LANDSCAPE HERITAGE ASSESSMENT
HERITAGE IMPACT STATEMENT

ELM AND ASH STREET TREE AVENUE
BUNBURY STREET, FOOTSCRAY

September 2022
Rev. November 2022

Prepared for Maribyrnong City Council by:

Fiona Webber

John Patrick Landscape Architects Pty. Ltd.

324 Victoria Street, Richmond VIC 3121

(03) 9429 4855

fwebber@johnpatrick.com.au

TABLE OF CONTENTS

1 Introduction

John Patrick Landscape Architects have been engaged by Maribyrnong City Council to prepare a Heritage Impact Statement to address the likely impact to the heritage values of a significant elm and ash street tree avenue at Bunbury Street, Footscray by the proposed removal of a number of specimens due to poor or hazardous condition.

2 Location and context

The elm and ash avenue, comprised of a row on the northern and southern sides of Bunbury Street, extends the full length of Bunbury Street from Hyde Street, adjacent to the Footscray Railway Station at the western extent to Maribyrnong Street, adjacent to the Maribyrnong River at the eastern extent. Bunbury Street, which runs approximately east-west is intersected by Cowper Street, Whitehall Street and Moreland Street, dividing the avenue planting into four sections of approximately equal length.

Direct access between Bunbury Street and the Footscray Railway Station is via a pedestrian overpass. The main business and shopping area of Footscray is to the west of the railway. Educational institutions, police station and municipal offices are located south-west of Bunbury Street on the eastern side of the railway lines. The location of the street tree avenue and context are shown in Figure 1.

Figure 1: Bunbury Street elm and ash avenue location (bounded in yellow).

The avenue consists of 54 trees or planting sites, comprising 40 English Elm (*Ulmus procera*) interspersed with 11 Desert Ash (*Fraxinus angustifolia* ssp. *angustifolia*). All of the Desert Ash are of mature age class. The English Elm specimens consist of a variety of ages from juvenile to mature. Juvenile elm specimens are infill planting undertaken to replace trees previously removed due to failure.

A review of Bunbury Street avenue trees was undertaken during a site visit on 7th June 2022.

3 Previous studies

The Elm and ash street tree avenue has been the subject of several studies and reports:

Heritage assessments

- *Maribyrnong Heritage Review (2000) Vol. 6, Historic places – Significant Trees in the City of Maribyrnong.* This project assessed the heritage significance of the tree planting and recommended the avenue be included in the Heritage Overlay.
- *Bunbury Streetscape Concept Project – Memorandum of Heritage Advice* (May 2021) prepared by RBA Architects.

Arboricultural condition reports:

- *Arboricultural Assessment* (December 2018) prepared by ArborCo Pty. Ltd.
- *Risk assessment and recommended works report* (May 2022) prepared by Homewood Consulting Pty. Ltd.
- *Picus Sonic Tomography test summary report* (January 2022 and April 2022), prepared by Enspec Pty. Ltd.
- *Tree risk and works assessment* (April 2022) prepared by Arbor Survey Pty. Ltd.

4 Heritage significance and status

The elm and ash street tree avenue is included in the schedule to the Heritage Overlay (HO108) of the Maribyrnong Planning Scheme. Inclusion is based on a recommendation of the Maribyrnong Heritage Review, 2000, presented in Volume 6 of the Review *Historic Places – Significant trees in the City of Maribyrnong*[1].

The Statement of Significance formulated in the Maribyrnong Heritage Review states that the street tree avenue is significant to the City of Maribyrnong *for the combination of its maturity and extent, as compared to other street planting in the City* (Australian Heritage Commission Criterion B2)[2], and *as a reflection of the role*

[1] Barnard, J, Butler, G, Gilfedder, F & Vines, G, 2000. Historic Places – Significant Trees in the City of Maribyrnong, Vol. 6 Maribyrnong Heritage Review.
[2] Criterion B2: Importance in demonstrating a distinctive way of life, custom, process, land-use, function or design no longer practiced, in danger of being lost, or of exceptional interest.

of the Footscray Railway Station and the perception of Bunbury Street as one of the main entry points to the municipality (Criterion A4)[3].

The stated management objectives arising from the Statement of Significance are:

- *To conserve and enhance the listed trees and the planting pattern at the place along with the associated medians and stone kerbs where enhancement includes replacement of missing original components in the planting scheme,*
- *To conserve and enhance the visual relationship between the trees,*
- *To conserve and enhance the public view of these trees,*
- *To ensure that works or plantings at or near the place are visually recessive and related to the trees,*
- *To ensure replacement trees match the existing specimens and planting pattern, and*
- *To further research the detailed origins of the rows and maintain the link with their history, via promotion and publication of the findings.*

The elm and ash avenue on Bunbury Street is not included in the Victorian Heritage Register.

Adjacent places of heritage significance

Several areas adjacent to the Bunbury Street elm and ash avenue are also of heritage significance. Those covered by the Heritage Overlay are:

- Old Footscray Township Residential Heritage Area (HO7),
- Footscray Railway Station complex, Irving and Hyde Streets, Footscray (HO49),
- Saltwater River Crossing Site and Footscray Wharves Precinct (HO50),
- Rail Bridge over Maribyrnong River & Tunnel, Bunbury Street, Footscray (HO107)
- Junction Hotel, 56 Whitehall Street, Footscray (HO173).

Of particular relevance is the Old Footscray Township Residential Heritage Area as the Statement of Significance for this Area notes that the Bunbury Street trees are *the best examples of rare mature street trees in the City, which support the period expression of the built environment* and specifically mentions conservation and enhancement of these trees as a policy objective.

Of the above places, the Footscray Railway Station complex, Saltwater River Crossing Site and Footscray Wharves Precinct, and part of Rail Bridge over Maribyrnong River & Tunnel, Bunbury Street, Footscray are included in the Victorian Heritage Register.

[3] Criterion A4: Importance for their association with events, developments or cultural phases which have had a significant role in the human occupation and evolution of the nations, state, region or community.

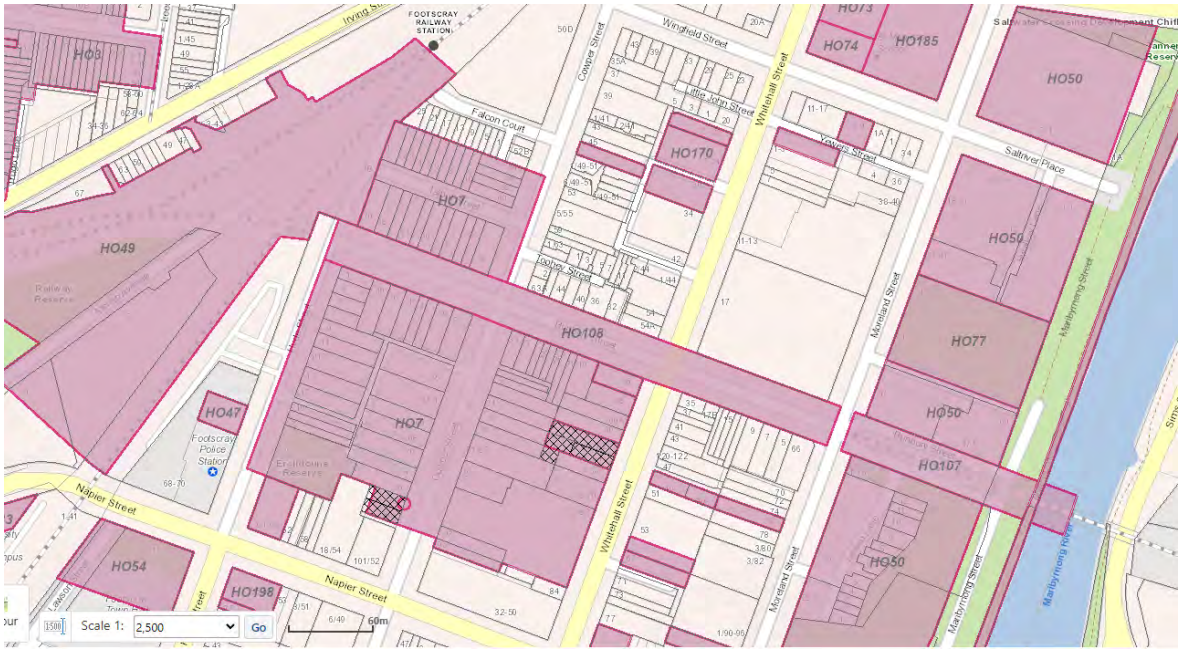

Figure 2: Diagram of places included in the Heritage Overlay adjacent to the Bunbury Street elm and ash avenue (HO108). Source: VicPlan <mapshare.vic.gov.ay/vicplan/>.

5 History of the avenue planting

Elms in Australia

The elm is one of the largest landscape trees commonly grown in Victoria, playing an important role in the landscape character of Melbourne and many regional towns, most notably in historic precincts where it can be the dominant tree within streetscapes and parks. The formal character of the elm has seen it used in traditional planting schemes, notably as avenues.

Elms in Victoria are generally of several taxa, including English Elm (Ulmus procera), Dutch Elm (*U.* × *hollandica*), Golden Elm (*U. glabra* 'Lutescens'), Wych Elm (*Ulmus glabra*) and Field Elm (*Ulmus minor*).

Elms have a long history of cultivation in Europe, particularly in parks, gardens and large private estates. Elms were introduced to the cooler areas of southeastern Australia in the early 1800s for their amenity value as large, spreading-canopied shade trees, and for the early settlers' nostalgia for the landscape character of Britain.

One of the earliest appearances of elms in nursery catalogues in Victoria was that of Thomas Lang of Ballarat who offered a range of *Ulmus* species and cultivars in the period 1860-1880. Victoria has the largest number of elm specimens of all states and territories of Australia, the majority of which are under municipal council management.

Elms were used extensively in Victoria by the 1880s, in public parks and gardens. Notable examples include avenues in the Fitzroy Gardens which were first planted with elms in 1859, and avenues in the Carlton and Treasury Gardens, Melbourne. Elms were popular for creation of Avenues of Honour after World War 1 and were also used as street trees in major boulevards in Melbourne with notable examples Victoria Parade (planted 1878-1890) and Royal Parade (1897, with additional planting 1910-1915)[4].

The use of elms has diminished in recent decades due to suckering which can damage services and, in the case of street planting, to footpaths and road infrastructure.

Elms tolerate a wide variety of site conditions, if provided with adequate water availability during establishment, however conditions in Australia result in a reduced lifespan of 100-150 years for well-maintained specimens in favourable conditions, compared with 250-350 years in Europe[5].

Recognising the potential threat of climate change to the future health and viability of the urban forest, the City of Melbourne has undertaken a large-scale study to assess the suitability of existing and potential tree taxa to future climate scenarios. Modelling uses comparison of the existing temperature range at which a tree taxon occurs with both current temperatures and the expected future temperatures of Melbourne under 'moderate' and 'extreme' carbon emission scenarios. Elms (*Ulmus* sp.) comprise a substantial portion of the urban forest in the City of Melbourne, particularly as prominent boulevard avenue plantings and in the many historical parks and gardens. Modelling indicates that most of the commonly grown elms are 'at risk' in current climate conditions as well as moderate and extreme future climate scenarios. *Ulmus glabra* (Wych Elm), *Ulmus ×hollandica* (Dutch Elm) and *Ulmus procera* (English Elm) are in the highest risk category under current and future scenarios, and *Ulmus minor* (Field Elm) is at moderate risk in current and moderate future climate. In contrast, modelling for *Ulmus parvifolia* (Chinese Elm) indicates that this species is climate-suitable under current and both moderate and extreme future climate scenarios[6]. Future climate suitability modelling is being used by metropolitan Melbourne and regional Victorian councils as a tool for open space planning.

Street tree planting in Melbourne

From the earliest period of settlement in the Port Phillip District, the provision of parks for public recreation was considered an essential element of town development. Charles La Trobe, Melbourne's first Lieutenant Governor, was instrumental in the reservation of land as recreational open space as early as 1840.

Recognition of the importance of park provision and tree planting was transferred from Britain where public open space was considered beneficial from both a social and public health viewpoint. Street tree planting was an extension of this ideal and was thought to have a civilising influence of citizens[7]. In Australia, additional

[4] Spencer, R, Hawker, J and Lumley, P (1991) *Elms in Australia*, Royal Botanic Gardens, Melbourne.
[5] Ibid.
[6] Kendal, D and Baumann, J, 2016, *The City of Melbourne's future urban forest: Identifying vulnerability to future temperatures*, City of Melbourne.
[7] Frawley, J (2009), 'Campaigning for street trees, Sydney Botanic Gardens, 1890s-1920s*', Environment and History*, vol.15, no.3, pp.303-22.

influences were the desire to recreate something visually familiar in the new land, while also playing a practical role in moderating the heat and dust exacerbated by clearing of native vegetation.

Avenues, double rows of trees usually of the same taxon planted at regular spacing, are a feature of both urban and rural landscapes in Australia. The linearity and consistency of avenue plantings confers a sense of formality and occasion. These characteristics have seen avenue plantings adopted for scenic, formal and commemorative purposes. The Avenues of Honour planted in many regional towns following World Wars 1 and 2 as a memorial for those who died in military service are notable examples of avenues used as commemorative form. This form of war memorial was particularly favoured in Victoria, which has more Avenues of Honour than any other state or territory.

Avenues were selected as street tree plantings for the major boulevards of Melbourne, for example Royal Parade and St Kilda Road, providing a sense of arrival at an important city. A long tradition of the use of avenues in European town plans and British Estates preceded the planting of avenues of street trees in Melbourne.

The form of the urban avenue and the tree species used was determined by available sources of trees and the influence key individuals and horticultural developments[8]. In Melbourne, Ferdinand Von Mueller, Director of the Melbourne Botanic Gardens was influential in the establishment of extensive avenues in the Botanic Gardens, Domain, and Government House Reserve. Von Mueller's successor, William Guilfoyle, continued to establish avenue plantings, in a more ornamental design than Von Mueller's scientific, ordered arrangement.

In the 1890s there was a shift in the use of avenues from special, and often official, landscape features to common municipal features as street tree plantings. In addition to the practical benefits of shade provision and visual amenity, avenues were a display of civic pride.

An increase in public interest in tree planting during the 1880s and 1890s, promoted by the initiation of Arbor Day in 1889, and the free supply of trees by state forest nurseries further accelerated municipal street tree planting[9]. Establishment of the Victorian Tree Planters Association in 1926 encouraged the recognition of the benefits of street trees. From the 1970s awareness of urban pollution again prompted intensive tree planting, including street trees, often with Australian trees selected.

Bunbury Street elm and ash avenue tree age

An important element of the stated significance of the elm and ash avenue is the *maturity and extent, as compared to other street planting in the City.* This significance statement implies a degree of consistency of size and age of avenue trees, with trees of mature age class. To determine the degree of intactness of the Bunbury Street avenue planting, the age of the extant trees was investigated.

[8] Aitken, R & Looker, M (eds) 2002, *The Oxford companion to Australian Gardens*, Oxford University Press, Victoria.
[9] Aitken, R & Looker, M (eds) 2002, *The Oxford companion to Australian Gardens*, Oxford University Press, Victoria.

The earliest evidence of street tree planting in the area adjacent to Bunbury Street is an indication on an 1895 MMBW plan[10] that street trees were present in Moreland Street, which intersects Bunbury, at this time. The plan shows a row of circles on each side of Moreland Street, annotated 'line of trees and guards'. Trees are not indicated in Bunbury Street at this time.

Newspaper reportage

Contemporaneous reports specific to tree planting in Bunbury Street are limited, however several accounts appear in newspapers, generally in reports of municipal works. The earliest reference discovered was reported in the Independent, 18 July 1903, p. 2, as follows:

> *Judging by the way property owners in this district are availing themselves of the offer of the local council to plant trees in front of their properties on payment of 10s each to cover the cost of the guards, Footscray will soon be able to boast a number of well shaded walks.*
> *A very generous offer in connection with this tree planting business was accepted by the council on Monday evening on the motion of Cr McDonald, who said he had met a man in the train the other day, who, after remarking that he was very fond of seeing streets planted with trees, offered to pay for 50 of them to be planted in Bunbury street, from the Footscray station to the river. The gentleman in question was Mr. J.J. White, who had no property in the street referred to…..The only stipulation he made was that the trees should be of a fair size, and that they should be planted outside the channels.*
> *The mayor thought the offer a very liberal one, and considered that in a ninety-nine (sic) feet street like Bunbury street, the planting of trees was very desirable. The motion was carried unanimously*.

This report indicates something of the prevailing attitude of the public in favour of street tree planting, the source of funding, and approximately dates what is assumed to be the first planting of trees in Bunbury Street. A further reference appears in the Independent, 10 June 1905, p. 2:

> *TREE PLANTING – The surveyor intimated that he had arranged to remove dead trees from all the streets where they were to be found and to plant live ones. On the motion of Crs Shillabeer and McDonald it was agreed to spend £10 in tree planting in each ward. Cr McDonald said they ought to be 6 to 7 feet high when they were put in. Little plants would take too long to grow…..At the instance of Cr Irving, a request by L. Benjamin, H.E. Richardson and S.C.Richardson, that 10 elm trees be planted in Bunbury street was granted.*

This article indicates that a degree of assessment and maintenance of the street tree population was undertaken, and that planting was budgeted by Council. It is interesting to note that semi-mature tree stock was intended for use, to achieve rapid results. The 10 elm trees referred to as to be planted in Bunbury Street may be additional to the 50 previously to be installed, paid for by J.J. White. A report of the proceedings of a

[10] MMBW detail plan 197,198, City of Footscray. State Library Victoria.

meeting of the Footscray Council published in the Weekly Times, 23 May 1914, p.1 indicates an intention to plant street trees in Ballarat Road and Gordon Street, in addition to several minor roads.

A general reference to street tree planting in Footscray appeared in The Age, 1 August 1938, p.8 indicating that tree planting was being undertaken as part of a 'beautifying campaign' conducted by the Footscray and District Tree Planters Association in conjunction with the local municipal council. The article mentions the planting of deciduous trees, *'mostly claret ash'*.

A search of local newspapers and a review of material held by the Footscray Historical Society was undertaken in the current study, however little additional information specific to tree planting in Bunbury Street was discovered.

In summary, newspaper reportage indicates a possible time period of planting of the first elms in Bunbury Street as c1903, with possible additional planting in 1905. A campaign of tree planting in Footscray was undertaken in 1938. While the extensive use of Claret Ash at this time is mentioned in the article, this is possibly a misidentification as Claret Ash (*Fraxinus oxycarpa* 'Raywood') which only became available in the British nursery trade in c.1928 and may have been unavailable in Australia in 1938.

Photographic evidence

Available historic photographic evidence of the location and size of trees in Bunbury Street is also somewhat limited, except for the period 1927-1928, with a series of photographs taken in association with the excavation of Bunbury Street and construction of the railway tunnel (Figs. 3- 8). These photographs show regularly spaced street trees of a form and consistent with English Elm. The trees are semi-mature, of a size which correlates with a planting period of 1903-1905.

Comparison of trees visible in Fig. 3, the western end of Bunbury Street, with Fig. 8, of the eastern end, both taken 1927-1928 appear to show a difference in trunk size. This may indicate planting at different time periods or may simply be due to variation in soil and drainage conditions along Bunbury Street resulting in different growth rates.

The photographs appear to indicate that some trees were removed during the construction process. This is evident when photographs of the western end of Bunbury Street, near the corner of Hyde Street, Figs. 3 and 4, taken during excavation, are compared with Fig. 5, during tunnel construction. Trees visible next to properties closest to the corner (now no.1 Hyde St/51 Bunbury St and nos. 47 & 49 Bunbury) during excavation appear to have been removed by the time works were completed.

Although speculative, it is considered likely that excavation works impacted on the health and viability of trees adjacent to works, given the close proximity of excavation to the trees. This is particularly evident in Figs. 6 and 8. While elms are reasonably tolerant of a variety of growing conditions, the extent of root damage would be expected to impact on the trees.

Figure 3: View east along Bunbury Street from the Footscray Railway Station during rail tunnel excavation. 1927. (Source: State Library Victoria, 'South Kensington to West Footscray, railway excavations').

Figure 4: View east down Bunbury Street from near the railway station/Hyde Street corner. 1927-1928. (Source: SLV).

Figure 5: View of the same portion of Bunbury Street as shown in Figs. 3 and 4, during tunnel construction. Note the absence of street trees to the right of frame, near the corner of Hyde Street. (Source: SLV).

Figure 6: View along Bunbury Street between Hyde Street and Cowper Street, looking west toward the railway station overpass during tunnel construction, 3/2/1928. (Source: Public Records Office Victoria).

Figure 7: View of the western end of Bunbury Street, 1927-1928, during the addition of basalt fill around the newly constructed tunnel. The steps of the pedestrian overpass from the railway station are visible at top right of frame. (Source: SLV).

Figure 8: View looking east down Bunbury Street during tunnel construction works, 1927-1928. This section of works appears to be the easternmost portion, adjacent to Moreland Road. (Source: SLV).

As the ground-plane photographs available are generally restricted to the 1927-1928 time period, a series of aerial photographs, from 1931, 1945, 1956, 1979, 1982 and 1989 were reviewed. By overlaying these photographs with the locations of currently existing trees, the presence or absence of a tree canopy in each location was determined. A limitation of this method is that, while it can be determined that a tree was present at a particular time, it may not be the same tree visible in that location in a later photo, as it is possible that removal and replacement has occurred in the intervening years. This is particularly important to consider where there is an interval of more than a few years, for example between 1931-1945, and 1956-1979. Canopy size provides some information, however it is not a definite indicator of tree age as maintenance pruning will alter the natural canopy growth. The historic aerial photos used are provided in Appendix A.

Comparison of the 1931 and 1945 aerial photographs indicates that, for the majority of the avenue, locations where a tree was present in 1931 were also occupied in 1945, approximately 17 years after works. Canopy size is substantially smaller in 1945, which may indicate remedial pruning was undertaken between 1931 and 1945 to mitigate the impact of root damage due to excavation. It is also possible that the entire avenue was replaced prior to 1945, although the consistency of gaps in the planting tend to suggest that this is not the case, as vacant planting sites would have been filled.

Through the series of photos 1931-1989, the removal and replacement of trees in several locations can be tracked. This is most evident in the western section of Bunbury Street, between Hyde and Cowper Streets, with several trees replaced between 1945 and 1956.

For each tree present at the time of site review in June 2022, age determined by aerial photo analysis was compared with current trunk diameter[11] and correlation assessed. Trunk diameter was used, as a more reliable indicator of tree age than canopy size. Of the 51 trees analysed (40 Elm, 11 Ash), 44 showed positive correlation between trunk diameter and age determined from photographic analysis (86%). A breakdown of the ages of existing avenue elm and ash is provided in Tables 1 and 2.

The results of the tree age analysis are provided as Appendix B and are shown in the Tree Age/Planting Period Plan, below. Tree numbers used refer to those assigned in *Risk assessment and recommended works report* (May 2022) prepared by Homewood Consulting Pty. Ltd.

[11] As per *Risk assessment and recommended works report* (May 2022) prepared by Homewood Consulting Pty. Ltd.

Table 1: Existing **English Elm** tree population[12] by planting period/tree age.

Planting period	Current age (years @ 2022)	Number of trees
Before 1931	> 90	11
1931-1945	77-91	0
1945-1956	66-76	0
1956-1979	43-66	0
1979-1982	40-43	0
1982-1989	33-40	2
Since 1989	< 33	6
Juvenile trees (<10 years)	<10	14
Total number of elm for which age determined		**33**
Undetermined	Undetermined	7

Table 2: Existing **Desert Ash** tree population by planting period/tree age.

Planting period	Current age (years @ 2022)	Number of trees
Before 1931	> 90	0
1931-1945	77-91	1
1945-1956	66-76	5
1956-1979	43-66	1
1979-1982	40-43	0
1982-1989	33-40	0
Since 1989	< 33	0
Juvenile trees (<10 years)	<10	0
Total number of ash for which age determined		**7**
Undetermined	Undetermined	4

[12] Trees present 7th June 2022 were used in the analysis.

LEGEND

- Existing Tree Planted prior to 1931
- Existing Tree Planted 1931-1945
- Existing Tree Planted 1945-1956
- Existing Tree Planted 1956-1979
- Existing Tree Planted 1982-1989
- Existing Tree Planted since 1989
- Existing Tree Planted recently (juvenile)
- ? Planting period uncertain
- Desert Ash specimen (*Fraxinus angustifolia*)
- X Tree Removed September 2022

NOTES

Tree symbols approximately indicate extent of canopy spread.

All trees are English Elm (*Ulmus procera*) unless indicated as Desert Ash (*Fraxinus angustifolia*).

JOHN PATRICK
LANDSCAPE ARCHITECTS PTY LTD
324 Victoria Street,
Richmond, VIC 3121
T +61 3 9429 4855
F +61 3 9429 8211
admin@johnpatrick.com.au
www.johnpatrick.com.au

CLIENT
Maribyrnong City Council

PROJECT
Elm and Ash Avenue
Bunbury Street, Footscray

DRAWING
Tree Age/Planting Period Plan

SCALE	NTS
DATE	SEP 2022
DRAWN	FW
CHECKED	
JOB NO	22-337
DWG NO	LH01

The English Elm population of the avenue is primarily comprised of juvenile trees planted in the last decade (37%) and trees of at least 90 years of age, planted before 1931 (32%). If we assume the oldest trees are remnant from a c1905 planting, these trees are now in excess of 115 years old. In the context of a street planting, a challenging growing environment, with major works having been undertaken proximal to the trees, retention of the number of original elms extant in Bunbury Street is notable.

The avenue contains 11 Desert Ash (*Fraxinus angustifolia*), the majority of which were planted 1945-1956 and are currently approximately 70 years old. Since establishment of the avenue, like-for-like replacement of failed trees with elms was the standard approach, however infill planting with Desert Ash (*Fraxinus angustifolia*) appears to have occurred between 1945 and 1979. Desert Ash was extensively used for park and street tree planting in southeast Victoria during this period, as an easily grown, medium-large deciduous shade tree tolerant of poor soil and drought. It produces a large quantity of winged seed which is dispersed by wind and washed into waterways. Desert Ash is now considered an environmental weed and is rarely planted.

The most consistent section of the avenue, with the fewest replacements and highest number of trees planted prior to 1931, is the section Cowper Street to Whitehall Street. While expansion of the Ryco facility on the northern side of Bunbury Street, adjacent to Moreland Street necessitated the removal of several trees, the section between Whitehall and Moreland Streets appears to retain at least 5 trees planted prior to 1931.

6 Heritage significance review

The Bunbury Street elm and ash avenue was previously assessed as of local significance *for the combination of its maturity and extent, as compared to other street planting in the City* and *as a reflection of the role of the Footscray Railway Station and the perception of Bunbury Street as one of the main entry points to the municipality.*

The tree age analysis undertaken in the current study determined that Bunbury Street retains a substantial proportion of mature elms, possibly from the early period of establishment c.1905. Subsequent infill and replacement planting with elms, has resulted in the majority of elms comprising juvenile and semi-mature specimens. While lacking the trunk diameter of the older elms, the semi-mature specimens reinforce the avenue character of the planting.

Comparative analysis

The Maribyrnong Heritage Review (2000) identified a number of significant street trees and avenue plantings within the City. A desktop review of these trees was undertaken in the current study as a comparative analysis, the results of which are provided in Table 3.

Table 3: Location and description of comparable trees in the City of Maribyrnong.

Planting	Location	Comments
Elm street tree avenue	33-109 Ballarat Rd, Maidstone.	Substantial avenue with several large gaps. Tree size comparable to Bunbury St elms. Major road.
2 Elm street trees	Fairlie St Yarraville (cnr Berry St)	Pair of trees frame entrance to Fairlie St. Size comparable to Bunbury St elms. Minor road. Remainder of street trees are elms, mostly semi-mature.
1 Elm street tree	Fairlie St Yarraville, immediately north of Somerville Rd.	Single tree of size equal to or greater than Bunbury St elms.
Oak avenue (*Quercus* sp.)	Fehon Street, Yarraville	Avenue of approx. 35 trees including several large, mature specimens. Several gaps present.
1 Elm street tree	Nicholson St, Seddon (no.288)	Single tree. Size comparable to older Bunbury Avenue elms.
London Plane (*Platanus* x *acerifolius*) street trees	Stephen St, Yarraville (north of Somerville Rd, no. 27-33	Section of street tree planting including 2 mature, 1 Semi-mature-mature and 3 elms immediately north of Somerville Rd. Elms comparable to Bunbury St specimens.
Elms and London Plane street trees	83-90 Stephen St, Yarraville (south of Somerville Rd).	2 large elms, 1 smaller but all mature, and 1 mature plane. Small group of trees, landscape feature.

Of the elm plantings compared to the Bunbury Street avenue, only the Ballarat Rd, Maidstone street tree planting is of similar maturity and extent. Several of the elm specimens reviewed in other locations are of similar size and apparent maturity as the Bunbury St mature elms, however all are either single trees or present as small groups.

The oak avenue at Fehon St, Yarraville contains several large specimens and presents as a mature avenue planting in several sections, however large gaps are present. At approximately 300m length the Fehon St planting is of comparable length to Bunbury St (370m).

The comparative analysis confirms that the Bunbury St avenue is outstanding in regard to maturity, extent and consistency compared to other examples in the City of Maribyrnong.

Location and connections

In addition to significance due to the maturity and extent of the Bunbury St avenue, significance was also ascribed *as a reflection of the role of the Footscray Railway Station and the perception of Bunbury Street as one of the main entry points to the municipality.*

In the early days of European settlement in Melbourne, the Saltwater River (Maribyrnong River) was an obstacle to travel west necessitating use of a circuitous route via the Braybrook Ford to the north. In 1939 Captain Lonsdale opened a direct route across the river with the establishment of a timber raft punt, landing on the western side at what later became the eastern end of Bunbury Street. The first punt could bear limited weight but was used to establish a mail cart service from Melbourne to Geelong[13]. The early punt was

[13] Lack, J (1991), *A history of Footscray*, Hargreen Publishing & City of Footscray.

replaced by one which could bear the weight of bullocks and heavy carts and the service became an important connection between Melbourne and Geelong and Williamstown.

The first survey of Footscray township by Assistant Surveyor Lindsay Clarke in 1849 was limited to four main blocks divided by north-south aligned Maribyrnong, Moreland, Whitehall and Cowper and running east-west, Bunbury and Whitehall. An 1857 parish plan shows the punt landing aligned with Bunbury Street and the railway station in Napier Street, which opened in 1859[14], south of the currently existing Footscray railway station which was constructed from 1899. The possible establishment period of the Bunbury Street tree avenue, c. 1905, correlates with the opening of the new station aligned with the western end of Bunbury Street c. 1908[15] and may have been installed in response to the new station location.

The current study tentatively recognises the connection between the extant railway station and the Bunbury Street tree planting. Further information would be required to confirm this.

7 Heritage Impact Statement

Cultural heritage significance

The Bunbury Street elm and ash avenue, which retains a substantial proportion of early-planted English Elm (c.1905) is significant for its maturity and extent compared to other street tree plantings in the City of Maribyrnong.

Proposed works

Emergency removal of 12 of the Bunbury Street avenue trees is proposed, in response to recommendations following several arboricultural assessments over approximately 3 years. Trees proposed for emergency removal due to poor condition, internal decay and an increased likelihood of failure are: Trees[16] 10, 12, 14, 16, 22, 27, 28, 29, 30, 31, 36 (removed August 2022) and 40, all English Elm except Tree 16, Desert Ash.

Elms to be removed are all early plantings, thought to be prior to 1931. The age of Trees 27 and 28 was not confirmed in the current study. The Desert Ash to be removed, Tree 16, is thought to have been planted 1945-1956.

Options considered

Available options are as follows:

a) Do nothing – A 'do nothing' approach would see the mature trees of the avenue continue to decline in condition, presenting substantial risk to people and property due to the likelihood of major failure. The mature

[14] Barnard, J (2000), *Maribyrnong Heritage Review*, Vol. 5, p.44.
[15] Ibid.
[16] Numbering adopted from *Risk assessment and recommended works* report, May 2022, Homewood Consulting Pty. Ltd.

trees may be able to be retained for a slightly longer period, than if immediate removal is undertaken, however this has a high associated risk. The requirement for removal is inevitable, in at most the medium term.

b) Remove trees after failure has occurred and replace with English Elm. This approach requires that the risk of damage to people and property is accepted and the avenue is gradually replaced with trees which are unsuitable to future climate. Infill planting results in a high degree of visual inconsistency in an avenue planting due to mixed age composition, for the period of time until trees reach maturity.

c) Undertake major canopy reduction (pollarding) to mitigate the likelihood of failure. This approach retains the tree in the landscape, albeit in a state of reduced visual amenity, for a period longer than immediate removal. Pollarding would reduce the risk of injury and/or damage to people and property but would not completely remove risk, as regrowth following pollarding is of epicormic origin, creating poorly attached stems which have a much higher risk of failure. Epicormic growth must be regularly removed or reduced to manage structural issues, resulting in an inability to achieve a tree of substantial canopy size.

d) Pre-emptively remove trees assessed by qualified arborists as in poor condition. This option is most effective in mitigating risk but has the greatest impact on the visual amenity of the avenue planting if several trees are removed simultaneously.

Impacts on cultural heritage significance

Removal of trees within the avenue will impact on the historical significance of the planting, and to adjacent places of heritage significance to which the avenue contributes. As a living landscape element, trees develop and mature, reaching over-maturity and senescence at a period determined by the taxon and environmental conditions. The eventual loss of significant trees from the landscape is unavoidable.

Succession planning is an important element of the management of any tree population. The recommended approach for trees of heritage significance is to maintain specimens for as long as is practical, using regular arboricultural maintenance, while considering the inputs required and benefit achieved, followed by replacement using the same taxon (like-for-like). This strategy has served historic plantings well, however the impact of climate change requires that careful consideration of replacement tree taxa is required.

Modelling of the tolerance of tree taxa under various future climate scenarios is currently used by local government and botanic gardens to inform the selection of replacement species for trees of heritage significance. In addition to future climate tolerance, consideration of the form and characteristics of trees to be replaced is of primary importance, as heritage significance often lies in aesthetic values. To recreate these values, foliage texture, density, colour and retention (evergreen vs. deciduous) should be considered, to achieve a replacement planting comparable to the original. The aesthetic values of the planting should be assessed both when viewed from a distance and as experienced from within a planting of multiple specimens. Taxa worthy of consideration as replacement trees for the Bunbury Street avenue include several oaks; *Quercus acutissima* (Sawtooth Oak), *Quercus macrocarpa* (Bur Oak) and *Quercus alba* (White Oak). Other

appropriate candidates may be *Ulmus parvifolia* (Chinese Elm), *Zelkova serrata* (Japanese Zelkova) – the species, not any of the cultivars - and *Melia azedarach* (White Cedar).

8 Recommendations

Prior to removal, specimens of the elm and ash avenue should be documented and archived, as per the objectives of the General guidelines 22.01-1 of the Cultural Heritage Policy of the Maribyrnong Planning Scheme which state: *Heritage places should be recorded if demolition is permitted. The recording should clearly demonstrate significant elements of the place and be of archival quality.*

9 Appendix A: Historic aerial photographs

Figure 9: November 1931 aerial photograph, cropped to centralise Bunbury Street. Maldon Prison Project, Run 6, Frame 2872. Source: Landata.vic.gov.au

Figure 10: 1945 aerial photograph, cropped. Project 5, Melbourne and Metropolitan Area, Run 2A, Frame 63645. Source: Landata.vic.gov.au

Figure 11: February 1956 aerial photograph, cropped. Melbourne Outer Suburbs Project, Run 8, Frame 2. Source: Landata.vic.gov.au

Figure 12: December 1979 aerial photograph, cropped. Heytesbury North Project, Run 9, Frame 187. Source: Landata.vic.gov.au

Figure 13: March 1982 aerial photograph, cropped. Heytesbury North Project 793, Run 4, Frame 223. Source: Landata.vic.gov.au

Figure 14: February 1989 aerial photograph, cropped. Melbourne 1989 Project, Run 20W, Frame 147. Source: Landata.vic.gov.au

10 Appendix B: Tree age analysis results

Tree #	Taxon	Planting period	Current age (years)	Correlation with current trunk diameter
NORTH SIDE OF BUNBURY STREET				
HYDE STREET/RAILWAY STATION				
1	Elm	1982-1989	Approx. 35	Correlates, within range
2	Elm	1982-1989	Approx. 35	Correlates, within range
3	Ash	1945-1956	Approx. 70	Correlates
4	Ash	1945-1956	Approx. 70	Correlates
5	N/A	1982-1989	Removed 2019	N/A
6	Elm	recent	< 10	Correlates
7	Elm	Since 1989	< 35	Correlates
8	Elm	Since 1989	< 35	Correlates
COWPER STREET				
9	Elm	Since 1989	< 35	Correlates
10	Elm	Before 1931	> 90	Correlates
11	Ash	1945-1956	Approx. 70	Correlates
12	Elm	Before 1931	> 90	Correlates
13	Elm	Undetermined		
14	Elm	Undetermined		
15	Elm	Undetermined		
16	Ash	1945-1956	Approx. 70	Correlates
17	Elm	Before 1931	> 90	Correlates
WHITEHALL STREET				
22	Elm	Before 1931	> 90	Correlates
18	Elm	recent	< 10	Correlates
19	Elm	recent	< 10	Correlates
20	Elm	recent	< 10	Correlates
21	Elm	recent	< 10	Correlates
23	Ash	Undetermined		
24	Elm	recent	< 10	Correlates
25	Elm	recent	< 10	Correlates
26	Elm	Undetermined		
27	Elm	Undetermined		
MORELAND STREET-EASTERN END				

Tree #	Taxon	Planting period	Current age (years)	Correlation with current trunk diameter
SOUTH SIDE OF BUNBURY STREET				
MORELAND STREET-EASTERN END				
28	Elm	Undetermined		
29	Elm	Before 1931	> 90	Correlates
30	Elm	Before 1931	> 90	Correlates
31	Elm	Before 1931	> 90	Correlates
32	Elm	Since 1989	< 35	Correlates
33	Elm	Before 1931	Removed 2021	N/A
34	Ash	Undetermined		
WHITEHALL STREET				
35	Ash	1956-1979	43-66	Correlates
36	Elm	Before 1931	> 90	Correlates
37	Elm	Recent	< 10	Correlates
38	Ash	Undetermined		
39	Elm	Before 1931	> 90	Correlates
40	Elm	Before 1931	> 90	Correlates
41	Elm	Recent	< 10	Correlates
42	Elm	Before 1931	> 90	Correlates
43	Elm	recent	< 10	Correlates
44	Ash	Undetermined		
COWPER STREET				
45	Elm	Recent	< 10	Correlates
46	Elm	Recent	< 10	Correlates
47	Elm	Removed 2022	N/A	N/A
48	Elm	Recent	< 10	Correlates
49	Elm	Undetermined		
50	Elm	Since 1989	<35	Correlates
51	Elm	Recent	< 10	Correlates
52	Ash	1931-1945	77-91	Correlates
53	Elm	Since 1989	< 35	Correlates, within range
54	Ash	1945-1956	Approx. 70	Correlates
HYDE STREET/RAILWAY STATION				