NURSERY PAPERS

THE VALUE OF A LEAFY NEIGHBOURHOOD

People like living in leafy suburbs, and an avenue of a single tree species has a special appeal—but what value do homebuyers place on having trees along the street and how does the size, age, health and diversity of the trees influence their purchasing decisions? These were the questions that University of Queensland researcher Lyndal Plant set out to answer. Ms Plant's research has quantified the additional value that homebuyers place on the quantity and type of trees in the streetscape.

Summary

- Homebuyers are willing to pay a premium for houses in leafy streets—and the leafier the better.
- Homebuyers tolerate 'a mixture, but not a mess' when it comes to types of trees in the streetscape.
- House values above the median sale price are achieved where the species diversity in nearby streets includes up to six species.
- Streetscapes with mature trees also attract premium house prices.
- Local government tree managers are seeking greater species diversity in the urban environment to improve the resilience of urban forests.
- The nursery industry can meet the likely increased demand with a range of high quality tree species options for councils and developers.

DIVERSITY IN STREETSCAPE VEGETATION

A diversity in street tree species within the urban forest can better suit the wide-ranging growing conditions and infrastructure constraints of roadside environments, provide resilience to changing climatic conditions, minimise pest and disease impacts and optimise the multiple functions of green infrastructure.

However, little was known about how tree species diversity within Australian streetscapes might influence homebuyers' decisions. With 69 per cent of Australian residents being home owners, the preferences they express through their house purchase patterns can assist with, and inform, the community consultation process regarding streetscape developments.
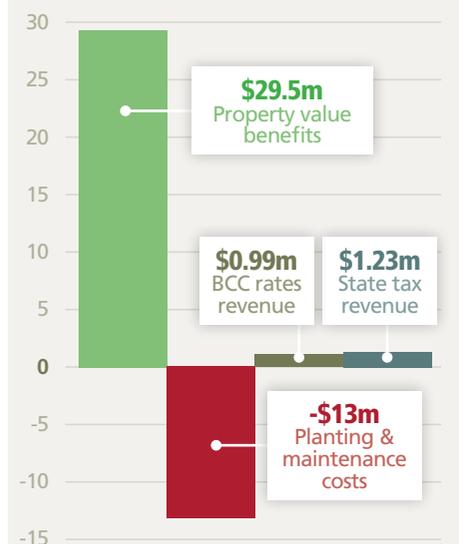
In the Brisbane City study area there was strong support for a limited level of species diversity within streets and a strong preference for some mature aged trees in the streetscape. These findings suggest some tolerance on the part of homebuyers, but also some caution required by councils and developers when moving toward more resilient, multipurpose streetscapes with mixtures of tree species at the street scale.

THE BUSINESS CASE FOR STREETSCAPE PLANTINGS

The average level of footpath leafiness (i.e. 35 per cent footpath tree canopy cover) added $26.8–29.5 million to house sale prices in residential Brisbane in 2010. This was more than twice the annual costs of planting and maintaining the street vegetation and related insurance claims. Another $2 million per year was also returned to the local council through increased rates revenue and to the state government in stamp duty taxes.

Home owners in Brisbane highly value street trees, which are paying their way in property value benefits alone. Returns to local councils and other beneficiaries suggest a strong case for collaborative investment in sustaining leafy streetscapes.

ANNUAL COSTS AND REVENUE RELATED TO PLANTING AND MAINTAINING STREET TREES IN BRISBANE, 2010

$29.5m Property value benefits

$0.99m BCC rates revenue

$1.23m State tax revenue

-$13m Planting & maintenance costs

Nursery & Garden Industry Australia

Horticulture Innovation Australia | **NURSERY PAPERS** May 2016

THE RESEARCH

Study method

This study used both linear and spatial regression analysis with house sale price as the dependent variable along with ten house, property and suburb attributes, and five to six street tree attributes as independent/explanatory variables. This type of analysis is also called a Hedonic Price Model (HPM), where the sale price of the house is explained as a function of the 'shopping trolley' of attributes homebuyers are willing and able to afford in making their purchase.

Each attribute that makes a significant contribution to explaining the price variance in a sample of house sales can be 'unpacked' or isolated and its value calculated while controlling for the effect of other attributes. Also called a 'revealed preference valuation' method, HPM uses actual house sales data rather than data collected through stated preference surveys.

Data from house sales between 2008 and 2010 was combined with attribute data from spatial analysis, Census 2011 and Brisbane City Council 2010 street tree survey data across 80 sample sites. Two data sets were analysed:

- house sales where street trees were present on the front footpath
- house sales where street trees were present within 100 m of property, but were not present on the front footpath.

Street tree features were converted to two continuous, and up to four dummy, variables for each house sale. Dummy variables are used to test the contribution of just two scenarios for a particular attribute, such as footpath frontages with or without powerline constraints and the effect of mature and aged street trees compared to all other age categories. Features of street trees on the front footpath not found to be significant were not tested again in the nearby streetscape data set.

Mature trees provide a significant positive contribution to house sale price.

TABLE 1: HOUSE, PROPERTY, SUBURB AND STREET TREE FEATURES USED IN THIS STUDY.				
House variables	**Property variables**	**Suburb variables**	**Street tree features**	
			On the property frontage	**Within 100m of property frontage**
• Sale price ($) • Number of bedrooms • Number of bathrooms • Number of garage spaces	• Lot size • Distance to nearest park	• % house sales in pre-war (WW2) suburbs • % house sales in post-war (WW2) suburbs • % households with income in upper quartile • % households with Yr 12 or higher education level • Distance to CBD (Translink zone)	• Number of street trees • Average tree height (m) • Powerline constrained or not • Tree health-poor, good • Tree age – Mature+aged, Maturing, New+juvenile	• Number of street trees • Average tree height (m) • Species richness (number of species) • Species diversity (Shannon-Weiner) • Tree age – Mature+aged, Maturing, New+juvenile

Study results

This research investigated the value that Brisbane homebuyers place on street trees on the property frontage and nearby. It has revealed that while homebuyers are indifferent to street trees on the property frontage and within 30 m of the property, leafy streetscapes nearby (within 100 m of the property) are significant and valued. In addition, street tree size, type and condition were not significant, but the age and level of species diversity within the street does influence the price homebuyers are willing to pay for houses with similar structural, property and location features.

Street tree features on the front footpath explained 70.4 per cent of the variance in house sale prices of that sample. However, only one of the six street tree attributes was significant at the 90 per cent probability level. Street trees in the mature and aged (>16 years) category had a significant positive effect and, when other variables were held constant, these trees added a 6.92 per cent premium to median house sale price. However, the small sample size limits the robustness of this model.

Mature trees provide a significant positive contribution to house sale price.

The second stage of this analysis confirmed the significant effect of mature and aged street trees nearby on house sale price and an indifference to tree size. While species diversity had no significant effect on house price, species richness (or number of species) was significant and negative.

The greater the number of different tree species in the street, the lower the house sale price.

Using a dummy variable equivalent to the mean number of street tree species nearby (5.85 species), a threshold of no more than six species reversed this negative effect to a significant positive effect. Six or fewer different species added $15,015 (or 2.86 per cent) to the median house sale price and each additional street tree nearby added $683 to the median house sale price.

The presence of some mature age street trees nearby added between $17,168 and $17,220 to the house sale price (3.27% to 3.28 per cent above the median house sale price). This premium is equivalent to the price the same home buyers were willing to pay for houses with 0.66 extra bedrooms or located almost twice as close to the city centre.

In summary, home buyers expressed their preference for more street trees, especially of mature age, and less variety, through their willingness to pay a premium house price.
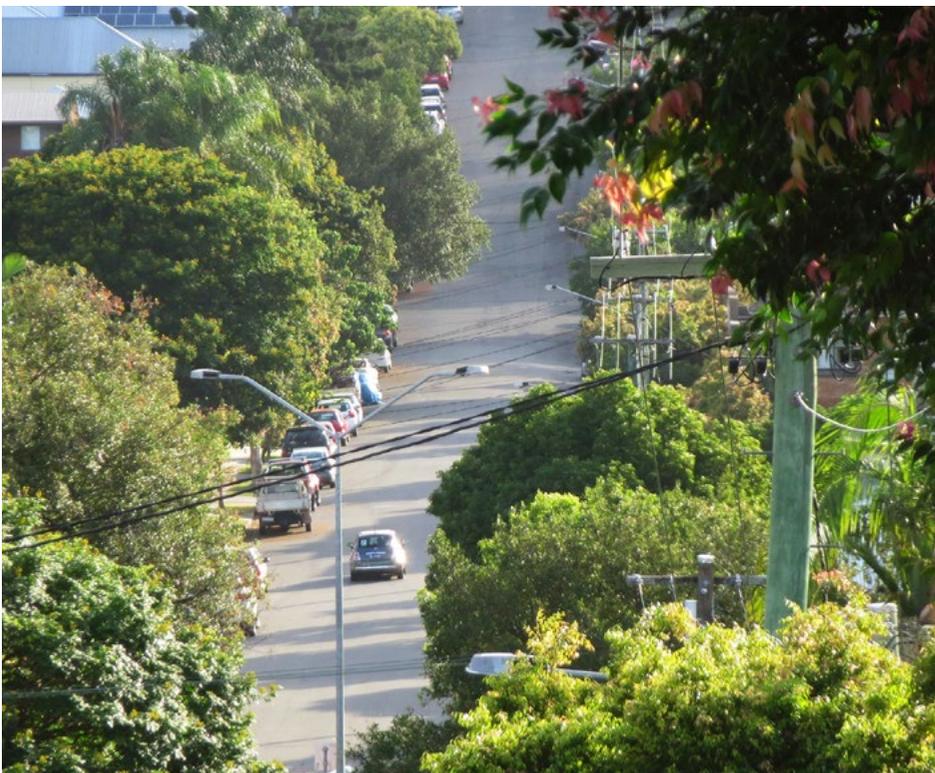
Brisbane home buyers prefer less diversity in tree species mix (tolerance for up to six species) at the street scale.

IMPLICATIONS OF THE FINDINGS FOR PLANNERS

There is a strong business case for the establishment and maintenance of trees in the streetscape with returns from property value premiums flowing to both homeowners and government. There is evidence of some level of support for increased diversity in urban forest planting within streetscapes, however, this study suggests that the community in Brisbane has a preference for a low level of diversity—fewer than six different street tree species within 100 m of a property.

While such levels of diversity tolerance align with Brisbane's streetscape design guidelines for 'neighbourhood streets', introducing too much of a mixture of tree species to satisfy resilience or biodiversity targets at individual streetscape scale in other cities may require substantial community consultation. Species diversity within streets is perhaps the most delicate scale, which must be tested with local communities in other cities and perhaps across different residential forms such as multi-unit dwellings or mixed use streetscapes.

The value expressed by home buyers in having street trees of mature age nearby also supports the investments that local government and developers made in the past. The increased premiums that buyers are willing to pay for these streetscape features translates to increased property values and tax revenues and support ongoing investment in planting, maintenance and protection of street trees within the urban environment.

IMPLICATIONS OF THE FINDINGS FOR THE NURSERY INDUSTRY

This study lends weight to the business case for increased investment in the establishment and maintenance of urban forests and multifunctioning streetscape environments in Australian towns and cities.

It will provide further support to the messages of the industry's 202020 Vision – to create 20 per cent more green space in urban areas by 2020. For the industry, this will help to drive demand for product and increase the size of the nursery market, providing more opportunities for growers.

Local governments are increasingly keen to strategically expand their urban forests and streetscape designers will be looking for more variety and high quality stock.

The 'AS2303:2015 Australian Standard Tree stock for landscape use' provides guidelines for nursery professionals to use when preparing tree stock for streetscape uses. The new nursery levy-funded 'Evaluation of Nursery Tree Stock Balance Parameters' project (NY15001) will also provide key resources to the nursery industry regarding the optimal root to shoot balance of different tree stock species grown in different climatic regions of Australia. Root to shoot balance is considered central to the rapid establishment and successful growth of tree stock used in landscape planting.

The Brisbane community's preference for streetscapes with trees that have grown to mature age also supports nursery industry strategies for the provision of high quality, high-value container and ex-ground tree stock to local government and developers. Consultation in other towns and cities may highlight a different set of home buyer preferences.

BRISBANE'S GREENSCAPE TARGETS

- Restore 40 per cent of mainland Brisbane to natural habitat by 2026

- Continue to be the capital city with the highest level of biodiversity in Australia

- Reconnect ecological corridors that facilitate wildlife movement

- Provide 50 per cent tree shade cover to footpaths and park pathways

- Maintain 95 per cent of Brisbane's population living within a five minute walk to a local park

Local governments prefer tree species that are compatible with ground-based pruning.

LINKS TO RESOURCES

Standards Australia, 2015 *AS2303:2015 Australian Standard Tree stock for landscape use*, available from www.standards.org.au

Streetscape design, Brisbane City Council 2014. http://www.brisbane.qld.gov.au/planning-building/planning-guidelines-and-tools/superseded-brisbane-city-plan-2000/centres-design-detail-manual/streetscape-design

Kendal, D., Williams, N. S. G. & Williams, K. J. H. 2012. Drivers of diversity and tree cover in gardens, parks and streetscapes in an Australian city. *Urban Forestry and Urban Greening*, 11, 257-265.

'Valuing Trees: What is Nature Worth?' Research Report for National Tree Day 2014. http://treeday.planetark.org/research/

202020 Vision: www.202020vision.com.au