

Integrating Trees into the Design of the City: Expert Opinions on Developing More Sustainable Practices for Planting Street Trees in Australian Cities.



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Abstract

Street trees provide cities with a range of social, economic and environmental benefits, with large, mature trees providing the maximum benefits. Street trees can be conceptualized as a form of 'green infrastructure', delivering a range of environmental and human services alongside the 'grey infrastructure' of conventional engineering services. However street trees face an extremely hostile environment in the city and may struggle to survive and grow. These challenges are exacerbated by 'unsustainable' streetscape design and tree planting practices, such as planting trees in undersized tree pits dug in compacted urban soils, and surrounding trees with hard impervious surroundings. These practices often result in declining tree health, reduced tree life spans, increased tree mortality and also conflicts between trees and surrounding infrastructure.

This thesis aims to develop a more sustainable model for urban streetscape design and street tree planting practices in Australian cities, which better integrates the needs of street trees, based on the expert opinions of researchers and practitioners in the field. A mixed-method research strategy was adopted, using both quantitative and qualitative techniques. A detailed literature review of current tree planting practices was undertaken covering the following topics: providing space both above and below ground; providing trees with the resources for growth; and minimizing a range of infrastructure conflicts. The views of a variety of professionals across Australia were then collected using various techniques. These included an Australia-wide online survey of local government practitioners to address the wider picture, and in-depth interviews with practitioners in metropolitan Adelaide, to provide a detailed understanding of the issues. Detailed case studies were also conducted in four Australian capital cities, including interviews with local luminaries, to review current 'best practice' techniques and policies for street tree planting.

The outcome of this research is presented as a new paradigm for the more sustainable urban tree planting and management practices, entitled 'Tree Sensitive Urban Design' (TSUD). A proposed "Model for TSUD" draws upon the practices identified in the thesis research, and recommends that the management of urban trees should move from an engineering-based approach to streetscape design, to considering street trees as an essential part of the city. The 'Model for TSUD' presented includes a set of objectives, planning and design principles, and a set of 'structural' and 'non-structural' best practices to accommodate street trees.

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Declaration

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