



Planning for excessive heat to encourage walking and cycling

- A review and reflection on research

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What's next...



This is a story about the future

How most people talk and think about the future:

Us



**The Future is benign
We'll deal with it when we get there**

Us



**The Future is scary
We need to neutralize it before it gets us**



**De-futuring human behaviour such
as walking and cycling**

What is the future of the urban outdoors?

Option 1: We interiorise all human urban life

Option 2: We make the outdoors habitable

Most likely: something in between involving big societal changes...



How to de-future urban heat?

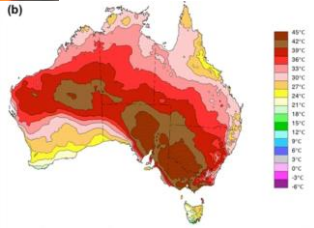
Survive the heat (by going indoors); Alkimos Beach Perth; Air condition the outdoors - Qatar



Heat as a natural/man made disaster: for people and the economy



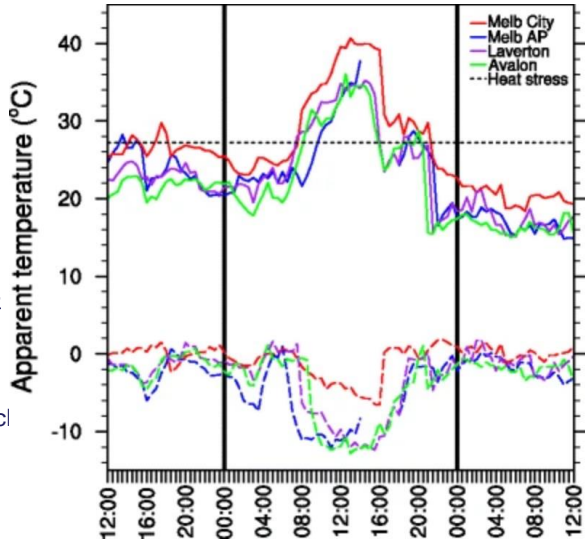
In the 2009 Black Saturday Bushfires killed 173 people, but the heat killed 374



In 2015 heat caused a productivity loss of \$6b USD

Sources: Bendigo Advertiser, <https://www.smh.com.au/opinion/heatwaves-are-more-deadly-than-bushfires-and-theyre-going-to-get-worse-20161212-gt9fyl.html>

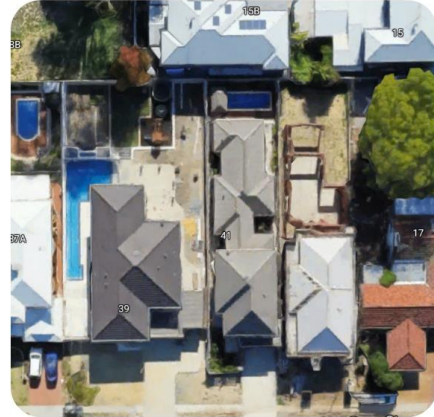
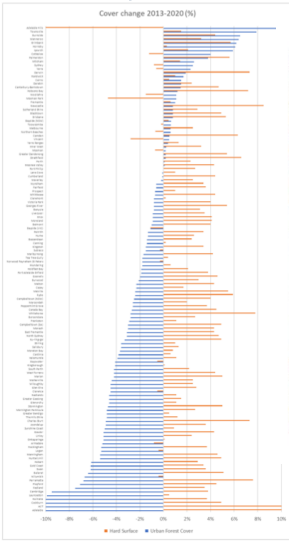
Jacobs, S. J., Vihma, T., & Pezza, A. B. (2015). Heat stress during the Black Saturday event in Melbourne, Australia. *International journal of biometeorology*, 59(6), 759-770. Zander, Kerstin K., et al. "Heat stress causes substantial labour productivity loss in Australia." *Nature climate change* 5.7 (2015): 647-651.





Yet... our cities are becoming less green and more unequal

Figure 4. Urban forest and hard surface cover change 2013-2020



What is the ratio of tree loss to house yield in this type of development?

Sources: Hurley, J., Amati, M., Deilami, K., Caffin, M., Stanford, H., Rowley, S. & Azizmohammad, S. (2020) Where will all the trees be? - an assessment of urban forest cover and management for Australian cities, prepared for Hort Innovation by the Centre for Urban Research, RMIT University, Melbourne.

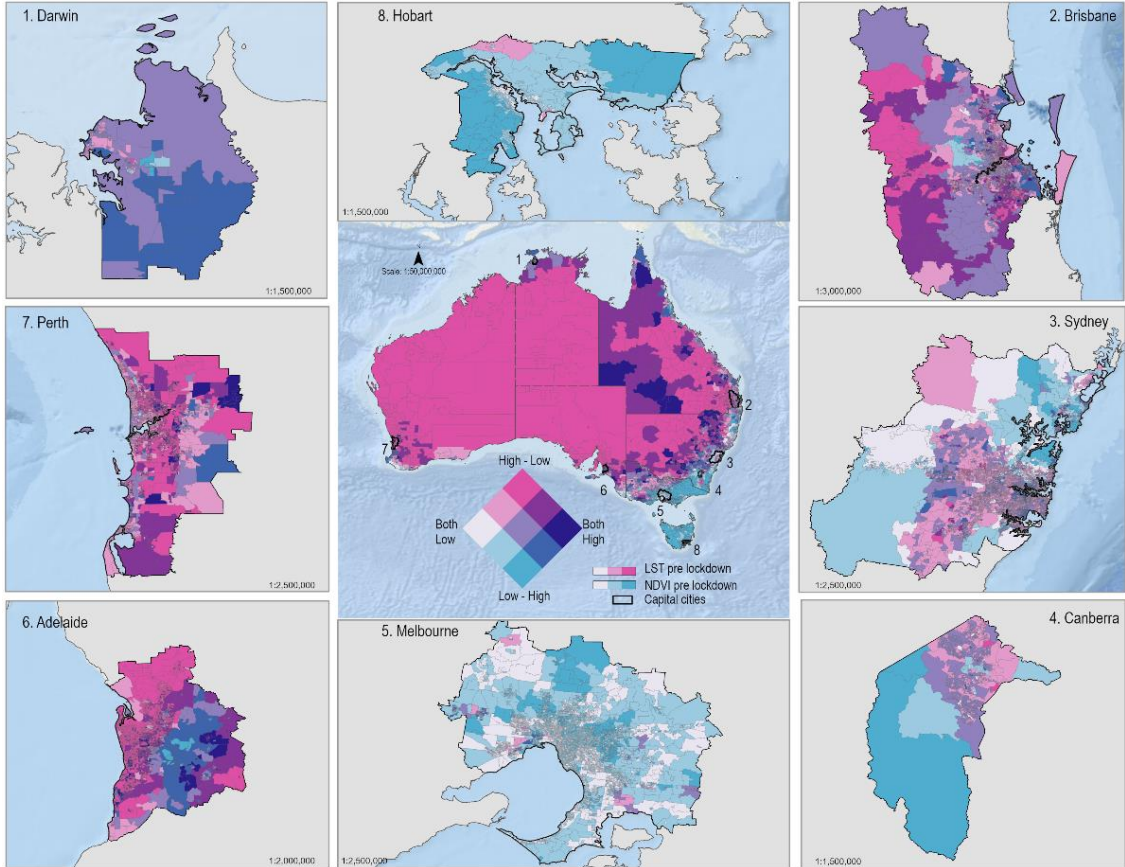
How to defuture urban heat for walking and cycling?

1. Mapping: who has the least time and resources to adapt?
2. Support: how can we support changes to behaviour today?





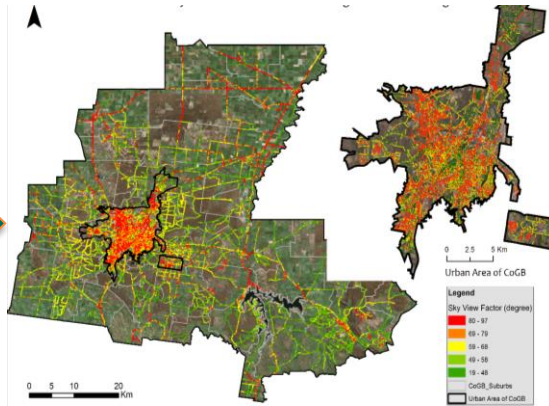
**Mapping heat X vulnerability
(in terms of environment,
demographics and cultural
and linguistic diversity)**



Local bivariate associations of LST and NDVI pre and post lockdown disclosing heat vulnerability level for SA1s. SA1s with 'high-low' class (purple) indicate negative association between LST and NDVI. Note: High LST indicates communities vulnerable to heat post lockdown as can be found in following urban areas of Melbourne, Sydney, Perth, and Adelaide.

Tackling urban issues with spatial approach

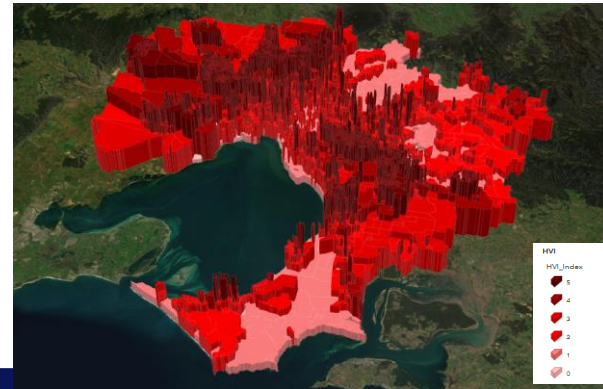
Cloud Computing + AI + Geospatial Big Data



A human-centred assessment framework to prioritise heat mitigation efforts for active travel at city scale (Sun et al., 2020)
Case study: Bendigo



Urban vegetation, heat islands, heat vulnerability and mitigation in Australian cities (Sun et al., 2019)
Case study: Melbourne





How can we support walking and cycling in the face of this today?

“I’m worried about isolation”: Sue’s story of living in one of Australia’s hottest suburbs



Busted Bus Stops



Ilots de fraîcheur urbaine



JOUR NUIT

Fontaines à boire



Equipements de rafraîchissement

Brumisateurs et autres jeux d'eau

Fontaines et brumisateurs (2 en 1) éphémères

Halte Fraîche

Activités

Baignade extérieure

Piscine

Bibliothèque

Musée

Lieux de culte

Equipements administratifs

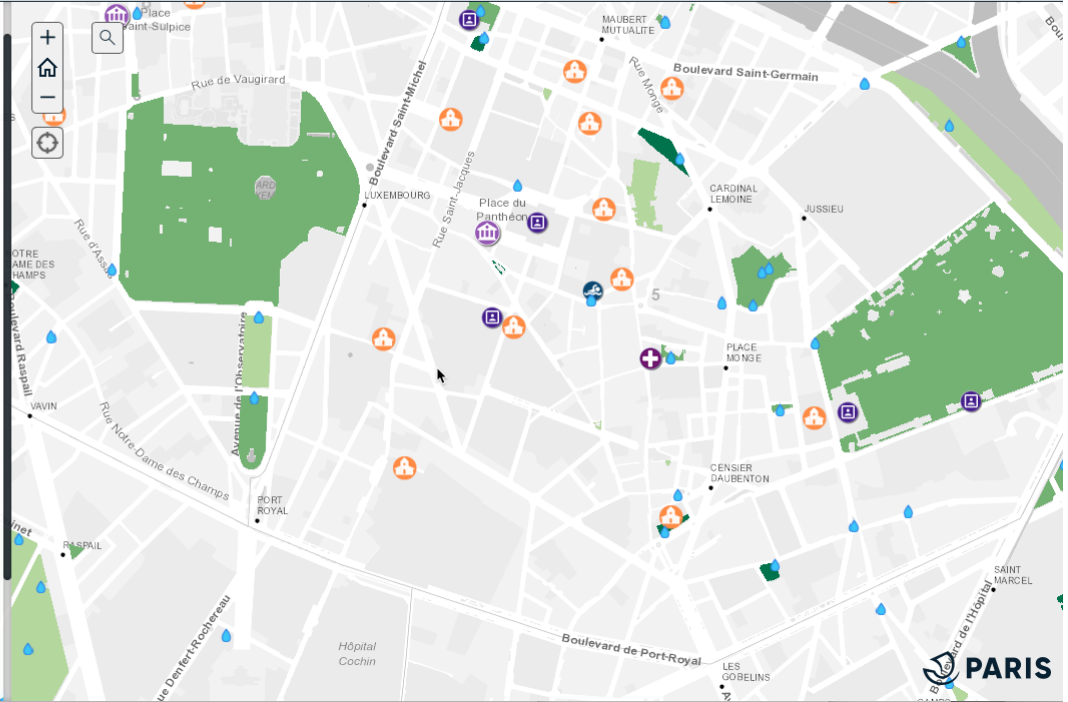
Mairie d'arrondissement

EHPAD ; Club/restaurant

Espaces verts

Très exposé au soleil donc plutôt chaud (moins de 25% de végétation haute)

Partiellement ombragé donc modérément frais /



Park Connector Network

With a large interlinking network of park connectors, you can easily park hop while indulging in various fun and recreational activities.

Feel the cool breeze as you navigate your way along the roads, picturesque rivers and canals that link you to the major parks in Singapore. Hop on a bicycle, put on a pair of rollerblades or simply jog along the park connectors and appreciate the myriad of sensory delights and adventures on offer.

Loops & Recommended Trails

Loops	Brochures / Recommended Trail Guides
Central Urban Loop	Download brochure / Download trail guide





SMART CITIES

Enabling active travel in Australian cities by mapping Shadeways

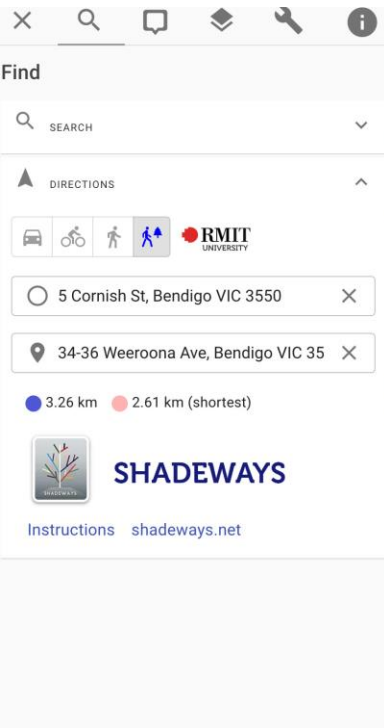
City of Greater Bendigo: pop. ~100k
Developed 2017-19



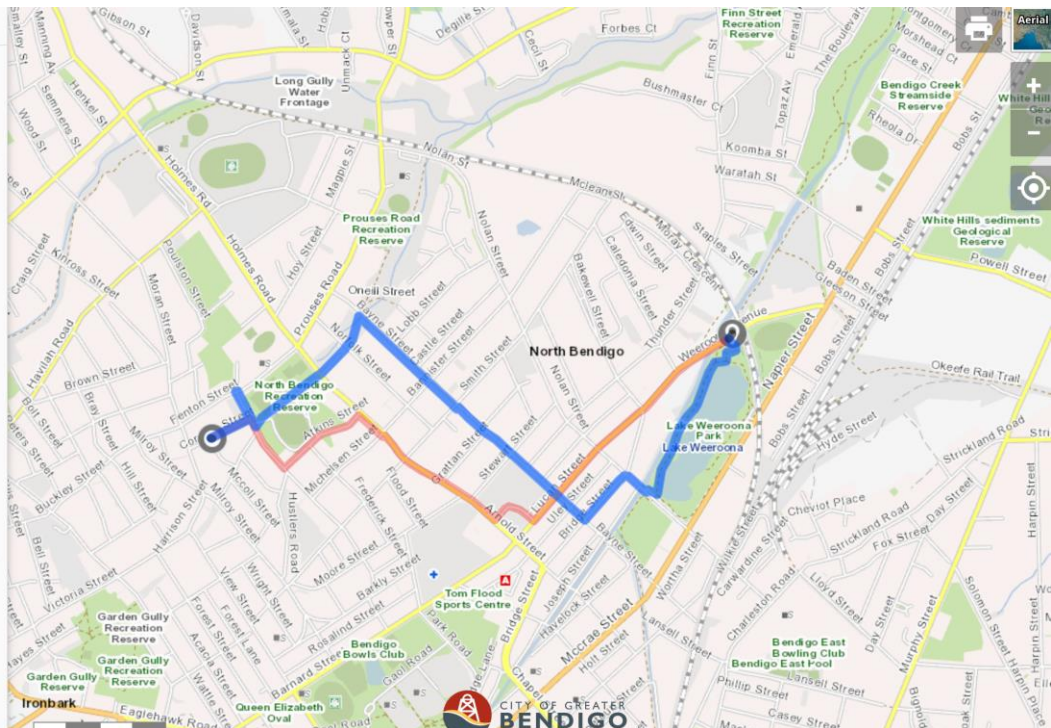


What the tool does...

RMIT Classification: Trusted



The screenshot shows the user interface of the SHADEWAYS application. At the top, there are navigation icons for search, directions, and other map functions. Below these is a search bar with the text "SEARCH". A "DIRECTIONS" section is visible, showing a route from "5 Cornish St, Bendigo VIC 3550" to "34-36 Weeroona Ave, Bendigo VIC 35". The interface also displays the distance of the route as "3.26 km" and "2.61 km (shortest)". The RMIT University logo is present, along with the text "SHADEWAYS" and "Instructions shadeways.net".



6000 hits in 6 months

Top Events

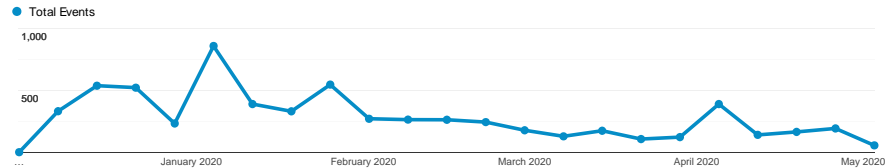
ALL » EVENT CATEGORY: Program » EVENT ACTION: Show route for travel modeshade » EVENT LABEL: Success show route Bendigo

Dec 1, 2019 - May 4, 2020

All Users
0.26% Unique Events

Explorer

Event



Event Label	Total Events	Unique Events	Event Value	Avg. Value
	6,428 % of Total: 0.72% (890,448)	1,216 % of Total: 0.26% (466,280)	0 % of Total: 0.00% (0)	0.00 Avg for View: 0.00 (0.00%)
1. Success show route Bendigo	6,428 (100.00%)	1,216 (100.00%)	0 (0.00%)	0.00

Rows 1 - 1 of 1



Kia ora – any questions?

(With thanks to the City of Greater Bendigo, Pozi, Smart Cities and Suburbs Program, AURIN High Impact grants)