

4.0 Street Tree Placement and Design Guidelines

4.1 Overview

As a collective asset, street trees are considered and planted to reinforce the public realm and landscape design principles. In an urban context the emphasis is commonly to:-

- Provide more consistency and visual uniformity for each street;
- Enhance the local character of distinct streets or areas;
- Reinforce and celebrate key corridors and nodal intersections;
- Enhance key cultural and commercial sites and
- Allow the adjoining landscape to take precedence over the street tree planting where existing parks or important private gardens adjoin the street.

In adhering to these design principles consideration must be given to site specific conditions that will determine an individual tree's placements. These include footpath and verge widths, sight-line clearances, underground utilities, overhead wires etc. An overview of these considerations is provided in the following pages.

Consistency and Visual Uniformity on Main Streets

The intention of this principle is to establish a more uniform visual character for each of the main streets in the urban centres, creating a sense of identity or 'sense of place' that compliments the surrounding architectural forms and provides streets with a distinctive and recognisable character. Inconsistent street plantings with a large number of different species may be appropriate and can add interest to some special streetscapes. However, they are often more difficult for Council to manage and may not be appropriate in many locations.

In many cases the proposed species will be an extension or continuation of the dominant existing species, if that species has been deemed to be suitable in scale and growth habit.

Urban Centre based approach

All new planting will be based on a centre based approach where tree species selection and planting will help reinforce the distinct physical character and heritage of each urban centre and be responsive to its unique environmental conditions.

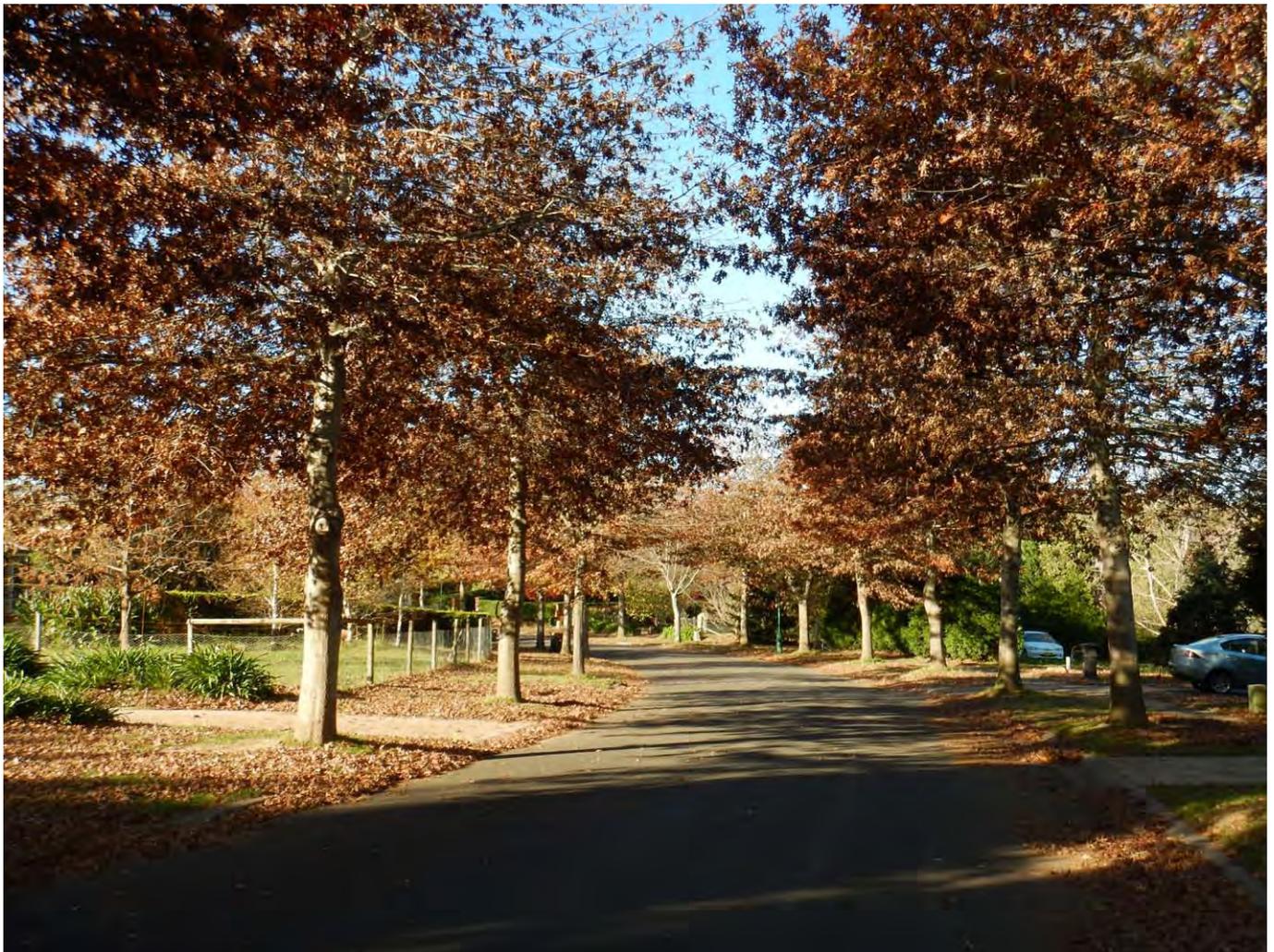


Figure 4.1 - The consistency and uniformity of Pin Oaks planted on Isabella Way, East Bowral gives the street a distinct character and appearance. A similar consistency and uniformity can be achieved with mixed species avenues provided the species selected have similar growth rates and forms. (Photo - Arterra)

Mixed Species

Most streets have been designed to have a small mixture of species. This may, for example, be in the form of one side of the street being a smaller species to fit under overhead wires and a larger species on the other side where absence of services and verge space permit. Issues such as tree supply, tree planting, tree maintenance and street cleaning frequency are all more difficult with highly mixed species streets.

Some streets may also benefit from a planned alternating mix of species. These are usually designed to cater for the continuation of a pre-existing street condition and importantly to balance the provision of native and exotic trees and/ or deciduous and evergreen trees. Attempts may be made to alternate the two (or more) species to provide for the designed intention of the mixed species street.

The selection of species to plant and the exact location within the street shall be at the sole discretion of the Council. Individual requests by adjoining residents for one or other of the species will typically not be accommodated unless it is in an area where a palette is provided.

Increased Canopy Coverage

Subject to verge width and constraints such as overhead power lines and building setbacks, larger growing street trees will be selected wherever possible. Too often small trees are currently planted on both sides of a street, when a larger growing tree could have been planted on the non-wire side of the street. A larger canopy tree contributes to the aesthetics of the street and overall environmental performance.

Planting Adjacent to Parks

Many of Wingecarribee's parks have very prominent boundary tree canopies that often contribute or even extend over the adjoining streets. Introduction of competing street trees along these streets is usually discouraged in order to avoid intrusive impacts on the park and minimise any future canopy conflicts. This also allows larger and more major trees along the park edges to 'read' from the street.



Figure 4.2 - Trees planted in parks often contribute to the character and appearance of the street. Street tree planting can often compete with and detract from park trees under these circumstances. Berrima Road, Moss Vale is an example where street tree planting would detract from the Pin Oaks growing in the adjacent park. (Photo - Arterra)



Figure 4.3 - A mix of deciduous and evergreen trees in a street can often achieve the desired outcome of allowing warm winter sun into the street and private properties while maintaining a portion of year round colour and interest. (Photo - Arterra)

General Solar Access

Street tree species should be selected to provide an appropriate level of solar access to dwellings. This applies most prominently to the more urban areas and where there are smaller dwellings on the southern side of the carriage ways.

This becomes less of a consideration where houses are on larger lots and are set back from the street. In these instances the street trees typically have smaller influences and the residents have an opportunity to manage and consider their sunshine and shade requirements within their own gardens and open areas.

Unreasonable requests for tree removal or excessive pruning for solar access will typically be rejected by Council.

Solar panels or Digital Data Receiver Access Considerations

Council shall consider this factor when planning any new tree planting. If a resident already has legally installed solar panel collectors or a digital data receiver and their performance is significantly diminished by a street tree, the pre-existing arrangement should stand. That is, was the tree there first or was the receiver/ panel installed prior to any street tree planting.

Even if the tree was small when the panels or receiver were installed, if it was reasonable for the mature size of the tree to be estimated and considered, then Council shall not be expected to prune the tree to maintain it at a smaller size.

If a resident currently relies on solar access for the operation of such a device Council will typically avoid planting a new tree that will unreasonably shadow the device. They may do this by repositioning the tree or planting a smaller tree species. The same will apply for any replacement tree planting. If the tree was originally large and shadowed the receiver, any replacement tree shall be also allowed to reach similar proportions without Council being expected or required to prune it.

Driveway Access

Where there is a request to expand an existing driveway or install a new driveway (or other access) to a private property and it requires the removal of a street tree, the following considerations shall be assessed in reaching a determination.

- Are there alternate options to relocate the driveway?
- How significant and prominent is the tree and its contribution to the local streetscape?
- Is the tree healthy and vigorous?
- Are there suitable alternative locations for a replacement street tree?
- Allocation of removal and replacement costs if a replacement tree is agreed.



Figure 4.4 - Solar access for private properties is an important consideration when planting new street trees. (Photo - Arterra)

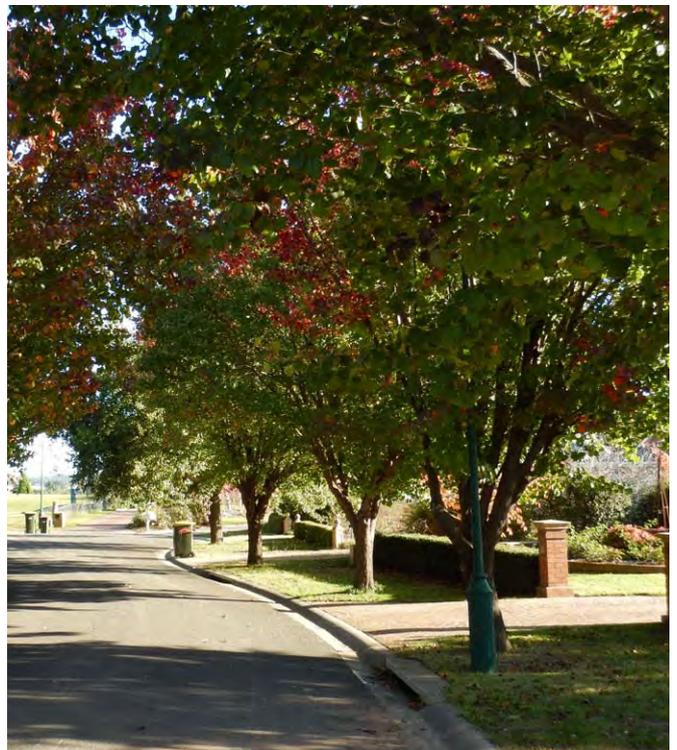


Figure 4.5 - Sightlines for motorists entering and exiting private driveways needs to be considered when spacing street trees. The location of new driveways should take into consideration the location of existing street trees. (Photo - Arterra)

4.2 Locating Street Trees

There are many limitations to the positioning of street trees on verges immediately behind the kerb. Distances from infrastructure elements such as intersections, pedestrian crossings, light and electricity poles, stormwater inlets, underground service pits and bus stops are important in determining final planting locations. Typically this will require individual site assessment and will be determined on a case by case basis.

Street Tree Spacing

Taking into account other relevant clearance requirements, street trees are to be typically planted as follows:

- small trees – spaced at a minimum of 7 to 10 metre intervals
- medium trees – spaced at a minimum of 10 to 15 metre intervals
- large trees – spaced at a minimum of 15 to 20 metre intervals

Sight Lines and Distances from Infrastructure

It is important to identify existing or proposed road elements and infrastructure when placing trees within a street. Acceptable clearances and sight lines to intersections, signs, light poles, crossings and other road elements should be maintained. The following table outlines the standards that Council will typically apply with regard to tree placement. These dimensions are for typical streets and may need to be increased depending on the design speed of the streets.

Council may consider alterations to these dimensions when the placement of the tree can be shown to not adversely affect safety or the future integrity of nearby infrastructure. Consideration shall also be given to pre-existing street trees and site conditions. Council will not normally remove a mature tree that has historically been planted within these distances unless the impacts of retaining the tree are found to be unacceptable and can't be otherwise mitigated through appropriate pruning.

Where possible, street trees should be located at least 3m (or 5m on 80km/h roads) from the edge of nearby travel lanes, but only when the verge is currently wide enough for this to reasonably occur. The width of roadside opportunities for parking or otherwise marked travel lanes can be taken into consideration when assessing this distance and does not necessarily mean the tree needs to be 3m from the edge of the "kerb". This distance is also a measurement to the centre of the new tree and not to the estimated edge of future trunk growth.

Table 2 - TREE PLACEMENT GUIDELINES	
Road and Layout Element	Typical Street Tree Planting Clearance
Street intersection - distance from projected line of the intersecting kerb line on approach side	10m
Street intersection - distance from projected line of the intersecting kerb line on non-approach side	7m
Stormwater inlet pit - distance from nearest edge of pit structure	2m
Driveway - distance from driveway edge on approach side	3m
Driveway - distance from driveway edge on non-approach side	2m
Traffic Lights - distance from signal pole on approach side	> 10m
Pedestrian crossings - distance from outer edge of crossing on either side	10m (on approach) 7m (on departure)
Street lighting pole - minimum distance from pole to centre of tree trunk (unless there are other light sources to consider)	3m
Cycle ways - clearance from edge of cycleway path to centre of tree trunk	0.5m

Bus Stops

Clearances and setbacks for trees near bus stops are to be determined typically on a case by case basis.

When a bus stop is proposed by other authorities to be installed in a street that currently has not had a bus stop or a bus stop is proposed to be relocated within a street, the existing street trees should be considered as a material constraint.

Existing street trees should not be unreasonably removed to facilitate a new bus stop unless all other possible alternatives have been explored. Where a bus stop is positioned adjacent to an existing street tree, the impacts to the trees roots and canopy shall be minimised to maintain the trees health and vitality.



Figure 4.6 - Street trees should be placed at a reasonable distance to ensure they have sufficient space to grow and reach their full potential. Stratford Way, Burradoo is an example where medium size trees (Claret Ash) have been planted close together and will compete with each other for essential resources and space. (Photo - Arterra)

Verge Widths and Treatments

Verges are varied throughout the LGA, as one would expect, given the range of periods in which the area was developed. Many streets have multiple verge widths and treatments along their length often changing from standard kerb and gutter, to roll-over kerbs to grass swale drain within a short distance. This presents many issues for establishing consistent street tree planting as the road edge is often hard to define and may vary. Likewise the verge width and treatment may be different on both sides of the road.

There are approximately 450 - 500 streets within the urban area across the whole LGA. Few are not capable of being planted with street trees due to space restrictions, however most do have opportunities or are currently planted with street trees.

The dominant verge width for each street was recorded at the time of assessment and is summarised as follows:-

- Less than 1% have verges less than 1.8m wide and would be described as narrow with many inherent difficulties in planting street trees.
- 17% have verges that are between 1.8 - 3.5m wide and would be considered small and difficult to plant larger trees.
- 55% have verges that are 3.5-5.0m wide and would be considered a medium or average size verge with minimal constraints to street tree planting.
- 28% have verges wider than 5m that would be considered large and provide no constraint to street tree planting.

There are many particularly large verges greater than 5m wide that have limited tree planting or are planted with only small trees. These streets present significant opportunities to increase the cover and quality of the urban forest through the planting of appropriate medium and large size trees.

The dominant verge treatment for each street was recorded at the time of assessment and is summarised as follows:-

- 18% Grass and Path
- 2% Fully Paved
- 80% Grass Only

The typical verge width and treatment combinations that occur in the urban areas are grouped into 6 typologies over the proceeding pages. The typologies are intended as a guide to assist in planning and implementing future tree planting works. Many streets will require the application of more than one verge typology in response to the different verge conditions along any given street.

Where verges have grassed portions, the tree shall be planted half way between the kerb and the edge of the concrete footpath. This method of planting allows a large area of water penetration to the roots of the tree and avoids some of the problems of pavement lifting by the roots of the tree. It also allows the tree to develop a more natural and radial root pattern. In this instance the species selection is based upon the overall width of the verge from the building/ boundary line to the back of the kerb, (i.e. small trees in narrow footpaths, medium trees in medium footpaths and large trees in wider verges).



Figure 4.7 - Hoddle Street, Burrawang is a good example of a small grass verge with a small tree planted in the middle of the grass area. (Photo - Arterra)

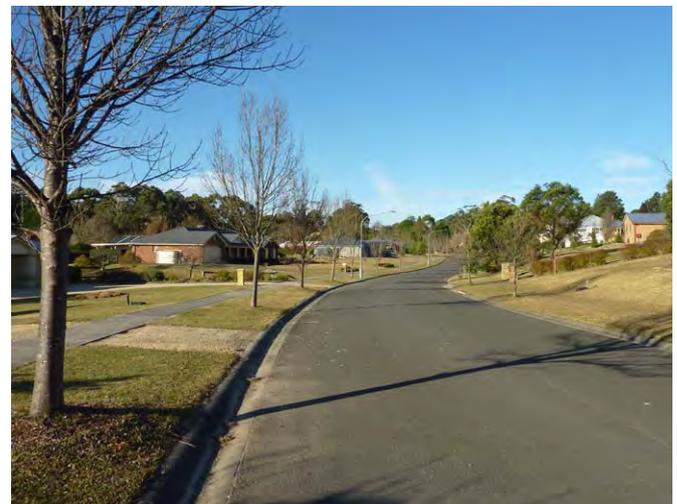


Figure 4.8 - Bromhall Road, Bundanoon is a good example of a medium size verge without powerlines with medium size semi-mature trees planted in the centre of the grass strip between footpath and kerb. (Photo - Arterra)



Figure 4.9 - Burrawang Street, Robertson is a good example of a large grass verge with medium size tree planted to the edge of the grassed swale drain. No kerb and gutter. (Photo - Arterra)

Tree Pit Dimensions

As an absolute minimum, an access width of 900mm is needed between the back of any tree pit and the building/boundary line. Since the minimum practical width of any tree pits is usually 600mm, the minimum width of a footpath that can be safely planted is 1500mm (600mm plus 900mm). This is also subject to the following other conditions: -

- that there are no obstructions overhanging the building line from the front yard of the adjacent property (eg. other trees, shrubs, vines, awnings) and;
- that the lower branches of the tree can be pruned to a height of at least 2400mm.

Further problems occur on very narrow roads where parking is restricted to one side only. Larger vehicles may tend to ride up over the kerb onto the verge to avoid parked cars. In this case trees may only be planted on one side of the street even if the verge is sufficiently wide.



Figure 4.10 - Bowral Street, Welby is an example of a large verge with powerlines offset towards the property boundary and no kerb and gutter. Opportunity to plant medium or large size trees with fastigiate form away from power lines. (Photo - Arterra)



Figure 4.11 - Bendooley Street, Bowral is an example of a small verge with medium size trees planted below ABC and in the centre of the grass strip between the footpath and kerb. (Photo - Arterra)



Figure 4.13 - Cupitt Street, Braemar is a good example of correct tree placement in the centre of the grass strip between the kerb and footpath. (Photo - Arterra)



Figure 4.12 - Queen Street, Mittagong is an example of a street with a small verge and in-road planting of medium size trees to reduce conflict with powerlines and adjacent properties. (Photo - Arterra)



Figure 4.14 - Sightlines and access for vehicles and pedestrians can be obscured by shrubs and low branching trees such as these Japanese Cedar on Viewland Street, Bundanoon. (Photo - Arterra)

4.3 Trees and Clearance Pruning for Roads and Power Lines

Priority ABC installation is typically given to streets to allow larger trees to be planted or to allow existing trees to continue unimpeded under wires before disfiguring pruning is undertaken. Trees that have already been trained around the wires should not be targeted, as the conversion of these streets will have limited benefits. The installation of ABC on any given street will be at the sole discretion of Council.

Relevant Legislation Regarding Roads

The removal or pruning of street trees is permitted in association with approved road works under sections 88, 107, 138 and 139 of the Roads Act 1993. Council is largely responsible for all planting, removal and maintenance of street and roadside trees.

Declared main arterial or 'State' roads are the responsibility of the Roads and Maritime Services (RMS) (previously the Roads and Traffic Authority). The Wingecarribee LGA contains several 'State' roads that fall under the jurisdiction of the Roads and Maritime Services (RMS). Many of the main arterial roads and 'State' roads pass through the urban centres and become the main street. In these instances different sections of the one road may be managed by both Local Council and RMS.

Relevant Legislation Regarding Power lines

Endeavour Energy is the state owned corporation responsible for the electricity network that provides power to Wingecarribee homes. Under the NSW Electricity Supply Act 1995 No.94, Endeavour Energy are responsible for ensuring street trees (as well as private property trees) are trimmed to maintain a minimum safety clearance between the tree and power lines. The typical safety clearance distance is 2.0m around bare, low voltage overhead wires and 2m around the power poles. In accordance with the Industry Safety Steering Committee Guidelines, the clearance distances described above may increase by 0.5m in bushfire prone areas. Where ABC is installed the safety clearance distances can be reduced to 0.5m in some instances.

If trees are within 3m of Endeavour Energy power lines, only vegetation management workers authorised by Endeavour Energy are permitted to carry out the pruning work. In theory, trimming is carried out by contractors who follow the Australian Standard AS4373-2007 Pruning of Amenity Trees. Endeavour Energy also employs qualified arborists to audit the work of their contractors. Each contractor is also supposed to employ arborists to monitor standards and ensure they are maintained.

4.4 Installation of Aerial Bundled Conductors (ABC)

From the ground ABC looks like a single thick cable however ABC contains the normal group of overhead services bundled together to reduce the cross sectional area necessary for the provision of overhead services. This method of cabling reduces conflict with trees. Pruning requirements are usually reduced and branches can be trained around the ABC more easily.

Priority for ABC conversion is given to major roads and particular problem streets where the conflicts between trees and overhead services are identified. Wingecarribee Shire Council and Endeavour Energy maintain an ongoing program to convert some conventional overhead wires to Aerial Bundled Conductors (ABC), however the cost of this conversion is considerable and is not favoured by Endeavour Energy due to the reduced life expectancy of the cables.



Figure 4.15 - Tree placement should consider existing and future (where possible) locations of above and below ground services. Large trees should be avoided near powerlines. (Photo - Arterra)



Figure 4.16 - Avoid planting trees under powerlines where existing planting on private property contributes to the character of the streetscape. Aitken Road, Bowral. (Photo - Arterra)

4.5 In Road Planting and WSUD

Many roads throughout the LGA have opportunities for additional and larger street tree planting, if the planting is located within the vehicular carriage way rather than the verge. This also allows trees to be planted in streets that have narrow grass strips or where overhead wires or awnings would otherwise present great challenges to achieving successful tree planting.

Any in-road street planting proposed will need to take into consideration the existing traffic and signage visibility, lot access and parking issues, underlying soil conditions and services. Council will aim to minimise disruptions to, or excessive removal, of parking spaces. Special attention will be paid to achieving appropriate drainage towards the tree planting together with adequate soil volumes, road pavement

protection, and trunk protection where necessary via bollards or preferably barrier kerbs.

The objective is to plant reasonable sized street trees that are away from overhead power lines and provide a more aesthetically pleasing street. This also allows trees to be planted further away from adjoining houses/shops, reducing any impact of street trees on adjoining properties. Many of these opportunities could be combined with rearrangement of parking and provisions of perpendicular or angled parking to minimise any parking loss.

Water Sensitive Urban Design (WSUD) opportunities should be considered when designing in-road planting, subject to the constraints imposed by tree pits, drainage and normal rain garden parameters.



Figure 4.17 - In-road planting opportunity in Victoria Street, Mittagong. A wide carriageway, overhead powerlines and narrow paved verges would prevent trees from being planted in this street. (Photo - Arterra)



Figure 4.18 - Photomontage showing potential in-road planting on Victoria Street, Mittagong. Street tree planting on Victoria Street would help define it as part of the urban centre and would improve the amenity of the street for pedestrians. (Photo - Arterra)

4.6 Gateways to Urban Centres

Creating a sense of arrival for each urban centre through consistent and distinct street tree planting rather than traditional gateway planting is recommended. Each experience should be unique and respond to the individual needs and character of that centre. The use of landmark trees at either end of a centre is less effective in creating a sense of arrival particularly in the Wingecarribee LGA where such planting would be lost in the complexity and scale of the existing trees and native vegetation. A carefully designed sign, sculpture or garden display may be more effective as an entry statement and in line with the character of the region.

4.7 Vegetation on Main Road Corridors Between Urban Centres

Tree planting and vegetation beyond the urban boundaries should be distinct from the trees in the urban areas to create a visual separation between the urban centres. Typically the planting should be native species or evergreen conifers that reinforce the rural or bushland setting.



Figure 4.20 - Gateway signage would be just as effective without adjacent exotic tree planting given the extent of established canopy in the background. (Photo - Arterra)



Figure 4.19 - The roadside vegetation between urban centres is dominated by large evergreen native trees and exotic conifers. This character should be maintained by ensuring exotic deciduous trees are not planted in these areas. Many of these areas also provide important corridors and links for native fauna to move between areas of bushland. (Photo - Arterra)