National Trust *of* Australia (Victoria)
ABN 61 004 356 192

NATIONAL TRUST

Tasma Terrace
4 Parliament Place
East Melbourne
Victoria 3002

Email: info@nattrust.com.au
Web: www.nationaltrust.org.au

T 03 9656 9800
F 03 9656 5397

12 September 2016

National Trust of Australia (Victoria) submission-in-chief

Melbourne Metro Rail Project EES hearing

Thank you for the opportunity to provide comment regarding the Melbourne Metro Rail Project (MMRP). We are cognisant of the strategic justification for the project, and we understand that heritage is but one factor that will constrain the MMRP design and construction.

Although the tunnelling method adopted will avoid many impacts on heritage, where works are required at street level they often intersect with places of heritage significance, which should be avoided wherever possible, particularly with regard to the Domain where it is very important to provide certainty that the landscape will not be negatively affected.

1 PRECINCT 1—TUNNELS

1.1 Domain Parklands H2304, HO398 - Tom's Block

The National Trust has heard the evidence of Mr Patrick and Mr Shears and retains serious concerns about the effect of soil stabilisation using 'grouting' techniques on trees in Tom's Block. It was the evidence of Mr Lovell, Mr Shears, and Mr Patrick that the alignment should preferably go under CityLink to avoid impacts on the Domain.

It is our submission that the alignment option above CityLink would have an unacceptable detrimental impact on the heritage of the Domain, which is characterised by a parkland of scattered trees dotted across lawns, divided by avenue plantings along winding roads and paths.

1.1.1 Significance

Domain Parklands is included on the Victorian Heritage Register, and the statement of significance includes the following reference to the plantings:

> *Hugh Linaker's design of the King's Domain with its avenue plantings, winding pathways and lawn areas with scattered specimen trees struck a balance between the strong geometry and regimented planting of the Shrine and Guilfoyle's picturesque landscaping around Government House…*

The Domain Parklands contain a number of well established and intact avenues and groups of trees to create a landscape of outstanding quality and diversity. There are avenues, rows and/or specimen trees of Ulmus, Platanus, Populus, Quercus, Ficus, Eucalyptus, Corymbia, Angophora, Callitris, Agathis, Schinus, Juniperus, Pittosporum, Erythrina, Rapanea, Brachychiton, Elaeodendron, Calodendrum, Cedrus, Pinus, Cupressus, Araucaria, Olea, Cinnamomum, Magnolia, Grevillea, Fraxinus, Alectryon, Agonis, Syncarpia, Syzygium, Lophostemon, Lagunaria, and Butia, Phoenix and Washingtonia palms. The wide variety of tree forms, evergreen, deciduous trees providing autumn colour, leaf shapes and palm fronds, dense conifer foliage (green, golden and blue), bark texture and colour, all combine to give a contrasting and diverse landscape of high landscape and aesthetic value.

The King's Domain and its plantings have historical associations with Baron Von Mueller, William Guilfoyle, Carlo Catani and Hugh Linaker, giving it an unrivalled pedigree of curatorship in Victoria.

Further, many trees within the Domain Parkland along the project footprint are commemorative trees which are culturally significant in their own right, often dedicated to eminent Victorians, organisations, or military personnel, battalions, vessels or conflicts.

The National Trust submits that the areas of the Domain impacted by the project are some of Melbourne's most important landscapes, and are irreplaceable.

The Domain provides the visual links between significant sites in Melbourne including the Shrine of Remembrance, the NGV International, Royal Botanic Gardens and Myer Music Bowl. The Domain, in the areas of the Shrine Reserve and Tom's Block is a much-loved, highly valued and prominent precinct.

With particular regard to Tom's Block, we submit its trees:

- are highly visible from St Kilda Road, one of Melbourne's key boulevards;
- hold an elevated position in the streetscape on a gentle rising slope;
- create the garden setting for the Victorian Police Memorial;
- frame the Weary Dunlop Memorial;
- frame the original Boer War Memorial;
- include a tree which was planted in memory of victims of crime;
- include historic flowering gums planted to commemorate George V;
- are in the direct foreground of the Shrine of Remembrance, when viewed down the key vista of the Swanston St/St Kilda Rd axis.

Figure 1. View from Police Memorial Tram Stop, down St Kilda Rd vista towards Shrine of Remembrance, in winter (all photos were taken in winter, ie when the deciduous trees were leafless, unless otherwise noted).

Figure 2. Boer War Memorial, with DC065 Hoop Pine (Araucaria cunninghamii) (MLTV, ULE = 31-60 yrs), DC066 Monterey Pine (Pinus radiata) (MLTV), to be removed for soil grouting.

Figure 3. View from St Kilda Road to Police Memorial, in summer (image: veganopoulos.com)

Figure 4. View south-west from Linlithgow Avenue to Walker Fountain.The majority of trees visible will be lost if soil grouting proceeds.

Figure 5. View east from Police Memorial towards Linlithgow Avenue. All trees in the foreground and middle distance would be impacted by soil grouting.

Figure 5. DC026 Canary Island Pine (Pinus canariensis), to be impacted by soil grouting (MLTV, ULE = 31-60 yrs).

Figure 6. DC036 Moreton Bay Fig (Ficus macrophylla) proposed to be impacted by soil grouting (MLTV, ULE = 31-60 years).

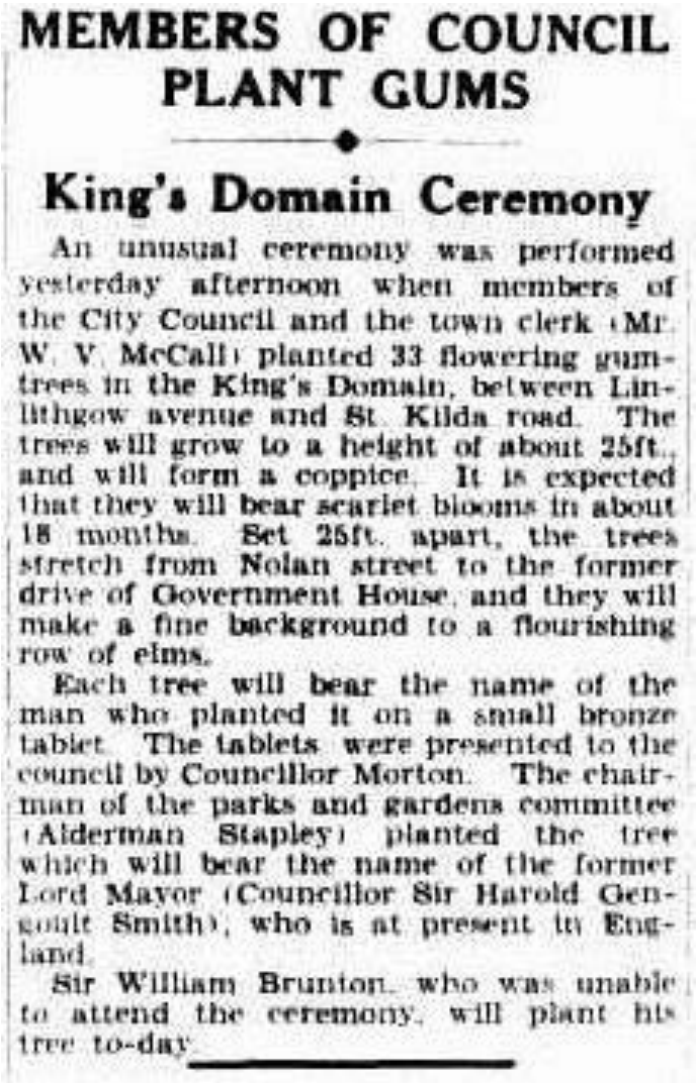
Figure 7. Statue of Sir Edward 'Weary' Dunlop, an Australian surgeon recognised for his leadership whilst a Japanese POW during WWII, which has been placed directly in front of DC050 (Image: cacb.wordpress.com).

Figure 8. DC050 Red Flowering Gum (Corymbia ficifolia), proposed to be impacted by soil grouting (MLTV, ULE = 21-30 years)

Although Mr Patrick gave evidence the Corymbias in Tom's Block were not identified in the Lovell Chen assessment as having cultural heritage significance, the National Trust submits that these trees are of local significance for historic and commemorative reasons.

The flowering gums (*Corymbia ficifolia*) in Tom's Block were planted by City of Melbourne Councillors to commemorate King George V's Silver Jubilee. It is the only surviving example known in Melbourne of a group of trees having been planted for the Jubilee, as well as being the only group planted by a cohort of Councillors, being described at the time as 'an unusual ceremony'.

George V died the following year, and his memorial was erected in the Domain (after much heated discussion as to its siting) and still stands today at the entrance to the Sidney Myer Music Bowl. The trees' significance, in the context of the George V memorial, makes them locally significant to the City of Melbourne.



MEMBERS OF COUNCIL PLANT GUMS

King's Domain Ceremony

An unusual ceremony was performed yesterday afternoon when members of the City Council and the town clerk (Mr. W. V. McCall) planted 33 flowering gum-trees in the King's Domain, between Lin-lithgow avenue and St. Kilda road. The trees will grow to a height of about 25ft., and will form a coppice. It is expected that they will bear scarlet blooms in about 18 months. Set 25ft. apart, the trees stretch from Nolan street to the former drive of Government House, and they will make a fine background to a flourishing row of elms.

Each tree will bear the name of the man who planted it on a small bronze tablet. The tablets were presented to the council by Councillor Morton. The chair-man of the parks and gardens committee (Alderman Stapley) planted the tree which will bear the name of the former Lord Mayor (Councillor Sir Harold Gen-goult Smith), who is at present in Eng-land.

Sir William Brunton, who was unable to attend the ceremony, will plant his tree to-day.

Figure 9. Extract from the Argus, 11 May 1935 (Image: trove.nla.gov.au)

Tom's Block and the Shrine Reserve are places that are sacrosanct to Victorians. The project should be undertaken in a way that provides certainty that the landscape of Tom's Block is able to be reinstated and re-established. It is the submission of the National Trust that, based on the evidence provided, the only way to ensure certainty at the time of this EES assessment is to mandate that the tunnel alignment proceed under CityLink.

1.1.2 Soil stabilisation works

In addressing the construction alignment option over the CityLink tunnels, page 23 of the Arboricultural Technical Report states:

Ground stabilisation (grouting/soil mixing) may be required through Tom's Block above the bored tunnel to limit the impact of surface settlement, which would be anticipated to be up to 50mm, and the potential for ground subsidence during tunnelling.

The National Trust understands that the soil stabilisation works required by the upper alignment involves injecting cement into the ground to a depth of approximately four metres (MMRA pers. comm.), a process which risks 81 trees in Tom's Block in the evidence of Mr Shears or 62 trees in the evidence of Mr Patrick. This scenario gives the National Trust cause for serious concern.

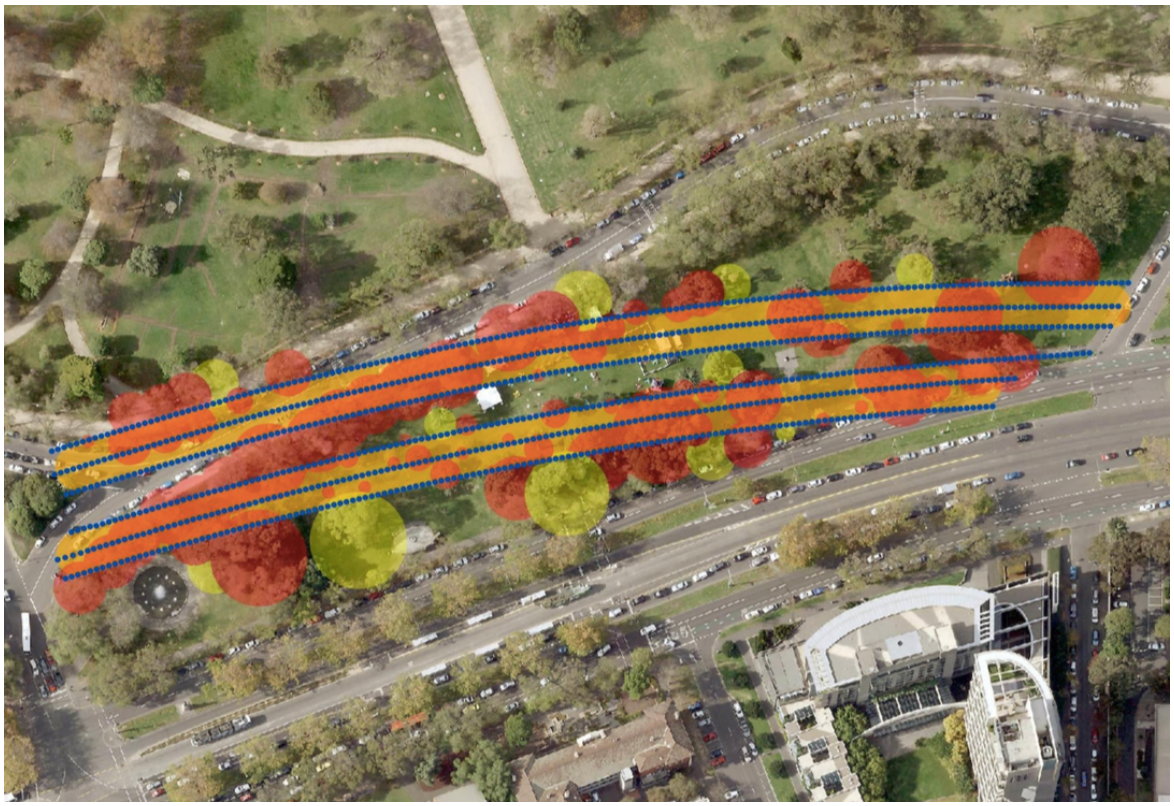


Figure 10. Scope of tree loss in Tom's Block based on Technical Note 47. 70 trees will have major Tree Protection Zone (TPZ) encroachment (>10%, marked red), 11 trees will have minor TPZ encroachment (<10%, marked yellow) (Image: City of Melbourne).

On the basis of Technical Note 47, Mr Shears' evidence was that he did not expect the trees to survive the proposed works and Mr Patrick's evidence was that more analysis of species is required to understand the impact of grouting on trees in the Domain. Mr Shears gave evidence that pumping cement into the soil would not be a precise procedure, with the liquid spreading under ground and expected to have a broader impact than that illustrated in Technical Note 47 – this is extremely concerning given the consequences for the treed landscape.

Mr Patrick characterised the canopy cover as dense within the Domain, and accepted that if the trees fail due to the concrete injection, there will be two linear scars across Tom's Block. Reading the figure provided by Mr Shears (Figure 10), there are only one or two existing trees currently in the centre alignment between the two lines of grouting. On this basis, this work will leave a scar more than 35 metres wide along the length of the 340 metre grouting area. By scaling off Figure 10, the scar will be more than 50 metres wide for approximately half the length of the grouting, increasing up to 75 metres wide in some locations as large trees adjacent to the works are subjected to major encroachment into their tree protection zones.

A 35- to 75- metre gap in the dense canopy cover of the Domain that extends over 340 metres is an unacceptable impact on the landscape and, in the National Trust's submission, is an impact so catastrophic that it cannot be adequately mitigated to ensure the broad character of the Domain is restablished.

We have formed this view on the basis that the top metre of soil will be disturbed every two metres by the injection of grouting, and furthermore, there is a very high risk of soil compaction at the surface and damage to adjacent trees. Peer-reviewed research discussing soil depth, in the context of its relationship to the risk of windthrow in Appendix 1.

In addition to tree removal, it is even more alarming to consider that soil grouting is irreversible and risks making this area unable to be reinstated to its current condition due to the presence of a 35 metre wide strip of twin concrete barriers pumped into the soil. The National Trust submits, in line with Mr Shears' evidence, that the gaseous exchange and hydrology of Tom's Block can not be maintained if grouting proceeds, and that this would likely kill both trees within the grouting alignment, and trees downslope, including on St Kilda Road.

We submit that one metre of soil is unlikely to be sufficient to re-establish the broad landscape character in Tom's Block, as the cement under the soil will prevent free drainage. Many of the trees in the Domain are showing good health and vigour on a free-draining slope with a somewhat sandy soil profile, including: *Corymbia ficifolia (11)*, *Angophora floribunda (1)*, *Pinus canariensis (2), Ficus*

macrophylla (1), Cupressus torulosa (1), Pinus halpensis (1), Pinus pinea (1), Araucaria cunninghamii (1), Pinus radiata (1), Grevillea hilleana (1), and Myrsine howittiana (1). These species prefer well-drained soils, and we submit that many could not be restablished to achieve a similar character if the grouting proceeded. The impact to the Domain would be a permanent one. These species have historical significance as they reflect the cumulative depth of the pedigree of curatorship of the Domain and the evolution of landscaping in Victoria since 1857.

Corymbia ficifolia was specifically identified by Mr Patrick as not tolerant of the works, and this species represents approximately 20% of the trees to be impacted by soil grouting. We submit that if grouting works proceed, *Corymbia ficifolia* and many other specieswill be lost from Tom's Block with no capacity for re-establishing the same level of canopy cover.

Mr Patrick also gave evidence supporting the lifting and replanting of palm trees, and the National Trust supports this view, although we would expect that they also be replaced as a ratio of 2:1 as in the experience of the National Trust's expert Significant Tree Committee, there is a success rate of approximately 50% where palms are reinstated after public works projects.

This is not a temporary impact. The effect of these works in removing the entire tree canopy will be seen and felt in this area for generations. We submit, in line with Mr Shears' evidence, that Tom's Block is a very valuable landscape, and it is important to leave this part of our state's heritage for future generations to enjoy.

The National Trust strongly advocates for the lower alignment under the CityLink tunnels, as the upper alignment poses an unacceptable risk to the state significant Domain Parklands.

1.1.3 Emergency Access Shaft and Construction Secondary Access

The National Trust is supportive of the decision of MMRA articulated in Technical Note 55 which confirms that a permanent Emergency Access Shaft (EAS) will no longer be required at Tom's Block/Queen Victoria Gardens, nor at Fawkner Park.

Technical Note 55 states that temporary secondary access to the shaft may be required in the vicinity of Tom's Block during construction, and the National Trust's strong preference is that any temporary or permanent access shaft required in the vicinity of Tom's Block be inserted into the Linlithgow Avenue intersection's left hand slip lane adjacent to the historic grotto, by closing the slip lane to traffic. Mr Shears' evidence was that City of Melbourne have already assessed this as a feasible option, and we submit this is a far preferable location for insertion of new built fabric and

the associated hardstand areas for access, rather than paving over the soft landscaping of Tom's Block.

Prior to the publication of Technical Note 55, Mr Lovell's evidence was that the emergency access shafts would be of a similar visual impact as the Water Recycling Facility in Yarra Park. On this basis, the National Trust considered such an insertion to Tom's Block would fail to meet the requirement for the EPR to re-establish the broad landscape character of the area of the Domain.

1.2 Fawkner Park

The National Trust understands that Fawkner Park is no longer to be a launch point for the tunnel boring machine, and that the emergency access shaft in this location has been eliminated. Were the use of that site required, it is understood that there will not be any impact on the 19th Century palm plantings along Toorak Road. The avenue of Moreton Bay Fig trees immediately adjacent to the Fawkner Park Kindergarten is of local heritage significance and should be retained and protected during works.

1.3 South Yarra Siding Reserve

Mature MLTV trees should be avoided in like with the relevant EPR, and those that cannot be avoided should be replaced as advanced trees as part of the project to ensure no net loss of green infrastructure. Some thought should be given to the railway history of the Reserve in redesigning the landscape following construction.

2 PRECINCT 2—WESTERN PORTAL (SOUTH KENSINGTON)

We note that while the proposed Western Portal would have adverse heritage impacts on the Kensington Precinct (H09), including the demolition for four graded Edwardian residences (1, 3 and 5–7 Childers Street and 133 Ormond Street), the alternative design option would avoid the demolition of graded places within the HO. The National Trust therefore supports the alternative design option, which is consistent with the EPR to avoid or minimise impacts on post-settlement cultural heritage values. We note that this is also the preferred option of the City of Melbourne (CoM EES Submission p.41) We concur with the City of Melbourne's assessment that these graded residences "form an important edge to the Kensington Heritage Overlay Precinct" and contribute to neighbourhood character. Their retention is therefore preferred.

3 PRECINCT 3—ARDEN STATION

We note the impact on the proposed Railways Reserve Precinct, 173–199 Laurens Street, which includes the former Victorian Railways Carpenters Shop (later Victorian Railways Printing Works). The National Trust understands that this heritage building has undergone sensitive adaptive reuse and now has a dual use as a carpentry workshop and event venue, making a positive contribution to this important urban renewal precinct. This building should therefore be retained if possible, or if removal is required, the opportunity to dismantle and re-erect the building on the site should be explored as this building, being industrial in nature with an open plan layout, provides high potential for adaptive reuse or salvage of materials for use in the new station precinct.

Mr Briggs' evidence was that the complex of railway sheds has historic and aesthetic value that warrant conservation. While we note that Lovell Chen recommends interpretation and archival recording prior to the demolition of these buildings (Lovell Chen Melbourne Metro Rail Project Historical Impact Assessment, 20 April 2016 p155), it is the view of the National Trust that these measures would not adequately compensate for the loss of this complex, and this view is shared by Mr Briggs' in his evidence.

4 PRECINCT 4—PARKVILLE STATION

4.1 Royal Parade – H2198, HO1093

The National Trust is supportive of the proposed Grattan Street station location, as it avoids impact on some of the Victorian Heritage Register-listed avenue of trees on Royal Parade. The National Trust accepts that the useful life expectancy of the elms is limited and that block replacement may be the most appropriate option. However, it is very important that any works for 'road functional layout' on Royal Parade do not affect, reduce or limit the soil available to reinstate advanced specimens in the same location. The technical report makes reference to widened central medians, which will facilitate replacement of elms currently missing from the Royal Parade Avenue, and this is supported. We submit that the elms must be reinstated in a way that comprehensively retains the existing regular spacing of trees that form the Avenue, and acknowledge that this replacement will be subject to a permit assessment under the *Heritage Act 1995* which affords Heritage Victoria the opportunity to impose permit conditions that address finer design details at such time.

4.2 Vice Chancellor's House, 156-292 Grattan Street, HO821, H1003
Gatekeeper's Cottage, 156-292 Grattan Street, HO338, H919
Main Entrance Gates (Gate 6), Pillars & Fence, 156- 292 Grattan Street, H918, HO343 and associated plantings

The National Trust appreciates that buildings and built fabric (gates & fences) will not be impacted. The National Trust is concerned that 38 (and possibly 16 additional) MLTV trees are proposed to be lost from the south and east sides of the Medical Building. Plantings around the house, cottage and the Grattan St gates are also proposed to be removed, and should be avoided wherever possible during the detailed design. We support the 10 metre buffer around the Gatekeeper's Cottage, and there is potential to retain a large Elm in front of the house in this location if the TPZ can be adequately protected.

The trees on the University of Melbourne property are an interesting and diverse mix of street trees, including Coast Redwoods and other species which are not commonly used as a street tree in the City of Melbourne, and so consideration must be made to allowing for very large trees to be reinstated into the landscape plan following the construction of the station box.

If Coast Redwoods can continue to be grown in the microclimate around the Medical Building, the National Trust encourages their replacement, as they are rarely seen as a mature street tree in the City of Melbourne. We acknowledge that this will be at the discretion of the University of Melbourne.

Figure 11. View from University Square facing west down Grattan Street at the Medical Building.

Figure 12. Coast Redwood (Sequoia sempervirens) outside the Medical Building

5 PRECINCT 5—CBD NORTH STATION

The Trust notes that there may be a visual impact associated with new above ground structures in proximity to the City Baths, which should be mitigated through sensitive detailed design. The Trust also shares the City of Melbourne's concerns about the potential impacts from the proposed excavation and tunnelling works on the structural integrity of the City Baths. We support the City of Melbourne's call for preventative remedial action to address the structural integrity of the place which should be developed in advance of the main construction program to ensure the protection of the assets.

5.1 Trees around CBD North Station – Swanston Street, Franklin Street, A'Beckett Street & vicinity

Loss of mature healthy trees in this area has been limited by the station box being mined, and the National Trust is pleased to see the plane trees along Swanston Street with high landscape value are largely being retained. Trees in this vicinity should be avoided wherever possible, given the minimal amount of natural heritage in this part of the city. The dearth of natural heritage in this corner of the city means it is particularly important that trees lost due to construction for the CBD North works should be replaced in situ or nearby as advanced trees as part of the project to ensure no net loss of green infrastructure. There are five mature Spotted Gums (CN 058, CN059, CN060, CN077 and CN076) slated for removal from the corner of Franklin Street and Victoria Street which are located at the edge of the construction area – we strongly encourage detailed design to retain these trees as they provide an attractive contribution to the streetscape and have high amenity value both for pedestrians (including thousands of RMIT students) and for drivers travelling west along Victoria Street.

6 PRECINCT 6—CBD SOUTH STATION

As noted in the Lovell Chen report, the CBD South precinct is the most sensitive in heritage terms, comprising a high concentration of registered heritage places. The Trust's key concerns are outlined below:

6.1 Flinders Street Station

We note that the proposed works to Flinders Street Station include the demolition of two shopfronts, internal wall structure and interiors of retail premises to Flinders Street (currently occupied by Scissors and Cignall); demolition of floors and ceilings to these spaces and floors and internal walls to level one above the escalator to access the concourse. This work should be undertaken in accordance with the Flinders Street Station Conservation Management Plan (Lovell Chen, 2012), and impacts on heritage fabric should be minimised through sensitive design.

6.2 Federation Square

The EES identifies two locations for station entrances in Federation Square; one utilising the "western shard" in which the Melbourne Visitor Centre is currently located, and one between the "western shard" and the entry to the "eastern shard". Although not currently a registered heritage place, perhaps due to its relatively recent construction, Federation Square clearly demonstrates heritage significance for aesthetic, social and historic reasons; when imagining Melbourne 100 years from now, it is easy to imaging Federation Square as one of the city's iconic heritage places.

As such, a heritage assessment should be undertaken as soon as practicable to guide work at this location, ensuring that insertions do not adversely impact the aesthetic and architectural significance of the place. Project Architects Lab Architecture and Bates Smart should be consulted during the development of detailed design to ensure that new work is integrated into the overall design.

We share the following concerns outlined by the City of Melbourne with regard to the impact on Federation Square and views to and from St Paul's Cathedral:

The City of Melbourne is concerned the construction of any new structures within the existing open space within Federation Square. This outcome would likely interrupt the significant views of St Paul's Cathedral from St Paul's Court and elsewhere in the square. The view of St Paul's is currently successfully framed by the eastern and western shards. The public space between these two shards is a popular gathering space that would be lost if the proposed entrance were to be constructed in this location. (Environmental Effects Statement City of Melbourne Submission, p75)

We note that the remains of Princes Bridge Station are located underneath Federation Square and run parallel to and abut with Flinders Street. The most easterly portion of the platform can be seen from the back of Federation Square. These remains are included in the HV extent of registration for Flinders Street Station (VHR H1083 and HO649). Any impacts on these remains should be assessed as part of the design process.

6.3 City Square

The Elm tree on the corner of Swanston and Collins streets (CS026) has local significance for the contribution that it makes to the landscape, and is also significant as an unusual horticultural specimen, having been transplanted as a mature specimen to its current location during the redevelopment of City Square. If this tree cannot be retained in situ during construction, the redesign of City Square should include a landmark tree near this street corner that provides a similar contribution to the streetscape as the established elm. Given pest control issues with elm trees, another deciduous species with a similar form could be more appropriate. We understand that arborists are providing advice regarding the most appropriate species choices over station boxes, and the National Trust Significant Tree Committee would welcome being consulted with regard to this particular location given the significance of this specimen.

We note that the Burke and Wills Statue may need to be relocated and stored during construction, or permanently relocated due to the new configuration of pedestrian access to the CBD South station. Rather than put the monument in storage for the duration of construction, the National

Trust and the Royal Society of Victoria are united in their recommendation that the Burke and Wills monument should be relocated to the grounds of the Royal Society of Victoria (RSV) on Victoria Street. The RSV were the sponsors of the ill-fated expedition. Later, when Burke and Wills were laid out for mourning in the hall of the RSV, 86,000 Melbournians were reported to have filed past to pay their respects. The RSV is a logical and respectful location for the monument to Burke and Wills. The dismantling, storage and reinstatement/relocation of the Burke and Wills State should be supervised by a suitably qualified conservator.

Other public artworks which may be impacted by works, including Larry La Trobe and the John Mockridge Water Fountain should be placed in storage and reinstated following the completion of works.

6.4 Flinders Gate Precinct

We note the proposed demolition of a number of graded buildings in the Flinders Gate precinct. The Trust's key concerns with regard to individual places are outlined below. However it is important to recognise that the proposed works as a whole, including demolition, buildings, structure and landscaping, also have the potential to impact on the values of the precinct as a whole. This must be addressed through sensitive detailed design which is sympathetic with the precinct's heritage values.

6.4.1 65 Swanston Street, HO505

The National Trust opposes the demolition of this building as an unacceptable detrimental impact to the precinct. If pedestrian access is required, the façade should be retained above street level and no rear addition should rise above the parapet.

6.4.2 Graham Hotel, 67-73 Swanston Street, HO505

Post-war hotel and shopfront, façade has been substantially altered with the metal and tile cladding all removed in 1982. The hotel opened in 1956 in time for the Olympic Games. The side of the building still bears a stylised sign reading 'The Graham' in mid-century typography, which could make an interesting addition if retained and reinstated on a new building.

6.4.3 222 Flinders Street, HO505

We note Lovell Chen's assessment that this building "is considered to be of a higher level of significance than the C-grading would suggest." We agree that the building should be retained in full to the extent of all original external fabric, with the carriageway utilised to provide pedestrian access from the station through to Flinders Street. Conservation works should also be undertaken to provide a positive heritage outcome.

6.4.4 Port Phillip Arcade, HO505

Representative of its era, the Port Phillip Arcade is included in an example in Guide to 1965 Architecture. We understand that the best (and only) option to achieve direct pedestrian access to Flinders Street Station from the City South portal would require the demolition of the arcade, and that priority has been given to preserving older heritage places in the immediate vicinity. The National Trust submits that Port Phillip Arcade building should be recorded and the Charles Bush sculpture should be conserved and incorporated into the new design.

7 PRECINCT 7—DOMAIN STATION

7.1 Domain Parklands H2304, HO398 – Shrine Reserve

A total of 223 trees will require removal in this area, with more than half (134) being healthy mature trees. In close proximity to the Shrine, the Domain in this area includes many dedicated trees, both mature examples and juvenile specimens planted as part of the recent landscaping works at the Shrine. Many of these trees commemorate specific sections of the armed forces. These trees form part of the Shrine of Remembrance and should be given due respect with every effort made to retain them as part of the detailed design. Some groups associated with the armed forces may consider that the dedicated trees should be moved elsewhere, and we submit this may be one of the few locations where the cost may be justified if the trees have social significance to the community. If some specimens cannot be retained, then their species and significance should be adequately recorded to replace the plantings and plaques as soon as possible, either *in situ* or in a new location nearby agreed by relevant stakeholders.

7.2 St Kilda Road H2359

It is noted that in St Kilda Road, the predicted useful life expectancy of the avenue plantings is short in some cases but approximately half are MLTV trees. The National Trust supports the evidence presented that block replacement is the best horticultural method for replacing avenues, however notes that there are also other factors to consider in an urban environment, including amenity and shade. The community's appreciation of the heritage significance of the avenue, and the amenity that the heritage asset provides, should be considered as part of succession planning. The National Trust observes that the St Kilda Road reserve is approximately 50 metres in width in this location, and given the large road width available to work within, the National Trust would expect that any tree removal in this location would be demonstrated to be completely unavoidable.

Mr Patrick's evidence was that alternative excavation methods are to be applied in St Kilda Road, with the aim of protecting trees, and this is strongly supported although it is not yet clear to what extent this will avoid tree removals.

The St Kilda Road avenue as a major boulevard is subject to many constraints, and sufficient soil volume and irrigation must be provided to re-establish an avenue with equal or improved landscape characteristics, namely large trees with touching canopies planted at similar regular intervals to emulate the existing trees. We note that the inclusion of St Kilda Road on the Victorian Heritage Register means that tree removals in this area will be subject to assessment under the Heritage Act in the same way as Royal Parade.

7.2.1 Block replacement of elm avenues

For the Committee's interest, Camperdown provides an example of an elm avenue on the Victorian Heritage Register (H0647) which is currently undergoing block replacement of trees. It is clearly visible that the replacement trees closest to the heritage trees are showing less vigour – they have only grown to half the height of those that have not competed for resources with established trees.

Figure 13. Finlay Avenue of Elms, Camperdown. Replacement trees have been boxed red to show relative growth rates. The smallest tree was replaced twice.

Figure 14. Finlay Avenue of Elms in Camperdown. Block replacement of only 3-6 trees per block maintains the amenity and heritage significance of the Avenue which still achieving a gradual succession plan.

7.2.2 Compensation for tree removal

The National Trust does not hold the view that a 2:1 replacement ratio is sufficient in the eyes of the Victorian community – we submit that the value of a mature tree (particularly one with heritage value) is not equal to the value of two advanced juvenile specimens. For this reason, the National Trust is supportive of requirements that the community receive funds (through local government) to ameliorate the loss of ecosystem services and amenity when a large tree is removed from an urban space. The value of the services provided by one tree can be a six-figure sum, and so to mitigate the loss of those services is a costly exercise in which the community (through local government) should be supported.

8 PRECINCT 9—WESTERN TURNBACK

The Trust concurs with the recommendation in the Lovell Chen report to retain and protect the Cross Street Electrical Substation (H0192) as part of the construction of the Western Turnback.

9 ENVIRONMENTAL PERFORMANCE REQUIREMENTS

The National Trust is broadly very supportive of the EPRs described in IAC Revision – Version 2, and suggests a small number of changes in Table 1.

Table 1. Comments from the National Trust regarding the Environmental Performance Requirements for arboriculture, cultural heritage and landscape/visual impact.

EPR Number	Comment	Request
Arboriculture		
AR1	During the detailed design, consideration should be made regarding the value of trees. Not all trees are equal in value; it is reasonable to protect a healthy mature tree at the detriment of a larger quantum of small or juvenile MLTV trees which are more easily replaced (in the evidence of Mr Patrick), particularly if the tree has a level of significance. The detailed design should prioritise retention of large MLTV trees, significant trees (such as unusual plantings and historic specimens). Support other changes in IAC Revision – Version 2.	EPR be amended to read: During detailed design, review potential tree impacts and provide for the maximum tree retention on both public and private land, also having regard, where practicable, to: • heritage value of the tree, • size, age and health of the tree, • significance of the tree, and, • valuable habitat linkages or corridors.
AR2	Support (IAC Revision – Version 2)	
AR3	Strongly support (IAC Revision – Version 2)	
AR4	Strongly support (IAC Revision – Version 2)	
AR5	Support the evidence of Mr Shears. Trees provide significant ecosystem and amenity services in situ, and the lag for restoration of those services could be upwards of 50 years for some established specimens. The community of the City of Melbourne, Stonnington and Port Phillip will require payment to ameliorate the loss of these ecosystem services and amenity value.	EPR be amended to add: For CoM, CoPP and CoS trees that are removed, payment shall be made for the Amenity Value and Ecological Services Value in accordance with the CoM Tree Retention and Removal Policy.

EPR Number	Comment	Request
Landscape and Visual		
LV1	This EPR should reflect the distinction in sensitivity between places that are included on the Victorian Heritage Register for their landscape and aesthetic value, and other places which may be of local heritage significance, or of no heritage significance. Support other changes in IAC Revision – Version 2.	EPR be amended to add: For places listed on the Victorian Heritage Register for aesthetic or landscape reasons, the design shall avoid AND minimise visual impacts on the place where possible. The location and design shall be undertaken to avoid temporary and permanent loss of parkland.
LV2	Strongly support (IAC Revision – Version 2)	
CULTURAL HERITAGE		
CH1	It is the National Trust's submission that the works to Flinders Street Station should be undertaken in accordance with the *Flinders Street Station Conservation Management Plan (CMP), Lovell Chen 2010*. This EPR should include a reference to any relevant Conservation Management Plan for heritage places to be affected.	EPR be amended to read: Design permanent and temporary works to avoid <u>AND</u> minimise impacts on the cultural heritage values of heritage places. EPR be amended to add: For heritage places on the Victorian Heritage Register, design permanent and temporary works having regard to any relevant Conservation Management Plan for the place.
CH2 to CH17 inclusive	Support (IAC Revision – Version 2)	

EPR Number	Comment	Request
CH18	This EPR currently requires the eastern Domain station entry to be as *recessive as possible* – given this is an insertion into the Shrine of Remembrance Reserve, we would submit that it is reasonable that the station entry is required to be simply *recessive*. Further the EPR requires that design needs to allow for the maintenance of an appropriate setting to the Macpherson Robertson Memorial Fountain. The National Trust also has some minor concerns about the subjective usage of 'appropriate' in this EPR.	EPR be amended to read: To the satisfaction of Heritage Victoria, review the siting and design of the eastern Domain station entry in detailed design to ensure it is ~~as~~ recessive ~~as possible~~ in this location and has only a limited presence on the edge of the Reserve.
CH19 to CH22 inclusive	Support (IAC Revision – Version 2)	
CH A*	Strongly support (IAC Revision – Version 2)	

10 CONCLUSION

The National Trust's primary concern regarding this project is the impact to natural heritage due to widespread losses of healthy mature trees from some of Melbourne's most historically significant parklands and boulevards. The EES documents include alternative options which allow for the retention of dozens of mature, healthy trees, and the National Trust encourages that these options be pursued strongly. For the King's Domain and Shrine reserve, areas considered sacrosanct by Victorians, alternative options must be engaged to avoid irreversible impacts, particularly on the landscape in Tom's Block which should be entirely avoided by opting for the lower alignment under CityLink. Elsewhere, trees lost due to construction for the MMRP works should be replaced as advanced trees as part of the project to ensure no net loss of green infrastructure. As outlined in our submission, impacts on built heritage places generally relate to vibrations, demolition, and construction. These impacts should be mitigated through sensitive design, and the retention or relocation of historic fabric where practicable.

Anna Foley
Senior Manager, Advocacy and Conservation (Acting)
National Trust of Australia (Victoria)

11 APPENDIX 1

Extract from

Moore G M (2014) *Windthrown Tree: Storms or Management?* Journal of Arboriculture and Urban Forestry. **40** (1), 53- 69.

The depth to which descending roots can grow varies depending on species, and soil conditions (Stone and Kalisz 1991; Stokes and Mattheck 1996; Tobin et al 2007). Jacobs (1955) describes eucalypt descending roots growing to depths of 900-1000mm, Kozlowski (1971) described *Camellia thea* having most of its feeding roots in the top 900mm, but deep roots that ramified through a larger volume of soil. Jarrah, *Eucalyptus marginata*, roots penetrate through a layer of bauxite often 5-8m thick, but in some instances up 15m deep (Stone and Kalisz 1991) and then develop a spreading lateral root system below the bauxite.

Eucalypt roots have been observed a depths of 45-60m (Stone and Kalisz 1991) coming through the ceilings of caves, especially in limestone based soils. In *Banksia prionotes* the typical pattern of root development consists of a persistent and dominant sinker root which penetrates 2-3m into the sandy soil to extract water, a series of lateral roots which are usually in the top 700mm of the soil and the fine roots are dimorphic in both anatomy and function with proteoid roots absorbing nutrients while other fine roots absorb water (Jeschke and Pate 1995). In more typical natural soil profiles descending roots penetrate to depths typically of 1.5 - 3m (Stone and Kalisz 1991).

Trees can be windthrown in very strong winds (Table 2), especially when heavy rain has saturated soils reducing soil strength (Harris 1992; Smiley et al 1998). Waterlogged soil may result in the windthrow of a tree, in which the windward root system is exposed more-or less intact (Table 3) with descending roots in place as they slip from the weakened soil (Crook and Ennos 1996). Such a situation may see a tree windthrown even without heavy rain because the soil in the vicinity of the base of the tree has lost strength due to excess water pooling due to poor drainage or altered subterranean water flows. The combination of heavy rain that saturates soil (reducing the strength of the connection between soil and tree roots) that is followed by strong winds may see trees fail in both urban and forestry situations (Coder 2010). However, even then the windthrown tree is usually the exception rather than the rule.

In the urban context, both tap and descending root development can be restricted by plant propagation techniques that horizontally cut roots when seedlings are removed from germination trays or pricked out and potted on (Moore 1985; Nielsen 2009). As they mature such trees may never develop a tap root and the number of descending roots that the trees develop may be lower than found in forest trees of the same species (Nielsen 2009). Urban landscape management practices which damage lateral roots particularly on the windward side of the tree could leave a tree vulnerable to windthrow, especially if the roots are damaged or severed close to the trunk, which could affect the number of descending roots on the windward side of the tree (Coutts, 1982; 1986; Stokes and Mattheck 1996).

Urban construction activities that compact or deposit fill around the base of trees can alter soil aeration, organic matter content, nutrient availability and water penetration, all of which can have a profound negative affect on tree root systems (Day 1999). Other construction practices that compact the lower soil horizons can make descending root penetration difficult and diminish both the extent and mass of the root plate. Furthermore management practices

that alter soil water flows creating waterlogged conditions can restrict root development to depths of 200mm or less (Coutts 1982; 1986, Nielsen 2009). The loss of soil strength from greatly increased soil moisture levels further increases the risks of windthrow.

Tree protection on development and construction sites often has the protection of the structural root zone (SRZ) as an aim, but the more extensive root protection zone (RPZ) protects not only the structural roots, but the lateral and descending roots further from the trunk (Matheny and Clark 1998: Anon 2009). However, while these are admirable attempts at protection they do not guarantee that the root system and root plate will remain intact or the stability of the tree. Furthermore, standard protection systems cannot deal with the nuances of every tree and the root systems that develop in response to particular environments. Many attempts have been made to generalise classification systems describing root system architecture, but the affects of soil type, soil conditions and the levels of environmental stress on the development of tree root systems means that generalisations rarely apply to trees growing in stressful urban sites (Stone and Kalisz 1991; Tobin et al 2007; Nielsen 2009).