

Where is the SPACE for new trees

Where did all the space for trees go?

In terms of all the benefits of trees, including aesthetic, social and environmental benefits, most research suggests that the greatest benefit is derived from large trees. Sustainable tree growth requires space and large trees need more space. However, in terms of residential development space for trees is always a compromise..and it is the trees and space for trees that is compromising.

How did we get to the point where a new dwelling can have no real usable open space and no space for existing trees or even for the planting of new trees? The trend for larger dwellings on smaller blocks has been around for some time but who said this was a good idea? There does not appear to be a gradual change. Space was there and now its not!

Prior to a certain date suburban form still had back gardens of useful size and a significant covering of trees. Professor Tony Hall in a Griffith University paper Where have all the gardens gone? (2007) states "...after a certain point in time, the construction of one type of suburban form was almost totally replaced by another."

Hall states that "residential built form is a product of commercial forces operating within a regulatory framework". The incentive is to now maximise floor area for the lowest cost resulting in square or rectangular forms with internal garages while forgoing amenity. Hall states that during the 1990s, a new suburban residential form emerged in Australia and the old one ceased to be built.

With the disappearance of the backyard there are significant disadvantages for the wider community:

- ▶ Reduced aesthetics
- ▶ Little or no biodiversity
- ▶ Poor microclimate, including loss of shade in hot weather and heat island effects
- ▶ Increased run-off
- ▶ Reduced carbon sequestration and pollutant removal
- ▶ Reduction in play and private areas
- ▶ Dark interiors & poor ventilation
- ▶ Increased electricity consumption

Hall states "The design of both the house and the space around it presumes an entirely indoor lifestyle, insulated from the prevailing climate and with little propensity for exercise."

With issues such as childhood obesity being a major nation-wide problem, the lack of outdoor recreation space is likely to be an additional factor at play.

Hall argues that built form is permanently changing the space for gardens (and trees). And....once its gone....its gone for good!

He states that the argument for the absence of private open space behind dwellings should not turn on what the current 'trends' are! If we let it, this argument rules out this open space permanently!

The suburban landscape has ceased to be one of large gardens with trees. These landscapes now tend to be confined to wealthier suburbs. Hall states that "This trend represents a loss that has serious ecological implications." "The narrow dimensions of the space around buildings Will lead to a substantial reduction in tree cover in perpetuity,.."

The implications for arboriculture is just as serious. Trees are being removed that will never be replaced. Not only is the tree gone but the space that was there to plant a replacement tree is now gone too!

Tree Soil Volume Requirements

Calculating the amount of soil required by a mature tree can assist in determining proper root zone volumes that provide a suitable growing environment for urban trees. The soil available to the roots needs a wide profile rather than deep. This is because roots proliferate in the first 500- 1000mm of soil. Soil at depths greater than this may not be utilized by the root system.

Several methods for calculating required soil volumes are available.

In this example we have used a modified version of the Crown Projection Method (CPM). This method uses the expected mature width of the canopy or half the expected mature height of the tree, whichever is greater, to provide a radial distance from the base of the tree used calculate the soil volume required. This method provides 0.6m³ for each 1m² of ground space within this radial distance (crown projection).

The calculation is straightforward and is based on the expectation that tree roots will utilise the top 0.6m of soil.

The calculation is represented as: Soil Volume (m³) = 3.14 x r²(m) x 0.6(m).

Therefore a tree with a height of 10 m and a crown spread of 16m would require the following soil volume:

Soil Volume (m³) = 3.14 x 8m² x 0.6m

Soil Volume (m³) = 121m³

However a tree with a height of 20 m and a crown spread of 5m would require the following soil volume:

Soil Volume (m³) = 3.14 x 10m² x 0.6m

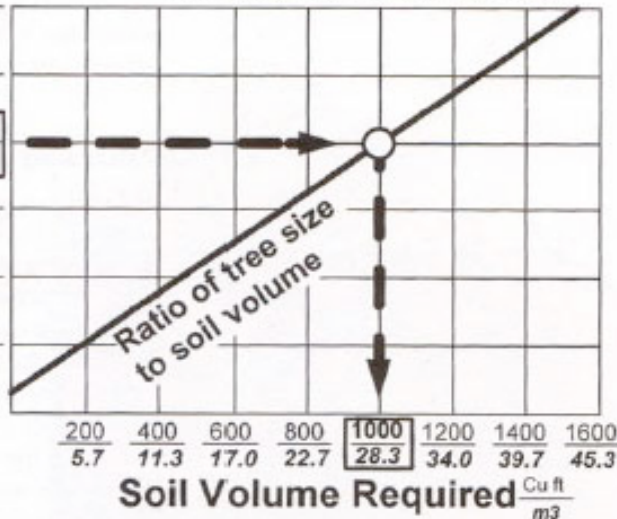
Soil Volume (m³) = 188m³

Adapted from Watson & Himelick (1997)

Ultimate tree size

Crown Spread Sq Ft	DBH-Trunk Diameter Inch
m ²	mm
1200	24
111	610
1000	20
92	508
800	16
74	406
550	12
51	305
350	8
32	203
150	4
14	102

Example: A 16 inch/406 mm diameter tree requires 1000 cu ft/28.3 m³ of soil.



This diagram shows the relationship between tree size and the amount of soil volume required for establishment and on-going growth. From: Urban, J. 2009 Up By The Roots

Matching Tree Species to Volume

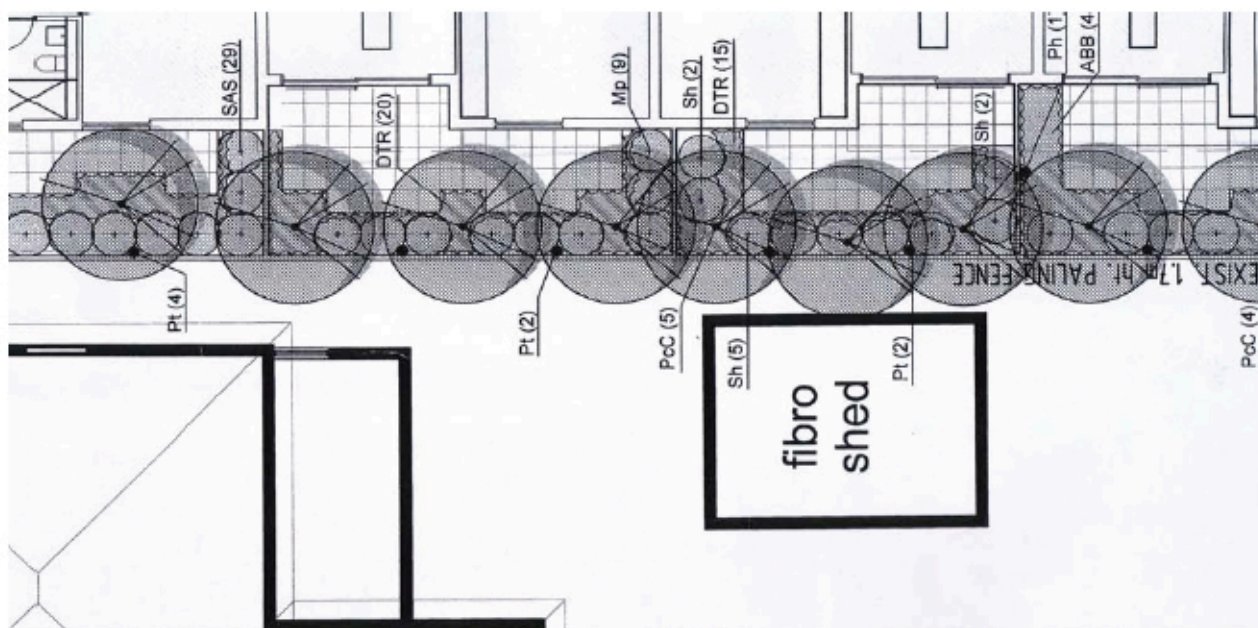
The following table highlights the potential ranges of rooting volumes for some of Melbourne’s most popular tree species.

Species	Common Name	≈ Rooting Volumes	Tree Size
<i>Acacia spp.</i>	Wattle	35-45m ³	Small – Medium
<i>Acer spp.</i>	Maple	30-40m ³	Medium - Large
<i>Betula spp.</i>	Birch	25-35m ³	Small - Medium
<i>Eucalyptus spp.</i>	Gums	30-100m ³	Medium – Large
<i>Fraxinus spp.</i>	Ash	40-50m ³	Medium – Large
<i>Hakea spp.</i>	Hakea	15-30m ³	Small
<i>Jacaranda spp.</i>	Jacaranda	40-60m ³	Medium
<i>Lagerstroemia spp.</i>	Crepe Myrtle	20-30m ³	Small
<i>Liquidambar spp.</i>	Liquidambar	40-100m ³	Medium – Large
<i>Pyrus spp.</i>	Ornamental Pear	40-60m ³	Medium
<i>Quercus spp.</i>	Oak	50-120m ³	Large
<i>Ulmus spp.</i>	Elm	50-120m ³	Large

Recent VCAT Decisions

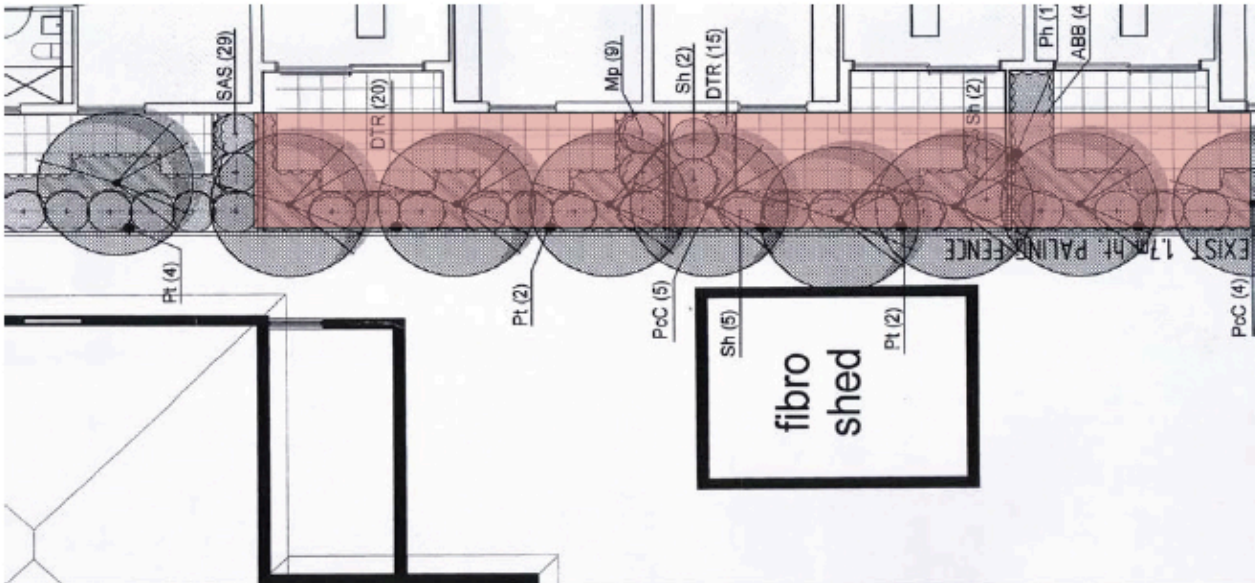
Railway Parade, Murrumbena:

19 dwellings over a significant basement (was 2 single-storey single dwellings)
 There are setbacks from the basement to the boundary fence lines of between 1.0 – 3.0 metres. The plan by the Landscape Architect shows a total of 42 individual trees to be planted (including 28 Capital Pears) and 151 shrubs (including 46 Lilly Pillys [clipped?])



One section where there are 9 Capital Pears shown measures 2.5 metres X 27.0 metres which equates to 67.5m³ of soil volume (assuming 1.0 metres depth of soil).

The table above indicates that Capital Pear is rated as being a 'medium' sized tree and requiring root zone volume for one tree of approximately 40-60m³. Yet we have a design that shows 9 trees in a space that is barely enough for 1 tree with the result being a short-term landscape solution.



The Chairman stated:

“The space available around the perimeter of the building is sufficient to establish a landscape setting for the building consistent with this planning context.

The submission that the layout of the basement does not provide sufficient space for the establishment of the canopy trees proposed in the landscape plan does not appear to be soundly based, and is in fact inconsistent with my experience of landscaping outcomes elsewhere in the metropolitan area;”

One can only ask what landscapes the Chairman was referring to and what his experience with landscape “outcomes” is ?

The Chairman stated that the argument that there was not enough space for new trees was not “soundly based”.

Why was the burden of ‘proof’ not on the Landscape Architect to show that there was enough space? What more did the Council opposing the development have to do?

Metaxas Architects Pty Ltd v Bayside CC [2007] VCAT 40 (15 January 2007)

I refer here to the landscaping report (by the LA), which provides details of this proposed planter bed approach. (This report refers) ...to such use of raised planter beds as a “...commonly implemented planting technique which has been used in many built form landscapes in residential Melbourne”.

In contrast, (Council’s Arborist and the Objectors) criticised this proposed use of raised planter beds as providing an inadequate amount of soil for the relevant trees to grow properly and to be secured in the event of high winds. Hence their evidence was that these trees are likely to grow to a much lower height than shown in the relevant elevation plans....

The Chairman stated that *“I am ultimately persuaded that the proposed use of raised planter beds is acceptable... I consider (the LA’s) evidence regarding the proposed use of the raised planter beds to be fundamentally credible.*

On one side of the ledger, I accept that the totality of evidence before me indicates that the growth potential of the new trees in the raised planter beds will probably be somewhat less than the ‘best case scenario’ put forward by (the LA).

All in all, I see the probable scenario with the proposed central landscaping as being that it will not be as expansive as (the LA's) evidence at its highest suggests, but this landscaping ultimately should still be acceptable.

To the extent that (Council's Arborist & Objectors) evidence conflicts with my findings set out above, that evidence is rejected. "

Highland Properties Pty Ltd v Glen Eira CC [2007] VCAT 1032 (11 June 2007)

The Chairman stated that *"We are satisfied that the proposed landscaping of the site is respectful of the neighborhood character and provides adequate opportunity for canopy tree planting. We reach this position having regard to the following:*

A detailed landscape plan was part of the advertised plans and shows some 125 canopy trees planted throughout the site and this will improve the canopy cover on this site.

We accept (the LA's) evidence in regard to the capability of planter boxes to support medium height trees. Our observations of existing planting in boxes on various sites together with examples provided by (the LA) support the contention that appropriate species planted in boxes can be healthy in the long term and contribute significantly to the landscape.

We are satisfied that the landscaping proposed through the centre of the site which includes a planting in a number of planter boxes is capable of contributing to the landscape character of the area, which we note is identified as low and medium scale. In this regard we agree with the findings of Member Martin in relation to planter boxes where he found that

...the growth potential of the new trees in the raised planter beds will probably be somewhat less than the "best case scenario" put forward by (the LA)."

Sharp v Glen Eira CC & Ors [2009] VCAT 1812 (2 September 2009)

The Chairman stated that *"The Responsible Authority was critical of the lack of landscaping opportunities due, it submitted, to the basement being located on the northern boundary and only 600mm off the southern boundary.*

This is considered to be another area where there must be some balance brought with providing increased housing.

The ground level dwellings each have areas of private open space that provide for landscaping that will contribute to the amenity of the future residents. The setback to the rear of the site allows for planting along the rear boundary and planting can be accommodated along the side boundaries within the private open space areas."

It should be understood that the VCAT Chairman is talking about tree planting in a 600mm wide gap next to a basement wall.