, 2007). Further research however indicates that antisocial behaviours such as looting are rare immediately following a natural disaster and that belief in the looting myth is largely promulgated by the media (Quarantelli et al 1970). Where there does appear to be some consensus however, is that crime rates during the reconstruction period gradually return to pre-disaster levels as the altruism of a community fades and that negative societal trends that existed before the disaster will re-emerge (Bailey, 2009).

Violence and Alcohol

- 1.71 The total number of violence offences over the three week period post quake showed a decrease of -10% in comparison to the same periods for the previous five years.
- 1.72 Over the earthquake period, 31% of all arrests recorded alcohol as a factor. This is marginally down from the same period last year 2009 (36%) and slightly higher than the average for the same period over the past five years (28%).
- 1.73 Within several days post the earthquake, as the extent of damaged to property became apparent, levels of frustration/anger turning to violence emerged in some sectors. Anecdotal evidence indicates that the large police, army and emergency services agency presence throughout the city, in particular severely earthquake damaged areas, assisted in keeping any more severe incidents to a minimum. There were however, several incidents recorded that were unique to the disaster situation⁷.

⁷ For example, an executive marketing manager for an insurance company was targeted through Facebook where a protest at his home address was arranged. A digger driver was charged with assault with a digger on an engineer as he attempted to get the digger driver to stop demolition.

- 1.74 Issues arose around the temporary welfare centers. There were incidents of persons claiming to be acting in an official capacity, looking for opportunity to prey on the vulnerable and the needy. Other issues arose when thirty members of a Mongrel Mob-linked family moved into a city welfare centre shortly after the earthquake.

Arson

- 1.75 Attempts to source international literature on trends relating to arson offending post natural disasters has been largely unsuccessful. Data from the Fire Service indicates there was a notable decrease in calls for service over the earthquake period when compared to the previous five year average. Provisional police data thus far indicates a similar trend, which strongly suggests that arson was not a feature of concern after the M7.1.
- 1.76 During the three week period following the earthquake, Northern Canterbury had Christchurch City Council (CCC) wheelie bins, vehicles and vegetation targeted by arsonists. Six stolen vehicles were torched over the scanned period; Southern Canterbury had three vehicles burnt while Central Canterbury had two. Overall there were 11 vehicle fires, six structure fires and five vegetation fires. It is unknown if the earthquake had any impact on the targeting of these arson locations.

Fraud

- 1.77 The total number of fraud offences in Canterbury for the three week period post the earthquake was significantly down on the same periods for the previous five years.
- 1.78 Within the three week period post the earthquake there were only two arrests for offences relating to a breach of Civil Defence Emergency Management Act 2002 for impersonation of an official and/or a qualified professional.
- 1.79 There were numerous 1C (car/person acting suspiciously) reports of persons impersonating and/or possibly impersonating Civil Defence/EQC officials within the central city cordons, earthquake damaged suburban areas and welfare centres. In some incidents, offenders gained entry to dwellings, installed confidence in occupants and left with possessions and money.
- 1.80 People wearing high visibility vests with no apparent reason for doing so, also presented as a risk across the city. It appeared likely that these high visibility vests were being worn to enable persons to access restricted areas for a number of reasons; to appear to be involved an official role, to detract from or enable offending activity, and/or to achieve some degree of 'hero' status.
- 1.81 Insurance Council chief executive, Chris Ryan reported that although there would be people making false claims, the insurance council research indicated that the numbers of this occurring in previous disasters have been low (Cowlshaw, 17/09/2010).
- 1.82 There was only one occurrence within the earthquake period where a business owner was charged with the fraud offences relating to an inflated claim (NZ\$20,000) for damaged goods in the earthquake. It is likely that there will be more such offences reported as time progresses.
- 1.83 Electronic stores in Christchurch have been fielding calls from people seeking damaged equipment. The insurance industry believes that these people are trying to take advantage of the earthquake event by buying cheap damaged goods and making bogus claims for their replacement (Cowlshaw, 17/09/2010).

Sexual Offending

- 1.84 Since the Canterbury earthquake, sexual offending reporting decreased notably across all affected areas. There have been no significant increases in any sexual offence codes throughout the scanned data.
- 1.85 International encounters with natural disasters show an increase in sexual offending after the turmoil, but the offending only increased when there was mass destruction and survivors had to live in make-shift refugee type camps or in large emergency shelters (Larrance & Lawry, 2007).
- 1.86 The issue of safety around port-a-loos was initially raised, as many suburbs were required to share these limited facilities for several weeks. However, there have been no reports suggesting that any inappropriate behaviour occurred around the temporary sewerage facilities. The councils are now installing temporary sewerage tanks at residences so that household services can be used; this initiative is likely to have reduced any such risk.

Social

- 1.87 The social impact of the September 4 quake, particularly in the psycho-social sense, is one of the more significant and permeating risk factors emerging from this natural disaster. Social recovery plans are coordinated by the Social Environment Taskforce Group, and attention is being paid to ensuring services are not shaped as 'welfare'. Many of those in need of assistance have never previously been in a situation of requiring such help, and hence the stigma of 'receiving welfare' is being carefully managed.
- 1.88 Four Recovery Assistance Centres have been established across the city to provide information, as well as access, to a number of services, including; Victim Support, Inland Revenue, Housing New Zealand, City Housing, Work and Income as well as providing access to counselling and budgeting services. Council information has stated that these centres will exist 'as long as required'.
- 1.89 Emergency grants, hardship grants and damaged housing grants are provided under the Red Cross Recovery Commission to assist those in affected areas, which are in addition to other support services such as the Housing Emergency Lease Programme (HELP), the Discretionary Response Fund for groups, and the Mayor's Welfare Fund for individuals or families.
- 1.90 Such a natural disaster is unique in the sense that the damage is still visible and to a degree, still being experienced in the hundreds of aftershocks. As the map below indicates, the frequency and ferocity of the aftershocks has been a considerable feature of this natural disaster.

Mental Health

- 1.91 Natural disasters have heightened awareness of the critical need to support effective mental health responses. Disasters disrupt stability and structure by altering normal economic and social activities both of individuals and of whole communities. They have had, and will continue to have, serious mental health consequences: bringing a sense of loss, grief, depression, and change to those impacted (<http://www.ncbi.nlm.nih.gov/pubmed/15645626>).
- 1.92 The total number of attempted suicides reported to Comms in the earthquake affected areas for the three week period post earthquake showed an increase of 32 occurrences in comparison to the same periods for the previous five years. Given the small number of

occurrences and short time period, this increase should be interpreted with great caution. Furthermore, it should also be noted that attempted suicide occurrences have been trending upwards for several years, and hence the increase over the earthquake period is within the control bands of what may traditionally be expected, irrespective of the quake.

- 1.93 There were 78 recorded attempted suicide occurrences during this period, along with 39 sudden deaths. There were five sudden deaths that were the result of suicide during this period which is similar to trend data from previous years.
- 1.94 Ministry of Social Development information has suggested that up to 5% of the population may be affected psychologically due to the effects of the earthquake. Many of those affected are likely not to have previously been in contact with social services, and hence there may be some reluctance to uptake assistance.

Christchurch City Council

- 1.95 As at June 2009, the estimated population of Christchurch city was 372,600, comprising 8.6% of New Zealand's population. Christchurch has the second largest population of all New Zealand territorial authorities after Auckland city. Christchurch city has a total zoned land area of 149,345 hectares, and around 70% of this land is located in Banks Peninsula.
- 1.96 Earthquake damage to old buildings within the central city and neighbouring areas is likely to reshape the future of business and shopping precincts. It has been suggested that previously, low rental costs of old buildings had kept many small buildings afloat. Rebuilding will likely result in rents being too high for some businesses and might not be viable, particularly where there were already been vacancies. In addition, there may be little demand for space in rebuilt or repaired buildings as many small tenants may not survive the wait (McDonald, 25/09/2010).



Figure 7 Inner City Quake Damage

- 1.97 Parts of the Waimakariri River stopbank system downstream of State Highway 1 were damaged during the earthquake. At present there is approximately 1 in 20 year flood protection for this area. A programme of repairs is now being undertaken by Environment Canterbury staff, and 1 in 30 year protection is expected within two months. Flood protection upstream of State Highway 1 has not been compromised and remains at 1 in 500 years.

- 1.98 Liquefaction and lateral spreading within the Halswell catchment has affected the capacity of the Halswell river and drainage system, and water levels are raised. Environment Canterbury staff are currently dredging the Halswell River channel and digging out side drains, and will move on to stabilising river banks. This work will take several months.
- 1.99 The level of flood protection on the Avon River has not been significantly affected by the earthquake. Despite initial concerns regarding flooding in the Bexley and Halswell areas due to ruptured water pumps, Christchurch City Council investigations show that the risk of flooding from the Avon and Heathcote rivers is no greater than before the earthquake. However, heavy rainfall could cause localised surface flooding in areas affected by liquefaction because of damage to stormwater systems (www.ccc.govt.nz).

Waimakariri Council

- 1.100 Waimakariri is one of the fastest growing territorial local authorities within New Zealand with a population of over 44,000. Covering a large geographical area, Waimakariri has a vast rural component but also a number of small urban centres.
- 1.101 Following the earthquake, it quickly emerged that the township of Kaiapoi was the main area of concern with significant reports of structural damage to properties and roads. By 0530 hours an operations base was running from the Waimakariri District Council (WDC) office in nearby Rangiora and police staff had voluntarily reported for duty to support local staff. High visibility patrols to promote community reassurance were quickly established and additional staff were supplied by Christchurch and the New Zealand Army.
- 1.102 It has been estimated that up to 600 houses within Kaiapoi will have to be demolished, a significant number for the small township. Among those severely affected were some of the most vulnerable members of the community who permanently resided in the camp ground to the north of the township and in baches at Pines Beach. Additionally the north east area of Kaiapoi which was badly affected contained a high number of low income rental properties.
- 1.103 The Kaiapoi business area has also been severely affected with a large number of buildings likely to be demolished. One supermarket has been lost with the remaining one struggling to cope with demand. The WDC have provided portacoms for as many of these businesses as possible but there is a concern that some will not survive. Many of the businesses were struggling before the earthquake despite the low rent for premises. WDC is holding weekly meetings with these businesses and are considering allocating NZ\$5 million for a town rejuvenation package.
- 1.104 Almost all of the social services buildings within Kaiapoi have been severely damaged and are currently unusable. This has created considerable concern given that they provided vital services for many vulnerable members of the community and significantly contributed to social cohesion. Despite this, the area is determined to continue with as many planned community events as possible in the coming months.
- 1.105 Reconstruction and repair within Kaiapoi is likely to take up to three years. The WDC envisages that the repair of land and buildings will be completed in stages. The demand for rental properties is therefore likely to also occur in stages but it is almost certain that some residents will need to relocate outside the area.
- 1.106 Concern has been expressed about the impact that the rebuilding stage will have on remaining residents. WDC envisages that there will be significant concern regarding the public health risks through noise and dust and while reduced speed limits have been

implemented on damaged roads and bridges, there is a concern that these will be ignored over time.

Selwyn Council

- 1.107 Selwyn District Council is responsible for approximately 40,000 people spread over 44 communities within a large geographical area.
- 1.108 Even though the epicentre of the earthquake was situated in the heart of the Selwyn District, by comparison to other areas of Canterbury, the number of affected people and damage to land and property has been relatively low. There are approximately 40 houses/buildings that have been 'red stickered' and will be demolished and rebuilt. There has been extensive damage to the land in parts, with large caverns opening up, liquefaction, and subsidence. Repair and recovery to the land is well underway with some areas now showing little evidence of the devastation.
- 1.109 Each community within the Selwyn District has a 'township committee' which is mentored and trained by relevant members of the Selwyn District Council to empower them to act for their communities in situations/disasters/events that may arise. The concept is based on 'The Community Response Model' which is the practical application of 'communities looking after communities' (Brown 2010).
- 1.110 Water was identified as an issue for this predominately rural area. There was a risk that water tables may have moved contaminating water supply and/or bores and wells sustaining damage. The district council purchased and distributed NZ\$40,000 of bottle water with fifty rural households receiving 10,000 litres of water delivered by the fire service. The council believes the supply of water at this time contributed to community reassurance and altruism.
- 1.111 There are remote communities within the Selwyn District where people have chosen an 'alternative lifestyle'. There are also communities where there are a high number of inhabitants with mental injury/illness. These communities were identified as the most vulnerable during the emergency response phase due to their remoteness, lack of resources and the possibility of some of their inhabitants with mental injury/illness becoming unstable.

Community Reassurance

- 1.112 The earthquake has brought neighbourhoods together to a degree not previously seen. This statement is supported by anecdotal reports from police staff and members of the public alike. People who have lived in the same area for several years have now met their neighbours and now know who lives around them. It has long been thought that the low level of community engagement has contributed to the high levels of crime that occurs in some suburban areas.
- 1.113 Police are trying to capitalise on this opportunity to re-engage with communities in areas affected by the quake. A strategy has been developed to get police staff to conduct a door to door cold calling initiative encouraging the communities to set up neighbourhood support networks to help each other. Feedback from the officers involved so far has been very positive with the members of the public openly receiving the officers and welcoming the information being provided.
- 1.114 A survey of Christchurch residents found that 93% planned to stay in Canterbury despite the damage caused by the earthquake, with only 1% saying they were unsure. Also measured in the survey were people's perceptions of emergency service responses. The Fire Service rated

highly, with 94% of respondents finding the fire response as very good or excellent. Close behind were police, who were rated very good or excellent by 89%, while ambulance and Civil Defence were both well rated by 87% (NZPA, 27/09/2010).

- 1.115 Adhering to the social needs of the affected areas should remain a constant priority, for as Gordon (2008:9) states "Social processes and the social impact of personal, financial and other influences operate as assets and liabilities to the recovery process. Often difference is related more to *how* things are done and *how* they are communicated. Whatever is done can be an asset or liability depending on how well it integrates with social processes and the personal state of members".
- 1.116 The majority of those affected in Kaiapoi are considered to be vulnerable members of society (elderly, low socio-economic, unemployed). The town has lost many of its social services buildings (community hall, library etc) which were an important link for these vulnerable people. In addition with the loss of one supermarket, the remaining supermarket is struggling to cope.

Media

- 1.117 The importance of maintaining effective relationships with the media, and maintaining coordinated control of police responses to media questions was highlighted with the supposed 'looting' issue. Public fears of looting were initially promulgated in the media, although later coverage of the prosecutions of 'looters' went some way toward mitigating these fears.
- 1.118 Bloggers and overseas media (C.H., 2010) also commentated on the initial media over-reaction and called for perspective. This is particularly important in Christchurch, as it has been shown that Christchurch residents' perceptions of safety are more heavily influenced by media reporting on crime than the national average (Bloy, 2010).
- 1.119 Hurricane Katrina offers a useful example regarding media and crime. Initial reports suggested there was a substantial crime wave in evacuee cities, including rape, rioting, violence and mass murder. Post hurricane analysis concluded that while there were crimes emerging from the chaos, there was also strong evidence of 'disaster myths' whereby incidents were highly exaggerated and largely falsified (Vergano, 2010; Associated Press, 2010). Factors such as hopelessness, fatigue and isolation in combination with frightening circumstances and a paucity of authoritative information can lead to a situation where "rumours become improvised news" (Associated Press, 2010).
- 1.120 Hence an effective media liaison in the event of a disaster is vital for disseminating key messages to the public and keeping media reporting in perspective. Care needs to be taken to ensure a balance between creating fear of crime and creating complacency about crime prevention measures.

Elderly Community

- 1.121 A demographic group more likely to be at greater risk in disasters and therefore more vulnerable in a disaster, are older adults (Bolin & Klenow, 1988; Cutter, Boruff & Shirley, 2003; Perry & Lindell, 1997, cited in Tuohy, 2010). Studies of Hurricane Katrina found disproportionately poorer outcomes for older adults compared to other population groups (Fussell, 2006). In the recovery phase of a disaster older adults are more likely to become

vulnerable by nature of their age-related physical and cognitive decline, and the influence of social conditions, which can affect health and wellbeing outcomes (Tuohy, 2010).

- 1.122 Age Concern has noted a considerable increase in workload since the earthquake, with many elderly people seeking support. As one Age Concern worker commented, the earthquake has 'shaken things to the top', whereby existing issues that were previously being managed have now surfaced and are exacerbated by the earthquake stresses.
- 1.123 The issues faced by the elderly community are often complex and not readily resolved, such as health, isolation and finances, which have been added to by earthquake stresses. In many cases, elderly people have moved in with their families, which can create compounding tension as more time passes.
- 1.124 Mental health is an issue for the elderly community, particularly following the quake. Depression and fatigue are commonly cited, along with some elderly people commenting they feel like they are 'going mad', or 'just want to die'. Given that much of the repair and rebuild is likely to take at two to three years or longer, for some elderly residents, this may be beyond their lifetime. Support services for this vulnerable section of the community are essential.
- 1.125 Housing availability is emerging as a risk for the elderly community, particularly those who are in rental accommodation. In addition to a shortage of respite beds through CDHB, there have also been situations where elderly tenants have been given their 90-day termination notice. Although the motivation for this has not been expressly stated, speculation suggests it is for the financial gain of the homeowner who is then able to re-rent the property at a higher price given the strong market demand for rental properties.
- 1.126 Police data indicates that approximately 2% of victims of family violence are aged 65+ years within Canterbury. Since the earthquake, there has been no noticeable increase in the number of family violence cases involving elderly people. Anecdotal evidence however, suggests that there have been instances of 'elder abuse' that have emerged post-earthquake where the abuse has been ongoing for considerable time, but only reported after the quake. It is also possible that cases have not yet been reported.
- 1.127 Alongside the problematic issues arising from the earthquake, there has also been evidence of strong pro-social behaviour with large numbers of people contacting Age Concern offering their volunteer services. Many of these people have sustained contact with the elderly community after the initial quake, and have provided positive support.

Economic

- 1.128 The Treasury's preliminary estimate of the direct financial cost of the earthquake is around NZ\$4 billion. This is based on assumptions of NZ\$2 billion worth of damage to private dwellings and contents, NZ\$1 billion worth of damage to commercial property and damage to public infrastructure of NZ\$1 billion (Treasury Economic Brief, 10/09/2010). These losses represent 5% of the estimated value of these three broad asset classes. However, the full cost is unlikely to be known for some time as insurance claims need to be finalised.
- 1.129 The magnitude of the financial losses sustained in the Canterbury earthquake is given some context by reference to similar events. The direct capital costs (in 2010 prices) of the Napier 1931 and Edgecumbe 1987 earthquakes have been estimated at NZ\$350 million and NZ\$560 million respectively - that is, 9% and 17% of the estimate referred to above for the Canterbury earthquake (Chapple, 1997; Aitken, 1999).

- 1.130 Prolonged losses of output and employment will exacerbate the estimated costs referred to above. Westpac economists estimate the income loss over September and October due to business interruption to be in the order of NZ\$600 million (Westpac, 22/09/2010).
- 1.131 Unemployment is likely to rise in some sectors, particularly small retailing and hospitality, as less established small businesses fail to survive loss of premises and stock, and lack of loss of profit insurance (Wood, 2010). Approximately 120 businesses could fail by mid-November; however this represents less than 1% of businesses in Canterbury (Heather, 2010; Worthington, 2010). Many commentators believe, however, that the medium term impact on unemployment will be negligible as demand for construction services rise during the reconstruction period (Townsend - interview 11/10/2010). Of relevance is that a comprehensive study of recorded crime statistics in New Zealand between 1962 and 1995 found "little support for an unemployment-crime link" (Trigg, 1997). From these findings, there is no reason to suspect that any short term structural unemployment caused by the Canterbury earthquake will have implications for crime patterns.
- 1.132 Economists' consensus view is that the earthquake will cause the Reserve Bank of New Zealand to delay possible increases to the Official Cash Rate, which is the base rate from which market interest rates are derived. However, it is possible that rates will rise simultaneous with the reconstruction phase of 2011 and 2012 (National Business Review, 13/09/2010).
- 1.133 The general opinion of economic and financial commentators is that the Canterbury earthquake has had little or no effect on New Zealand's financial or currency markets. The Bank of New Zealand reports that the most affected sector could be local government: councils will face a "huge expense associated with the reconstruction of water and sewerage infrastructure . . . in addition to work on the roading system" (BNZ Markets Outlook, 06/09/2010). Of relevance to this point is that the Christchurch City Council faces a \$NZ500 million bill for earthquake related infrastructure damage, but this will be fully funded from insurance, reserves for future works and a roading subsidy from the NZTA (Conway, 03/11/2010).
- 1.134 Interruptions to supply chains of products and resources were short-lived and minimal. The earthquake has had little or no direct impact on inbound or outbound transportation. Chairman of the Canterbury Employers' Chamber of Commerce Peter Townsend has commented that the supply chain network survived the earthquake impressively well.

Legal

Civil Defence Emergency Management Act 2002

- 1.135 The Civil Defence Emergency Management Act 2002 (CDEM) creates a framework within which New Zealand must address hazards and prepare for, deal with, and recover from local, regional and national emergencies. It encourages coordination across a range of agencies and stipulates clearly the roles and responsibilities of these agencies.
- 1.136 Civil defence emergency management is focused on planning and acting to reduce the social and economic impacts and improve recovery. The process is commonly referred to as the 4Rs:

- Reduction: Identifying and analysing long-term risks to human life and property from natural or man-made hazards and taking steps to eliminate these risks where practical, and where not, reduce the likelihood and management of their impact.
- Readiness: Developing operational systems and capabilities before a disaster happens. These include self help and response programmes for the general public as well as specific programmes for emergency services.
- Response: Actions taken immediately before, during or directly after a disaster to save lives and property, as well as helping communities to recover.
- Recovery: Activities beginning after the initial impact has been stabilised and extending until the communities capacity for self help has been restored.

1.137 For a major disaster event, a declaration of a 'state of emergency' may be made by Civil Defence. Once a declaration is made, it allows for additional powers to assist in the response stage. In Canterbury a state of emergency was declared following the earthquake on 4 September and remained in place until 16 September.

1.138 Police have legal responsibilities and duties under the CDEM and the Policing Act 2008. The main priority for civil defence emergency management is public safety and protection of property. Police are responsible for evacuations and by having these additional powers they may evacuate people who refuse to leave, enter buildings and, requisition vehicles, equipment and supplies.

Canterbury Earthquake (Civil Defence Emergency Management Act) Order 2010

1.139 The Canterbury Earthquake (Civil Defence Emergency Management Act) Order 2010 came into effect on 16 September 2010 and expires on 29 November 2010. It modifies or extends provisions of the CDEM 2002 and provides police with various powers, as if a local emergency was still in place. These include powers to:

- evacuate and to exclude persons or vehicles from premises and places (including public places) and an associated offence and penalty,
- enter on, and if necessary break into, premises and places,
- impose prohibitions or restrictions on public access, with or without vehicles, to roads and public places and an associated offence and penalty,
- remove (and if necessary for that purpose to use force or break into) aircraft, vessels, vehicles, etc, and
- requisition property, associated offences and an associated penalty, and an associated provision for compensation.

Canterbury Earthquake Response and Recovery Act 2010

1.140 Following the earthquake on 4 September 2010, the government acted quickly to introduce legislation to speed up the recovery process. The Act was introduced on 14 September and will expire no later than 1 April 2012.

1.141 The purpose of the Canterbury Earthquake and Recovery Act 2010 is to:

- enable the relaxation or suspension of some statutory requirements that may divert resources away from the effort to efficiently respond to the damage caused by the Canterbury earthquake and to minimise further damage, or that may not be capable of being complied with, or complied with fully, owing to the circumstances resulting from the Canterbury earthquake; and

- facilitate the gathering of information about any structure or any infrastructure affected by the Canterbury earthquake that is relevant to understanding how to minimise the damage caused by earthquakes.

1.142 The Act established the Canterbury Earthquake Recovery Commission to advise Ministers with respect to any Orders in Council that may be required, and how resources might be prioritised and funding allocated, for the response to the Canterbury earthquake. It also provides protection from liability for certain acts or omissions and provides that the Act does not create a right to compensation.

Environmental and Geographical

1.143 Although the initial earthquake and subsequent aftershocks are not yet strong enough proof that a previously hidden fault lies beneath the city, scientists say it cannot be ruled out. The recently revealed Greendale fault, which runs from near Hororata to north of Rolleston, may indeed extend underneath the city. Earthquake scientists have stated that in their research programme which extends over the next one to two years, they will be analysing about where the Greendale fault joins up with others (Gorman, 06/10/2010).

1.144 The M7.1 earthquake released energy equivalent to 670,000 tonnes of explosives, or 67 nuclear bombs (Gorman, 6/09/2010). It has been suggested that the fault that caused the Canterbury earthquake had not moved for at least 16,000 years.

1.145 Following the quake, it was reported that within the Canterbury region, there were approximately 7600 earthquake prone buildings, with 958 of these being constructed of unreinforced masonry (CCC, 2010, Wells, 2010 cited in Ingham & Griffith, 2010). The damage sustained to these unreinforced buildings was consistent with previous observations of the seismic performance of such buildings.

1.146 As at midnight on 25/10/2010, a total of 102,503 claims have been registered with EQC in relation to the Canterbury earthquake, with 81,513 in Christchurch, 8119 in the Selwyn District, 6426 in the Waimakariri District, 2546 in Timaru, 2093 in Ashburton and the remaining 1820 in other parts of Canterbury (www.eqc.govt.nz).

1.147 A geotechnical report, prepared by EQC and their consultant engineers, Tonkin & Taylor, was released in late October 2010. This report provides an assessment of damaged properties and land, and was released with the government's decision on what will be done to address the damage in each affected area. A version of this report contains the location specific information on the houses that are to be demolished, have ground reinstated and/or to have houses repaired.

1.148 Citing Privacy Act reasons, EQC has not released the detailed version of the report externally, including to any agencies involved in the recovery phase. Home owners who are directly affected by the results of the report have been individually contacted and made aware of the decisions relating to their property.

1.149 Summary information from the report has been obtained and indicates that 16 properties will not be rebuilt or reinstated, 1200 houses will be demolished, and 4800 houses require repair. Anecdotal information indicates a number of the 16 houses are in the higher income areas such as Fendalton. Other information received suggests that as many as 15,000 - 18,000 houses are to be rebuilt. Due to the protracted and comprehensive process involved with land/house assessments, and the overall fluidity of the situation, it is likely that these numbers will alter significantly over time.



Figure 8 Inner City and Dwelling Damage

1.150 The land damage assessment process has been undertaken in two stages. Preliminary broad mapping was undertaken from 4 to 8 September 2010 followed by local assessments of the main areas affected by liquefaction. The detailed, local assessment mapping has been undertaken since 9 September 2010 and is ongoing. Assessments are undertaken based on observations visible from public roads and reserves, entering private properties and communicating with homeowners where appropriate (Tonkin & Taylor, 2010).

District	Suburb	<i>No. of mapped properties as at 1 October 2010</i>		
		Land Damage	No Apparent Land Damage	Total
Waimakariri District	Kaiapoi North	845	893	1738
	Kaiapoi South	409	2101	2510
	Kairaki Beach	70	-	70
	Pines Beach	235	-	235
Christchurch City	Avondale	337	357	694
	Avonside	418	55	473
	Bexley	771	71	842
	Brooklands	494	250	744
	Burwood	636	-	636
	Dallington	531	84	615
	Fendalton	290	94	384
	Halswell	1177	3605	4782
	Northcote	32	95	127
	Parklands	193	158	351
	Spencerville	225	-	225
	Wainoni	98	591	689
Selwyn District	Lincoln - Tai Tapu	97	1421	1518
Total		6855	9775	16630

Table 1 Suburb Inspection and Damage

1.151 In eight of the hardest-hit areas, the government is proposing to build perimeter dams on vacant public land that borders rivers and waterways. This would involve stone pillars about 10 to 20 metres wide and 5m to 10m deep being driven into the ground in a ring around the

suburb, protecting it from the lateral damage that could occur in a future quake (Cowlshaw, 22/10/10).

- 1.152 Avonside and Kaiapoi are two of the areas to have the perimeter dams, but Tonkin & Taylor have not commented where the remaining six are.

Liquefaction

- 1.153 Liquefaction occurred during the earthquake in some specific areas where there were saturated, unconsolidated (loose) soils. This caused water and silt or sand to be ejected to the ground surface, resulting in subsidence and, in places, lateral spreading (sideways movement) of the ground. This has led to damage to houses and underground services (www.ccc.govt.nz).



Figure 9 Liquefaction

- 1.154 Where liquefaction has occurred and particularly where sand and water has been ejected to the ground surface, ground settlement must have occurred, and will continue to occur until excess pore water⁸ pressures have dissipated. This ongoing consolidation of the silts and sands, and ground settlement, is expected to have continued for several weeks after the earthquake.
- 1.155 While settlement and general densification will occur, a layer of loosened surface material may remain in some areas. Liquefaction can also result in the flotation of buried services and structures (such as manholes and tanks), as is evident in Brooklands (refer above photo) (Tonkin & Taylor, 2010).
- 1.156 In general, liquefaction occurred in areas known to be susceptible. However, because soil properties vary greatly across the greater Christchurch area, and different earthquakes have different ground shaking patterns, it is very difficult to predict exactly where liquefaction will occur in a particular earthquake.
- 1.157 There may be some further minor subsidence in areas of severe liquefaction. This is normal and may continue for a few more weeks (www.ccc.govt.nz).

⁸ Pore water is the water filling the spaces between grains of sediment. Pore water pressure refers to the pressure of groundwater held within a soil or rock, in gaps between particles (pores).

Recovery and reconstruction

1.158 From the initial site reconnaissance and discussions with members of the community, it was observed that properties in the following areas were most severely affected by land damage:

- Riverside areas, particularly the inside and on some outside of bends. Areas include Avondale, Avonside, Burwood, Dallington, Kaiapoi, and parts of Fendalton, Halswell and St Martins.
- River delta areas. Areas include Bexley, Brooklands, Kairaki, Pines Beach, and Spencerville.
- Inland loose alluvial deposit areas. Areas include parts of the suburbs of Belfast, Casebrook, Fendalton, Halswell, Hoon Hay, Parklands and St Albans (Tonkin & Taylor, 2010).

1.159 Formulating a response to the damaged land and properties has been considered around a number of potential options, as outlined below:

Remediation Option	Estimated Cost	Expected Performance (for an equivalent sized earthquake)	Reconstruction Impact
A & B	Highest ↑ ↓ Lowest	Greatest Improvement ↑ ↓ Least Improvement	Greatest Social Disruption Longest reconstruction time and requires the demolition of the greatest No. of houses.
C & F1			
D & F2			
E & F3			
G (in suburbs with no very severe lateral spreading)	Lowest	Least Improvement	Least Social Disruption Shortest reconstruction time and requires the demolition of the least No. of houses
G (in suburbs with very severe lateral spreading)	Variable	Some Improvement	Variable Reconstruction impact is different for the various categorised properties (i.e. <u>lowest</u> for minor, moderate and major but <u>highest</u> for very severe)

Table 2 Proposed Options to Repair

1.160 Following a review of the above considerations and options by central and local government, and peer review by Beca Infrastructure Ltd and John Wood Consulting (Beca, 2010), Tonkin & Taylor has been instructed, and is currently working up, Options E and G on a suburb by suburb basis. The order in which suburbs will be addressed has not been made available to police or other organisations involved with the recovery response.

1.161 Options A to D and Option F have been discounted based on the substantially greater costs, the much longer duration and effects, and the fact that remediation to levels significantly above most of the Canterbury Plains cannot be justified. One district council has indicated they are not entirely satisfied with the proposed plans, and would prefer to see all land reinstated and foundations reinforced, to ensure higher levels of community reassurance.

1.162 The Earthquake Commission has awarded Fletcher Construction the contract to manage residential and business property reconstruction in the Canterbury region. The contract is believed to be worth approximately NZ\$1 billion. Approved builders, suppliers and tradespeople will be accredited to Fletcher Construction so as to maintain quality standards. Repairs are expected to commence in early November, with priority given to weather proofing damaged properties. However, local builders are expressing concern that many

reconstruction jobs will bypass the official channel due to urgency or ignorance of procedures. Tony Grimward of T G Decorators suggests that many people will still be vulnerable to unqualified, extortionate or malicious tradespeople.

- 1.163 Public debate has vigorously assessed the need for consideration given to heritage aspects of the affected areas. Several heritage buildings within the CBD are destined for demolition, while other heritage features within the city have also been extensively damaged. Ian Athfield has been appointed Christchurch's architectural ambassador by Mayor Bob Parker on September 14. Athfield is to head a team of architects and urban designers who will focus on five issues:
1. settlement patterns and land use
 2. urban design as the context for change
 3. offering choice in housing patterns
 4. how existing heritage buildings can inform future design
 5. integrating traffic, transport and infrastructure decisions more closely to the requirements of settlements.
- 1.164 McDonald (2010) highlights the possibility of a glut of bare land for development as condemned buildings are demolished, and suggests that demolitions could be staggered to avoid this situation. In either instance, these sites are likely to become crime attractors, with empty buildings likely to be used as doss-houses and falling victim to vandalism and possibly arson. Some vacant lots will likely have poor security, night lighting and lines of sight from public areas.

Forecasts

Short Term Forecasts (October - December 2010) and Implications for Policing

Crime and Crash

- 1.165 Overseas studies indicate that all crime rates drop during the emergency period of a natural disaster (with the exception of domestic violence) and return to pre-disaster levels during the reconstruction phase (Bailey, 2009). Although the decrease in violent crimes (10%) in the emergency period of the Canterbury earthquake was marginal, indications are that they are likely to increase to, and supersede, pre-disaster levels within a short time into the reconstruction phase. Likely contributing factors include:
- Increased frustration by those whose properties and/or land are damaged, their dealings with insurance providers, EQC, tradespersons and other agencies. This could also include time delays and the perception of lack of relevant information from associated stakeholders.
 - Business owners, particularly small business owners, under extreme economic pressure, increasing the likelihood of stress related violent behaviour with the possibility of drugs and/or alcohol as a contributing factor.
 - The re-opening of licensed premises in the central city area attracting patrons back to this area and increasing the likelihood of alcohol-fuelled violence and disorderly behaviour.
 - There has been what is described as a sombre atmosphere in the city since the earthquake, however with the festive season just around the corner, Cup Week celebrations (November) and Christmas/New Year festivities (November, December, January), it is

possible that people may 'break out' with increased consumption of alcohol and 'partying' resulting in possible violent and/or disorderly behaviour across the community.

- Those members of the community with a propensity for violent crime may believe there is an opportunity to commit such crime without or with little consequence, believing police and other agencies are 'busy' with the earthquake related business.

1.166 There has been an ongoing increasing trend within the district of vacant properties being targeted for hot water cylinders and scrap metal. It is likely that this trend will continue.

1.167 It is likely car crime levels will return to pre-quake levels, however how quickly this occurs is uncertain. Influencing factors include offenders' perceptions of other crime opportunities such as burglary. Therefore the speed with which empty homes and streets can be reoccupied, or cleared of goods, and/or demolished will impact on how soon car crime levels return to expected levels.

1.168 Sudden pot-hole formation during peak times in heavy rain remains a risk, for as long as high volume road surfaces remain only temporarily repaired. Large pot holes increase the crash risk for motorcyclists and the risk of tyre blowouts on other vehicles.

1.169 As more claims for damage are made, it is likely that there will be a corresponding increase in false or exaggerated claims to EQC and/or insurance providers leading to investigation by police and possible prosecution.

1.170 Before and around Christmas, there is expected to be a notable number of prisoners released into the community. As there is potential for some release addresses to have been damaged by the earthquake, Probation staff are to be conducting physical checks before approving release addresses.

1.171 It is likely there will be an increase in persons fraudulently claiming to be insurance assessors and/or trades people in order to gain access to dwellings and/or premises with the intention of committing crime. Elderly members of the community and/or those living alone are likely to be at greatest risk of this fraudulent/offending behaviour.

1.172 For those persons uninsured or inadequately insured, there is a likely risk of them attempting to recoup costs via illegal means. Those uninsured or inadequately insured not only include homeowners and business owners but those working and living in the rural sector where inadequate insurance has been highlighted as a problem (Cowlshaw, 17/09/2010).

Geographical and Environmental

1.173 Where liquefaction has occurred and particularly where sand and water has been ejected to the ground surface, ground settlement must have occurred, and will continue to occur until excess pore water pressures have dissipated. This ongoing consolidation of the silts and sands, and ground settlement, is expected to have continued for several weeks after the earthquake (Tonkin & Taylor, 2010).

1.174 Earthquake damage to old buildings within the central city and neighbouring areas is likely to reshape the future of business and shopping precincts. It has been suggested that previously, low rental costs of old buildings had kept many small buildings afloat. Rebuilding would result in rents too high for some businesses and might not be viable, particularly where there had already been vacancies. In addition, there may be little demand for space in rebuilt or repaired buildings as many small tenants may not survive the wait (McDonald, 25/09/2010).

- 1.175 The worst of damaged stop-banks around Kaiapoi are expected to be fixed within a month; however the total stop-bank repairs are expected to take at least a year, costing approximately NZ\$3million. There are serious weaknesses around the banks near the State Highway 1 Bridge, and the Williams Street Bridge in Kaiapoi. Although a flood is unlikely, it is one potential risk to this area that engineers are keeping a close watch on (Williams, 24/09/2010).

Social and Legal

- 1.176 Public meetings have been held at various locations around the district since the earthquake, most of which have attracted large numbers of attendees. The most popular topics have centred on insurance, EQC and decisions made around damaged housing. It is possible that if resolutions to these issues are not provided within coming months, residents' frustrations may become more apparent. Furthermore, delays in such resolutions will also provide a disservice to efforts made towards community reassurance.
- 1.177 The capacity for individuals, families and communities to cope with the stress of the event, economic stress, damage to land and property, EQC/insurance provider issues and damage to infrastructure and systems has been identified as a high risk. As in areas across Canterbury, psycho-social resilience is already stretched and as aftershocks continue alongside other issues, there is a high risk of people developing severe responses to stress. School holidays and the pre and post Christmas period along with earthquake related issues will almost certainly result in an increase in stress, possible increases in alcohol consumption, violence and breakdowns within families and communities.
- 1.178 Within the rural community, those on small land holdings are likely to be high risk in relation to developing severe responses to stress during the recovery phase. Many commute to the city or towns for other vocations but still require earnings from their land to meet the mortgage. Aside from damage to dwellings and/or buildings, many have sustained damage to land with subsidence, cracks and liquefaction. In addition, many do not have the equipment or the time to deal with the repair work making the land unproductive.

Economic

- 1.179 The government's wage subsidy scheme was initially provided until the end of September 2010 for small businesses affected by the earthquake. This scheme was extended to 1 November 2010 and provided approximately NZ\$15 million to businesses for the key cash flow operations of paying staff, creditors and suppliers. The government hopes that the scheme has allowed for 'business as usual' to prevail in the short term as companies adjust to their post earthquake environment.
- 1.180 The Canterbury Recovery Management Group has signalled that it intends to present the government with a proposal for Business Relocation Support. This would fund the approximately 100 businesses needing relocation with a NZ\$3 million package.
- 1.181 A Canterbury Earthquake Recovery survey conducted in September found that of 400 Christchurch business surveyed, 368 (92%) were open. The majority of the remaining businesses were expecting to reopen by the end of October 2010.
- 1.182 Economic commentators believe that the recession of 2009 and 2010 will allow sufficient skill capacity within the Canterbury region for significant reconstruction to commence almost immediately. A BNZ research article quotes that "currently, the building sector should have

significant spare capacity as activity levels have been clobbered by the current economic malaise" (BNZ Markets Outlook, 06/09/2010). However, the Southland Times (Sue Fea, 19/10/2010) reports that as many as 15,000 tradespeople will be needed to work on Christchurch's reconstruction. A significant proportion of these workers will be drawn from outside the Canterbury region. WINZ reports that between 600 and 800 off-season meat workers from Timaru to Invercargill are ready to start work in Christchurch.

- 1.183 Real Estate commentators point to an imminent rise in rental rates across Canterbury. This is due to both the increased demand and reduced supply following damage sustained in the Canterbury earthquake. TradeMe property manager Brendon Skipper estimates a 27% fall in listings in Christchurch over the short term period, while he has observed a 'surge' of enquiries in September (Harris, 01/10/2010).

Medium Term Forecasts (December 2010 - June 2011) and Implications for Policing

Crime and Crash

- 1.184 Research post-Hurricane Katrina has indicated evidence of geographical crime displacement, whereby evacuees perpetrated crimes in towns and cities where they were temporarily housed (Thornton & Voigt, 2010). Many of those evacuees committing crimes had existing criminal histories, and a number were on probation or parole. An increased demand for law enforcement in the cities that received the criminally minded evacuees was noted. It is possible that this issue may be noted locally once households begin to be temporarily relocated.
- 1.185 It is almost certain that burglary of construction sites will be a high risk in the medium to long term during the reconstruction period. Building materials are likely to be in high demand and are almost certain to be targeted commodities along with tools and equipment. In addition, poor security of construction sites and the lack of guardians in suburbs that have been badly affected by the earthquake are almost certain to be contributing factors. This latter point has strongly been identified as a mitigating factor in the high burglary and looting rates post Hurricane Katrina (Frailing & Harper, 2010).
- 1.186 Known alternatively as 'architectural looting' (thefts of historical architectural items such as doors, mantels, shutters, windows, and other such structures) and 'scrapping' (thefts of copper from abandoned homes and businesses and new building sites), these issues are likely to present challenges for policing during the recovery phase. Following Hurricane Katrina, architectural looting and scrapping, particularly the latter, became significant problems. In 2007, the New Orleans City Council "passed an ordinance making it unlawful for any purchaser of certain types of scrap metal to buy from persons or scrap metal businesses, who do not have specific licenses, requiring all purchasers to record very detailed information on the seller and making that information available for police inspection" (Preventing Copper Theft 2007, cited in Thornton & Voigt, 2010:47).
- 1.187 Research has indicated that increases in family violence are likely to occur approximately six months after a natural disaster (Houghton, 2010). This can occur for several reasons, which include people becoming frustrated if recovery efforts are not progressing, if people are having to continue to live in damaged housing, if employment is adversely affected and/or if 'promises' of assistance/rebuilding are not fulfilled. In relation to the Canterbury earthquake, the six month prediction would suggest that March may be a high risk month for family violence.

- 1.188 EQC is paying out claims up to NZ\$10,000, in relation to 'house and contents', and in many circumstances the damaged goods remain with the claimant. It is possible some claimers will then fraudulently lodge another claim with their insurance provider for the same item, claiming it was damaged by other means post the earthquake. It is likely that this 'double dipping' will occur within the first six months as people tidy up and dispose of damaged items.
- 1.189 It is not uncommon for members of the Asian community to be uninsured. AMI has experienced a higher than usual volume of enquiries for new insurance policies for house and contents from members of the Asian community in Canterbury post the earthquake.
- 1.190 Speed is likely to cause further damage to poorly or unsealed roads, as well as dust and noise which is likely to contribute to the long term stresses on residents during reconstruction.

Geographical and Environmental

- 1.191 The Stage Two report by Tonkin & Taylor is due for public release by early December 2010, with the Stage Three version expected in January 2011. Although the degree of detail that will be available in these reports is unknown at this stage, it is likely that a more comprehensive picture of the earthquake damage to land and properties will become apparent following each release.
- 1.192 EQC have estimated that all claims under NZ\$10,000 will be settled by Christmas, and that all properties with claims over NZ\$10,000 to be settled by March 2011.
- 1.193 The suburb-by-suburb repair and reinstating of land is likely to begin sometime in the New Year. However, as it is not known in which order the suburbs will be addressed, it is likely there will be a degree of confusion, conjecture and frustration as residents continue to wait. Furthermore, if pockets of communities are to be temporarily relocated, this in turn will impact on the communities receiving the displaced residents.
- 1.194 As at late November 2010, there were 1700 rental properties available via Trademe. As it is estimated that approximately 15,000 - 17,000 households will need to be relocated during the recovery phase, it is likely that the shortage of rental accommodation will become problematic.
- 1.195 On the 10/09/2010, six days after the earthquake, Christchurch City Council passed new rules in relation to the building requirements for all commercial buildings to be earthquake strengthened to 67% of the Building Code. Before this change, the proposal being considered by the council was to strengthen to 33% of the Code. Raising the level to 67% will almost certainly result in some property owners finding they are underinsured and unable to afford to repair/rebuild their buildings. Insurance providers will pay for repairs to earthquake-damaged commercial buildings but strengthening work is considered an improvement and would not be covered. (Heather, 2010.)
- 1.196 John Lucas of Insurance Council New Zealand reports they are currently negotiating with Christchurch City Council on behalf of their members to endeavour to provide an acceptable outcome for all parties involved. Should commercial building owners not be in a position to be able to repair or rebuild, it is almost certain there will be displacement of tenants (businesses and private accommodation), unsafe buildings will remain vacant, and building owners severely impacted financially with the potential to recoup some of those costs via fraudulent and/or criminal means.

Social and Legal

- 1.197 It is possible that the relocation of households may begin over the medium term, which will have a significant impact not only on the communities from where people are moved from, but also those communities which receive the relocated households. Social cohesion is at potential risk over these months, and there is the possibility of integration issues as households adjust to their new spaces/neighbours.
- 1.198 Research following Hurricane Katrina found some evidence of hostility from the host communities, where evacuees were perceived as 'outsiders' and as taking advantage of government assistance or job opportunities to the detriment of those already living in the community (Shelton & Coleman, 2009). Some of this hostility was race and/or class based, and remained for approximately a year following relocation, after which time it began to subside. It is possible that varying levels of hostility may be experienced locally, particularly if there are significant ethnic/class divides between the incoming and host communities.
- 1.199 It is almost certain insurance premiums will increase if there is an increase in inflated or fraudulent claims to insurance providers.
- 1.200 Legal services within the district are reportedly expecting an influx of cases concerning tenancy, employment and insurance as a result of the earthquake (Todd, 2010). It has been alleged that some tenants are still expected to pay rents despite the properties having been destroyed or classed as uninhabitable and that insurance companies were using 'loopholes' to deny people cover. It is possible that some of these disputes will escalate to the point where police attendance is required and it is also possible that violence may occur.

Economic

- 1.201 Christchurch City Council Mayor Bob Parker has urged Cantabrians to inform people in other parts of New Zealand and overseas that Christchurch and Canterbury is - in general - functioning and safe. A positive image of the region is needed to promote tourist, consumer and investor confidence. The newly appointed manager of Christchurch and Canterbury Tourism, Tim Hunter, claims that the earthquake has been "largely forgotten" overseas, so normal marketing campaigns should remain in place (Wood, 19/10/2010).
- 1.202 The Canterbury Development Corporation - in conjunction with the Department of Labour and other key government agencies - is to instigate a workforce needs analysis. The analysis is to focus on identifying skills requirements and how these can be met by the local labour market, as well as the consequences of any skills and labour movements around wider areas.
- 1.203 According to the Canterbury Recovery Management Group, around 100 Christchurch businesses need to relocate. Approximately 20% intend to relocate temporarily for between 6 and 12 months.
- 1.204 The Christchurch City Council has imposed a deadline of 31 January 2011 for Christchurch business property owners to repair or demolish earthquake damaged buildings. Failure to do so will mean a mandatory repair bill. This deadline is therefore expected to accelerate decisions on property survival and reconstruction. The Council is currently monitoring repair progress on approximately 500 such buildings within the CBD and on main arterial routes (Heather, 23/10/2010).
- 1.205 Based on economic theory and historical precedents, the reconstruction phase over the coming year will provide a boost to Canterbury's and New Zealand's economic output.

Westpac economists estimate that local reconstruction efforts of NZ\$1.8 billion will translate to an economic stimulus of NZ\$4.1 billion, most of which will be experienced in 2011. This estimated value represents 14% of Canterbury's annual gross domestic product and over 2% of national GDP (Westpac, 22/09/2010).

- 1.206 The economic stimulus from reconstruction does not generate wealth or new capacity in the economy, however. As a recovery effort, the expenditure boost is not dedicated to progress but only restoration. Economists refer to this increased activity as 'broken windows' expenditure.

Long Term Forecasts (July 2011 - July 2012/2013) and Implications for Policing

Crime and Crash

- 1.207 Research has suggested that levels of family violence often return to 'normal' approximately one year following a natural disaster (Houghton, 2010). However, it should be noted that this research was conducted on other New Zealand natural disasters that were not of the same magnitude as the Canterbury Earthquake. Hence it is likely Canterbury's rates of family violence make take somewhat longer to readjust.
- 1.208 It is possible necessary delays in repairing damaged road surfaces will negatively impact on rates of fatal and serious injury crashes. The 30km/h speed limits in the inner city and other affected areas may offset this, depending on how long this remains in place.
- 1.209 Reconstruction will generate more Heavy Vehicle (HVM) traffic generally, and is likely to last a year or more. The extra traffic and loads will present a raised general risk through increased traffic volumes and loading issues, and in the central city will present an increased risk to pedestrians (Kirkwood, 2010).
- 1.210 Contractor fraud emerged as an issue in the rebuilding process in New Orleans following Hurricane Katrina. It is possible fraudulent contractors will engage in the building process here in Canterbury, insisting on payment prior to, or part way through projects, then fail to complete the work. With earthquake damaged customers receiving lump sums of available funds from EQC and/or insurance providers for the purpose of rebuild/repair, coupled with the possible shortage of labour/materials and the possibility of frustration over time delays, dishonest contractors are likely to attempt to capitalise on the opportunity to hike prices and deliver substandard or incomplete work whilst already having received full or part payment.
- 1.211 Rational Choice Theory provides some explanation for fraud offending post-earthquake, in the sense that there are likely to be more opportunities to commit such an offence, and also the costs/risks of fraud offending may be seen to be outweighed by the perceived benefits. A particular strength of rational choice theory is that it provides recommendations for reducing offending; namely target hardening and increasing perceived risks of offending (Frailing, 2010). Research has recommended that procedures for distributing relief benefits/funding involve inter-agency cross-checking and verification, and also that fraud offending is addressed without impunity.
- 1.212 International research indicates that as the immediate affects of a natural disaster wear off, so does the sense of altruism that flows through the community. The breakdown of this togetherness is reflected in crime trends during the reconstruction stage returning to pre-disaster levels during this period. In relation to violent crimes, this was certainly true in New

Orleans after Hurricane Katrina where the murder rate rose to unprecedented levels, one to two years after the disaster (Bailey 2009).

- 1.213 Indications are that violent crime in Christchurch will return to, and likely supersede pre-earthquake levels within one to two years or sooner, particularly in light of the possibility of the displacement (temporary or permanent) of whole communities whilst land is repaired. Again this is reflective of the belief that the low level of community engagement contributes to the high levels of crime.

Geographical and Environmental

- 1.214 EQC have estimated that the reinstating of damaged land is likely to take up to 18 months, and that repair work for all claims between NZ\$10,000 and NZ\$100,000 which are managed by the EQC Project Management Office, are likely to take up to two years before settlement.
- 1.215 Christchurch's damaged sewer and water lines are likely to cost in excess of NZ\$100million, and will take more than a year to fix, according to the Christchurch City Council. Sewers in Avonside, Avondale, Dallington, Bexley and Brooklands were extensively damaged, while there was lesser damage in Halswell and Southshore (22/10/2010).
- 1.216 In Kaiapoi/Pines Beach it is estimated that it will take up to two years for roading issues in the affected areas to be resolved as the underground services need to be repaired first.
- 1.217 Approximately 40% of the wharves at Lyttelton Port were damaged during the earthquake, and it has been suggested that the damaged container terminal is likely to keep sinking for another three years due to significant slumping and cracks.
- 1.218 The damage to the port is estimated to top more than NZ\$50million, with the Gladstone Pier and a coolstore facility both having to be demolished. Lyttelton Port has decided to cancel its proposed merger with the Port of Otago, to let it focus on repairs sustained by the earthquake, and it has been suggested it could be several years before the foundation earth settles down from its agitated state. The decision to cancel the merger plan is a disappointment to both Port Otago and Lyttelton Port staff, as both ports could have jointly benefited financially from the merger by several million dollars a year (Wood, 2010).
- 1.219 Although politically, the rebuilding and restoration has been said to be completed within two years, it is likely that the full extent of the rebuild will take at least three years, if not longer.
- 1.220 As the cooler months approach, the ability of damaged houses to withstand the winter conditions will become critical. Early indications suggest as many as 29,000 chimneys have come down with the earthquake, and thousands of houses have been damaged. If the rebuilding phase has not made progress by winter, particularly in the significantly damaged areas, it is likely the living conditions for some residents will become untenable. Furthermore, the ability of power-lines that may have been strained by the earthquake to cope with severe winter conditions may be questionable, which presents further risk and vulnerability to damaged suburbs.

Social and Legal

- 1.221 It has been estimated that the psychosocial effects of the earthquake may take up to three years to fully resolve, particularly if there are unanticipated delays in the rebuilding phase. Evidence from the Australian bushfires has indicated that suicides peaked two years after the actual event of the fires, as the stresses of recovery took their toll.

- 1.222 It is possible that some form of protest action will be held regarding the Canterbury Earthquake Response and Recovery Act 2010 as the reconstruction period gets underway. The Act allows for the relaxation or suspension of some statutory requirements that may divert resources away from the effort to efficiently respond to the damage. It also provides protection from liability.
- 1.223 One of the leading concerns expressed about this legislation is that decisions cannot be challenged in court. It is therefore possible that in the medium to long term, discontent regarding any decisions made on the reconstruction of the city, will be expressed through protest action with those involved believing it to be the only option available.
- 1.224 The Act also removes the need for prior building consent for certain demolition, construction and repair work although all work must still comply with the New Zealand Building Code. It is therefore likely that some sections of the community will inadvertently employ unskilled or unqualified building practitioners. It is possible that the long term will see an increase in the number of disputes between property owners and building practitioners.
- 1.225 Staff directly involved with the response and recovery phases of the earthquake are at potential risk of fatigue/psychological stress, particularly as more time progresses. Organisations such as Age Concern, council staff, insurance staff as well as emergency service staff have ongoing responsibilities to respond to the needs of those affected by the earthquake. The daily reminders of the community's stress and anxiety, the magnitude of the recovery effort, and also personal experiences of the earthquake are likely to take their toll, and staff welfare should be considered a priority.

Economic

- 1.226 Some affected householders may prefer to relocate to other areas, rather than return to rebuild or repair. It is possible that this would impact on community cohesiveness, resulting in a loss of social capital and effective guardianship in these areas, even after they are repopulated. Ongoing promotion of Neighbourhood Watch initiatives would assist, particularly in affected areas where many previous residents do not return, and new residents may not integrate into the community easily, having not lived through the same experiences.
- 1.227 It is almost certain there will be long term effects on property prices. Although several housing supply and demand studies are yet to be completed, it is expected there will be relative adjustments in the property values in Christchurch and Kaiapoi, with price trends favouring those suburbs in the less affected areas.
- 1.228 Prime Minister John Key has indicated that the government will not compensate residents for loss of home value and has acknowledged that there could be future insurance issues for properties on remediated land. However, Earthquake Recovery Minister Gerry Brownlee has indicated that house prices in affected areas could rise above their original levels due to subsequent land improvements in excess of the Earthquake Commission's obligation to return land to its original state (Cowlshaw, 23/10/2010). Although this is a possible phenomenon, there will be a period of time in which home owners are unable to capitalise on such improvements.
- 1.229 Chairman of the Canterbury Employers' Chamber of Commerce, Peter Townsend, believes that the biggest long term issue facing Canterbury businesses and households is insurance. Although approximately 90% of Canterbury businesses are currently fully insured with

respect to property and contents (including stock), less than 60% were eligible for business continuity cover - which in general is conditional upon the business sustaining physical damage.

- 1.230 It is likely insurance companies will review whether or not to cover and/or increase their premiums in Canterbury, especially to those areas which are vulnerable to direct damage and liquefaction. Decisions to remove insurance cover would effectively ghettoise businesses and residential areas, while any subsequent increases in insurance costs will discourage future insurance cover.
- 1.231 With reference to insurance, the government has not yet made any decisions on whether or not it will assist uninsured property owners facing losses. Obviously there is pressure to provide some compensation, given that insurance holders are receiving up to NZ\$100,000 of essentially taxpayer support through the Earthquake Commission. However, opposition to a central government bail out is posed on the two grounds: (1) the ethics of why those individuals and businesses that choose to insure should subsidise those who do not and, (2), the introduction of a 'moral hazard' problem; namely the disincentive to purchase insurance given the implicit guarantee of a 'free insurer of last resort'.

Reference List

- Aitken, J.J. (1999). *Rocked and ruptured: geological faults in New Zealand*. Auckland: Reed.
- Associated Press. (2010). *Crimes after Katrina may have been overblown*. www.msnbc.msn.com accessed 14/10/2010.
- Bailey, K. (2009). *An Evaluation of the Impact of Hurricane Katrina on Crime in New Orleans, Louisiana*. Public Administration Program, Texas State University.
- Bank of New Zealand. BNZ Markets Outlook 6 September 2010.
- Bloy, A. (2010). Strategic Assessment CND-SA-1003
- Brown, W. (2010, September 12). *The Community Response Model*. Selwyn District Council
- Brunsmma, D.L., Overfelt, D., Picou, J.S. (2007). *The sociology of Katrina: Perspectives on a modern catastrophe*, Landham, MD. Rowman & Littlefield Publishers.
- C.H. (2010, September 7). Facing disaster, like a Kiwi. *The Economist*. Retrieved from http://www.economist.com/blogs/asiaview/2010/09/earthquake_christchurch.
- Chapple, S. (1997). The economic effects of the 1931 Hawke's Bay earthquake. *New Zealand Institute of Economic Research working paper 97/7*.
- Conway, G. (2010, November 3). Rates safe from huge repair bill. *The Press*, p. 1.
- Cowlshaw, S. (2010, September 7). Some owners may have to reduce section size. *The Press*
- Cowlshaw, S. (2010, September 17). Insurers warn against fake claims for damage. *The Press*
- Cowlshaw, S. (2010, October 22). The great walls of Canterbury. *The Press*, p. 1.
- Cowlshaw, S. (2010, October 23). Owners of 'frozen assets' need help. *The Press*, p. 5.
- Cronshaw, T. (2010 September 17). FMG expects big payout. *The Press*
- Crampton, E. (2010, September 16). Let's use price to allocate resources. *The Press*, p. A19.
- Fea, S. (2010, October 19). Quake trades drain tipped. *The Southland Times*, p. 4.
- Frailing, K. (2010). 'Fraud Following the 9/11 & Hurricane Katrina Disasters' in Harper, D., & Frailing, K. (2010). *Crime and Criminal Justice in Disaster*. Carolina Academic Press, North Carolina.
- Frailing, K., & Harper, D. (2010). 'Fear, Prosocial Behaviour and Looting' in Harper, D., & Frailing, K. (2010). *Crime and Criminal Justice in Disaster*. Carolina Academic Press, North Carolina.
- Gill, D. (2007). Secondary Trauma or Secondary Disaster: Insights from Hurricane Katrina. *Sociological Spectrum*, 27, 613-63
- Gordon, R. (2008). A "Social Biopsy" of social processes and personal responses in recovery from natural disaster. *GNS Science Report 2008/09 14p*.
- Gorman, P. (2010, October 6). Scientists can't rule out fault below Christchurch. *The Press*, A5.
- Grimward, T. (Interview 27 October 2010).
- Harper, D., & Frailing, K. (2010). *Crime and Criminal Justice in Disaster*. Carolina Academic Press, North Carolina.

- Harris, C. (2010, October 1). Quake hits Christchurch rentals. *The Press*.
- Heather, B. (2010, September 28). Up to 500 jobs to go. *The Press*, p. A1.
- Heather, B. (2010, October 8). Buildings may fall to tough rules. *The Press*, p. A13.
- Heather, B. (2010, October 23). Deadline set for building repairs. *The Press*, p. A7.
- Holden, K. (2010) Canterbury District Gang Update, November 2010. p. 12
- Houghton, R. (2010). "We had to cope with what we had": Agency Perspectives on Domestic Violence and Disasters in New Zealand. Doctoral thesis, Victoria University of Wellington.
- Ingham, J., & Griffith, M. (2010). *Performance of unreinforced masonry buildings during the 2010 Darfield (Christchurch, NZ) earthquake*.
- Kirkwood, R. (2010). Tactical Assessment CVIU-TA-1010, p. 4.
- Larrance, R, Anastasia, M.& Lawry, L. (2007), Health Status Among Internally Displaced Persons in Louisiana and Mississippi Travel Trailer Parks, *Annals of Emergency Medicine* 29,5: 590-601.
- Marvell, T., & Moody, C. (1996). "Specification Problems, Police Levels, and Crime Rates", *Criminology*, Vol 34, No.4, 1996.
- McDonald, L. (2010, September 22). Property scramble follows quake. *The Press*, p.C10.
- Mueller, B. (2008) Communicating with the multicultural consumer: theoretical and practical, p. 272
- Norris, F.H., Matthews, B.A., Riad, J.K. (2000). *Characterological, situational, and behavioral risk factors for motor vehicle accidents: a prospective examination*. *Accident Analysis and Prevention* 32 (2000), pp 505 -515.
- NZPA. (2010, September 27). Stress takes toll on Cantabrians.
- Quarantelli, E.L., Dynes, R. (1970) *Property norms and looting: Their patterns in community crisis*. *Phylon* 31(2): 168-182
- Shelton, J., & Coleman, N. (2009). 'After the Storm: How Race, Class, and Immigration Concerns Influenced Beliefs About the Katrina Evacuees', *Social Science Quarterly*, 90, 3 pp 480 - 496.
- Southern California Earthquake Center. (2010). *Recovering from a big one*. Retrieved from <http://www.earthquakecountry.info/roots/recovering.html>
- Tella, R., & Schargrodsy, E. (2001). Using a Terrorist Attack to Estimate the Effect of Police on Crime. http://www.aaep.org.ar/espa/anales/pdf_01/ditella_schardgrodsy.pdf. Accessed 04/11/2010.
- Thornton, W., & Voigt, L. (2010). 'Disaster Phase Analysis and Crime Facilitation Patterns' in Harper, D., & Frailing, K., (Eds). *Crime and Criminal Justice in Disaster*. Carolina Academic Press, North Carolina.
- Trigg, S. (1997). Interpreting Trends in Recorded Crime in New Zealand. <http://www.ncjrs.govt/App/Publications/abstract.aspx?ID=166169>. Accessed 23/09/2010.
- The Press. (2010, September 27). Showing Fortitude. *The Press*, A14.
- The Treasury. (2010). *Economic Impact of Canterbury Earthquake*. Economic Brief 10 September 2010.
- Tonkin & Taylor. (2010). Geotechnical Land Damage Assessment and Reinstatement Report: Stage 1 Report. www.eqc.govt.nz

Townsend, P. (Interview 11 October 2010.)

Tucker, E. (2001) *Crime and Disaster*. Business Recovery Managers Association Newsletter 12(2)

Tuohy, R. (2010). Post-disaster recovery of older adults. *GNS Science Report*. 2010/09

Waterfield, B. (2010). *Haiti earthquake: police face return of gangs in Port-au-Prince*. Daily Telegraph, 19 January, 2010.

Westpac Institutional Bank (2010). Potential financial impacts of the Canterbury earthquakes on Canterbury economy. 22 September 2010 Web:64/10.

Williams, D. (2010, September 22). Sewer repairs will take a year. *The Press*, p.A1.

Williams, D. (2010, September 24). Stopbank repairs a priority. *The Press*, A5

Wood, A. (2010). *Quake damage derails Otago merger plans*. The Press, October 2, 2010, C22.

Wood, A. (2010, September 18). Retailer warns of business failures. *The Press*.

Wood, A. (2010, October 23). Quake forgotten overseas. *The Press*, p. A13.

www.eqc.govt.nz (2010, October 25.) <http://www.eqc.govt.nz/insurance/recent-events.aspx>

Vergano, D. (2010). Report: No crime wave among Hurricane Katrina evacuees. USA Today, 12/02/2010.