Australian Urban Forestry Network

Better Practice Guide: Urban forests for healthy cities

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SUMMARY

The purpose of this guide is to equip Australian urban planners, landscape architects, arborists, designers, and managers of treed spaces (urban forest planners and managers) with an overview of how human health and wellbeing objectives might be practically considered in Australian urban forestry projects.

"If you are a green infrastructure provider, you are a health provider."[1]

INTRODUCTION

Today, our understanding of wellbeing is becoming more holistic, wherein nature and trees have an important role to play in people's health — in the prevention of ill-health, as much as in treatment and rehabilitation. The contribution of natural and semi-natural habitats to human health and wellbeing is the subject of an extensive and rapidly growing body of academic literature, which can be overwhelming in its scope and diversity. Research specific to the health benefits of urban forestry is less available, and urban forestry in Australia even less so. **Key resources have been provided below and over-page.**

URBAN FORESTS AND HUMAN HEALTH – THE RESEARCH

According to the World Health Organization, "health is a state of complete physical, mental and social well-being and not merely the absence of disease and infirmity" (WHO, 1948). Based on this definition, we can consider the health benefits of urban trees in these three categories:

- **Physical health**, which may be influenced by interactions of trees with environmental pollution, climate, and/or physical activity;
- **Mental health**, or the psychological effects of trees; and
- **Social impacts of trees on connectedness**, sense of place, and social capital.

Here we have selected some helpful review papers, resources, and studies specific to Australia that may be helpful in synthesising and communicating information about urban trees and health.

In addition, van den Bosch (2017) provided a very useful summary of our current understanding of the impacts of urban forests on health and wellbeing, including theories of how and why exposure to

[1] Willamette Partnership and Oregon Public Health Institute, Green Infrastructure and Health Guide, V1 (2018)

nature affects health. Additionally, Kendal et.al. (2016), summarised benefits of urban green space in an Australian urban context.

PHYSICAL HEALTH

Physical health effects of urban trees are arguably the most varied health and wellness impacts according to the literature, as they depend on localised effects of trees on pollution, allergens, and climate, and the spatial configuration of trees that impact mobility and physical activity.

James et al. (2015) reviewed studies of health benefits of trees and concluded that there was evidence for positive outcomes for cardiovascular disease, mortality, and birth weight. Fong et al. (2018) also found evidence for improvements in mortality and birth weight related to urban greenness, though evidence for improvements in cardiovascular health were mixed.

However, Astell-Burt and Feng (2019) studied health outcomes in a large database of residents of Sydney, Wollongong, and Newcastle and found that increases in local tree canopies were associated with lower odds of cardiovascular disease, hypertension, and diabetes.

Some of the physical outcomes of proximity to urban greenness may be indirect and more directly associated with improvements in psychological health and mental outcomes (Triguero-Mas et al. 2015).

MENTAL HEALTH

Synthesising a large number of studies of greenness and health, van den Bosch and Sang (2017) concluded that there was evidence for relationships between emotions and greenspace, with reduction of feelings of anger and sadness. Berto (2014) summarised restorative effects and cognitive improvements associated with exposure to natural scenes and settings. In their extensive survey of Australian adults, Astell-Burt and Feng (2019b) found that exposure to tree canopies with 30% cover was associated with 31% lower odds of psychological distress compared to exposure to 0-9% cover.

SOCIAL CONNECTEDNESS

Finally, greenspace that promotes social interactions and connectedness facilitates social cohesion, the “interpersonal dynamics and/or collective efforts that may be used to assess quality of life” (Jennings and Bamkole 2019). Although research in this area is at a fairly early stage, there is great potential to implement green urban designs, as well as active interventions such as therapeutic horticulture, to promote social health, inclusion, and a sense of place and belonging.

RECOGNITION OF URBAN FOREST AND HEALTH IN AUSTRALIA

A World Health Organisation-funded paper by Western Australia’s University of Curtin says, “recognition of the potential benefits to health of retaining and restoring trees in the urban environment must be a key component of planning strategies and policy,” and across Australia, we are increasingly seeing urban forestry and public health outcomes aligned in government strategy and

planning documents. The City of Melbourne's urban forest strategy, for example, Living Melbourne, cites 'healthy people' as its first goal: "to protect and increase access to nature, green space and canopy cover to reduce heat exposure and improve mental and physical wellbeing."

"Cities around the world now regard trees and other vegetation as critical urban infrastructure – as important to how a city functions as roads or public transport and particularly vital to the health and wellbeing of communities," says South Australia's City of Burnside Urban Tree Strategy 2014 – 2025.

CONSIDERATIONS FOR URBAN FORESTRY PROJECTS

So how might we as urban forest planners and managers proactively incorporate health and wellbeing objectives into our work?

1. CONSIDER THE PROJECT'S PERIPHERAL HEALTH AND WELLBEING BENEFITS

The health and wellbeing impacts of your project can be framed from multiple angles and at varying scales. While planning for the patients or residents of a health/rehabilitation facility, consider the health and wellbeing co-benefits affecting staff and visitors. If working on a project for children, consider their parents and elderly caretakers, and the neighbours and passers-by who may also benefit from seeing children at play. With this lens, the health and wellbeing benefits of green infrastructure can have exponential impact.

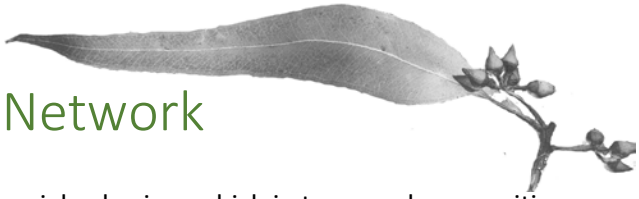
Also consider the health and wellbeing benefits (social cohesion, belonging, inclusiveness) available to a community during its ongoing stewardship of the urban forest, as well as what cultural or social activities the urban forest might facilitate for improved wellbeing (eg. mindfulness walks, shirin-yoku, sensory engagements).

CASE STUDY: BENDIGO HOSPITAL

The new state-of-the-art Bendigo Hospital continues to receive resounding acclaim, with the $630 million development named a winner in the 2019 Good Design Awards and 2019 Victorian Landscape Architecture Awards. "The Bendigo Hospital urban design project delivers inspiring landscaped areas that will support the patients and families, as well as staff," said the jury. "The design delivers social impact in a regional area. A benchmark for regional hospitals, this project showcases the benefits of designing for healthcare using integrated and landscape architecture to be part of the visitor/client experience as well as the health solution. The integrated network of green roofs, roof decks, balconies, courtyards, and external public spaces offers a high quality, attractive and impactful public realm."

2. CONSULT AFFECTED COMMUNITIES ABOUT THEIR HEALTH & WELLBEING

'Health and wellbeing' can be a subjective and complex concept, influenced by cultural, personal, and social factors, and community consultation or engagement in urban forestry projects for improved health is essential. Affirming and including the wisdom, expertise, and experience of the community



can generate better project outcomes and increase social cohesion, which in turn can have positive effects on community health.[2] Gathered evidence of what a community values and wants can also be a powerful tool for the justification of urban forestry and greening projects. Understanding the communities involved in your project will also reveal the context for framing its health and wellbeing benefits. In designing your consultation methodology, consider engaging the skills of a social geographer, social psychologist, environmental psychologist, or environmental sociologist.

The success of an urban forestry project can depend heavily on the degree of community involvement from planning through planting, and into stewardship stages. Ben Seamark, Urban Forest Consultant and Coordinator of Environmental Assets at South Australia's City of Burnside would argue that increase in urban canopy cover is indeed impossible without active community involvement.

CASE STUDY: BRISBANE NEIGHBOURHOOD SHADEWAYS

This program built on an existing and ongoing Brisbane City Shadeway Project (already underway for ecological outcomes) and shifted its focus to leverage the stakeholder's interest in creating 'green, cool pathways' for walking and cycling. "We asked ourselves, where is the community expressing a demand for 'greenness'?," says Urban Forester, Lyndal Plant. "And we found this in already completed community surveys which asked Brisbane residents about the qualities of life they wanted to see preserved. Access to green space and shade ranked highly among respondents." A website was also established by the project which asked people how they felt about street trees, which trees they preferred, and where the priorities for street trees in Brisbane were. This valuing of community sentiment served the project through its planning, implementation, and funding phases.

3. LOOK FOR OPPORTUNITIES FOR EDUCATION AND RESEARCH COLLABORATIONS

Urban forestry projects with proposed or actual public health and wellbeing outcomes may be of interest to your local university or research institution, and your project might benefit from collaboration with a research initiative. Every park and playground can be measured, and there may be a rich source of expertise and support on-hand, waiting to be tapped. Look to existing community research, such as surveys of behaviour, opinion, and wellbeing, that might inform or support your project's evidence base.

Equally, there is important work to be done on an interdisciplinary level, for education and training bodies in Australia to build the health and wellbeing benefits of urban forests and green spaces into their curriculums across a variety of subjects. These might include nursing and medicine, public health, psychology, education, and beyond. The closer that urban forest planners and managers can work with educative institutes, the more normalised the link between health and urban forestry becomes.

[2] Willamette Partnership and Oregon Public Health Institute, Green Infrastructure and Health Guide, V1 (2018)

CASE STUDY: SWEDISH LANDSCAPE UNIVERSITY – ALNARP PROJECT

Research at SLU Alnarp has made the campus one of the leading environments within nature-based interventions. In 2001 the Alnarp Rehabilitation Garden was designed and built in a corner of the university campus to develop a new kind of therapy that combined the use of restorative natural areas, with horticultural therapy and traditional occupational therapy, physiotherapy and psychotherapy and create a garden design that merged theories on horticultural therapy with restorative environments.

4. QUESTION THE ROLE OR LACK OF NATURE-BASED HEALTH SOLUTIONS IN POLICY DOCUMENTS

While there may be a consensus that trees and natural space can deliver health benefits, the frameworks, guidelines, and policies within which planning and management professionals operate in Australia may not explicitly recognise this. In approaching your project with its health objective, ask if there is an opportunity to better address the role of trees and urban forests in the policies and guiding documents that frame it.

CASE STUDY: URBAN LIVEABILITY CHECKLIST

As an example, see the Urban Liveability Checklist, developed by RMIT's Healthy Liveable Cities Group and collaborators, and supported by the NHMRC Centre of Research Excellence in Healthy Liveable Communities. The culmination of a five-year research program, the checklist was designed as a simple and short tool for planners to apply in established or proposed urban areas to assess its liveability and potential to improve health and wellbeing. A brief look at the checklist shows that while it includes a metric for 'open space', there is no mention of trees or urban forest. 'Open space' is defined by the Victorian Planning Authority as 'land that provides outdoor recreation, leisure and/or environmental benefits and/or visual amenity.'

5. THINK CREATIVELY ABOUT SOURCES OF FUNDING

Economic benefits of urban green spaces are achieved through public health outcomes. A 2017 American report, *Funding trees for health: an analysis of finance and policy actions to enable tree planting for public health,* resolved that, given the increasingly well-documented benefits of urban and peri-urban forests for human health, "there is a strong business case for more investment in urban trees"; and that, "the health sector (whether public or private institutions) could supply some financial resources that help partially pay for activities in the urban forestry sector"[3].

Sources of co-funding worth exploring in Australia include government health bodies, the private health sector, corporate sponsorship and philanthropic funding. There is a growing interest in 'blue-green bonds' in the private and government space[4], and new models of co-funding and impact investment are emerging from the philanthropic sector. Look to the visions and strategic plans of each

[3] The Nature Conservancy. 2017. *Funding trees for health: an analysis of finance and policy actions to enable tree planting for public health*. Arlington, USA, The Nature Conservancy.
[4] Maree Grenfell, Resilient Melbourne Networks and Learning Manager, lecture December 5 2019, Australian School of Urban Forestry, the University of Melbourne, Australia.

of your project's stakeholders for opportunities to link the health and wellbeing benefits of your project with their mission.

Where the complex and often problematic calculation of economic benefits of trees and green spaces on public health is concerned, various methodologies are being implemented around the world. To quantify the financial impact potential of your project, consult epidemiological studies or an epidemiologist in the first instance.

CASE STUDY: PARKS PRESCRIPTION

In the United States, some communities are starting '*Parks Prescription*' programs. "The medical community is teaming up with local parks organisations to prescribe outdoor activity," explained researcher Kathy Wolf in 2012. "Imagine you're in the doctor's office and you're carrying a few extra pounds; you might be put on a diet, you might get meds, but an alternative is to be advised to go walk in a park a certain amount of time each week."[5] Park Rx America is a non-profit organisation working closely with managers of publicly-accessible land and water, as well as directly with healthcare professionals and their respective organizations, to "make it easy" to prescribe parks and other protected areas to their patients real-time in the clinical practice setting.

6. THINK OUTSIDE THE BOX WHERE HEALTH BENEFITS ARE CONCERNED

The greatest marker of health success is staying alive. Where your urban forest project intersects with road and traffic plans, be aware of opportunities to literally save lives!

CASE STUDY: SUPERBLOCKS IN SPAIN

The Superblock project took 9 urban mixed-use blocks (3x3), and moved the normal traffic to the periphery, calming traffic flow in the centre. This was to reduce the road space and increase green space. Implemented in 2012 as part of a new transport strategy in Barcelona which looked to reduce car dependency. Results showed that 667 premature deaths be prevented annually through implementing 503 Superblocks.

The greatest number of preventable deaths could be attributed to reductions in NO2, followed by noise, heat, and green space development. The Superblocks were estimated to result in an average increase in life expectancy for the Barcelona adult population of almost 200 days, and result in an annual economic impact of 1.7 billion EUR.

[5] Nature Sacred website, (2012) 'Health Benefits of Urban Greening: A Q&A with Kathy Wolf'

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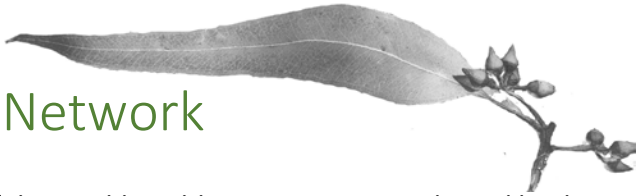

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ADDITIONAL READING AND HANDY RESOURCES

- Urban trees found to improve mental and general health, University of Wollongong, NSW Thomas Astell-Burt, Xiaoqi Feng

  The longitudinal study tracked the changes in health of around 46,000 people aged 45 and older living in Sydney, Newcastle and Wollongong. In neighbourhoods with a tree canopy of 30 per cent or more, adults had 31 per cent lower odds of developing psychological distress, and 33 per cent lower odds of rating their general health as “fair” or “poor” over six years. Urban green spaces with open grass rather than a tree canopy did not deliver the same benefits.

- Cool communities: Urban trees, climate and health, Helen Brown, Dianne Katscherian, May Carter, Jeff Spickett, Curtin University, WA

  “Our research established that increases in extreme heat in Perth, would pose the greatest risk to human health associated with climate change.” The effects of extreme heat range from heat-related illnesses (such as heat rash and heat cramps) to heat exhaustion and heat stroke which can lead to death.

- The Healthy Places and Spaces project; a collaboration of the Heart Foundation, Planning Institute of Australia and Australian Local Government Association supported by the Australian Government Department of Health and Ageing.

  The manual is for those working within the built and natural environment to help tackle some of Australia’s major preventable health issues by encouraging walking, cycling and the use of public transport.

- Healthy Liveable Cities Group, RMIT University Centre for Urban Research

  A multidisciplinary research team, this program examines the influence of city design and planning on health and wellbeing. The team draws from experience in epidemiology, behavioural science, geography, geomatics, psychology and public health. They use a variety of quantitative and qualitative analyses including geospatial analyses, policy analysis and economic evaluation.

- HABITAT: A study of how areas in Brisbane influence health and activity.

  Designing cities to promote health and well-being: the HABITAT multilevel longitudinal study

of Brisbane (Australia) neighbourhoods and their 'baby boomer' residents. The study's findings are providing policy makers, planners, and urban designers with evidence about meeting a range of public health challenges. HABITAT is funded by the Australian National Health and Medical Research Council (NHMRC) and supported by the Brisbane City Council.

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