



2° Degrees: Design for Climate Adaptation

A collaborative process for neighbourhood action

by John Mongard Landscape Architects, November 2019

| Specialising in community and urban design |

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Collaborative process for neighbourhood action

This climate adaptation co-design workshop has been prepared by John Mongard Landscape Architects and is intended to be able to be used by any group within their own neighbourhood. Grass roots action is likely to be the forerunner for governmental action. In many parts of Australia communities can prepare themselves for the shifting climate, in the coming years.

Purpose of a neighbourhood climate strategy

In the increasingly complex and confusing world of climate change, we need shared, simple and sensible thinking about what helps us to respond effectively as a community. As we face decisions and advocate changes that affect our community, we can choose to embrace our diverse worldviews, engage our concerns about climate risks, and act to thrive as a community in our neighbourhood.

A climate framework

Our climate strategy focuses on resilient adaptation: an approach to climate adaptation that understands and respects the worldviews and the shared needs of our community and which intentionally designs and develops the urban setting to respond to our shared applications. For us this involves three community actions:

- **Resetting** - Expectations
- **Regaining** - Knowledge, Skills & Assets
- **Rebounding** - From Setbacks

For more detail about getting up a neighbourhood climate framework, refer to: The Kurilpa Climate Strategy (by John Mongard, Bob Spiers and Pam Burke, located at www.mongard.com.au).

Workshop background

By the year 2030 it is projected that our climate will have altered by 2 degrees in temperature above pre-industrial times. Our cities and places will need to be adapted for this climate shift: within ten years.

Communities, planners and designers will need to strongly alter their patterns and practices to achieve this adaptation. This workshop aims to make people think about actions required to ramp up and prepare for this climate shift.

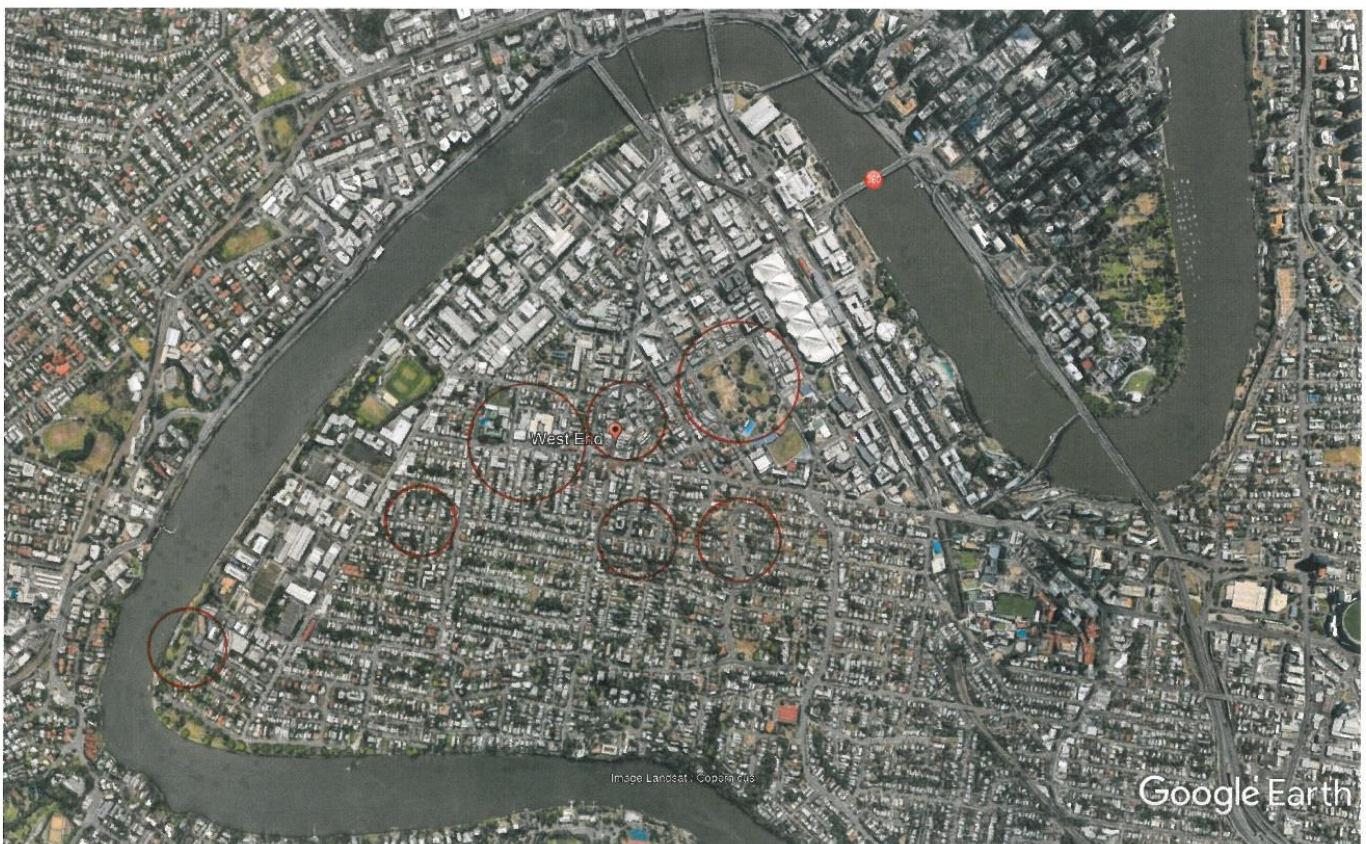
Process

The co-design workshop process is designed for 5 to 100 people, ideally in tables of up to seven people. It's a workshop with 1 -2 hours of talks followed by 2 hours of brainstorming (a half day process).

Google maps are used to produce aerial and street level views of neighbourhood precincts of about a five-minute walk: roughly an area of 2 or 3 street blocks. We need to visualize how we might adapt these neighbourhoods now, in anticipation of more extreme climatic weather. Print these images at A3 size for marking up ideas during the workshop.

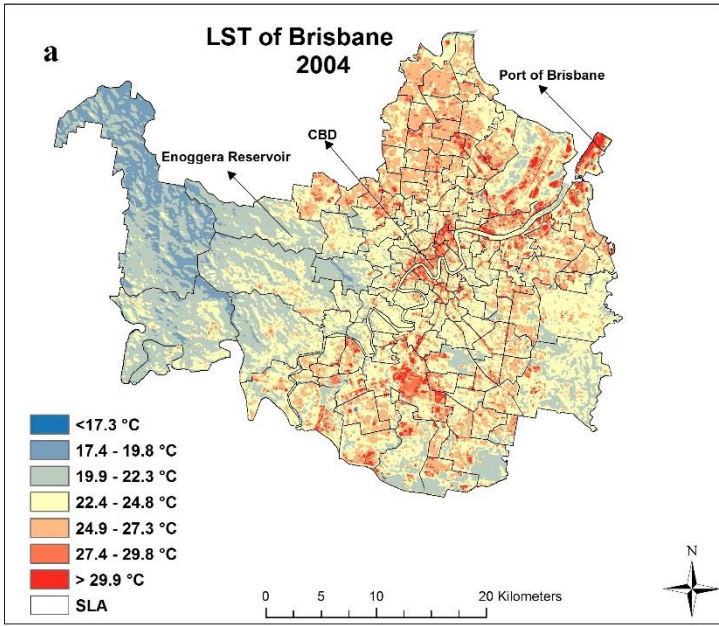
Government can provide communities with projected heat and flood mapping, which should be available through an internet search of government websites on the topic climate change. Print these maps A3 for workshopping ideas.

Climate adaptive design may require big moves (such as shifting homes in fire or flood risk areas) and also small moves (capturing kerb water to keep street trees alive). The Kurilpa Climate Strategy sets a template framework for action, which could be applied anywhere. How will we adapt our neighbourhoods?

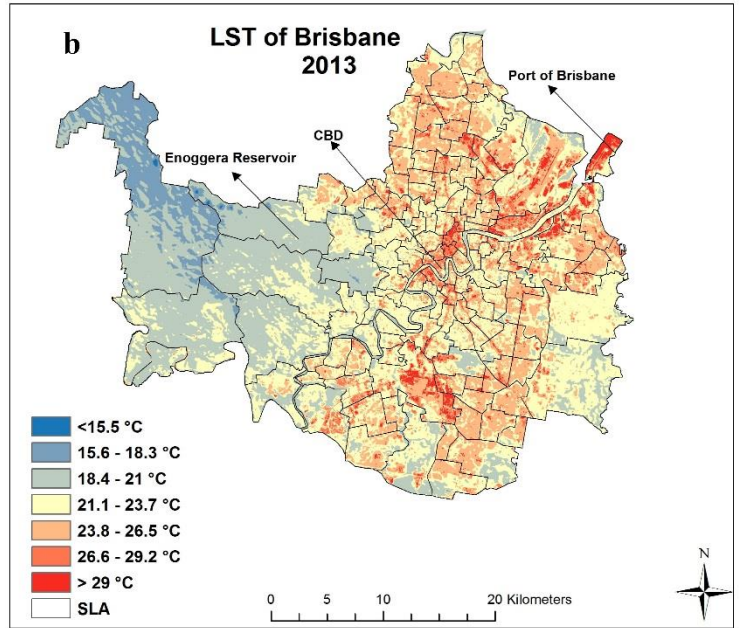


KURILPA CLIMATE STRATEGY

KURILPA AREA MAP

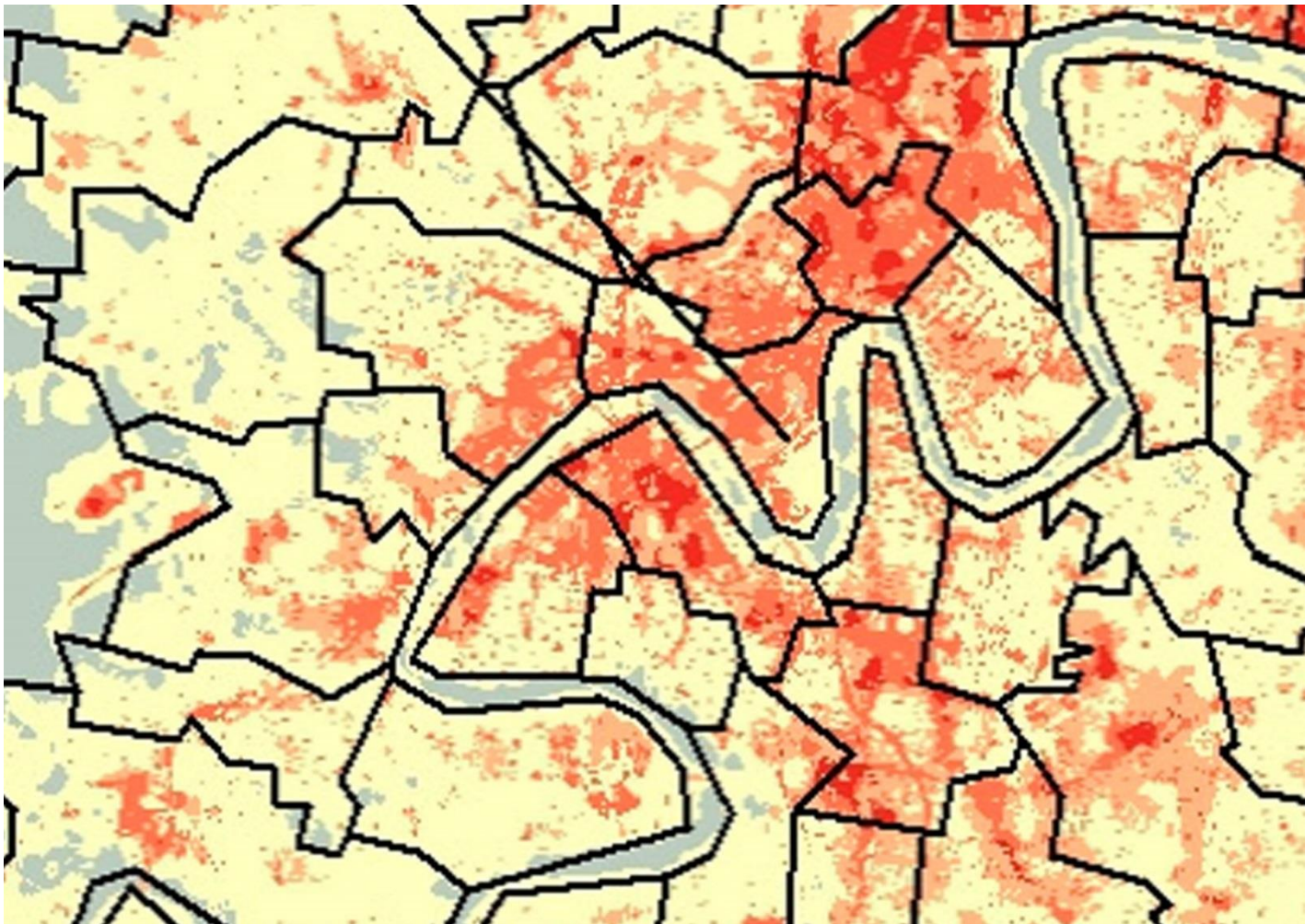


Brisbane 2004 Heat Map



Brisbane 2013 Heat Map

Reference - https://www.mdpi.com/remotesensing/remotesensing-08-00716/article_deploy/html/images/remotesensing-08-00716-g005-1024.png



Brisbane 2013 Heat Map

Reference - https://www.mdpi.com/remotesensing/remotesensing-08-00716/article_deploy/html/images/remotesensing-08-00716-g005-1024.png

Kurilpa Area: Heat Mapping & Possible Interventions



Baseline Heat Map: ~48C LST (Land Surface Temperature)

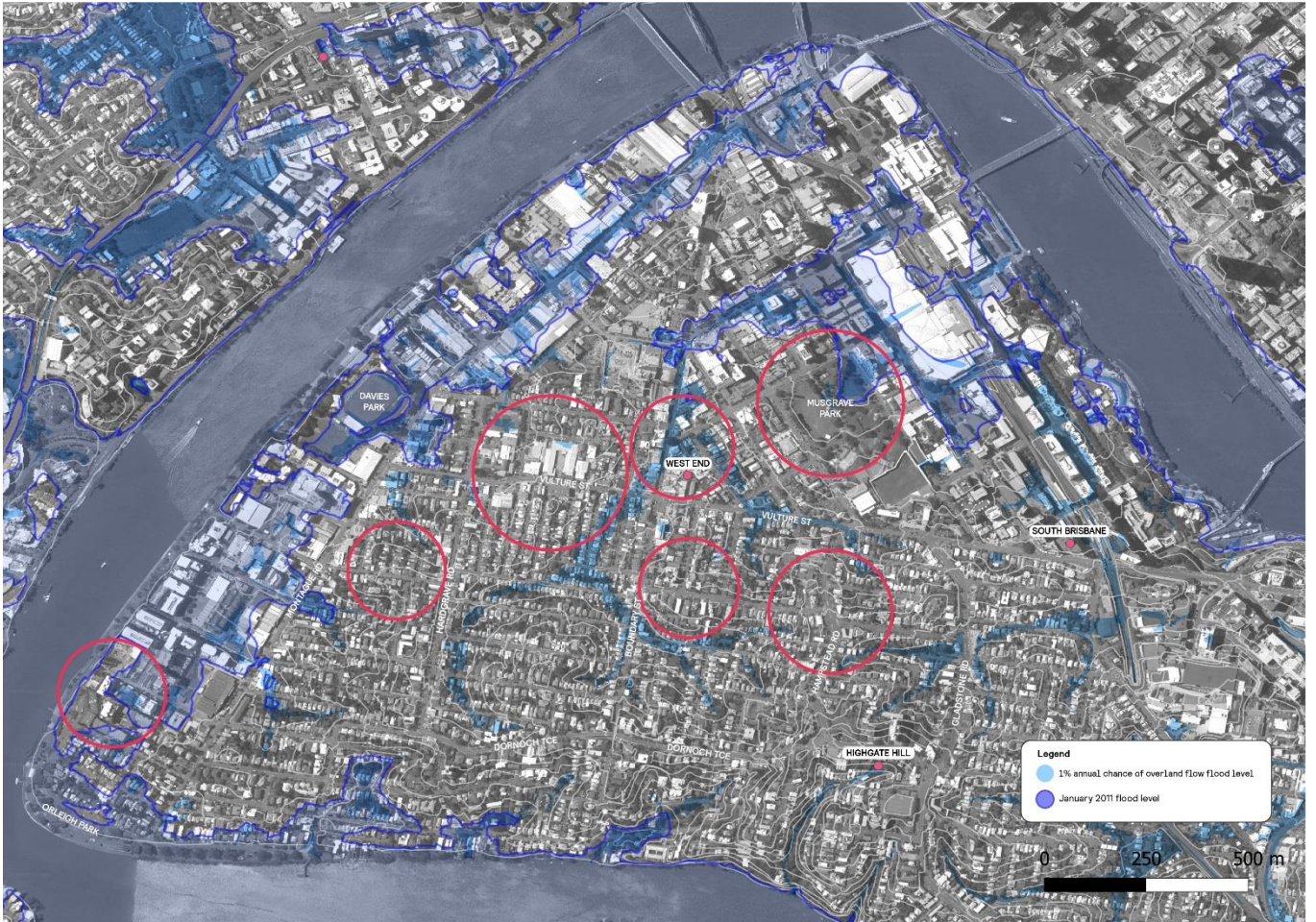


Business as Usual Heat Map: + say 5%

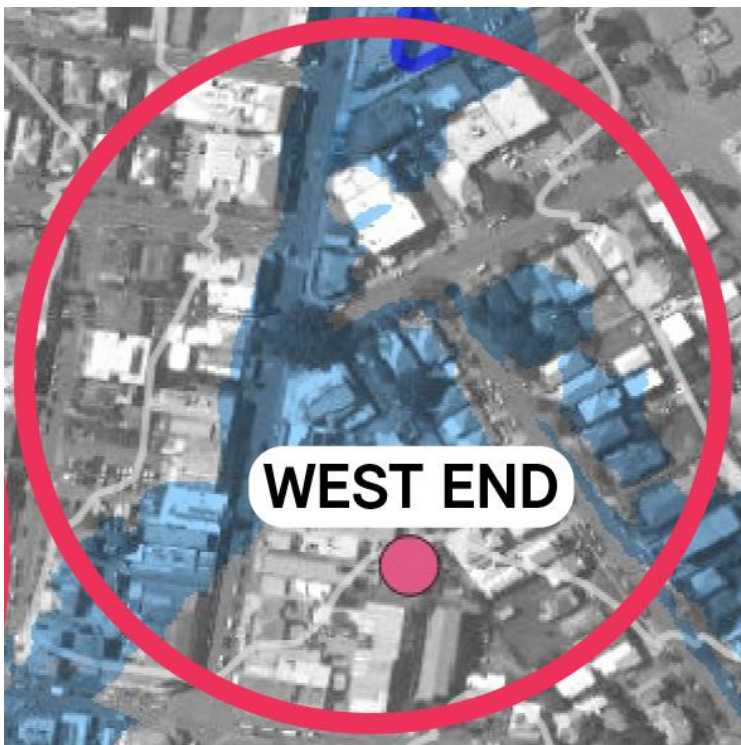


Water Sensitive City Approach with Interventions: Heat Map -say 2%

Reference: CRC for Water Sensitive Cities, Watersensitvecities.org.au



Projected Flood Map For Kurilpa Precinct



Projected Flood Map For Boundary Street area in Kurilpa

Workshop scenario: planning for the summer of 2030 (+2°)

The climatic shift is most likely to be of impact in our summers. In Brisbane, we will see a shift to a more hotter style climate: longer summers with more extreme heat days, less rainfall and more frequent and strong storm events. Hot dry wind will reduce humidity and increase fire risks. Impacts from flooding and overland water will likely increase in many low and water prone neighbourhoods.

Urban heat stress will increase particularly in open and hard city areas. We will find it harder to move around or cool down in our neighbourhoods. Urban heat stress will increase particularly in open and hard city areas. We will find it harder to move around or cool down in our neighbourhoods, homes and streets.



Scenario 1: adapting to water / storms / drought

Water and storms

Imagine we are planning for a 2030 summer in Brisbane which anticipates cyclonic storms moving southward into South-East Queensland, bringing much heavier rainfall, very strong winds and flash flooding. Looking at the flooding mapping projected for a major event such as the 2011 flood, we see impacts and changes which might be required in this neighbourhood.

What actions can we take now in this neighbourhood, to adapt to this shift in storm and water events?

How can development modify to reduce storm risk?

What should we do with homes in high risk, flood prone land?

Water and drought

Imagine we have no rain for six months:

Long hot summers will bring drought. How do we adapt for this?

How do we create local water resilience?

How do we store and hold water better?

- *Brainstorm water and storms in your group. List actions on A3 sheets and images in blue pen. Brainstorm ideas for 20mins. (Example of brainstorming sheets and aerial views are shown for the Boundary Street precinct area).*

Water/storms	Boundary St Area.
<p>more storms and flooding</p> <ul style="list-style-type: none"> • create rain gardens in streets • reduce hard pavements and increase permeable surfaces • change code to cyclonic rating of buildings. • select storm hardy street trees and give them deep gardens • grade surfaces to slow water and direct to gardens. • roof hatches for flood prone shops: goods to roof space • mandate storage tanks on all dev. sites: hold water • roof gardens • flood hardy plants. 	<p>less water/more drought</p> <ul style="list-style-type: none"> • more succulents and drought hardy natives • deeper/wider gardens • all new roads trap water <ul style="list-style-type: none"> - flush kerbs - rain gardens - minimize gutters and pipes/maximize gardens. • Road storage tanks to hold water & irrigate street gardens • more public drink fountains • food gardens on rooves and developments irrigated by site tanks under car parks. • restrictions to traders and homes <ul style="list-style-type: none"> - hosing - waste

Scenario 2: adapting to landscape & vegetation

Imagine we are planning for a 2030 summer with all the changes described earlier. Our landscapes, ecologies and vegetation will alter toward a warmer climate. This will impact fauna and biodiversity.

What actions can we take now in this neighbourhood to adapt to this shift in our landscapes and vegetation?

How can we build food resilience into our cities and places?

How do we retain our native flora and fauna in the growing city?

What actions can we do to increase landscape in the urban landscape?

- *Brainstorm landscape and vegetation in your group. List actions on A3 sheets and images in green pen. Brainstorm ideas for 20 minutes.*

landscape/nature/ food.	Boundary Street Area.
<ul style="list-style-type: none"> • Big tree canopies • soft and permeable ground layers. • fruit trees on verges • shrubberies on verges for habitat • native trees to support local animals • plantings to be more dry tropical rather than subtropical in 10 years • Triple the shade • triple the ground absorption. • community owned verges and community gardens built into un-used road reserves and future developments. 	<ul style="list-style-type: none"> • New building codes with strong landscape policies: triple the shade tree requirement • Raised planters to provide herbs for restaurants. • Regular taps to allow occasional watering. • Build wider, deeper and longer gardens in public/private realms. • more grass/less concrete • Connected greenways to allow wildlife movement • Food gardens mandated into new developments (integrated). • Promote non-invasive plants and animals.

Scenario 3: adapting to heat

Imagine we are planning for a 2030 summer which anticipates 3 weeks of very hot days of 40°C+, with evenings of 30°C+:

What actions can we take now, in this neighbourhood, to adapt to this shift in heat?

How can we plan around increasing fire events?

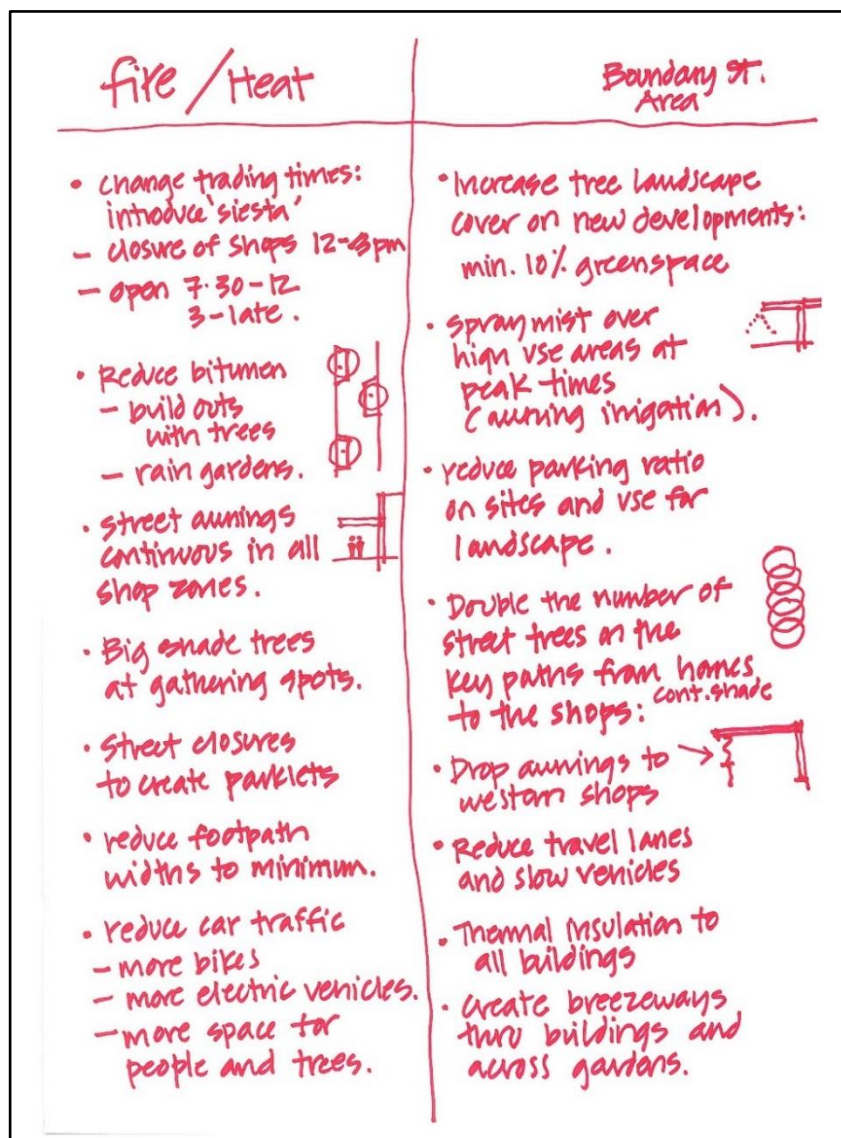
How can we reduce heat in buildings without air-conditioning?

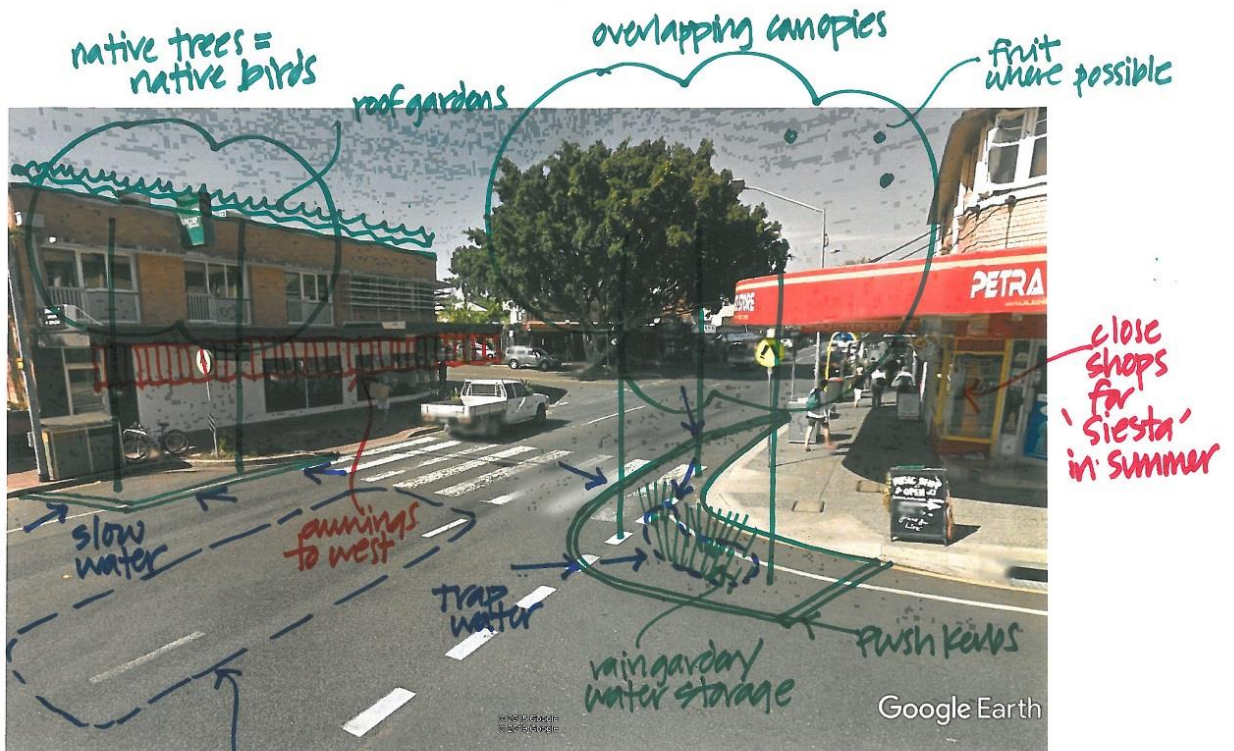
What materials and surfaces should we use to reduce urban heat stress in the city?

How do we cool the city as it densifies further?

How do we adapt the rhythm of our daily life around heat?

- Looking at the heat mapping projected for the neighbourhood, we see impacts and changes. Brainstorm in your group ideas and describe/list them (in full sentences) on an A3 sheet, or on the google maps and images (use red pens for ideas around heat). Draw doodle sketches if it helps. Brainstorm ideas for 20 minutes.
- Brainstorm for 20mins on **heat**, imagine big and small moves required. List actions on A3 sheets in red pen. Brainstorm ideas for 20mins.





KURILPA CLIMATE STRATEGY

BOUNDARY STREET PRECINCT

subsurface water tanks slow flooding and drought proof.



KURILPA CLIMATE STRATEGY

BOUNDARY STREET PRECINCT

parklet in street

water storage tanks under park

food gardens on roof

zone for night markets / weekend markets
Temporary shaded zone
(provide night trading in lieu of midday trading)

Imagine in the summer of 2030 there is a major climate event such as the 2011 flood or a major cyclone:

What actions can we take now in this neighbourhood to manage such events within the community?

Who are people most vulnerable and where might they go in such an event?

What safe access and escape routes can be anticipated?

What infrastructure needs protection?

What do we do about waste and hazardous materials likely in the neighbourhood (paints, pesticides)?

How do we tell people or engage them about future climate risks?

- *Brainstorm in your group. List actions on A3 sheets or images in black pen. Use the whole of neighbourhood aerial plan for discussion and mark-up. Brainstorm ideas for 15 minutes.*



Community	Boundary Street Area
<ul style="list-style-type: none"> • need to create programmes and forums to tell people about local climate changes and promote actions. • climate change anxiety will become a big issue: need counselling and community support to deal with emotional issues • Council/state/Fed gov. needs to reach out at the neighbourhood level in co-ordinated way. • vulnerable groups in Kurilpa to focus efforts: <ul style="list-style-type: none"> • homeless/street folk • disabled/less abled • elderly • migrant/mm-english speaking 	<ul style="list-style-type: none"> • fire, flood and storm events have different processes and spaces to deal with: multiple events need to be planned for in each local area. • Kurilpa is a cul-de-sac: exit points and routes during events will get clogged: need to educate community on processes and exits. • Industrial lands by river have many waste products: may get impacted or moved & may contaminate other areas. Industries need risk plans for climate events. • community groups can collaborate to create.

provide 'left' storage for retailers in flood risk areas

older structures need auditing for rating during large storms

reduce road and concrete areas to allow absorption during long rain events

share/public housing identified

adapt roads to store flood water

audit and design stormwater pits so flood water does not come up pipes

use town hall events to mobilise and prepare residents for climate events.

eg. tsunami planning in Japan.



KURILPA CLIMATE STRATEGY

change building act to rate buildings for cyclones in the next 10 years.

prepare key roads for increased stormwater flooding and create 'storage' or exit routes for water

BOUNDARY STREET PRECINCT

Sharing our outcomes

The workshop groups come together to discuss the emerging ideas. The workshop material is placed on the walls to enable people to walk around and view all the ideas. Each group presents their neighbourhood climate actions.

The ideas that have been mapped out represent a range of actions which can be collectively applied through a neighbourhood. The ideas can be sorted into themes and then prioritized for action. Use the actions to lobby local, state and federal government and to implement neighbourhood led change. Community groups can collaborate.

References

Deilami K., et.al. (2016). *Correlation or Causality between Land Cover Patterns and the Urban Heat Island Effect? Evidence from Brisbane, Australia* (Heatmaps). 2 George Street, 4000 Brisbane, Australia: Science and Engineering Faculty, Queensland University of Technology (QUT), (<https://www.mdpi.com>)

CRC Water Sensitive Cities. (*Heatmaps from An Analysis of Brisbane*). www.watersensitive.org.au

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Mongard, J. (2019) *2 Degrees - Design for Climate Adaptation: Key Neighbourhood Maps*. Brisbane Australia: John Mongard Landscape Architects, www.mongard.com.au

For more information go to:

mongard.com.au > 2 Degrees: Design for Climate Adaptation