



Your Tropical City

An online resource for tropical design that is responsive to Darwin's Character and Climate

Stephen Cook | 12 December 2019

Australia's National Science Agency





Overview

- Purpose of the website
- Drivers for Darwin specific approach
- Intended user groups
- Overview of content
- Progress to date
- Pathway forward





Your Tropical City

Purpose

Provide an online resource that provides context and guidance for tropical urbanism in Darwin



Drivers for a Darwin specific approach to tropical urbanism





Your Tropical City – sections and intended audience

Living in Darwin

- *Prospective residents and tourists*

Built environment

- *Developers, builders, real estate agents, existing residents*

Knowledge hub

- *All previous plus - Researchers (local and international), other cities*



Living in Darwin - content

Pages	Content
Darwin Climate information	<ul style="list-style-type: none">• Overview (highlighting seasonality and implications for heat stress)• Projected climate change impacts on extreme heat days and warm spells
Outdoor thermal comfort in Darwin's climate	<ul style="list-style-type: none">• Highlight potential indicators of heat stress and role of humidity, but that heat stress risk is more than a function of climate exposure but what people are doing and who they are• Highlight everyday adaption practices
Thermal comfort at home	Architectural styles for thermal comfort: <ul style="list-style-type: none">• energy efficient insulated,• passive cooling Guidelines to manage heat stress in the home
Building energy and zero emissions house in Darwin	<ul style="list-style-type: none">• renewable energy sources on site to generate energy for their operation, so that over a year the net amount of energy generated on site equals the net amount of energy required by the building.
Getting around Darwin	Active transport options and managing thermal comfort – potential to link to heat mapping
Darwin lifestyle	Highlight lifestyle opportunities



Darwin's Built Environment –draft content

Pages	Purpose
Character of Darwin's Built Environment	Highlights how tropical design character emerges from the local context where the built environment reflects the unique conditions and setting of Darwin.
Moving air is cooling air <ul style="list-style-type: none"><li>• Cross ventilation	<ul style="list-style-type: none"><li>• Highlight importance of air movement for thermal comfort in both high and low humidity scenarios. Design principles to facilitate natural cross-ventilation, Building articulation for air movement and efficient cooling
Building materials in tropical design <ul style="list-style-type: none"><li>• Thermal mass<li>• Reflectivity	Highlight role of thermal mass in regulating building temperature and different approaches in tropics, and the reflectivity of roof materials in reducing build up of heat
Landscaping locally	<ul style="list-style-type: none"><li>• Highlights the role of appropriate plant selection in maximising benefit in the tropics- Principles for plant selection and efficient irrigation
Cyclonic construction	Highlight how buildings in Darwin need to be built to withstand extreme wind forces from cyclones. This has in turn shaped the built form character of Darwin
Layered shade and cool streets <ul style="list-style-type: none"><li>• Structural building shade devices	Highlight how building articulation can create shade for the building itself and work together to help shade the streetscape and create an inviting public domain.
Balconies and outdoor living	Highlights that balcony design can influence liveability of apartments and the appearance of the building in Darwin CBD.



Knowledge Hub

Pages	Content
Mapping of heat mitigation	Heat risk (exposure and vulnerability)
Planting guidelines	to be developed
Case studies of tropical urbanism <ul style="list-style-type: none">• Cairns• Singapore	
Building assessment tools and calculators	
Darwin Living Lab and other monitoring studies	to be developed



Draft website



- HOME
- LIVING
- BUILDING DARWIN
- KNOWLEDGE



- Overview
- Green walls and facades
- Moving air
- Building materials
- Landscaping locally
- Cyclonic construction
- Shade devices
- Balcony projections
- Cool streets
- Sustainability features

Your Tropical City

This website provides a resource on tropical living and design for existing and future Darwin residents, as well as those wishing to build and do business in Darwin. The website highlights opportunities to improve thermal comfort and liveability both within buildings and public open space within the Darwin CBD. Information will continue to be updated as knowledge emerges from experiences with the [Darwin Living Lab](#).

The City of Darwin and NT Government, in collaboration with the Commonwealth Government, are already undertaking many [projects](#) in the public domain to help improve comfort for existing residents and create a cooler city centre that attracts more permanent residents.



Next steps

- Finalise draft website following any feedback on planned content
- Ensure content is consistent with key strategies and policies
- Broaden input to ensure diversity of perspectives and knowledge
- Content review by all partners prior to public launch
- Workshop to define next steps



Future opportunities

- Explore how tropical design opportunities apply across different building typologies and land uses in Darwin
- Systems perspective that considers how approaches at a building scale can contribute to thermal comfort for pedestrians
- Explore incentives and trade-offs
- Model how tropical design approaches can increase thermal comfort and reduce energy demand
- Increase understanding of community values and understanding of tropical design in Darwin



Thank you

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