Earthquakes and the rebuild of Christchurch: how Geography provides the answers

Professor Simon Kingham
Dept of Geography, University of Canterbury
Director of The Geospatial Research Institute and the GeoHealth Laboratory

Cashmere High School, August 2016
The importance of the ‘whole’

People: political boundaries, socio-economic, cultural, age, gender places

Infrastructure: buildings, transport, water systems, energy, waste

Earth System: geology, tectonics, materials

Environment: land use, ecology, green space, waterways

Time: past, present & future people & places

Real world: complex, interrelated & interdependent ‘neural network’ of physical, built & human environments
EARTHQUAKE DAMAGE – WHERE?
EARTHQUAKE DAMAGE – WHAT?
4 Sep 2010


GSA Today, March 2015.

GSA Today, March 2015.

GSA Today, March 2015.

GSA Today, March 2015.
EARTHQUAKE DAMAGE – WHY?
Rebuilding a resilient city involves understanding the past.
Rebuilding a resilient city involves understanding the present

e.g. flooding: land, channels & pipes
Rebuilding a resilient city involves understanding the future.
What are key features of geography?

• in context of rebuild
The power of where

‘The power of where’ drives New Zealand’s success

Land Information New Zealand (LINZ) makes a significant contribution to the smooth running and development of New Zealand.

So many decisions involve information about location— from finding the best use for farmland, to deciding where to build a school, to planning underground infrastructure maintenance, to deciding which route to take to work. This is information that LINZ provides.

Decisions using location information already add $1.2 billion to New Zealand’s economy. LINZ’s vision is to increase this value by tenfold over the next decade. We call this ‘the power of where’.
The anchor projects

Projects and Places

The Recovery Plan identifies the location of major anchor projects: key developments in Christchurch's central city. The anchor projects inspire confidence and give momentum to the inner city rebuild. Each project provides opportunities for individuals and organisations to be part of the city's future.

The anchor projects

1. Canterbury Earthquake Memorial
2. Te Puna Ahurea Cultural Centre
3. The East Frame: a new inner city community
4. Innovation Precinct
5. Performing Arts Precinct
6. Central Library
7. The South Frame
8. Te Papa Otaïkarō/Avon River Precinct
9. Margaret Mahy Family Playground
10. Residential Demonstration Project
11. Metro Sports Facility
12. The Stadium
13. The Square
14. Retail Precinct
15. Government Accommodation
16. Cricket Oval
17. Bus Interchange
18. Convention Centre Precinct
19. Health Precinct
20. Justice and Emergency Services Precinct

Name some liveable cities

• What makes them liveable?
Placemaking

“If you plan cities for cars and traffic, you get cars and traffic. If you plan for people and places, you get people and places.” Fred Kent
Placemaking

Earth Day 1970

Lighter, Quicker, Cheaper

Community is the Expert

Kissing, Beer Garden

What Do You Want to Do on the Bridge?

How Do We Save Place?

Market

You Have to Be a Zealous Nut!

Best Bench

Hall of Shame

Transportation

What Can You Do Here?

Create Places Where People Can Walk

Reduce Auto

White Stones

Black Stones

Keep one

Intuitive Intelligence

Organic Natural Process

People Like to Look at Other People

Community Engagement

Happiness

The Street as Public Place

Foot Traffic

We Call It Multi-Use

Thinking Small in a Big Way

Mode of Transformation

The Uses People Want

Parks: The New Climate Classroom

Ice Cream

Affection

Infectious

You Take Off Your Shoes!

We Have to Turn Everything Upside Down to Turn It Right Side Up

Parks: The New Climate Classroom

Fred Kent

Lloyd Dangle
Placemaking
Placemaking

Cheonggyecheon, Seoul, Korea

Placemaking

1970

2005

www.lafoundation.org
Placemaking
‘Cheonggyecheon – symbol of the green economy’ President Lee
Where did the traffic go?

“It just disappeared” - Prof Jeff Kenworthy
Figure 2 — Obesity (BMI $\geq 30$ kg $\cdot$ m$^{-2}$) prevalence and rates of active transportation (defined as the combined percentage of trips taken by walking, bicycling, and public transit) in countries of Europe, North America, and Australia. BMI was computed from self-reported height and weight. Data were obtained from national surveys of travel behavior and health indicators conducted between 1994 and 2006 (see text for details).
Co-benefits

CYCLING AND HOUSE SALES

Properties within 100 feet of bike paths sell for $8,800 more.
Properties closer to the Monon Trail sell for an average of 12% more.

ROLLING UP REVENUE

All told and the economic benefits of bicycling are striking. Adding the impact across all states and the nation can be staggering. A recent Pew Research study of the economic impact of cycling at the state and national level.

NYC CAR-CENTRIC STREETS

5% increase in commercial vacancies across Manhattan.
$2.34 billion in sales lost.

NYC BIKE-FRIENDLY STREETS

Pedestrian-friendly redesign with bike track results in 40% fewer commercial vacancies.
$16.48 billion in sales.

SIX MILLION NORTH WISCONSIN CONSUMERS GENERATE $92.4 MILLION IN NATIONAL TAXES

Bicyclists in Wisconsin generate more than $40 million in economic activity.
Bikes in Colorado contribute $3.2 million to the economy.

Biking and walking in Vermont create $3.4 million in wages.

RECREATIONAL RIDERS IN WISCONSIN CONTRIBUTE $92.4 MILLION ANNUALLY.

UC UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND
Co-benefits
Placemaking in Christchurch?

Calmer traffic will make for a cooler city

SIMON KINGHAM

The Christchurch City Council has announced it is permanently reducing the speed limit on many of the roads within the four avenues to 30kmh.

This seems to have gained a degree of negative comment with people complaining that it is going to make their journeys longer and suggesting the council is anti-car.

The reality is that for someone who chose to drive through the city centre a permanent speed limit reduction to 30kmh would have no or little impact on journey times. Even if someone were able to drive through the city centre at a consistent 30kmh then recouping the speed to 30kmh would actually only add a minute or so at most to a journey.

Even at the best of times, driving through the city centre involves stopping at traffic lights or junctions and being in traffic. And of course we are hardly at the best of times with ongoing road repairs meaning many journeys are far slower and less direct. So this speed reduction will have little impact on journey times.

It is worth mentioning that such a speed reduction dramatically improves the chance of someone surviving an accident. For example, if you are hit by a vehicle travelling at 50kmh you have around a 15 per cent chance of living, at 30kmh, your chances improve to around 80 per cent.

Of course, the plans for the central city are to encourage through traffic to avoid the 30kmh roads and instead use roads that are better designed for flow traffic. This approach is common in many parts of the world, where traffic is discouraged from driving through city centres.

However, important, speed and safety are not the only issues here. The fundamental question is, what does our central city to be like? Back in 2011 the people of Christchurch were asked what they wanted from their city. They responded in huge numbers in the ongoing debate about the merits of some of the flagship projects and the concept of the product, the reduction in speed limit to 30kmh.

I doubt many Christchurch residents would dispute that the pre-2011 Christchurch’s city centre was not working as a destination.

Walkways, green space, markets, riverside features, and for it to be safe and eco-friendly. Fewer cars was also a significant theme. There was no demand for more cars, big road and faster speeds.

We only have to see the recent attendance at the Noodle Market and Lantern Festival to appreciate that people enjoy coming into the city to attend events. Consider the popularity of the Margaret Mahy playground.

Around the world there is a growth in the idea of “placemaking”. This is not a new concept (it originated in the 1940s), but it is growing in popularity and being implemented in cities all around the globe. It is the idea that you create/design/pain public spaces so that they promote people’s health, happiness, and well-being.

The many excellent Gap Filler and Growing the Rubble projects that we find around some of our transitional spaces typify this. I doubt many Christchurch residents would dispute that pre-2011 Christchurch’s city centre was not working as a destination.

Yet we have stunning botanical gardens, one of the largest central city parks in the world, a beautiful meandering river and some unforgettable heritage buildings all set in a flat landscape that is perfect for walking and cycling.

Lower speed limits would make the central city safer. If you are hit by a vehicle travelling at 50kmh you have around a 10 per cent chance of living, at 30kmh, your changes improve to around 80 per cent.

The buildings blocks for a great city centre are in place. Hamilton along with many parts of the world.

It is also worth noting that we are not alone in implementing slower speed limits.

In Europe there are major campaigns to reduce speed limits, including the European Union, and the Netherlands, which have some of the lowest speeds in the world. The United States has seen a similar campaign, particularly in the Pacific Northwest, where speeds are reduced to 25mph in many areas.

Simon Kingham is Geography at the University of Canterbury.
Earthquakes impacts are a function of geography.
Where we rebuild is crucial to recovery.
Understanding interactions between human’s and their environment.
The power of where.
Geography at University

• Undergraduate courses
  – part of Geography degree or other
The power of where

Geospatial science
- e.g. GIS, GPS, satellite imagery, drones

......geographical ‘glue’
The power of where

Orange = Motor vehicle
Blue = Cycle
Green = Walk
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CERA online maps

The CERA Map

- The CERA Map
- More information about the CERA map viewer

This easy-to-use map viewer will run on any device. It contains the following layers of information:

- Land tenure status and technical categories
- Demolished status and section 43 notices
- Prorogued routes for different travel modes from the Accessible City chapter of the Recovery Plan
- Aerial images of the city over time (including aerial pre-September 2010)
- Central City (CCDU) Blueprint and Anchor Projects

Planning and Community Toolset (PACT)

- A multi-layered desktop tool showing the changes across greater Christchurch providing a raft of information including land use and zoning, transport routes, and population figures to help with future planning in the region.
- The aim is to give community groups and organisations easy access to information that will help them plan their own future facilities.

Maps and geospatial services

In this section:

- Maps and geospatial services
- Geospatial data - Terms and conditions
- Natural Resource Group GIS network
- Download DOC GeoSpatial Data

DOC is one of New Zealand’s leading organisms in geospatial technology. Geospatial data is location-based data, and GIS (Geographic Information Systems) is a tool to manage, store, view, and edit this data.

DOC has developed for public use, the following mapping tools to view and access DOC’s spatial data.

DOC Maps

DOC Maps is designed for a broad audience including scientists, planners, Governmental agencies and teachers. It displays information on:

- DOC land, activities and facilities
- general land classifications
- property and cadastral information

GIS mapping
Data Analyst
Hudson New Zealand
- Permanent Role
- SQL focus
- CBD Location
Permanent Data Intelligence Analyst, SQL Databases, knowledge of web applications and GIS. CBD location
Information & Communication Technology > Database Development & Administration
Add to shortlist

Spatial Intelligence Analyst
Hudson New Zealand
- Permanent Role
- CBD Location
- Enterprise GIS environment
Permanent Spatial Intelligence Analyst, GIS, ESRI and Intergraph, enterprise analysis and modelling, some knowledge of SQL. A bonus
Information & Communication Technology > Business/Systems Analysts
Add to shortlist

GIS Analyst
AECOM
- Join a global Fortune 500 organisation
- Sydney CBD location
- Supportive environment
Excellent opportunity for a Professional Spatial Information Specialist to join our Geographic Information Systems team. 
Information & Communication Technology > Other
Add to shortlist

Spatial Intelligence Analyst
New Zealand Fire Service
Exciting role within the NZ Fire Service, opportunity to utilise your knowledge within a supportive team and make a real difference to the business!
Information & Communication Technology > Business/Systems Analysts
Add to shortlist

14/1175 - Senior Geospatial Consultant
Statistics New Zealand
- Christchurch or Wellington - Permanent
- Flexible working hours
- Internal & external training programmes on offer
A key part of this role involves engaging with internal stakeholders to ensure statistical requirements and geospatial solutions are meeting needs.
Government & Defence > Government
Add to shortlist
Spatial experts added to Immigration's skills shortage list

Immigration New Zealand has responded favourably to an industry request to ease a shortage of geospatial knowledge

Stephen Bell (Computerworld New Zealand) on 12 February, 2013 20:39
GEOGRAPHERS IN THE WORKPLACE
Aimee Martin

'I definitely love how relevant Geography is to everything happening in the world...'

**Bachelor of Science in Geography**

**Postgraduate Diploma in Science in Geography**

**Master of Science in Geography**

**Assistant Research Analyst, Christchurch City Council**

'I definitely love how relevant Geography is to everything happening in the world, and how wide-ranging it is as a discipline,' Aimee says. 'There are so many different options and opportunities within the one subject.'

Indeed, Aimee found studying Geography at UC to be far more varied than she initially thought.
Andreas Wilson

'I feel that I have been well prepared for the professional world...'

Studying towards a Master of Science in Geography

With a strong interest in health-based geography, Andreas’ studies at UC have focused on urban communities and its impact on the health of people.
Joshua Neville

'Despite how intensive it is, the work is really engaging and enjoyable...'

Bachelor of Science in Geography

Studying towards a Master of Science in Geography

Choosing to study Geography was a choice inspired by living in Christchurch during a time of dramatic change to the city's landscape.
Penny Goddard

'My studies have helped me understand what I am seeing in the landscape as I have travelled and worked...'

Bachelor of Science in Geography

Avalanche Forecaster, Canadian Avalanche Centre, Revelstoke, Canada

Only the third New Zealand woman to reach the summit of Everest, Penny feels very fortunate. 'Everything came together for me and I got to experience this amazing thing,' she says.

It was just one year before her summit that Penny was in Nepal and first considered the idea.
Geographers in the workplace

Emma Kelland, CERA, Rebuild
Gareth Taylor, Jacobs, Environmental Consultant
Anthea Fiolitakis, HERE Maps, Geographic Analyst
Mallory Kindred and Astoria Delaney, Statistics NZ, GIS analysts

Anne Heins, ECan, Public Transport Planner
Hayley Hume-Merry, ECan, GIS Data Officer
Iain Dawe, Greater Wellington, Senior Hazards Analyst
Justin Cope, ECan, Team Leader Hazards & Coastal
Hamish Kingsbury, Interpret Geospatial Solutions, Consultant