



Christchurch - A Resilient City

Mike Gillooly

Chief Resilience Officer

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22 February 2011 – What is Critical Infrastructure?

The 2010 and 2011 earthquakes struck one of New Zealand's oldest cities, a community with deep ties to the land, the environment and each other.

The devastation was widespread, especially in the city's centre.

Some questioned whether central Christchurch could ever be the same again.

It won't be.

It will be even better.



22 February 2011.

Photo credit: Gray Ingers Photographers Gillian Knowlton.

Christchurch Airport



← A5 A F →

Port of Lyttelton



Waste Water Treatment Plant



Lyttelton Tunnel



Water Supply



Roads

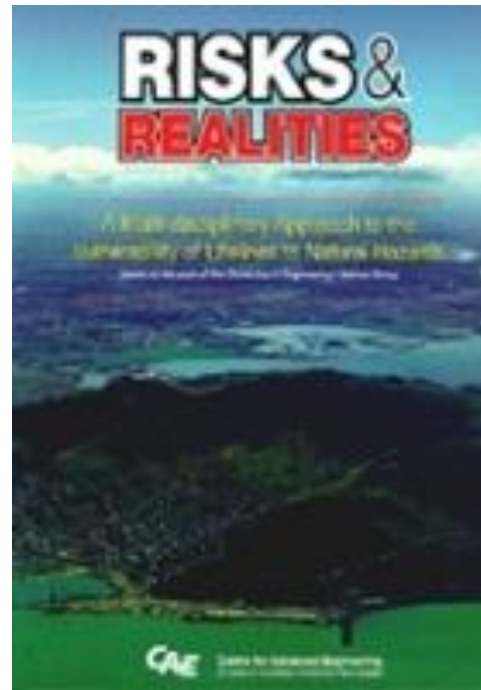


Bridges



What is Critical Infrastructure?

In order to answer that requires a rigorous analysis in order to understand your particular **Risks and Realities.**



What Are the Challenges....

- for cooperative urban resilience-oriented governance of critical assets and infrastructures?
- Planning for Recovery **Before a Disaster** is critical.
- Data –
 - what do you own?
 - where is it?
 - what condition is it in?
 - how much is it worth?

Strategies and tools to map critical assets and infrastructures.....

....and to collect and share relevant data?

- investment in technology
- LIDAR
- CCTV for underground infrastructure
- 2-D hydraulic and hydrological waterway modelling
- asset identification across local authorities and emergency services.

How to evaluate the exposure and vulnerability of critical assets and infrastructures.

Network and Assets	Is the asset relevant	Data source	Current overall condition assessment			
			Management of assets, i.e. how well are they being looked after?	Level of service, i.e. functionality and capacity	Condition/state of repair	Criticality and business risk
	Drop-down	Free text	Assign score of 1-5	Assign score of 1-5	Assign score of 1-5	Assign score of 1-5
Water Supply						
Aquifer	Yes	Reports/Trim	1	1	1	5
Wells	Yes	SAP	2	1	2	2
Water treatment plants	Yes		2	2	2	4
Pump Stations	Yes	GIS/SAP	1	1	2	2
Reservoirs	Yes	GIS/SAP	1	1	2	3
Trunk Mains	Yes	GIS/SAP	2	1	1	2
Minor Mains	Yes	GIS/SAP	2	1	3	1
Lyttelton Rail Tunnel Trunk Main	Yes	GIS/SAP	1	2	5	5
North South Trunk Main	Yes	GIS/SAP	1	2	5	5
Waste Water						
Trunk Sewers (incl PM's)	Yes	GIS/SAP	2	1	2	4
Minor Gravity Mains	Yes	GIS/SAP	2	1	3	3
Pump Stations	Yes	GIS/SAP	1	2	2	2
Banks Peninsula treatment Plant	Yes		3	1	2	2
ChCh Treatment Plant	Yes	GIS/SAP	2	1	2	2
Land Drainage						
Waterways	Yes	Webmap	3	2	4	3
Pipelines	Yes	SAP & Trim	2	2	3	4
Pumping Stations	Yes	SAP & Trim	3	3	4	3
Structures	Yes	Models	4	2	4	3

Asset and Risk Tool Output Overview – Key Assets 1

Feb/March 2014

The risk and asset tool is a modular tool designed to provide insight on the city's

- Physical assets
- Potential future shocks and prioritisation of those shocks
- Asset vulnerability
- Potential future stresses and prioritisation of those stresses
- Relationship between shocks and stresses identified



Asset and Risk Tool Output Overview – Key Assets 2

Feb/March 2014

	Current condition	Vulnerability	
Worst	Cashin Quay (port)	Pumping Stations (drainage)	Most
	Inner Harbour (port)	Drainage structures (drainage)	
	Lyttelton Tunnel Trunk Main (water supply)	Waterways (drainage)	
	North South Trunk Main (water supply)	Railway Bridges (rail)	
	Pumping Stations (drainage)	Cashin Quay (port)	
	Drainage structures (drainage)	Arterial Roads (roads)	
	Waterways (drainage)	Lyttelton Tunnel Trunk Main (water supply)	
	Retaining walls (roads)	Trunk Sewers (Incl. PMs) (waste water)	
	Railway Bridges (rail)	Minor Gravity Mains (waste water)	
	Pipelines (drainage)	Pipelines (drainage)	
	Arterial Roads (roads)	Local Roads (roads)	
	Local Roads (roads)	Railway Tunnels (rail)	
	Bridges (roads)	Railway Lines (rail)	
	Railway Tunnels (rail)	North South Trunk Main (water supply)	
	Water treatment plant (water supply)	Bridges (roads)	
Best	Railway Lines (rail)	Water treatment plant (water supply)	Least

Overall areas for improvement in city asset management

