

the power of  
**where**  
drives NZ's success



**Presented at the FIG Working Week 2016,  
May 2-6, 2016 in Christchurch, New Zealand**



# Earthquake creates a 'first' for N.Z. mapping

Graeme Jupp | Cartographer



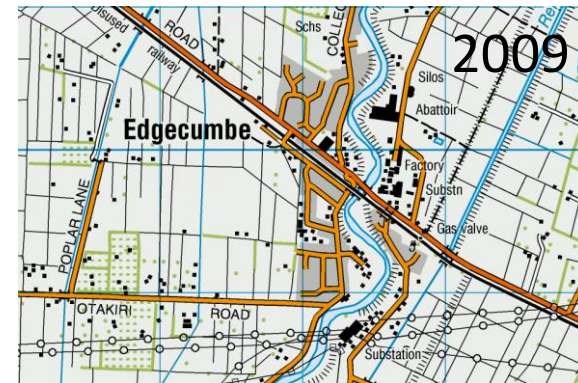
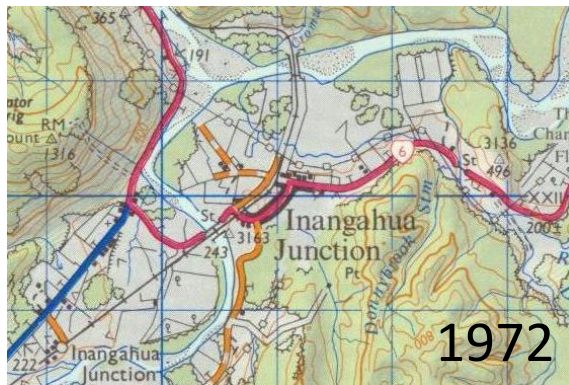
# The Shaky Isles...



Napier, 1931



Inangahua, 1968

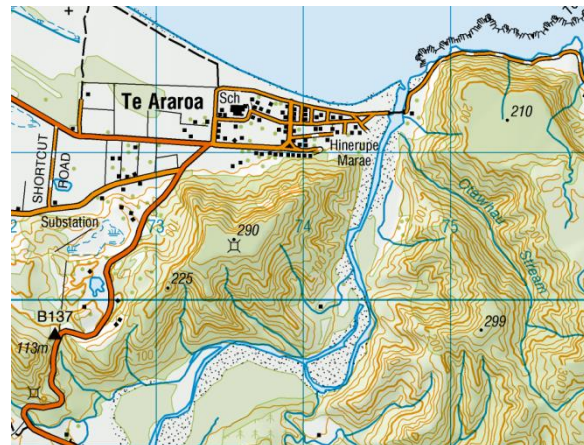
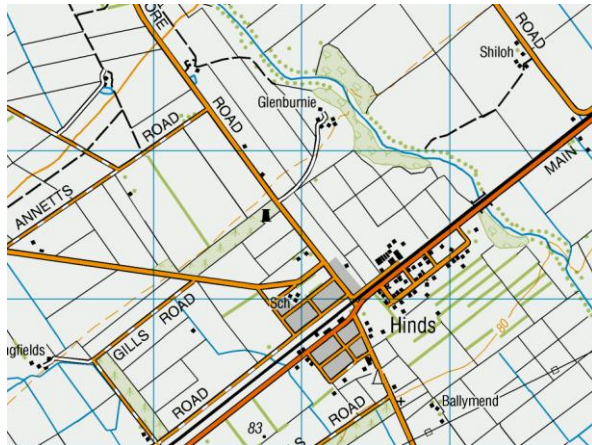
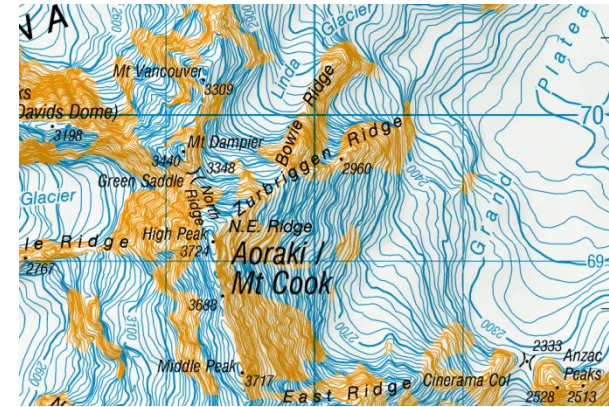


Edgecumbe, 1987



# NZTopo50 series

- National coverage to a consistent standard
- Scale of 1:50 000; Series released in 2009
- 451 sheets in total (including Chatham Islands)
- Accuracy and currency are high priorities
- Used by New Zealand emergency services



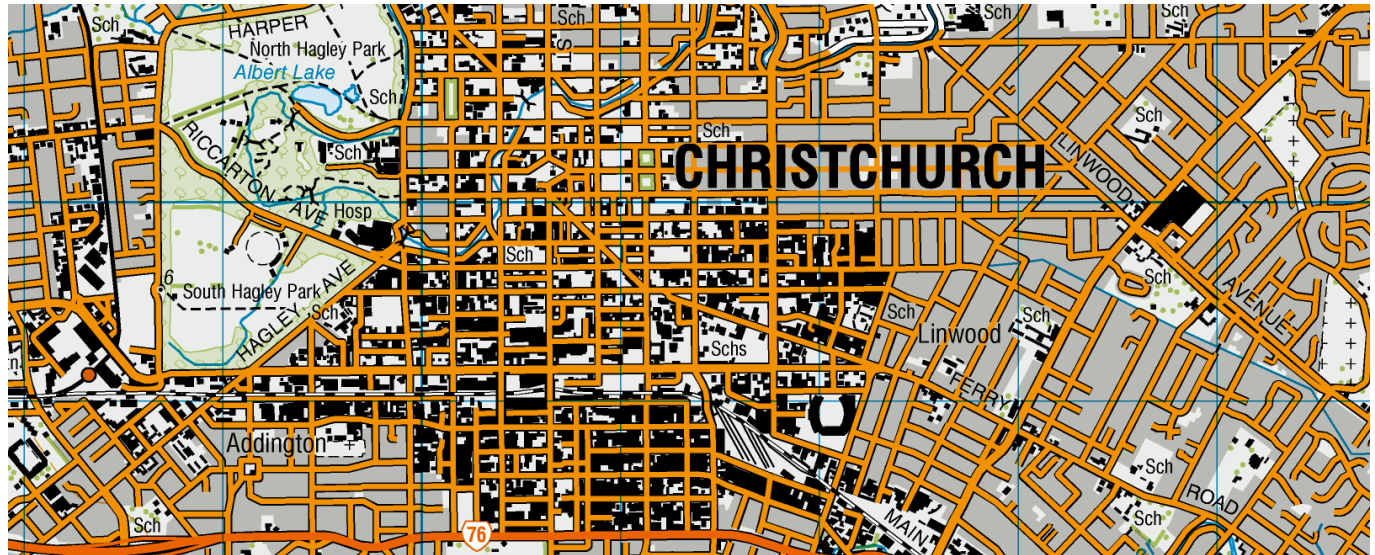
# The map in question...



## Christchurch

NZTopo50-BX24 1:50 000

- Sheet BX24
- Originally published in 2009
- Area coverage of 36 x 24 kilometres
- Available in printed and digital formats

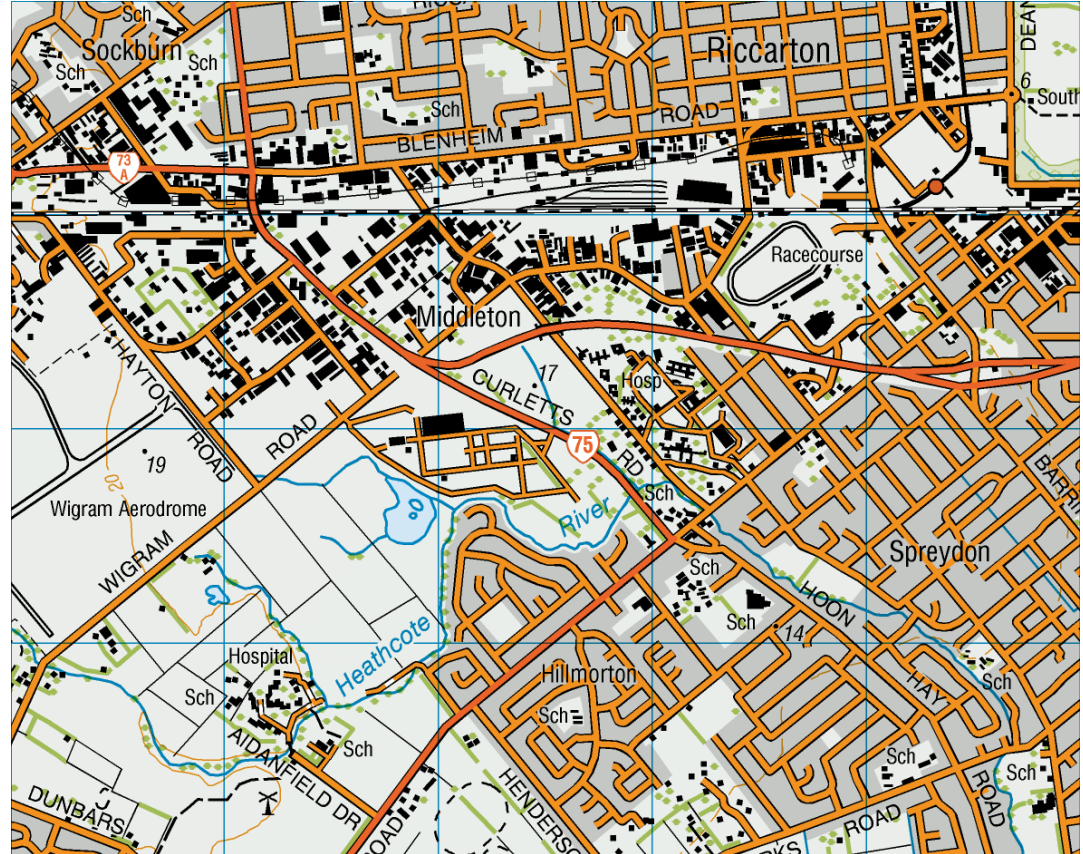


# High visibility maintenance (1)

Industrial area of  
Sockburn, Middleton  
and Riccarton (2000)

Existing topographic  
features included:

- State highways (red)
- Local roads (orange)
- Large buildings
- Individual buildings
- Residential areas

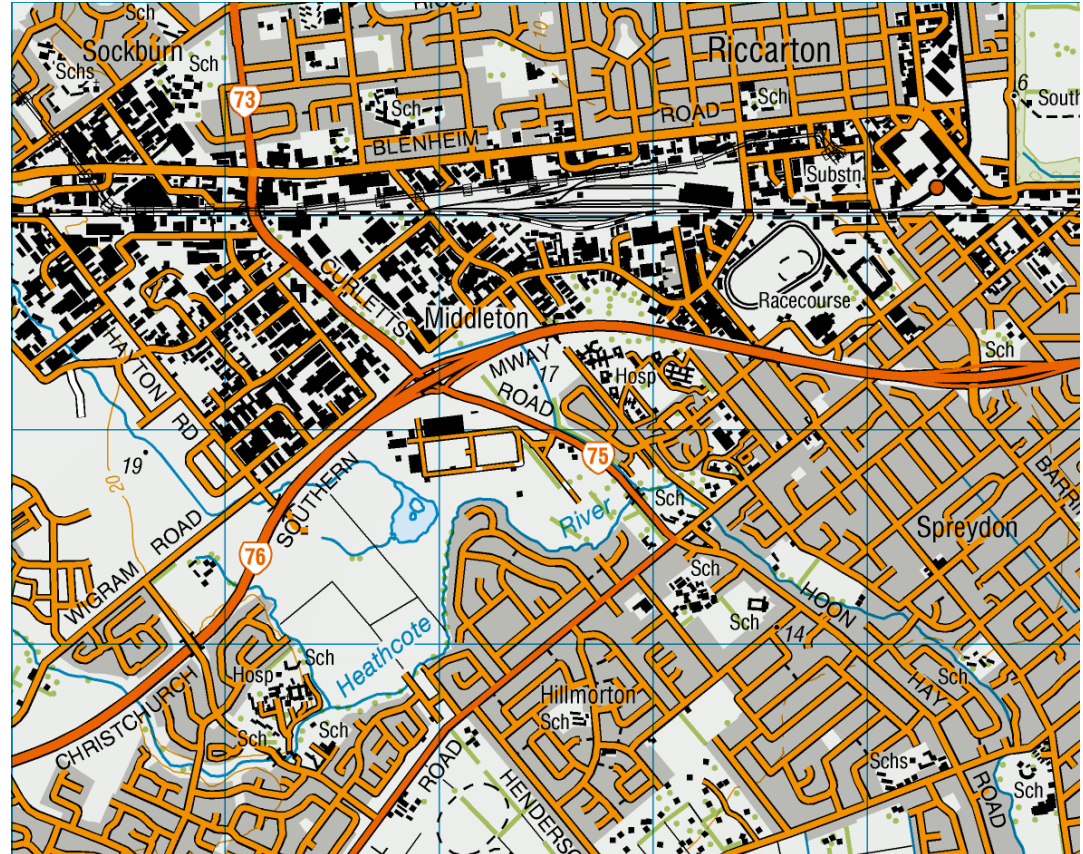


# High visibility maintenance (1)

Industrial area of  
Sockburn, Middleton  
and Riccarton (2014)

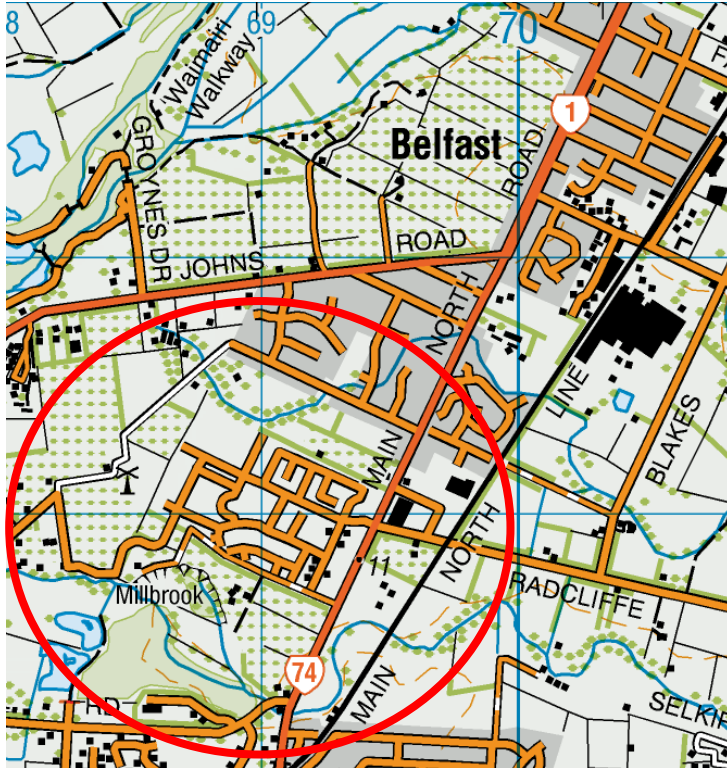
Topographic features  
updated included:

- State highways (red)
- Local roads (orange)
- Large buildings
- Individual buildings
- Residential areas



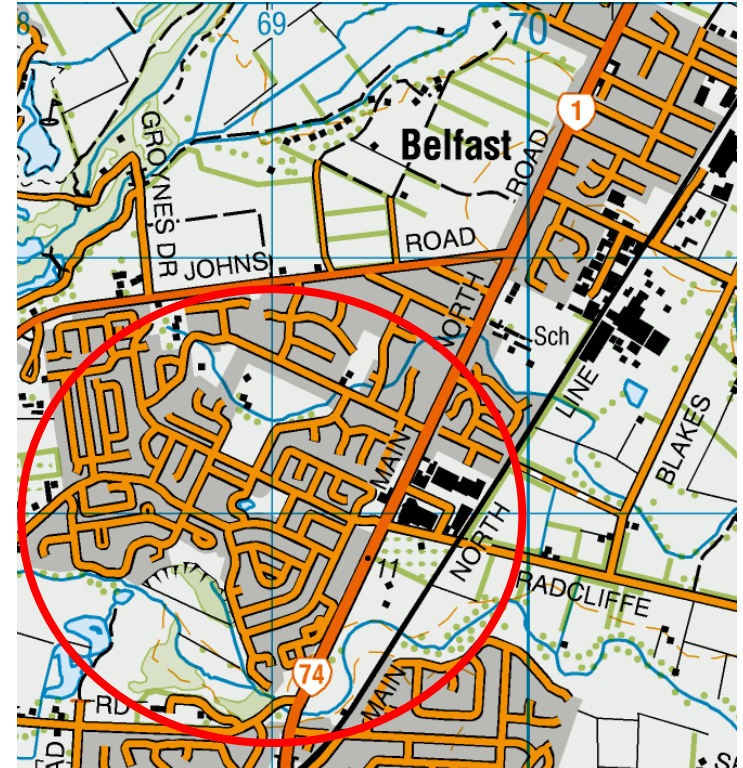
# High visibility maintenance (2)

## Expanding suburban area of Belfast



2000

*Belfast is  
10 kilometres  
north of  
Christchurch  
city centre*



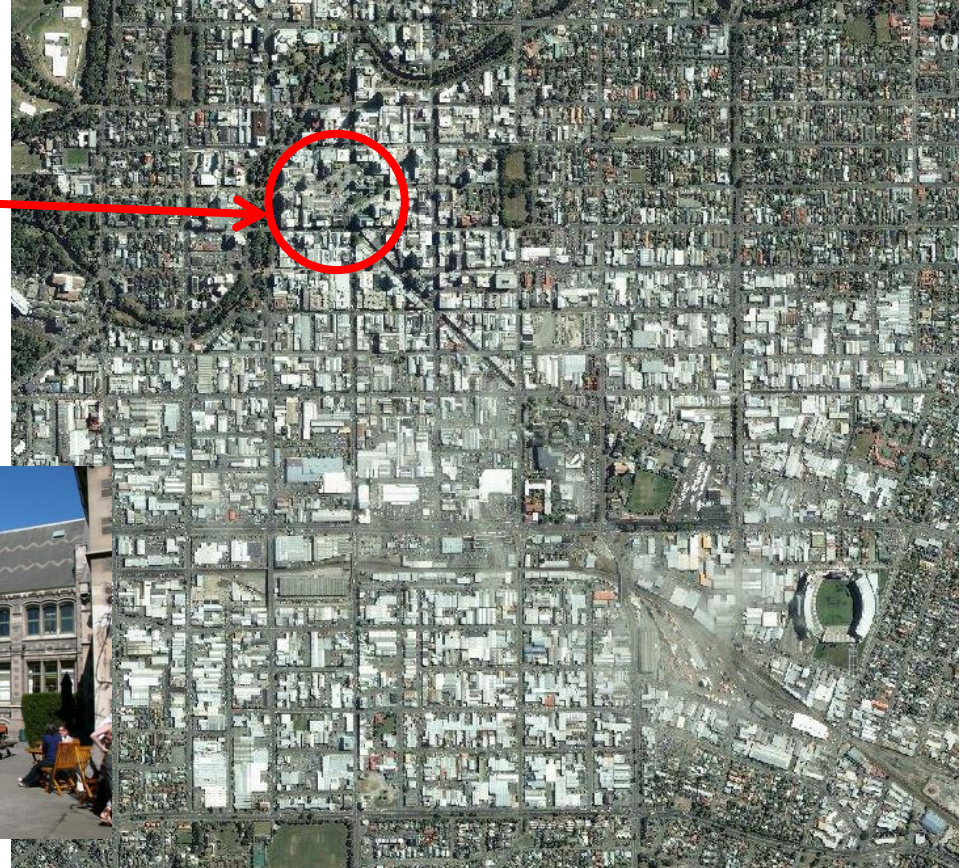
2014

# The calm before the storm...

Christchurch City Centre  
November 2010



Christ Church  
Cathedral  
Arts Centre



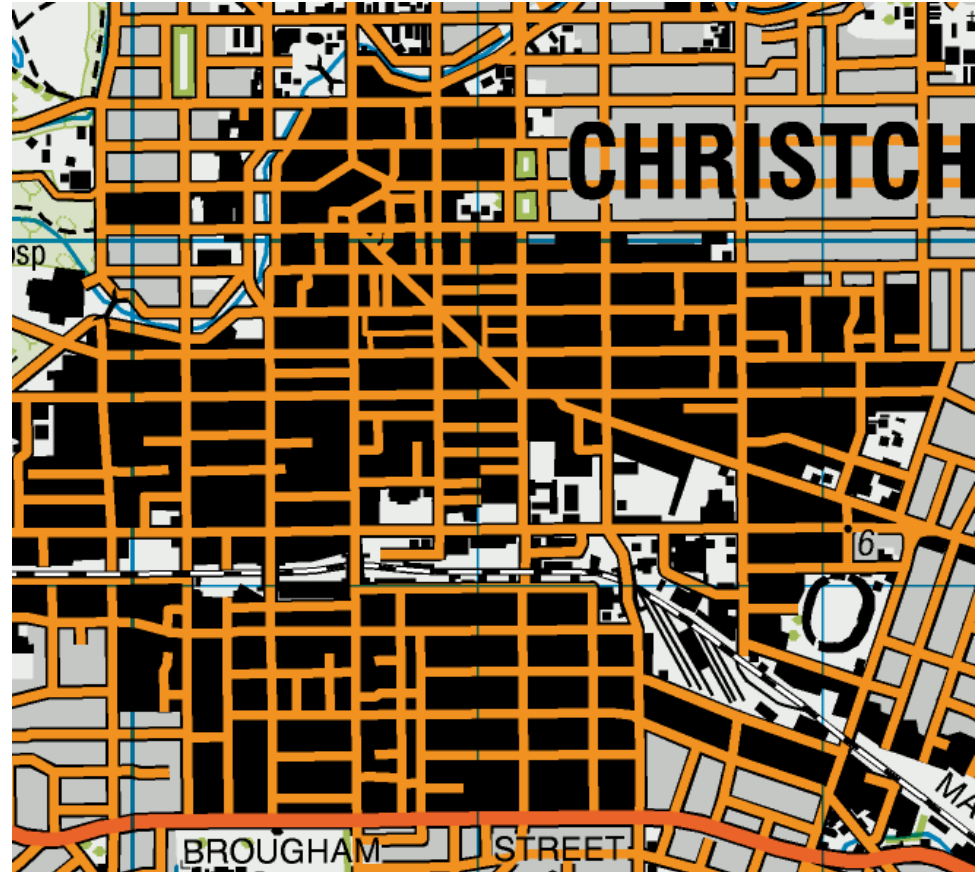


# Setting the scene...

Christchurch City Centre  
Extract from BX24  
(Edition 1, 2009)

Topographic features  
prominent in urban areas:

- State highways (red infills)
- Local roads (orange infills)
- Large buildings
- Individual buildings
- Residential areas



# Earthquake! February 22, 2011



Property destroyed...  
Infrastructure devastated...

185 lives lost



# After the earthquake



## Christchurch Central Business District, 2013

- Restricted access
- Removal of debris
- Controlled demolitions
- Clearance of entire blocks

# The same area in 2010...

Christchurch Central  
Business District,  
2010

2015



# The challenge...

How to represent the changes at a scale of 1:50 000

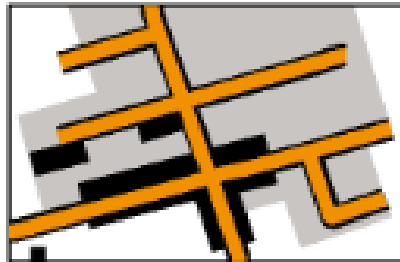
Topographic features most affected:

- Roads
- Large buildings (CBD/industrial areas)
- Smaller (individual) buildings
- Residential areas
- Cliffs (mostly too small at map scale)

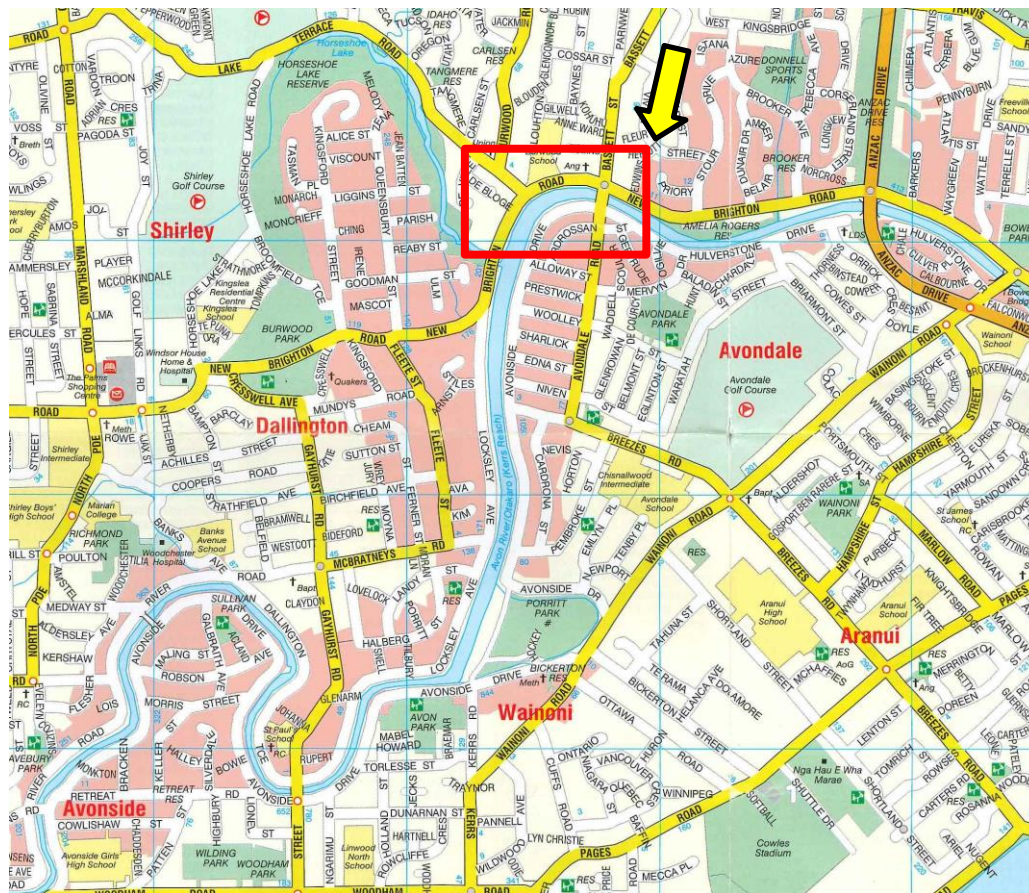
Residential area .....

Large buildings .....

Isolated building .....



# An option discounted...

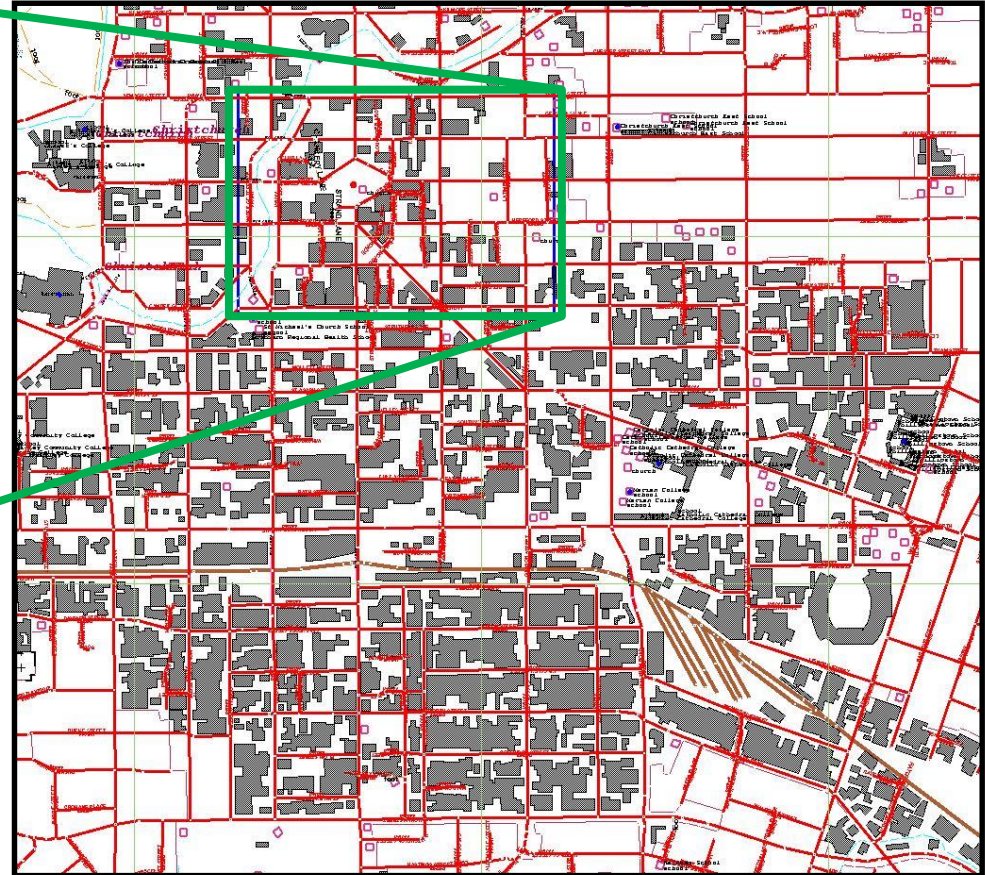


Christchurch City Map  
Published by AA maps (2013)



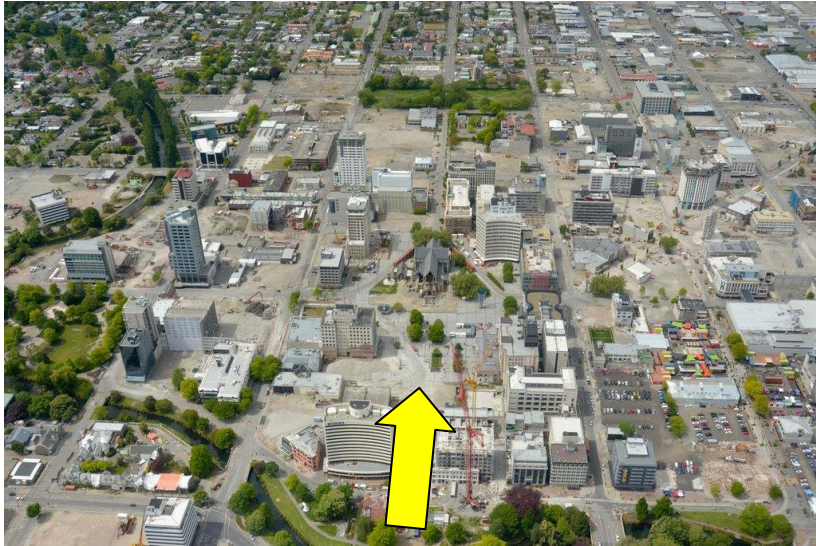
The pink screen denotes  
earthquake-affected areas

# Capturing what remained...



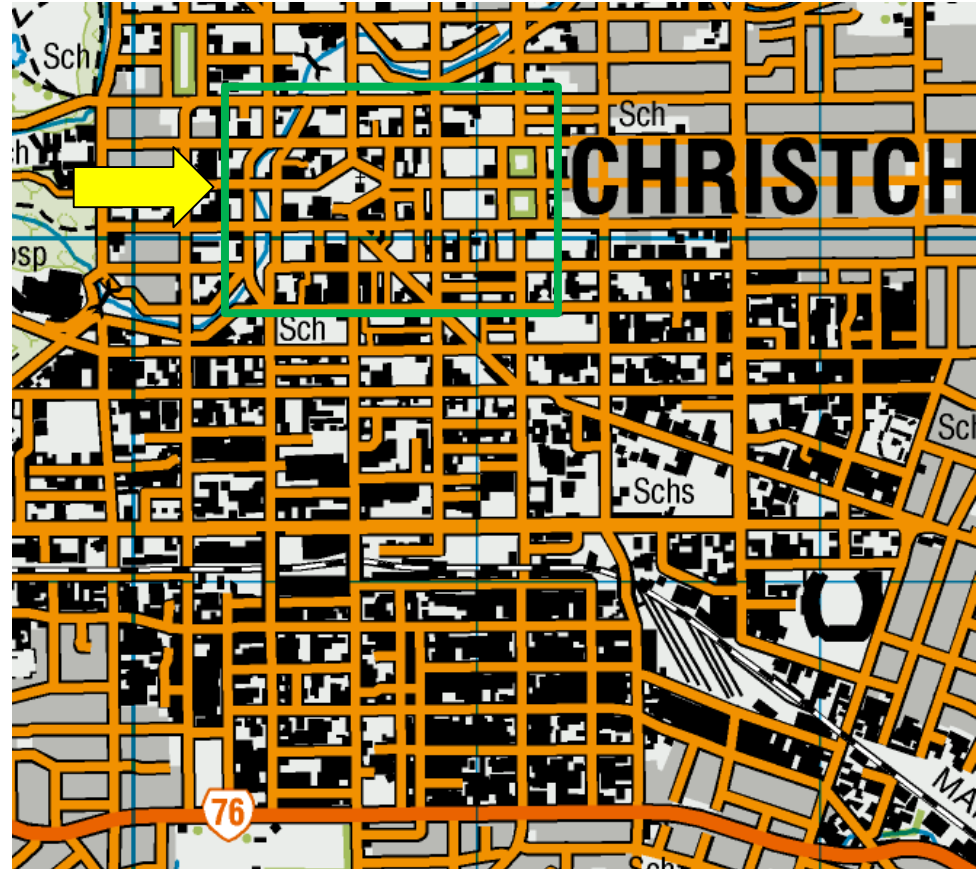
Updating building outlines  
in Central Business District  
(buildings were plotted to scale)

# The final result...



*Looking east across Christchurch*

Completed building outlines  
in Central Business District  
(some detail lost with roads)





# Compared with 2009 and before...



*Looking northwest across Christchurch*

Original (generalised)  
representation of buildings in  
Central Business District

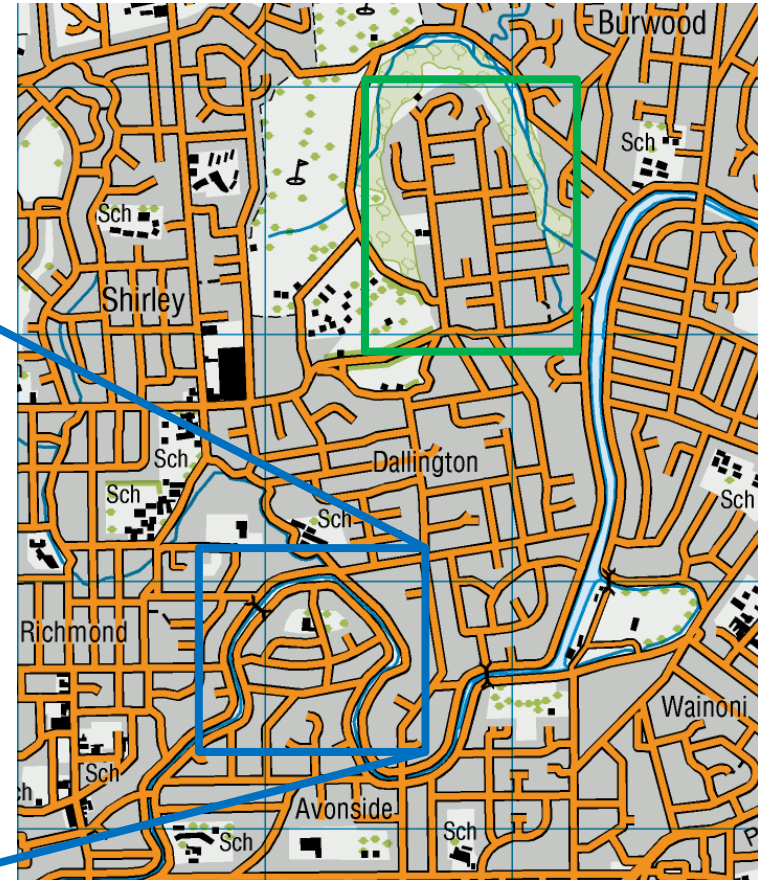


# Avonside & Burwood (2009 edition)

Standard topographic representation:

- Two-lane sealed roads (orange infill)
- Residential areas (grey screen)
- Large and individual buildings (black)

Avonside  
before the  
quake (2009)



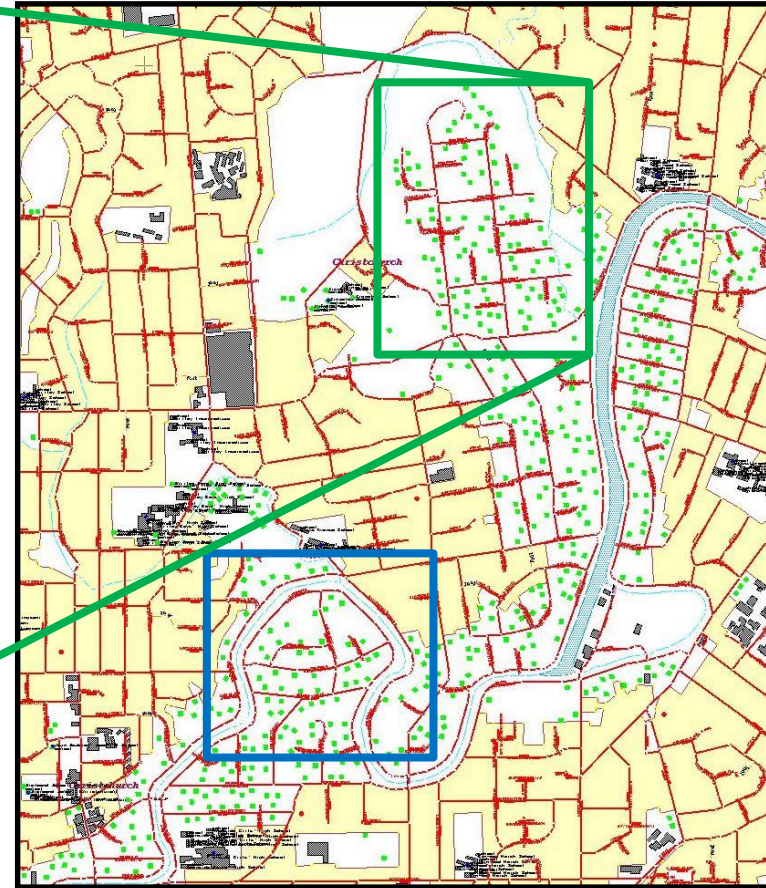
# Updating Avonside & Burwood



Burwood before  
the quake (2009)



Removal of houses  
underway (2014)



# Avonside & Burwood (2014 edition)

Red-zoned areas:

- Roads retained; road infills removed
- Representative individual buildings added in lieu of residential area



# The future of sheet BX24...

What will become of the red-zoned areas?

- Roads closed to the public
- Restricted access
- Roads to be removed?



Dallington

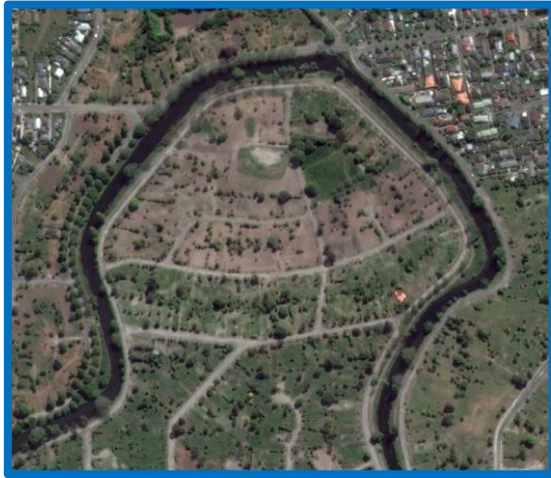


Avondale



Bexley

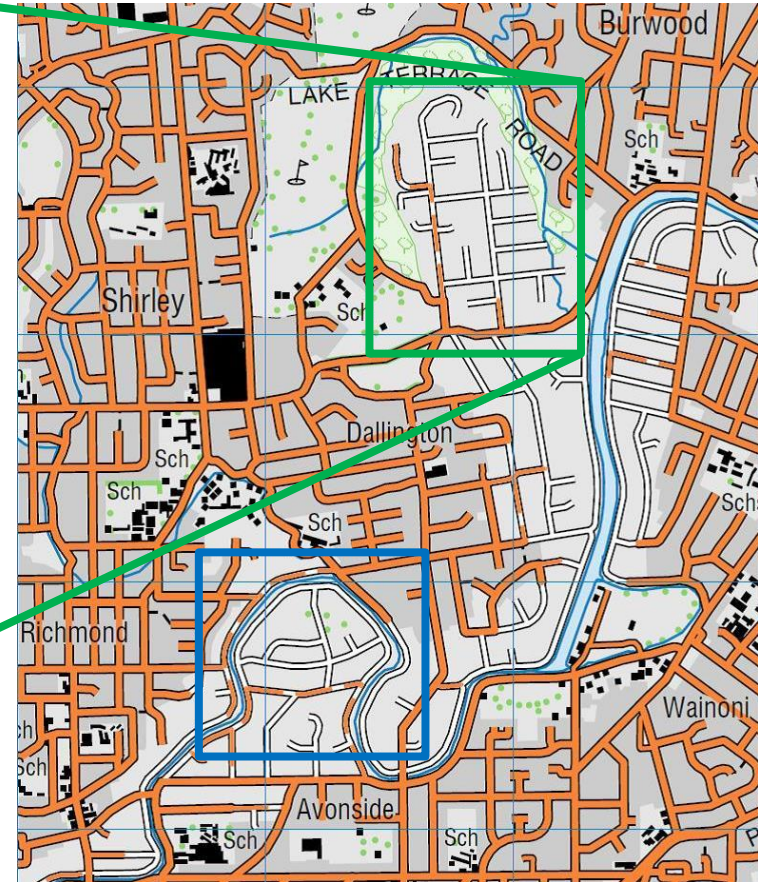
# A possible future update...



Avonside



Burwood

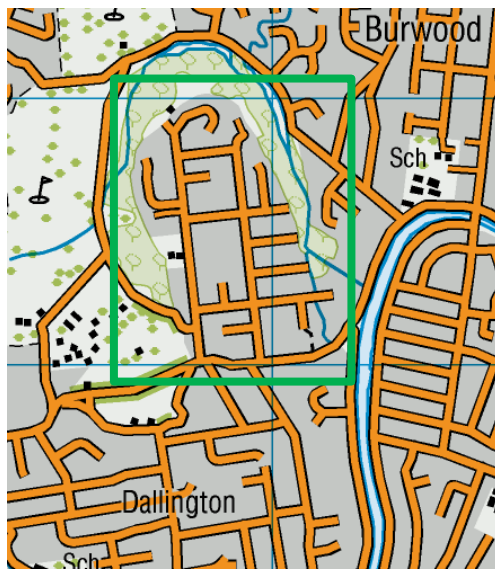
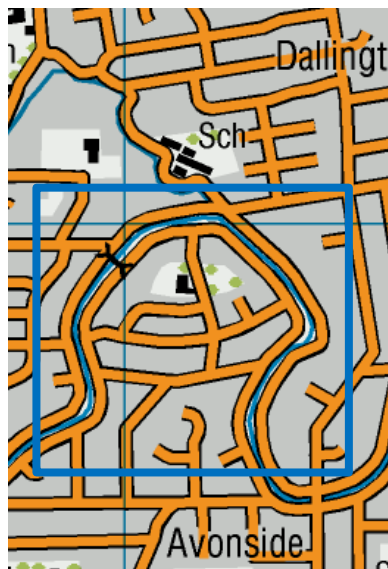


Aerial photographs (2016) with  
virtually all houses removed, and  
roads abandoned and closed

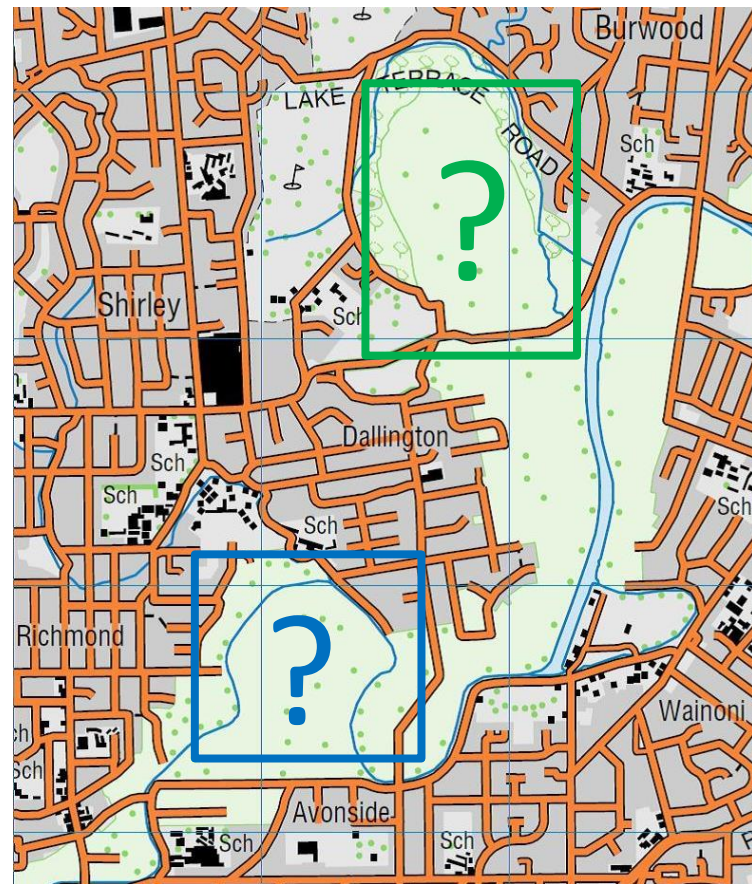
# The red-zoned areas in the future?

- Nature takes over...
- Removal of roads?
- Future land use?

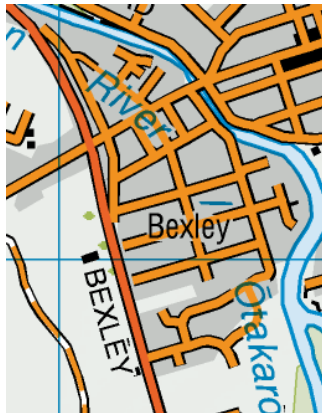
The map  
in 2020?



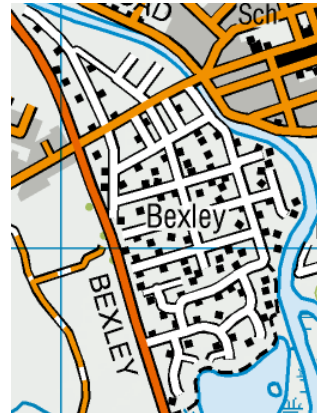
2009 edition



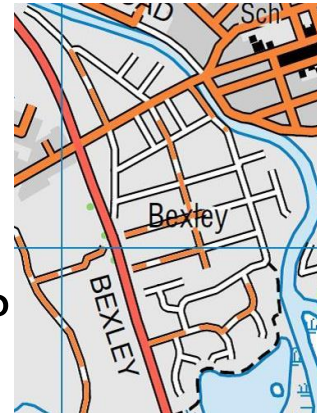
# The changing face of Bexley...



2004



2014



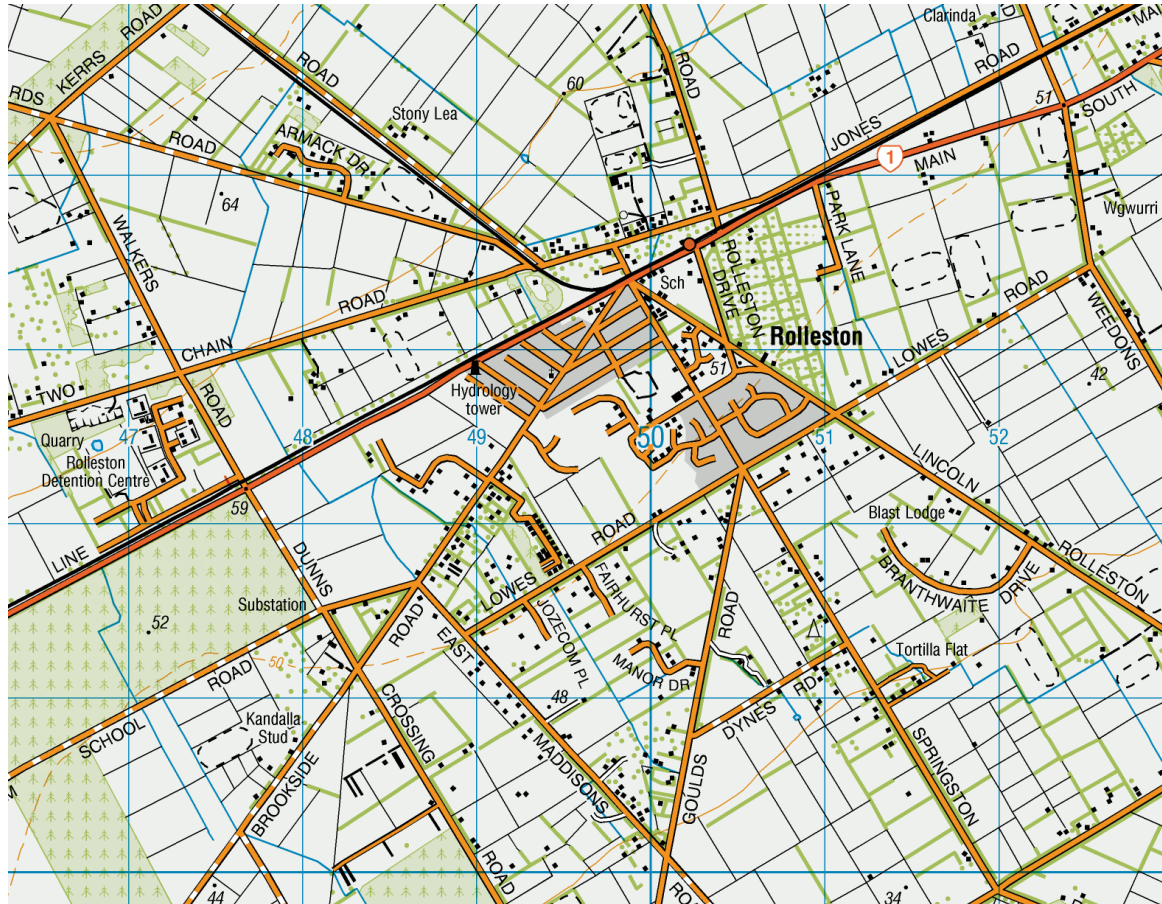
2016?



2020?



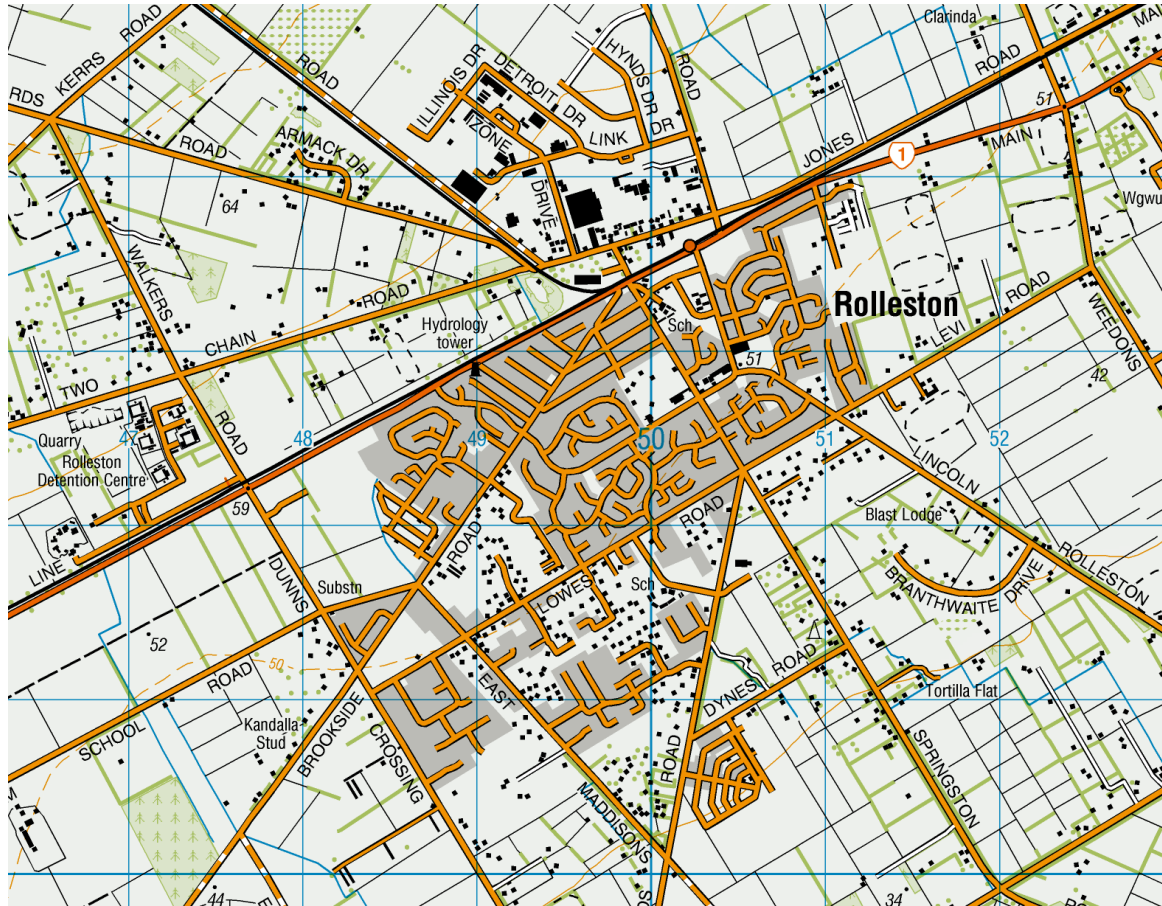
# The growth of Rolleston (1)



Rolleston  
as revised in 2002

*The town of Rolleston is 22 kilometres (14 miles) southwest of Christchurch on State Highway 1. It is within easy commuting distance of the city.*

# The growth of Rolleston (2)

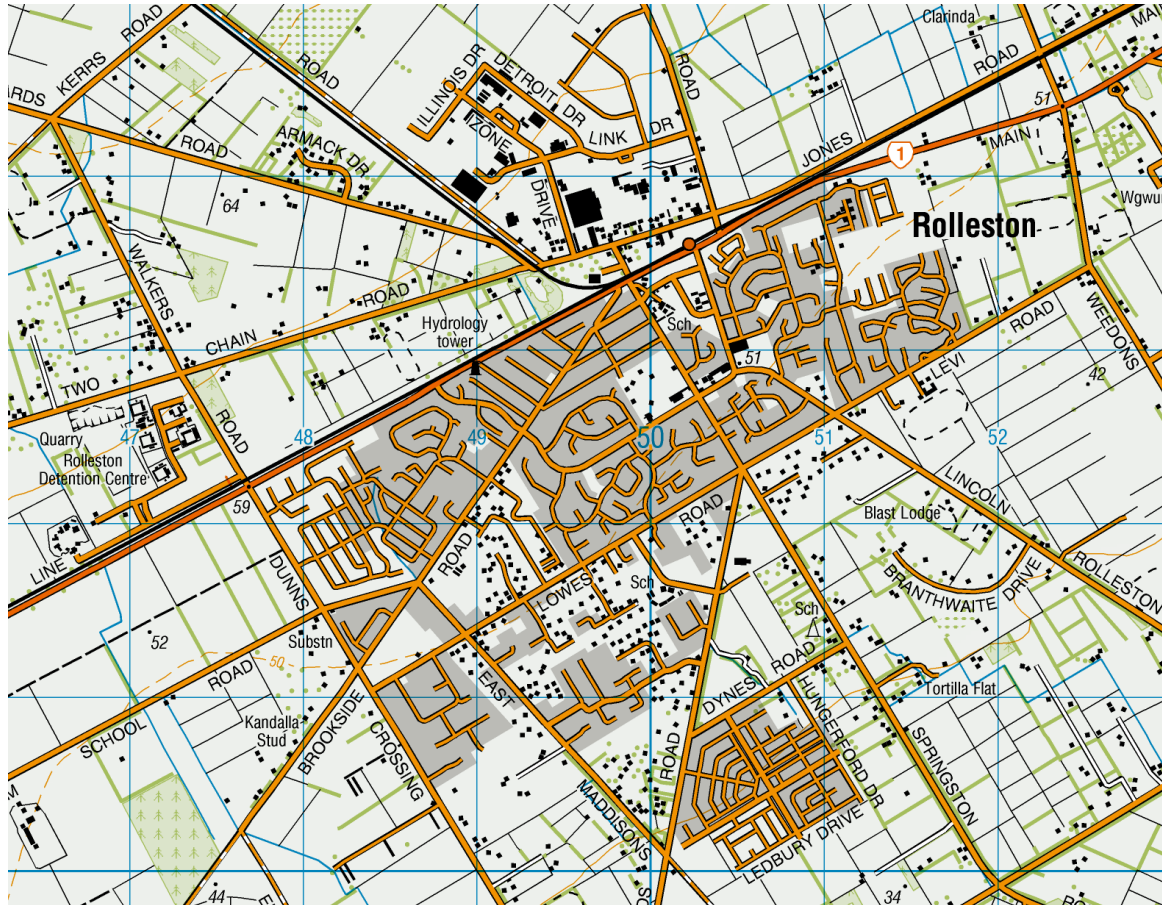


Rolleston  
as revised in 2014  
(NZTopo50 sheet BX23)



*New housing  
in Rolleston*

# The growth of Rolleston (3)



Rolleston  
as revised in 2015  
(NZTopo50 sheet BX23)

*Rolleston's population increased from **1,000** in the 1980s, to **3,800** in the 2006 census, and has reached approximately **11,800** as at June 2015. (Statistics New Zealand)*

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Questions?

