



Assessment of trees along Nicholson
Street as part of tramstop upgardes

Construction Impact Assessment

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1. Introduction

It is proposed to upgrade the tramstops along Nicholson Street (Route 96) to create centre island platforms. As part of the works, parking lanes are being converted to vehicle running lanes and there is concern relating to overhead tree canopy clearance and kerb upgrades.

C&R Ryder Consulting has been engaged to complete assessments of potentially impacted trees. This report will provide:

- the findings of the assessment
- the impact of the proposed works to the trees above and below ground
- any protection measures for trees to ensure their longevity.

2. Referenced Plans

The following plans were used for the assessments of works and pruning:

- Nicholson Street, OHP 84 to Gertrude Street, Drawing Number: SB20485-ESR-DG-1505-T1, Date 22/04/15, Jacobs
- Nicholson Street, Hanover Street to Moor Street, Drawing Number: SB20485-ESR-DG-1508-T1, Date 22/04/15, Jacobs
- Nicholson Street, Stop 20-Reid Street, Drawing Number: IS168200-LP-DRG-0206, Date 19/01/17, Jacobs
- Nicholson Street, Stop 21-Scotchmer Street, Drawing Number: IS168200-LP-DRG-0306, Date 19/01/17, Jacobs
- Nicholson Street, Salisbury Crescent to Cecil Street, Sheet 2, Drawing Number: SP3-C-071 D3, Date 04/12/15, Argot Consultants
- Nicholson Street, Salisbury Crescent to Cecil Street, Sheet 4, Drawing Number: SP3-C-073 D3, Date 04/12/15, Argot Consultants
- Nicholson Street, Cecil Street to Bell Street, Sheet 2, Drawing Number: SP4-C-071 D3, Date 04/12/15, Argot Consultants
- Nicholson Street, Cecil Street to Bell Street, Sheet 4, Drawing Number: SP4-C-073 D3, Date 04/12/15, Argot Consultants

3. Methodology

Cameron Ryder inspected the all trees potentially impacted as identified on the supplied plans on Monday, 13 March 2017. The following data was collected for the trees:

- Unique ID
- Location ID
- Image of tree
- Botanic and common name
- Tree dimensions (Height x Width)
- Diameter at breast height (DBH)
- Diameter at base (DAB)
- Health
- Structure

- Useful life expectancy (ULE)
- Tree significance
- Retention value
- Existing minimum clearance over road
- Pruning Requirements
- Ground disturbance
- Likely outcome from the works
- Comments

The trees were assessed from ground level, heights and widths were estimated and trunks measured with a diameter tape. No invasive tests were conducted or samples taken and any assessments of decay are qualitative only.

For all tree assessment descriptors, see Appendix 1.

Canopy clearance was measured using a pole to assess clearance requirements from the edge of kerb. Tree viability is an opinion of whether the tree will remain viable in the landscape as a result of proposed pruning. In general, more than 50% canopy loss resulted in the tree being determined unviable.

The impact of kerb and gutter upgrades has not been fully assessed as the plans do not detail the final designs. Comments regarding kerb impacts have been provided.

All tree protection zones and structural root zones have been aligned to the feature survey and are in accordance with AS4970-2009 *Protection of Trees on Development Sites*. Detailed maps of each site are provided in Appendix 3.

4. Site Map

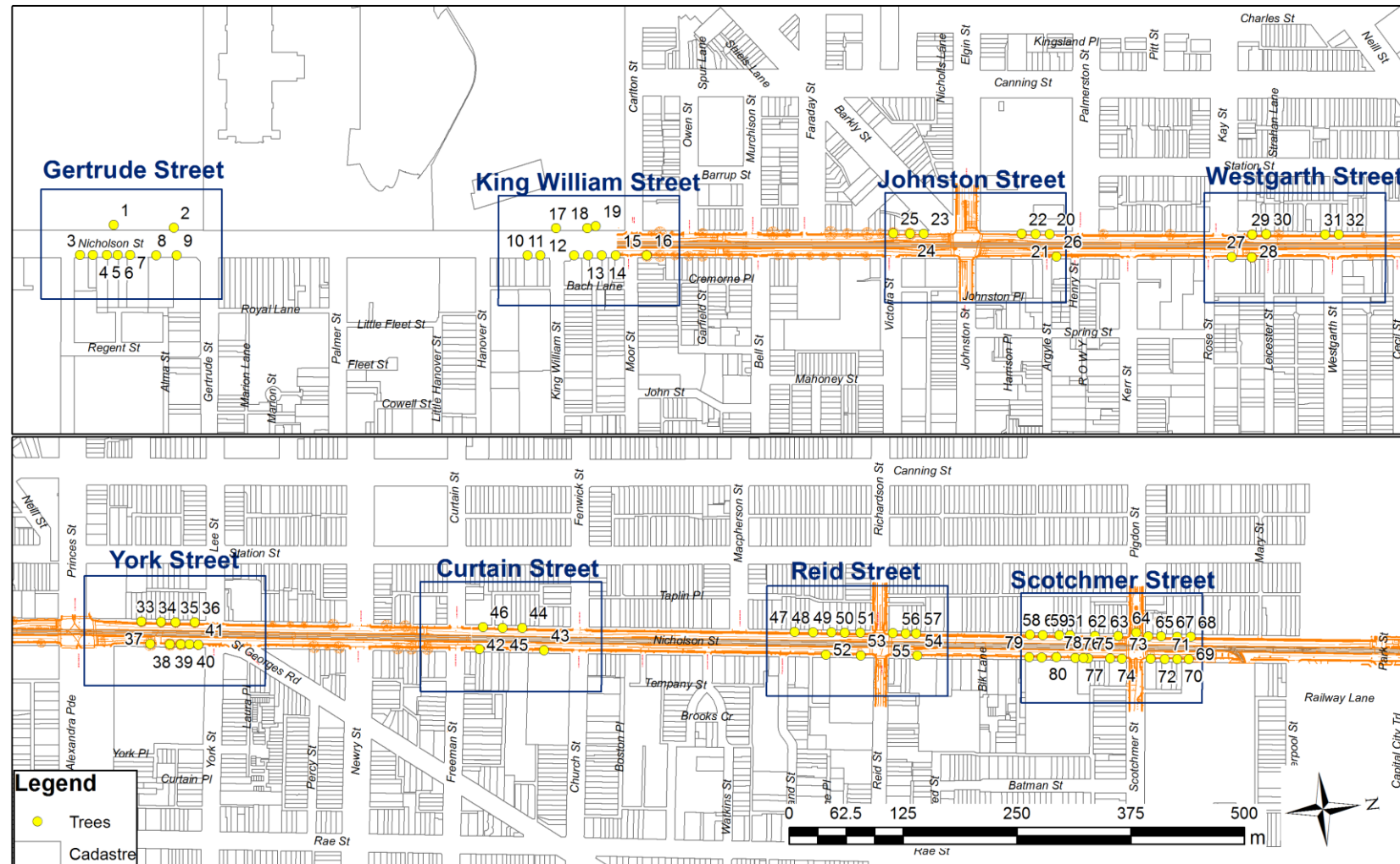


Figure 1: Overview of all trees

5. Tree Details

ID	Botanical Name	Common Name	Origin	Height	Width	DBH	DAB	Health	Structure	ULE	Retention Value	TPZr (m)	SRZr (m)
1	<i>Ficus macrophylla</i>	Moreton Bay Fig	Native	18	18	145	145	Good	Fair	20+ years	Very High	15	3.87
2	<i>Ficus macrophylla</i>	Moreton Bay Fig	Native	15	20	161	161	Good	Fair	20+ years	Very High	15	4.04
3	<i>Platanus Xacerifolia</i>	London Plane	Exotic	15	10	45	52	Good	Good	20+ years	High	5.4	2.51
4	<i>Platanus Xacerifolia</i>	London Plane	Exotic	14	8	41	47	Good	Good	20+ years	High	4.92	2.41
5	<i>Platanus Xacerifolia</i>	London Plane	Exotic	16	12	45	54	Good	Fair	20+ years	High	5.4	2.55
6	<i>Platanus Xacerifolia</i>	London Plane	Exotic	16	12	57	68	Good	Fair	20+ years	High	6.84	2.81
7	<i>Platanus Xacerifolia</i>	London Plane	Exotic	15	10	54	64	Good	Fair	20+ years	High	6.48	2.74
8	<i>Platanus Xacerifolia</i>	London Plane	Exotic	8	5	16	20	Good	Fair	20+ years	Moderate	2	1.50
9	<i>Platanus Xacerifolia</i>	London Plane	Exotic	15	10	50	61	Good	Fair	20+ years	High	6	2.69
10	<i>Platanus Xacerifolia</i>	London Plane	Exotic	9	7	32	39	Good	Fair	20+ years	High	3.84	2.23
11	<i>Platanus Xacerifolia</i>	London Plane	Exotic	16	10	48	57	Good	Fair	20+ years	High	5.76	2.61
12	<i>Lophostemon confertus</i>	Queensland Brush Box	Native	8	6	33	39	Good	Fair	10-20 years	High	3.96	2.23
13	<i>Platanus Xacerifolia</i>	London Plane	Exotic	12	10	43	50	Good	Fair	20+ years	High	5.16	2.47
14	<i>Fraxinus 'Raywood'</i>	Claret Ash	Exotic	10	9	31	36	Fair	Fair	10-20 years	High	3.72	2.15
15	<i>Fraxinus 'Raywood'</i>	Claret Ash	Exotic	10	10	46	55	Fair	Fair	10-20 years	High	5.52	2.57
16	<i>Platanus Xacerifolia</i>	London Plane	Exotic	14	9	42	53	Good	Good	20+ years	High	5.04	2.53
17	<i>Ficus macrophylla</i>	Moreton Bay Fig	Native	16	24	106	122	Good	Good	20+ years	Very High	12.72	3.60
18	<i>Ficus macrophylla</i>	Moreton Bay Fig	Native	18	26	176	230	Good	Good	20+ years	Very High	15	4.70
19	<i>Corymbia citriodora</i>	Lemon-scented Gum	Native	17	16	85	99	Fair	Fair	10-20 years	High	10.2	3.30
20	<i>Corymbia maculata</i>	Spotted Gum	Native	10	10	44	53	Good	Fair	20+ years	High	5.28	2.53
21	<i>Platanus Xacerifolia</i>	London Plane	Exotic	9	6	26	33	Good	Fair	20+ years	High	3.12	2.08
22	<i>Corymbia maculata</i>	Spotted Gum	Native	14	10	54	68	Good	Good	20+ years	High	6.48	2.81
23	<i>Platanus orientalis</i>	Plane	Exotic	6	2	9	11	Fair	Fair	20+ years	Moderate	2	1.50
24	<i>Platanus Xacerifolia</i>	London Plane	Exotic	15	9	52	66	Good	Good	20+ years	High	6.24	2.78
25	<i>Corymbia maculata</i>	Spotted Gum	Native	17	10	60	72	Good	Good	20+ years	High	7.2	2.88

ID	Botanical Name	Common Name	Origin	Height	Width	DBH	DAB	Health	Structure	ULE	Retention Value	TPZr (m)	SRZr (m)
26	<i>Platanus orientalis</i>	Plane	Exotic	13	9	41	55	Good	Fair	20+ years	High	4.92	2.57
27	<i>Platanus Xacerifolia</i>	London Plane	Exotic	8	8	33	42	Good	Fair	20+ years	High	3.96	2.30
28	<i>Platanus Xacerifolia</i>	London Plane	Exotic	15	12	57	70	Good	Fair	20+ years	High	6.84	2.85
29	<i>Platanus orientalis</i>	Plane	Exotic	12	9	35	41	Fair	Fair	10-20 years	Moderate	4.2	2.28
30	<i>Corymbia maculata</i>	Spotted Gum	Native	15	10	50	58	Good	Fair	20+ years	High	6	2.63
31	<i>Corymbia maculata</i>	Spotted Gum	Native	14	8	35	43	Good	Fair	20+ years	Moderate	4.2	2.32
32	<i>Platanus orientalis</i>	Plane	Exotic	8	7	27	33	Good	Fair	20+ years	Moderate	3.24	2.08
33	<i>Platanus orientalis</i>	Plane	Exotic	17	12	59	70	Good	Good	20+ years	High	7.08	2.85
34	<i>Corymbia maculata</i>	Spotted Gum	Native	15	10	49	58	Fair	Fair	20+ years	High	5.88	2.63
35	<i>Platanus orientalis</i>	Plane	Exotic	16	12	62	74	Good	Fair	20+ years	High	7.44	2.92
36	<i>Corymbia maculata</i>	Spotted Gum	Native	16	12	72	85	Good	Fair	20+ years	High	8.64	3.09
37	<i>Platanus Xacerifolia</i>	London Plane	Exotic	16	12	70	78	Good	Fair	20+ years	High	8.4	2.98
38	<i>Platanus Xacerifolia</i>	London Plane	Exotic	14	12	48	56	Fair	Fair	20+ years	High	5.76	2.59
39	<i>Platanus Xacerifolia</i>	London Plane	Exotic	14	10	45	52	Fair	Fair	10-20 years	High	5.4	2.51
40	<i>Platanus Xacerifolia</i>	London Plane	Exotic	14	8	43	49	Fair	Fair	10-20 years	High	5.16	2.45
41	<i>Platanus Xacerifolia</i>	London Plane	Exotic	13	10	50	58	Good	Fair	20+ years	High	6	2.63
42	<i>Platanus Xacerifolia</i>	London Plane	Exotic	16	14	70	82	Good	Fair	20+ years	High	8.4	3.04
43	<i>Platanus Xacerifolia</i>	London Plane	Exotic	14	10	40	49	Fair	Fair	20+ years	High	4.8	2.45
44	<i>Platanus Xacerifolia</i>	London Plane	Exotic	16	10	45	53	Good	Fair	20+ years	High	5.4	2.53
45	<i>Corymbia maculata</i>	Spotted Gum	Native	15	10	52	68	Good	Fair	5-10 years	High	6.24	2.81
46	<i>Platanus orientalis</i>	Plane	Exotic	11	10	67	95	Fair	Fair	10-20 years	High	8.04	3.24
47	<i>Platanus Xacerifolia</i>	London Plane	Exotic	13	9	43	50	Good	Fair	10-20 years	High	5.16	2.47
48	<i>Corymbia maculata</i>	Spotted Gum	Native	15	10	67	77	Good	Fair	20+ years	High	8.04	2.97
49	<i>Platanus Xacerifolia</i>	London Plane	Exotic	9	6	25	30	Good	Fair	20+ years	Moderate	3	2.00
50	<i>Corymbia maculata</i>	Spotted Gum	Native	17	10	72	80	Good	Fair	20+ years	High	8.64	3.01
51	<i>Platanus orientalis</i>	Plane	Exotic	16	12	62	78	Good	Fair	20+ years	High	7.44	2.98
52	<i>Platanus Xacerifolia</i>	London Plane	Exotic	16	12	52	62	Good	Fair	20+ years	High	6.24	2.71
53	<i>Platanus Xacerifolia</i>	London Plane	Exotic	16	10	54	62	Good	Fair	20+ years	High	6.48	2.71

ID	Botanical Name	Common Name	Origin	Height	Width	DBH	DAB	Health	Structure	ULE	Retention Value	TPZr (m)	SRZr (m)
54	<i>Platanus Xacerifolia</i>	London Plane	Exotic	15	10	48	59	Good	Fair	20+ years	High	5.76	2.65
55	<i>Lagerstroemia indica</i>	Crepe Myrtle	Exotic	2	1	10	11	Good	Fair	20+ years	Moderate	2	1.50
56	<i>Laurus nobilis</i>	Bay Tree	Exotic	2	1	6	6	Good	Fair	20+ years	Moderate	2	1.50
57	<i>Corymbia maculata</i>	Spotted Gum	Native	16	10	55	70	Good	Good	20+ years	High	6.6	2.85
58	<i>Laurus nobilis</i>	Bay Tree	Exotic	3	1	10	12	Good	Good	20+ years	Moderate	2	1.50
59	<i>Laurus nobilis</i>	Bay Tree	Exotic	3	1	8	9	Good	Good	20+ years	Moderate	2	1.50
60	<i>Laurus nobilis</i>	Bay Tree	Exotic	3	1	8	9	Good	Good	20+ years	Moderate	2	1.50
61	<i>Lagerstroemia indica</i>	Crepe Myrtle	Exotic	3	1	8	9	Good	Good	20+ years	Moderate	2	1.50
62	<i>Laurus nobilis</i>	Bay Tree	Exotic	3	1	5	6	Good	Good	20+ years	Moderate	2	1.50
63	<i>Laurus nobilis</i>	Bay Tree	Exotic	3	1	6	8	Good	Good	20+ years	Moderate	2	1.50
64	<i>Eucalyptus saligna</i>	Sydney Blue Gum	Native	15	10	50	58	Good	Good	20+ years	Moderate	6	2.63
65	<i>Lagerstroemia indica</i>	Crepe Myrtle	Exotic	3	1	7	9	Good	Good	20+ years	Moderate	2	1.50
66	<i>Laurus nobilis</i>	Bay Tree	Exotic	3	1	7	9	Good	Good	20+ years	Moderate	2	1.50
67	<i>Laurus nobilis</i>	Bay Tree	Exotic	2	1	5	6	Good	Good	20+ years	Moderate	2	1.50
68	<i>Laurus nobilis</i>	Bay Tree	Exotic	2	1	5	6	Good	Good	20+ years	Moderate	2	1.50
69	<i>Platanus orientalis</i>	Plane	Exotic	8	8	25	31	Good	Fair	10-20 years	Moderate	3	2.02
70	<i>Laurus nobilis</i>	Bay Tree	Exotic	2	1	6	8	Good	Fair	10-20 years	Moderate	2	1.50
71	<i>Laurus nobilis</i>	Bay Tree	Exotic	2	1	6	8	Good	Fair	10-20 years	Moderate	2	1.50
72	<i>Laurus nobilis</i>	Bay Tree	Exotic	3	1	8	9	Good	Fair	10-20 years	Moderate	2	1.50
73	<i>Laurus nobilis</i>	Bay Tree	Exotic	2	1	6	7	Good	Fair	10-20 years	Moderate	2	1.50
74	<i>Laurus nobilis</i>	Bay Tree	Exotic	2	1	6	7	Good	Fair	10-20 years	Moderate	2	1.50
75	<i>Laurus nobilis</i>	Bay Tree	Exotic	2	1	5	6	Good	Fair	10-20 years	Moderate	2	1.50
76	<i>Laurus nobilis</i>	Bay Tree	Exotic	3	1	5	6	Good	Fair	10-20 years	Moderate	2	1.50
77	<i>Platanus Xacerifolia</i>	London Plane	Exotic	16	14	72	86	Good	Good	20+ years	High	8.64	3.11
78	<i>Platanus Xacerifolia</i>	London Plane	Exotic	16	14	86	96	Good	Fair	20+ years	High	10.32	3.25
79	<i>Platanus Xacerifolia</i>	London Plane	Exotic	16	10	48	60	Good	Good	20+ years	High	5.76	2.67
80	<i>Lagerstroemia indica</i>	Crepe Myrtle	Exotic	3	1	8	9	Good	Good	20+ years	Moderate	2	1.50

6. Discussion

6.1 The Site

The broader site for works and subsequent tree assessment is along Nicholson Street from North of Victoria Parade, Fitzroy, through to Scotchmer Street, Fitzroy North. 8 individual tramstop installations/upgrades are proposed along the 2.7km length of the street including:

- Site 1, Gertrude Street
- Site 2, King William Street
- Site 3, Johnston Street
- Site 4, Westgarth Street
- Site 5, York Street
- Site 6, Curtain Street
- Site 7, Reid Street
- Site 8, Scotchmer Street (Figure 1)

6.2 The Trees

80 trees were assessed across the 8 sites comprising 15 trees within the City of Melbourne and 65 trees within the City of Yarra. Trees on the western side of Nicholson Street for the first 4 sites are within the City of Melbourne boundary, trees to the east and north are within the City of Yarra.

Trees of note within the City of Melbourne include the 4 Moreton Bay Figs (ID 1, 2, 17 & 18) located in the Carlton Gardens listed as a World Heritage Place in 2004 (Heritage Victoria 2004). A permit may be required to complete pruning works on any trees that are within the gardens.

The majority of trees are street trees planted on both sides of the road, largely in a council verge that is dominated by hard surface, primarily asphalt. Table 1 details a summary of the species assessed.

Table 1: Tree species summary.

Botanical Name	Common Name	Origin	Count
<i>Platanus Xacerifolia</i>	London Plane	Exotic	31
<i>Laurus nobilis</i>	Bay Tree	Exotic	16
<i>Corymbia maculata</i>	Spotted Gum	Native	11
<i>Platanus orientalis</i>	Plane	Exotic	9
<i>Lagerstroemia indica</i>	Crepe Myrtle	Exotic	4
<i>Ficus macrophylla</i>	Moreton Bay Fig	Native	4
<i>Fraxinus 'Raywood'</i>	Claret Ash	Exotic	2
<i>Lophostemon confertus</i>	Queensland Brush Box	Native	1
<i>Eucalyptus saligna</i>	Sydney Blue Gum	Native	1
<i>Corymbia citriodora</i>	Lemon-scented Gum	Native	1
			80

Plane Trees

London Plane *Platanus Xacerifolia*, was the most common species assessed and is typical of the plantings of many areas of Melbourne. A broad crowned deciduous tree of uncertain

garden origin, London Plane regularly reaches heights of 20m in urban areas. The bark is cream to grey and peels in large plates to give a mottled appearance (Spencer 1997).

Its tolerance of urban conditions including atmospheric pollution, compaction and regular pruning make it a highly successful species for road side planting. Studies have shown it is far less likely to cause damage to kerbs and footpaths than other species reaching a similar size (Hitchmough 1994).

The other species of Plane planted along the site is *Platanus orientalis*. It is similar to London Plane in form; however has more deeply divided leaves (Simpfendorfer 1992).

These 2 species (grouped together) account for half of all trees assessed.

Spotted Gum

Spotted Gum *Corymbia maculata* is the other large, maturing species planted as a street tree comprising 11 specimens. It is an evergreen tree native to a small population near Mt Tara in Victoria though more common in coastal and sub-coastal regions of New South Wales (Brooker & Kleinig 1994).

The species has a moderate growth rate, is commonly single stemmed and can attain a mature height of 40m in its natural habitat (Nicolle, 2006). In urban conditions, it is unlikely to grow taller than 20-25m.

Trees managed as topiary

20 trees planted in streets have been managed as topiary 'balls', primarily at the northern end of the site. They include"

- 16 Bay Laurel *Laurus nobilis*
- 4 Crepe Myrtle *Lagerstroemia indica* cv.

These specimens have often been planted under shop front awnings or where space is particularly restricted. They generally perform well and can be maintained as small specimens with regular pruning.

6.2.1 Tree Condition

The assessed trees were generally in good condition with:

- approximately 75% of all trees having good health
- all trees having fair or good structure.
- approximately 75% of all trees expected to have a useful life expectancy (ULE) of more than 20 years (Table 2).

This is not surprising as the tree species are generally long-lived and they are being actively managed.

Table 2: Summary of tree condition.

Health	Count	Structure	Count	ULE	Count
Good	69	Good	24	20+ years	62
Fair	11	Fair	56	10-20 years	17
Poor	0	Poor	0	5-10 years	1
Dead	0	Hazardous	0	<5 years	0
Total	80		80		80

Plane trees are generally planted because of their established tolerances to harsh urban conditions. Spotted Gums are somewhat similar and are known to be long-lived. Moreton Bay Figs are known to be long-lived with many across Melbourne in excess of 100 years old.

Although small, Bay Laurel and Crepe Myrtle are also long-lived.

The only species that would be considered relatively short-lived is Claret Ash *Fraxinus* 'Raywood'. It often succumbs to Ash Dieback in maturity (Spencer 2002).

6.3 Tree Protection Zones

It is important when considering development or construction that assets to be retained are properly protected. In this case the trees are the assets and require protection if they are to be retained in the landscape long-term. Damage to the trees can come in 1 of 2 ways. The first is immediate damage directly to the tree in the form of root severance, breaking of branches and wounding of the trunk. The second is more insidious and can take some time to manifest. This is a more indirect form of damage and usually relates to modification of soil structure or grade, drainage patterns or hydrology (Coder 1995).

Trees can be easily protected from development by the installation of Tree Protection Zones (TPZ). TPZs have been calculated according to AS4970-2009 *Protection of Trees on Development Sites* for all trees to be retained. This calculates the TPZ radius by multiplying the trunk DBH by 12 to a maximum of 15m radius. These figures have been supplied in section 5 Tree Details.

The TPZ calculation is used to help determine encroachment impacts from the proposal and the outcome of the trees.

6.4 Structural Root Zones (SRZs)

The structural root zone is a formula to define the theoretical volume of soil and tree roots required to keep a tree stable in the ground. It is in no way related to tree health and significant excavation at or near the SRZ for many trees will cause severe decline and/or death.

Excavation within SRZs can lead to whole tree failure often with devastating results. SRZs have been calculated in accordance with AS 4970-2009 *Protection of Trees on Development Sites* using the equation:

$$R_{srz} = (D \times 50)^{0.42} \times 0.64$$

Where D=trunk diameter at base in metres.

These figures have been supplied in section 5 Tree Details.

6.5 Pruning Impacts

A large part of this report is assessing the impact of pruning to achieve clearance. Because the road usage will change and a kerbside lane will be implemented, vertical clearance from the kerb edge of 4.8m is required. Factors that influence the amount of pruning the trees will require include:

- The presence of overhead power lines
- Width of the verge
- Species form.

A measure was used to assess clearance requirements and is shown in all tree photos for scale. A 4m pole helps to provide scale and allowed measurement of which trees would require pruning or removal to achieve 4.8m clearance. The following figures provide some examples of the tree pruning assessments.

The following figures provide some examples of the assessments completed.



Figure 2: Pruning required to achieve 4.8m over the road. This tree will not remain viable (Tree 13).



Figure 3: Pruning required to achieve 4.8m over the road. This tree will not remain viable (Tree 54).



Figure 4: Example of where trunk removal is required to achieve clearance (Tree 21).



Figure 5: Example of a tree that will remain viable with pruning (Tree 34).

6.6 Construction Impact

Encroachment of less than 10% of the TPZ and outside the SRZ is deemed to be minor encroachment according to AS 4970-2009. Variations must be made by the project arborist considering other relevant factors including tree health, vigour, stability, species sensitivity and soil characteristics.

Encroachment of more than 10% of the TPZ or into the SRZ is major encroachment. The project arborist must demonstrate that the tree(s) would remain viable. This may require root investigation by non-destructive methods and consideration of relevant factors tree health, vigour, stability, species sensitivity and soil characteristics.

6.7 Modifying Kerbs

The kerb replacement process as noted in many of the plans has not been assessed as detail has not been provided. In many cases, the trunks of the mature Planes and Spotted Gums have expanded and the flare or roots are impacting the bluestone kerbing. Simple replacement, root cutting and excavation is likely to damage trees and potentially cause many to require removal.

When preparing detail for these works near trees, the following should be considered to minimise impacts:

- Removal of the bluestones set into the road is likely to be achievable with minimal root damage.
- Excavation below the bluestones is not likely to be achievable with some root damage, the extent of which cannot be determined until the stones are lifted.
- Bluestones forming the kerb line are to be retained wherever possible. Where they are removed and relaid, there is to be no additional excavation if roots are present.
- Bluestones within SRZs that must be removed are to be done so by hand or with the aid of a small excavator (~2 tonne)
- Selective root pruning may be achievable in accordance with AS 4373-2007 *pruning of Amenity Trees*.
- All kerb and gutter replacement works within TPZs should be supervised by a project arborist.

Modifying the kerb and gutter is likely to be challenging near many trees, particularly Trees 3, 7, 33, 35-8, 41, 43, 47, 48, 50, 51, 54, 57, 77 & 78.

6.8 Tree Root Distribution in Roadways

In general, the impacts of the tramstop installation/upgrades have not been assessed as impacts in accordance with AS4970-2009 *Protection of Trees on Development Sites*. This is because the majority of works will be occurring centrally within the roadway. Construction of many busy urban roads is such that root growth under the sealed surface is highly restricted. Additionally, the works will occur in areas with existing tram lines, usually requiring several hundred millimetres depth of reinforced concrete.

Where minor road changes and levels are proposed, the works won't generally exceed the sub-base of the existing road.

Given these factors, the tramstop upgrades are not expected to impact trees.

7. Individual Sites

The following summarises the assessments of impacts for each site above and below ground. The full assessment data is provided in Appendix 2 and detailed maps including TPZs and SRZs are provided in Appendix 3.

7.1 Site 1, Gertrude Street

Site 1 involves the installation of a new 66m long centre island platform and modification of the tram alignment. As such, 24 car parking spaces will be lost for new vehicle running lanes. Additionally, new pedestrian crossings, signalling and tram poles are required.

For the 9 trees assessed at Gertrude Street:

- All will remain viable
- Pruning is required for all trees as detailed.
 - Trees 1 and 2 are located within the Carlton Gardens and pruning may require a heritage permit.
- Poles 85d and 87d should be moved to be installed south of the existing poles.
- There will be no impact for the crossover installed within the TPZ of Tree 1 due to existing level changes and hard infrastructure.
- There will be a minor impact from the installation of the pedestrian crossing near Trees 5 & 6.

7.2 Site 2, King William Street

Site 2 involves the installation of a new 33m long centre island platform and modification of the tram alignment. As such, 34 car parking spaces will be lost for new vehicle running lanes. Additionally, new pedestrian crossings and signalling are required.

For the 10 trees assessed at King William Street:

- Trees 11, 16-19 will remain viable.
- Tree 10 will remain viable with a possible reduction in ULE.
- Trees 12-15 will not remain viable and require removal. The proposed crossover will also encroach on the trunk of Tree 15.
- There will be no encroachment for other trees for the installation of infrastructure not in the road surface.
- Of the trees that will remain viable, all will require pruning to achieve clearance.
 - Trees 17-19 are located within the Carlton Gardens and pruning may require a heritage permit.

7.3 Site 3, Johnston Street

Site 3 involves the installation of 2 new centre island platforms on either side of the Johnston Street intersection and modification of the tram alignment.

For the 7 trees assessed at Johnston Street:

- Trees 20 & 22-26 will remain viable.
- Tree 21 will require removal as the trunk overhangs the roadway.
- Pruning will be required as detailed to Trees 20, 22, 23 and 26.
- No pruning will be required for trees 24 & 25.

7.4 Site 4, Westgarth Street

Site 4 involves the installation of a new centre island platform and modification of the tram alignment. As such, 14 car parking spaces will be lost for new vehicle running lanes. Additionally, new pedestrian crossings and signalling are required.

For the 6 trees assessed at Westgarth Street:

- Trees 27 & 30-32 will remain viable.
- Tree 28 will remain viable with a possible reduction in ULE due to large branch loss.
- Tree 29 will not remain viable due to the required loss of stem and canopy.
- Pruning will be required as detailed to Trees 27 & 28.
- No pruning will be required for trees 30-32.
- There will be no encroachment for other trees for the installation of infrastructure not in the road surface.

7.5 Site 5, York Street

Site 5 involves the installation of a new centre island platform and modification of the tram alignment. As such, 21 car parking spaces will be lost for new vehicle running lanes. Additionally, new pedestrian crossings and signalling are required.

For the 9 trees assessed at York Street:

- Trees 34-37, 40 & 41 will remain viable.
- Trees 33 & 38 will remain viable with a possible reduction in ULE due to large branch loss.
- Tree 39 will not remain viable due to the required loss of stem and canopy.
- Pruning will be required as detailed to Trees 33-35, 37 & 38.
- No pruning will be required for trees 36, 40 & 41.
- There will be minor encroachments to Trees 35 and 38 for the installation of infrastructure not in the road surface.

7.6 Site 6, Curtain Street

Site 6 involves the installation of a new centre island platform and modification of the tram alignment. As such, 24 car parking spaces will be lost for new vehicle running lanes. Additionally, new pedestrian crossings and signalling are required.

For the 5 trees assessed at Curtain Street:

- Tree 46 will remain viable.
- Trees 42 & 43 will remain viable with a possible reduction in ULE due to large branch loss.
- Tree 44 & 45 will not remain viable due to the required loss of the main trunk over the road.
- Pruning will be required as detailed to Trees 42, 43 & 46.
- There will be minor encroachments to Tree 45 (already requiring removal) for the installation of infrastructure not in the road surface.

7.7 Site 7, Reid Street

Site 7 involves the installation of a new 33m long centre island platform and modification of the tram alignment. As such, 16 car parking spaces will be lost for new vehicle running lanes. The existing intersection pedestrian crossings will be upgraded for access to the platform.

For the 11 trees assessed at Reid Street:

- Trees 48-51, 53 & 55-57 will remain viable.
- Tree 47, 52 & 54 will not remain viable due to the required loss of the main trunk or stems over the road.
- Pruning will be required as detailed to Trees 49, 51 & 53.
- No pruning will be required for Trees 48, 50 & 55-57.
- There will be no encroachments to Trees for the installation of infrastructure not in the road surface.

7.8 Site 8, Scotchmer Street

Site 8 involves the installation of a new 33m long centre island platform and modification of the tram alignment. As such, 22 car parking spaces will be lost for new vehicle running lanes. The existing intersection pedestrian crossings will be upgraded for access to the platform.

For the 23 trees assessed at Curtain Street:

- Trees 58-76 & 80 will remain viable.
- Tree 77-79 will not remain viable due to the required loss of the main branches over the road.
- Pruning will be required as detailed to Tree 69, all others proposed to be retained do not require pruning for canopy clearance.

7.9 Summary

For the 80 trees assessed around the proposed 8 tramstops:

- 56 trees will remain viable. These include Trees 1-5, 8, 11, 16-20, 22-27, 30-32, 34-37, 40, 41, 46, 48-51, 53, 55-76 & 80.
 - 32 trees will not require any pruning for clearance.
 - 24 trees will require pruning.
- 9 trees will remain viable with a possible reduction in ULE. These include Trees 6, 7, 9, 10, 28, 33, 38, 42 & 43.
- 15 trees will not remain viable and will need to be removed to implement the design. These include Trees 12-15, 21, 29, 39, 44, 45, 47, 52, 54, 77-79.

8. Conclusion

C&R Ryder Consulting was engaged to complete an assessment of likely impacts to trees from 8 proposed tramstop upgrades along Nicholson Street (Route 96).

80 trees were assessed across the 8 sites comprising a mix of large species including London Plane and Spotted Gum as well as Crepe Myrtle and bay Laurel managed as topiary 'balls'. In general the trees are in good condition with long ULEs. Several assessed trees are located within the Carlton gardens, a World Heritage Site and may require a permit if pruning is completed.

The trees have been assessed to determine their long-term viability taking into account the requirement to achieve 4.8m vertical clearance from the kerb for new running lanes.

- 56 trees will remain viable. These include Trees 1-5, 8, 11, 16-20, 22-27, 30-32, 34-37, 40, 41, 46, 48-51, 53, 55-76 & 80.
 - 32 trees will not require any pruning for clearance.
 - 24 trees will require pruning.
- 9 trees will remain viable with a possible reduction in ULE. These include Trees 6, 7, 9, 10, 28, 33, 38, 42 & 43.
- 15 trees will not remain viable and will need to be removed to implement the design. These include Trees 12-15, 21, 29, 39, 44, 45, 47, 52, 54, 77-79.

An assessment of the impacts from kerb reconstruction has not been completed as the detail has not been provided. In general, the impacts to trees can be mitigated if the guidelines detailed in section 6.7 are implemented. Traditional kerb and channel replacement has the potential to cause another 13 trees that would previously have been viable to likely require removal.

9. References

- AS 4373, 2007, *Australian Standard, Pruning Amenity Trees*, 2nd Edition Standards Australia
- AS 4970, 2009, *Australian Standard, Protection of Trees on Development Sites*, Standards Australia
- Brooker M.I.H, Kleinig D.A, 1994 *Field Guide to Eucalypts Volume 3*, Second edition, Bloomings Books Melbourne Australia.
- Coder, K. D., 1995, 'Tree quality BMPs for developing wooded areas and protecting residual trees', in *Trees and Building Sites, Proceedings of an International Workshop on Trees and Buildings*, Edited by G. W. Watson and D. Neely, International Society of Arboriculture, Champaign, Illinois.
- Heritage Victoria, 2004, Royal Exhibition Building and Carlton Gardens (World Heritage Place), accessed 13 March 2017, Victorian Heritage Database, <http://vhd.heritagecouncil.vic.gov.au/places/228>
- Hitchmough, J., 1994, *Urban Landscape Management*, Inkata Press, Sydney.
- Nicolle, D., 2006, *Eucalypts of Victoria and Tasmania*, Bloomings Books, Melbourne.
- Simpfendorfer, K. J. 1992, *An Introduction to Trees for South Eastern Australia*, Inkata Press, Chatswood, NSW.
- Spencer R. 1997, *Horticultural flora of south eastern Australia*; Vol. 2, Flowering Plants Dicotyledons, Part 1, University of New South Wales Press, Sydney, NSW.
- Spencer R. 2002, *Horticultural flora of south eastern Australia*; Vol. 4, Flowering Plants Dicotyledons, Part 3, University of New South Wales Press, Sydney, NSW.

Appendix 1. Tree Assessment Descriptors

1.1 Image of tree

Digital image captured on the day of assessments.

1.2 Botanic Name/Common Name

The tree identified to genus and species level as well as the generally accepted common name for the tree.

1.3 Tree Dimensions

The height and width of the tree as estimated by the arborist in whole metres.

1.4 Diameter at Breast Height

The trunk diameter of the tree measured with a diameter tape at 1.4m above ground level.

1.5 Diameter at Base

The trunk diameter of the tree measured with a diameter tape above the root flare.

1.6 Health

Very Good	The tree is demonstrating exceptional growth for the species, has a full, dense canopy and there is no sign of any pest or disease.
Good	The tree is demonstrating good growth for the species in its location with respect to its location and broader context. The canopy is full and complete and there are no signs of pest or disease.
Fair	The tree may have shown a reduction in optimal growth and/or there may be some twiggy deadwood within the canopy. There may be the presence of some pests or diseases that are not causing a significant decline in the tree
Poor	The tree is in decline with little growth. There may be sections of the canopy missing and pests or diseases may be prevalent
Very Poor	The tree is in significant decline, with large sections of the canopy dead. This tree is very unlikely to recover.
Dead	The tree is dead

1.7 Structure

Good	The tree's structure is typical of the species with no significant hazards such as included bark, trunk decay, splits or tears. In general there will be a single trunk with scaffold and/or subordinate branches that display good attachments
Fair	There may be minor defects in the canopy, but the overall tree is still relatively free of significant issues. The tree may need minor pruning to fix minor defects. The canopy will be mostly symmetrical and typical of the species.
Poor	The tree will have 1 or more significant defect that may be able to be remedied with pruning. This tree is likely to have an atypical canopy and may contain defects such as included bark or codominant stems.
Very Poor	The tree has substantial defects associated with its primary trunk and scaffold structure that cannot be remedied with pruning or other measures. It is likely that this tree will require removal in the short term.
Hazardous	The tree has major defects and is likely to fail. It should be removed as soon as possible.

1.8 Useful Life Expectancy

20+	The tree is a healthy specimen in good condition. It is expected to provide a degree of safety and contribution to the landscape for at least another 20 years with an appropriate level of management.
10-20 years	The tree is a reasonably healthy specimen in good or fair condition. It is expected to provide a degree of safety and contribution to the landscape for 10-20 years with an appropriate level of management.
5-10 years	The tree is in fair condition or a short lived species. It is likely to provide contribution to the landscape for 5-10 years with an appropriate level of management at which point removal may need to be considered.
1-5 years	The tree is a poor specimen in decline and is likely to require removal within 1-5 years.
0 years	The tree is either dead or has substantial defects requiring its removal in the short term.

1.9 Tree Significance

Highly Significant	The tree is a large, mature example of the species, generally in fair to good condition. It may be a remnant specimen or have substantial habitat value. The tree may have specific landscape context or be very prominent in the broader environment. This tree may be suitable for inclusion on a significant tree register at local or state government level. Significant efforts should be made to retain this tree.
Significant	The tree is a mature example of the species in good condition and/or have particular prominence in the landscape. There may be evidence of the tree being used as a habitat tree by local fauna and/or it may be a remnant specimen. It has a long ULE and should be considered for retention. The loss of the tree may have a significant impact on the surrounding landscape.
Moderately Significant	The tree is a semi mature to mature example of the species in good condition, may be well sited in the landscape and/or may have habitat value. The removal of this tree would be noticed in the landscape.
Low	The tree is generally a smaller specimen or may be in decline. It is not located in a prominent position and its removal would have little impact on the broader landscape.
None	The tree is considered insignificant and its loss would go unnoticed.

1.10 Tree Retention

Very High	The tree is an outstanding example of the species and it should be retained at all costs.
High	The tree is a mature specimen in fair to good condition with a ULE of at least 10 years, is suitable to the site and should be retained in a new development.
Moderate	The tree is a semi-mature or mature specimen, in fair to good condition that is suitable for retention; however, is located such that its loss would not have a significant impact on the landscape.
Low	The tree is likely to be juvenile or in decline and could be retained; however design changes are not considered worthwhile to retain a tree in this category.
None	The tree should be removed irrespective of a design as it is in severe decline, hazardous or dead.
Third Party Tree	This tree is located off the subject property and is owned by a third party. The assessment of health and structure is considered irrelevant as the tree must be retained.

Appendix 2. Tree Impact Assessments

Site	ID	Botanical Name	TPZr (m)	SRZr (m)	SRZ encroachment	TPZ Encroachment	Existing Clearance	Pruning Required	Ground impacts	Likely outcome
Gertrude Street	1	<i>Ficus macrophylla</i>	15	3.87	No	0.93	>5	Possible minor pruning required for new pole, consider moving to south side of existing pole.	New pole and crossover required in footpath, minor impacts	Tree will remain viable
Gertrude Street	2	<i>Ficus macrophylla</i>	15	4.04			>5	Driving lane already exists. Possible minor pruning required for new pole, consider moving to south side of existing pole.	None	Tree will remain viable
Gertrude Street	3	<i>Platanus Xacerifolia</i>	5.4	2.51			~3	3 low branches over road, approx 30% canopy loss	Trunk flare is displacing kerb	Tree will remain viable
Gertrude Street	4	<i>Platanus Xacerifolia</i>	4.92	2.41			~4	3 low branches over road, approx 25% canopy loss	None	Tree will remain viable
Gertrude Street	5	<i>Platanus Xacerifolia</i>	5.4	2.55	No	1.63	~3.75	1 low branch over road and some fine foliage, approx 15% of canopy	Minor impact from pedestrian crossing	Tree will remain viable
Gertrude Street	6	<i>Platanus Xacerifolia</i>	6.84	2.81	No	4.09	~4	1 large scaffold over road requires removal.	Minor impact from pedestrian crossing	Tree will remain viable, possible reduction in ULE
Gertrude Street	7	<i>Platanus Xacerifolia</i>	6.48	2.74			~4	1 scaffold over road requires removal.	Trunk flare is displacing kerb	Tree will remain viable, possible reduction in ULE
Gertrude Street	8	<i>Platanus Xacerifolia</i>	2	1.50			~3.5	Small lower limbs to achieve clearance, but not for design changes.	None	Tree will remain viable
Gertrude Street	9	<i>Platanus Xacerifolia</i>	6	2.69			~4	None for design, but 2 large low limbs to comply with 4.8m	None	Tree will remain viable, possible reduction in ULE
King William Street	10	<i>Platanus Xacerifolia</i>	3.84	2.23			~3.75	3 branches growing over road, approx. 50% canopy loss	None	Tree will remain viable, possible reduction in ULE
King William Street	11	<i>Platanus Xacerifolia</i>	5.76	2.61			~3	No significant branches, only small epicormics.	None	Tree will remain viable

Site	ID	Botanical Name	TPZr (m)	SRZr (m)	SRZ encroachment	TPZ Encroachment	Existing Clearance	Pruning Required	Ground impacts	Likely outcome
King William Street	12	<i>Lophostemon confertus</i>	3.96	2.23			~3.5	Both main stems over road, ~60% loss	None	Tree will not remain viable
King William Street	13	<i>Platanus Xacerifolia</i>	5.16	2.47			~3	Both main stems over road, ~60% loss	None	Tree will not remain viable
King William Street	14	<i>Fraxinus 'Raywood'</i>	3.72	2.15			~4	Both main stems over road, ~60% loss	None	Tree will not remain viable
King William Street	15	<i>Fraxinus 'Raywood'</i>	5.52	2.57	Yes	100.00	~3	3 stems over road, ~50% canopy loss	New crossover and signals will require tree removal	Tree will not remain viable
King William Street	16	<i>Platanus Xacerifolia</i>	5.04	2.53			~3.75	3-4 stems over road, ~30-40% loss	None	Tree will remain viable
King William Street	17	<i>Ficus macrophylla</i>	12.72	3.60			~4.5	1 x 300mm branch and low hanging foliage.	None	Tree will remain viable
King William Street	18	<i>Ficus macrophylla</i>	15	4.70			~4.5	Only low hanging foliage.	None	Tree will remain viable
King William Street	19	<i>Corymbia citriodora</i>	10.2	3.30			~3.5	1 small branch and low hanging foliage.	None	Tree will remain viable
Johnston Street	20	<i>Corymbia maculata</i>	5.28	2.53			~4.5	Small amount of low hanging foliage.	None	Tree will remain viable
Johnston Street	21	<i>Platanus Xacerifolia</i>	3.12	2.08			~4.5	Whole of canopy to be removed as trunk leans over roadway	None	Tree will not remain viable
Johnston Street	22	<i>Corymbia maculata</i>	6.48	2.81			~4.5	Only low hanging foliage	Possible root damage to fix kerb	Tree will remain viable
Johnston Street	23	<i>Platanus orientalis</i>	2	1.50			2	Only low foliage	Large surface roots evident	Tree will remain viable
Johnston Street	24	<i>Platanus Xacerifolia</i>	6.24	2.78			>5	None	None	Tree will remain viable
Johnston Street	25	<i>Corymbia maculata</i>	7.2	2.88			>5	None	None	Tree will remain viable
Johnston Street	26	<i>Platanus orientalis</i>	4.92	2.57			~3.5	2 branches over road, ~25% canopy loss	None	Tree will remain viable

Site	ID	Botanical Name	TPZr (m)	SRZr (m)	SRZ encroachment	TPZ Encroachment	Existing Clearance	Pruning Required	Ground impacts	Likely outcome
Westgarth Street	27	<i>Platanus Xacerifolia</i>	3.96	2.30			~3.5	Whole stem over road, ~35% canopy	Existing pedestrian within TPZ	Tree will remain viable
Westgarth Street	28	<i>Platanus Xacerifolia</i>	6.84	2.85			~3.5	2 large branches over road, ~40% canopy	None	Tree will remain viable, possible reduction in ULE
Westgarth Street	29	<i>Platanus orientalis</i>	4.2	2.28			~3.5	Whole stem over road, ~70% canopy	None	Tree will not remain viable
Westgarth Street	30	<i>Corymbia maculata</i>	6	2.63			~5	None	None	Tree will remain viable
Westgarth Street	31	<i>Corymbia maculata</i>	4.2	2.32			~4	None	None	Tree will remain viable
Westgarth Street	32	<i>Platanus orientalis</i>	3.24	2.08			~3.5	None	None	Tree will remain viable
York Street	33	<i>Platanus orientalis</i>	7.08	2.85			~4	Whole stem over road, ~40% canopy loss.	Trunk flare is displacing kerb	Tree will remain viable, possible reduction in ULE
York Street	34	<i>Corymbia maculata</i>	5.88	2.63			~4	2 small branches over road, ~20% canopy loss.	None	Tree will remain viable
York Street	35	<i>Platanus orientalis</i>	7.44	2.92	No	3.20	~4	3 moderate sized branches over road, ~25% canopy loss.	New crossing will impact tree roots, Trunk flare is growing over kerb	Tree will remain viable
York Street	36	<i>Corymbia maculata</i>	8.64	3.09			~4.8	None	Trunk flare is displacing kerb	Tree will remain viable
York Street	37	<i>Platanus Xacerifolia</i>	8.4	2.98			~3.75	Remove large northeastern stem, ~25% of canopy loss	Trunk flare is growing over kerb	Tree will remain viable
York Street	38	<i>Platanus Xacerifolia</i>	5.76	2.59	No	0.75	~4	Remove 2 branches over road, ~40% of canopy	Minor impact from new pedestrian crossing, Trunk flare is displacing kerb	Tree will remain viable, possible reduction in ULE

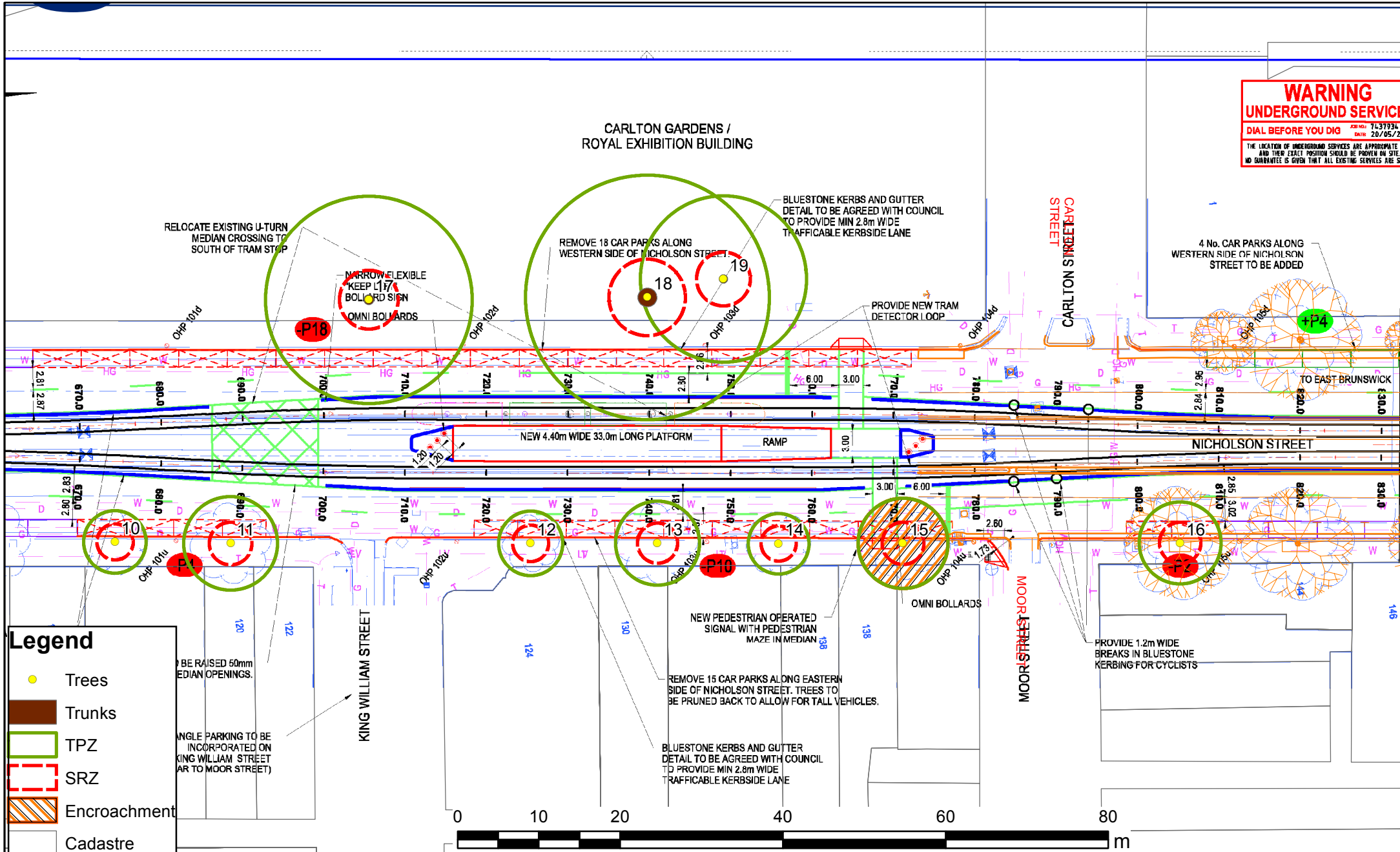
Site	ID	Botanical Name	TPZr (m)	SRZr (m)	SRZ encroachment	TPZ Encroachment	Existing Clearance	Pruning Required	Ground impacts	Likely outcome
York Street	39	<i>Platanus Xacerifolia</i>	5.4	2.51			~3.5	Remove 2 branches over road, ~60% of canopy	None	Tree will not remain viable
York Street	40	<i>Platanus Xacerifolia</i>	5.16	2.45			>5	None	None	Tree will remain viable
York Street	41	<i>Platanus Xacerifolia</i>	6	2.63			~4.7	None	Trunk flare is displacing kerb	Tree will remain viable
Curtain Street	42	<i>Platanus Xacerifolia</i>	8.4	3.04			~3.5	3 large branches over road, ~50% canopy loss	None	Tree will remain viable, possible reduction in ULE
Curtain Street	43	<i>Platanus Xacerifolia</i>	4.8	2.45			~3	2 large branches over road, 50% canopy	Trunk flare is growing over kerb	Tree will remain viable, possible reduction in ULE
Curtain Street	44	<i>Platanus Xacerifolia</i>	5.4	2.53			~2	Remove main trunk heading over road, ~60% canopy loss	None	Tree will not remain viable
Curtain Street	45	<i>Corymbia maculata</i>	6.24	2.81	Yes	4.57	~3.8	Remove main trunk heading over road, ~60% canopy loss	New crossing will impact tree roots, move crossing south outside of SRZ.	Tree will not remain viable
Curtain Street	46	<i>Platanus orientalis</i>	8.04	3.24			~3	Remove large branch ~300mm diameter heading over road, ~30% canopy loss	None	Tree will remain viable
Reid Street	47	<i>Platanus Xacerifolia</i>	5.16	2.47			~3	Removal of main stem at kerb to achieve clearance	Trunk flare is displacing kerb	Tree will not remain viable
Reid Street	48	<i>Corymbia maculata</i>	8.04	2.97			>5	None	Trunk flare is displacing kerb	Tree will remain viable
Reid Street	49	<i>Platanus Xacerifolia</i>	3	2.00			~3	1 branch to be removed, ~20% of canopy.	None	Tree will remain viable
Reid Street	50	<i>Corymbia maculata</i>	8.64	3.01			~4.8	None	Trunk flare is displacing kerb	Tree will remain viable

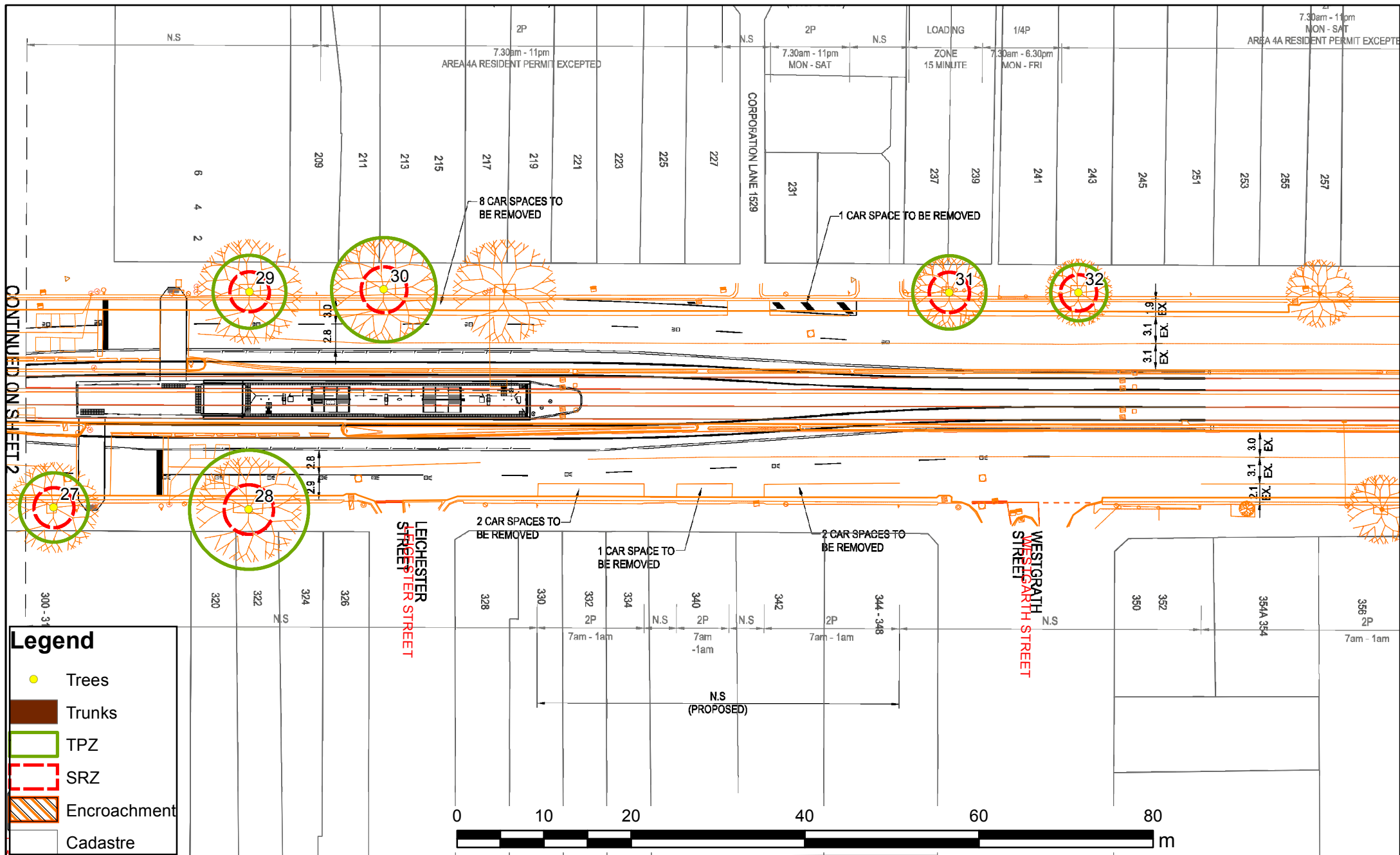
Site	ID	Botanical Name	TPZr (m)	SRZr (m)	SRZ encroachment	TPZ Encroachment	Existing Clearance	Pruning Required	Ground impacts	Likely outcome
Reid Street	51	<i>Platanus orientalis</i>	7.44	2.98			~4	1 low branch to remove, ~15% of canopy	Trunk flare is displacing kerb	Tree will remain viable
Reid Street	52	<i>Platanus Xacerifolia</i>	6.24	2.71			~3.5	2 large branches over road to remove, ~60% of canopy	None	Tree will not remain viable
Reid Street	53	<i>Platanus Xacerifolia</i>	6.48	2.71			~4	Only low hanging foliage	None	Tree will remain viable
Reid Street	54	<i>Platanus Xacerifolia</i>	5.76	2.65			~3.5	2 main stems to be pruned	Trunk flare is displacing kerb	Tree will not remain viable
Reid Street	55	<i>Lagerstroemia indica</i>	2	1.50			2	None	None	Tree will remain viable
Reid Street	56	<i>Laurus nobilis</i>	2	1.50			2	None	None	Tree will remain viable
Reid Street	57	<i>Corymbia maculata</i>	6.6	2.85			~5	None	Trunk flare is displacing kerb	Tree will remain viable
Scotchmer Street	58	<i>Laurus nobilis</i>	2	1.50			>5	None	None	Tree will remain viable
Scotchmer Street	59	<i>Laurus nobilis</i>	2	1.50			>5	None	None	Tree will remain viable
Scotchmer Street	60	<i>Laurus nobilis</i>	2	1.50			>5	None	None	Tree will remain viable
Scotchmer Street	61	<i>Lagerstroemia indica</i>	2	1.50			>5	None	None	Tree will remain viable
Scotchmer Street	62	<i>Laurus nobilis</i>	2	1.50			>5	None	None	Tree will remain viable
Scotchmer Street	63	<i>Laurus nobilis</i>	2	1.50			>5	None	None	Tree will remain viable
Scotchmer Street	64	<i>Eucalyptus saligna</i>	6	2.63			>5	None	None	Tree will remain viable
Scotchmer Street	65	<i>Lagerstroemia indica</i>	2	1.50			>5	None	None	Tree will remain viable

Site	ID	Botanical Name	TPZr (m)	SRZr (m)	SRZ encroachment	TPZ Encroachment	Existing Clearance	Pruning Required	Ground impacts	Likely outcome
Scotchmer Street	66	<i>Laurus nobilis</i>	2	1.50			>5	None	None	Tree will remain viable
Scotchmer Street	67	<i>Laurus nobilis</i>	2	1.50			>5	None	None	Tree will remain viable
Scotchmer Street	68	<i>Laurus nobilis</i>	2	1.50			>5	None	None	Tree will remain viable
Scotchmer Street	69	<i>Platanus orientalis</i>	3	2.02			~4.8	Only foliage and branches ~10mm	None	Tree will remain viable
Scotchmer Street	70	<i>Laurus nobilis</i>	2	1.50			>5	None	None	Tree will remain viable
Scotchmer Street	71	<i>Laurus nobilis</i>	2	1.50			>5	None	None	Tree will remain viable
Scotchmer Street	72	<i>Laurus nobilis</i>	2	1.50			>5	None	None	Tree will remain viable
Scotchmer Street	73	<i>Laurus nobilis</i>	2	1.50			>5	None	None	Tree will remain viable
Scotchmer Street	74	<i>Laurus nobilis</i>	2	1.50			>5	None	None	Tree will remain viable
Scotchmer Street	75	<i>Laurus nobilis</i>	2	1.50			>5	None	None	Tree will remain viable
Scotchmer Street	76	<i>Laurus nobilis</i>	2	1.50			>5	None	None	Tree will remain viable
Scotchmer Street	77	<i>Platanus Xacerifolia</i>	8.64	3.11			~3.5	2 large branches over road, 50% canopy loss	Trunk flare is displacing kerb	Tree will not remain viable
Scotchmer Street	78	<i>Platanus Xacerifolia</i>	10.32	3.25			~3	3 main stems over road, 70% canopy loss	Trunk flare is displacing kerb	Tree will not remain viable
Scotchmer Street	79	<i>Platanus Xacerifolia</i>	5.76	2.67			~3	5 branches over road, 60% canopy loss	None	Tree will not remain viable
Scotchmer Street	80	<i>Lagerstroemia indica</i>	2	1.50			>5	None	None	Tree will remain viable

Appendix 3. TPZ Maps

WARNING
UNDERGROUND SERVICE
DIAL BEFORE YOU DIG
 THE LOCATION OF UNDERGROUND SERVICES ARE APPROXIMATE IN THIS MAP AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.





CONTINUED ON SHEET 2

Legend

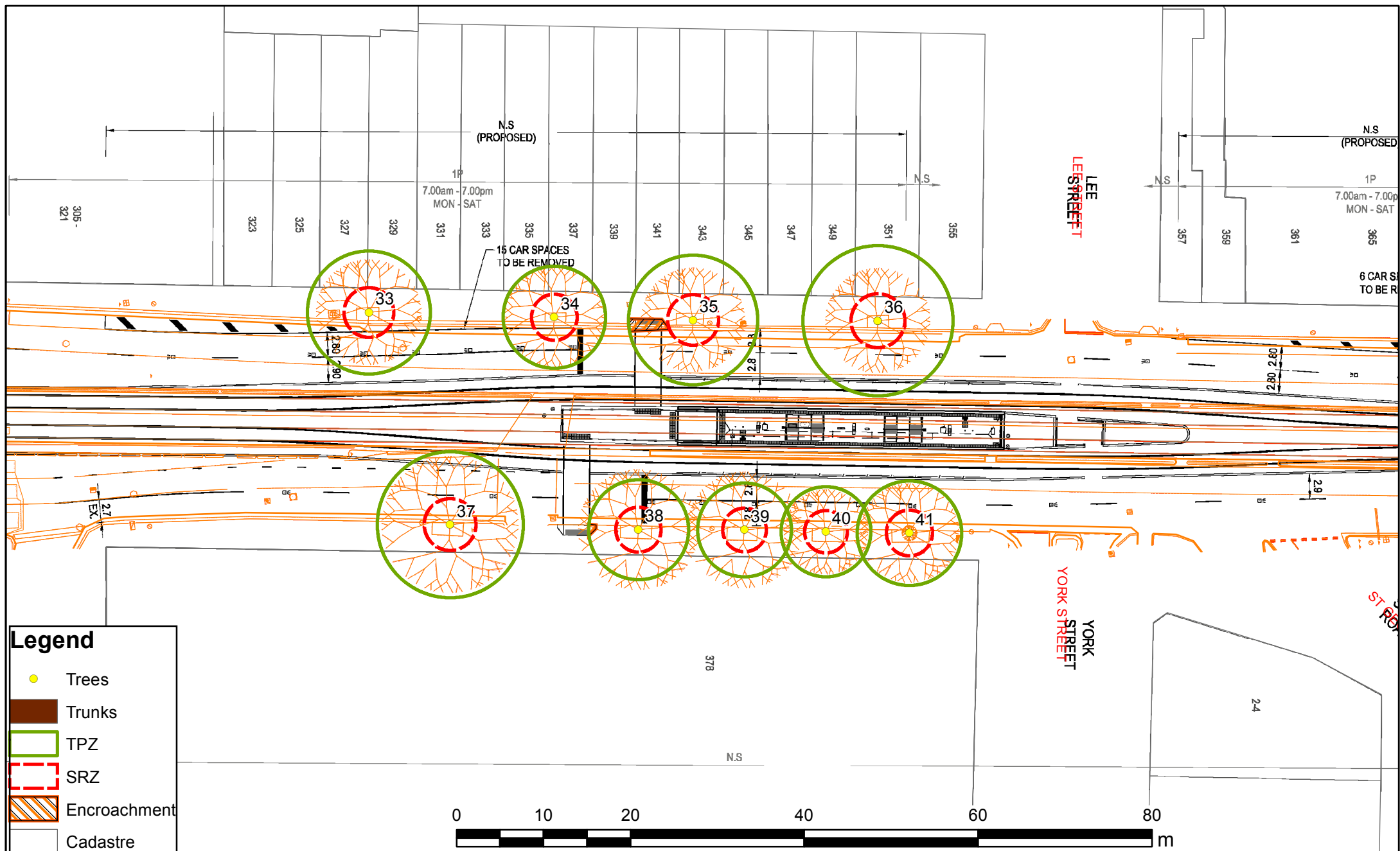
- Trees
- Trunks
- TPZ
- SRZ
- Encroachment
- Cadastre

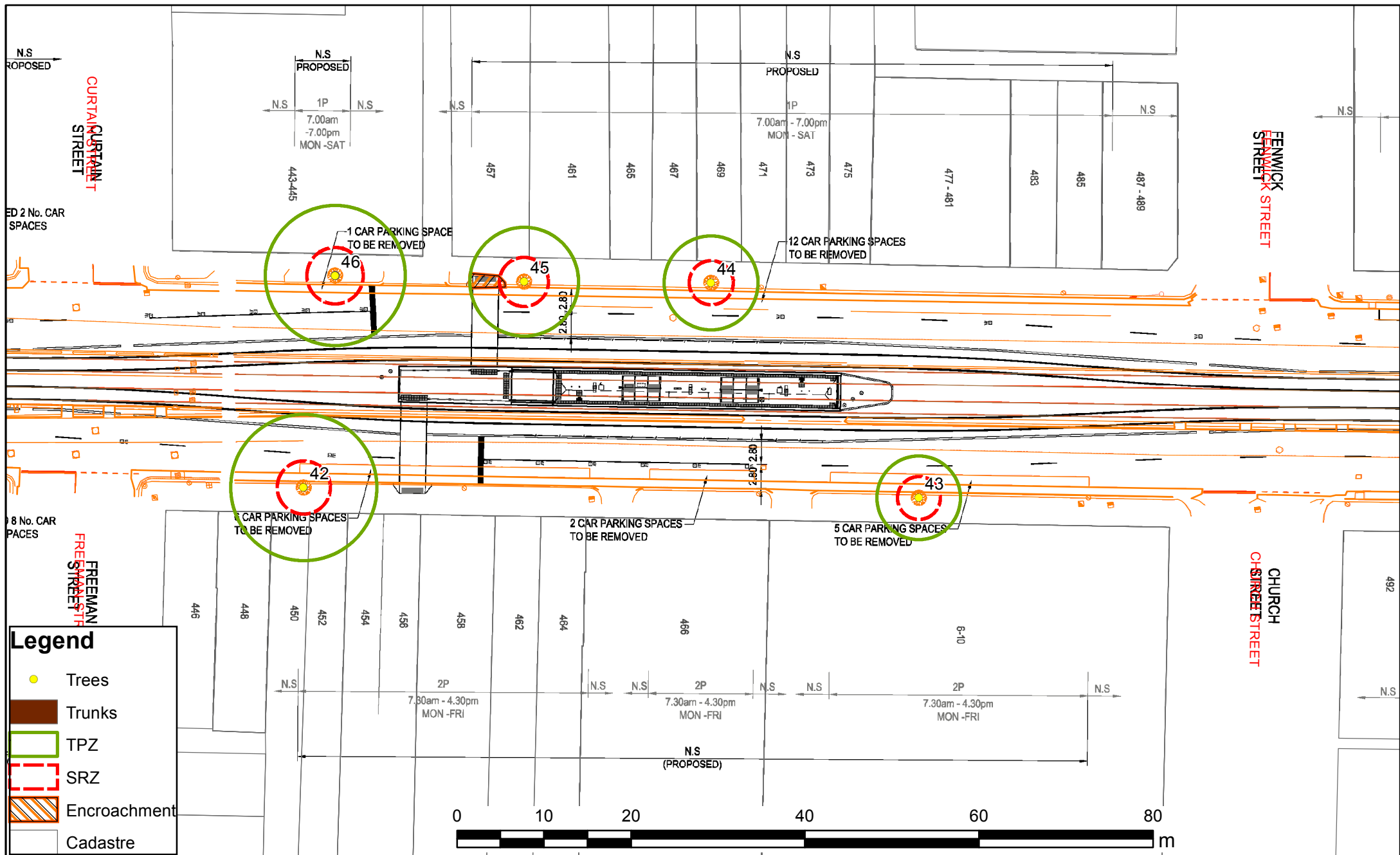
RYDER
ARBORICULTURE & ENVIRONMENT

160 Eastfield Road Croydon South 3136
P: 0434 351 567 | E: cameron@crryder.com.au

TPZ Map for Site 4, Westgarth Street
Yarra Trams Nicholson Street Upgrades

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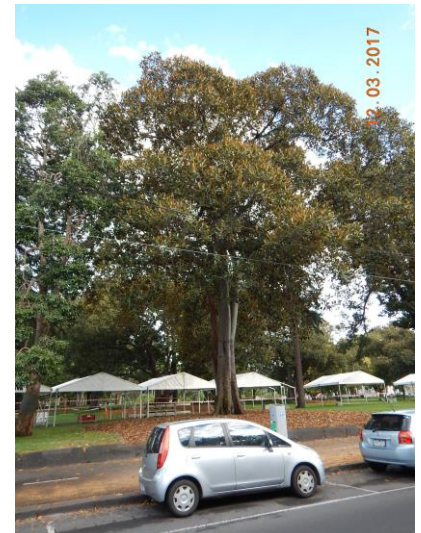




Appendix 4. Photographic Tree Assessments

Tree ID: 1 **Botanical Name:** *Ficus macrophylla*

Common Name: Moreton Bay Fig
Origin: Native
Height (m): 18 **Health:** Good
Width (m): 18 **Structure:** Fair
DBH (cm): 145 **ULE:** 20+ years
Dia. @ base (cm): 145
Tree Significance | Retention: Highly Significant | Very High
TPZ | SRZ Radius (m): 15 | 3.9
Minimum canopy clearance: >5
Pruning required Possible minor pruning required for new pole, consider moving to south side of existing pole.
Likely Impact Tree will remain viable
Comments: Tree located in Carlton Gardens



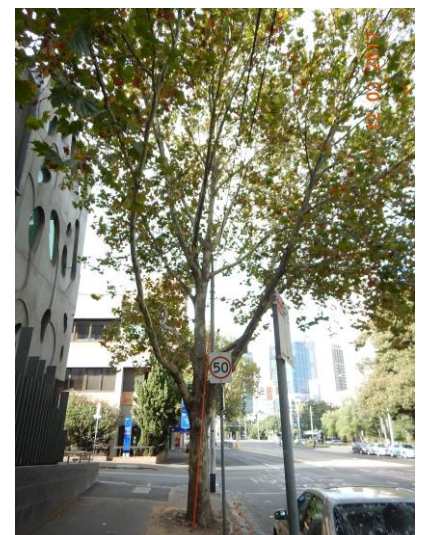
Tree ID: 2 **Botanical Name:** *Ficus macrophylla*

Common Name: Moreton Bay Fig
Origin: Native
Height (m): 15 **Health:** Good
Width (m): 20 **Structure:** Fair
DBH (cm): 161 **ULE:** 20+ years
Dia. @ base (cm): 161
Tree Significance | Retention: Highly Significant | Very High
TPZ | SRZ Radius (m): 15 | 4.0
Minimum canopy clearance: >5
Pruning required Driving lane already exists. Possible minor pruning required for new pole, consider moving to south side of existing pole.
Likely Impact Tree will remain viable
Comments: Tree located in Carlton Gardens



Tree ID: 3 **Botanical Name:** *Platanus Xacerifolia*

Common Name: London Plane
Origin: Exotic
Height (m): 15 **Health:** Good
Width (m): 10 **Structure:** Good
DBH (cm): 45 **ULE:** 20+ years
Dia. @ base (cm): 52
Tree Significance | Retention: Moderately Significant | High
TPZ | SRZ Radius (m): 5.4 | 2.5
Minimum canopy clearance: ~3
Pruning required 3 low branches over road, approx 30% canopy loss
Likely Impact Tree will remain viable
Comments:



Tree ID: 4 **Botanical Name:** *Platanus Xacerifolia*

Common Name: London Plane
Origin: Exotic
Height (m): 14 **Health:** Good
Width (m): 8 **Structure:** Good
DBH (cm): 41 **ULE:** 20+ years
Dia. @ base (cm): 47
Tree Significance | Retention: Moderately Significant | High
TPZ | SRZ Radius (m): 4.92 | 2.4
Minimum canopy clearance: ~4
Pruning required 3 low branches over road, approx 25% canopy loss
Likely Impact Tree will remain viable
Comments:



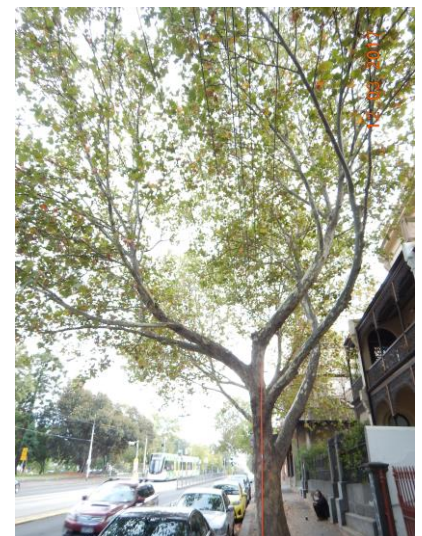
Tree ID: 5 **Botanical Name:** *Platanus Xacerifolia*

Common Name: London Plane
Origin: Exotic
Height (m): 16 **Health:** Good
Width (m): 12 **Structure:** Fair
DBH (cm): 45 **ULE:** 20+ years
Dia. @ base (cm): 54
Tree Significance | Retention: Moderately Significant | High
TPZ | SRZ Radius (m): 5.4 | 2.6
Minimum canopy clearance: ~3.75
Pruning required 1 low branch over road and some fine foliage, approx 15% of canopy
Likely Impact Tree will remain viable
Comments:



Tree ID: 6 **Botanical Name:** *Platanus Xacerifolia*

Common Name: London Plane
Origin: Exotic
Height (m): 16 **Health:** Good
Width (m): 12 **Structure:** Fair
DBH (cm): 57 **ULE:** 20+ years
Dia. @ base (cm): 68
Tree Significance | Retention: Moderately Significant | High
TPZ | SRZ Radius (m): 6.84 | 2.8
Minimum canopy clearance: ~4
Pruning required 1 large scaffold over road requires removal.
Likely Impact Tree will remain viable, possible reduction in ULE
Comments:



Tree ID: 7 **Botanical Name:** *Platanus Xacerifolia*

Common Name: London Plane
Origin: Exotic
Height (m): 15 **Health:** Good
Width (m): 10 **Structure:** Fair
DBH (cm): 54 **ULE:** 20+ years
Dia. @ base (cm): 64
Tree Significance | Retention: Moderately Significant | High
TPZ | SRZ Radius (m): 6.48 | 2.7
Minimum canopy clearance: ~4
Pruning required 1 scaffold over road requires removal.
Likely Impact Tree will remain viable, possible reduction in ULE
Comments: tree has already been pruned of several low, large branches.



Tree ID: 8 **Botanical Name:** *Platanus Xacerifolia*

Common Name: London Plane
Origin: Exotic
Height (m): 8 **Health:** Good
Width (m): 5 **Structure:** Fair
DBH (cm): 16 **ULE:** 20+ years
Dia. @ base (cm): 20
Tree Significance | Retention: Low | Moderate
TPZ | SRZ Radius (m): 2 | 1.5
Minimum canopy clearance: ~3.5
Pruning required Small lower limbs to achieve clearance, but not for design changes.
Likely Impact Tree will remain viable
Comments: tree requires LV clearance.



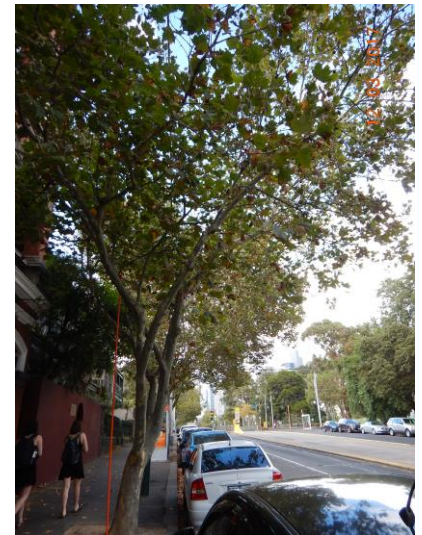
Tree ID: 9 **Botanical Name:** *Platanus Xacerifolia*

Common Name: London Plane
Origin: Exotic
Height (m): 15 **Health:** Good
Width (m): 10 **Structure:** Fair
DBH (cm): 50 **ULE:** 20+ years
Dia. @ base (cm): 61
Tree Significance | Retention: Significant | High
TPZ | SRZ Radius (m): 6 | 2.7
Minimum canopy clearance: ~4
Pruning required None for design, but 2 large low limbs to comply with 4.8m
Likely Impact Tree will remain viable, possible reduction in ULE
Comments:



Tree ID: 10 Botanical Name: *Platanus Xacerifolia*

Common Name: London Plane
Origin: Exotic
Height (m): 9 **Health:** Good
Width (m): 7 **Structure:** Fair
DBH (cm): 32 **ULE:** 20+ years
Dia. @ base (cm): 39
Tree Significance | Retention: Moderately Significant | High
TPZ | SRZ Radius (m): 3.84 | 2.2
Minimum canopy clearance: ~3.75
Pruning required 3 branches growing over road, approx. 50% canopy loss
Likely Impact Tree will remain viable, possible reduction in ULE
Comments:



Tree ID: 11 Botanical Name: *Platanus Xacerifolia*

Common Name: London Plane
Origin: Exotic
Height (m): 16 **Health:** Good
Width (m): 10 **Structure:** Fair
DBH (cm): 48 **ULE:** 20+ years
Dia. @ base (cm): 57
Tree Significance | Retention: Moderately Significant | High
TPZ | SRZ Radius (m): 5.76 | 2.6
Minimum canopy clearance: ~3
Pruning required No significant branches, only small epicormics.
Likely Impact Tree will remain viable
Comments:



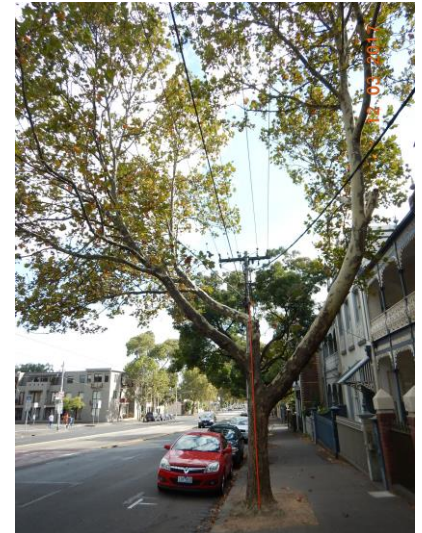
Tree ID: 12 Botanical Name: *Lophostemon confertus*

Common Name: Queensland Brush Box
Origin: Native
Height (m): 8 **Health:** Good
Width (m): 6 **Structure:** Fair
DBH (cm): 33 **ULE:** 10-20 years
Dia. @ base (cm): 39
Tree Significance | Retention: Moderately Significant | High
TPZ | SRZ Radius (m): 3.96 | 2.2
Minimum canopy clearance: ~3.5
Pruning required Both main stems over road, ~60% loss
Likely Impact Tree will not remain viable
Comments:



Tree ID: 13 Botanical Name: *Platanus Xacerifolia*

Common Name: London Plane
Origin: Exotic
Height (m): 12 **Health:** Good
Width (m): 10 **Structure:** Fair
DBH (cm): 43 **ULE:** 20+ years
Dia. @ base (cm): 50
Tree Significance | Retention: Moderately Significant | High
TPZ | SRZ Radius (m): 5.16 | 2.5
Minimum canopy clearance: ~3
Pruning required Both main stems over road, ~60% loss
Likely Impact Tree will not remain viable
Comments: low limbs have been hit in the past.



Tree ID: 14 Botanical Name: *Fraxinus 'Raywood'*

Common Name: Claret Ash
Origin: Exotic
Height (m): 10 **Health:** Fair
Width (m): 9 **Structure:** Fair
DBH (cm): 31 **ULE:** 10-20 years
Dia. @ base (cm): 36
Tree Significance | Retention: Moderately Significant | High
TPZ | SRZ Radius (m): 3.72 | 2.2
Minimum canopy clearance: ~4
Pruning required Both main stems over road, ~60% loss
Likely Impact Tree will not remain viable
Comments:



Tree ID: 15 Botanical Name: *Fraxinus 'Raywood'*

Common Name: Claret Ash
Origin: Exotic
Height (m): 10 **Health:** Fair
Width (m): 10 **Structure:** Fair
DBH (cm): 46 **ULE:** 10-20 years
Dia. @ base (cm): 55
Tree Significance | Retention: Moderately Significant | High
TPZ | SRZ Radius (m): 5.52 | 2.6
Minimum canopy clearance: ~3
Pruning required 3 stems over road, ~50% canopy loss
Likely Impact Tree will not remain viable
Comments:



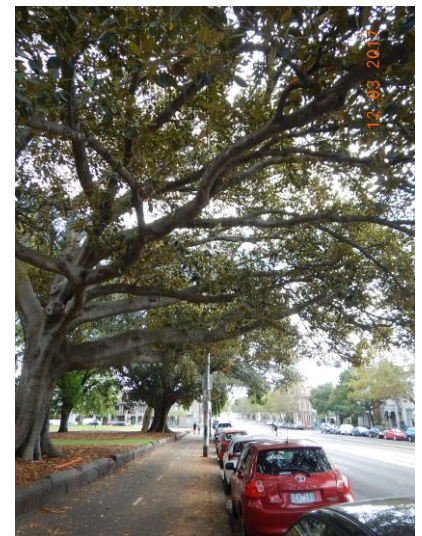
Tree ID: 16 Botanical Name: *Platanus Xacerifolia*

Common Name: London Plane
Origin: Exotic
Height (m): 14 **Health:** Good
Width (m): 9 **Structure:** Good
DBH (cm): 42 **ULE:** 20+ years
Dia. @ base (cm): 53
Tree Significance | Retention: Significant | High
TPZ | SRZ Radius (m): 5.04 | 2.5
Minimum canopy clearance: ~3.75
Pruning required 3-4 stems over road, ~30-40% loss
Likely Impact Tree will remain viable
Comments:



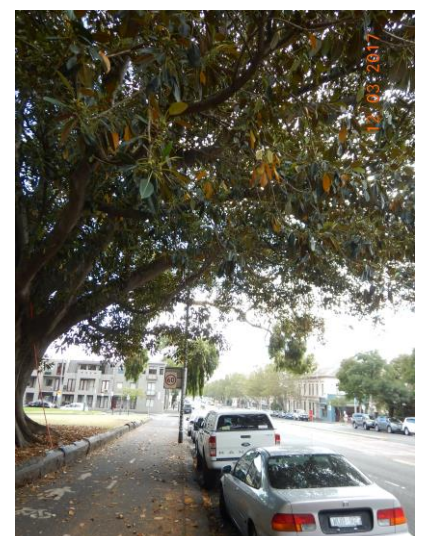
Tree ID: 17 Botanical Name: *Ficus macrophylla*

Common Name: Moreton Bay Fig
Origin: Native
Height (m): 16 **Health:** Good
Width (m): 24 **Structure:** Good
DBH (cm): 106 **ULE:** 20+ years
Dia. @ base (cm): 122
Tree Significance | Retention: Significant | Very High
TPZ | SRZ Radius (m): ##### | 3.6
Minimum canopy clearance: ~4.5
Pruning required 1 x 300mm branch and low hanging foliage.
Likely Impact Tree will remain viable
Comments: Tree located in Carlton Gardens



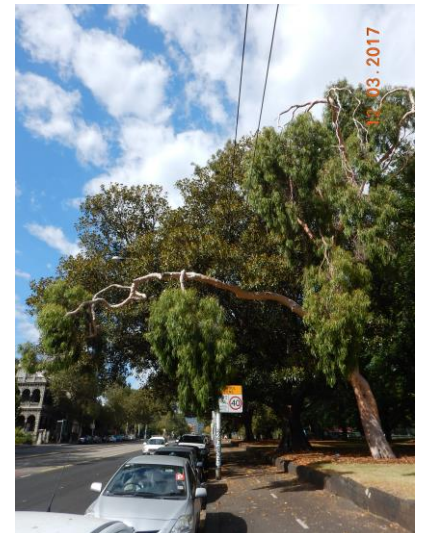
Tree ID: 18 Botanical Name: *Ficus macrophylla*

Common Name: Moreton Bay Fig
Origin: Native
Height (m): 18 **Health:** Good
Width (m): 26 **Structure:** Good
DBH (cm): 176 **ULE:** 20+ years
Dia. @ base (cm): 230
Tree Significance | Retention: Highly Significant | Very High
TPZ | SRZ Radius (m): 15 | 4.7
Minimum canopy clearance: ~4.5
Pruning required Only low hanging foliage.
Likely Impact Tree will remain viable
Comments: Tree located in Carlton Gardens



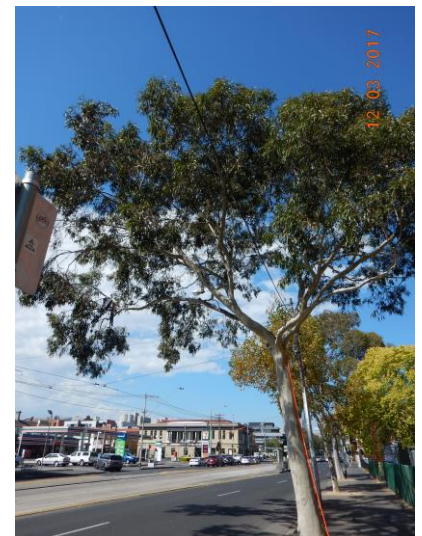
Tree ID: 19 Botanical Name: *Corymbia citriodora*

Common Name: Lemon-scented Gum
Origin: Native
Height (m): 17 **Health:** Fair
Width (m): 16 **Structure:** Fair
DBH (cm): 85 **ULE:** 10-20 years
Dia. @ base (cm): 99
Tree Significance | Retention: Significant | High
TPZ | SRZ Radius (m): 10.2 | 3.3
Minimum canopy clearance: ~3.5
Pruning required 1 small branch and low hanging foliage.
Likely Impact Tree will remain viable
Comments: Tree located in Carlton Gardens



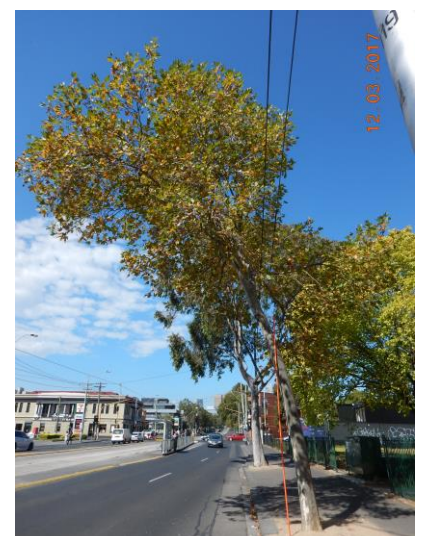
Tree ID: 20 Botanical Name: *Corymbia maculata*

Common Name: Spotted Gum
Origin: Native
Height (m): 10 **Health:** Good
Width (m): 10 **Structure:** Fair
DBH (cm): 44 **ULE:** 20+ years
Dia. @ base (cm): 53
Tree Significance | Retention: Moderately Significant | High
TPZ | SRZ Radius (m): 5.28 | 2.5
Minimum canopy clearance: ~4.5
Pruning required Small amount of low hanging foliage.
Likely Impact Tree will remain viable
Comments: no design change.



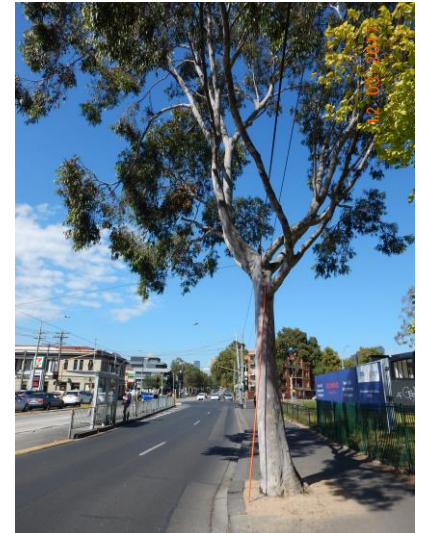
Tree ID: 21 Botanical Name: *Platanus Xacerifolia*

Common Name: London Plane
Origin: Exotic
Height (m): 9 **Health:** Good
Width (m): 6 **Structure:** Fair
DBH (cm): 26 **ULE:** 20+ years
Dia. @ base (cm): 33
Tree Significance | Retention: Moderately Significant | High
TPZ | SRZ Radius (m): 3.12 | 2.1
Minimum canopy clearance: ~4.5
Pruning required Whole of canopy to be removed as trunk leans over roadway
Likely Impact Tree will not remain viable
Comments: no design change.



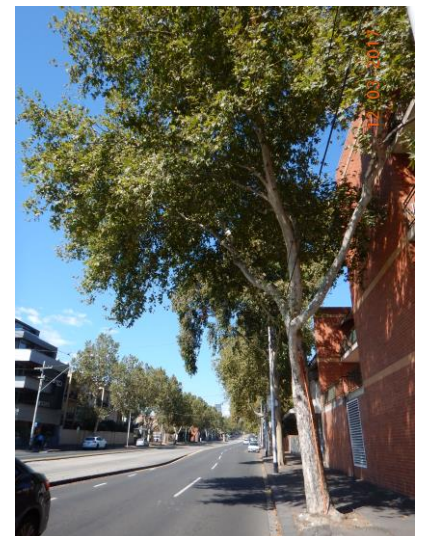
Tree ID: 22 Botanical Name: *Corymbia maculata*

Common Name: Spotted Gum
Origin: Native
Height (m): 14 **Health:** Good
Width (m): 10 **Structure:** Good
DBH (cm): 54 **ULE:** 20+ years
Dia. @ base (cm): 68
Tree Significance | Retention: Moderately Significant | High
TPZ | SRZ Radius (m): 6.48 | 2.8
Minimum canopy clearance: ~4.5
Pruning required Only low hanging foliage
Likely Impact Tree will remain viable
Comments: no design change.



Tree ID: 23 Botanical Name: *Platanus orientalis*

Common Name: Plane
Origin: Exotic
Height (m): 6 **Health:** Fair
Width (m): 2 **Structure:** Fair
DBH (cm): 9 **ULE:** 20+ years
Dia. @ base (cm): 11
Tree Significance | Retention: Low | Moderate
TPZ | SRZ Radius (m): 2 | 1.5
Minimum canopy clearance: 2
Pruning required Only low foliage
Likely Impact Tree will remain viable
Comments: no design change.

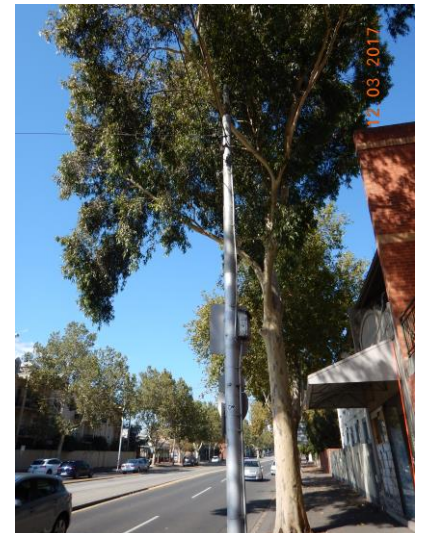


Tree ID: 24 Botanical Name: *Platanus Xacerifolia*

Common Name: London Plane
Origin: Exotic
Height (m): 15 **Health:** Good
Width (m): 9 **Structure:** Good
DBH (cm): 52 **ULE:** 20+ years
Dia. @ base (cm): 66
Tree Significance | Retention: Moderately Significant | High
TPZ | SRZ Radius (m): 6.24 | 2.8
Minimum canopy clearance: >5
Pruning required None
Likely Impact Tree will remain viable
Comments: no design change. root liftinf pavement.

Tree ID: 25 Botanical Name: *Corymbia maculata*

Common Name: Spotted Gum
Origin: Native
Height (m): 17 **Health:** Good
Width (m): 10 **Structure:** Good
DBH (cm): 60 **ULE:** 20+ years
Dia. @ base (cm): 72
Tree Significance | Retention: Moderately Significant | High
TPZ | SRZ Radius (m): 7.2 | 2.9
Minimum canopy clearance: >5
Pruning required None
Likely Impact Tree will remain viable
Comments: no design change



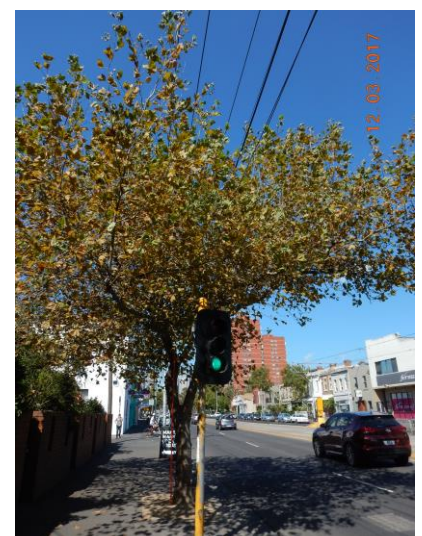
Tree ID: 26 Botanical Name: *Platanus orientalis*

Common Name: Plane
Origin: Exotic
Height (m): 13 **Health:** Good
Width (m): 9 **Structure:** Fair
DBH (cm): 41 **ULE:** 20+ years
Dia. @ base (cm): 55
Tree Significance | Retention: Moderately Significant | High
TPZ | SRZ Radius (m): 4.92 | 2.6
Minimum canopy clearance: ~3.5
Pruning required 2 branches over road, ~25% canopy loss
Likely Impact Tree will remain viable
Comments: no design change



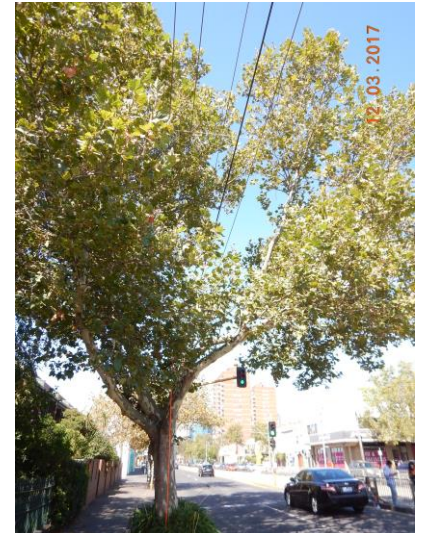
Tree ID: 27 Botanical Name: *Platanus Xacerifolia*

Common Name: London Plane
Origin: Exotic
Height (m): 8 **Health:** Good
Width (m): 8 **Structure:** Fair
DBH (cm): 33 **ULE:** 20+ years
Dia. @ base (cm): 42
Tree Significance | Retention: Moderately Significant | High
TPZ | SRZ Radius (m): 3.96 | 2.3
Minimum canopy clearance: ~3.5
Pruning required Whole stem over road, ~35% canopy
Likely Impact Tree will remain viable
Comments:



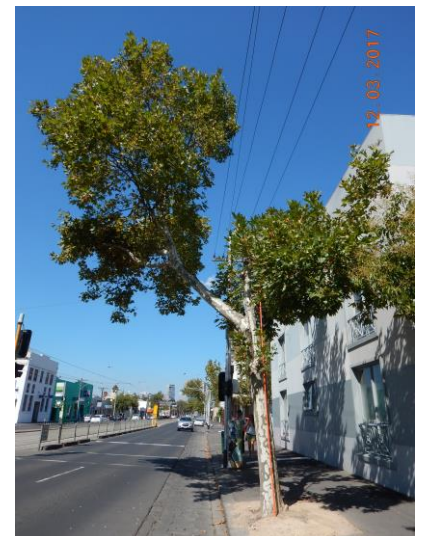
Tree ID: 28 Botanical Name: *Platanus Xacerifolia*

Common Name: London Plane
Origin: Exotic
Height (m): 15 **Health:** Good
Width (m): 12 **Structure:** Fair
DBH (cm): 57 **ULE:** 20+ years
Dia. @ base (cm): 70
Tree Significance | Retention: Moderately Significant | High
TPZ | SRZ Radius (m): 6.84 | 2.8
Minimum canopy clearance: ~3.5
Pruning required 2 large branches over road, ~40% canopy
Likely Impact Tree will remain viable, possible reduction in ULE
Comments:



Tree ID: 29 Botanical Name: *Platanus orientalis*

Common Name: Plane
Origin: Exotic
Height (m): 12 **Health:** Fair
Width (m): 9 **Structure:** Fair
DBH (cm): 35 **ULE:** 10-20 years
Dia. @ base (cm): 41
Tree Significance | Retention: Moderately Significant | Moderate
TPZ | SRZ Radius (m): 4.2 | 2.3
Minimum canopy clearance: ~3.5
Pruning required Whole stem over road, ~70% canopy
Likely Impact Tree will not remain viable
Comments: canker and hanging branches.



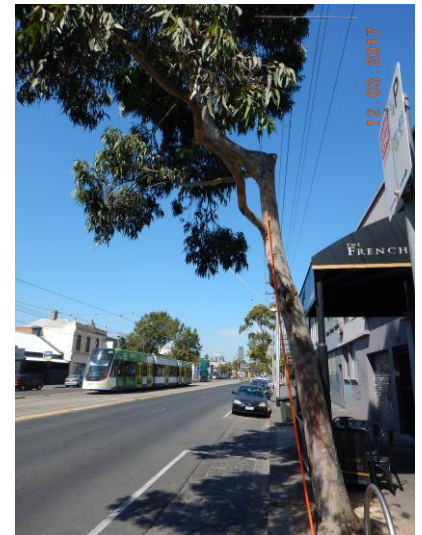
Tree ID: 30 Botanical Name: *Corymbia maculata*

Common Name: Spotted Gum
Origin: Native
Height (m): 15 **Health:** Good
Width (m): 10 **Structure:** Fair
DBH (cm): 50 **ULE:** 20+ years
Dia. @ base (cm): 58
Tree Significance | Retention: Moderately Significant | High
TPZ | SRZ Radius (m): 6 | 2.6
Minimum canopy clearance: ~5
Pruning required None
Likely Impact Tree will remain viable
Comments:



Tree ID: 31 Botanical Name: *Corymbia maculata*

Common Name: Spotted Gum
Origin: Native
Height (m): 14 **Health:** Good
Width (m): 8 **Structure:** Fair
DBH (cm): 35 **ULE:** 20+ years
Dia. @ base (cm): 43
Tree Significance | Retention: Moderately Significant | Moderate
TPZ | SRZ Radius (m): 4.2 | 2.3
Minimum canopy clearance: ~4
Pruning required None
Likely Impact Tree will remain viable
Comments: car space to remain, trunk hit by trucks multiple times.



Tree ID: 32 Botanical Name: *Platanus orientalis*

Common Name: Plane
Origin: Exotic
Height (m): 8 **Health:** Good
Width (m): 7 **Structure:** Fair
DBH (cm): 27 **ULE:** 20+ years
Dia. @ base (cm): 33
Tree Significance | Retention: Moderately Significant | Moderate
TPZ | SRZ Radius (m): 3.24 | 2.1
Minimum canopy clearance: ~3.5
Pruning required None
Likely Impact Tree will remain viable
Comments: car space to remain, clearance not required.



Tree ID: 33 Botanical Name: *Platanus orientalis*

Common Name: Plane
Origin: Exotic
Height (m): 17 **Health:** Good
Width (m): 12 **Structure:** Good
DBH (cm): 59 **ULE:** 20+ years
Dia. @ base (cm): 70
Tree Significance | Retention: Significant | High
TPZ | SRZ Radius (m): 7.08 | 2.8
Minimum canopy clearance: ~4
Pruning required Whole stem over road, ~40% canopy loss.
Likely Impact Tree will remain viable, possible reduction in ULE
Comments: car space to remain, clearance not required.



Tree ID: 34 Botanical Name: *Corymbia maculata*

Common Name: Spotted Gum
Origin: Native
Height (m): 15 **Health:** Fair
Width (m): 10 **Structure:** Fair
DBH (cm): 49 **ULE:** 20+ years
Dia. @ base (cm): 58
Tree Significance | Retention: Moderately Significant | High
TPZ | SRZ Radius (m): 5.88 | 2.6
Minimum canopy clearance: ~4
Pruning required 2 small branches over road, ~20% canopy loss.
Likely Impact Tree will remain viable
Comments:



Tree ID: 35 Botanical Name: *Platanus orientalis*

Common Name: Plane
Origin: Exotic
Height (m): 16 **Health:** Good
Width (m): 12 **Structure:** Fair
DBH (cm): 62 **ULE:** 20+ years
Dia. @ base (cm): 74
Tree Significance | Retention: Significant | High
TPZ | SRZ Radius (m): 7.44 | 2.9
Minimum canopy clearance: ~4
Pruning required 3 moderate sized braches over road, ~25% canopy loss.
Likely Impact Tree will remain viable
Comments:



Tree ID: 36 Botanical Name: *Corymbia maculata*

Common Name: Spotted Gum
Origin: Native
Height (m): 16 **Health:** Good
Width (m): 12 **Structure:** Fair
DBH (cm): 72 **ULE:** 20+ years
Dia. @ base (cm): 85
Tree Significance | Retention: Significant | High
TPZ | SRZ Radius (m): 8.64 | 3.1
Minimum canopy clearance: ~4.8
Pruning required None
Likely Impact Tree will remain viable
Comments:



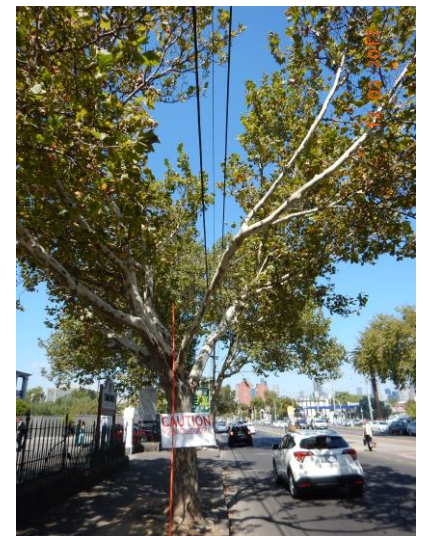
Tree ID: 37 Botanical Name: *Platanus Xacerifolia*

Common Name: London Plane
Origin: Exotic
Height (m): 16 **Health:** Good
Width (m): 12 **Structure:** Fair
DBH (cm): 70 **ULE:** 20+ years
Dia. @ base (cm): 78
Tree Significance | Retention: Significant | High
TPZ | SRZ Radius (m): 8.4 | 3.0
Minimum canopy clearance: ~3.75
Pruning required Remove large northeastern stem, ~25% of canopy loss
Likely Impact Tree will remain viable
Comments: tree roots growing over kerb.



Tree ID: 38 Botanical Name: *Platanus Xacerifolia*

Common Name: London Plane
Origin: Exotic
Height (m): 14 **Health:** Fair
Width (m): 12 **Structure:** Fair
DBH (cm): 48 **ULE:** 20+ years
Dia. @ base (cm): 56
Tree Significance | Retention: Moderately Significant | High
TPZ | SRZ Radius (m): 5.76 | 2.6
Minimum canopy clearance: ~4
Pruning required Remove 2 branches over road, ~40% of canopy
Likely Impact Tree will remain viable, possible reduction in ULE
Comments: tree roots growing over kerb. canopy already asymmetrical.



Tree ID: 39 Botanical Name: *Platanus Xacerifolia*

Common Name: London Plane
Origin: Exotic
Height (m): 14 **Health:** Fair
Width (m): 10 **Structure:** Fair
DBH (cm): 45 **ULE:** 10-20 years
Dia. @ base (cm): 52
Tree Significance | Retention: Moderately Significant | High
TPZ | SRZ Radius (m): 5.4 | 2.5
Minimum canopy clearance: ~3.5
Pruning required Remove 2 branches over road, ~60% of canopy
Likely Impact Tree will not remain viable
Comments:



Tree ID: 40 **Botanical Name:** *Platanus Xacerifolia*

Common Name: London Plane
Origin: Exotic
Height (m): 14 **Health:** Fair
Width (m): 8 **Structure:** Fair
DBH (cm): 43 **ULE:** 10-20 years
Dia. @ base (cm): 49
Tree Significance | Retention: Moderately Significant | High
TPZ | SRZ Radius (m): 5.16 | 2.5
Minimum canopy clearance: >5
Pruning required None
Likely Impact Tree will remain viable
Comments: no canopy over road.



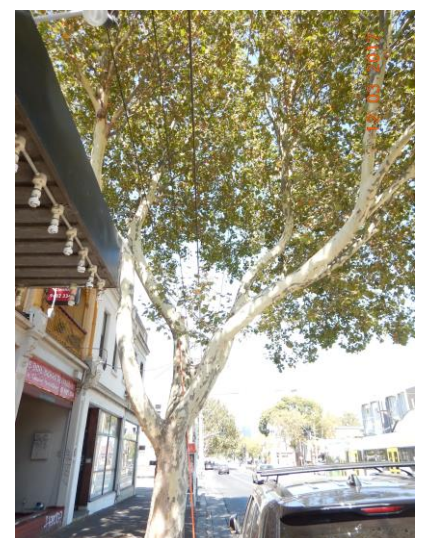
Tree ID: 41 **Botanical Name:** *Platanus Xacerifolia*

Common Name: London Plane
Origin: Exotic
Height (m): 13 **Health:** Good
Width (m): 10 **Structure:** Fair
DBH (cm): 50 **ULE:** 20+ years
Dia. @ base (cm): 58
Tree Significance | Retention: Moderately Significant | High
TPZ | SRZ Radius (m): 6 | 2.6
Minimum canopy clearance: ~4.7
Pruning required None
Likely Impact Tree will remain viable
Comments:



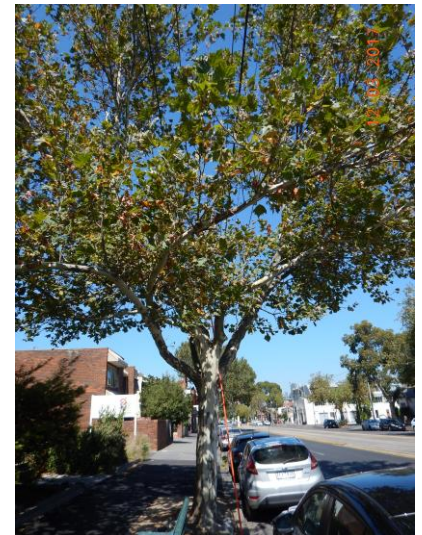
Tree ID: 42 **Botanical Name:** *Platanus Xacerifolia*

Common Name: London Plane
Origin: Exotic
Height (m): 16 **Health:** Good
Width (m): 14 **Structure:** Fair
DBH (cm): 70 **ULE:** 20+ years
Dia. @ base (cm): 82
Tree Significance | Retention: Moderately Significant | High
TPZ | SRZ Radius (m): 8.4 | 3.0
Minimum canopy clearance: ~3.5
Pruning required 3 large branches over road, ~50% canopy loss
Likely Impact Tree will remain viable, possible reduction in ULE
Comments:



Tree ID: 43 Botanical Name: *Platanus Xacerifolia*

Common Name: London Plane
Origin: Exotic
Height (m): 14 **Health:** Fair
Width (m): 10 **Structure:** Fair
DBH (cm): 40 **ULE:** 20+ years
Dia. @ base (cm): 49
Tree Significance | Retention: Moderately Significant | High
TPZ | SRZ Radius (m): 4.8 | 2.5
Minimum canopy clearance: ~3
Pruning required 2 large branches over road, 50% canopy
Likely Impact Tree will remain viable, possible reduction in ULE
Comments:



Tree ID: 44 Botanical Name: *Platanus Xacerifolia*

Common Name: London Plane
Origin: Exotic
Height (m): 16 **Health:** Good
Width (m): 10 **Structure:** Fair
DBH (cm): 45 **ULE:** 20+ years
Dia. @ base (cm): 53
Tree Significance | Retention: Moderately Significant | High
TPZ | SRZ Radius (m): 5.4 | 2.5
Minimum canopy clearance: ~2
Pruning required Remove main trunk heading over road, ~60% canopy loss
Likely Impact Tree will not remain viable
Comments:



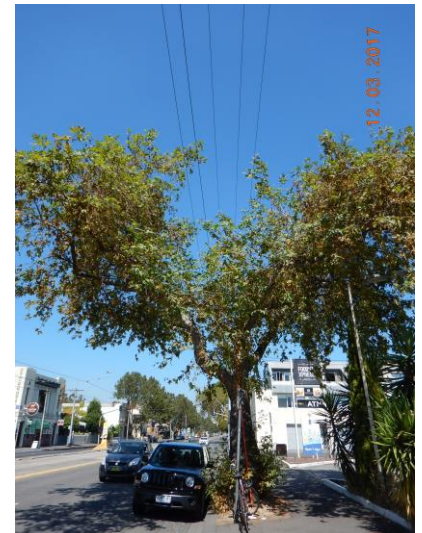
Tree ID: 45 Botanical Name: *Corymbia maculata*

Common Name: Spotted Gum
Origin: Native
Height (m): 15 **Health:** Good
Width (m): 10 **Structure:** Fair
DBH (cm): 52 **ULE:** 5-10 years
Dia. @ base (cm): 68
Tree Significance | Retention: Moderately Significant | High
TPZ | SRZ Radius (m): 6.24 | 2.8
Minimum canopy clearance: ~3.8
Pruning required Remove main trunk heading over road, ~60% canopy loss
Likely Impact Tree will not remain viable
Comments: decay in main stem, damage from vehicle impacts.



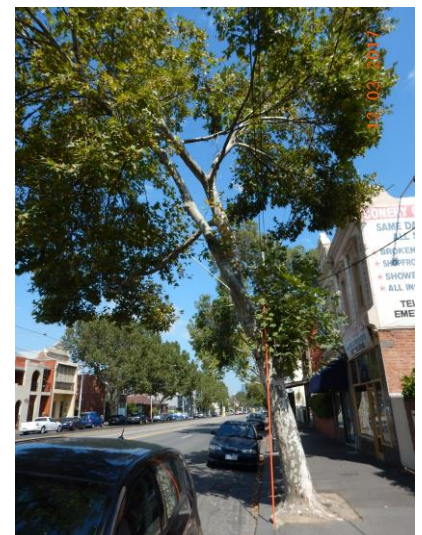
Tree ID: 46 Botanical Name: *Platanus orientalis*

Common Name: Plane
Origin: Exotic
Height (m): 11 **Health:** Fair
Width (m): 10 **Structure:** Fair
DBH (cm): 67 **ULE:** 10-20 years
Dia. @ base (cm): 95
Tree Significance | Retention: Moderately Significant | High
TPZ | SRZ Radius (m): 8.04 | 3.2
Minimum canopy clearance: ~3
Pruning required Remove large branch ~300mm diameter heading over road, ~30% canopy loss
Likely Impact Tree will remain viable
Comments:



Tree ID: 47 Botanical Name: *Platanus Xacerifolia*

Common Name: London Plane
Origin: Exotic
Height (m): 13 **Health:** Good
Width (m): 9 **Structure:** Fair
DBH (cm): 43 **ULE:** 10-20 years
Dia. @ base (cm): 50
Tree Significance | Retention: Moderately Significant | High
TPZ | SRZ Radius (m): 5.16 | 2.5
Minimum canopy clearance: ~3
Pruning required Removal of main stem at kerb to achieve clearance
Likely Impact Tree will not remain viable
Comments:



Tree ID: 48 Botanical Name: *Corymbia maculata*

Common Name: Spotted Gum
Origin: Native
Height (m): 15 **Health:** Good
Width (m): 10 **Structure:** Fair
DBH (cm): 67 **ULE:** 20+ years
Dia. @ base (cm): 77
Tree Significance | Retention: Significant | High
TPZ | SRZ Radius (m): 8.04 | 3.0
Minimum canopy clearance: >5
Pruning required None
Likely Impact Tree will remain viable
Comments:



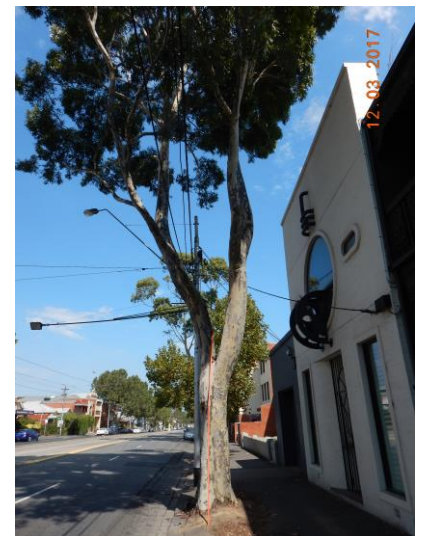
Tree ID: 49 **Botanical Name:** *Platanus Xacerifolia*

Common Name: London Plane
Origin: Exotic
Height (m): 9 **Health:** Good
Width (m): 6 **Structure:** Fair
DBH (cm): 25 **ULE:** 20+ years
Dia. @ base (cm): 30
Tree Significance | Retention: Moderately Significant | Moderate
TPZ | SRZ Radius (m): 3 | 2.0
Minimum canopy clearance: ~3
Pruning required 1 branch to be removed, ~20% of canopy.
Likely Impact Tree will remain viable
Comments:



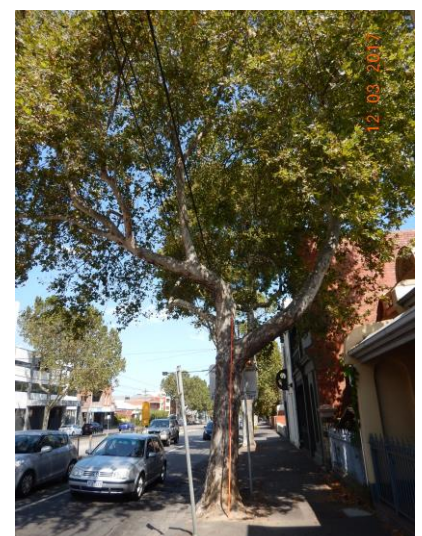
Tree ID: 50 **Botanical Name:** *Corymbia maculata*

Common Name: Spotted Gum
Origin: Native
Height (m): 17 **Health:** Good
Width (m): 10 **Structure:** Fair
DBH (cm): 72 **ULE:** 20+ years
Dia. @ base (cm): 80
Tree Significance | Retention: Significant | High
TPZ | SRZ Radius (m): 8.64 | 3.0
Minimum canopy clearance: ~4.8
Pruning required None
Likely Impact Tree will remain viable
Comments:



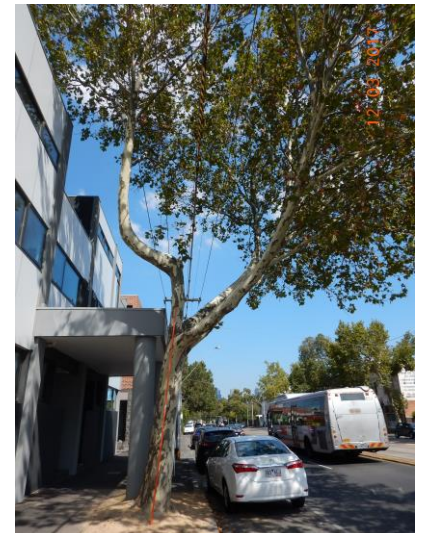
Tree ID: 51 **Botanical Name:** *Platanus orientalis*

Common Name: Plane
Origin: Exotic
Height (m): 16 **Health:** Good
Width (m): 12 **Structure:** Fair
DBH (cm): 62 **ULE:** 20+ years
Dia. @ base (cm): 78
Tree Significance | Retention: Significant | High
TPZ | SRZ Radius (m): 7.44 | 3.0
Minimum canopy clearance: ~4
Pruning required 1 low branch to remove, ~15% of canopy
Likely Impact Tree will remain viable
Comments:



Tree ID: 52 Botanical Name: *Platanus Xacerifolia*

Common Name: London Plane
Origin: Exotic
Height (m): 16 **Health:** Good
Width (m): 12 **Structure:** Fair
DBH (cm): 52 **ULE:** 20+ years
Dia. @ base (cm): 62
Tree Significance | Retention: Moderately Significant | High
TPZ | SRZ Radius (m): 6.24 | 2.7
Minimum canopy clearance: ~3.5
Pruning required 2 large branches over road to remove, ~60% of canopy
Likely Impact Tree will not remain viable
Comments:



Tree ID: 53 Botanical Name: *Platanus Xacerifolia*

Common Name: London Plane
Origin: Exotic
Height (m): 16 **Health:** Good
Width (m): 10 **Structure:** Fair
DBH (cm): 54 **ULE:** 20+ years
Dia. @ base (cm): 62
Tree Significance | Retention: Moderately Significant | High
TPZ | SRZ Radius (m): 6.48 | 2.7
Minimum canopy clearance: ~4
Pruning required Only low hanging foliage
Likely Impact Tree will remain viable
Comments:



Tree ID: 54 Botanical Name: *Platanus Xacerifolia*

Common Name: London Plane
Origin: Exotic
Height (m): 15 **Health:** Good
Width (m): 10 **Structure:** Fair
DBH (cm): 48 **ULE:** 20+ years
Dia. @ base (cm): 59
Tree Significance | Retention: Moderately Significant | High
TPZ | SRZ Radius (m): 5.76 | 2.7
Minimum canopy clearance: ~3.5
Pruning required 2 main stems to be pruned
Likely Impact Tree will not remain viable
Comments:



Tree ID: 55 **Botanical Name:** *Lagerstroemia indica*

Common Name: Crepe Myrtle

Origin: Exotic

Height (m): 2 **Health:** Good

Width (m): 1 **Structure:** Fair

DBH (cm): 10 **ULE:** 20+ years

Dia. @ base (cm): 11

Tree Significance | Retention: Low | Moderate

TPZ | SRZ Radius (m): 2 | 1.5

Minimum canopy clearance: 2

Pruning required None

Likely Impact Tree will remain viable

Comments:



Tree ID: 56 **Botanical Name:** *Laurus nobilis*

Common Name: Bay Tree

Origin: Exotic

Height (m): 2 **Health:** Good

Width (m): 1 **Structure:** Fair

DBH (cm): 6 **ULE:** 20+ years

Dia. @ base (cm): 6

Tree Significance | Retention: Low | Moderate

TPZ | SRZ Radius (m): 2 | 1.5

Minimum canopy clearance: 2

Pruning required None

Likely Impact Tree will remain viable

Comments:



Tree ID: 57 **Botanical Name:** *Corymbia maculata*

Common Name: Spotted Gum

Origin: Native

Height (m): 16 **Health:** Good

Width (m): 10 **Structure:** Good

DBH (cm): 55 **ULE:** 20+ years

Dia. @ base (cm): 70

Tree Significance | Retention: Significant | High

TPZ | SRZ Radius (m): 6.6 | 2.8

Minimum canopy clearance: ~5

Pruning required None

Likely Impact Tree will remain viable

Comments:



Tree ID: 58 **Botanical Name:** *Laurus nobilis*

Common Name: Bay Tree

Origin: Exotic

Height (m): 3 **Health:** Good

Width (m): 1 **Structure:** Good

DBH (cm): 10 **ULE:** 20+ years

Dia. @ base (cm): 12

Tree Significance | Retention: Moderately Significant | Moderate

TPZ | SRZ Radius (m): 2 | 1.5

Minimum canopy clearance: >5

Pruning required None

Likely Impact Tree will remain viable

Comments:



Tree ID: 59 **Botanical Name:** *Laurus nobilis*

Common Name: Bay Tree

Origin: Exotic

Height (m): 3 **Health:** Good

Width (m): 1 **Structure:** Good

DBH (cm): 8 **ULE:** 20+ years

Dia. @ base (cm): 9

Tree Significance | Retention: Moderately Significant | Moderate

TPZ | SRZ Radius (m): 2 | 1.5

Minimum canopy clearance: >5

Pruning required None

Likely Impact Tree will remain viable

Comments:



Tree ID: 60 **Botanical Name:** *Laurus nobilis*

Common Name: Bay Tree

Origin: Exotic

Height (m): 3 **Health:** Good

Width (m): 1 **Structure:** Good

DBH (cm): 8 **ULE:** 20+ years

Dia. @ base (cm): 9

Tree Significance | Retention: Moderately Significant | Moderate

TPZ | SRZ Radius (m): 2 | 1.5

Minimum canopy clearance: >5

Pruning required None

Likely Impact Tree will remain viable

Comments:



Tree ID: 61 **Botanical Name:** *Lagerstroemia indica*

Common Name: Crepe Myrtle

Origin: Exotic

Height (m): 3 **Health:** Good

Width (m): 1 **Structure:** Good

DBH (cm): 8 **ULE:** 20+ years

Dia. @ base (cm): 9

Tree Significance | Retention: Moderately Significant | Moderate

TPZ | SRZ Radius (m): 2 | 1.5

Minimum canopy clearance: >5

Pruning required None

Likely Impact Tree will remain viable

Comments:



Tree ID: 62 **Botanical Name:** *Laurus nobilis*

Common Name: Bay Tree

Origin: Exotic

Height (m): 3 **Health:** Good

Width (m): 1 **Structure:** Good

DBH (cm): 5 **ULE:** 20+ years

Dia. @ base (cm): 6

Tree Significance | Retention: Moderately Significant | Moderate

TPZ | SRZ Radius (m): 2 | 1.5

Minimum canopy clearance: >5

Pruning required None

Likely Impact Tree will remain viable

Comments:



Tree ID: 63 **Botanical Name:** *Laurus nobilis*

Common Name: Bay Tree

Origin: Exotic

Height (m): 3 **Health:** Good

Width (m): 1 **Structure:** Good

DBH (cm): 6 **ULE:** 20+ years

Dia. @ base (cm): 8

Tree Significance | Retention: Moderately Significant | Moderate

TPZ | SRZ Radius (m): 2 | 1.5

Minimum canopy clearance: >5

Pruning required None

Likely Impact Tree will remain viable

Comments:



Tree ID: 64 Botanical Name: *Eucalyptus saligna*

Common Name: Sydney Blue Gum
Origin: Native
Height (m): 15 **Health:** Good
Width (m): 10 **Structure:** Good
DBH (cm): 50 **ULE:** 20+ years
Dia. @ base (cm): 58
Tree Significance | Retention: Moderately Significant | Moderate
TPZ | SRZ Radius (m): 6 | 2.6
Minimum canopy clearance: >5
Pruning required None
Likely Impact Tree will remain viable
Comments:



Tree ID: 65 Botanical Name: *Lagerstroemia indica*

Common Name: Crepe Myrtle
Origin: Exotic
Height (m): 3 **Health:** Good
Width (m): 1 **Structure:** Good
DBH (cm): 7 **ULE:** 20+ years
Dia. @ base (cm): 9
Tree Significance | Retention: Moderately Significant | Moderate
TPZ | SRZ Radius (m): 2 | 1.5
Minimum canopy clearance: >5
Pruning required None
Likely Impact Tree will remain viable
Comments:



Tree ID: 66 Botanical Name: *Laurus nobilis*

Common Name: Bay Tree
Origin: Exotic
Height (m): 3 **Health:** Good
Width (m): 1 **Structure:** Good
DBH (cm): 7 **ULE:** 20+ years
Dia. @ base (cm): 9
Tree Significance | Retention: Moderately Significant | Moderate
TPZ | SRZ Radius (m): 2 | 1.5
Minimum canopy clearance: >5
Pruning required None
Likely Impact Tree will remain viable
Comments:



Tree ID: 67 Botanical Name: *Laurus nobilis*

Common Name: Bay Tree
Origin: Exotic
Height (m): 2 **Health:** Good
Width (m): 1 **Structure:** Good
DBH (cm): 5 **ULE:** 20+ years
Dia. @ base (cm): 6
Tree Significance | Retention: Moderately Significant | Moderate
TPZ | SRZ Radius (m): 2 | 1.5
Minimum canopy clearance: >5
Pruning required None
Likely Impact Tree will remain viable
Comments:



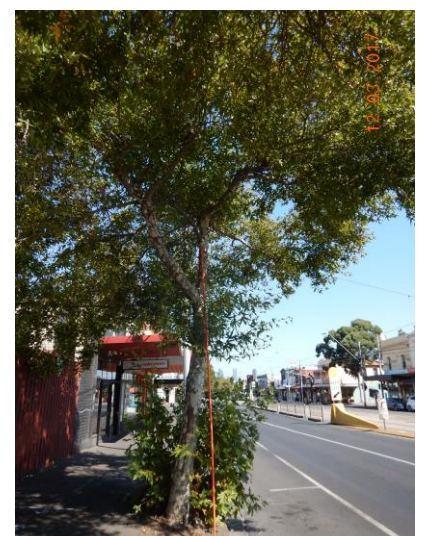
Tree ID: 68 Botanical Name: *Laurus nobilis*

Common Name: Bay Tree
Origin: Exotic
Height (m): 2 **Health:** Good
Width (m): 1 **Structure:** Good
DBH (cm): 5 **ULE:** 20+ years
Dia. @ base (cm): 6
Tree Significance | Retention: Moderately Significant | Moderate
TPZ | SRZ Radius (m): 2 | 1.5
Minimum canopy clearance: >5
Pruning required None
Likely Impact Tree will remain viable
Comments:



Tree ID: 69 Botanical Name: *Platanus orientalis*

Common Name: Plane
Origin: Exotic
Height (m): 8 **Health:** Good
Width (m): 8 **Structure:** Fair
DBH (cm): 25 **ULE:** 10-20 years
Dia. @ base (cm): 31
Tree Significance | Retention: Moderately Significant | Moderate
TPZ | SRZ Radius (m): 3 | 2.0
Minimum canopy clearance: ~4.8
Pruning required Only foliage and branches ~10mm
Likely Impact Tree will remain viable
Comments: many suckers



Tree ID: 70 Botanical Name: *Laurus nobilis*

Common Name: Bay Tree
Origin: Exotic
Height (m): 2 **Health:** Good
Width (m): 1 **Structure:** Fair
DBH (cm): 6 **ULE:** 10-20 years
Dia. @ base (cm): 8
Tree Significance | Retention: Moderately Significant | Moderate
TPZ | SRZ Radius (m): 2 | 1.5
Minimum canopy clearance: >5
Pruning required None
Likely Impact Tree will remain viable
Comments:



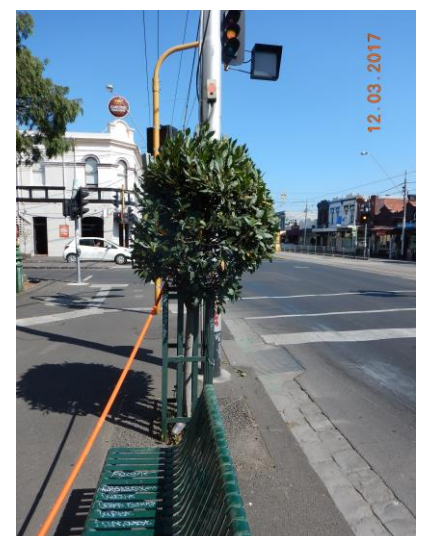
Tree ID: 71 Botanical Name: *Laurus nobilis*

Common Name: Bay Tree
Origin: Exotic
Height (m): 2 **Health:** Good
Width (m): 1 **Structure:** Fair
DBH (cm): 6 **ULE:** 10-20 years
Dia. @ base (cm): 8
Tree Significance | Retention: Moderately Significant | Moderate
TPZ | SRZ Radius (m): 2 | 1.5
Minimum canopy clearance: >5
Pruning required None
Likely Impact Tree will remain viable
Comments:



Tree ID: 72 Botanical Name: *Laurus nobilis*

Common Name: Bay Tree
Origin: Exotic
Height (m): 3 **Health:** Good
Width (m): 1 **Structure:** Fair
DBH (cm): 8 **ULE:** 10-20 years
Dia. @ base (cm): 9
Tree Significance | Retention: Moderately Significant | Moderate
TPZ | SRZ Radius (m): 2 | 1.5
Minimum canopy clearance: >5
Pruning required None
Likely Impact Tree will remain viable
Comments:



Tree ID: 73 **Botanical Name:** *Laurus nobilis*

Common Name: Bay Tree

Origin: Exotic

Height (m): 2 **Health:** Good

Width (m): 1 **Structure:** Fair

DBH (cm): 6 **ULE:** 10-20 years

Dia. @ base (cm): 7

Tree Significance | Retention: Moderately Significant | Moderate

TPZ | SRZ Radius (m): 2 | 1.5

Minimum canopy clearance: >5

Pruning required None

Likely Impact Tree will remain viable

Comments:



Tree ID: 74 **Botanical Name:** *Laurus nobilis*

Common Name: Bay Tree

Origin: Exotic

Height (m): 2 **Health:** Good

Width (m): 1 **Structure:** Fair

DBH (cm): 6 **ULE:** 10-20 years

Dia. @ base (cm): 7

Tree Significance | Retention: Moderately Significant | Moderate

TPZ | SRZ Radius (m): 2 | 1.5

Minimum canopy clearance: >5

Pruning required None

Likely Impact Tree will remain viable

Comments:



Tree ID: 75 **Botanical Name:** *Laurus nobilis*

Common Name: Bay Tree

Origin: Exotic

Height (m): 2 **Health:** Good

Width (m): 1 **Structure:** Fair

DBH (cm): 5 **ULE:** 10-20 years

Dia. @ base (cm): 6

Tree Significance | Retention: Moderately Significant | Moderate

TPZ | SRZ Radius (m): 2 | 1.5

Minimum canopy clearance: >5

Pruning required None

Likely Impact Tree will remain viable

Comments:



Tree ID: 76 Botanical Name: *Laurus nobilis*

Common Name: Bay Tree
Origin: Exotic
Height (m): 3 **Health:** Good
Width (m): 1 **Structure:** Fair
DBH (cm): 5 **ULE:** 10-20 years
Dia. @ base (cm): 6
Tree Significance | Retention: Moderately Significant | Moderate
TPZ | SRZ Radius (m): 2 | 1.5
Minimum canopy clearance: >5
Pruning required None
Likely Impact Tree will remain viable
Comments:


Tree ID: 77 Botanical Name: *Platanus Xacerifolia*

Common Name: London Plane
Origin: Exotic
Height (m): 16 **Health:** Good
Width (m): 14 **Structure:** Good
DBH (cm): 72 **ULE:** 20+ years
Dia. @ base (cm): 86
Tree Significance | Retention: Significant | High
TPZ | SRZ Radius (m): 8.64 | 3.1
Minimum canopy clearance: ~3.5
Pruning required 2 large branches over road, 50% canopy loss
Likely Impact Tree will not remain viable
Comments:


Tree ID: 78 Botanical Name: *Platanus Xacerifolia*

Common Name: London Plane
Origin: Exotic
Height (m): 16 **Health:** Good
Width (m): 14 **Structure:** Fair
DBH (cm): 86 **ULE:** 20+ years
Dia. @ base (cm): 96
Tree Significance | Retention: Significant | High
TPZ | SRZ Radius (m): ##### | 3.3
Minimum canopy clearance: ~3
Pruning required 3 main stems over road, 70% canopy loss
Likely Impact Tree will not remain viable
Comments:



Tree ID: 79 **Botanical Name:** *Platanus Xacerifolia*

Common Name: London Plane

Origin: Exotic

Height (m): 16 **Health:** Good

Width (m): 10 **Structure:** Good

DBH (cm): 48 **ULE:** 20+ years

Dia. @ base (cm): 60

Tree Significance | Retention: Significant | High

TPZ | SRZ Radius (m): 5.76 | 2.7

Minimum canopy clearance: ~3

Pruning required 5 branches over road, 60% canopy loss

Likely Impact Tree will not remain viable

Comments:



Tree ID: 80 **Botanical Name:** *Lagerstroemia indica*

Common Name: Crepe Myrtle

Origin: Exotic

Height (m): 3 **Health:** Good

Width (m): 1 **Structure:** Good

DBH (cm): 8 **ULE:** 20+ years

Dia. @ base (cm): 9

Tree Significance | Retention: Moderately Significant | Moderate

TPZ | SRZ Radius (m): 2 | 1.5

Minimum canopy clearance: >5

Pruning required None

Likely Impact Tree will remain viable

Comments:

