



THE UNIVERSITY OF  
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School of Ecosystem and Forest  
Sciences



# Road verges for people and biodiversity

More than a third of all public open space in Melbourne is nature strip, and this unique type of open space is the city-wide park we walk out into when we leave our homes, which is a vital resource for urban greening that can provide many benefits for people and biodiversity.

Adrian Marshall [ajm@unimelb.edu.au](mailto:ajm@unimelb.edu.au)

## Background

Road verges are a ubiquitous form of green space that contribute to urban biodiversity, ecosystem function and human amenity. We know greenery in the street can provide habitat, shelter and resources for a wide range of species from bees and butterflies to birds and bats. We also know street greenery helps mitigate the urban heat island effect, and it improves water infiltration into soils, retarding peak flows into our creeks and rivers and helping avoid urban stream syndrome. Street greenery also helps make the street a social space and improves walkability, with consequent reduction in lifestyle diseases such as obesity and heart disease.

This project looks at how we can maximise the benefits of road verges. To do this, I asked: What spatial, environmental and social drivers underpin road verge extent, distribution and vegetation?

## Approach

I investigated road verges across 47 mostly residential neighbourhoods in Melbourne, Australia. I quantified their extent and distribution related verge gardening undertaken by residents. I also surveyed residents on their beliefs regarding the road verge and verge gardening, and I characterised the flora of the road verge understorey.

## Research findings

Green space within the road easement constituted 7.0% of land cover and 36.7% of all public green space. The percentage of the road easement that was green space was positively correlated with date of neighbourhood development, footpath absence, social disadvantage and parcel size. Streets with a greater percentage of road easement green space were associated with residential parcels that had a greater percentage of garden. Verge gardening was common, occurring in almost a quarter (22.1%) of

verges and in almost every block in every neighbourhood.

I investigated two types of verge gardening: resident-planting of understorey and resident-planting of street trees. The absence of footpaths was a major driver of both. Properties with no adjacent footpath were 5.27 times more likely to have understorey verge gardening, and 2.06 times more likely to have resident-planted street trees, than those with a footpath. Tree cut-outs (also called tree pits) were a second major driver of understorey verge gardening, 1.75 times more likely to be gardened than standard verges. Local roads were 3.74 times more likely to have understorey verge gardening than major roads.

Age of street was negatively correlated with understorey verge gardening. Social contagion was also present, with the presence of verge gardening in a neighbouring property increasing the likelihood of verge gardening by 9%. By surveying residents, I identified

cultural background, gardening enthusiasm, sense of community and level of education as significant factors differentiating respondents who planted verge understorey, who planted street trees and who did not verge garden. Verge gardeners were less likely to be constrained by others' perceived disapproval of verge gardening, compared to residents who didn't verge garden. In particular, residents were constrained by their perceptions of local government attitudes, much more so than their perceptions of neighbours' attitudes or housemates' attitudes.

Floral surveys identified 150 species, of which 82.7% were exotic, with native species mostly introduced through verge gardening. Species richness, abundance and composition were driven in part by residents' verge gardening behaviour, mowing frequency, rainfall, soil compaction and canopy openness, but there may be other drivers such as the degree and frequency of disturbance.

Verge gardening increases the overall species richness of verges, doubles the number of native species, and introduced structural complexity, suggesting that verge gardening can significantly contribute to quality and complexity of urban greening through the summed effect of the many small acts of citizen greening.

## Research implications

The extent of the road verge, combined with its city-wide distribution, makes the road verge a green space component of fundamental importance to our urban ecosystems. Its varying distribution and extent across neighbourhoods means its significance also varies across the urban area. Verge gardening promotes further verge gardening in a positive feedback loop. The influence of footpaths, road type and tree cut-outs shows that urban design can encourage this resident greening of public space.



Municipal authorities are well-positioned to lead change through reframing policy. Planners, landscape architects, urban foresters, engineers and ecologists should work together to reimagine the ecological and greening roles of existing and future road easements. The potential for road easement green space to provide for the biodiversity, ecosystem function and human amenity now being demanded from urban green spaces is much greater than previously thought

## References

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## Contact

Adrian Marshall  
Grassland Project Officer|  
ajm@unimelb.edu.au



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