

TOWN OF BASSENDEAN

NOTICE OF A MEETING OF THE TOWN ASSETS COMMITTEE

Dear Committee Member

A meeting of the Town Assets Committee of the Town of Bassendean will be held in the Council Chamber, 48 Old Perth Road, Bassendean, on Wednesday 10 July 2019, commencing at 10:00am.



Ms Peta Mabbs
CHIEF EXECUTIVE OFFICER

5 July 2019

1.0 DECLARATION OF OPENING/ANNOUNCEMENT OF VISITORS

Acknowledgement of Traditional Owners

The Town of Bassendean acknowledges the past and present traditional owners of the land on which we gather to conduct this meeting, and pays its respects to their Elders, both past and present.

2.0 ATTENDANCES, APOLOGIES AND APPLICATIONS FOR LEAVE OF ABSENCE

3.0 DEPUTATIONS

4.0 CONFIRMATION OF MINUTES

4.1 Town Assets Committee Meeting held on 19 June 2019

OFFICER RECOMMENDATION – ITEM 4.1

That the minutes of the Town Assets Committee meeting held 19 June 2019, be confirmed as a true record.

5.0 ANNOUNCEMENTS BY THE PRESIDING PERSON WITHOUT DISCUSSION

6.0 DECLARATIONS OF INTEREST

7.0 BUSINESS DEFERRED FROM PREVIOUS MEETING

8.0 REPORTS

8.1 Update - Tree Planting in the Town

As per Council's direction, the Parks Department of the Town has purchased 200 trees to be incorporated into the Street Tree Planting Program. The species include:

- 10 Chinese Elm;
- 50 Flooded Gums;
- 50 Spotted Gum;
- 30 Claret Ash; and
- 30 Chinese Pistachio.

The planting program will commence on the 5 July 2019 and will run for approximately two weeks. Residents can nominate a location and choose from the species provided.

OFFICER RECOMMENDATION – ITEM 8.1

That the Town Assets Committee notes the update on tree planting in the Town.

8.2 Tree Protection in the Town

Officers are currently examining other jurisdictions and local governments in WA to assess what mechanisms they have in place to promote greater preservation of trees particularly on development sites.

A report and recommendations will be referred to the next meeting of the Town Assets Committee.

OFFICER RECOMMENDATION – ITEM 8.2

That the information be received.

8.3 Old Perth Road Street Tree Audit (Ref: GOVN/CCLMEET/1); Ken Cardy, Manager Asset Services)

APPLICATION

The purpose of this report is to provide Arbor Carbon's audit finding to the Town's Asset Committee regarding, existing streetscape plantings in Old Perth Road, and identified areas to increase street tree canopy and greenness of the area.

ATTACHMENTS

Attachment No. 1:

- Arbor Carbon Street Tree Audit; and
- Street Tree Pruning, Removal and Replacement Policy.

BACKGROUND

At its meeting held in August 2018 (OCM-28/10/18) Council recognised that the current street trees in Old Perth Road were not providing significant shading or amenity to the Town's main street and therefore requested staff carry out an audit of the street trees to identify opportunities for increasing canopy through either:

- Additional plantings with broad canopy trees;
- Transplanting/replacement of existing smaller and/or narrow tree species with broad canopy trees;
- Explore other possibilities for further greening of Old Perth Road with additional plantings (ie: pots, planter boxes, wall gardens, etc);

COMMUNICATION & ENGAGEMENT

Through the Town’s procurement process, two contractors provided a quote - Arbor Carbon and Bowden Tree Consultancy. Arbor Carbon was contracted to undertake the requested works as it was deemed the best value for money.

No community consultation has been undertaken.

STRATEGIC IMPLICATIONS

Strategic Priority 2. Natural Environment

Strategies <i>How we’re going to do it</i>	Identified Project / Program	Strategic Measures of Success
2.2.1 Protect and restore our biodiversity and ecosystems 2.2.2 Sustainably manage significant natural areas	Review strategy and plan for the protection and rehabilitation of natural areas. Increase purchase, planting & maintenance of street trees:- 412 to 600 trees –Eden Hill area and Ashfield (Underground Power area	Community / Stakeholder Satisfaction Survey (Rivers, Bushland and Reserves)

COMMENT

Old Perth Road contains 116 trees, primarily in the public streetscape land with several of the more significant trees found in private land or in Council property, such as those outside the Council buildings. The total canopy coverage within the streetscape is estimated to be 13.4%.

The dominant tree species (71.9%) in the Old Perth Road streetscape are *Melaleuca quinquenervia* (broad-leaved paperbark) and *Triadica sebifera* (Chinese tallow).

The *Melaleuca quinquenervia* trees are well established and make up 39.7% of the total number of trees within Old Perth Road and provides 47.3% of the total canopy cover. The *Triadica sebifera* tree makes up 41.4% of the total tree numbers and provides 24.6% of the total canopy cover. These trees generally have a narrow form with a dense canopy, which makes them well suited to their position in the medium strip.

It was noted that the health of the *Triadica sebifera* trees was generally poor, with several individuals displaying a stunted growth form. Symptoms included frequent branch dieback, foliar chlorosis, sunscald and vandalism. Many trees displayed an unstable root plate indicating poor root system development, and below-ground investigation revealed evidence of girdling roots.

(Girdling roots are lateral roots that emerge at or slightly below the soil surface and cut into at least one side of the main trunk. These roots restrict the movement of water and nutrients to the leaves as they put pressure on the trunk).

Arbor Carbon advised that its calculations show the estimated maximum current canopy area, including Crown land, within the street verge, is 15,994.2 m² and currently, 2140.9 m² or 13.4% has canopy. The Town's canopy target for the street verge area is 70%.

Arbor Carbon is suggesting that the simplest and cheapest option to improve canopy coverage within the street, would be to remove and replace all poor performing *Triadica sebifera* (Chinese tallow) as many of these trees have been planted for 4 to 5 years and are in a declining state of health. The principle reason for the poor performance is the quality of the initial planting stock, for which there is no remediation possible.

Replacing these trees with a tree species with a greater potential crown size at maturity is recommended. However, the lack of sufficient soil volume of suitable quality will likely restrict the crown volume possible in many of the planting spaces. *(Due to available size of pit only 90L trees \$300 / tree to buy & plant and \$480 to remove current tree).* A list of possible tree species is within the attached report.

Other options suggested with estimated costs are to:

- Create additional tree pits in available spaces, mainly footpath areas. *(\$5,000 per tree pit)*
- Create additional planting pits in existing car bays. *(\$5,500 per tree pit)*
- Reclaim car parking spaces for additional alfresco dining spaces with incorporated greening and tree planting spaces. *(\$20,000 - \$30,000/space)*
- Create additional tree pits in available (middle of) new roundabouts at road intersections. *(\$350,000/roundabout)*
- Installation of planter boxes and garden beds in narrow areas where trees are not suitable. *(\$500 /flower box)*
- Addition of a green wall feature piece or climbing plants to cover bare wall *(\$2,000 per wall)*
- Hanging plants from awnings or the addition of climbing plants on supporting posts to add vibrancy to the streetscape. *(no cost available)*
- Create an "arbor" over the first section of Old Perth Road where there is no medium strip. *(no cost available)*

The Town's Engineering Design Unit has provided estimated costs associated to most of the above options. Actual cost figures for each option, identified by the contractor, will be provided to Council pending the project's direction.

RISK ASSESSMENT

Nil.

STATUTORY REQUIREMENTS

Nil.

FINANCIAL CONSIDERATIONS

No project items are listed in the Capital Budget 2019/20.

OFFICER RECOMMENDATION — ITEM 8.3

That the Asset Committee:

1. Receives the report findings from Arbor Carbon;
2. Supports the consideration of options for increasing tree canopy as part of the future development of a precinct plan for the Town Centre.

9.0 CLOSURE

The next meeting is to be held on Wednesday 9 October 2019, commencing at 10am.

ATTACHMENT NO. 1



Old Perth Road Street Tree Audit

Town of Bassendean

Report No. J19384

29 May 2019

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Approved & Released by	Position	Approval Signature
Dr Paul Barber	Managing Director	

REVISION SCHEDULE

Revision	Report Description	Submission Date	Author(s)
A	Old Perth Road Street Tree Assessment	29/05/2019	Briony Williams Dr Harry Eslick Dr Paul Barber

DISCLAIMER

ArborCarbon Pty Ltd has prepared this document using data and information supplied from Town of Bassendean and other individuals and organisations, who have been referred to in this document.

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Any conclusion and/or recommendation contained in this document reflect the professional opinion of ArborCarbon Pty Ltd and the author(s) using the data and information supplied. ArborCarbon Pty Ltd has used reasonable care and professional judgement in its interpretation and analysis of data in accordance with the contracted Scope of Works.

Executive Summary

The Town of Bassendean (the Town) recognize that their existing street trees are not providing significant shading or amenity to the Town's main street, Old Perth Road. Old Perth Road is culturally and historically important to the Town. It begins at the Bassendean Train Station, and extends approximately 1.2 km to the east. It has numerous cafes and restaurants, the Town's library, community centre, and Town of Bassendean Council Information Centre. The Old Perth Road Markets are also held there monthly.

ArborCarbon were engaged by the Town to audit the existing streetscape plantings in Old Perth Road, and identify areas to increase canopy and greenness of the area.

ArborCarbon consultant's Dr Harry Eslick and Briony Williams visited the site on the 2nd of May 2019. All trees on old Perth Road between Guilford Road and West Road were surveyed and examined. An image was taken of each tree and its location, species, position, stem diameter and height were recorded along with a brief above-ground health inspection. Root plate stability was assessed by applying pressure to the main stem and observing movement of the soil and root plate. Examination of the below-ground root structure was conducted on several trees by gently removing the surface soils to expose the lateral surface roots.

The audit of current street trees found the current canopy cover within the street was 13.4% which is regarded as insufficient by council. Roughly half of the current canopy area is provided by *Melaleuca quinquenervia* in the median strip. A tree planting program was initiated in 2013 that has involved establishment of mainly *Triadica sebifera* within planting pits created in the footpath and between car-parking bays. These trees have in general performed poorly. Our limited inspection suggests that the primary reason for the poor establishment was poor quality nursery stock resulting in girdling roots and poor root development.

There currently exists relatively little space within the street for additional tree planting without compromising other functions of the street. A range of possible options is presented for consideration by council including a summary of their benefits and limitations. The most cost-effective option to increase canopy is likely to be replacement of the existing poor performing *T. sebifera*. These trees in their current form are unlikely to thrive in the future and are likely to die within the next 5-10 years regardless of management. Achieving the ambitious target of 70% canopy cover is unlikely to be possible without the implementation of major changes, such as replacing current median trees with high-quality advanced tree stock of species with a greater potential crown area once mature. The use of structural cells is recommended for any future tree planting within the street in order to maximise the health, growth rates and potential crown size of tree planted therein.

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1 Introduction

The Town of Bassendean (the Town) recognize that their existing street trees are not providing significant shading or amenity to the Town’s main street, Old Perth Road. Old Perth Road is culturally and historically important to the Town. It begins at the Bassendean Train Station, and extends approximately 1.2 km to the east. It has numerous cafes and restaurants, the Town’s library, community centre, and Town of Bassendean Council Information Centre. The Old Perth Road Markets are also held there monthly.

ArborCarbon were engaged by the Town to audit the existing streetscape plantings in Old Perth Road, and identify areas to increase canopy and greenness of the area.

1.1 Scope of Works

- Audit the street trees planted along Old Perth Road,
- Identify opportunities for increasing canopy through either:
 - Additional plantings with broad canopy trees;
 - Transplanting/replacement of existing smaller and/or narrow tree species with broad canopy trees;
 - Explore other possibilities for further greening of Old Perth Road additional plantings (e.g. pots, planter boxes, wall gardens, trellis etc; and
 - Provide a report on the results of the audit and options identified for increasing tree canopy & greening along the main street.

2 Methods

ArborCarbon consultant's Dr Harry Eslick and Briony Williams visited the site on the 2nd of May 2019. All trees on old Perth Road between Guilford Road and West Road were surveyed and examined. An image was taken of each tree and its location, species, position, stem diameter and height were recorded along with a brief above-ground health inspection. Root plate stability was assessed by applying pressure to the main stem and observing movement of the soil and root plate. Examination of the below-ground root structure was conducted on several trees by gently removing the surface soils to expose the lateral surface roots.

3 Existing streetscape

Old Perth Road extends from Bassendean Train Station approximately 1.2 km east to Brook Street. However, this analysis was limited to Old Perth Road up until it intersects with West Road, according to the survey design documents provided by the Town (Appendix 1). The dominant tree species in the existing Old Perth Road streetscape are *Melaleuca quinquenervia* (broad-leaved paperbark) and *Triadica sebifera* (Chinese tallow) (Table 1).

An estimate of canopy (vegetation more than 3 m in height) was calculated by delineating the crowns of trees using aerial imagery sourced from Nearmap (Figure 1). The analysis includes trees on Town of Bassendean owned land, as well as crowns of trees planted on private land that contribute to the streetscape. The current canopy area within the street area assessed was 2140.9 m² (Table 1). This equates to a 13.4 % canopy cover if the total area of interest is 15,994.2 m². The Town of Bassendean have suggested a target of 70% canopy cover is desired to enhance the aesthetics and amenity of the street.



Figure 1: Current canopy cover of Old Perth Road.

Table 1: Tree species present on Old Perth Road, and the canopy that they provide.

Species	Number	Canopy area (m ²)	Proportion of total canopy (%)
<i>Melaleuca quinquenervia</i>	46	1013.7	47.3
<i>Triadica sebifera</i>	48	596.9	24.6
<i>Lophostemon confertus</i>	5	200.8	12.6
<i>Calistemon viminalis</i> *	7	117.8	5.5
Other	10	211.7	9.9
TOTAL	116	2140.9	100

* Not on Town of Bassendean owned land but still contributing to canopy of streetscape.

Melaleuca quinquenervia make up 39.7% of the total number of trees contributing to the streetscape of Old Perth Road, and provide 47.3% of the canopy cover (Table 1). The *M. quinquenervia* are planted single file down the median strip (approximately 1.8 to 2.2 m wide) (Figure 2A) of the majority of Old Perth Road, and are well established (planted over 10 years ago). They have a generally narrow growth form (Figure 2B)

with dense canopy, which makes them well suited to their position in the median strip. However, they do not provide as much canopy as a tree with broader growth form. They can be structurally pruned to have a broader growth form (Figure 2C). *Melaleuca quinquenervia* roots are known to cause structural damage to their surrounds when planted in similar scenarios. There was minor cracking and uplifting of the median strip curb and surrounding road (Figure 2D). Root barriers were observed around the root systems of some of the *M. quinquenervia* (Figure 2E), which may have reduced or delayed such root damage.

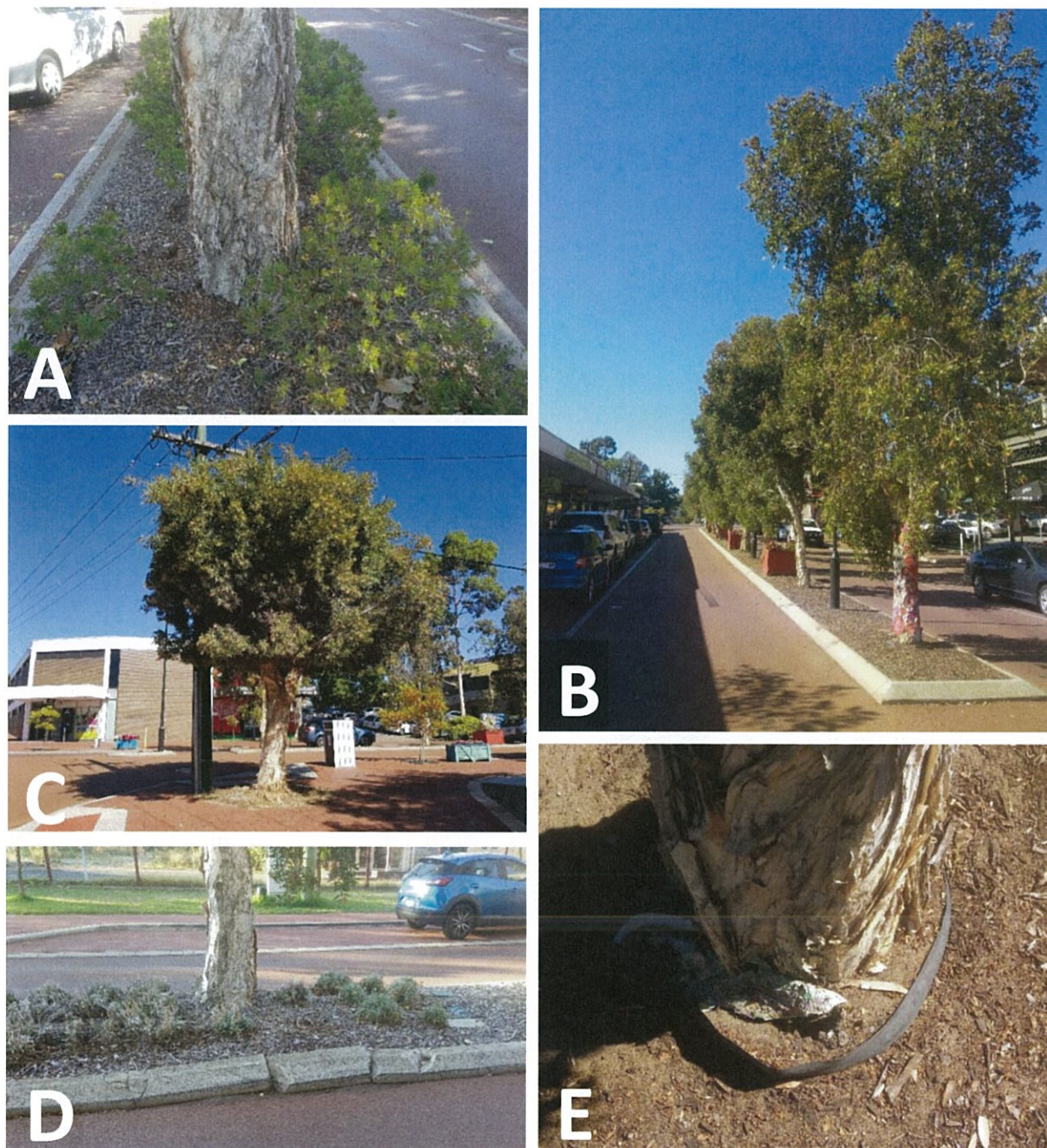


Figure 2: *Melaleuca quinquenervia* along old Perth Road, showing (A) their position in the median strip, (B) their narrow growth form, (C) their broad growth form, (D) damage to curbs from their invasive roots, and (E) root barriers.

Triadica sebifera make up 41.4% of the total number of trees planted along the streetscape of Old Perth Road, and provide 24.6% of the canopy (Table 1). An assessment of historical aerial imagery showed the

majority of these appeared to be planted between 2013 and 2014. The health of these recently established trees was generally poor. Several individuals displayed a stunted growth form (Figure 3A). Symptoms included frequent branch dieback, foliar chlorosis, sunscald (Figure 3D) and vandalism (Figure 3E). Many trees displayed an unstable root plate indicating poor root system development, and below-ground investigation revealed evidence of girdling roots (Figure 3B). These symptoms are often found in poor quality planting stock reflective of their sub-optimal growth and management in the nursery. In many cases, trees lacked a visible basal stem taper and appeared to be planted too deep or had received fill over their basal stem subsequent to planting (Figure 3C).

The use of planting pits of approximately 1m² is a fairly standard approach to establishment of trees in urban areas (Figure 3A). However, the soil conditions outside the direct planting pit are often very hostile to tree root establishment. Soil under roads and footpaths are generally highly compact, often including the use of high pH limestone sub-base material. The type of surface treatment also can prevent water infiltration into the soil. It is true that some trees are able to exploit these harsh soil environments. However, the number of species is limited and the rates of growth and mature tree dimensions will ultimately be restricted (Urban 2008). Where possible planting spaces should be increased to fill the available space and minimise footpath area. The remaining area of the planting space can be filled with ground level plants and shrubs, providing additional opportunity for greening and reducing radiant heat and physical damage to the basal stem which can be associated with tree pit covers. Alternatively, structural cells containing high quality imported soils with suspended hard surfaces provide good results, although these comes at a high cost.

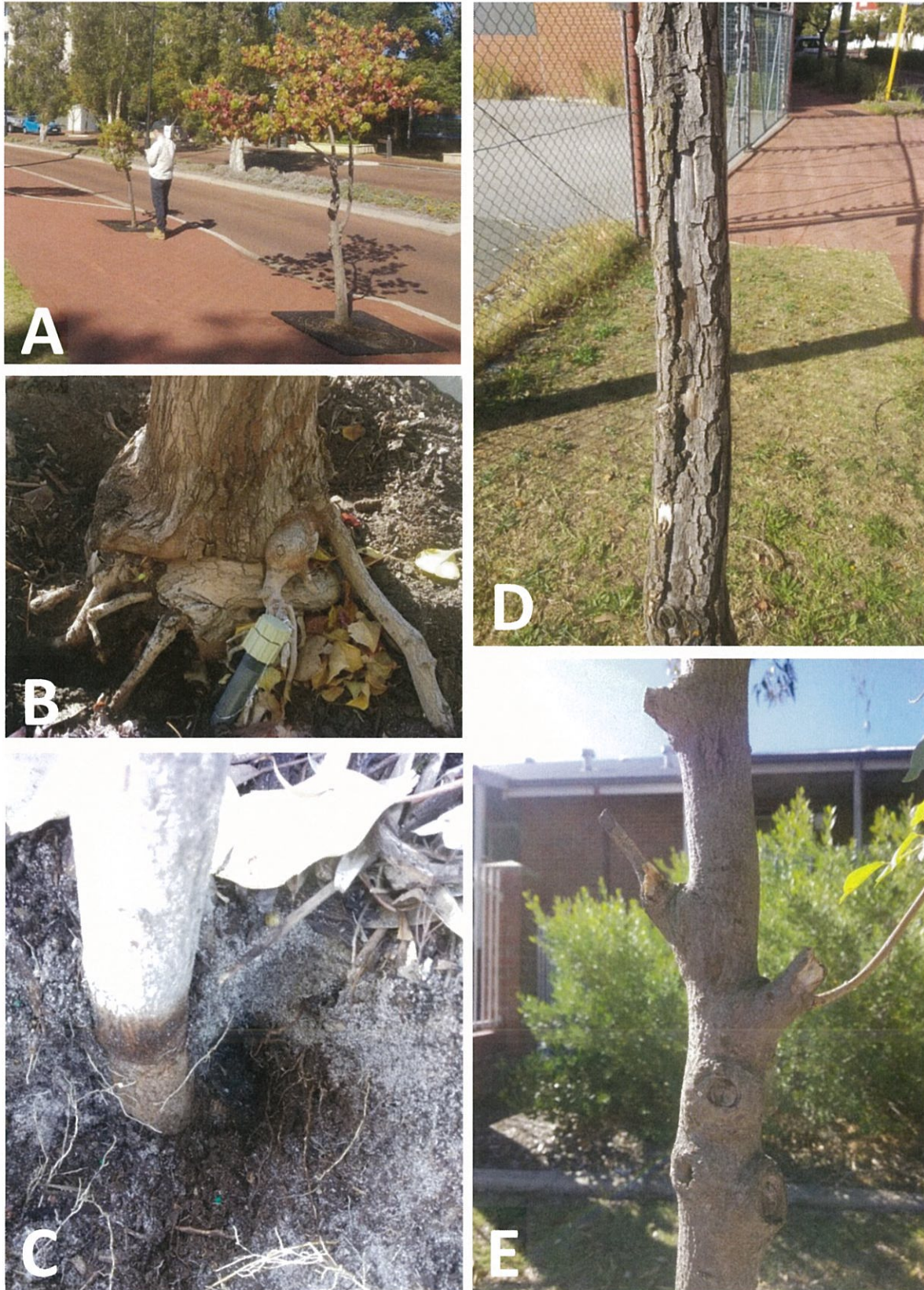


Figure 3: Examples of *T. sebifera* in poor condition: (A) stunted growth form, (B) girdling roots, (C) fill over basal stem, (D) sun-scald damage to the trunk, and (E) broken branches due to vandalism.

Many *T. sebifera* on the eastern end of Old Perth Road had severe sun-scald and mechanical damage to their trunks and branches, presumably from vehicles. This was particularly evident in specimens growing in roadside diamonds. The trees growing in roadside diamonds were relatively healthy when compared to many of the trees established in footpath planting pits. However, the extent of sunscald, and vehicle damage will likely reduce the lifespan of these tree in the future. Evidence of girdling roots was also observed in several specimens, which is likely to further reduce the life expectancy of these trees.

Relatively healthy *T. sebifera* were observed on Old Perth Road between Wilson Street and James Street. Examination of historical aerial photography showed these trees were planted in the same period as many of the other *T. sebifera* in 2014. Comparison of healthy and unhealthy *T. sebifera* established in the same year are presented in Figure 4.



Figure 4: Examples of unhealthy (A) and healthy (B) *Triadica sebifera* on Old Perth Road, both planted at the same time (2014).

A stand of mature *T. sebifera* were present on the south eastern end of Old Perth Road. These trees were greater than 10 years of age and appeared to be relatively healthy, with some evidence of minor branch dieback observed. Tree condition was, however, difficult to ascertain as the foliage was becoming senescent as the trees entered their dormant stage. These trees had a much larger soil area in which to grow which likely contributed to the success of these plantings (Figure 5).



Figure 5: Example of mature *Triadica sebifera* in good condition on south eastern end of Old Perth Road, planted in (A) larger carpark bay and (B) turfed area.

There were five mature, healthy *Lophostemon confertus* located on the eastern half of Old Perth Road. The trees had large, broad crowns (Figure 6A), and while they only made up 4.3% of the total number of trees, they contributed to 12.6% of the total canopy cover of Old Perth Road. Some individuals had raised garden beds built around them, bringing the soil level up around the base of the tree (Figure 6B), however, this has not appeared to have had a negative impact on the condition of the trees.



Figure 6: Healthy, mature *Lophostemon confertus* with (A) large, dense crown and (B) raised garden bed around base.

3.1 Audit findings

Old Perth Road contained 116 trees, primarily in the public streetscape land. Detailed assessment of the trees is presented in Appendix 2. Several of the more significant trees were found in private land or in council property, such as those outside the Town of Bassendean council buildings. The total canopy coverage within the streetscape was 13.4%. The main species contributing towards canopy was *Melaleuca quinquenervia*, which was planted almost exclusively down the median strip and accounted for 47.3% of the street's canopy area. A tree planting program was initiated in 2013, involving the establishment of mainly *Triadica sebifera* in new tree pits within the footpath and car parking area. These trees have generally failed to thrive or were in decline.

The main factors preventing the increased canopy development on Old Perth Road appear to be:

- Use of small to medium sized tree species with limited canopy area capacity.
- Low success rate of recently established trees primarily due to poor quality planting stock and root development
- Lack of high-quality soil volume to sustain crown growth.

4 Options for increasing tree canopy

Old Perth Road is a relatively dense and narrow commercial precinct with little space on the streetscape to support additional tree plantings. Increase in the canopy cover within the street from the current level of 13.4% to the ambitious target of 70% canopy cover will require major changes to the street form through a combination of optimizing the existing planting space to support additional canopy, as well as finding new spaces for tree planting. This may reduce space available for current uses, such as car-parking.

We have provided options below to increase canopy cover and green space along Old Perth Road. Benefits and limitations are presented for each option, and a qualitative scale from lowest (left) to highest (right) for each of the categories of cost; time to maturity; maintenance; visual impact; and canopy addition are presented based on a subjective determination by ArborCarbon. Cost has been estimated considering both the cost of advanced tree stock and installation as well as potential engineering works and material required for development of the planting space. For example, the cost of replacing the *T. sebifera* would involve tree removal, soil improvement and installation of new planting stock. Whereas replacement of median strip trees will involve additional costs associated with street closure, complications associated with road engineering and curbing. Time to maturity considers both the expected tree growth rate in the different environments and the potential canopy size. Trees planted in structural cells would be expected to reach maturity more rapidly than trees planted directly into field soil. Maintenance score is based on estimated annual maintenance requirement once the plants are established, eg. excluding two years of irrigation for trees. Visual impact is a highly subjective measure of the potential contribution to streetscape aesthetics. Canopy addition is based on the total potential canopy addition to the street as a whole, considering the potential crown size and the number of potential planting locations.

The simplest and cheapest option to improve canopy coverage within the street would be to remove and replace all poor performing *T. sebifera* (Chinese tallow) (Figure 7). Many of these trees have been planted for 4-5 years and are in a declining state of health. Our investigation suggests that the principle reason for the poor performance is the quality of the initial planting stock, for which there is no remediation possible. These trees could be replaced with a tree species with a greater potential crown size at maturity. However, the lack of sufficient soil volume of suitable quality will likely restrict the crown volume possible in many of the planting spaces.
















1. Replace poor performing <i>Triadica sebifera</i> (Chinese tallow)											
<p>Remove current poor performing Chinese tallow and replace with high quality stock.</p> <p>Benefits</p> <ul style="list-style-type: none"> • Opportunity to choose new species with greater potential crown size, which will vastly increase canopy cover. • Increase number of species planted. • Relatively low maintenance. <p>Limitations</p> <ul style="list-style-type: none"> • Lack of soil volume will restrict the species choices and final crown size • Number of available planting species. 	<table> <tr> <td>Cost</td> <td></td> </tr> <tr> <td>Time to maturity</td> <td></td> </tr> <tr> <td>Maintenance</td> <td></td> </tr> <tr> <td>Visual Impact</td> <td></td> </tr> <tr> <td>Canopy addition</td> <td></td> </tr> </table>	Cost		Time to maturity		Maintenance		Visual Impact		Canopy addition	
Cost											
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Maintenance											
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Figure 7: Replacement of poor performing *Triadica sebifera* with a species that has bigger potential crown size. The purple polygons are existing *T. sebifera* crowns, and the semi-transparent green polygons indicate potential canopy of poor performing *T. sebifera* are replaced with broader crowned trees. Note that some *T. sebifera* are could remain.

Similarly, there are still remaining spaces within the footpath area in which additional planting pits could be installed. The initial Old Perth Road drawings from 2013 (TOB 11-2013/1) (Appendix 1) identify several potential locations for additional planting pits which have not been utilised. It is possible that reasons exist for not adopting these planting locations which may be known within the Town. We have identified 40 potential new planting locations which could be developed (Figure 8).

2. Increased planting in available spaces

Create additional tree pits in available spaces, mainly footpath areas. Choose species with greater potential crown size.

Benefits

- Will increase shade provided to pedestrians
- Relatively low maintenance and potential for greater increase in canopy cover.

Limitations

- Lack of soil volume will restrict the species choices and final crown size
- Limited areas available to plant due to underground services and overhead structures

Cost



Time to maturity



Maintenance



Visual Impact



Canopy addition



Figure 8: Increased tree planting in available spaces. The semitransparent purple polygons indicate potential canopy of additional planting of short trees, which are located under powerlines or other overhead obstructions. The semitransparent blue polygons are potential canopy of additional planting of larger, tall trees.

In addition to finding space for additional planting pits within footpath areas, an option exists to develop new planting pits in areas currently reserved for on-street parking. This option allows for greater flexibility in the location and number of spaces for tree planting. Existing attempts to plant trees within diamonds placed in between car parking bays have been relatively successful compared to footpath pits established at the same time. However, increasing the size of the pits would increase tree growth rates, and also reduce the incidence of vehicle impacts which are likely to suppress the vigour of these trees. This would necessitate sacrificing car parking space for each tree.

3. Creation of new planting locations in car bays

Create additional planting pits in existing car bays.

Benefits

- Opportunity to choose species with large crown size.
- High flexibility in location and number.
- Reduced chances of conflict with underground services and powerlines.

Limitations

- Lack of soil volume will restrict the species choices and final crown size.
- Reduced space for car parking.

Cost



Time to maturity



Maintenance



Visual Impact



Canopy addition



Figure 9: An example of a section of Old Perth Road where car parking bays could be reclaimed and new plantings spaces for trees created, (indicated by the semitransparent green canopies).

The installation of parklets within existing car-parking bays is an increasingly popular form of increasing street vibrancy and greenery in similar commercial centres. Parklets are generally implemented by local businesses in partnership with the council, which may involve a fee for rental of the street space. Parklets are generally non-permanent structures, however, if developed in partnership with the council, permanent tree planting pits could be established within the parking area prior to establishment of the semi-permanent parklet installed above. These options are advantageous because the establishment and maintenance cost is passed on to the business owner, who benefits in the form of increased seating capacity and alfresco dining options.

4. Creation of parklets

Reclaim car parking spaces for additional alfresco dining spaces with incorporated greening and tree planting space.

Benefits

- Reduced chances of conflict of tree roots with underground services and powerlines
- Opportunities for partnership with local businesses

Limitations

- Lack of rooting volume will restrict the species choices and final crown size.
- Reduced space for car parking
- Low number of suitable locations.

Cost



Time to maturity



Maintenance



Visual Impact



Canopy addition

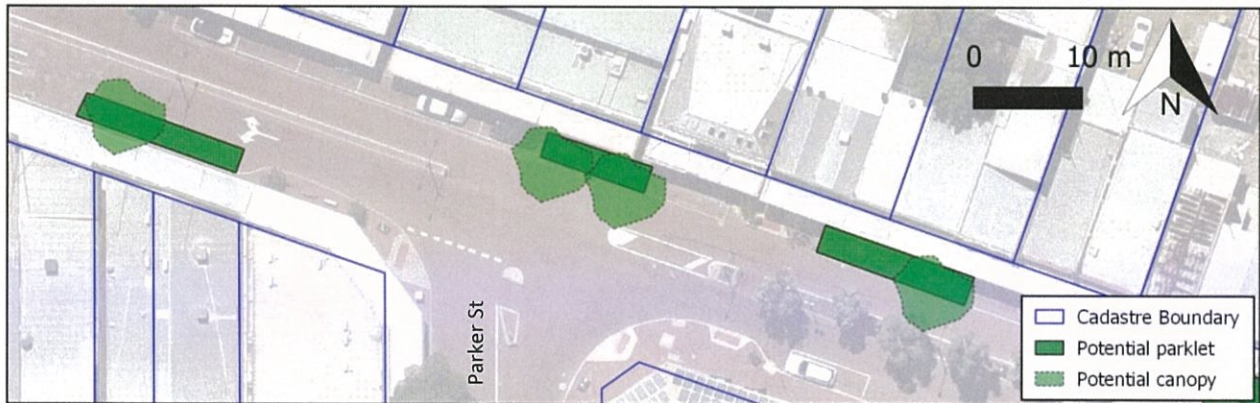


Figure 10: Example of the creation of parklets in reclaimed car parking bays. The shaded green polygons indicate the boundary of the potential parklet, and the semitransparent green polygons are potential canopy if broad crowned trees are planted within the parklet.



Figure 11: Two parklets established in former car parking bays now used for alfresco dining in the (A) Town of Claremont and (B) City of Vincent.

Some of the largest areas of exposed land within Old Perth Road are found at road intersections. There may be a possibility to install a small roundabout at the centre of each junction. This would allow a relatively large tree species to be planted without interference from overhead wires, or underground services, which is a limiting factor of tree establishment in footpath areas. Roundabouts may also have a traffic calming effect, making the street more attractive to pedestrians while improving traffics flows.






4. Roundabouts at road intersections with large internal planting spaces	
<p>Create additional tree pits in available the middle of a new roundabout at road intersection.</p> <p>Benefits</p> <ul style="list-style-type: none"> • Opportunity to choose new species with greater potential crown size. • May have calming effect on traffic. <p>Limitations</p> <ul style="list-style-type: none"> • May not be enough available space for new roundabout. • May increase overall road area, taking area away from footpaths. 	<p>Cost </p> <p>Time to maturity </p> <p>Maintenance </p> <p>Visual Impact </p> <p>Canopy addition </p>



Figure 12: Potential canopy if new roundabouts are installed and large trees are planted in them. The dark circles are the proposed roundabouts, and the semitransparent green polygons are the potential canopy.

The installation of additional gardens beds and planter boxes has the potential to make a significant contribution the streetscape aesthetic (Figure 13). Planter boxes are generally not appropriate for planting large trees with the aim of increasing canopy. However, planter boxes can contribute to vegetation at or

below eye level. These can also be used to grow screening vegetation to reduce the visual impact of bare walls and car parks. Additionally, they are easily customizable and easy to move locations if necessary.

Green walls are another popular method to screen bare walls and increase vegetation at eye level (Figure 14). These are a relatively modern and fashionable design statement. There are relatively few examples within the Perth region. This is possibly due to difficulties in establishing and maintaining these systems in the hot and dry Perth conditions. However, it is certainly possible with thoughtful design and selection of plant species, such as *Bouganvillea*, which are commonly used in Mediterranean countries. If this option is to be selected it would be advisable that a competent contractor be sought with a successful track record of green wall establishment in the Perth region.

To achieve a similar effect, trellising could be established on these walls with climbing plants or vines established from garden beds below. These are likely to be easier to establish and maintain, however, it would take several years to fill a target wall. On a smaller scale, climbing plants could also be established on supporting structures associated with shop awnings, light poles and other opportunistic locations (Figure 15).

Hanging baskets are another option to increase vegetation under the shop awnings and add to the aesthetic of the streetscape (Figure 15). However, given the age and condition of the current awnings this option may require additional engineering to support the weight of soil and water required. These also require irrigation and regular maintenance and can be difficult to implement successfully.

In order to achieve a major transformation to the level of shade and vegetation within the street, an arbor could be erected (Figure 16). This could be used to achieve close to 100% shade cover in at least part of Old Perth Road, with comparatively little footprint at ground level. The use of vine and climbing plants for shade cover would reach maturity faster than tree canopy would. The drawback to this approach is the significant cost that would be involved in the design, engineering and installation of the support structures. However, such a structure would be unique in WA and would provide a feature to raise the profile of the street and draw in visitors from outside the local area.

5. Garden beds and/or planter boxes

Installation of planter boxes and garden beds in narrow areas where trees are not suitable.

Benefits

- Easy to install
- Flexible to locate
- Practical for small/narrow spaces e.g. alongside footpaths

Limitations

- Only limited impact
- Require ongoing maintenance

Cost



Time to maturity



Maintenance



Visual Impact



Canopy addition

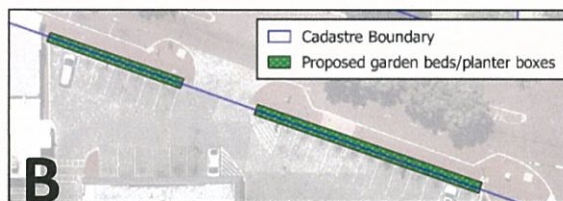


Figure 13: (A) and (B) Examples of locations for potential planter boxes and garden beds on Old Perth Road. (C to F) Examples of planter boxes and garden beds that could be used.

6. Green walls

The addition of a green wall feature piece or climbing plants to cover bare wall.

Benefits

- Hide unsightly wall
- Reduce urban heat island effect by reducing radiance from brick/concrete wall
- Feature piece that will attract attention

Limitations

- Difficult to establish and maintain
- May be expensive
- Does not contribute to shade/canopy cover

Cost



Time to maturity



Maintenance



Visual Impact



Canopy addition

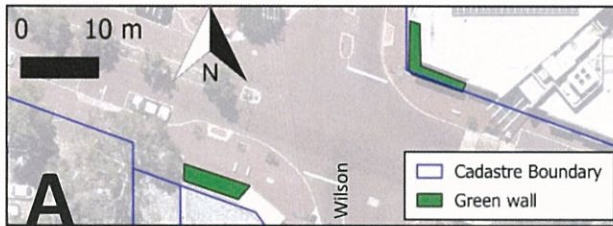


Figure 14: (A) Potential locations for the addition of a green wall (green polygons). (B) and (C) show currently bare walls that could be made into green walls such as shown in D to F.

7. Hanging and climbing plants

Hanging plants from awnings or the addition of climbing plants on supporting posts to add vibrancy to the streetscape.

Benefits

- Relatively inexpensive
- Can provide colour and greening to areas that are too small for trees e.g. under awnings and around supporting structures.

Limitations

- Prone to vandalism
- Does not provide shading/canopy
- High maintenance

Cost



Time to maturity



Maintenance



Visual Impact



Canopy addition

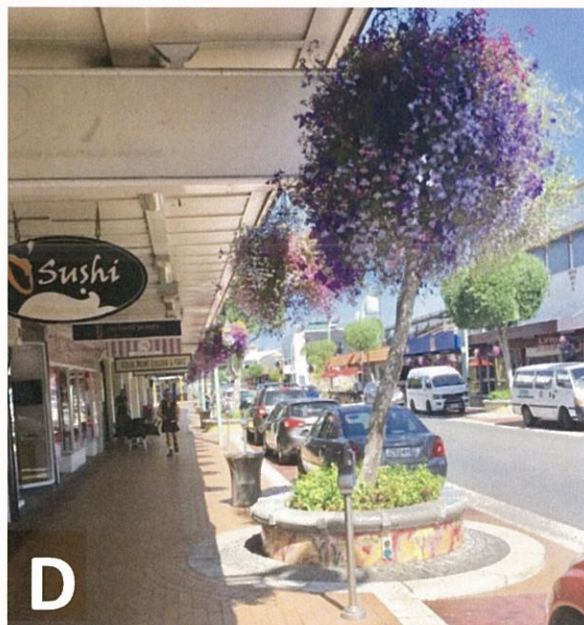
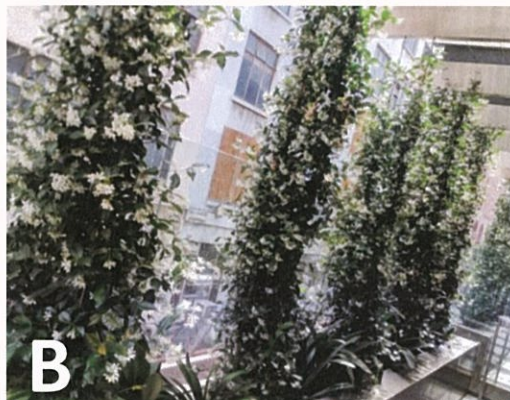


Figure 15: (A) Example of supporting poles on Old Perth Road that could be enhanced with climbing plants such as in (B). Hanging plants could be established along awnings (C) such as that shown in (D).

8. Arbor

Create an arbor over the first section of Old Perth Road where there is no median strip.

Benefits

- Can provide very high canopy coverage.
- Very high visual impact.
- Arbors are rare and could be considered a feature piece that will attract people to the area.

Limitations

- Expensive to install and maintain.
- Will need a strong structural set up.
- Road is possibly too wide.

Cost



Time to maturity



Maintenance



Visual Impact



Canopy addition



Figure 16: (A) The addition of an arbor between Guildford Road and Parker Street could add a large amount of canopy. B and C are examples (Source: Pinterest).

A direct correlation exists between soil volume, root mass and crown size of urban trees. It is estimated that an urban tree with a 5 m diameter wide crown requires a soil volume of approximately 12 cubic meters (m³).

Availability of quality, uncompacted soil for root growth can be difficult to find in urban settings resulting in sub-optimal growth, premature decline in condition and possible death.

The use of structural cell systems such as Stratacells™ is becoming increasingly popular. These systems involve a modular suspended pavement system that can support pedestrian and vehicle traffic above ground (load-bearing) while creating an air void between the soil and the paved surface. This gives the root system access to a large volume of high-quality uncompacted soil, while minimizing the possibility of root damage to hard surfaces above. These systems can be integrated with storm water management systems to provide water and stormwater mitigation functions. Stratacells™ also allow for the use of custom soil blends which can be tailored to the requirements of different tree species, allowing a greater range of potential species to be planted.

The cost of providing high quality growing environments in the urban setting is not small. A base cost of \$700 per m³ of soil should be allowed for supply and installation of structural cells. A tree crown of 5 m² diameter ideally would require at least 12 m³ of soil therefore \$8,400 per tree should be allowed. Costs could be reduced by connecting the soil pits, thus allowing tree roots to share adjacent pits. Initial costs, however, can be offset through decreased costs for establishment, maintenance and reduced rates of failure and replacement. Using structural cell systems is likely to improve establishment success, growth rates and final crown volume of any of the options listed therein, resulting in improved amenity and benefits to residents and businesses along Old Perth Road.

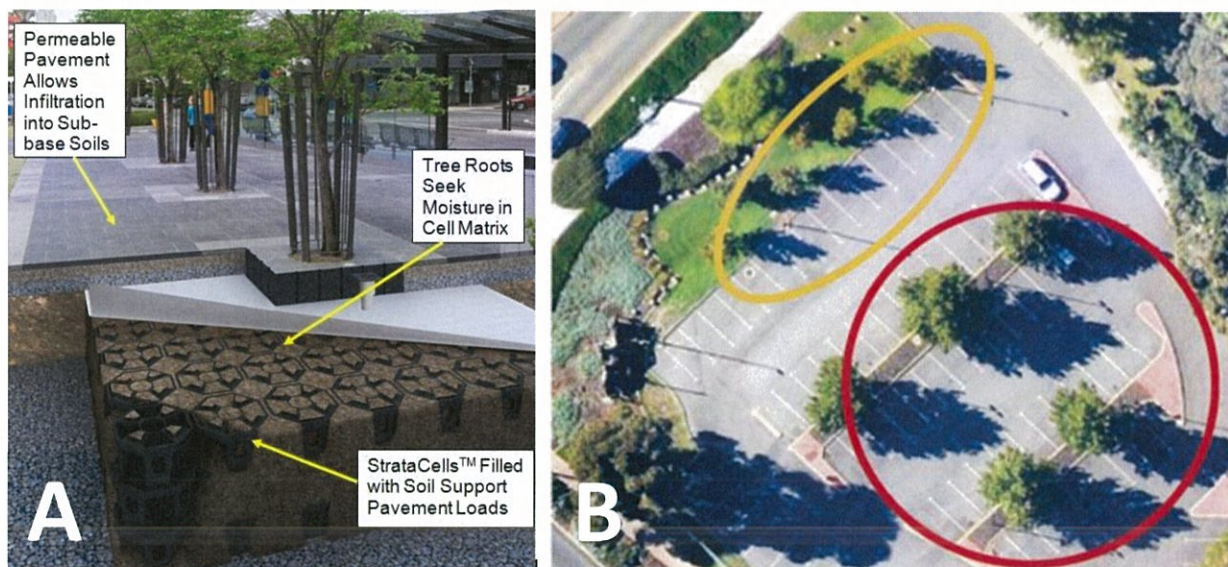


Figure 17: (A) Example of a Stratacell™ and a (B) carpark in Belmont demonstrating the size and health of trees planted using Stratacells™ (circled in red) compared to those planted conventionally (circled in yellow) (Source: City Green Pty Ltd.).

The best potential planting area within Old Perth Road is probably in the street median. These locations are less restricted by buildings and awnings, underground services, powerlines, and the long relatively thin strip of soil offers a greater volume of quality soil for root growth than individual tree pits. However, the median strips are currently fully occupied by the mature *Melaleuca quinquenervia*. These trees are generally performing well within Old Perth Road, however, this species tends to have an erect form which projects relatively little overhead shade. The use of different species within this area could almost reach the 70% canopy target without additional tree planting (Figure 18). However, removal of these trees is likely to be

controversial, expensive, disruptive to business owners and residents, with the benefits not likely to be realised for another 5-10 years.



Figure 18: Rokeby Road in the City of Subiaco, demonstrating high canopy cover by planting a broad canopied tree such as *Platanus x acerifolia* (London plane) along the median strip (Source: Google Maps).

The greatest area of land within the streetscape is reserved for vehicle traffic. Conversion of the street or part thereof to a pedestrian mall would provide ample space for additional planting of broad canopied tree species (Figure 19A). This type of dramatic renovation of the street will have far reaching implications for the current commercial tenants of the street impacting traffic flow and availability of parking. This option would require extensive community engagement and be part of a larger plan which is beyond the scope of this document. Less severe alternatives to the pedestrian mall exist, such as reducing the traffic flow by converting the street to a one-way street. This could allow space for increased parking spaces at the same time as additional tree planting space (Figure 19B).



Figure 19: (A) Pedestrian-only mall in the City of Perth and (B) a one-way street in the City of Claremont.

5 Species suggestions

5.1 Large crowns

Large crown species are suggested for establishment within the road footprint. It is important to consider species that are suitable for the proposed location, but also availability of suitable quality stock in advanced tree nurseries for planting and establishment in 2020.

Species	Size	Comments
<i>Corymbia maculata</i> (Spotted gum)	Height: 20m Width: 8m	Evergreen tall eucalypt with good urban performance.
<i>Platanus x acerifolia</i> (London Plane)	Height: 18m Width: 10m	Commonly planted in urban areas due to excellent performance. Deciduous habit. Fine hairy leaves and seeds can produce irritation in some people. Root system can be destructive in confined spaces. Not suitable for small median strips.
<i>Platanus orientalis</i> (Old World Sycamore)	Height: 20m Width: 10m	Fine hairy leaves and seeds can produce irritation in some people. Root system can be destructive in confined spaces. Not suitable for small median strips.
<i>Liquidambar styraciflua</i> (Sweet gum)	Height: 18m Width: 8m	Large, fast growing deciduous tree. Best known for their spectacular autumn colour. Low maintenance. Many varieties available.
<i>Jacaranda mimosifolia</i> (Jacaranda)	Height: 10m Width: 8m	Some green semi-deciduous foliage with superb purple floral display. May require supplemental irrigation for best performance.
<i>Eucalyptus gomphocephala</i> (Tuart)	Height: 15m Width: 9m	Local evergreen native. Fast growing large eucalypt.
<i>Ulmus parvifolia</i> (Chinese elm)	Height: 12m Width: 8m	Semi-deciduous tree with attractive dark green foliage. Good spreading crown with proven urban performance. Attractive mottled bark.

5.2 Medium crowns

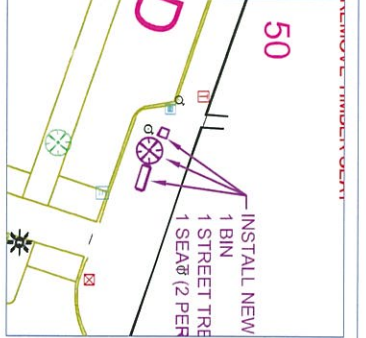
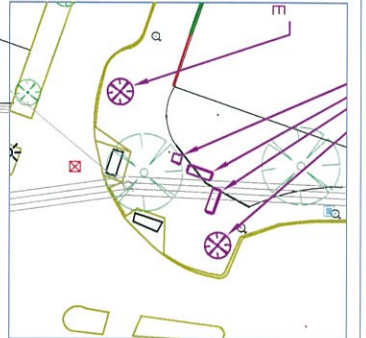
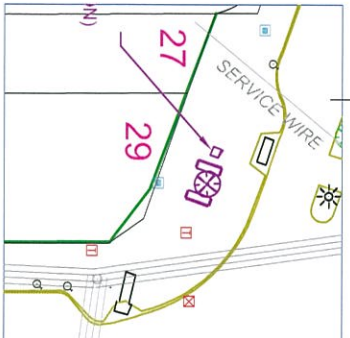
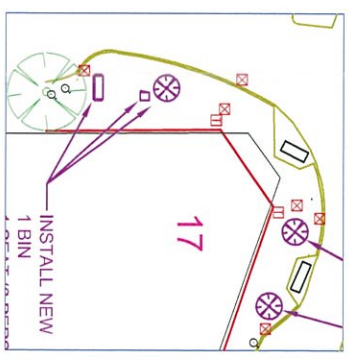
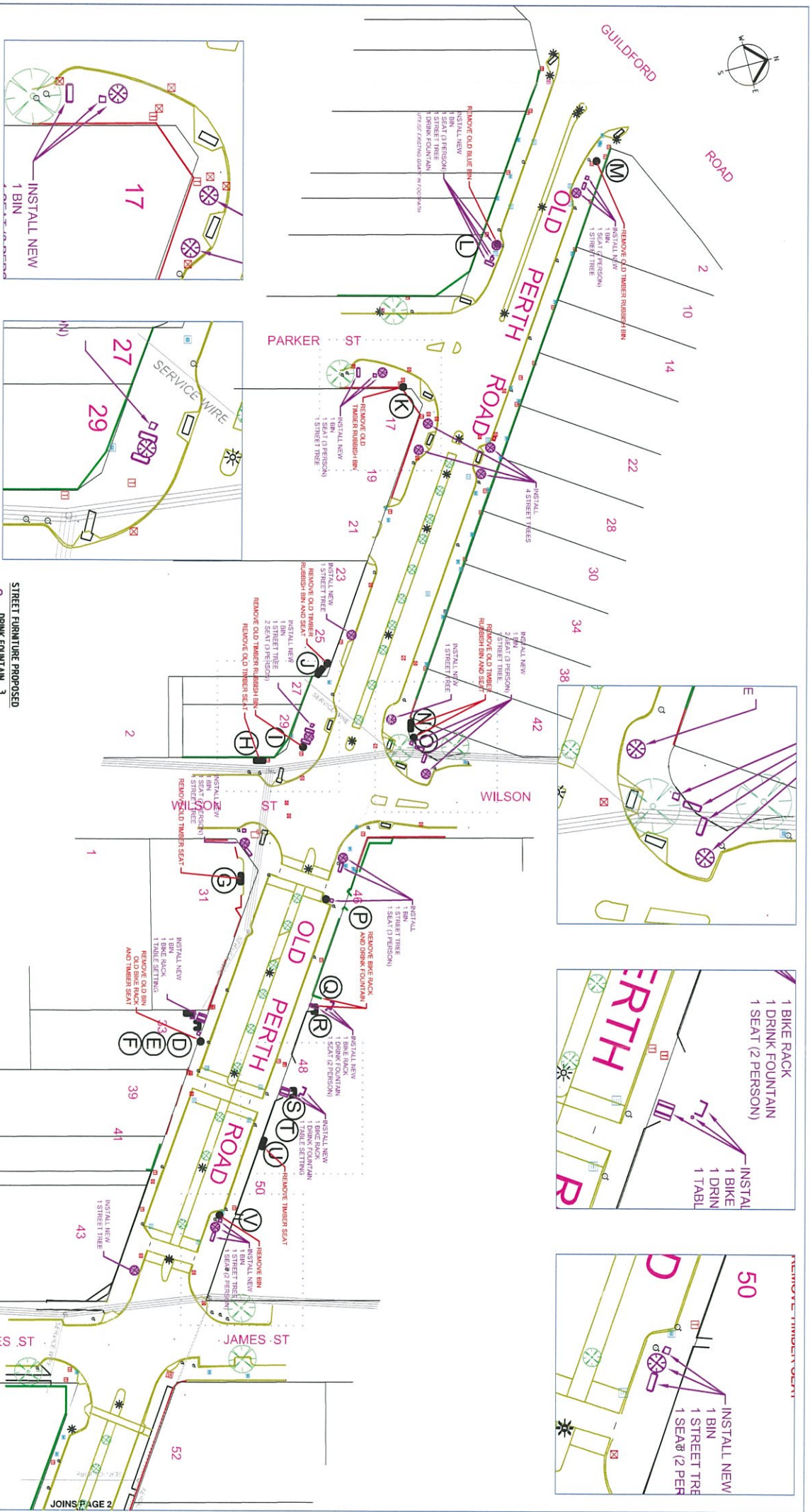
Species	Size	Comments
<i>Pyrus nivalis</i> (snow pear)	Height: 10m Width: 6m	Upright form with silver/green foliage turning red in autumn (deciduous). White flowers in spring.
<i>Eucalyptus cladocalyx nana</i> (Dwarf sugar gum)	Height: 7m Width: 5m	Attractive evergreen eucalypt with dark green leaves and smooth cream coloured bark.
<i>Callistemon viminalis</i> (Bottlebrush)	Height: 6m Width: 4m	Larger bottlebrush evergreen species with spreading crown. Can be maintained under powerlines. Red bottlebrush shaped flowers.
<i>Agonis flexuosa</i> (WA peppermint, Wonil)	Height: 8m Width: 5m	Local evergreen native species. Slender green leaves with a weeping habit. Can be maintained under powerlines.

6 Conclusion and Recommendations

Old Perth Road is the historic and municipal centre of the Town of Bassendean and an important commercial precinct. The audit of current street trees found the current canopy cover within the street was 13.4% which is regarded as insufficient by council. Roughly half of the current canopy area is provided by *Melaleuca quinquenervia* in the median strip. A tree planting program was initiated in 2013 that has involved establishment of mainly *Triadica sebifera* within planting pits created in the footpath and between car-parking bays. These trees have in general performed poorly. Our limited inspection suggests that the primary reason for the poor establishment was poor quality nursery stock resulting in girdling roots and poor root development.

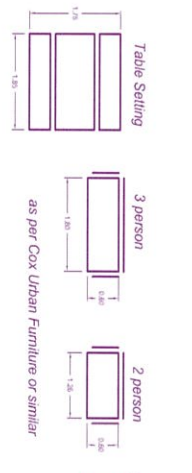
There currently exists relatively little space within the street for additional tree planting without compromising other functions of the street. A range of possible options is presented for consideration by council including a summary of their benefits and limitations. The most cost-effective option to increase canopy is likely to be replacement of the existing poor performing *T. sebifera*. These trees in their current form are unlikely to thrive in the future and are likely to die within the next 5-10 years regardless of management. Achieving the ambitious target of 70% canopy cover is unlikely to be possible without the implementation of major changes, such as replacing current median trees with high-quality advanced tree stock of species with a greater potential crown area once mature. The use of structural cells is recommended for any future tree planting within the street in order to maximise the health, growth rates and potential crown size of tree planted therein.

Appendix 1 – Town of Bassendean Survey Design Documents



- LEGEND**
- Sewer Manhole
 - Grate/Side Entry Pit
 - Valve
 - ⊛ Testra Pit
 - ⊛ Light Pole
 - ⊛ Electrical Pit
 - Survey Station/Datum
 - Fence Line

- STREET FURNITURE PROPOSED**
- DRINK FOUNTAIN 3
 - STREET TREE 15
 - ⊛ BIKE RACK 3
 - ⊛ BIN 120L 9
 - ⊛ SEAT 2 PERSON 4
 - ⊛ SEAT 3 PERSON 7
 - ⊛ TABLE SETTING 2

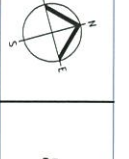


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NO.	DESCRIPTION	QUANTITY	UNIT
1	DRINK FOUNTAIN	3	
2	STREET TREE	15	
3	BIKE RACK	3	
4	BIN 120L	9	
5	SEAT 2 PERSON	4	
6	SEAT 3 PERSON	7	
7	TABLE SETTING	2	



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Drawing No: 10/07/2013-01

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GUILDROD ROAD - JAMES STREET
DESIGN STREET FURNITURE

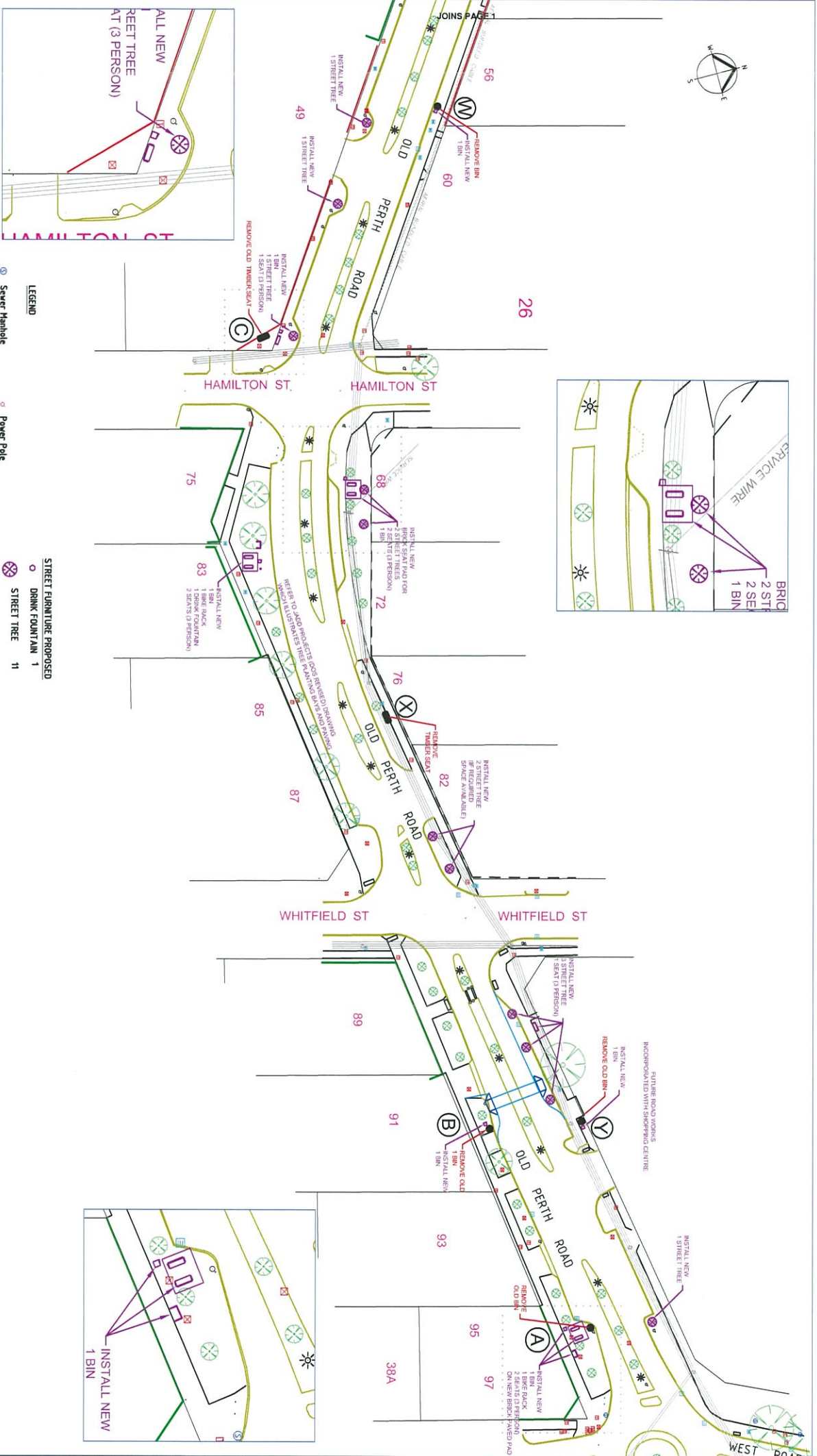
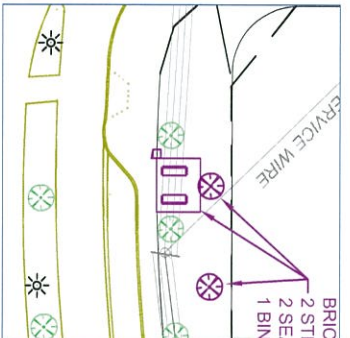
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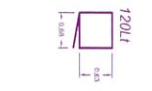
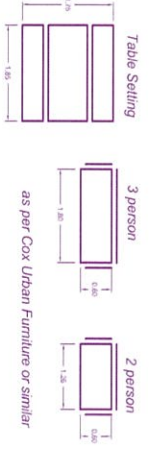
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TOB 11-2013 1

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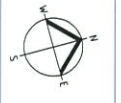
- LEGEND**
- Sewer Manhole
 - Grate/Side Entry Pit
 - Valve
 - ⊕ Telstra Pit
 - ⊙ Light Pole
 - ⊛ Electrical Pit
 - Survey Station/Datum
 - - - Fence Line
- STREET FURNITURE PROPOSED**
- DRINK FOUNTAIN 1
 - STREET TREE 11
 - ⊗ BIKE RACK 2
 - BIN 120L 7
 - SEAT 2 PERSON 0
 - SEAT 3 PERSON 8
 - TABLE SETTING 0



as per Cox Urban Furniture or similar

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NO.	DESCRIPTION	QUANTITY	UNIT
A	DRINK FOUNTAIN	1	
B	STREET TREE	11	
C	BIKE RACK	2	
D	BIN 120L	7	
E	SEAT 2 PERSON	0	
F	SEAT 3 PERSON	8	
G	TABLE SETTING	0	



100% of the project is funded by the State Government.
 0% 10% 20% 30% 40% 50%
 FEDERAL GOVERNMENT 20% 30% 40% 50%
 CHANGING THE FUTURE

NO.	DESCRIPTION	QUANTITY	UNIT
A	DRINK FOUNTAIN	1	
B	STREET TREE	11	
C	BIKE RACK	2	
D	BIN 120L	7	
E	SEAT 2 PERSON	0	
F	SEAT 3 PERSON	8	
G	TABLE SETTING	0	

OLD PERTH ROAD
 JAMES STREET - WEST ROAD
 DESIGN STREET FURNITURE
 DRAWING NO: 108-11-2013-2
 DATE: 2013-11-20
 SHEET: 2
 TOTAL SHEETS: 11

Appendix 2 – Street Tree Audit Results

Tree No.	Position	Species	Common Name	Too Deep Planting	DBH (cm)	Height (cm)	Crown Thinning	Push Instability	Dieback	Sun burn	Form	Chlorosis	Comments
1	Footpath	<i>Triadica sebifera</i>	Chinese tallow	Absent	5	450	Absent	Minor	Absent	Absent	Good	Absent	Healthy looking tree close to awning, planted in footpath
2	Footpath	<i>Triadica sebifera</i>	Chinese tallow	Absent	5	300	Moderate	Major	Minor	Absent	Average	NA	Small foliage, small in size, tree performing poorly in crown. Unstable root-plate.
3	Footpath	<i>Triadica sebifera</i>	Chinese tallow	Absent	5	300	Moderate	Major	Moderate	Absent	Poor	NA	Small foliage, small in size, tree performing poorly in crown. Unstable root-plate. Tree with moderate lean towards road correcting above 1.5
4	Footpath	<i>Triadica sebifera</i>	Chinese tallow	Absent	5	300	Minor	Major	Major	Absent	Poor	NA	Stem half a metre from awning. Poor taper, pruned up to 1.8m. Poor root plate stability.
5	Footpath	<i>Triadica sebifera</i>	Chinese tallow	Absent	5	450	Minor	Major	Major	Absent	Poor	NA	Stem 0.5m from awning. Poor taper, pruned above 2m. Poor root plate stability. Possible shaded from awning, insufficient light.
6	Median	<i>Melaleuca quinquener via</i>	Broad-leaved paperbark	Absent	35	600	Absent	Absent	Absent	Absent	Good	NA	All trees in median strip in healthy condition with dense canopy, appears to be irrigated, trees have lighting that requires loosening.
7	Median	<i>Melaleuca quinquener via</i>	Broad-leaved paperbark	Absent	35	500	Absent	Absent	Absent	Absent	Good	NA	All trees in median strip in healthy condition with dense canopy, appears to be irrigated, trees have lighting that requires loosening.
8	Median	<i>Melaleuca quinquener via</i>	Broad-leaved paperbark	Absent	35	700	Absent	Absent	Absent	Absent	Good	NA	All trees in median strip in healthy condition with dense canopy, appears to be irrigated, trees have lighting that requires loosening.
9	Median	<i>Melaleuca quinquener via</i>	Broad-leaved paperbark	Absent	30	600	Absent	Absent	Absent	Absent	Good	NA	All trees in median strip in healthy condition with dense canopy, appears to be irrigated, trees have lighting that requires loosening.
11	Median	<i>Melaleuca quinquener via</i>	Broad-leaved paperbark	Absent	30	500	Absent	Absent	Absent	Absent	Good	NA	All trees in median strip in healthy condition with dense canopy, appears to be irrigated, trees have lighting that requires loosening. Minor lean to the north.
12	Median	<i>Melaleuca quinquener via</i>	Broad-leaved paperbark	Absent	30	550	Absent	Absent	Absent	Absent	Good	NA	All trees in median strip in healthy condition with dense canopy,

ArborCarbon Report: Old Perth Road Street Tree Audit – Town of Bassendean

Tree No.	Position	Species	Common Name	Too Deep Planting	DBH (cm)	Height (cm)	Crown Thinning	Push Instability	Dieback	Sun burn	Form	Chlorosis	Comments
													appears to be irrigated, trees have lighting that requires loosening.
13	Median	<i>Melaleuca quinquener via</i>	Broad-leaved paperbark	Absent	25	600	Absent	Absent	Absent	Absent	Good	NA	All trees in median strip in healthy condition with dense canopy, appears to be irrigated, trees have lighting that requires loosening.
14	Median	<i>Melaleuca quinquener via</i>	Broad-leaved paperbark	Absent	35	600	Absent	Absent	Absent	Absent	Good	NA	All trees in median strip in healthy condition with dense canopy, appears to be irrigated, trees have lighting that requires loosening.
15	Private property buy car park	<i>Corymbia citriodora</i>	Lemon-scented gum	Absent	80	1600	Moderate	Absent	Major	Absent	Good	NA	Substantial frequent branch dieback of branches up to 8 cm in diameter. Very close to adjacent building possible structural issues in the future.
16	Private property buy car park	<i>Corymbia citriodora</i>	Lemon-scented gum	Absent	80	1600	Absent	Absent	Absent	Absent	Good	NA	Impacting on adjacent bollard. Close to car park drainage (within half metre).
17	Private property buy car park	<i>Corymbia ficifolia</i>	Red-flowering gum	Absent	15	400	Severe	Absent	Major	Absent	Good	Severe	
18	Private property buy car park	<i>Corymbia ficifolia</i>	Red-flowering gum	Absent	35	500	Major	Absent	Major	Absent	Good	Absent	
19	Private property buy car park	<i>Corymbia citriodora</i>	Lemon-scented gum	Absent	55	1500	Moderate	Absent	Absent	Absent	Good	Absent	Major damage to the kerb probably caused by root uplift.
20	Footpath	<i>Triadica sebifera</i>	Chinese tallow	Absent	4	150	Major	Severe	Moderate	Absent	Good	Major	Crown very small, evidence of pruning to remove a lot of dead branches. Abundance scale observed, epicormic shoots and vandalism (breaking of several branches).
21	Footpath	<i>Triadica sebifera</i>	Chinese tallow	Absent	4	200	Moderate	Major	Major	Moderate	Good	Major	Epicormic shoots on stem, abundant scale. Fair bit of pruning to remove small branches, probably dieback. Tree planting grate is 5-8 cm above footpath level (trip hazard).

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Tree No.	Position	Species	Common Name	Too Deep Planting	DBH (cm)	Height (cm)	Crown Thinning	Push Instability	Dieback	Sun burn	Form	Chlorosis	Comments
22	Footpath	<i>Triadica sebifera</i>	Chinese tallow	Absent	5	200	Absent	Major	Absent	Absent	Good	Absent	
23	Footpath	<i>Triadica sebifera</i>	Chinese tallow	Minor	6	250	Minor	Severe	Minor	Absent	Acceptable	Absent	
24	Footpath	<i>Melaleuca quinquener via</i>	Broad-leaved paperbark	Absent	45	450	Absent	Absent	Absent	Absent	Good	Absent	Pruned to fit under power lines.
25	Footpath	<i>Triadica sebifera</i>	Chinese tallow	Major	5	250	Moderate	Minor	Moderate	Absent	Acceptable	Minor	Tree in ok condition, planted at least 10cm too deep. Several branches broken due to vandalism and a little bit of a canker or dieback of small branches. Opportunity for a much larger feature tree in front of library.
26	Median	<i>Melaleuca quinquener via</i>	Broad-leaved paperbark	Absent	25	650	Absent	Absent	Absent	Absent	Good	NA	Good condition. Slightly broader form than towards the railway station. Apparent damage to kerb and road is minor. Understorey planted with ground covers.
27	Median	<i>Melaleuca quinquener via</i>	Broad-leaved paperbark	Absent	30	700	Absent	Absent	Absent	Absent	Good	NA	Good condition. Slightly broader form than towards the railway station. Apparent damage to kerb and road is minor. Understorey planted with ground covers.
28	Median	<i>Melaleuca quinquener via</i>	Broad-leaved paperbark	Absent	50	850	Absent	Absent	Absent	Absent	Good	NA	Good condition. Slightly broader form than towards the railway station. Apparent damage to kerb and road is minor. Understorey planted with ground covers.
29	Median	<i>Melaleuca quinquener via</i>	Broad-leaved paperbark	Absent	40	850	Absent	Absent	Absent	Absent	Good	NA	Good condition. Slightly broader form than towards the railway station. Apparent damage to kerb and road is minor. Understorey planted with ground covers.
30	Median	<i>Melaleuca quinquener via</i>	Broad-leaved paperbark	Absent	35	700	Absent	Absent	Absent	Absent	Good	NA	Good condition. Slightly broader form than towards the railway station. Apparent damage to kerb and road is minor. Understorey planted with ground covers.

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Tree No.	Position	Species	Common Name	Too Deep Planting	DBH (cm)	Height (cm)	Crown Thinning	Push Instability	Dieback	Sun burn	Form	Chlorosis	Comments
31	Median	<i>Melaleuca quinquener via</i>	Broad-leaved paperbark	Absent	40	750	Absent	Absent	Absent	Absent	Good	NA	Good condition. Slightly broader form than towards the railway station. Apparent damage to kerb and road is minor. Understorey planted with ground covers.
32	Median	<i>Melaleuca quinquener via</i>	Broad-leaved paperbark	Absent	40	600	Absent	Absent	Absent	Absent	Good	NA	Good condition. Slightly broader form than towards the railway station. Apparent damage to kerb and road is minor. Understorey planted with ground covers.
33	Median	<i>Melaleuca quinquener via</i>	Broad-leaved paperbark	Absent	60	800	Absent	Absent	Absent	Absent	Good	NA	Good condition. Slightly broader form than towards the railway station. Apparent damage to kerb and road is minor. Understorey planted with ground covers.
34	Median	<i>Melaleuca quinquener via</i>	Broad-leaved paperbark	Absent	60	900	Absent	Absent	Absent	Absent	Good	NA	Good condition. Slightly broader form than towards the railway station. Apparent damage to kerb and road is minor. Understorey planted with ground covers.
35	Footpath	<i>Triadica sebifera</i>	Chinese tallow	Absent	5	300	Absent	Absent	Absent	Absent	Acceptable	NA	Relatively healthy tree, poor taper but good stability of root plate. Basal flare and structural roots visible, good planting depth
36	Footpath	<i>Triadica sebifera</i>	Chinese tallow	Major	5	300	Moderate	Major	Minor	Absent	Poor	NA	
37	Community centre	<i>Ficus microcarpa</i>	Chinese banyan	Absent	100	1000	Absent	Absent	Absent	Absent	Good	NA	Very healthy, pruned to avoid power lines
38	Community centre	<i>Poplar</i>	Poplar sp.	Absent	60	1300	Minor	Absent	Moderate	Absent	Acceptable	NA	Some active dieback, particularly over the footpath, otherwise healthy. Only small basal taper observed.
39	Community centre	<i>Citharexylum spinosum</i>	Fiddlewood	Absent	25, 25, 20	800	Absent	Absent	Absent	Absent	Poor	NA	Multi stem tree
40	Community centre	<i>Poplar</i>	Poplar sp.	Absent	50	1300	Absent	Absent	Absent	Absent	Acceptable	NA	Healthy tree, some evidence of previous poor pruning practices, lack of basal taper, some mower damage to root system surface

ArborCarbon Report: Old Perth Road Street Tree Audit – Town of Bassendean

Tree No.	Position	Species	Common Name	Too Deep Planting	DBH (cm)	Height (cm)	Crown Thinning	Push Instability	Dieback	Sun burn	Form	Chlorosis	Comments
													roots. Competition from adjacent liquidambar causing lean to South.
41	Customer service centre	<i>Jacaranda mimosifolia</i>	Jacaranda	Absent	900	900	Absent	Absent	Absent	Absent	Good	NA	Dual stem at half a metre above ground level, 30 and 35 cm DBH. Planted in clusters. Adjacent to smaller <i>C. ficifolia</i> & <i>Melaleuca</i> . <i>C. ficifolia</i> is approximately 50 cm DBH, good healthy specimen, significant basal flare, lignotuber visible, all trees within 1.5 metres of Jacaranda
42	Bassendean ideas hub	<i>Pyrus calleryana</i>	Ornamental pear	Absent		500	Absent	Absent	Absent	Absent	Acceptable	NA	4 stems originating at ground level, 1 ascending stem crossing the others, possible target for removal.
43	Private property	<i>Plumeria sp.</i>	Frangipani	Absent			Absent	Absent	Absent	Absent	Good	NA	
44	Footpath	<i>Triadica sebifera</i>	Chinese tallow	Absent	20	450	Absent	Absent	Absent	Absent	Good	Absent	Good healthy well-established specimen, nice stem taper and form
45	Footpath	<i>Triadica sebifera</i>	Chinese tallow	Absent	15	400	Absent	Absent	Absent	Absent	Good	Absent	Good healthy well-established specimen, nice stem taper and form
46	1m garden bed between Footpath and wall	<i>Triadica sebifera</i>	Chinese tallow	Absent	15	450	Minor	Absent	Minor	Absent	Good	Absent	Relatively healthy tree, some dieback of internal branches, evidence of frequent vandalism on branches up to 1 cm
47	1m garden bed between Footpath and wall	<i>Triadica sebifera</i>	Chinese tallow	Absent	15	450	Minor	Absent	Minor	Absent	Good	NA	
48	Median	<i>Melaleuca quinquener via</i>	Broad-leaved paperbark	Absent	55	800	Minor	Absent	Absent	Absent	Good	Absent	Understorey planted with clumping grasses
49	Median	<i>Melaleuca quinquener via</i>	Broad-leaved paperbark	Absent	60	700	Absent	Absent	Absent	Absent	Good	Absent	Understorey planted with clumping grasses

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Tree No.	Position	Species	Common Name	Too Deep Planting	DBH (cm)	Height (cm)	Crown Thinning	Push Instability	Dieback	Sun burn	Form	Chlorosis	Comments
50	Median	<i>Melaleuca quinquener via</i>	Broad-leaved paperbark	Absent	45	700	Absent	Absent	Absent	Absent	Good	NA	Bifurcated stem at 1.5 m above ground level with occluded bark
51	Median	<i>Melaleuca quinquener via</i>	Broad-leaved paperbark	Absent	60	750	Absent	Absent	Absent	Absent	Good	Absent	
52	Median	<i>Melaleuca quinquener via</i>	Broad-leaved paperbark	Absent	45	700	Absent	Absent	Absent	Absent	Good	Absent	
53	Median	<i>Melaleuca quinquener via</i>	Broad-leaved paperbark	Absent	40	450	Absent	Absent	Minor	Absent	Good	Absent	
54	Median	<i>Melaleuca quinquener via</i>	Broad-leaved paperbark	Absent	50	1100	Absent	Absent	Absent	Absent	Good	Absent	Minor uplift of kerb and road associated with basal flare is starting
55	Median	<i>Melaleuca quinquener via</i>	Broad-leaved paperbark	Absent	40	650	Absent	Absent	Absent	Absent	Good	Absent	
56	Median	<i>Melaleuca quinquener via</i>	Broad-leaved paperbark	Absent	60	650	Absent	Absent	Absent	Absent	Good	Absent	Displacement of kerb
57	Median	<i>Melaleuca quinquener via</i>	Broad-leaved paperbark	Absent	60	650	Absent	Absent	Absent	Absent	Good	Absent	
58	Verge adjacent to footpath, possibly private land	<i>Triadica sebifera</i>	Chinese tallow	Major	3	180	Major	Moderate	Severe	Moderate	Poor	Major	Mechanical damage on main stem and multiple branches broken off, possible vandalism, significantly reduced Crown volume. Lack of stem taper or visible root flair.
59	Verge adjacent to footpath, possibly private land	<i>Triadica sebifera</i>	Chinese tallow	Absent	3	120	Severe	Major	Severe	Moderate	Poor	Absent	Crown severely reduced, all major branches dying back, leaves restricted to epicormic shoots.

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Tree No.	Position	Species	Common Name	Too Deep Planting	DBH (cm)	Height (cm)	Crown Thinning	Push Instability	Dieback	Sun burn	Form	Chlorosis	Comments
60	Verge adjacent to footpath, possibly private land	<i>Triadica sebifera</i>	Chinese tallow	Moderate	10	300	Minor	Minor	Moderate	Absent	Acceptable	NA	Heavy pruning of lower branches below 2 metres to achieve upright form. Structural root 10 cm below ground level.
61	Verge adjacent to footpath, possibly private land	<i>Triadica sebifera</i>	Chinese tallow	Moderate	7	300	Major	Moderate	Major	Absent	Poor	NA	Frequent dieback of minor branches, poor form, does not look healthy, stem lacking taper and basil root flair
62	Verge adjacent to footpath, possibly private land	<i>Lophostemon confertus</i>	Queensland box	Absent	50	700	Moderate	Absent	Minor	Absent	Poor	Moderate	Tree with thinning canopy and slightly light coloured foliage, multiple stems at 1 m above ground level, branch dieback up to 4 cm in diameter, larger branches missing from upper canopy up to 8 cm in diameter
63	Verge	<i>Corymbia calophylla</i>	Marri	Absent	90	1300	Moderate	Absent	Minor	Absent	Acceptable	NA	Large mature marri asymmetrical due to powerline pruning, apparent mechanical damage around base and branches at 3 m with weeping lesions
64	Footpath	<i>Triadica sebifera</i>	Chinese tallow	Major	12	200	Major	Absent	Major	Major	Acceptable	NA	
65	Footpath	<i>Triadica sebifera</i>	Chinese tallow	Moderate	4	160	Severe	Severe	Severe	Severe	Poor	NA	Severe sun scald on western face and on the back of all major branches possible related
66	Verge	<i>Triadica sebifera</i>	Chinese tallow	Absent	13	350	Major	Absent	Major	Severe	Poor	NA	Strong competition from grass around base, heavy mower damage present
67	Verge	<i>Triadica sebifera</i>	Chinese tallow	Absent	10	350	Severe	Absent	Severe	Minor	Acceptable	NA	
68	Verge	<i>Triadica sebifera</i>	Chinese tallow	Absent	15	300	Major	Moderate	Major	Minor	Acceptable	NA	Possible early leaf drop, several branches broken due to vandalism. Apparent major branch tip dieback but difficult to tell, possible leaf drop

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Tree No.	Position	Species	Common Name	Too Deep Planting	DBH (cm)	Height (cm)	Crown Thinning	Push Instability	Dieback	Sun burn	Form	Chlorosis	Comments
69	Verge	<i>Triadica sebifera</i>	Chinese tallow	Moderate	4	250	Minor	Minor	Minor	Moderate	Acceptable	NA	Slight possible instability due to root issues, strong grass growth around base, possible competition
70	Verge	<i>Triadica sebifera</i>	Chinese tallow	Absent	7	300	Minor	Minor	Minor	Major	Acceptable	NA	
71	Median	<i>Melaleuca quinquener via</i>	Broad-leaved paperbark	Absent	50	750	Absent	Absent	Absent	Absent	Good	NA	
72	Median	<i>Melaleuca quinquener via</i>	Broad-leaved paperbark	Absent	40	750	Absent	Absent	Absent	Absent	Good	NA	
72	Median	<i>Melaleuca quinquener via</i>	Broad-leaved paperbark	Absent	45	700	Absent	Absent	Absent	Absent	Acceptable	NA	
73	Garden bed next to footpath	<i>Triadica sebifera</i>	Chinese tallow	Absent	25	500	Moderate	Absent	Minor	Absent	Good	NA	Leaves small in size, possible thinning but difficult to tell due to Autumnal leaf drop
74	Garden bed next to footpath	<i>Triadica sebifera</i>	Chinese tallow	Absent	30	500	Moderate	Absent	Moderate	Absent	Good	NA	Definite branch dieback occurring up to 20 mm in diameter, several broken branches also.
75	Median	<i>Melaleuca quinquener via</i>	Broad-leaved paperbark	Absent	30	500	Absent	Absent	Absent	Absent	Good	Absent	
76	Median	<i>Melaleuca quinquener via</i>	Broad-leaved paperbark	Absent	10	250	Absent	Moderate	Absent	Absent	Good	NA	
77	Median	<i>Melaleuca quinquener via</i>	Broad-leaved paperbark	Absent	10	250	Absent	Minor	Absent	Absent	Good	Absent	
78	Median	<i>Melaleuca quinquener via</i>	Broad-leaved paperbark	Absent	15	250	Absent	Absent	Absent	Absent	Good	Absent	
79	Median	<i>Melaleuca quinquener via</i>	Broad-leaved paperbark	Absent	35	600	Absent	Absent	Absent	Absent	Good	Absent	

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Tree No.	Position	Species	Common Name	Too Deep Planting	DBH (cm)	Height (cm)	Crown Thinning	Push Instability	Dieback	Sun burn	Form	Chlorosis	Comments
80	Garden bed next to footpath	<i>Triadica sebifera</i>	Chinese tallow	Absent	10	300	Absent	Absent	Absent	Absent	Acceptable	Absent	
81	Garden bed between footpath and carpark possible private property	<i>Callistemon viminalis</i>	Weeping bottlebrush										Pruned to fit beneath power lines, not in Town of Bassendean land
82	Garden bed between footpath and carpark possible private property	<i>Callistemon viminalis</i>	Weeping bottlebrush										Pruned to fit beneath power lines, not in Town of Bassendean land
83	Median	<i>Melaleuca quinquener via</i>	Broad-leaved paperbark	Absent	35	700	Absent	Absent	Absent	Absent	Good	Absent	
84	Median	<i>Melaleuca quinquener via</i>	Broad-leaved paperbark	Absent	20	350	Absent	Absent	Absent	Absent	Good	NA	Several broken branches possible traffic impact
85	Median	<i>Melaleuca quinquener via</i>	Broad-leaved paperbark	Absent	20	400	Absent	Absent	Absent	Absent	Good	Absent	
86	Median	<i>Melaleuca quinquener via</i>	Broad-leaved paperbark	Absent	15	400	Absent	Absent	Absent	Absent	Good	NA	
87	Median	<i>Melaleuca quinquener via</i>	Broad-leaved paperbark	Absent	30	800	Absent	Absent	Absent	Absent	Good	NA	
88	Median	<i>Melaleuca quinquener via</i>	Broad-leaved paperbark	Absent	30	400	Absent	Absent	Absent	Absent	Good	NA	

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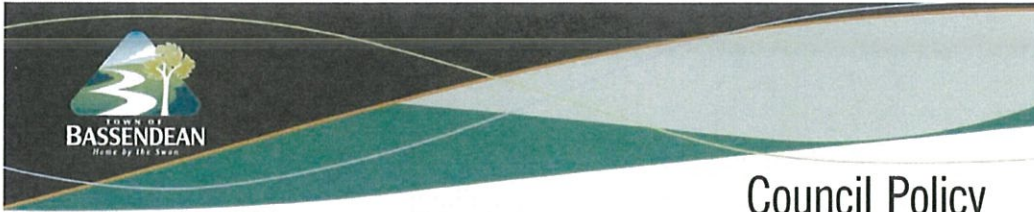
Tree No.	Position	Species	Common Name	Too Deep Planting	DBH (cm)	Height (cm)	Crown Thinning	Push Instability	Dieback	Sun burn	Form	Chlorosis	Comments
89	Median	<i>Melaleuca quinquenervia</i>	Broad-leaved paperbark	Absent	45	700	Absent	Absent	Absent	Absent	Good	NA	
90	Footpath	<i>Triadica sebifera</i>	Chinese tallow	Absent	10	300	Absent	Minor	Minor	Absent	Good	Moderate	Small leaf size, marginal chlorosis of leaves observed
91	Footpath	<i>Triadica sebifera</i>	Chinese tallow	Absent	10	300	Moderate	Absent	Moderate	Absent	Good	Minor	
92	Verge	<i>Triadica sebifera</i>	Chinese tallow	Absent	18	600	Absent	Absent	Minor	Absent	Acceptable	NA	
93	Verge	<i>Triadica sebifera</i>	Chinese tallow	Absent	12	500	Absent	Absent	Minor	Moderate	Good	NA	Minor sun damage, large branch broken off, overall pretty good health
94	Verge	<i>Triadica sebifera</i>	Chinese tallow	Absent	14	450	Moderate	Absent	Moderate	Absent	Acceptable	NA	Some mower damage to surface roots, many dead branches in the crown and epicormic shoots
95	Verge	<i>Triadica sebifera</i>	Chinese tallow	Absent	24		Moderate	Absent	Moderate	Absent	Acceptable	NA	Growing in garden bed that has that has been edged therefore possible root damage, poor pruning
96	Verge	<i>Triadica sebifera</i>	Chinese tallow	Absent	10	400	Major	Absent	Major	Absent	Acceptable	NA	Growing in garden bed that has that has been edged therefore possible root damage, large flared base that then narrows towards roots
97	Verge	<i>Triadica sebifera</i>	Chinese tallow	Absent	16	500	Minor	Absent	Minor	Absent	Good	NA	Some branches broken off due to vandalism, there is some epicormic growth present, growing in edged garden bed
98	Verge	<i>Lophostemon confertus</i>	Queensland box	Absent	48	850	Absent	Absent	Minor	Absent	Acceptable	Absent	Healthy
99	Verge	<i>Triadica sebifera</i>	Chinese tallow	Absent	17	500	Minor	Absent	Minor	Absent	Good	NA	

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Tree No.	Position	Species	Common Name	Too Deep Planting	DBH (cm)	Height (cm)	Crown Thinning	Push Instability	Dieback	Sun burn	Form	Chlorosis	Comments
100	Verge	<i>Triadica sebifera</i>	Chinese tallow	Absent		600	Absent	Absent	Absent	Major	Good	NA	Root system abused. Mower damage and grass installation damage
101	Verge	<i>Triadica sebifera</i>	Chinese tallow	Absent	15	550	Minor	Absent	Absent	Absent	Good	NA	
102	Verge	<i>Triadica sebifera</i>	Chinese tallow	Absent	22	450	Absent	Absent	Absent	Major	Good	NA	Damage to root system due to lawn maintenance
103	Verge	<i>Triadica sebifera</i>	Chinese tallow	Absent	17	450	Absent	Absent	Absent	Moderate	Good	NA	Significant damage to surface roots from lawn mowers and lawn maintenance. Constrained root system probably due to growth in pot
104	Footpath	<i>Triadica sebifera</i>	Chinese tallow	Absent	17	450	Absent	Absent	Absent	Minor	Good	NA	Constrained roots from being in a pot, growing in a garden bed
105	Carpark diamond	<i>Triadica sebifera</i>	Chinese tallow	Absent	15	450	Absent	Absent	Absent	Major	Good	NA	Sunburn or vehicle impact damage to trunk
106	Carpark diamond	<i>Triadica sebifera</i>	Chinese tallow	Absent	9	350	Minor	Moderate	Absent	Major	Acceptable	NA	Tree severely damaged from vehicle impact, also branch is broken from vandalism, severe girdling roots
107	Carpark diamond	<i>Triadica sebifera</i>	Chinese tallow	Absent	13	500	Minor	Absent	Absent	Minor	Good	NA	Damage to trunk from vehicle impact
108	Footpath	<i>Triadica sebifera</i>	Chinese tallow	Absent	14	500	Minor	Absent	Absent	Minor	Acceptable	NA	Poorly pruned
109	Carpark diamond	<i>Triadica sebifera</i>	Chinese tallow	Absent	10	300	Moderate	Absent	Moderate	Major	Acceptable	NA	Severe damage from sunburn or vehicle impact, some branches broken off and epicormic shoots present
110	Raised garden bed	<i>Lophostemon confertus</i>	Queensland box	Absent	39	600	Minor	Absent	Minor	Absent	Good	Absent	Very healthy tree. Garden bed has been raised up around the tree, there for increasing soil levels around the trunk

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Tree No.	Position	Species	Common Name	Too Deep Planting	DBH (cm)	Height (cm)	Crown Thinning	Push Instability	Dieback	Sun burn	Form	Chlorosis	Comments
111	Carpark diamond	<i>Triadica sebifera</i>	Chinese tallow	Moderate	13	450	Minor	Absent	Minor	Major	Good	NA	Damage to trunk, could be from sunburn or vehicle damage or both
112	Footpath	<i>Triadica sebifera</i>	Chinese tallow	Absent	13	500	Moderate	Absent	Absent	Absent	Good	NA	Situated in footpath outside restaurant under patio beams
113	Raised garden bed	<i>Lophostemon confertus</i>	Queensland box	Absent	43	700	Absent	Absent	Absent	Absent	Poor	Absent	History of lopping resulting in poor branching structure. Raised soil level's around trunk due to constructed garden bed around base of tree
114	Raised garden bed	<i>Lophostemon confertus</i>	Queensland box	Absent	58	1050	Absent	Absent	Absent	Absent	Poor	Absent	History of lopping resulting in poor branching structure, raised garden bed around trunk resulting in raised soil levels
115	Footpath	<i>Triadica sebifera</i>	Chinese tallow	Absent	6	300	Moderate	Major	Minor	Minor	Acceptable	NA	
116	Footpath	<i>Triadica sebifera</i>	Chinese tallow	Absent	6	250	Major	Severe	Moderate	Minor	Poor	NA	Epicormic shoots, very poor health
	Corner of car park	<i>Metrosideros excelsa</i> and <i>magnolia</i>	New Zealand Christmas tree and Magnolia										All plants in good health, height limited by power lines. Not on Town of Bassendean land



1.11 Street Tree Pruning, Removal and Replacement Policy

The Town of Bassendean recognises the importance of trees in the streetscape, the requirement to maintain and protect them from needless removal and ensure that trees removed are replaced in accordance to the Street Tree Master Plan.

Objectives

The objectives of this policy are to provide:

- A set of criteria by which the Town can assess a requirement or request for the pruning or removal of a street tree or trees.
- A policy outline for the implementation of a street tree renewal program.

Strategy

The Town of Bassendean will achieve these objectives through:

- The application of a set of criteria by which the Town can assess requirements or requests for the pruning, removal or planting of street trees.
- The implementation of the Street Tree Master Plan.

Detail

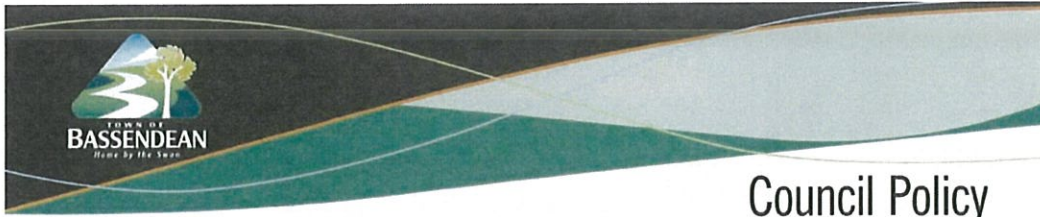
Application of this Policy

This policy applies both the street trees located on the verge abutting privately owned land, or trees located in the Town's parks and reserves (or other publically owned land) that abut privately owned land.

Tree Pruning

Under the direction of Asset Services, the pruning of street trees will only be undertaken in the following circumstances:

- a) to correct structurally unsound growth habit

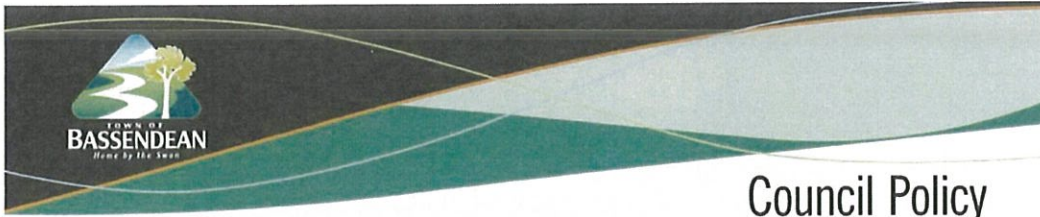


- b) to provide safe clearance from aerial power lines; or
- c) to ensure appropriate sight-lines at intersections and crossovers; or
- d) to reduce undue safety or amenity impact on an adjoining property; or
- e) to maintain appropriate clearance from pedestrian footpaths or shared paths

Street Tree Removal Criteria

The removal of street trees shall only be approved if one or more of the following criteria are satisfied:

- The tree has been assessed by a qualified and competent person (consulting Arborist or suitably qualified/experienced Council Officer) as:
 - Being dead having less than 10% photosynthetic material or live tissue present in the canopy mass.
 - Being diseased and unlikely to respond to treatment within the scope of approved modern arboricultural management practices.
 - Being structurally unsound to the extent it presents a danger to the community. In this case a written report and photographic evidence is to be provided in support of the assessment.
 - Having sustained storm damage whereby remedial pruning is likely to encourage future tree related structural issues to occur that have the potential to result in litigation.
- The tree is affected by road widening, servicing modification/relocation or other infrastructure works and all other options to retain the tree have been deemed by the Town to be inappropriate or uneconomical.
- The tree is dangerously in contact with overhead power or service lines and where, for reasons of growth habits pertaining to the species, selective pruning is not practical with the only other option available to address the issue is severe lopping.
- The tree for removal is part of a documented schedule for removal tree management strategy in place for the future management of the Town's tree population.
- The tree is deemed hazardous to motorists and/or pedestrians due to interference with appropriate sightlines as a result of the trees alignment and/or spacing.
- The tree impinges on the development potential of the abutting property or properties and there are no reasonable design alternatives available. A reasonable design alternative may include:
 - Deletion of a second or additional crossover to development sites thus creating a requirement for shared access.



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- Design modification (ie. "flipping") so as to relocate the crossover out of the way of street trees.
- The tapering of the driveway to avoid the street tree. *Note: driveways and/or crossovers should be located a minimum of 1.0 metre away from the street tree(s). Reduction of this to 0.5 metre may be permitted with consideration to appropriate sight lines being maintained, and the ability to avoid future damage to the crossover through the installation of root barrier.*
- The tree species is declared a noxious weed or the species has become a weed problem for native vegetation in the eastern metropolitan region, including invasion of remnant vegetation on private land.

The removal of street trees shall not be permitted for any of the following reasons:

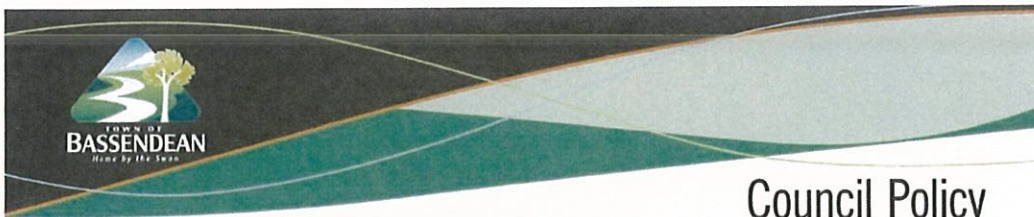
- The tree obscures or has the potential to obscure views other than traffic/pedestrians line of sight.
- The tree species is disliked.
- The tree species causes nuisance by way of leaf, fruit, and/or bark shedding or the like.
- The tree causes allergy and or health problems.
- The tree is in the way of a non-essential crossover or verge paving option.
- The tree shades a private garden, solar hot water systems, or the like.

In the event of a person illegally removing damaging, pruning or poisoning a street tree, Council may prosecute the offender under the *Local Government Act 1995 Schedule 9.1 clause 2 Disturbing local government land or anything on it* and the *Uniform Local Provisions Regulations 1996, Regulation 5 Clause 1 Interfering with, or taking from, local government land* or other relevant provisions under the Act.

Street Tree Replacement

Trees removed for any reason shall be replaced at the next available tree planting season. The trees shall be replaced with the species nominated on the Street Tree Master Plan for the portion of the street on which it is to be planted.

Non-replacement of street trees shall require a report outlining the reasons for non-replacement unless it is documented in other council work programs, projects or developments.



Acceptable reasons for non-replacement include:

- Removal of the tree was approved because of the unsuitability of the location, and no suitable alternative location is available at that site.
- The portion of the street from which the tree has been removed is due for a major replanting program within five years of the removal.
- Adjacent development, civil, or utilities work is due to occur within two years from removal and is likely to disrupt the future establishment of the tree.

Documented Schedule for Removal

A schedule for removal shall require a report that includes the following:

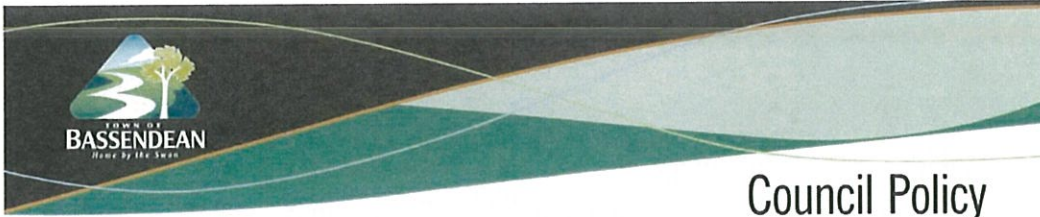
- A description of the management, development, or streetscape reasons for the scheduled removal(s).
- A replacement program or a description of why or how non-replacement conforms to the Street Tree Master Plan.
- An assessment for the removal time required to allow for all preparatory work for the replacement of trees to be completed safely and cost effectively prior to the optimum replacement planting time (typically July/August).

Advertising is required for all street tree removals that are being removed under a documented schedule for removal program. Where the scheduled removal is associated with private developments or as required by utility or government agency works, the cost of advertising shall be borne by the developer or the utility or government agency, whichever is applicable.

Prioritising Streetscape Programs

As the Street Tree Master Plan is progressively implemented, trees that currently do not have good tree amenity will require removal. In situations where an existing street tree is in good condition but conflicts with the streetscape objectives or the Street Tree Master Plan, the streetscape improvement shall take priority. The Street Tree Master Plan has been strongly influenced and directed by the Town's environmental policies and shall take priority over amenity with regard to the development and implementation of street tree works programs.

Prioritising the programming of scheduled street tree removal and replacement shall be on a street-by-street basis and shall consider the average condition of existing trees for the whole street.



Streets shall be prioritised for removal and replacement programs if they satisfy one or more of the following:

- More than 30% of trees qualify for removal because they are considered a noxious weed, or have become a weed problem.
- Recent or confirmed near future undergrounding of power.
- They are classified as main or collector road, or have public facilities within them.

Parts or sections of streets that have low quality trees shall not be prioritised for partial street tree renewal unless more than 40% of street trees are missing, or are likely to qualify for removal under the guidance of this policy.

Street Tree Planting - Alignment

Street trees are to be planted on an alignment measuring 2.7 metres from the property line which will avoid underground services.

Proximity to crossovers, footpaths or side streets - trees should not be planted where the tree would be:

- * Within 3 metres of a vehicle crossover measured longitudinally (along the road);
- * Within 3 metres of a pedestrian ramp measured longitudinally (along the road);
- * Within 25 metres of either side of a terminating road intersection; and
- * No closer than the tree canopy at maturity.

Minimum number of trees to be planted per frontage

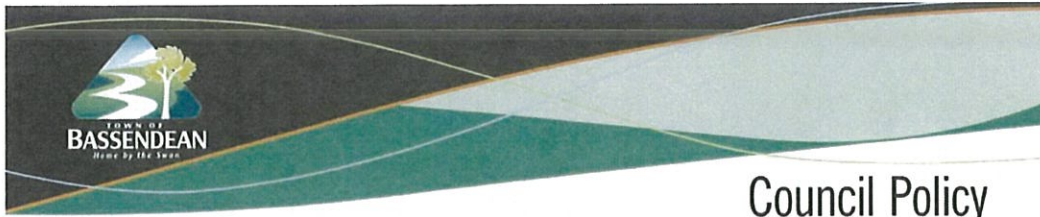
The aim of the Town is to plant at least one tree per frontage for residential, commercial and industrial properties, subject to the above guidelines.

Where planting gaps exist within a street, staff are to identify these gaps and liaise with the abutting property occupier with a view to planting a tree at that location within the following seasonal planting schedule, subject to budgetary considerations.

Planting Schedule and Timing

The planting of street trees will generally take place once per year in the months of July and August so as to take advantage of initial winter rains.

Planting will not take place at any other time of the year except where the tree/s are being planted as part of an overall streetscape programme provided with reticulation or staff consider that the tree/s will be adequately maintained.



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Staff are to maintain a schedule (list) of locations and proposed trees to be planted, and where applicable, the name of the abutting property occupier. This information will be maintained and accessible to the public throughout the year.

Residents requesting a tree/s are to be recorded and liaised with regards to tree selection as per the above guidelines.

Residents will not be charged directly for street trees.

Application

Responsibility for the implementation of this policy rests with the Mayor, Councillors, Council delegates and Chief Executive Officer. The Chief Executive Officer (CEO) has the authority to administer the requirements of this policy. The CEO has on-delegated this authority to the Manager Asset Services.

The Policy is to be reviewed every three years.

<p>Policy Type: Strategic Policy</p> <p>Link to Strategic Community Plan: Town Planning & Built Environment</p>	<p>Policy Owner: Director Operational Services</p> <p>First Adopted: OCM2-11/7/09</p> <p>Last Reviewed: March 2014</p> <p>Version 1</p> <p>Next Review due by: December 2016</p>
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