



# Research brief: Benefits of urban greening

CAUL RB02 Benefits of Urban Greening | August 2016

## *What benefits does urban greening really provide for people and the plants and animals that live in our cities?*

This research note is particularly relevant for parks, infrastructure, health, conservation and planning departments at all levels of government. It is also of interest to designers, developers and consultants in the private sector as well as NGOs and landowners in general.



### Background

Diverse benefits of urban greening have been well established. We know that urban greening contributes to people's physical and mental health and wellbeing.<sup>1</sup> Health and wellbeing is improved as green space facilitates physical activity, improves social cohesion, and reduces stress.<sup>2</sup>

The ecological functioning of cities is also improved by green spaces as they generate important ecosystem services.<sup>3,4</sup> Green spaces help adaptation to and mitigation of the effects of climate change by cooling cities through shade and transpiration. They reduce air pollution through the capture and filtering of large particles. Green spaces planted with a diversity of plants can provide habitat for many kinds of organisms.<sup>5</sup>

However, not all green space is the same and various kinds of green space promote the diverse benefits in different ways. Some forms, and features, of green space are better for promoting physical activity while others are better for cooling the city, or conserving plants and animals. Forms of green space are described in a separate Research Brief.<sup>6</sup> Understanding these differences is crucial for managing or planning urban spaces and yet the literature rarely addresses this complexity.

The benefits of green space are also distributed unequally. Disadvantaged areas have fewer trees and parks, and lower quality green areas.<sup>7</sup> This reinforces inequity in health outcomes and people's contact with nature.<sup>8</sup>

## Focus

Research undertaken by the Clean Air and Urban Landscapes Hub will address the uncertainties about the specific features of green spaces that provide benefits. For example, what are the characteristics of green space that lead to improved mental health? Do the same characteristics increase or decrease cooling, or the conservation of species?

Research will also consider different goals for green spaces in different cities. It is likely that the amount and kinds of green space in cities, and the benefits it provides, varies with factors such as socioeconomic disadvantage, cultural preferences, temperature and rainfall.

## Detail

Specific tasks that will be undertaken by the Clean Air and Urban Landscapes Hub include:

- Identifying the features of green spaces that are related to different kinds of benefits for people and biodiversity.
- Identifying how different kinds of people may respond to green spaces in different ways, and thus obtain different levels of benefits.
- Identifying likely synergies and trade-offs in the provision of different kinds of benefits from urban green spaces.
- Designing experiments to quantify these synergies and trade-offs of different kinds of benefits.
- Providing guidance on the effects of temperature and rainfall on levels of urban greening and the benefits its provides.
- Providing guidance on how the social fabric of cities, such as socioeconomics and culture are likely to lead to different kinds of green space outcomes.

## Expected Outcomes

This research will improve our understanding of the features of green spaces that provide different kinds of benefits to people and to biodiversity. From this understanding, we will identify potential synergies and trade-offs on human wellbeing, ecosystem service benefits and biodiversity. We will ascertain how the benefits supplied by different green space features vary for different kinds of people, and different kinds of biodiversity. This information can be used to identify the likely effects of different kinds of green space interventions. We will devise strategies to improve the co-benefits for delivered by urban green spaces.

As a result of this research, we will develop a better understanding of the benefits provided in different environments (e.g. climates) and to different kinds of people (e.g. socioeconomic groups, cultural groups). This can be used to inform the setting of green space targets, and to prioritise areas for greening interventions.

## About the CAUL Hub

The Clean Air and Urban Landscapes Hub is part of the Australian Government's National Environmental Science Programme. The remit of the CAUL Hub is to undertake "Research to support environmental quality in our urban areas". This includes research on air quality, urban greening, liveability and biodiversity, with a focus on practical implementation of research findings, public engagement and Indigenous Australian participation. The CAUL Hub is a consortium of four universities: the University of Melbourne, RMIT University, the University of Western Australia and the University of Wollongong.



## References

1. Hartig & Kahn Jr. (2016). *Living in Cities*, Naturally. *Science*, 352(6288), 938–940
2. Sugiyama, T., Leslie, E., Giles-Corti, B., & Owen, N. (2008). *Associations of neighbourhood greenness with physical and mental health: do walking, social coherence and local social interaction explain the relationships?* *Journal of Epidemiology & Community Health*, 62(5).
3. Sadler et al. (2010). *Bringing Cities Alive*. In Gaston (ed) *Urban Ecology* Cambridge University Press
4. Zupancic et al. (2015). *The impact of green space on heat and air pollution in urban communities*. David Suzuki Foundation, Canada
5. Ikin, K., Knight, E., Lindenmayer, D. B., Fischer, J., & Manning, A. D. (2013). *The influence of native versus exotic streetscape vegetation on the spatial distribution of birds in suburbs and reserves*. *Diversity and Distributions*, 19(3), 294–306.
6. Whelan, K. & Hurlley, J. (2016). *CAULRB01 Enhancing Urban Greening*. [www.nesurban.edu.au](http://www.nesurban.edu.au)
7. Dobbs, C., Kendal, D., & Nitschke, C. R. (2014). *Multiple ecosystem services and disservices of the urban forest establishing their connections with landscape structure and sociodemographics*. *Ecological Indicators*, 43, 44–55.
8. Shanahan, D. F., Bush, R., Gaston, K. J., Lin, B. B., Dean, J., Barber, E., & Fuller, R. A. (2016). *Health Benefits from Nature Experiences Depend on Dose*. *Scientific Reports*, 6.

This Research Brief was prepared by Dave Kendal as part of the Urban Greening for Liveability and Biodiversity research project, Team Leader Nicholas Williams.  
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