

MELBOURNE METRO RAIL PROJECT ENVIRONMENT EFFECTS STATEMENT
INQUIRY AND ADVISORY COMMITTEE

MMRA TECHNICAL NOTE

TECHNICAL NOTE NUMBER: 065

DATE: 29 September 2016

PRECINCT: Tunnels Precinct

EES/MAP BOOK REFERENCE: EES Map Book Map 9 of 15 for Construction (Horizontal Alignment Plans), and Maps 10-12 of 15 (Vertical Alignment Plans)

SUBJECT: Response to the 'Matters for further consideration and/or clarification' request dated 12 September 2016

(i) Domain Parklands and St Kilda Road boulevard

NOTE:

1. This Technical Note has been prepared to respond to issues raised by the Inquiry and Advisory Committee ("IAC") in the 'Matters for further consideration and/or clarification' request dated 12 September 2016.
2. For ease of reference, this Technical Note sets out each relevant request made by the IAC followed by a response from MMRA.

Request:

3. The IAC has requested:

Further information about the relative benefits of the above-City Link option in light of evidence about preference for the under-City Link option.

Response:

4. The vertical alignment of both options are clearly depicted on Maps 10-12 of the Vertical Alignment Plans in the EES Map Book. The above-CityLink option rises from the Yarra River in order to pass above the Crown Allotment that is leased to the operator of CityLink, CityLink Melbourne

Limited (an entity in the Transurban group of companies). After clearing the CityLink Crown Allotment, the alignment falls towards Domain Station. The under-CityLink option falls from the Yarra River towards the CityLink crossing, passing beneath the existing CityLink tunnels and through the existing CityLink Crown Allotment. Both options come to the same alignment and depth before reaching Domain station.

5. An advantage of the above-CityLink option is that it does not require any intrusion into the CityLink Crown Allotment. However, the above-CityLink option also has a number of construction risks/issues, mainly due to the shallow cover tunnelling operations, and the close proximity to the structural lining of the CityLink tunnels (further details are provided in **Attachment A**).
6. Ground stabilisation works in Tom's Block near Linlithgow Avenue in the Domain Parklands would be required if the rail tunnels cross over the City Link tunnels. The nature of these works was described in some detail in Technical Note 047.
7. The ground stabilisation works would have a significant impact on trees (up to 60 trees) in Tom's Block, which has been raised as a major concern in EES submissions and by parties in their submissions and evidence to the IAC. Details of the impacts are set out in Chapter 7, and in particular Section 7.5, of the Arboriculture Impact Assessment in Technical Appendix R of the EES. The impacts were also discussed in the expert evidence of Mr Patrick.
8. MMRA has consulted with bidders and relevant stakeholders who have indicated that an under-CityLink alignment is the preferred option based on consideration of a number of factors. MMRA therefore proposes that the rail tunnels should pass under-CityLink and through the existing Crown Allotment. It is appropriate for the EPRs and Incorporated Document to reflect this recommendation.
9. It should however be noted that part of Tom's Block may still be required for a potential temporary secondary access to the Tunnel Boring Machines ("TBM"). It is therefore proposed to retain this location only for a potential shaft to access the TBM if required by the PPP Contractor for temporary purposes during construction. Even if the Contractor requires a temporary access to the TBM tunnels, the impact footprint will be much smaller than the assessed impact of ground stabilisation works for the above-CityLink option, and there should be scope to avoid the need to remove mature trees from Tom's Block.

Request:

10. The IAC has requested:

The IAC seeks to understand how it is proposed to re-instate tree cover including to re-instate the characteristic boulevard appearance of St Kilda Road created by four rows of trees in the vicinity.

Response:

11. In the Domain station precinct, as with all precincts, strategic planning for the timing of removal and replanting of trees to minimise visual impact is a key consideration, especially along St Kilda Road boulevard.
12. Where trees are to be removed, they will be replaced with super-advanced trees (which are approximately 3 metres in height) in accordance with the heritage values of the place and to ensure consistency with the species used in the four rows along the boulevard.
13. The City of Melbourne has already commissioned replacement trees for St Kilda Road in anticipation of trees reaching the end of their Useful Life Expectancy during the life of the project, and these trees will be made available to replace trees along St Kilda Road that are removed to enable the construction of the Melbourne Metro.
14. Trees will be replaced as soon as practicable after works have been completed, noting that seasonal conditions influence the planting time to maximise successful establishment of the trees.
15. Trees will be replaced in better growing conditions through the use of high quality tree plots utilising water sensitive urban design and quality soils. The replacement trees are expected to put on one metre of growth per year in the first five years and, as such, trees along the boulevard are expected to reach a height of around eight metres within five years of their replacement.
16. Replacement trees will be established in block plantings in both the Cities of Melbourne and Port Phillip, thus further enhancing the visual amenity of St Kilda Road.
17. Tree location and the boulevard arrangement for St Kilda Road will be determined during detailed design stage. As St Kilda Road is now on the Victorian Heritage Register, plans for reinstatement of the boulevard formation will need to comply with heritage approval requirements. Plans would also be developed in consultation with local council, VicRoads, Yarra Trams and PTV.

CORRESPONDENCE:

No correspondence

ATTACHMENTS:

- A. Comparison of Melbourne Metro tunnels passing above or under CityLink

ATTACHMENT A.

ABOVE/UNDER CITYLINK COMPARISON

Aspect	Above CityLink Option	Under CityLink Option
Impact to CityLink Crown Allotment	Passes above CityLink Crown Allotment	Passes through CityLink Crown Allotment. Amendment to Crown Allotment required (minimal area required)
Impact to structural lining of CityLink tunnel (overall stability)	Not a differentiator	Not a differentiator
Impact to CityLink tunnel fixtures	Not a differentiator	Not a differentiator
Vibration impact during construction of Melbourne Metro	The operation of the TBM within 1 metre of the top of the CityLink is predicted to result in vibration levels approaching or exceeding the DIN 4150 continuous vibration criterion of 10 mm/s PPV. It does not necessarily follow that the CityLink tunnel would be subject to damage, as DIN 4150 is considered to be a conservative standard.	Vibration levels due to the TBM operating within 3 m of the bottom of the CityLink are predicted to be below the DIN 4150 continuous vibration criterion of 10 mm/s PPV. The risk of damage to the CityLink tunnel for construction of the variation design is therefore low.
Vibration impact during operation of Melbourne Metro	Not a differentiator	Not a differentiator
Hydrogeological impacts	Tunnel alignment does not cut part of the Holocene Aquifer.	Cutting off part of the Holocene Aquifer may lead to partial constriction of the aquifer. The expected effect is minimal with no adverse effects on the aquifer flows
Melbourne Metro operational characteristics	Not a differentiator	Not a differentiator
Surface impacts / land use impact	Ground improvement works in Tom's Block near Linlithgow Avenue in the Domain Parklands will be required if the rail tunnels cross over the CityLink tunnels. These works will have an impact on up to 60 trees in Tom's Block Increased surface settlement.	No grouting required
Constructability considerations	High risk constructability issues/risks include: <ul style="list-style-type: none"> • Shallow cover TBM tunnelling • Cross-passage construction in poor ground conditions with shallow cover • Minimal clearance between CityLink canopy tubes and Melbourne Metro tunnels (approx. 250 mm) • Uncertainty regarding installation tolerances of canopy tubes (as-built tolerance) may lead to potential clash with TBM 	Under CityLink option eliminates the constructability issues/risks identified for the Above CityLink option.