

# Building resilient & sustainable cities

How can we build cities that create strong communities?

A presentation for Reinventing Progress  
by Paul Downton PhD  
Cairns 17 April 2012



# Sustainability leadership for a new era





**60** *minutes*



- **8,700** more people on the planet





**60** *minutes*



- **3,120,000** tonnes more carbon dioxide in the atmosphere





**60** *minutes*

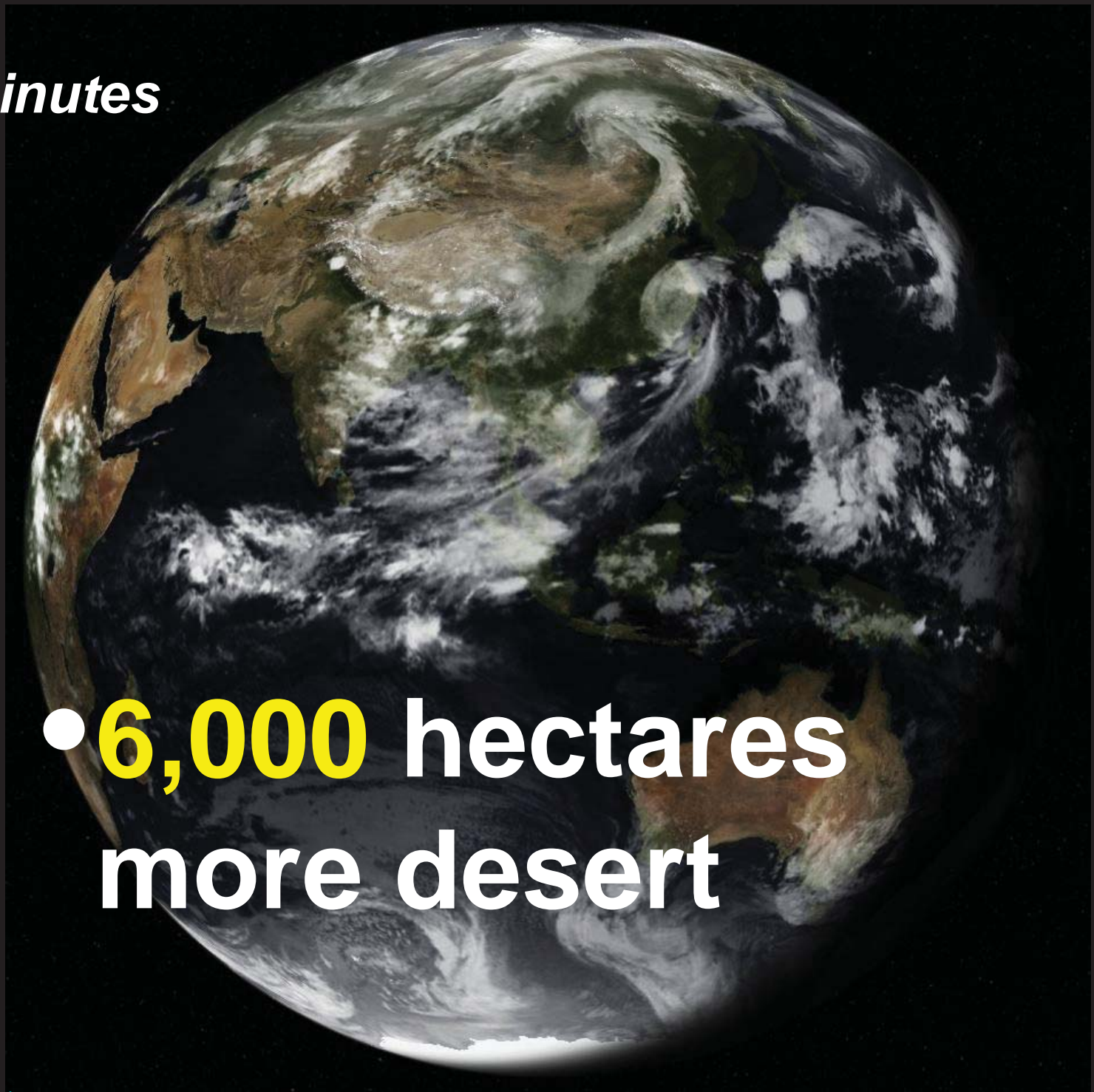


- **1,500** hectares of rainforest lost





**60** *minutes*



- **6,000** hectares more desert





**60** *minutes*



- **856** hectares  
**covered by cities**

[http://www.newsroomamerica.com/story/229335/cities\\_to\\_cover\\_extra\\_1.5\\_million\\_square\\_kilometers\\_within\\_20\\_years\\_.html](http://www.newsroomamerica.com/story/229335/cities_to_cover_extra_1.5_million_square_kilometers_within_20_years_.html)



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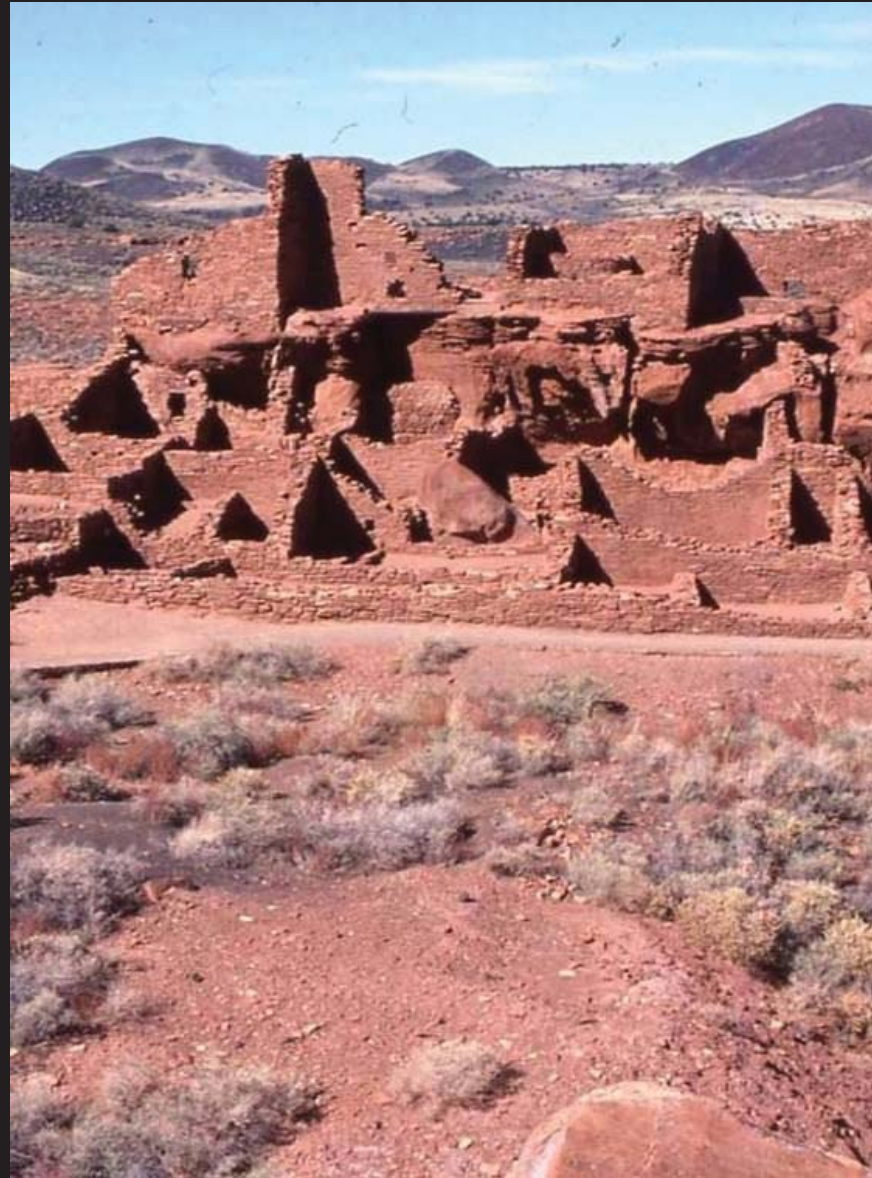
# Can we build resilient & sustainable cities?





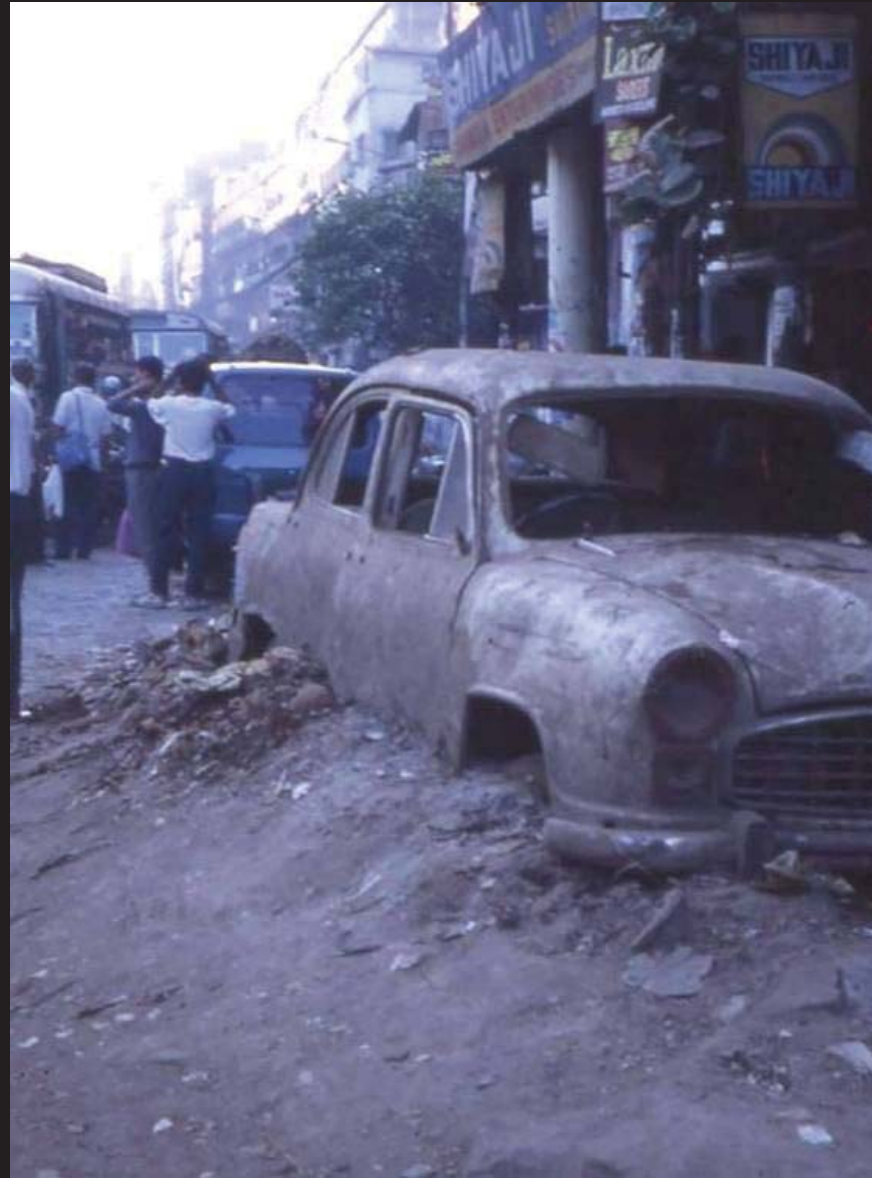
Do we know **how**?





# What makes a city **resilient?**





# What makes a city **sustainable?**





When a city falls apart  
what **survives**?





When buildings fail  
all you have is **people**






**Empires** come & go  
but cities survive





# Through **war** & disaster cities survive



An aerial photograph of a dense urban cityscape, likely New York City, showing a grid of streets, numerous buildings, and a river winding through the city. The text is overlaid on the top half of the image.

*The urban eco-system is the most elaborate geographical control-system or **integrated resource-management** system in human experience.*  
(Douglas 1983)



A **well-designed** built environment can provide the basis for sustainable physical performance (energy, water, resource use, etc)





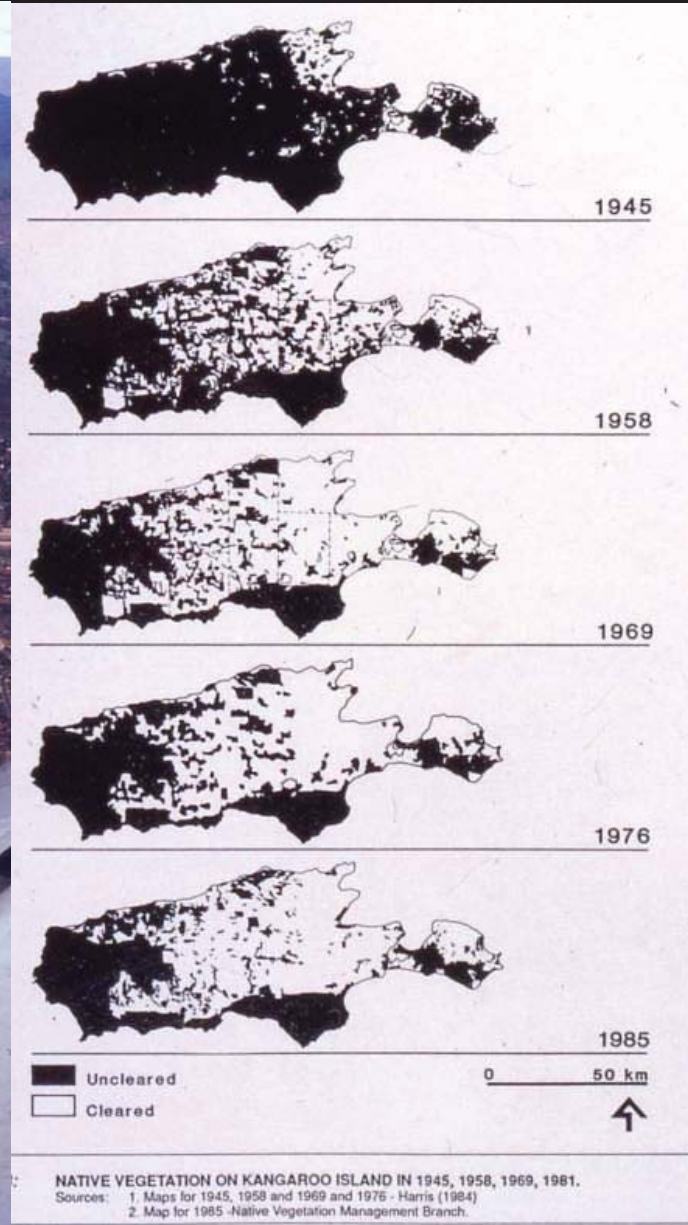
# liquidating ecological capital



Australia has one of the world's highest rates of vegetation clearance



Canberra



Kangaroo Island





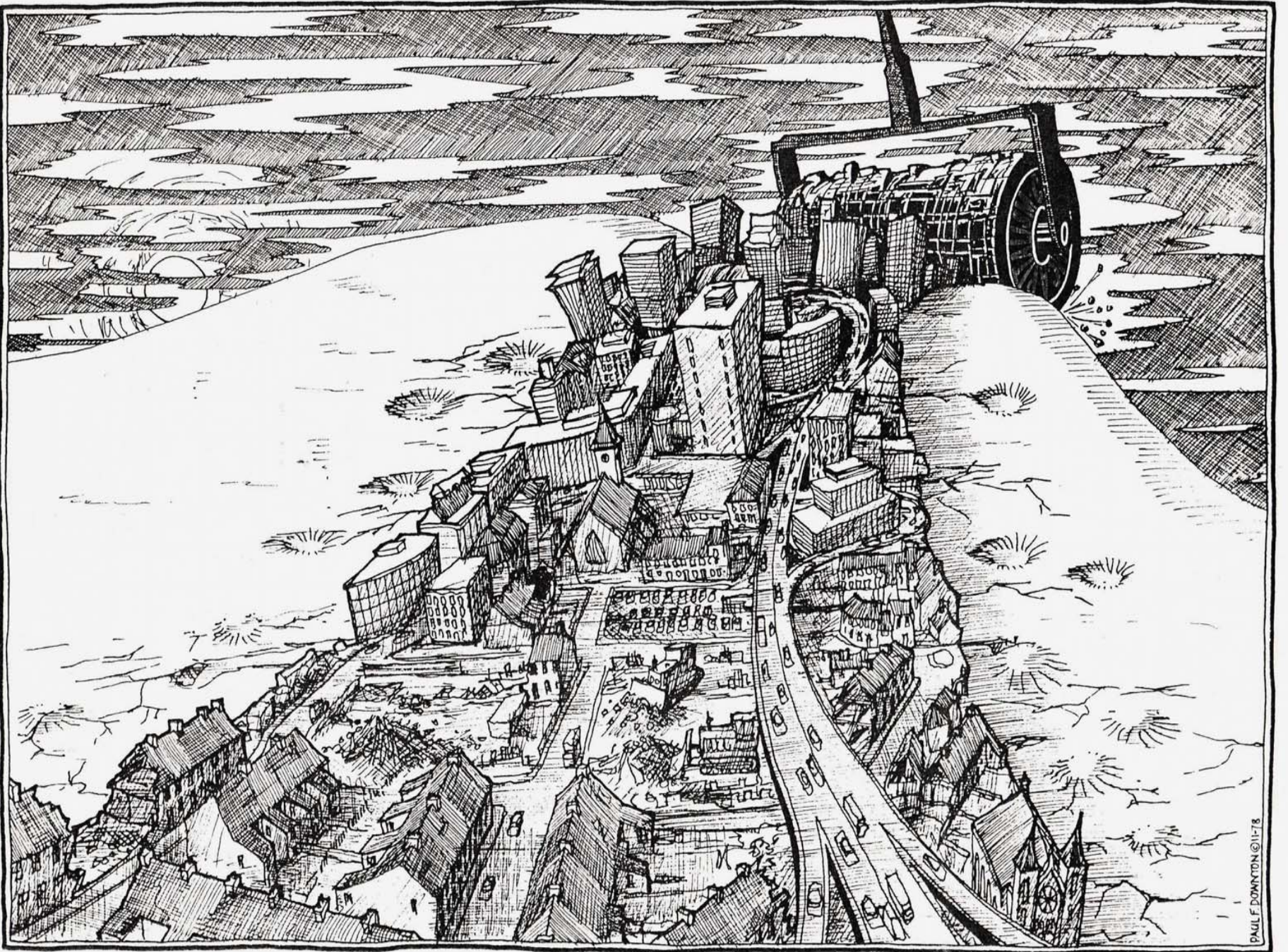
After 10,000 years we still use the same basic **tools & skills** to make our cities





Mumford defined technology as **'tool + use'**  
Our values determine how we use our tools





PF Downton 1978



Simply having physical elements like **renewable energy** and **green roofs** can't guarantee that a city will be sustainable.

They have to be in the right places, connected, designed and configured to contribute to genuinely sustainable performance.



If you don't have the  
right things in the right  
places, they don't work  
properly



Likewise, merely having elements of **community infrastructure** in a city doesn't guarantee that the community will be effective, and without an effective community there can be no resilience.




Above and beyond such things as schools, meeting rooms, halls, clinics and sports stadiums, **community infrastructure** is made up of those **spaces** and **places** that facilitate the essential workings of a healthy **society**.





Too often in modern architecture and planning, this is an aspect of design that is neglected

A group of people is gathered outside a two-story house with a red roof. The house has solar panels and a water heater on the roof. The people are looking up at the sky, and one man is gesturing with his hand. The scene is outdoors with trees and a blue sky with clouds.

Just as pipes and wires must be correctly sized and connected to enable liquid and electronic currents to flow and deliver, so community infrastructure elements have to have the right size, shape and interconnections to support community formation and interaction

the buildings & social structures of a successful community requires active participation by citizens in making & managing





<http://www.news.com.au/world/quake-aftershock-hits-christchurch/story-e6frfkyi-1226009960218>

# Christchurch showed the real city is its community



ecopolis.com.au  
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paul@ecopolis.com.au



# ecologically responsible development



facilitated and reinforced by being  
built with and for a **real community** of  
people

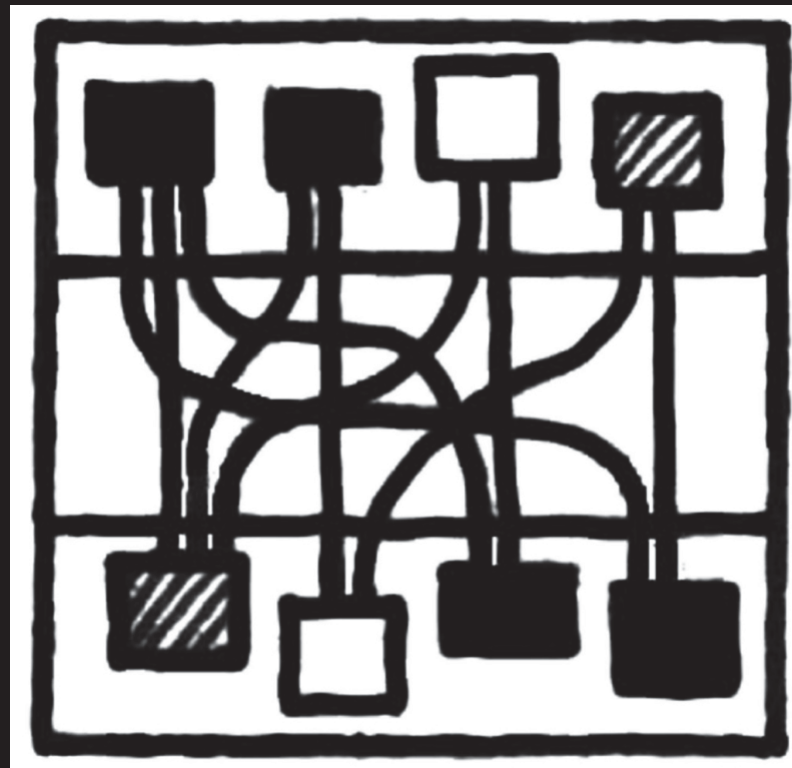




Cultural fractals convey a lot of information very economically

An **urban fractal** is the smallest piece of the urban system that possesses enough of its essential characteristics to define the larger city. It is a type of **cultural fractal**.

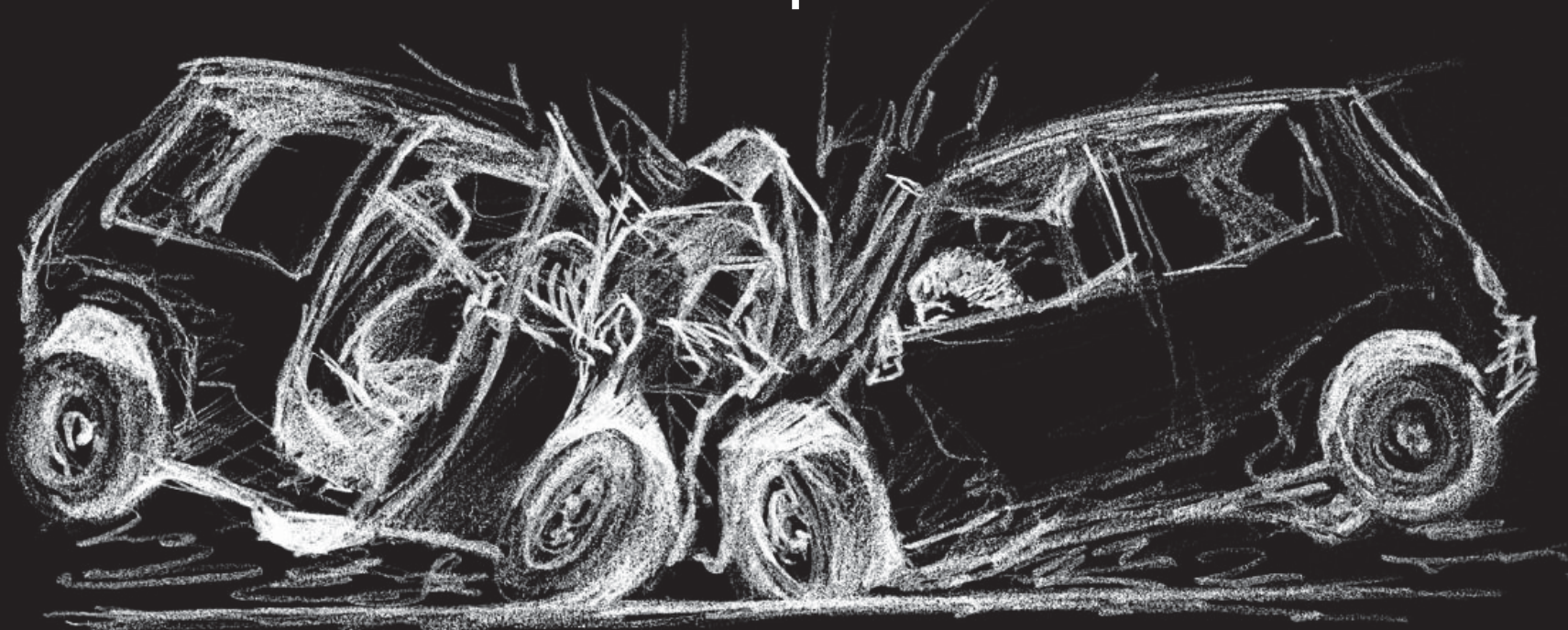
The **essential characteristics** embodied in an urban fractal are about **patterns of relationship.**



Consider, for example, meeting people...



5 kph



50 kph

ecocities catalyse development of **the** urban fractals that contain the patterns & processes of ecocities



It's no accident that the scale of the tribe, the village and the neighbourhood are so similar.



Ross Chapin is pioneering ways to put real community back into real estate and his tool is the 'pocket neighbourhood'.



A pocket neighbourhood has around 10-20 households sharing an outdoor space. It is designed to promote neighbourly interactions and create a sense of place.



Christie Walk is an example of a modern, dense, sustainable, inner-urban pocket neighbourhood.

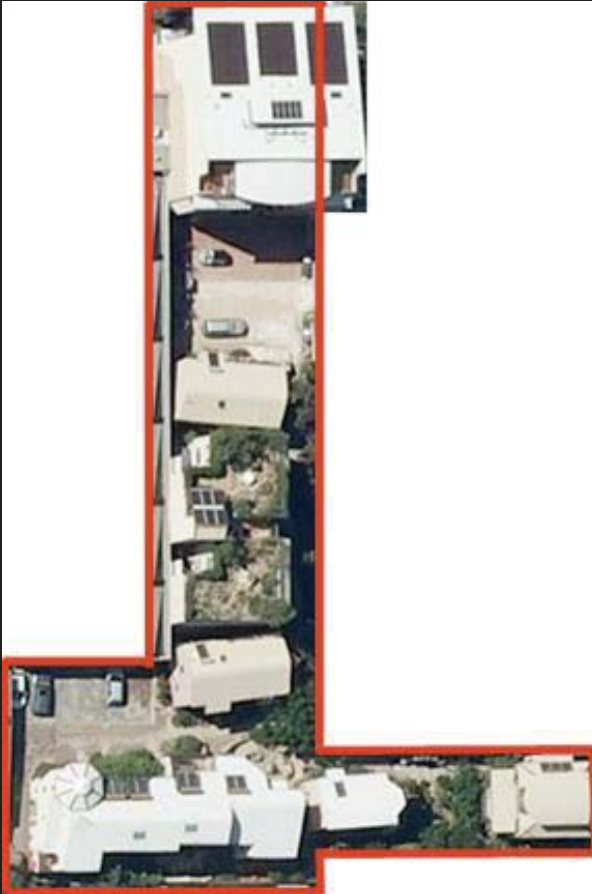
Christie Walk is high-density



but it is not high-rise

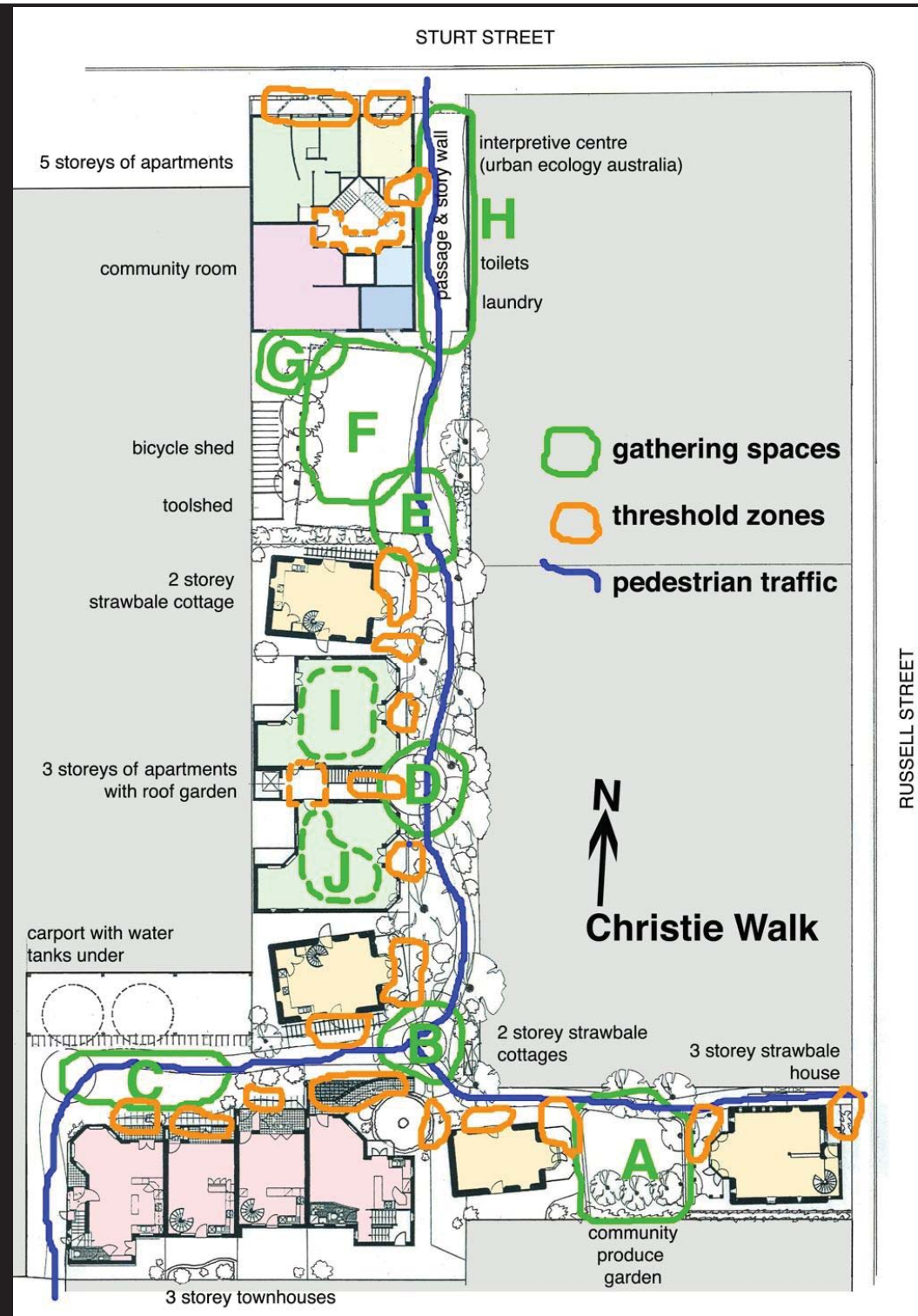
Christie Walk is not big enough  
to be a fractal.

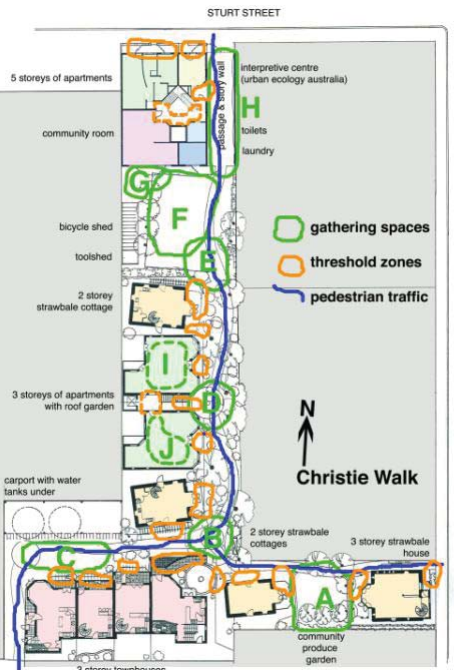
But it is just the right size to be  
recognised  
as a **pocket neighbourhood**.





# Pocket Neighbourhood



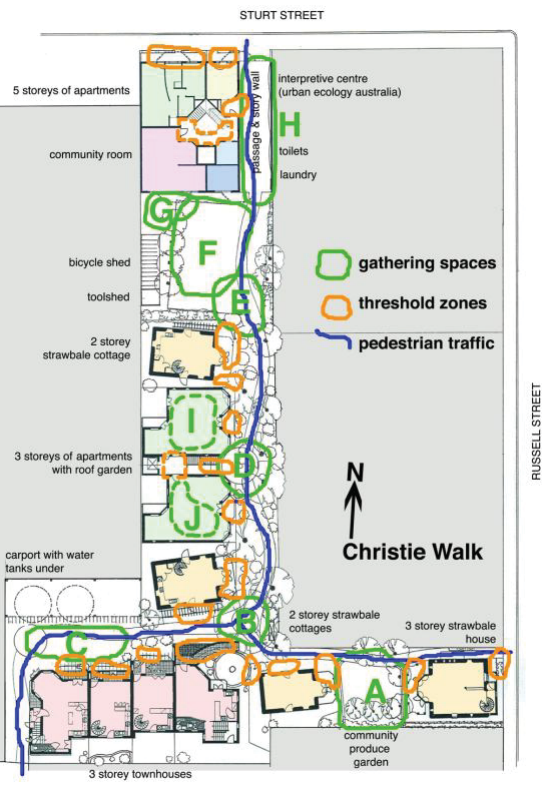


# Community Produce Garden



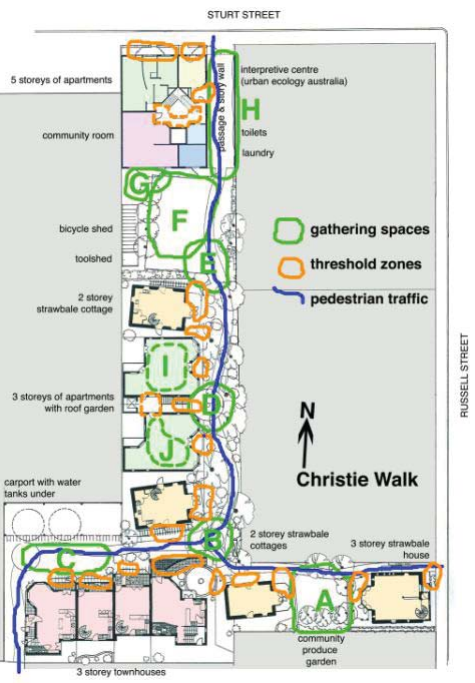
# Neem Tree Circle





# Carport Courtyard





D



# Pot Circle Place



# Sand Pit Corner



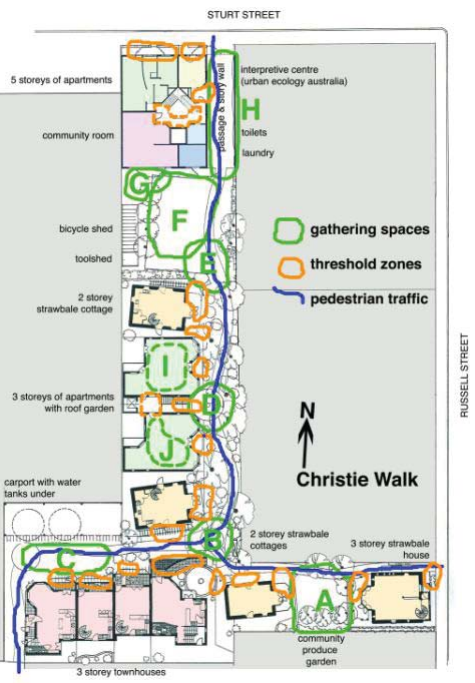
compact apartments

roof garden

strawbale cottages

play spaces

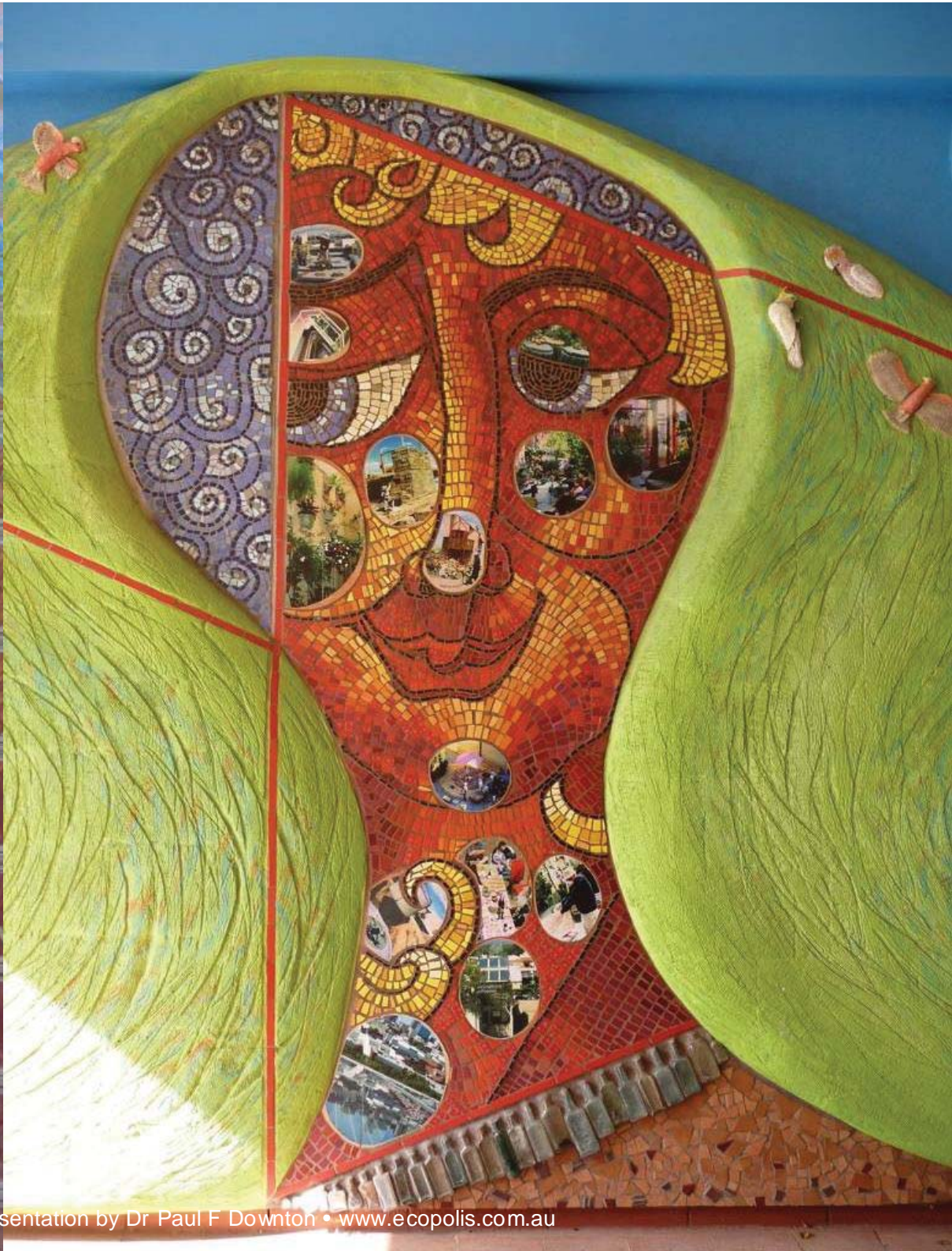
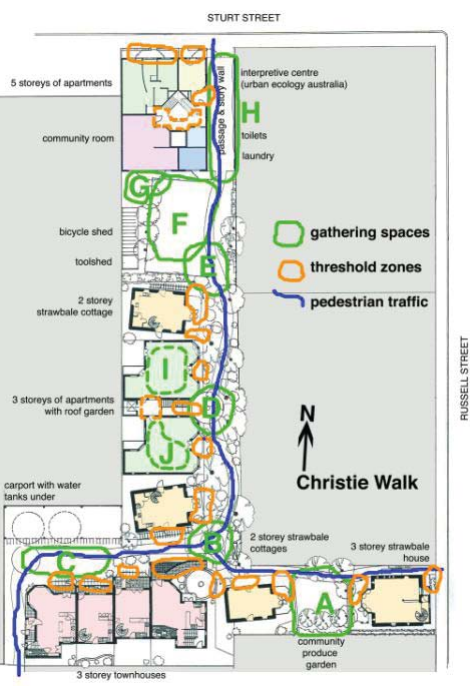




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# Car Park Courtyard



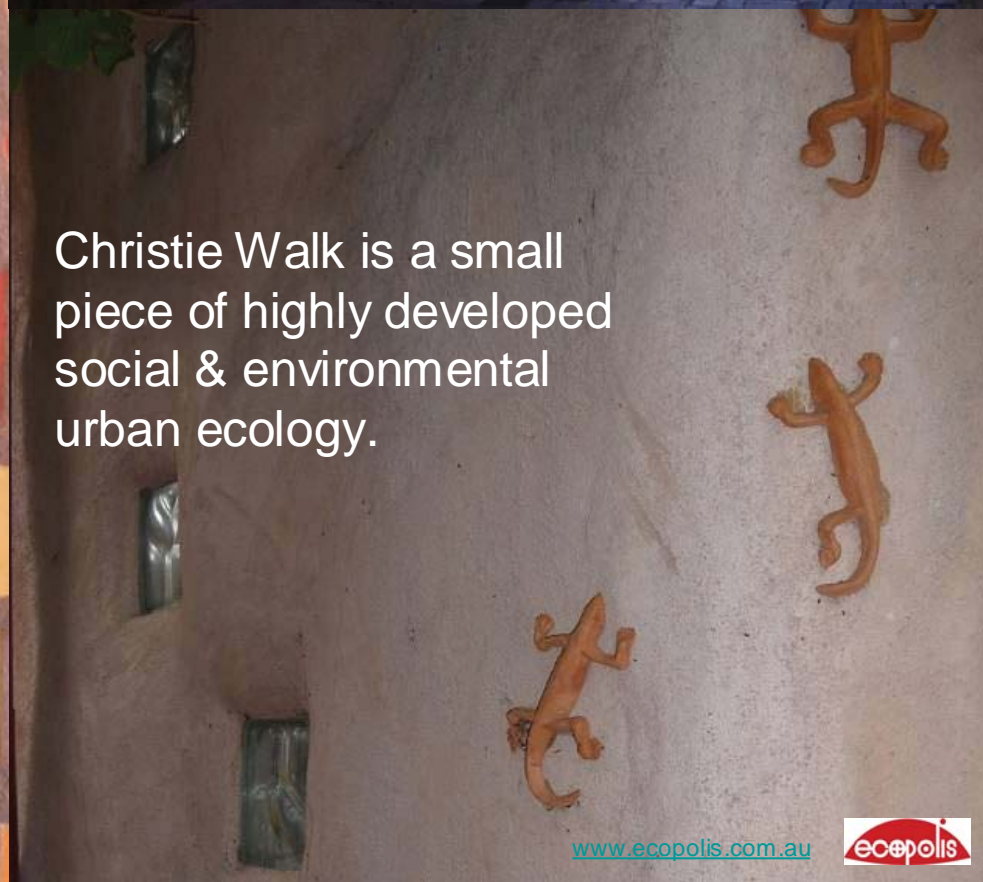
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# Story Wall Passage



'Instant patina'

# Story Wall Passage



Christie Walk is a small piece of highly developed social & environmental urban ecology.





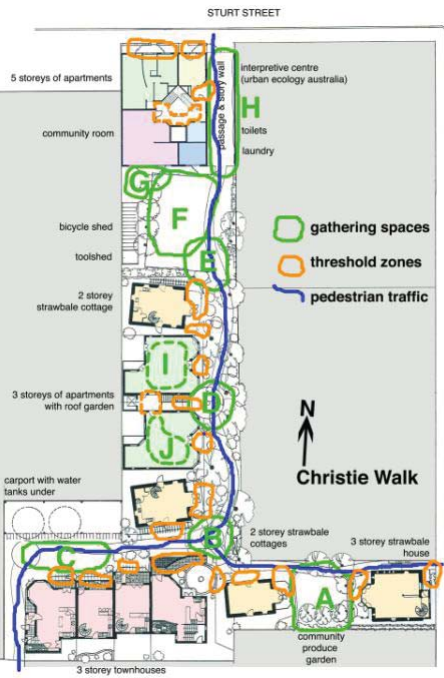
No poisonous guided missiles up here!



native vegetation

# Roof Garden (North)





# Roof Garden (South)

# Pedestrian Pathways



# Threshold Zones



# Threshold Zones



*“Building a **neighborhood** is about having a **vision** and understanding how all the **pieces** and **layers** fit together. Skipping over a key **detail** or two is the difference between a subdivision and a neighborhood.”*

M. CASEY LAND, developer



- We have to build as if it is already 2050





We need to be remaking our towns & cities right now **for the conditions our grandchildren will live in when it's 2050**



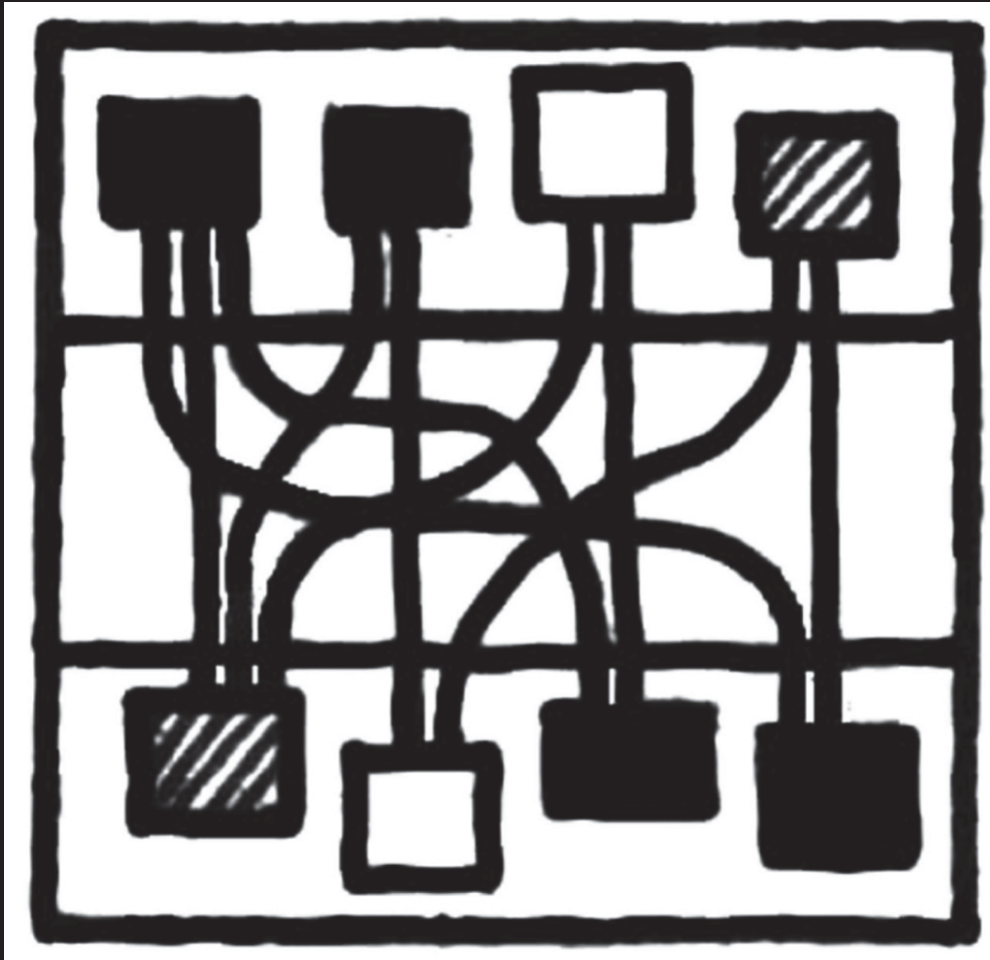


# One fractal at a time...





One **fractal** at a time...





# One fractal **at a time...**





The concept of the urban **fractal** offers a way to capture the essence of sustainable **urbanism** by working at a scale that can be understood at the level of the **local neighbourhood** whilst being effective at the scale of **city-wide** and **regional** planning.





# Positive Development



Janis Birkeland

- Not just resilient, but **regenerative**
- Not simply sustainable, but **ecologically vibrant**





# Positive Development



- Working at the scale and scope of the urban fractal, these goals come within reach.



*think*

**SMALL**

sustainable modern architecture & living landscapes  
form regenerative architecture, cities, towns and living  
systems

**FRACTALS**

*think*

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*think*

small  
fractals

...and that's how you  
put together a city  
and transition to a  
resilient, sustainable  
future – little by little,  
bit by bit – in pieces.



what do cities need to be?

*“...the entire planet is becoming a **village**; and as a result, the smallest **neighbourhood** or precinct must be planned as a working model of the larger **world**.”*

Lewis Mumford  
circa 1960

downton



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what do cities need to be?

# Homework

Work out what the characteristics of the urban **fractal** would be for your **community**, and make your next **project**, whatever it is, a fractal of that vision

Paul Downton  
circa 2012

downton

