

MELBOURNE METRO RAIL PROJECT ENVIRONMENT EFFECTS STATEMENT
INQUIRY AND ADVISORY COMMITTEE

MMRA TECHNICAL NOTE

TECHNICAL NOTE NUMBER: 040

DATE: 19 August 2016

PRECINCT: All Precincts

EES/MAP BOOK REFERENCE: EES Chapter 21; Technical Appendix R: Arboriculture: City of Melbourne, Port Phillip and Maribyrnong; Technical Appendix S: City of Stonnington

SUBJECT: Arboriculture

Response to Section 15 of the 'Preliminary Matters and Further Information' Request

NOTE:

1. This Technical Note responds to the matters identified in Section 15 of the 'Preliminary and Further Information' request made by the IAC on 25 July 2016 (**Request**).
2. For ease of reference, this Technical Note adopts the topic headings set out in the Request and reproduces the relevant 'references' and 'requests' prior to setting out MMRA's response.

15.1 Useful life expectancy (ULE) divergence

(i) Reference

EES Technical Folder 13 of 14 includes Appendix R Arboriculture: City of Melbourne, Port Phillip and Maribyrnong states that:

It is noted that there was divergence (in some cases significant) between the existing City of Melbourne ULE assessments for many plane trees within the proposed project boundary, against the field assessment undertaken as part of this study. In many cases, the field assessment revealed much longer ULEs than those recorded by City of Melbourne, possibly a response to more favourable growing conditions in recent years, exhibiting improved health characteristics.

As the trees were dormant at the time of assessment, limited sampling of these particular trees is recommended once the trees are

in leaf, to confirm the updated ULE. The ULE of each tree contributes to its monetary value as calculated by City of Melbourne (p18).

(ii) Request

The IAC requests further information on:

87. the significance of this divergence with regard to the potential impacts of the Project.

MMRA Response:

3. This observation about the longer ULEs recorded in the EES assessment relates primarily to Plane Trees that were assessed within the CBD South Precinct and St Kilda Road in the Domain Precinct. In many cases the trees have been assessed with longer useful life expectancies (ULEs) than what was previously recorded in the City of Melbourne urban forest data. A comparison is provided for Plane Trees impacted by the project in **Attachment A**. It is understood that the improved health observation is supported by recent assessments undertaken by the City of Melbourne.
4. 34 specimens assessed as mature medium and long term viable (MLTV) trees (semi-mature to over-mature trees with a ULE of 20+ years) had previously been assessed as having ULEs of no more than 10 years by the City of Melbourne. The significance of the divergence in ULEs is that the MMRA's assessment is more conservative than that adopted by the City of Melbourne. This has resulted in an overall more conservative assessment of impacts on Plane Trees than if the project had relied on older City of Melbourne data.

15.2 Timeframe for mitigation

(i) Reference

EES Technical Folder 13 of 14 includes Appendix R Arboriculture: City of Melbourne, Port Phillip and Maribyrnong states that:

To ensure loss of trees would be temporary, mitigation should seek to re-establish canopy cover in accordance with the City of Melbourne's Urban Forest Strategy as part of project delivery ... (p78)

As they mature, replanted trees would progressively mitigate impacts and contribute to the landscape and, at an estimate, it is considered that within 20-30 years following planting, a high quality semi-mature canopy can be established ... (p79)

(ii) Request

The IAC requests further information on:

88. the basis for the conclusion that this mitigation measure is 'acceptable', having regard to the time required for plantings to mature.

MMRA Response:

5. It is acknowledged that trees will require removal due to the nature of the proposed works at ground level and the proposed construction methodology. However, it should also be noted that by tunnelling through the CBD with the deeper alignment adopted for the Concept Design, most trees along Swanston Street will be protected.
6. Where trees require removal, replacement will occur that conforms to the Cities of Melbourne, Port Phillip and Stonnington urban forest strategies, and requirements of relevant conservation management plans for places included on the Victorian Heritage Register.
7. The 20-30 year estimate to achieve a high quality semi-mature canopy is based on observed historic growth of Plane Trees within Swanston Street, but will ultimately be determined by the species selected, growing conditions and climatic factors. Whilst trees could be close planted and replacements selected from faster growing species to achieve a more rapid canopy cover, the shorter term benefit of this planting regime will in time be lessened by competition between trees, resulting in sub-optimal growth in the longer term.
8. It is instead proposed that replacement tree plantings will occur in improved soil, utilise irrigation, and where appropriate, super advanced specimens can be used to mitigate against immediate loss of amenity, and provide necessary infrastructure to optimize future growth. Super-advanced trees are trees supplied in 1000 litre containers or larger with a likely height in the order of 6 metres.
9. It should be noted that the Impact Assessment has been prepared as a “worst-case” scenario by assuming the removal of all trees within the construction footprint. EPR AR1 requires that during detailed design, potential tree impacts will be reviewed with a view to facilitating the maximum tree retention where possible. On this basis, the expectation is that the detailed design of the project will enable many of the trees nominated for removal in the EES to be retained.
10. Moreover, many of the trees to be removed are either juvenile, with very limited anticipated loss of amenity and canopy cover due to their modest size, or have limited ULEs and are anticipated to require replacement within the timeframe of the project¹.
11. The mitigation measure is considered acceptable in regard to the timeframe required for plantings to mature, because what is proposed for the Project is within the current extent of tree removal and replacement undertaken in accordance with the Urban Forest Strategies of City of Melbourne and City of Port Phillip.

15.3 Visual impacts from removal of trees

¹ John Patrick’s Expert Witness Statement, paragraphs 10.7-10.8.

(i) Reference

EES Technical Folder 13 of 14 includes Appendix R Arboriculture: City of Melbourne, Port Phillip and Maribyrnong at p78 and p79 states that:

To ensure loss of trees would be temporary, mitigation should seek to re-establish canopy cover in accordance with the City of Melbourne's Urban Forest Strategy as part of project delivery. As they mature, replanted trees would progressively mitigate impacts and contribute to the landscape and, at an estimate, it is considered that within 20-30 years following planting, a high quality semi-mature canopy can be established.

Chapter 16 of the EES, Section 16.7.1 states: "The recommended Environmental Performance Requirements specify the outcomes to be achieved and the proposed mitigation measures that would apply across all precincts and would help to mitigate the impacts of tree removal. While a number of these trees are nearing the end of their useful life expectancy and would require replacement in the future, there would still be a high residual impact during construction in the Parkville and Domain station precincts, and a medium residual impact in all other precincts."

Technical Appendix R, Appendix B Tree assessment descriptors states that a tree in the Juvenile phase "is actively growing and is still in its establishment phase. Tree currently makes little contribution to the landscape". Technical Appendices R, S, J, and L assess impacts on trees to be removed from those perspectives/disciplines. Appendix R outlines the number of trees that would need to be removed to construct the Project, these total approximately 900 trees.

Technical Appendix R states at p34: "it is considered that within 20-30 years following planting, a high quality semi-mature canopy can be established." Technical Appendix L states at pV that "residual impacts gradually reducing over a period of 7 to 10 years following construction (as trees and vegetation take time to grow)".

(ii) Request

The IAC requests:

- 89. an explanation about the measures or strategies that will be employed to ensure that replacement trees will not all approach the end of their useful life at the same time*
- 90. advice on which, if any, of the trees proposed to be removed would be likely to need replacing under the normal course of events within the time span of the construction and maturation phase*
- 91. clarification of the total number of juvenile and mature trees to be removed*

MMRA Response:

12. **Response to 89.** The measures and strategies that will be employed to ensure that replacement trees will not all approach the end of their useful life at the same time have been guided by:
 - a) the urban forest strategies of the Cities of Melbourne, Port Phillip and Stonnington; and
 - b) any specific provisions for places included on the Victorian Heritage Register, where in most cases a like-for-like replacement strategy is required (for example Royal Parade elm trees).
13. In avenue plantings such as Royal Parade and St Kilda Rd, where like-for-like replanting will occur, it is inevitable that trees of the same species planted in groups will age and approach the end of their useful life at a similar time, which is currently evident in the large numbers of over-mature trees within Royal Parade. Block replacement strategies can mitigate against wholesale removal and loss of amenity along an entire avenue by staged replacement of discrete sections within the avenue. These trees have the opportunity to establish and contribute to amenity prior to the later replacement of adjacent blocks, thereby limiting the overall impact of an entire avenue replacement. This approach could be explored for the portion of Royal Parade within the project area, initiating a longer term plan for the replacement of an over-mature plantation.
14. Where like-for-like replacement of avenues is not required, the urban forest strategies expressly seek diversification of tree species so that:
 - a) a greater mix of tree ages develop within the urban landscape;
 - b) trees will develop, mature and senesce at different times as a consequence of differing useful life expectancies between species; and
 - c) a more resilient urban forest will establish against potential pest and disease outbreaks. For example, because Elms and Planes currently comprise a high proportion of street trees within the City of Melbourne, the occurrence of Dutch Elm Disease would likely have a catastrophic impact on many of Melbourne's most valued avenues and parks. Planning for and implementing greater species diversification significantly reduces the potential for a pest or disease to impact on any one species within the Urban Forest.
15. **Response to 90.** The IAC has requested advice on which, if any, of the trees proposed to be removed would be likely to need to be replaced under the normal course of events within the time span of the construction and maturation phase.
16. Trees which have been assessed under the arboricultural assessments as being likely to be removed include trees which have a Useful Life Expectancy of up to 10 years, and therefore would be likely to need replacing under the normal course of events during the time span of the Melbourne Metro Rail Project. These trees would require removal based on the poor success rate of the tree. This success rate is classified as 'in

decline', which represents any tree (juvenile, semi-mature, mature, and over-mature) which has a low ULE and is therefore not successful.

17. The arboricultural assessments have assessed 336 trees as having a ULE of up to 10 years, consisting of the 331 trees identified in the EES² plus a further five trees subsequently identified by further ground-truthing. This figure includes 57 trees scheduled to be removed under the City of Melbourne University Square Draft Concept Plan and trees on St Kilda Road that City of Melbourne's Urban Forest Strategy identifies as needing replacement. To put this figure in some context, we are advised that the City of Melbourne removes approximately 1,000 trees per year and replants around 3,000 trees per year as part of its Urban Forest Strategy.
18. These trees, which were assessed as a part of the environmental impact assessment, are shown in maps for each precinct in **Attachment B**.
19. MMRA aims to double the baseline tree canopy cover by 2040 by ensuring that every tree removed will be replaced and that an additional tree will be planted back in the localised area. Tree planting will commence during project construction to minimise the overall timeframe with loss of canopy.
20. **Response to 91.** The rest of the tree data has also been categorised according to the success rate of the tree (in addition to those trees which are likely to need replacing under the normal course of events identified above). The rest of the trees have been categorised as:
 - a) 'juvenile' which is a newly planted tree with a ULE greater than 10 years;
 - b) 'MLTV' (Mature/Medium Long Term Viable) which is a mature or semi-mature tree with a ULE greater than 10 years which contributes to the landscape; and
 - c) Rail land trees, which are mature or semi-mature trees with a ULE greater than 10 years but have not been assessed with the same vigor as public trees due to their location on Vic Track land.
21. These categorisations identify the longer living trees with reference to the combined implications of the age, species, health and ULE of the tree.
22. With these definitions, there are:
 - a. 160 total juvenile trees potentially impacted by the project
 - b. 394 total MLTV trees potentially impacted by the project (excluding the trees identified as needing to be removed for the City of Melbourne University Square Draft Concept Plan)
 - c. 106 total rail land trees
 - d. These numbers also still include the trees within Fawkner Park associated with the TBM launch location (approximately 60), which are no longer proposed to be removed (see Technical Note 16)

² John Patrick's Expert Witness Statement, Appendix C.

23. Whilst the number above reflects a total of 996 trees impacted (including the 336 trees referred to in paragraph 17), the total number of trees to be impacted due to the project has been identified in the EES as 'up to and around 900 trees'. This is because the removal of noxious environmental weed species and self-sown mixed plantations (over 100 trees in the Eastern Portal and Arden precincts in particular) were not included in the assessment. In a 'no-project' scenario, these self-sown weedy species would have continued to spread across the precincts, causing environmental damage. Their removal provides new opportunities to accommodate planting of replacement juvenile vegetation, and can be viewed as an environmental benefit, rather than an environmental impact or loss. Additionally, some trees (including 14 palms) can be successfully relocated, and therefore will not be permanently removed, and as such are not included in the 'up to and around 900' number.
24. Together with the contractor, the project will continue to endeavor to reduce tree removals as evidenced in the exclusion of Fawkner Park as a TBM launch site.

15.4 Urban heat effect

(i) Reference

EES Volume 3, Chapter 22 details Greenhouse Gas as well as Technical Folder 14 of 14 Appendix V.

(ii) Request

The IAC requests further details on:

92. the impact of the removal of 900 trees on urban heat effect.

MMRA Response to request 92:

25. Urban vegetation, in particular tree canopy, is one of the most cost effective and efficient tools for mitigating urban heat.
26. For the Melbourne Metro Rail project, there are areas where tree canopy will be lost such as Parkville, Domain and CBD South. As a result of loss of canopy, there is likely to be some increased urban heat retention over summer, contributing to the urban heat island effect.
27. Thermal imagery shows that existing hotspots in red are interspersed over the region, with the largest being in CBD South. It is possible that the temporary loss of tree canopy cover along the project alignment could contribute to urban heat retention effects. **Attachment C** shows thermal mapping for the project alignment prepared by Loci on behalf of MMRA.
28. However, the impacts from loss of tree cover are short term and should be viewed in the wider context of the total number of trees presently in the respective precincts. For context, we note that as at 9 August 2016 there

were a total of 65,116 trees recorded in the City of Melbourne alone,³ 33,500 in the City of Stonnington⁴ and 26,372 within the City of Port Phillip,⁵ representing approximately 125,000 trees in total. Based on this existing information, the tree losses estimated by the concept design would comprise 0.72% of this total urban forest. It is therefore expected that any increased urban heat retention would be modest and confined to the locations where the tree canopy is proposed to be removed.

29. MMRA aims to ensure that higher performing landscapes will be reinstated in these locations to support a larger, healthier and more effective urban forest canopy for mitigating urban heat. This will include significantly improving current growing conditions by utilising larger volumes of high performance soils as well as water sensitive urban design to allow enough nutrients and moisture for each tree to perform at its optimal capacity. EPRs AR2 regarding soil and AR3 regarding re-establishment of trees in accordance with the relevant councils and other stakeholder policy documents implements this intent.

CORRESPONDENCE:

No correspondence.

ATTACHMENTS:

- A. ULE comparison table
- B. Mapped precincts showing trees with ULE of up to 10 years
- C. Thermal mapping

³ Melbourne's Urban Forest Tree Data, City of Melbourne
<https://data.melbourne.vic.gov.au/Environment/Melbourne-s-Urban-Forest-Tree-data/fp38-wiyy>.

⁴ A New Leaf, City of Stonnington,
<http://www.stonnington.vic.gov.au/files/assets/public/vision/council-strategies/street-tree-strategy.pdf>.

⁵ Greening Port Phillip - An Urban Forest Approach, City of Port Phillip
http://www.portphillip.vic.gov.au/an_urban_forest_approach.pdf.