

# The role of open space for Post-Disaster Recovery in Wellington's city centre

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## The Problem

In the aftermath of a magnitude 7.5 or higher earthquake in Wellington, the city centre would be thrown into a state of emergency. Most roads would be blocked off, our port and main lifelines would be severely damaged and safe housing could be in scant supply in the centre.



Studies on earthquakes show a city's incapacity to act as a centre for commerce and the loss of housing stock makes recovery a long term event. There is currently no coordinated strategy in place in Wellington to cope with this situation. Such a strategy is essential because it would give people a sense of certainty about a positive future of Wellington, and would encourage more Wellingtonians to rebuild their lives in place.

## The Method



The purpose of this study is to identify the open space opportunities that might enable Wellington to recover, by 'sheltering in place'. In particular we want to see the potential of the open space within the central city or within its immediate vicinity, in order to accommodate post-disaster temporary housing and economic activity.

To do this, we mapped all available open space in the city centre and matched urban functional requirements with the open space network to give planners and emergency management personnel an understanding of the potential of the network as a resource for recovery. We showed how the network could be utilized post-disaster in order to establish dwellings, business hubs and commercial spaces.

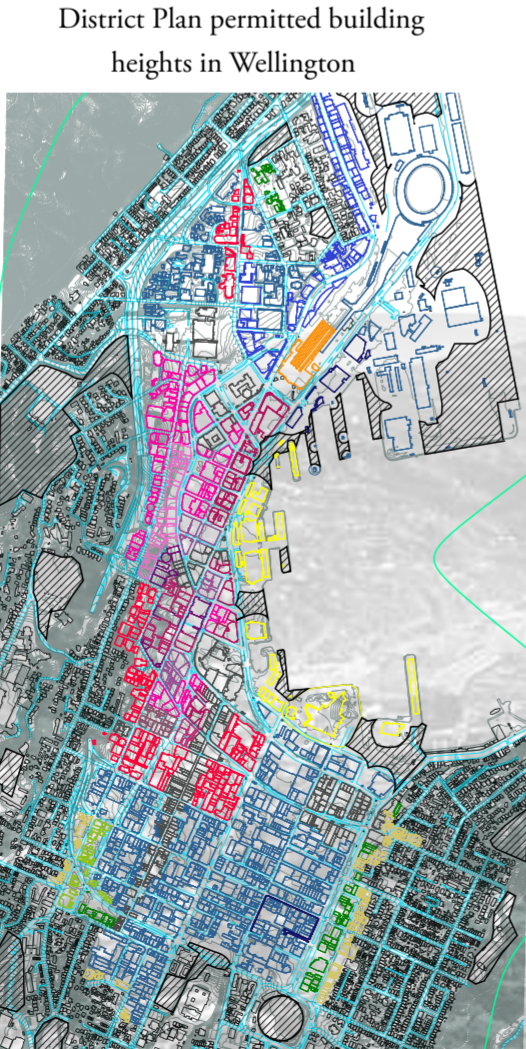
## The Challenges

We considered the post-disaster scenario in two phases: the **response phase** and the **recovery phase**. In each phase we looked at what sort of accommodation could be provided on which pieces of open space in configurations that would allow the city to continue to function.

### Assumptions

- We have assumed 75% of the population will attempt to remain in Wellington Central
- The government will remain in Wellington
- Schools and businesses would be operational to service the population
- All earthquake-strengthened buildings will cooperate post disaster in order to give people shelter.

	Left over open space		Building height 35.4 m		Building height 60 m		Building height 90 m
	Building height 14.4 m		Building height 40 m		Building height 65 m		Building height 95 m
	Building height 10.2 m		Building height 43.8 m		Building height 75 m		Waterfront Zone
	Building height 18.6 m		Building height 50 m		Building height 80 m		Heritage Buildings
	Building height 27 m		Building height 55 m		Building height 85 m		50 m Radius

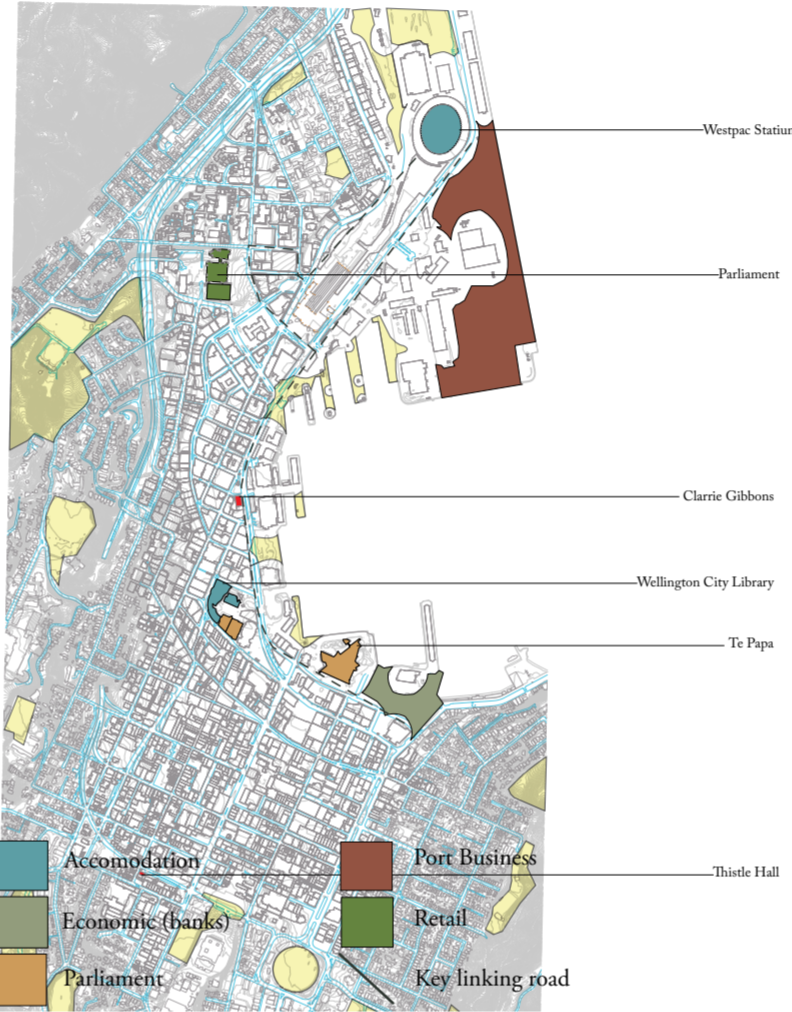


## EMERGENCY PHASE (SHORT TERM ACCOMMODATION)

What	Where (AREA)	How (TYPE OF STRUCTURE)
 Re-house most of the inhabitants of Wellington CBD and Te Aro (75%) within the city or surrounding areas immediately after a disaster. Provide infrastructure to enable parliament, health facilities and schools to restart quickly.	 The fastest option would be housing people in existing earthquake strengthened buildings e.g. Te Papa, with temporary walls or curtains placed up for privacy. The next option is emergency housing (temporary shelter).	 Preparedness will provide certainty to residents which will encourage people to stay in Wellington. Thus establishing living and working quarters, even if they are basic, is essential in the post-disaster stage.

**Response (Emergency) Phase** is the immediate hours, days and weeks that occur after a disaster. Activity in this phase is about getting people to safety, giving them security and ensuring they have access to medical attention, a bed and their family / friends. But it is also essential in this phase to get the most important businesses re-established. This will include government, telecommunications, banking etc. A food market place should also be established near the dwellings. Schools should continue as best as possible.

The goal of this phase should be to keep people healthy, and to provide a certainty that it is possible to get back to normal in a short period of time.



## RECOVERY PHASE (LONGER TERM ACCOMMODATION)

What	How (TYPE OF STRUCTURE)	Where (AREA)
 Provide housing for 75% of the inhabitants of Wellington CBD and Te Aro areas immediately after a disaster. Ensure there is infrastructure to allow businesses to kick start, even from alternative premises. Continue to ensure institutions can operate.	 Provide housing that can be erected in open space and will allow villages / communities for people to reside in and work from.	 In the existing open space surrounding the CBD and Te Aro, and possibly within the streets of the CBD where there is clear space e.g. around the earthquake safe buildings. Earthquake proof buildings will continue to hold businesses, schooling and retail.

**The recovery phase** is the next phase, when things start becoming more regular for Wellington Central residents. During this phase, alternative temporary housing could be shipped in and set up in the open spaces around Wellington Central to provide temporary residences and places for businesses and institutions to operate. The goal of this phase is to keep Wellington's economy running.

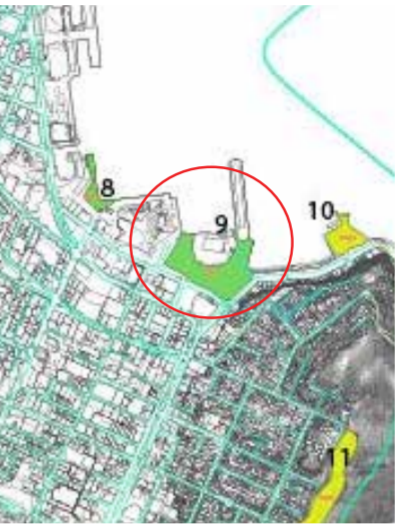
The recovery phase uses different types of temporary accommodation structures in order to conduct spatial analysis to provide housing and economic activity in / around the CBD and Te Aro.



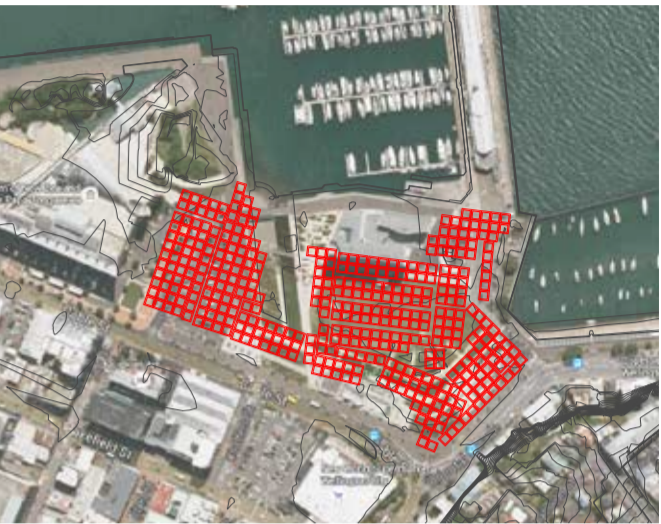
## The Results

The results conclude that there is in fact enough open space already surrounding Wellington CBD and Te Aro to re-house people, schools and businesses. This can be achieved through the utilization of a few temporary housing options and consideration of some pre-disaster design strategies. Below are some of the example layouts used to analyse how temporary shelters may be set up around Wellington's CBD and Te Aro.

### WAITANGI PARK



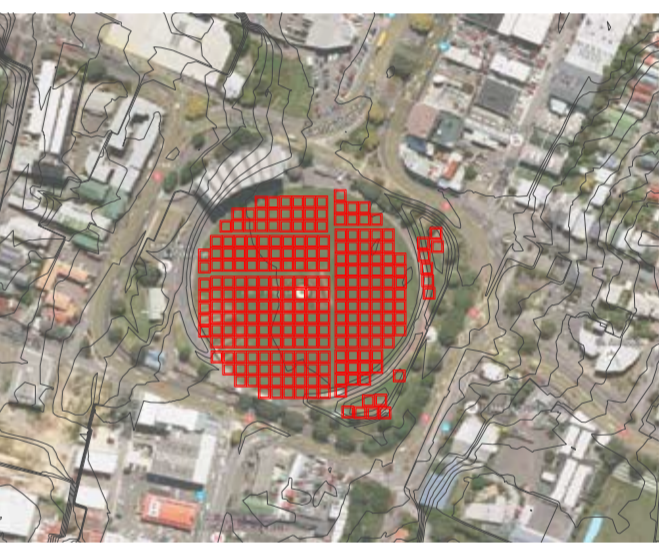
29519 m2  
398 dwellings



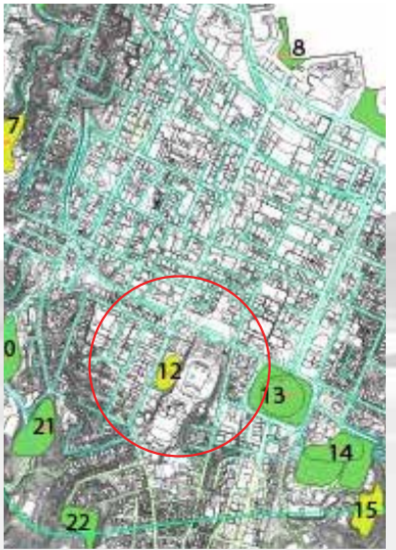
### THE BASIN RESERVE



18075.4 m2  
244 dwellings



### WELLINGTON HIGH SCHOOL FIELD



7291.6 m2  
83 dwellings



The configuration and layout of these spaces are very dependent on the post-disaster spatial conditions. Flat spaces are typically easier to layout as the main concern for this is to ensure they facilitate the accommodation of required space around each dwelling. For these examples we have used the rule; 2 m perimeter around each dwelling plus 1 m<sup>2</sup> per dwelling to account for access paths. This rule means each dwelling is approximately 4 m from the next closest dwelling so people feel like they have their own space.