

Sarah Dunn,
A/Principal Council Officer
Upper House Committees, Parliament of New South Wales

Re: Responses to Parliamentary Inquiry about CESLR, 20th August, 2018

Thank you for the opportunity to respond to Mr David Shoebridge's request for further details about the number of trees lost simply for convenience.

Highlighted Item 1

Mr DAVID SHOEBRIDGE: ... *Do any of you know how many trees were lost simply for convenience, as opposed to being for the long-term needs of the light rail corridor?*

Ms HOGG: As far as I understand, in Maiden's Row, there were an extra 58 to 60 trees just in that one section. It is still mounting. As this project rolls on, there seem to be more and more amendments made and more trees seem to be going with them. That was seen in the Government Information (Public Access) Act request release, where we started to see modification after modification. Each modification rolls out with more trees going. We have not been able to get those figures because we were unable to access all of the documentation until Friday afternoon. So we have not had a chance to have an audit on what has been lost.

Mr DAVID SHOEBRIDGE: Just on Maiden's Row, we know we lost 58 for that purpose?

Ms HOGG: Just for that particular one.

Mr DAVID SHOEBRIDGE: *If you get some further detail once you go through those documents—*

Ms HOGG: We will definitely pass it on to you. It is going to take a while.

Mr DAVID SHOEBRIDGE: It is a bit of a coincidence that you got them on the Friday before the hearing.

Ms HOGG: I thought so.

Mr DAVID SHOEBRIDGE: *Could you provide some further detail on notice if you have some?*

Response by SST

First, we will explain how we determined the canopy loss in hectares. We used a combination of Google Satellite images, annotated plans by ASPECT, and plans and charts by the designated arborist, Urban Tree Management. The published document "ARBORICULTURAL IMPACT ASSESSMENT – STAGE 1" Revision 4 dated 23 October 2015, had an extensive appendix that listed 1506 trees, 229 of which were marked as "Not Present", leaving 1277 actual trees. The document was a PDF and John Judge of Saving Sydneys Trees used software to extract a soft copy of the table and converted it into a CSV file. Each tree had a spread in metres, using that field and assuming the canopy was a circle, a program was written to calculate the area of the canopy in hectares for the trees to be removed, retained, pruned and transplanted. The figures for each are listed below. 3.24 Ha for just the trees that were marked for removal from a total canopy of 9.89 Ha as of 2015. The AIA-Revision 10 July 2017 indicates 4.93ha canopy loss. This includes 123 trees removed as 3rd Party Agreements (*). The retained trees (792) include those for crown pruning.

Action	AIA 2015 Number of trees	Canopy Area (ha)	AIA Rev 10, 2017 Number of trees	Canopy loss
Remove	448	3.24ha	558 +123*=681	4.93ha
Retain	185 + (a + b) = 695	1.49ha (6.18ha)	792	
a) Retain, prune crown	a)386	2.05ha	-	
b) Retain, prune cr & roots	b) 124	2.64ha	-	
Transplant	134	0.47ha	154	
Total	1277	9.89ha	1625	

AIA – STAGE 1 indicated that pruning and crown lifting would involve 30-40% canopy loss. Thus, overall canopy loss to pruning (2.05+2.64ha) would be 35% of 4.69ha = 1.64ha. The final canopy loss predicted at 2015 assessment would be 3.24ha + 1.64ha = 4.73ha. Table 2 from AIA Rev 11, p28 summarises the totals through revisions 4 to 10.

Table 2: Summary of Tree Impacts – Stage 1

Category	Full Alignment	Stage 1* (Rev 4)	Revised tree impacts (Rev 5)	Revised tree impacts (Rev 6)	Revised tree impacts (Rev 6a)	Revised tree impacts (Rev 6b)	Revised tree impacts (Rev 7)	Revised tree impacts (Rev 8)	Revised tree impacts (Rev 9)	Revised tree impacts (Rev 10)	Revised tree impacts (Rev 11)
Trees Assessed	1532	1400	1400	1407	1408	1408	1419	1614	1622	1625	1656
Trees to be Retained	-	695	690	717	717	717	701	788	791	792	765
Trees to be Removed with potential to be Translocated	-	134	138	129	129	129	143	154	154	154	155
Trees to be Removed for construction	-	448	449	438	439	439	452	549	556	558	587
Trees to be Removed under a Third Party Agreement with City of Sydney		120	No change	No change	No change	No change	No change	No change	No change	No change	No change
Trees to be Removed under a Third Party Agreement with Australian Turf Club		3	No change	No change	No change	No change	No change	No change	No change	No change	No change

* The numbers in this column refer to this Report.

Note: refer to Appendix G for trees to be removed as required by Third Party Agreements.

Highlighted Item 1(cont'd)

Mr DAVID SHOEBRIDGE: how many trees were lost simply for convenience?

This is more difficult to assess but the 58 trees making up Maidens Row were for the convenience of the Racecourse and the 21 extra trees removed for the Anzac Pde road diversion for convenient fast-tracking. Thus 79 trees were clearly removed for convenience. Other trees have been reclassified from 'Retain with Canopy and Root Pruning' to 'Remove'. This may have been from convenience or because of design changes. Of the trees to be retained, 37 trees were changed from pruning canopy to remove and 18 trees were changed from transplant to remove; that is a further loss of 55 trees.

A simple assessment of trees lost for convenience would be 113; this does not include the trees lost due to negligence and lack of protection. ARBORICULTURAL IMPACT ASSESSMENT – STAGE 1 – REVISION 10, July 2017 released by GIPA on 17th August 2018 has a similar Appendix of listed trees; totalling 1625 of which 681 (558 plus 123 by 3rd Party) are to be removed and 792 are retained. The Report points out the discrepancy of tree numbers from 2015 to 2017 where first assessment was only a concept design; as a result, the impact on the trees has been revised due to design development and construction impact. For example: Page 14 of Revision 10 states '*the following aspects have resulted in the changes to the tree classifications:* ☐ Kerb/footpath alignment changes; ☐ water pipe and new pit installation on Alison Road; and ☐ public safety.'

The loss of trees due to the alterations of drainage along Alison Rd again relates to convenience for the Racecourse.

Other tree losses not accounted for, appear to relate to the long term needs of the light Rail corridor, for example

p16 Hay Street substation

The trees of various species within the site at corner Hay and Parker Street, Haymarket are concentrated in an approximately 6x10m space with some of good and some of fair condition and will require removal to construct the Hay Street substation.

P18 Along Devonshire Street from Elizabeth to Crown Streets, the following utilities need to be installed in the footpath;

This has resulted in the identification of further trees for removal.

P19 Wimbo Park and Olivia Gardens

All trees at Wimbo Park and Olivia Gardens will require removal to accommodate the works at this location.

P19 South Dowling Street

Trees along South Dowling Street in the vicinity of the bridge will require removal for works on the east side and pier and retaining wall construction on the west side. Trees impacted consist of 9 Lemon-scented Gum and a mix of exotic and Spotted Gums on the west side.

P20-21 proposed Kensington Substation site are a mixture of recent and older plantings with most at maturity. The most significant trees are the *Ficus macrophylla* (Moreton Bay Fig), *Quercus robur* (English Oak) in a linear stand and *Quercus ilex* (Holly Oak) as a mature specimen of substantial dimensions and good form. Further assessment will be required once the underground service requirements are confirmed. *Note further loss of trees is likely*

P21 Martin Road / Robertson Road

a medium sized Moreton Bay Fig is to be removed for infrastructure drainage works proceeding from Robertson Road at the intersection of Martin Road. Tree 438, a Hills Weeping Fig is in fair condition and is to be removed due to its proximity to construction works.

P21 22 Alison Road

The row of mature Brush Box and Oak trees along the embankment adjacent to the north of Alison Road and south of Centennial Park lands will require removal. The sixteen Brush Box located on the embankment adjacent to the Kensington Pond will require pruning as a result of additional requirements of the Dam Safety review. The revised design requires the levee bank to be stabilized using reno mattress along the embankment requiring root and crown pruning to enable placement of the mattress.

The row of adjacent young Queensland Kauri on northern side of Alison Road will now not be able to be retained. The two (2) mature figs (Hills Weeping Fig) on the corner of Alison Road and Darley Road will require some root and crown pruning in order to be retained. The four (4) mature London Plane trees on the opposite side of this intersection will require removal. Some mature Hills Weeping Figs on the south side of Alison Road along the Racecourse will require removal. The design for the stormwater drainage on the southern side of Alison Road has resulted in the removal of Tree 1208.

P22 Wansey Road

*A small number of mature trees on the western side of Wansey Road will require removal. Additional trees have been identified on Wansey Road as requiring removal as a result of new traffic lights being installed to enable access to the racecourse in this location. Line of sight to the traffic lights may result in the pruning of additional trees on Wansey Road. The detailed design for the stormwater alignment on Wansey Road has been assessed and an additional small/young tree (*Pistacia chinensis*) may require removal as a result due to the impact from the works.*

P 23 Anzac Parade Kensington/Kingsford Precinct

Road design to modify lane widths, enable line of sight to traffic lights, or adjust kerbs is progressing along Anzac Parade. Approximately 13 additional street trees will require pruning and five additional trees require removal.

P23 UNSW bus stop design at UNSW has been further progressed and an additional four street trees have been identified as requiring removal to enable the stop to be located here.

P23 The Nine Ways

This area has a mixture of contemporary and mature plantings. Most mature *Eucalyptus* sp. and Swamp Oaks planted at the south side of Anzac Parade, where the road is split, will require removal. Some older trees in the island between Wallace Street and Anzac Parade will require removal, with mature Canary Island Date Palms to be transplanted.

During tree removal and construction activities at the Nine Ways intersection, a tree (TN1667) has become unstable. The independent arborist has undertaken an assessment and determined that removal of the tree is required.

Highlighted Item 2

Mr DAVID SHOEBRIDGE: Could you take on notice what you think the likely cost in terms of economic cost, let alone the health and other costs, of the loss of all that mature canopy was and whether or not that was included in the business case.

We cite below the Melbourne study in 2009 about the economic cost of urban trees.

- What is the value of shade provided by trees that drop temperatures by up to 8C, reduce air conditioner use and reduce carbon emissions? Estimates put the savings on air conditioning alone at between 12-15% per annum.
- What is the value of reduced wind speeds of up to 10% due to the presence of trees under a climate change scenario when winds will be stronger?
- What is the value of removing pollutants from the air of Australian cities? The value returned to the City of Melbourne by its public trees alone would be more than \$14 million per annum.
- What is the value of trees in holding and absorbing water and reducing localized flooding during intense rainfall events under a changed climate?

G. M. Moore⁴ from Burnley College in Victoria asked these questions about financial compensation for the loss of urban trees, such as those lost and damaged by Sydney's Light Rail project. The following table provides an estimate.

Table1: Estimates of environmental economic values for 100,000 large mature urban trees growing in an Australian city (Moore,2009b)

Parameter	Value per tree	Quantity	Unit Price AUD\$	Value AUD\$
Carbon sequestered in trees	12.5 tonne	1.25million tonne	\$20 per tree	\$25 million
Street Tree value	\$ AUD200 per annum			\$20million per annum
Electricity Saving	30KWh	3 million kWh	\$0.17 per kWh	\$510,000 per annum
Carbon emissions saved	1.2Kg for each kWh	3,600 tonne \$20 per tree	\$72,000 per annum	\$72,000 per annum

Notes on estimations and calculations:

- the estimate of 12.5 tonne is for a large mature urban tree
- the price of AUD\$20 per tonne is based on the Australian carbon market price
- the electricity saving is based on reduced energy use due to shade from trees
- the price used for electricity is based on a rounded Victorian rate per kWh
- water valued at \$1.50 per kilolitre
- assumes tree canopy of 75m2 shading bitumen covering 30% of its canopy area⁵

4. Moore G M (2009a) People, Trees, Landscapes and Climate Change, in Sykes H (Ed) Climate Change for Young and Old, p 132-149. Future Leaders, Melbourne

5. Moore G M (2009b) *Urban Trees: Worth More Than They Cost* Lawry D, J Gardner and S Smith Editors, Proceedings of the Tenth National Street Tree Symposium, 7-14, University of Adelaide/Waite Arboretum, Adelaide

City of Melbourne: Urban Forest Tree Valuation

Basic Value (\$) in 2013

The basic monetary value of a tree is determined by matching the trunk diameter at breast height (DBH) with its corresponding base value:

DBH cm	Base Value	DBH cm	Base Value	DBH cm	Base Value
6	\$ 309.92	50	\$21,522.33	100	\$ 86,089.33
8	\$ 550.98	55	\$26,042.03	105	\$ 94,913.49
10	\$ 860.89	60	\$30,992.16	110	\$104,168.09
15	\$ 1,937.00	65	\$36,372.74	115	\$113,853.14
20	\$ 3,443.57	70	\$42,183.77	120	\$123,968.63
25	\$ 5,380.58	75	\$48,425.25	125	\$134,514.58
30	\$ 7,748.04	80	\$55,097.17	130	\$145,490.97
35	\$10,545.94	85	\$62,199.54	135	\$156,897.81
40	\$13,774.29	90	\$69,732.35	140	\$168,735.09
45	\$17,433.09	95	\$77,695.62	145	\$181,002.82

<https://www.melbourne.vic.gov.au/SiteCollectionDocuments/Tree-valuations.DOC>

Increased Health Problems

As stated in our Submission, analysis of the South East Light Rail project sees an initial 5-hectare loss of canopy which can only be rectified over 50 years of productive growth depending on species and survival rates.

This enormous negative impact upon the public purse was not accounted for in the Planning Process and Cost Benefit Analysis. The well-documented and linked Respiratory disorders, Asthma, Particulate cancers, Alzheimer's, Parkinson's, Obesity and Mental Illness issues cannot be dismissed from the Cost Benefit Analysis. The role of the trees and their canopy should be included in the costs of these illnesses.

Randwick and other areas of Sydney are fast approaching Environmental Protection Authority dangerous levels of heat and pollution. The planned population increases will

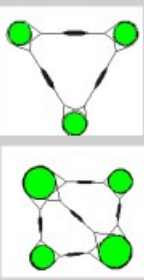
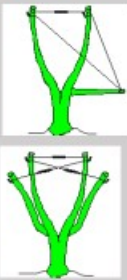
surely take these over the limit and render families, children and elderly not only vulnerable to health problems, but also to increased energy costs.

The cost of care for the trees damaged by the construction works also needs to be included. If the remaining trees are not to have the same fate as those on Cahill Expressway, they will need on-going remedial care. As our slide 9 submitted to the Inquiry shows.

Estimate for Remedial Tree works for CSELR Impact

Total \$10,920.00 per tree
800 trees = \$8,736,000.00 per year
10 year contract = \$80,736,000.00

1. Initial Ground & Aerial Inspection
2. Arboricultural Impact Assessment (AIA)
3. Root Mapping & Remediation
4. Bracing weakened branches by Cobra method
5. Selective pruning
6. Insect control
7. Fertilising & Weed Control
8. Electronic Monitored Irrigation



Best Practice Tree Management
cobra - dynamic tree support system specially designed to be strong, gentle, flexible and shock-absorbing resulting from scientific research.



Saving Sydney's Trees Response to the Inquiry into the CSELR 2018
TERMS OF REFERENCE B: APPROPRIATE FINANCIAL COMPENSATION

We trust that we have clarified the questions on notice.

yours sincerely,

Prof Helen Armstrong
Emeritus-Professor of Landscape Architecture, QUT

For Saving Sydney's Trees