

*Environment Effects Act 1978*

*Planning and Environment Act 1987*

**Inquiry and Advisory Committee Report**

# Melbourne Metro Rail Project

**21 November 2016**

*Environment Effects Act 1978*

Inquiry pursuant to section 9 of the Act

*Planning and Environment Act 1987*

Advisory Committee pursuant to section 151 of the Act

Melbourne Metro Rail Project

21 November 2016



Kathy Mitchell, Chair



Geoff Underwood, Deputy Chair



Craig Barker, Member



Jenny Donovan, Member



Mandy Elliott, Member



Elizabeth Hui, Member



Helen Lardner, Member



Kate Partenio, Member

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## List of Abbreviations

AEP	Annual Exceedance Probability
ASHRAE	American Society of Heating Refrigerating and Air-conditioning Engineers
BCR	Benefit to Cost Ratio
BSGC	Business Support Guidelines for Construction
CBD	Central Business District
CEMP	Construction Environmental Management Plan
CHMP	Cultural Heritage Management Plan
CMP	Conservation Management Plan
CNVMP	Construction Noise Vibration Management Plan
(the) Committee	Inquiry and Advisory Committee
D	Document (and number)
DDO	Design and Development Overlay
DEDJTR	Department of Economic Development, Jobs, Transport and Resources
DELWP	Department of Environment, Land, Water and Planning
DHHS	Department of Health and Human Services
EAS	Emergency Access Shaft
EE Act	<i>Environment Effects Act 1978</i>
EES	Environmental Effects Statement
EMF	Environmental Management Framework
EMI	Electromagnetic Interference
EP Act	<i>Environment Protection Act 1970</i>
EPA	Environment Protection Authority
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)
EPR	Environmental Performance Requirements
ESO	Environmental Significance Overlay
GC45	Draft Planning Scheme Amendment GC45
GHG	greenhouse gas
GMP	Groundwater Management Plan
GVA	Gross Value Added
HHIA	Historic Heritage Impact Assessment
HIS	Heritage Impact Statement
HMP	Heritage Management Plan
HO	Heritage Overlay
LPPF	Local Planning Policy Framework



LSIO	Land Subject to Inundation Overlay
MATC	Melbourne Anglican Trust Corporation
MGS	Melbourne Grammar School
MHA	Melbourne Heritage Action
Minster's Assessment	Minister for Planning's Assessment
MLTV	Medium and Long Term Viability
MMRA	Melbourne Metro Rail Authority
MMRP	Melbourne Metro Rail Project
MTPF Act	<i>Major Transport Projects Facilitation Act 2009</i>
NEPM	National Environment Protection (Ambient Air Quality) Measure
NSW ICNG	NSW Interim Construction Noise Guidelines
NVIA	Noise and Vibration Impact Assessment
OH&S	Occupation Health and Safety
OVGA	Office of the Victorian Government Architect
PAHs	polycyclic aromatic hydrocarbons
(the) Project	The full Project as provided in the EES
P&E Act	<i>Planning and Environment Act 1987</i>
PIW	prescribed industrial waste
PPP	Public Private Partnership
PPRG	Parkville Precinct Reference Group
PPV	peak particle velocity
PRINP	Victorian Passenger Rail Infrastructure Noise Policy, April 2013
PSA	Planning Scheme Amendment
PTV	Public Transport Victoria
RAP	Registered Aboriginal Party
RCS	respirable crystalline silica
RIMG	Residential Impact Mitigation Guidelines for Construction
RING	Rail Infrastructure Noise Guideline, May 2013 (NSW EPA document)
RMIT	RMIT University
RMS Velocity	Root Mean Square velocity
RSV	Royal Society of Victoria
S	Submission (and number)
SEIP	Site Environment Implementation Plan
SEPP	State Environment Protection Policy
SEPP (AQM)	State Environment Protection Policy (Air Quality Management)
SGS	SGS Economics and Planning

SPPF	State Planning Policy Framework
TBM	tunnel boring machine
TDMS	Travel Demand Management Strategy
TfNSW	Transport for NSW
The Botanica	The Botanica Owners Corporation
The Graduate Union	The Graduate Union of the University of Melbourne
The Westin	Owners Corporation 3 on plan of subdivision PS 428405M and the owners of the Westin Residential Apartments
TIA	Transport Impact Assessment
TI Act	<i>Transport Integration Act 2010</i>
TMP	Transport Management Plans
TN	Technical Note (and number)
TTWG	Traffic and Transport Working Group
UDS	Urban Design Strategy
ULE	Useful Life Expectancy
VCCC	Victorian Comprehensive Cancer Centre
VDV	Vibration Dose Value
VHI	Victorian Heritage Inventory
VHR	Victorian Heritage Register
VITM	Victorian Integrated Transport Model
VPP	Victoria Planning Provisions
WSUD	water sensitive urban design

## Executive Summary

### (i) Issues and approach

The Melbourne Metro Rail Project is a city-shaping project that will re-define the way public transport will be delivered and used in Victoria. It comprises the construction of twin, nine-kilometre rail tunnels from Kensington to South Yarra, through the Central Business District of Melbourne and connecting the Sunbury to Cranbourne and Pakenham lines, removing them from the City Loop.

Five new stations will be built at Arden, Parkville, CBD North, CBD South and Domain, which will allow for direct interchanges with Melbourne Central and Flinders Street stations, as well as a new train and tram interchange at Domain.

This infrastructure, coupled with proposed new High Capacity Trains, will allow for a greater capacity network with more reliable services. It will reshape travel demand throughout the network, and provide the foundation for restructuring the train network and expanding Melbourne's wider public transport system.

There will be significant construction effects over a six to ten year period but on completion, the Project will bring decades of benefit to public transport users and the broader community.

The Project was declared 'public works' by the Minister for Planning under the *Environment Effects Act 1978*, the procedures for which required an Environment Effects Statement (EES), the application of appropriate peer review, and a public exhibition process (from which 379 submissions were received). The Minister for Planning appointed a joint Inquiry and Advisory Committee (the Committee) to provide an opportunity for people to speak in support of their submission through a public hearing process, and to make findings and recommendations on the environmental and planning effects of the Project.

The Committee sat for 33 days in August, September and October 2016 during which time approximately 115 parties were heard.

The submissions focused on residual concerns mostly directed towards ameliorating the impacts arising from the construction period. Direct impacts included noise and vibration from tunnel works; changes to access to traffic and transport; loss of trees; impacts on open space; impacts on heritage places and areas; the perception that Melbourne will be cut-off and inaccessible as major construction works run for lengthy periods; and disruption and fragmentation of communities. The Project works will predominantly occur at or near the proposed new stations, and will impact on residences, businesses, public spaces and institutions, including schools, hospitals and universities.

What was before the public and the Committee through the EES was a Concept Design, rather than a detailed project. The Concept Design presented a technically feasible means of delivering the Project. Once approved, the Melbourne Metro Rail Authority (MMRA) will provide the opportunity for contractors to present innovative design solutions to achieve the best design and cost outcomes for the Project. However, because there was no detailed design to review, submitters were concerned about what will get built in terms of temporary and permanent structures, and the direct impacts these may have on their residence, places of business, the university and medical precincts, and local area open spaces.

Aspects of the Project changed through the Hearing as the MMRA responded to submissions and evidence. Where the MMRA has modified parts of the Project (such as advising Fawkner Park is no longer required, and selecting a vertical alignment under CityLink), the Committee has not considered the environmental effects of these options no longer being pursued. The Committee adopts the MMRA position that these changes are confirmed modifications to the Project, and has proceeded on the basis that where it has been advised that an option or approach is no longer being considered, it will not form part of the approved Project.

The key focus of the Committee's review, findings and recommendations has been on the planning and environmental control framework for the Project, and in particular, the Environmental Management Framework, the Environmental Performance Requirements and the Incorporated Document, which will direct the delivery of the Project.

Under this framework of controls, there are requirements for the preparation of numerous plans as a second layer of control to cover major engineering and environmental works, likely impacts and outcomes. Those plans include management plans to deal with matters such as general construction, noise and vibration, contaminated land and groundwater, electromagnetic interference, traffic and transport, as well as heritage and urban design.

The aim of these measures is to ensure that there is a clear, unambiguous and transparent set of controls in place to guide Project delivery. While it will not be possible to avoid all effects and impacts, the recommendations and outcomes of the public submission and hearing process has helped to provide the Committee with a degree of certainty that impacts can be mitigated and minimised as far as practicable.

A call for on-going and thorough communication was a consistent theme in submissions. There was a level of concern raised about the opportunity for stakeholders, including residents, business operators and commercial property owners, not-for-profit organisations, educational establishments and health care providers, to be informed about and participate in the ongoing decision making process to realise the Project. The Committee believes the commitment to prepare a Community and Stakeholder Engagement Plan will ensure community views will continue to be sought and considered. The Committee considers that meaningful communication, and a robust process for dealing with queries and complaints, are essential to managing residual impacts on stakeholders, particularly residents.

Changes to the Environmental Performance Requirements have been recommended with the aim of strengthening these processes.

## **(ii) Summary of findings**

In providing its overall findings, the Committee has summarised the key issues for determination in each Precinct of the Project.

### **Precinct 1 – Tunnels**

The key issue for the Tunnels Precinct relates to the uncertainty regarding noise and vibration impacts during construction and in operation. Particular concerns were raised for heritage buildings, and within the North Melbourne residential area, where the tunnels are at their shallowest.

### **Precinct 2 – Western portal (Kensington)**

The key issue for the Western portal precinct is whether the Concept Design (Option A) should be preferred over the Alternative Design (Option B). The Committee supports and recommends Option B be adopted as it reduces impacts on traffic, social, recreation, landscape and heritage values, both during construction and in legacy. In addition, the Committee comments on the poor state of South Kensington station and suggest there is a legacy opportunity to upgrade the station.

### **Precinct 3 – Arden Station**

The Arden precinct presents an opportunity to facilitate significant urban renewal in concert with the Arden Precinct Structure Plan. There are several issues relating to urban design and heritage values that remain outstanding for the Precinct, however the Committee understands that these will be addressed in the future urban renewal of the area. Traffic management and amenity impacts during construction were raised as key issues.

### **Precinct 4 – Parkville Station**

The Committee notes the particular sensitivities of the Parkville precinct, which is home to many of Melbourne's world-class health and educational institutions, surrounded by the elm-tree boulevards of Royal Parade and Grattan Street. The heritage values of Royal Parade and the University of Melbourne, and changed traffic and access conditions attracted significant discussion. The Committee considers access to and within the Precinct; noise, vibration and electromagnetic impacts upon sensitive facilities and equipment; and the protection of heritage values can be adequately managed by the proposed framework and through guidance provided by the establishment of the Parkville Precinct Reference Group. The Committee recommends that the station entries be reviewed in this Precinct as part of the final design process.

### **Precinct 5 – CBD North Station**

RMIT University, as the major landholder in this Precinct had similar concerns to the University of Melbourne in relation to sensitive equipment and the impacts of noise, vibration and electromagnetic interference on its teaching and research areas. Impacts on heritage places such as the City Baths and businesses due to restriction of access are further considerations in this Precinct.

### **Precinct 6 – CBD South Station**

Acquisition and temporary occupation of private and public land, loss of car parking, impacts on Federation Square and impacts on the heritage values of places such as Flinders Street Station and St Paul's Cathedral are key considerations in this Precinct.

The Committee considers that a new public transport spine running under Swanston Street will provide significant opportunities for urban design enhancements above and below ground. For both CBD North and CBD South Precincts, the Project represents an opportunity to revitalise Swanston Street as the heart of the City.

### **Precinct 7 – Domain Station**

St Kilda Road is a world-renowned boulevard, with its avenues of trees, gracious parks, wide setbacks and complementary architecture. The challenges for the Project in this Precinct

cannot be understated. The particular sensitivities of the Precinct present significant challenges from a noise, urban design, heritage, arboricultural, and traffic and access perspective, and has led the Committee to conclude that further resolution of these issues in the detailed design stage is required. The MMRA is urged to continue to seek opportunities to minimise impacts within this Precinct, and to further review the design process, including construction methodology, and station locations for the Precinct.

#### **Precinct 8 – Eastern portal (South Yarra)**

Many residents living in streets adjacent to the construction area will feel the impacts in this Precinct. The Committee believes that maximising the retention of trees and the development of a new park post construction will be positive outcomes for the area. A number of submissions, most notably from the City of Stonnington, called for a new station at South Yarra to be included as part of the Project. While the Committee does not support this proposition, it suggests that the final design should not preclude such an opportunity in the future.

#### **Precinct 9 – Western turnback (West Footscray)**

Activities in the Western turnback precinct are proposed to be located solely within publicly owned VicTrack land, however they will require the use of some commuter parking. Key issues raised in relation to this Precinct include the loss of public parking and truck activity around neighbouring streets.

#### **The Project**

The Committee supports the Project and concludes that it is capable of achieving acceptable planning and environmental outcomes. Impacts can be adequately managed and monitored through a case management approach and the proposed planning and environmental management framework.

#### **(iii) Consolidated recommendations**

- 1. Adopt Amendment GC45 to the Melbourne, Port Phillip, Stonnington and Maribyrnong Planning Schemes:**
  - a) subject to further modifications to Clause 81.01 - Incorporated Document (based on Document 357) as set out in Appendix E**
  - b) subject to any further changes to the Planning Scheme maps in the Incorporated Document and/or Schedule 67 to the Design and Development Overlay to reflect any final changes to the Project Land.**
- 2. Adopt the Environmental Management Framework (Document 360), which includes Environmental Performance Requirements (based on Version 4, Document 365), subject to further modifications as set out in Appendix F.**
- 3. Investigate an alternate option to locate the Linlithgow Avenue access shaft on the western Linlithgow Avenue carriageway at the northern end of Tom's Block in Precinct 1.**
- 4. Review the location and number of station entries proposed in Precinct 4 - Parkville station.**

5. Prepare a Planning Practice Note with technical guideline(s) to support development applications for land impacted by Schedule 67 to the Design and Development Overlay.
6. Adopt Option B as the preferred option for the location of the Western portal in Precinct 2.
7. Adopt the Business Support Guidelines for Construction referenced in Environmental Performance Requirement B2, and amend as follows:
  - a) Replace paragraph 1 of Clause 2.1 Scope with the words *“The Guidelines apply to businesses which may be adversely impacted due to works for the Project.”*
  - b) Delete the heading on column 1, ‘Business type and location’, and insert the words *“All businesses affected by works for the Project.”*
  - c) Delete the words ‘Café or restaurant in Domain Road, South Yarra’ in cell 2 of column 1 and insert the words *“Food and beverage premises including cafés, take-away food premises and restaurants in all precincts.”*
  - d) Delete the words ‘Clothing retailer in laneway or street adjacent to a construction site in CBD South/North’ in cell 3 of column 1 and insert *“Food and beverage premises, retail premises, hairdressers and other shops in CBD South/North”*.
8. Redraft the Residential Impact Mitigation Guidelines to adopt the trigger levels and thresholds shown in Figure 3 at Chapter 10.4.9 of this report.
9. Amend the Urban Design Strategy as follows:
  - a) Add a fifth point under 2.1 under ‘Designs must be sustainable ... They must be:’ to read *“designed to utilise green infrastructure to support a high standard of amenity.”*
  - b) Add a new Objective 5 in Section 3.1 to read *“Recognise and enhance the importance placed on active transport.”*
  - c) Add a third dash point in the Design Guidelines at 3.2 at No 11 ‘Incorporate public art in appropriate places’ to read *“Integrate site responsive art into the project design, facilitating playful interaction and seating opportunities and located to optimise the legibility of the surrounding area.”*
  - d) Add a new dash point under 3.5c3 to read *“permanent infrastructure elements of the Project such as station entries, portals, vents and access shafts need to be co-located where possible and incorporate public art and other activities that contribute to the wider public realm.”*
  - e) Add a new statement as the first sentence of 3.5 after the heading ‘Design to help manage construction impacts’ to read *“The Project requires careful consideration of its impact on the places where the construction activities are located.”*
  - f) Add a final dot point to the paragraph commencing ‘Construction processes need to ...’ to read *“The potential of these temporary features to achieve broader objectives. These include improving visual amenity, facilitating wider engagement in the planning and design processes, creating a canvas for the creative community and wider community to express and develop*

*their creativity and create design icons that can contribute to the image and identity of the city.”*

- g) Amend the fifth dash point under 3.5c4 to read *“Provide opportunities to convey information about the history of the site and the Melbourne Metro ...”*
  - h) Add a new dash point under 3.5c4 to read *“Recognise the potential of the acoustic sheds, in particular those at CBD North, South and Domain to be designed to contribute to the image and identity of the City.”*
  - i) Include the Melbourne Metro Rail Authority Creative Strategy as a Reference Document at 3.5d.
  - j) Replace 4.4.3e.1 to state: *“Design the station entries as entrances orientated to the wider Parkville community. Provide a high quality arrival experience, meeting places and direct, legible connections to the north south spine that extends across Grattan Street.”*
  - k) Add a new design guidelines at 4.4e to read *“Maximise the northern footpath width to create space for the station infrastructure and to enhance provision for pedestrian movement.”*
  - l) Add a second paragraph to 5.2 ‘Design review and advice’ to read *“Supplement the VDRP/Urban Design Reference Group process to ensure it includes experts in sustainability, public art, accessibility, health and place making.”*
  - m) Add the following words at the end of the second paragraph in 5.2 to read *“... to ensure the PPP contractor had adequately responded to recommendations of the Urban Design Reference Group.”*
10. Amend the Concept Design to retain Council Lane CL0112.
  11. Ensure that future plans to reinstate South Yarra Siding Reserve facilitate the opportunity to provide an accessible link to the south side of Toorak Road.
  12. Install temporary landscape treatments with other urban design, landscape and visual treatments along the length of the Osborne Street Reserve during the construction stage to enhance its function as a treed open space area, and to provide better visual and noise protection for the adjacent residents.



## **PART A: BACKGROUND AND INQUIRY PROCESS**

# 1 Introduction

## 1.1 The Inquiry and Advisory Committee

The Minister for Planning appointed a six member Inquiry and Advisory Committee (the Committee) (noted as IAC in the Terms of Reference) on 10 April 2016, pursuant to section 9(1) of the *Environment Effects Act 1978* (EE Act) and section 151 of the *Planning and Environment Act 1987* (P&E Act) to consider and report on the Melbourne Metro Rail Project (MMRP) (the Project).

The Minister for Planning signed the Terms of Reference for the Committee on 23 May 2016 (Appendix A).

The proponent for the Project is the Melbourne Metro Rail Authority (MMRA).

The original six member Committee comprised:

- Ms Kathy Mitchell (Chair)
- Mr Geoff Underwood (Deputy Chair)
- Mr Craig Barker
- Ms Jenny Donovan
- Ms Mandy Elliott
- Ms Kate Partenio.

Paragraph 24 of the Terms of Reference notes the Committee may seek the written or verbal advice from experts or specialists. In this regard, the Committee intended to retain the services of:

- Mr Stephen Hancock - hydrogeology and tunnelling
- Ms Elizabeth Hui – acoustics and vibration
- Ms Helen Lardner – heritage.

Paragraph 25 of the Terms of Reference noted the Committee may retain its own legal counsel and in this regard, the Committee retained the services of Mr Nicholas Tweedie SC and Mr Rupert Watters.

The Environment Effects Statement (EES) for the Project was on public exhibition from 25 May to 6 July 2016, and 379 written submissions were received in response to exhibition.

From its review of the submissions prior to the Directions Hearing, the Committee considered that the nature and complexity of issues associated with noise and vibration impacts, and impacts on heritage assets were such that it felt the specialists in these subjects should be members of the Committee, rather than specialist advisers. The Chair wrote to the Minister for Planning seeking that the Committee be reconstituted to include two new members (Ms Hui and Ms Lardner), and this was finalised through appointment on 17 August 2016.

The Committee was assisted by the office of Planning Panels Victoria, and more specifically:

- Ms Elissa Bell, Senior Project Manager
- Ms Julia Thomson, Senior Project Officer
- Mr Harry Matheas, Assistant Director
- Mr Adrian Williams, Business Manager

- Mr Jesse Percival, Hearing Room Assistant.

## 1.2 Terms of Reference and the role of the Committee

The role of the Committee has two distinct components as set out in the relevant Acts (P&E Act and EE Act), and through its Terms of Reference dated 23 May 2016.

In overview, the 'Inquiry' role under the *EE Act* is to review the EES and technical appendices, conduct a public hearing and consider the public submissions received. Clause 14b. of the Terms of Reference notes that the Inquiry is to investigate and consider, and provide a report presenting findings and recommendations in relation to:

- i. the potential magnitude, likelihood and significance of adverse and beneficial environmental effects of the Project*
- ii. potential modifications to the Project and/or environmental management measures that are needed to address likely adverse effects or environmental risks*
- iii. the overall significance of likely adverse effects and environmental risks of the Project, relative to likely benefits of the Project, within the context of applicable legislation, policy, strategies and guidelines*
- iv. the assessment contained in the EES and technical appendices of each of the potential specific environmental effects in light of the Order and Scoping requirements, and any mitigation measures, or performance requirements contained in the EES to address the identified environmental effects*
- v. the adequacy and/or appropriateness of the proposed environmental management framework for the works, including but not limited to a consideration of the environment performance measures or other mitigation measures contained in the EES*
- vi. whether acceptable environmental outcomes can be achieved by the Proposal overall, both with and without potential modifications or environmental management measures*
- vii. ...*

With respect to the draft Planning Scheme Amendment, the Advisory Committee role under the P&E Act and as set out in Clause 16 of the Terms of Reference, is to review the draft Planning Scheme Amendment (PSA) GC45 and submissions received, conduct a public hearing jointly with the 'Inquiry' hearing and in accordance with Clause 16c:

*provide a report to the Minister containing the Advisory Committee's advice as to whether the draft PSA is an appropriate means by which to facilitate and implement the Project, and any recommendations it might have in relation to the statutory framework to be established for the Project.*

In summary, the role of the Committee was, as set out in the submission of Mr Finanzio on behalf of the Minister for Planning at paragraphs 26 and 27, to:

- (a) Review the EES, its technical appendices, and public submissions*
- (b) Investigate and consider a number of specified matters in relation to the environmental effects of the Project, modifications, mitigation measures and an environmental management framework*

*(c) Conduct a hearing*

*(d) Subsequently provide a report to the Minister for Planning containing a description of the proceedings conducted by the Inquiry, and findings and recommendations in relation to its investigations and considerations.*

*Owing to the inclusion of a proposed draft planning scheme amendment, the IAC has been asked to:*

*(a) Review the terms of the draft planning scheme amendment and public submissions received in relation to it*

*(b) Conduct a hearing*

*(c) Provide a report to the Minister containing advice as to whether the draft planning scheme amendment is an appropriate means by which to facilitate and implement the Project, and any recommendations in relation to the statutory framework to be established for the Project.*

Clause 17 notes that the submissions are public documents unless otherwise directed by the Committee. Some parties requested that certain parts of their submissions be kept confidential, and that certain documents not be made publicly available. Where appropriate, the Committee agreed to receive these submissions and documents on a confidential basis.

In addition, the University of Melbourne and RMIT University (RMIT) requested the Committee undertake confidential inspections of those sites and areas they considered to be particularly sensitive to noise and vibration impacts, and to do so on a confidential basis. These inspections occurred on the afternoon of Hearing Day 18 on 15 September 2016.

A second confidential site inspection was undertaken for another submitter on the afternoon of Hearing Day 26 on 27 September 2016.

At each of these inspections, and at the hearing of the confidential submissions, only representatives of the Minister for Planning and the MMRA were invited to be present at the hearing, to receive a copy of the confidential documents, and accompany the Committee on the confidential site inspections.

Clause 19 notes *“The IAC will meet and conduct hearings when there is a quorum of at least four of its members present including the IAC Chair or Deputy Chair”*. In this regard, the Committee did generally operate as a full or near full quorum during Hearing Weeks 1 to 4, and then as a quorum of four for the last three weeks of its Hearing timetable, except for the final two days of the Hearing when closing submissions were made.

The Terms of Reference note that the Committee’s report is to be provided to the Minister within 30 business days of the last Hearing date.

### **1.3 Hearings**

A Directions Hearing was held at the Mercure Melbourne Treasury Gardens on 26 July 2016. At that Directions Hearing, the Committee introduced itself and its team, made various declarations, clarified its role, the Hearing dates and venue, the exhibition and submission process, site inspections, expert conclaves, experts and cross examination, tabled

documents and the public nature of such, and finalised its directions with regard to expert evidence and other procedural matters.

The Committee advised of its intent to seek reconstitution to add Ms Hui and Ms Lardner to the Committee at the Directions Hearing.

The Committee noted that it had provided a letter to the MMRA seeking clarification about a number of matters raised through its preliminary review of the EES, and it tabled that letter as Document 1 (D1). Additionally, the Committee had prepared a further document which it tabled at the Directions Hearing that sought a response from the MMRA on a number of further matters arising from its more complete review of the EES (D2).

Public Hearings for the Project were held for 33 days over seven weeks, from 22 August to 7 October 2016. All Hearings were held at the Mercure Melbourne Treasury Gardens on Spring Street, Melbourne. Those who represented the various parties, presented and gave evidence to the Committee are shown in Appendix C.

The Committee thanks all who participated in the Public Hearing process and for the way in which all submitters presented and interacted with the Hearing.

## **1.4 Site inspections**

Prior to the Directions Hearing, members of the Committee had variously inspected parts of the alignment and specific sites impacted by the Project. At the Directions Hearing, the Committee advised of its intention to undertake a more detailed site inspection, and in this regard, advised that the inspections would take place over two days, and would be accompanied by interested parties. This occurred on 16 and 17 August 2016.

Both days commenced with a briefing at Planning Panels Victoria by the MMRA, principally through Ms Quigley of Counsel for the MMRA and Mr Campbell of the MMRA.

Day 1 on 16 August 2016 inspected:

- Eastern portal (Osborne Street and surrounds, Fawkner Park)
- Precinct 7 (Melbourne Grammar School, Domain Road, St Kilda Road area, Tom's Block, Queen Victoria Gardens and Linlithgow Avenue)
- CBD South (Federation Square, Port Phillip Arcade, Flinders Lane, Westin Hotel and City Square).

Day 2 on 17 August 2016 inspected:

- CBD North (Swanston Street, RMIT, Franklin Street area)
- Parkville Precinct (Grattan Street and Royal Parade, the University of Melbourne, Royal Melbourne Hospital, Victoria Comprehensive Cancer Centre, University Square, Berkeley Street)
- Arden and Lauren Street and surrounds in North Melbourne
- Precinct 2 (South Kensington, JJ Holland Park, Childers Street, various industrial areas)
- Western turnback site at West Footscray Station.

The inspections were external in nature and generally, in most cases, on public property adjacent to the various buildings and infrastructure, with the exception of an internal inspection of aspects of the Christ Church South Yarra and the Westin Hotel.

Some participants joined the Committee for the whole of the two days, while others met the Committee at various sites and areas of interest.

Post hearing, the selected members of the Committee continued to visit sites and areas of interest, and the full Committee reviewed all Precincts and the whole of the Project alignment unaccompanied on 20 October 2016, to assist it in consideration of its findings and recommendations.

## **1.5 Summary of issues raised in submissions**

A total of 379 submissions were received as a result of the public exhibition of the EES. In the main, these were from:

- local councils (Melbourne, Stonnington, Port Phillip and Maribyrnong)
- Government agencies and/or departments
- interest groups, community organisations, local clubs
- cultural, health and education establishments
- commercial/business operations
- owners corporations
- individuals.

The list of submitters is provided in Appendix B.

The Committee notes that, almost without exception, these submissions expressed support for the Project. Most supported the initiative of building and providing the Project tunnel, stations and infrastructure. Submissions in the main focused on the potential impacts of the Project's construction stage on particular properties or areas. From its review of submissions, the Committee notes the key issues raised included:

- construction impacts, including:
  - traffic disruption and access
  - loss of public space
  - public health and safety
  - air quality and dust
  - noise and truck movement
- heritage impacts
- social impacts
- noise and vibration
- tunnelling impacts
- loss of property values
- commercial and business
- alternative construction design and station locations
- environmental impacts
- loss of trees

The various Chapters in this Report detail the key issues raised in the submissions as part of the analysis of issues.

## **1.6 Approach to report**

As put by many submitters, the EES comprises a very detailed series of reports, with significant technical analysis across a 'Concept Design', but very little detail on the ultimate

Project design. In synthesising this material, along with the submissions received, the further submissions made by various parties, the evidence and the further work of the MMRA, the Committee is cognisant of its task to draw it all together and provide clear recommendations to take the Project forward. As noted previously, there is widespread support for the Project. It is the impacts of the Project on particular areas during the construction period (of up to 10 years), that were the primary focus of concern from various submitters.

The Committee has approached its consideration of issues and the preparation of this report in the following way.

Part A provides the **Background and Inquiry Approach**, which includes the introductory matters, a description of the Project, the relevant legislation and policy context, the exhibition process, and the Public Hearing process (Chapters 1 -4).

Part B provides the **Environmental Effects of the Project**, and assesses these to determine whether they have been appropriately addressed. The Committee has generally followed the order of issues presented in the EES. Effects assessed include transport; land use and planning; social and community; business; air quality; noise and vibration; historical, cultural and aboriginal heritage; urban design, landscape and visual; surface water; groundwater; ground movement and land stability; contaminated land and spoil management; biodiversity; arboriculture; and greenhouse gas (Chapters 5 – 19).

Some of these Chapters are structured by issue (for example in Chapter 7 – Social and Community), while others are structured by Precinct (for example in Chapter 5 – Transport).

Part C provides the **Integrated Assessment and Conclusions**, with commentary on the Environmental Management Framework, Environmental Performance Requirements, the Planning Scheme Amendment GC45 and the Incorporated Document. It provides an Integrated Assessment and includes the summary response of the Committee to its Terms of Reference (Chapters 21 and 22).

Where appropriate, the Committee references the evidence of various experts, submissions made by advocates, and the presentations and submissions of community groups, businesses, sporting organisations and individuals. While some of these are specifically named, it is not possible to include or reference all as part of the Committee's assessment. This does not mean the submissions were not considered, the Committee has focused on the key issues, rather than who said what. Additionally, some submissions were made in confidence and these have been referenced by submission number only, where applicable.

In responding to issues raised by submitters, the Committee has identified all submissions by number and using the prefix 'S'. It only includes the prefix 'S' and the number for individual submitters, but for others (such as the councils, universities, businesses), it names the submitters as well. Where submitters provide additional material through tabled documents, this is identified by the prefix 'D'. Additionally, the MMRA provides Technical Notes in response to issues raised through submission, evidence and by the Committee. These are referenced as (TN#).

The critical considerations that provide the framework for the application and implementation of the Project include the Environmental Management Framework (EMF), the Environmental Performance Requirements (EPR), the Urban Design Strategy (UDS) and

the Incorporated Document. All were provided as part of the exhibition material and were key and major considerations during the course of the Public Hearing process. Many submissions and recommendations referred to these.

During the Hearing process, the MMRA provided updates to these documents based on submissions, evidence, the expert conclaves and its further considerations. Version 1 of the EPR was tabled on Day 1 of the Hearing (D18) and then Version 2 on Day 10 (D82).

On 21 September 2016, the Committee directed that the MMRA prepare Version 3 of both documents and by letter of the same date, provided the opportunity for all submitters to comment on these revisions. Versions 3 of the EPR (D205 and D206) and the Incorporated Document (D207 and D208) were subsequently tabled by the MMRA.

On the final day of the Hearing, the MMRA tabled its final versions of the Incorporated Document dated 7 October 2016 (D357 and D358) and the EPR (D365). Additionally, it tabled Version 1 of the (Draft) Environmental Management Framework (D360). For the avoidance of doubt and for clarity, the Committee is using these documents (D357, D358, D365 and D360) as the basis of its discussions, further considerations and findings throughout this report.

In some chapters, it has been necessary for context to refer to the EPR which were exhibited, in these cases, they have been referred to as the 'exhibited EPR'.



## 2 The Project

### 2.1 Project rationale and benefits

The Victorian Government is proposing to build the Project to connect the Cranbourne/Pakenham line to the Sunbury line through the construction of new, twin, nine-kilometre rail tunnels and five, new underground rail stations.

The Project is underpinned by a Business Case prepared by the MMRA and accepted by Government. Though the Business Case was not formally provided in its entirety to the Committee, references were made to parts of it by the MMRA and by other submitters including Public Transport Victoria (PTV) and the City of Stonnington.

It is relevant to note certain context statements from the Business Case:

*Melbourne Metro represents a generational change to the metropolitan rail network. Melbourne Metro responds to the growth needs of Melbourne's most heavily congested lines and provides long term capacity for the Sunshine – Dandenong Line into the middle of this century. At an estimated cost of \$10.9bn, Melbourne Metro will be one of the largest public transport Projects ever undertaken in Australia. It is the first major investment in the CBD metropolitan rail infrastructure capacity since the City Loop was completed 30 years ago.*

The Business Case declared:

- a Benefit to Cost Ratio (BCR) of 1.1 at standard assessment figures, BCR of 2.4 with a lower per cent discount rate and before considering wider economic benefits and 1.5 to 3.3 when wider economic benefits are included
- an increased BCR when the costs and benefits of an extended program (i.e. future Projects enabled on the Sunshine – Dandenong Line) are taken into account the BCR for this case increases to 1.5 to 3.2 excluding wider economic benefits and 2.1 to 4.5 including wider economic benefits.

The Business Case stated the Project will:

- (i) *enable workers to commute to and from the CBD with relative ease, increasing accessibility to economic opportunities, high quality jobs and services*
- (ii) *enable businesses in the CBD to access a broad range and wider pool of workers*
- (iii) *enable more workers (and businesses) to locate in highly productive, employment-dense areas, Melbourne Metro generates a range of WEBS.*

The Project is expected to:

- create 3,900 additional jobs (net) across Victoria and approximately 4,700 additional jobs (net) nationwide at the peak of construction
- increase Victoria's Gross State Product by between \$7bn and \$14bn in present value terms (using a 7 per cent and 4 per cent discount rate respectively).

The Business Case notes that:

*Melbourne Metro also provides the backbone for further improvements to the network in the future, by incorporating features such as longer platforms and high capacity signalling, which allows a logical staged approach to expanding the rail network.*

## 2.2 Project description

Following relevant legislative requirements, the Project was formally declared to be public works for the purposes of the EE Act by an Order made by the Minister for Planning and published in the Government Gazette on 3 September 2015. That Order published the procedures and requirements to be met including that an inquiry would “*be appointed under the Environment Effects Act 1978 to consider environmental effects of the proposal*”. It also flagged that certain ‘enabling works’ may be treated differently under the EE Act once further information was available.

On 20 November 2015, an Amendment of the Order was published in the Government Gazette, which specified in detail, works which would be excluded from the EES process. This Order defined the Project to broadly comprise:

*Two nine-kilometre rail tunnels from South Kensington to South Yarra to connect the Sunbury and Cranbourne–Pakenham railway lines, to be used by electric trains and generally following an alignment passing:*

- *Western portals generally in the vicinity of South Kensington Station, with realignment of the existing Sunbury Line tracks to form an at-grade junction with the Project tunnel tracks;*

*New underground stations at:*

- *Arden, proposed to be located east of CityLink*
- *Parkville, proposed to be located generally in the Grattan Street road reserve, near the intersection of Royal Parade, and including train-tram interchange*
- *CBD North, proposed to be located generally under the Swanston Street road reserve, generally between Franklin Street and Latrobe Street, and including interchange with Melbourne Central Station*
- *CBD South, proposed to be located generally under the Swanston Street road reserve generally between Collins Street and Flinders Street, and including interchange with Flinders Street Station*
- *Domain, proposed to be located generally under the road reserve of St Kilda Road and Albert Road, and including train-tram interchange.*

*Eastern portals generally in the vicinity of South Yarra Station, with the Project tunnel tracks tying into the existing Cranbourne–Pakenham Line tracks west of Chapel Street.*

*Relevant ancillary temporary and permanent works to support the construction and operation of the tunnels, stations and interchanges, including turnbacks and emergency access shafts for safety purposes in a number of locations as required, which may include Fawkner Park and the Domain parklands.*

Attached to the amending Order was a schedule specifying nominated works to be excluded from the declaration of 'public works'. These largely fell in two categories, being design and investigatory activities relating mainly to the relocation of utilities.

### **2.3 Project boundary and area precincts**

The EES defines the *"proposed Project boundary"* as encompassing *"all areas that would be used for Melbourne Metro's permanent structures and temporary construction areas"*. The proposed Project boundary formed the basis for most technical assessments conducted for the EES and *"will inform the declaration of the 'Project Area' under the Major Transport Projects Facilitation Act 2009"*. The proposed Project boundary or Area (both refer to the same concept but now called the Project Area for the purposes of this Report) was divided into nine Precincts for assessment purposes as follows:

- Precinct 1 – Tunnels
- Precinct 2 – Western portal (Kensington)
- Precinct 3 – Arden station
- Precinct 4 – Parkville station
- Precinct 5 – CBD North station
- Precinct 6 – CBD South station
- Precinct 7 – Domain station
- Precinct 8 – Eastern portal (South Yarra)
- Precinct 9 – Western turnback (West Footscray)

These Precincts are shown as Figure 1.

In some cases, technical assessments adopted study areas larger than the proposed Project boundary to fully understand its potential effects.

The proposed Project boundary and assessments undertaken for the EES have informed the 'draft Project Land' that is being exhibited in the draft Planning Scheme Amendment Incorporated Document.

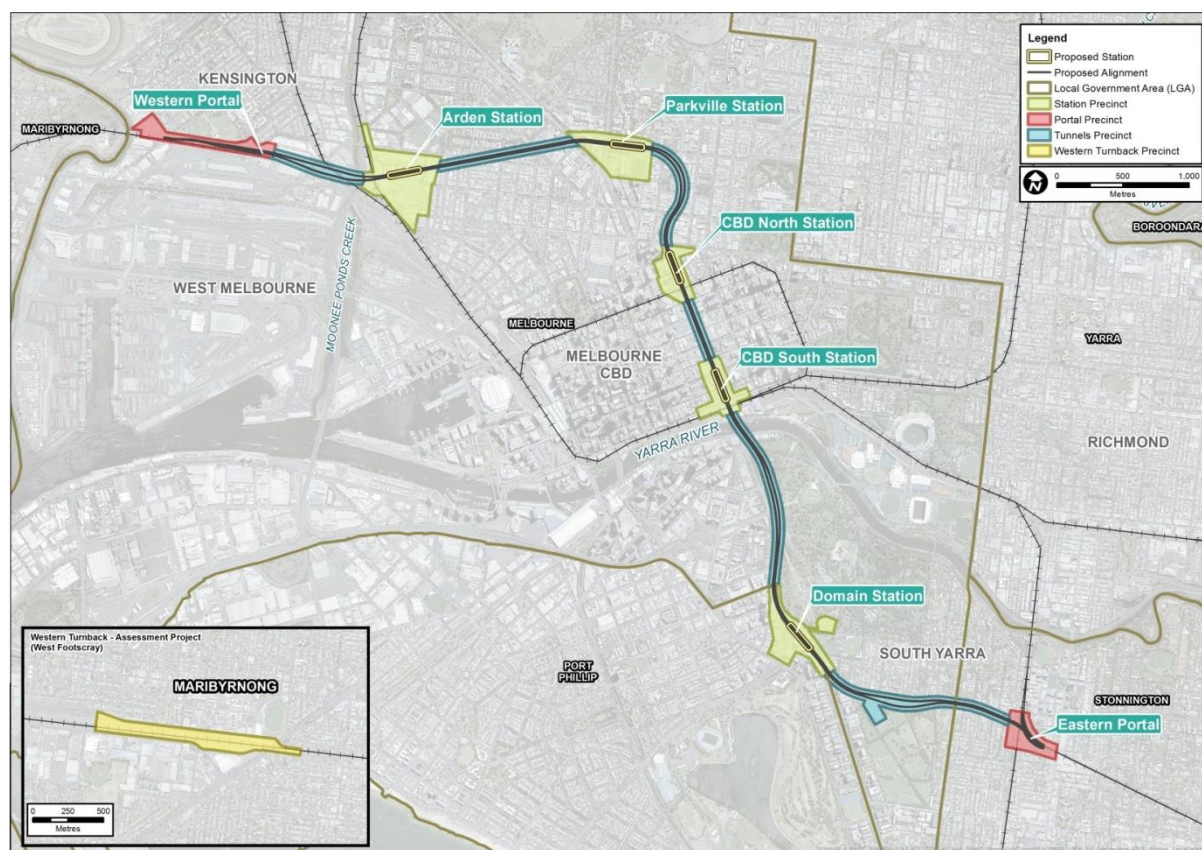


Figure 1 Concept design key project components and precincts

## 2.4 Concept design components and options

The EES did not provide a detailed project description. Instead it provided a ‘Concept Design’ which was described as *“a technically feasible way for the project to be developed that meets the Victorian Government’s objectives and the recommended Environmental Performance Requirements documented in this EES”*. The Concept Design included *“specific alternative design options”* and *“proposed construction methodology”*.

The EES explained that contractors tendering to construct the Project would be responsible for the final design and would be able to propose alternatives *“that deliver better value for money or that incorporate innovative approaches in design, technology, operations or construction techniques”*. It anticipated that further design changes may be made in response to stakeholders. In order to avoid the need for further assessment, the EES provided that such refinements would need to *“be contained within the proposed Project Area”* and to *“comply with the recommended Environmental Performance Requirements”*. The EES acknowledged that *“if the alternatives do not meet these conditions, further impact assessment and approvals could be required subject to the decision of the Minister for Planning”*.

A summary of the Concept Design components and options is provided in Table 6-1 of the EES and further detailed in Chapter 6. The proposed construction methodology used to assess the Project is outlined in Section 6-6 of the EES. As with the Concept Design, the EES stated that contractors *“would have flexibility to adopt alternative construction methods and*

*practises provided these still meet the approved Environmental Performance Requirements and comply with relevant statutory approvals”.*

In its opening submissions to the Hearing (D20), the MMRA advised it had made changes to the Concept Design as a result of submissions received. Through the Hearing, further changes were made in response to evidence and submissions. These changes were described in Technical Notes presented to the Committee. Each of the Technical Notes is included in the tabled documents.

The changes included but were not limited to:

- various agreements with the City of Melbourne about refinements to the Project such as the redesign of Franklin Street to allow for through traffic
- the abandonment of the option for the tunnel boring machine (TBM) launching from within Fawkner Park in favour of the Domain Precinct option
- abandonment of the option for the vertical alignment of the rail tunnel to pass above the CityLink, in favour of the below CityLink option
- advice that permanent tunnel Emergency Access Shafts (EAS) are not required to be situated within Fawkner Park such that this park is not to be used at all for the Project
- changes to traffic and transport arrangements in Precincts in response to submissions including previous arrangement for temporary or permanent access such as at Domain for Melbourne Grammar School (MGS) (367) and residential buildings as well as institutional uses, truck haulage routes and the reinstatement of public and private parking
- changes to the premises on the list of properties to be acquired.

The Concept Design still includes alternative design options in three Precincts.

Where the MMRA changed parts of the Concept Design, such as the use of Fawkner Park, or removed options, such as selecting the vertical alignment under City Link, the Committee has not considered the environmental effects of the deleted part or options. The Committee adopts the MMRA position that these changes are confirmed modifications to the Concept Design. The Project examined, assessed and reported by the Committee excludes these deleted parts.

As well as these design changes, the MMRA advised that there would be other changes to the Concept Design to improve situations during construction and after the Project as a legacy. These changes include but are not limited to:

- administrative changes to processes and procedures included in the planning control documents in GC45 which have the effect of committing the MMRA and its contractors to meeting standards aimed at minimising impacts of the Project during construction
- changes to the Project area as defined on maps and overlay controls forming part of GC45
- commitments to meeting outcomes under the UDS
- enhancements to open space and public places
- further attention to detailed design to ensure the impacts of the Project are minimised.

For some Project works the EES considered, but did not resolve a number of alternative sites and construction options. At the end of the Hearing, two such options remained as exhibited and for consideration by the Committee. They were

- the siting of the Western Portal in Precinct 2 where the Concept Design proposed a location that has drawn opposing submissions from residents and groups who favour an alternative location 'Option B' that moves the portal further from residential areas and conceded by the MMRA as having less impact to its preferred Option A
- the location of an electrical sub-station in Precinct 3 where three alternative sites were considered as suitable sites.

The MMRA's position was the options presented will allow contractors the opportunity to introduce alternative design solutions to the Concept Design. In its closing submission, the MMRA said "*the Committee should be loath to prescribe the implementation of a particular design option or a particular construction methodology in circumstances where – as is generally the case in respect of Melbourne Metro – a range of satisfactory options may exist*".

The MMRA position is summarised in TN57 as a response to recommendations from the conclave of urban design experts, where the MMRA stated:

*... decisions on any of the options will be made after consideration of the Committee's recommendations and the Minister's assessment of those recommendations. The final decision will be made following the Minister's assessment and through the respective procurement processes and will be balanced against a number of factors including, but not limited to, operational efficiency and value for money.*

For the choice of options for Precinct 2, the MMRA advised that notwithstanding the strong community position and lesser environmental impacts against Option A, it remains an option for consideration. The MMRA stated that the Committee's assessment of the environmental effects of the options would inform the decision making process as to which option to adopt.

Of the three alternative sites considered as suitable sites for the required electrical sub-station, the site in Langford Street was put as the preferred location over others in the Arden works area. Witnesses for the City of Melbourne argued against the Langford Street site because of its location in an area subject to inundation, and for reasons to do with difficulty in avoiding an industrial-look for a large building.

The MMRA maintained that the UDS would ensure that an appropriate outcome was achieved at the Langford Street site.

Options associated with a third aspect of the Project, being the potential use of Tom's Block in the Domain Parklands, changed complexion through the Hearing as the MMRA abandoned the proposal to use of Tom's Block for a permanent Emergency Access Shaft (EAS), and instead proposed that it be only one of two possible locations for a temporary access shaft for construction use only. Now, the options are for Tom's Block or Linlithgow Avenue as the potential location.

## 2.5 Project schedule and delivery model

Works will be conducted simultaneously within each Precinct. Subject to approval of the Project, early works are scheduled to begin in 2017, with expected completion of the Project by 2026.

At the Hearing, the Committee requested further detail of the Project schedule and this was provided in TN49 (D53). This TN included a high order Gantt chart which provided indicative timeframes and duration times for construction works in each Precinct, except Precinct 9. TN49 indicated that the duration for construction for many aspects ranged between three and five years. Each Precinct may have a number of such aspects, and the total duration of construction impacts would be dependent on whether or not works could or would be undertaken concurrently.

The MMRA, on behalf of the State Government, is the proponent for this Project and is responsible for delivering the Project by 2026, in line with the requirements and objectives of PTV and the Victorian Government. The MMRA is an Administrative Office established under the Office of the Coordinator General to assist the State Government to achieve its integrated transport policy objectives. The MMRA Chief Executive Officer is accountable to the Minister for Public Transport, reporting to the Secretary of the Department of Economic Development, Jobs, Transport and Resources (DEDJTR).

The MMRA is responsible for overseeing and engaging contractors and consultants for all aspects of the Project, including planning and development of a Project Concept Design, site investigations, stakeholder engagement, obtaining planning approvals and procurement, through to construction delivery and Project commissioning.

Fulfilling the responsibilities and accountabilities across all elements of the EMF involves the MMRA, contractors and regulators. The contractors responsibilities would be included as contractual conditions in Project contracts. The contractors would be responsible for activities undertaken by their sub-contractors.

The EES Summary document advised that the Project would be procured through four separate works packages:

- *Early works – A Managing Contractor approach (where a head contractor is responsible for overseeing delivery of the works) would be used for utility service relocations and the preparation of construction sites. Yarra Trams would deliver tram infrastructure works via a Project Agreement. Separate agreements would be entered into with individual utility service providers to provide construction power for the project.*
- *Tunnels and stations – Construction, operation and maintenance of the tunnels and stations would be procured using a Public Private Partnership (PPP). A PPP is a long-term service contract between the Government and a private party (usually a consortium) to deliver infrastructure and related services over an agreed period of time and to specified standards.*
- *Rail infrastructure – Rail infrastructure works at the eastern and western portals would be procured via a Competitive Alliance, where the Government would collaborate with one or more parties to share risks and responsibilities during construction.*

- *Rail systems – A Competitive Alliance would also be used to procure the design, installation, integration and commissioning of the rail systems for Melbourne Metro.*

At the completion of construction and commissioning of the Project, PTV would become responsible for the ongoing operation of the train services using the Project infrastructure. The PPP contractor will be responsible for the maintenance of the tunnels and stations for the term of the PPP contract.



### 3 Legislative and policy context

Details of the legislative and policy context for the Project are set out in the EES Chapters 1, 3 and 4. For completeness, a summary is provided below. There are three aspects to the legislative framework for the Project being:

- environmental assessment of the proposal
- approvals required to proceed
- measures in place to guide Project implementation (both construction and operation).

#### 3.1 Environmental assessment

##### 3.1.1 *Commonwealth Environment Protection and Biodiversity Conservation Act 1999*

The Project was referred under the *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act) (referral number EPBC 2015/7549) to determine whether or not assessment was required to address potential impacts to matters of national environmental significance. The Referral Decision was that the Project is not a controlled action, provided specified measures are undertaken to avoid significant impacts on Commonwealth land, being the Victoria Barracks. The specified measures relate to potential vibration impacts on the Victoria Barracks heritage structures and include preconstruction dilapidation surveys, vibration monitoring and implementation of mitigation measures should monitoring indicate the potential for degradation of these heritage structures.

As the Project is not a controlled action, no further assessment or approval of the Project under the EPBC Act is required as part of this EES process. The Commonwealth specified measures are reflected in EPR NV2.

##### 3.1.2 *Environment Effects Act 1978*

The EE Act provides for the integrated assessment of public works that have the potential for significant environmental effects. The Project was declared public works under the EE Act by the Minister for Planning, requiring an EES be prepared and Inquiry appointed to consider submissions. This is the report of the Inquiry appointed under section 9 of the EE Act to consider the Project. The Committee report will inform the Minister for Planning's Assessment (Minister's Assessment) of the Project under the EE Act.

The Minister's Assessment is not an approval as such, but is an assessment of the environmental effects of the proposal that must be considered by decision-makers in determining approvals required for the Project and any conditions to be imposed.

#### 3.2 Approvals framework

The key approvals required for the Project to proceed are:

- a PSA under the *Planning and Environment Act 1987*
- an approved Cultural Heritage Management Plan (CHMP) under the *Aboriginal Heritage Act 2006*
- Permits and consents under the *Heritage Act 1995*.

### **3.2.1 Planning and Environment Act 1987**

The draft Planning Scheme Amendment (GC45) was exhibited as part of the EES. It proposes to amend the Melbourne, Port Phillip, Stonnington and Maribyrnong Planning Schemes to facilitate delivery of the Project planning approvals in the following way:

- amend the schedule to Clause 52.03 (Specific Sites and Exclusions) to facilitate the planning approval for the Project in accordance with the *Melbourne Metro Rail Project Incorporated Document, April 2016*
- amend the schedule to Clause 61.01 to make the Minister for Planning the Responsible Authority for the Project land
- amend the schedule to Clause 81.01 to insert the Incorporated Document *Melbourne Metro Rail Project Incorporated Document, April 2016*.

The land affected by the Amendment is included Maps 1 to 16 in the Incorporated Document.

With the exception of the Maribyrnong Planning Scheme, the Amendment seeks to introduce new schedules to Clause 43.02 Design and Development Overlay to apply to land above and adjacent to the proposed new tunnels, station and associated infrastructure, and update the Planning Scheme maps to reflect this as follows:

- Melbourne Planning Scheme – a new Schedule 67
- Port Phillip Planning Scheme – a new Schedule 30
- Stonnington Planning Scheme – a new Schedule 20

The relevant schedules to the DDO require that any application with respect of this land to which it apply establish the Secretary of DEDJTR as a determining referral authority for permit applications required by Clause 43.02 up until 31 December 2026 and, thereafter VicTrack. Apart from the maps that accompany the DDO, the provisions for each of the schedules are the same.

The Incorporated Document will switch off planning controls for the defined Project Area for the purposes of implementation of the Project, provided the Project works are carried out in accordance with stated conditions within the Incorporated Document.

This Committee was appointed under section 151 of the P&E Act to consider the draft PSA and submissions received in relation to it. This is the report of the Committee to consider the Project and to report any recommendations in relation to the statutory framework established for the Project.

### **3.2.2 Aboriginal Heritage Act 2006**

A main purpose of the *Aboriginal Heritage Act 2006* is to provide for the protection of Aboriginal cultural heritage in Victoria. A CHMP is a report which sets out the results of a cultural heritage assessment of a project area and conditions to be complied with in undertaking an activity. Section 49 of the *Aboriginal Heritage Act 2006* states that where an EES is required for a project, a CHMP is automatically required to be prepared and approved prior to the commencement of works. A CHMP may either be approved by the relevant Registered Aboriginal Party (RAP), or where there is no RAP, by the State Government body Aboriginal Victoria. A CHMP has not been prepared as part of the EES documentation before the Committee.

### 3.2.3 Heritage Act 1995

The *Heritage Act 1995* concerns places of heritage significance listed on the Victorian Heritage Register (VHR) and archaeological sites and relics listed on the Victorian Heritage Inventory (VHI). Under this Act, permits are required to carry out works or activities in relation to any registered place or object and consents are required to impact on an archaeological relic. In addition, all archaeological sites more than 50 years of age in Victoria are protected by the Act, regardless of whether they are included on the VHI. The Project is likely to require permits for works within the Registered land of the following places:

- to carry out works to South African Soldiers' Memorial (VHR H1374), St Kilda Road (VHR H2359) and the Shrine of Remembrance (VHR H0848) at Domain station
- to carry out works within the Domain Parklands (VHR H2304) if needed for the Linlithgow EAS (Tunnels Precinct)
- to remove trees along St Kilda Road (VHR H2359) and in Royal Parade (VHR H2198)
- to carry out works to Royal Parade and the three University of Melbourne sites; the Vice-Chancellor's House (VHR H1003), Main Entrance Gates, Pillar and Fence (VHR H0918) and the Gatekeeper's Cottage (VHR H0919) in the Parkville Precinct
- to carry out works at Flinders Street Station (VHR H1083), St Paul's Cathedral precinct (VHR H0018) and Nicholas Building (VHR H1083) within Precinct 6.

There are many other places in the VHR which are within the proposed Project Area. Permits or written approvals would be required under the Act for any works if required for rectification, for example as a result of vibration or ground movement.

The number of VHI places within the proposed Project Area is extensive, especially within the Tunnels precinct, and CBD North and Precinct 6. There are also VHI places at the Domain and Parkville precincts. The Project is likely to require consents for these places.

### 3.3 Secondary consents

The Project is likely to require a number of secondary consents as described in Table 1.

Table 1 Secondary consents required for the Project to proceed

Activity	Approval or Requirement	Act
Works on reserved Crown land such as Domain Parklands and Shrine of Remembrance Reserve	Use of Crown land prior to declaration of Project Area under the MTPF Act.	<i>Crown Land (Reserves) Act 1978</i>
Project delivery	Must be consistent with relevant State Environment Protection Policies prepared under the <i>Environment Protection Act 1970</i>	<i>Environment Protection Act 1970</i>
Management of contaminated soil	Must be consistent with relevant State Environment Protection Policies prepared under the <i>Environment Protection Act 1970</i>	<i>Environment Protection Act 1970</i>
Land acquisition	Process for land acquisition and compensation	<i>Land Acquisition and Compensation Act 1986</i>

Activity	Approval or Requirement	Act
Land acquisition	Guides the management of unreserved Crown land and freehold land, would apply to land acquired which becomes Crown land.	<i>Land Act 1958</i>
Works on, in or under roads	Consent	<i>Road Management Act 2004</i>
Works around the Yarra River and Moonee Ponds Creek	Licence to construct, alter, operate or decommission a waterway	<i>Water Act 1989</i>
Groundwater bore	Licences to construct and operate a groundwater bore	<i>Water Act 1989</i>
Groundwater recharge bores (if required)	Approval from the Minister for Environment	<i>Water Act 1989</i>
Removal of protected species from Crown land, if required.	Permit to take protected species from Crown land	<i>Flora and Fauna Guarantee Act 1988</i>
Pre-clearance surveys	Permits for the removal of wildlife	<i>Wildlife Act 1975</i>
Project construction	Implementation of measures to minimise the potential spread of noxious weeds	<i>Catchment and Land Protection Act 1994</i>

### 3.4 Project implementation

The *Major Transport Projects Facilitation Act 2009* (MTPF Act) facilitates the assessment and delivery of major transport projects in Victoria. Projects may be declared under this Act for assessment or delivery powers (or both). The Project has been declared under the Act for the purpose of Project delivery. The Minister for Public Transport has been nominated as the Project Minister and in due course, will appoint a Project authority to deliver the Project. The Minister for Planning will designate a Project Area within which the Project authority will be able to implement its delivery powers. The Project Area will likely match the Project Land as defined in the Incorporated Document.

Delivery powers include:

- processes for the temporary occupation and acquisition of land
- powers to restrict access to Project or temporarily occupied areas
- a streamlined process for the surrender of public land
- a power for the Governor in Council to revoke reservations over Crown land within the Project Area.

The Act modifies the operation for the *Land Acquisition and Compensation Act 1986* in relation to land portions within the Project Area.

The Project is likely to be delivered through a PPP. It is intended that the approved EPR will be included in the Project Agreement between the State and contractor to ensure they are adhered to. Clause 5.2 of the Incorporated Document states that “*the EMF must include Environmental Performance Requirements addressing the following areas ...*” and further that “*the use and development for the Project must be carried out in accordance with the approved EMF and the Environmental Performance Requirements*”.

### 3.5 Legislative framework

Figure 2 provides an overview of the relevant aspects of environmental assessment, Project approvals and Project implementation.

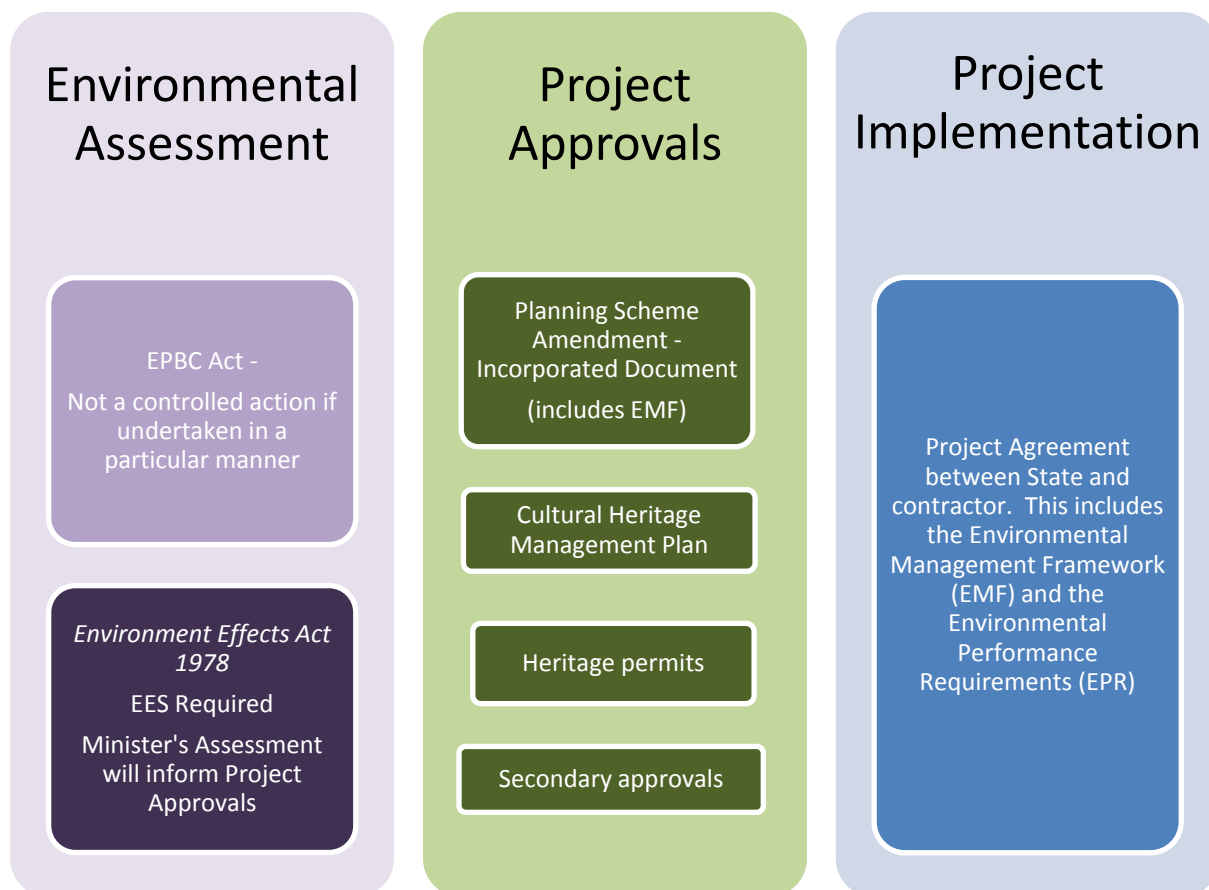


Figure 2 Overview of assessment approval and implementation of the Project

### 3.6 Applicable policy and guidelines

Applicable policy and guidelines considered by the Committee include:

- Arden-Macaulay Structure Plan 2012
- Plan Melbourne
- Plan Melbourne Refresh discussion paper
- Network Development Plan – Metropolitan Rail
- Planning schemes for City of Melbourne, Maribyrnong, Port Philip and Stonnington
- Urban Design Charter for Victoria
- Creating Places for People: an Urban Design Protocol for Australian Cities
- Good Design and Transport
- State Environment Protection Policies (SEPPs)
- Environment Protection Authority – Victoria (EPA) Noise Control Guidelines (Publication 1254)
- EPA Environmental Guidelines for Major Construction Sites (Publication 480)
- NSW Interim Construction Noise Guidelines
- Victorian Passenger Rail Infrastructure Noise Policy
- National Environment Protection (Ambient Air Quality) Measure (NEPM)
- Australia ICOMOS Charter for the Conservation of Places of Cultural Significance (Burra Charter) 2013

- Industrial Waste Management Policies
- City of Melbourne's Urban Forest Strategy and Tree Retention and Removal Policy 2012
- City of Port Philip's Greening Port Philip. An Urban Forest Approach
- City of Stonington's General Local Law 2008 (No. 1)
- Memorandum of Understanding for Native Vegetation Offsets (Victoria Government), 2010.

These are discussed further as required in the relevant chapters.

## 4 Approach to assessment of effects

### 4.1 The Project and draft evaluation objectives

The high-level Project objectives established for the Project are to:

*Provide additional capacity on Melbourne's rail system to meet customer needs that, as part of a program of investment, meets Projected medium-term demand and supports long-term patronage growth.*

*Optimise the efficiency and reliability of operations and improve the customer experience by moving towards a metro-style rail system.*

*Support the long-term plan and vision to develop and operate Victoria's rail network.*

*Improve access and reduce congestion of the tram system in central Melbourne and the road network in the north, west, and south east by diverting travel to the rail network.*

*Improve accessibility to jobs, education and other social and economic opportunities by enabling the growth and more effective use of land in Melbourne.*

*Deliver strong productivity, sustainability and liveability benefits by providing a value for money transport solution.*

*Contribute to a safe, accessible rail network that supports the health and wellbeing of users.*

The draft evaluation objectives from the scoping requirements (November 2015) which were carried through the EES are listed in Table 2.

Table 2 Draft evaluation objectives and key legislation

Draft evaluation objective	Key legislation
<b>Transport connectivity</b> – To enable a significant increase in the capacity of the metropolitan rail network and provide multimodal connections, while adequately managing effects of the works on the broader transport network, both during and after the construction of the Project	<i>Transport Integration Act 2010 (TI Act)</i>
<b>Built environment</b> – To protect and enhance the character, form and function of the public realm and buildings within and adjacent to the Project alignment, and particularly in the vicinity of Project surface structures, having regard to the existing and evolving urban context.	<i>Planning and Environment Act 1987 (P&amp;E Act)</i>
<b>Social, community, land use and business</b> – To manage the effects on the social fabric of the community in the area of the Project, including with regard to land use changes, community cohesion, business functionality and access to services and facilities, especially during the construction phase.	<i>Environment Protection Act 1970 (EP Act) and State Environment Protection Policies (SEPPs)</i> <i>P&amp;E Act</i> <i>TI Act</i>
<b>Amenity</b> – To minimise adverse air quality, noise or vibration effects on the amenity of nearby residents and local communities, as far as practicable, especially during the construction phase.	<i>EP Act and SEPPs</i> <i>P&amp;E Act</i> <i>TI Act</i>

Draft evaluation objective	Key legislation
<b>Cultural heritage</b> – To avoid or minimise adverse effects on Aboriginal and historic cultural heritage values	<i>Aboriginal Heritage Act 2006</i> <i>Heritage Act 1995</i> <i>P&amp;E Act</i>
<b>Land stability</b> – To avoid or minimise adverse effects on land stability that might arise directly or indirectly from Project works	<i>P&amp;E Act</i>
<b>Landscape, visual and recreational values</b> – To avoid or minimise adverse effects on landscape, visual amenity and recreational values as far as practicable	<i>P&amp;E Act</i>
<b>Hydrology, water quality and waste management</b> – To protect waterways and waterway function and surface water and groundwater quality in accordance with statutory objectives, to identify and prevent potential adverse environmental effects resulting from the disturbance of contaminated or acid-forming material and to manage excavation spoil and other waste in accordance with relevant best practice principles.	<i>EP Act, SEPPs and guidelines</i>
<b>Biodiversity</b> – To avoid or minimise adverse effects on native terrestrial and aquatic flora and fauna, in the context of the Project’s components and urban setting.	<i>Flora and Fauna Guarantee Act 1988</i> <i>Wildlife Act 1975</i>
<b>Environmental Management Framework</b> – To provide a transparent framework with clear accountabilities for managing environmental effects and hazards associated with construction and operation phases of the Project, in order to achieve acceptable environmental outcomes.	<i>TI Act</i> <i>EP Act</i> <i>Environment Effect Act 1978</i>

The Committee evaluated the Project against these evaluation objectives as well as against applicable legislation, policy and guidelines. The outcomes of the Committee’s evaluation are detailed in Part C of this report.

The Project Land is defined in clause 3 of the Incorporated Document as “*land described as Project Land for the Melbourne Metro Rail Project on Maps 1 to 16 at Appendix 1*”.

As discussed in Chapter 2.4, the EES presented a Concept Design which was developed to demonstrate it was technically feasible to deliver the Project in a manner that meets the Victorian Government objectives and the EPR presented in the EES. The Concept Design was made up of components and options to assist in the assessment of potential environmental risks and impacts associated with the Project. In assessing the Project, the Committee has considered whether aspects of the Concept Design need to be amended or options removed in addition to those conceded by the MMRA, and this is discussed in Part C of this report.

## 4.2 Environmental Management Framework

The EMF is intended to provide a “*transparent and integrated governance framework*” to manage environmental effects of the Project. The EMF includes EPR which are objective-based outcomes that must be achieved by the Project regardless of the adopted design. As discussed in Chapter 3.4, the draft Incorporated Document at Clause 5.2 requires implementation to be in accordance with the EMF and EPR. Detailed discussion of the EMF and EPR is provided in Chapter 21.

A key issue raised in submissions was the need to include the EPR table as an Appendix within the Incorporated Document. This matter is discussed further in Chapter 21.

The EPR being resolved through this Committee process is intended to ensure that construction activity occurs with limited impacts. The genesis of the EPR lies in the Risk Register included in the EES. From that Risk Register, and upon recommendations from the



experts commissioned by the MMRA to study the Concept Design, a set of Project-specific EPR was presented at the Hearing. This initial version of the EPR highlighted submissions concerned about the function of the EPR, as well as their direction and content, particularly the controls over impacts of particular concern to submitters (such as noise and vibration impacts). Advocates, witnesses and submitters proposed numerous variations to the EPR aimed primarily at achieving specific outcomes and at improving the EPR overall. At the conclusion of the Hearing, the MMRA tabled Version 4 of the EPR as part of its response to submissions and evidence, and to comments from the Committee.

### **4.3 Primary recommendations**

For the reasons expressed in this report, the Committee concludes that the Project has significant strategic merit, and should be supported and approved. The EES and the planning documentation is generally robust, and provides support to and for the Project.

The Committee concludes that GC45 to the Maribyrnong, Melbourne, Port Phillip and Stonnington Planning Schemes is the appropriate means by which to facilitate and implement the Project, and should be approved, subject to some modifications to the Version 4 Incorporated Document.

The Committee concludes that the EES is well supported by the EMF and the EPR, and it recommends approval of the Project subject to further modifications to the Version 4 EPR.

The primary recommendations of the Committee are therefore to support and endorse approval of the Project:

- 1. Adopt Amendment GC45 to the Melbourne, Port Phillip, Stonnington and Maribyrnong Planning Schemes:**
  - a) subject to further modifications to Clause 81.01 - Incorporated Document (based on Document 357) as set out in Appendix E**
  - b) subject to any further changes to the Planning Scheme maps in the Incorporated Document and/or Schedule 67 to the Design and Development Overlay to reflect any final changes to the Project Land.**
- 2. Adopt the Environmental Management Framework (Document 360), which includes Environmental Performance Requirements (based on Version 4, Document 365), subject to further modifications as set out in Appendix F.**



## **PART B: ENVIRONMENTAL EFFECTS OF THE PROJECT**

## 5 Transport

Transport impacts are addressed in Chapter 8 of the EES, and in Technical Appendix D.

The draft evaluation objective of the Scoping Requirements in relation to transport at 4.2 is:

*To enable a significant increase in the capacity of the metropolitan rail network and provide multimodal connections, whilst adequately managing effects of the works on the broader transport network, both during and after the construction of the Project.*

The following evidence was provided in relation to transport:

- MMRA - Shaun Smedley of Smedley Technical & Strategic and Rose McArthur of AJMJV
- Melbourne Grammar School - Brett Young of Ratio Consultants
- George Weston Foods - Chris Coath of GTA Consultants
- City of Stonnington - Stephen Hunt of Cardno and William McDougall
- University of Melbourne - Jason Sellars of GTA Consultants
- City of Melbourne – Haig Poulson and Richard Smithers of Council (Mr Smithers was not called to present)
- The Botanica Owners Corporation (The Botanica)- John Kiriakidis of GTA Consultants
- Citywide Service Solutions - John Kiriakidis of GTA Consultants.

There was a conclave of experts on transport, held on Wednesday 17 August and Thursday 18 August 2016, which focused on the transport EPR. The conclave was not attended by Mr McDougall, as his evidence related to a station at South Yarra, and Ms McArthur, as her evidence related to the Travel Demand Management Strategy (TDMS) (proposed under EPR T4). Mr Poulson was represented by Mr John Tekeili of the City of Melbourne at the conclave. The transport conclave report was tendered during the hearings by the MMRA as D38. The MMRA adopted many of the recommended changes to the EPR arising from the conclave.

EPR T1 to 7 and TA and TB specifically dealt with matters relating to transport.

Numerous submissions referred to a range of transport and traffic impacts as a result of construction and in legacy. The majority of submissions recognised the benefits of the Project for the broader public transport system in terms of enabling a significant increase in capacity of the metropolitan rail network and to provide multimodal connections.

The Committee has referred to all transport EPR as per version 4, except in its findings, as they have been renumbered.

### 5.1 Project wide issues

#### 5.1.1 Key Issues

The Committee considers the key issues relate to:

- Traffic and Transport Working Group
- construction worker traffic and parking
- bicycle parking.

## 5.1.2 Traffic and Transport Working Group

### (i) Evidence and Submissions

EPR TA was added by the MMRA during the Hearing, to require the MMRA to establish the Traffic and Transport Working Group (TTWG) to review and provide feedback on the preparation and implementation of the Transport Management Plan (TMP) required under the EMF. The EMF requires that the TMP be approved by the MMRA.

The MMRA submitted TN25, which set out details of the current and future role of TTWG. The TTWG has been in operation since October 2015 and is chaired by the MMRA. It has been assisting with the scope and design of parking and traffic surveys, transport modelling and selecting appropriate solutions to mitigate the effects of the Project.

In response to a query from the Committee regarding the need for an independent chair, the MMRA responded that the TTWG has been in place for some time, is working well and recommended an *it's not broken so don't fix it* approach.

There were no submissions seeking an independent chair, however when asked, several expert witnesses considered that an independent chair would be appropriate. With the exception of the Botanica who included this in their list of final EPR amendments, the issue was not raised in the closing submissions.

Several parties queried how the TTWG engages with and responds to issues raised by key stakeholders. The City of Melbourne (S365) sought the TTWG to “*incorporate stakeholder's responses*” rather than just elicit or consider responses, and sought the University of Melbourne to be identified as a key stakeholder. Several other parties, including George Weston Foods (S357), Citywide Services Solutions (S170) and MGS sought the inclusion of a nominated discrete list of key stakeholders in this EPR and a mandatory requirement to consult. The MMRA agreed to the latter.

Reference to a requirement to consult with key stakeholders was sought in a number of other transport EPR including T1, T2, T4 and T6.

### (ii) Discussion

The TTWG comprises a number of transport related authorities, however it is not a decision-making body or referral authority. Rather its role is to ensure that relevant authorities are brought together to jointly comment on the TMP prior to these being submitted by the contractor(s) to the MMRA for approval. The Committee notes that approval be required for road works and changes to public transport from these respective authorities.

The Committee acknowledges that the TTWG has been working for the last 12 months with the MMRA as its chair. However, the Committee has concern that the EES has not managed to include resolved outcomes on significant traffic issues, resulting in EPR requiring extensive further modelling and investigations to identify traffic impacts and specific mitigation measures and to set performance outcomes.

The Committee is particularly concerned with the potential conflict of MMRA acting as both chair of the TTWG and final approver for the TMP under the EMF. An independent chair would remove the potential conflict and allow the MMRA's participation in the group to be a support role for the chair. By comparison, the Committee notes that TN44 states that the

Parkville Precinct Reference Group (PPRG) will have an independent chair appointed by the State Government, with terms of reference.

In relation to the nomination of key stakeholders within EPR TA, it is noted that no specific definition is provided to determine who might qualify as a 'key' or 'key affected' stakeholder. Whether a party made a submission to the Committee does not in itself lead to a definition or limitation of potential key stakeholder status. The EPR at SC3 requires the preparation of a Community and Stakeholder Engagement Plan which should ensure consultation requirements for the whole community are met. Chapter 7 addresses the identification of key stakeholders further.

'Incorporating' rather than 'considering' stakeholders' responses in the TTWG's response on the TMP will add a higher level of transparency on how stakeholders' comments are considered. Given that elements of the transport assessment is not complete, resulting in the EPR containing requirements for more analysis rather than clear performance measures, a high level of transparency is considered appropriate.

### **5.1.3 Construction workforce traffic and parking**

#### **(i) What did the EES say?**

The Transport Impact Assessment (TIA) was underpinned by general assumptions in relation to construction worker traffic and parking. Contractors will be expected to minimise construction worker parking impacts through a range of strategies including facilitating use of public or active transport, and by providing on-site storage for tools. Some on-site parking is expected in non-CBD sites, and/or leasing of parking spaces and providing shuttle buses if necessary. The EES stated that traffic impacts due to construction worker travel will be minimal, due to shift change times outside of commuter peak periods and the parking strategy. Based on these assumptions, no analysis of construction worker traffic and parking was undertaken.

EPR T1 contains requirements to assist in managing or minimising construction parking.

#### **(ii) Evidence and submissions**

The MMRA's transport expert, Mr Smedley noted that while the lack of assessment of the impact of the construction workforce is not typical for a TIA, the overall impact is "*likely to be negligible.*" He further stated that:

*Every effort should be made to minimise the impact to car parking supply, and the workforce should not use on-street car parks wherever possible to limit the localised impacts.*

Several submissions raised concern regarding the lack of assessment of construction workforce traffic and parking, including S170, S357, S367.

The transport conclave generally agreed with the wording for the transport EPR, but sought consideration be given to the use of shuttle buses to ferry workers for offsite parking. The University of Melbourne sought a mandatory requirement to consult with operators of any private carparks to be used for provision of construction worker parking.

**(iii) Discussion**

The EES provided limited information in relation to the transport impacts of construction worker traffic and parking. It relied on several assumptions and EPR to control impacts, rather than seeking to quantify impacts. The Committee notes that the provision of a green travel plan (EPR T1) will assist. In addition, typical construction shift times result in many workers travelling outside of the peak traffic periods analysed. Furthermore, the sites with the greater numbers of construction workers are on either arterial or industrial roads, limiting amenity impacts.

The Committee considers the current EPR could be strengthened to reference consideration be given to the use of shuttle buses, which was identified in the EES as a typical strategy employed to manage construction worker parking. This would assist in directing the contractor towards a possible solution, without constraining the solution. Importantly, since the EES had minimal assessment in the EES of the quantum or impact of construction parking, the significant loss of parking in many precincts as well as limited availability of suitable locations for off-site parking, the Committee considers that such an inclusion is not unreasonable.

The relevant local council, in coordination with the TTWG will have the opportunity to respond to the parking management strategy prepared by the contractors as part of the TMP. The TTWG is required to consult with stakeholders on the TMP prior to providing its feedback.

**5.1.4 Bicycle Parking****(i) What did the EES say?**

In legacy, 20 bicycle parking spaces will be provided at the two CBD stations and 50 bicycle parking spaces will be provided at the other stations.

**(ii) Evidence and submissions**

TN27 advised the basis for informing the provision of bicycle parking at the new stations, given there is no Victorian or Australian guidance on such provision. TN27 concluded with the statement that:

*MMRA will undertake further consultation with stakeholders regarding bicycle parking including identification of suitable locations for bicycle parking.*

The City of Port Phillip called for a significantly greater provision of bicycle parking spaces, seeking 400 spaces with sufficient space to allow parking to grow to up to 2,000 spaces, noting “25 hoops is embarrassing” and “we need to be futurists”. It noted the difficulty in forecasting demand but that access from Port Phillip will be significant and Fishermen’s Bend is less than a 5 km ride. To get to the station, trams from within the municipality will be at capacity and bikes will be a significant option.

Submitter S123 requested that bicycle access be considered both during construction and as part of the re-development.

### **(iii) Discussion**

The Committee has not been provided with sufficient evidence to recommend a specific supply of bicycle parking at any station, but is concerned with both the lack of justification for the specified provision as well as the use of the terms ‘appropriate’, ‘generous’ or ‘maximise’ to describe a suitable provision in the EPR and UDS. Cycling in Melbourne has been growing in popularity over the last decade and the use of bicycles has well documented transport and health benefits, and should be encouraged.

The proposed new stations are being developed without providing any commuter car parking spaces and will seek to attract passengers who choose to walk, ride or catch other modes of public transport to the train station. Bicycle parking at stations is provided for passengers who ride to the station and then take a train to another destination. It is not provided and nor should it be required to be provided at the end destination station of the train trip. The Committee agrees that less bicycle parking would be required at the CBD stations than at the other stations, as the CBD is highly walkable to a train station from most areas. Further study is needed to determine an appropriate provision of bicycle parking.

#### **5.1.5 Findings**

The Committee finds that the TTWG should include an independent chairperson (now included in EPR T1) and consultation should be governed by the Community and Stakeholder Engagement Plan established under EPR SC3, rather than listing specific stakeholders in EPR TA.

While the impacts of worker parking during construction are not known, the EPR now includes an appropriate control to manage and minimise impacts through reference to shuttle buses under the green travel strategy. In addition, there should be a mandatory requirement that the use of private car parks be by prior agreement with the car park operators when specified for use as part of the construction worker parking strategy in EPR T1.

The Committee considers the MMRA commission a study to determine the appropriate level of bicycle parking provision at each station and parameters around special requirements for future expansion. Consultation should occur with the local Council(s) and with bicycle users at the relevant times, and this is included as EPR T8.

The relevant EPR have been amended accordingly, as provided in Appendix F.

## **5.2 Precinct 1 – Tunnels**

### **5.2.1 Key issues**

The Committee considers the key issue relates to traffic and parking management during construction.

### **5.2.2 What did the EES say?**

The only above ground work sites in Precinct 1 are the two alternate EAS sites in Linlithgow Avenue (at Tom’s Block or Queen Victoria Gardens). The site is expected to operate continuously over 18 months generating around 20 daily truck trips.

Construction truck routes are set out in Technical Appendix D Appendix C. Two routes are identified as follows with the final route along Linlithgow Avenue:



- Route 1 – Power Street, City Road
- Route 2 – Batman Avenue, Swan Street, Alexandra Avenue.

It is noted that Linlithgow Avenue forms part of both Route 3 and Route 5 (of five routes) for the Domain Road construction traffic. Truck movement on Linlithgow Avenue is expected to operate outside of peak periods with an average of one truck movement per hour. Active control will be needed to maintain safety for pedestrians and cyclists around the construction sites.

EPR T2 requires a TMP to include, among other things, the management of any temporary or permanent full or partial closure of traffic lanes including (but not limited to) Linlithgow Avenue.

### **5.2.3 Evidence and submissions**

TN55 noted that an EAS is no longer required at Linlithgow Avenue. However, it added that that site provides for a potential temporary secondary access to the TBM tunnels if required. The location is proposed to be retained for a potential shaft to access the TBM if required by the PPP Contractor for temporary purposes during construction.

Mr Poulson gave evidence that the EES does not provide a clear understanding of the impact of the Project on traffic movements and on-street parking supplies. Similarly, the impact on footpaths and cycle paths is also unclear. Mr Moore gave evidence that an alternate site for the Linlithgow Avenue shaft should be explored opposite the Queen Victoria Garden site utilising the western carriageway of the southern leg of Linlithgow Avenue (where Linlithgow Avenue forks on three sides of a small triangular piece of parkland). This carriageway is proposed by the City of Melbourne to be permanently closed and the land incorporated into Tom's Block.

### **5.2.4 Discussion**

Linlithgow Avenue provides an alternate local access route to Domain Road, which is proposed to be fully closed from St Kilda Road to just after the existing entrance to Edmund Herring Oval to facilitate the construction of Domain station. Linlithgow Avenue is a nominated construction truck route for Precinct 7. Modelling for Precinct 7 has focused only on the arterial road network with no consideration of traffic impacts on local streets. The Committee expects that a large proportion of the 10,000 vehicles per day that currently use Domain Road will be diverted to Linlithgow Avenue, noting that the network enhancement projects have focused on the traffic diverted from St Kilda Road (refer Precinct 7 for further discussion).

It is noted that the proposed EPR T5 (Travel Demand Management Strategy (TDMS)) will seek to re-mode some locally destined trips from car travel. However, the impact of the closure of Domain Road, as well as potential road closures on Flinders Street as part of Precinct 6 works and the use of Linlithgow Avenue as a construction traffic route for Precinct 7 could be further compounded by any partial or full closure of Linlithgow Avenue adjacent to either of the nominated construction sites at Tom's Block or Queen Victoria Gardens.

The EES failed to provide an assessment of loss of public parking around the construction site in an area observed by the Committee to be in high demand during the day. While the Committee notes that some existing parking demand may be reduced by encouraging mode

shift away from cars, this will to some extent be offset by the significant loss of parking in the adjacent Domain Station Precinct during construction.

While EPR T2 provides some control over the use of on-street parking by construction workers, it provides no control in relation to minimising any loss of public parking for the duration of the construction period.

### **5.2.5 Findings**

The Committee finds that EPR T1 requires additional transport modelling to support the TMP, the proposed EPR are sufficient to manage the environmental impacts in relation to traffic management. Notwithstanding this, the Committee notes that the impacts on traffic, pedestrians and cyclists may be minimised if Mr Moore's option to locate the access shaft on the western carriageway of Linlithgow Avenue at the northern end of Tom's Block be adopted.

EPR T1 should be modified to include a requirement to minimise parking loss during construction. Consideration should be given to locating the Linlithgow Avenue access shaft on the western carriageway at the northern end of Tom's Block to minimise obstruction to Linlithgow Avenue traffic. The EPR provide a reasonable ability to control the impacts on pedestrians and cyclists.

The relevant EPR have been amended accordingly, as provided in Appendix F.

## **5.3 Precinct 2 – Western portal**

### **5.3.1 Key issues**

The Committee considers that the key issues relate to:

- restricted access to the 50 Lloyd Street Business Park in Kensington
- the impact of the Concept Design on access, amenity and safety of JJ Holland Park
- truck diversions along residential streets
- opportunity to upgrade South Kensington station
- impact on the Childers Street cycling route.

### **5.3.2 What did the EES say?**

There are two options for the location of the western tunnel portal, being the Concept Design (Option A) and the Alternative Design (Option B). Option A has the tunnel portal to the east of McClure Road, while Option B has the portal just west of Ormond Street opposite JJ Holland Reserve.

During the 30 month construction period in this Precinct:

- the shared footway along the south side of the road will be removed for construction of the portal, with a permanent shared footway provided along the south side of JJ Holland Park
- the parking along Childers Street will be removed to allow for construction traffic
- the eastern end of Childers Street will be closed to traffic during certain construction stages, which will require the diversion of trucks accessing the 50

Lloyd Street Business Park via local streets, necessitating the removal of road closures that block traffic from Childers Street entering the local area

- a construction site will be established on the southeast corner of Hobsons Road and Kensington Road.

The closure of Childers Street and resulting loss of car parking could result in reduced connectivity for transport modes, and would need to be addressed as part of the TMP. It would be desirable for as many replacement car parking spaces as practicable to be provided in the vicinity of South Kensington Station and JJ Holland Park. Parking on Childers Street is currently used by both rail commuters and users of JJ Holland Park.

In respect to the loss of parking, Option A results in the greater loss of parking as set out in Table 3.

Table 3 Western portal parking spaces

Option	Existing	Construction – net loss	Legacy – net loss
Childers Street	153		
Concept Design (Option A)		-153	-56
Alternative Design (Option B)		-148	-34
Kensington Road	68	0	0

The EES stated that options were being investigated to provide replacement parking near the station to minimise impacts on rail patrons driving to the station. These lost spaces are located on the road reserve (not on the VicTrack land) and the need for replacement car spaces would need to be discussed further with the City of Melbourne.

### 5.3.3 Evidence and submissions

TN9 advised that for Option A, access into the business estate from Tennyson Street will be created via a new temporary ramp from the Tennyson Street and Altona Street intersection into McClure Road. TN9 did not identify whether there will be impact on parking or dock access in McClure Road as a result of the construction of the ramp. TN27 stated in relation to replacement parking during construction:

*An assessment determined that there is only one practical site for the replacement parking at the Western portal for South Kensington station patrons. The proposal is to construct car parking on the vacant site on Hobsons Street to the east [sic] of Kensington Road.*

The figure in TN27 indicated the site at 1-39 Hobsons Road is marked as part of the construction zone in the EES Map Book, and identified in the TIA as being utilised for support activities including site offices and facilities, laydown areas and materials and equipment storage. TN22 identified this same site for the location of a transmission tower in both Options. In Option A, a temporary tower would be installed on this land, with a permanent tower installed to the south of the site on VicTrack land following construction of the portal. In Option B, the tower would be permanent once installed prior to construction of the portal.

TN52 provided information of how access to South Kensington Station may be managed during construction. TN52 confirmed that access will be provided across Childers Street from Ormond Street at all times, except for major rail occupations that include the Werribee line, when the station would be closed.

Mr Smedley gave evidence that Option A has more road network limitations impacting on 50 Lloyd Street Business Park than Option B, but he was satisfied that the impacts of both options are acceptable. When asked about the impact of reopening local streets during construction, he advised that he hadn't looked at that issue, but decisions to re-open roads for construction purposes need a "*different lens than rat-running*".

The City of Melbourne submitted that Option B appeared to provide the best opportunities for an optimal road layout for Childers Street and minimising parking loss. In relation to the replacement of the lost shared path along the rail line, Mr Poulson gave evidence that a survey indicated it was not very popular, and on-road cycling facilities in Project legacy were more important. He stated that the legacy design should not include a commuting cycle path within JJ Holland Park. Mr Poulson suggested a temporary route via Altona Street should be investigated for use during construction work.

Mr Smithers' report criticised the concept legacy road designs for the reinstatement of Childers Street, as a roundabout and cycle paths behind angle parking do not provide the safest environment for cyclists. The City of Melbourne expressed concern about reopening local roads as they were closed to discourage rat-running of traffic through local streets, with Childers Street having previously been part of JJ Holland Park, but then developed with parking to take vehicles off local streets.

The Metropolitan Transport Forum (S328) noted:

*South Kensington station does not meet modern standards in any respect and will be due for an upgrade or repositioning to serve a larger catchment at some stage. It is critical that no future plans for South Kensington station be jeopardised by this Project, as the Western portal is close by.*

This was echoed by S124, who called the lack of inclusion of an upgrade to the station "*a lost opportunity*".

Submitters' concerns included the impact of truck diversions on the safety and amenity of the area, restricted pedestrian access, loss of car parking and the impact of heavy construction, noise and dust on the general amenity of the area. Health and safety was raised as a key concern, as local children regularly use the area for sports and recreation. Option B was considered to offer more relief from noise and heavy traffic impacts.

### **5.3.4 Discussion**

Submitters showed a strong preference for Option B. During construction, Option B may have a slightly less traffic impact as the length of time trucks need to be deviated through local streets to reach the business park may be less. There would be no need to construct a ramp down from Tennyson Street into the business park, which may also result in a loss of parking and dock access on McClure Road in the business park, noting a clear design has not yet been provided.

With respect to parking, Option B allows the greatest reinstatement of parking in Childers Street. While there were no parking demand surveys, there is strong demand and preference to maximise parking in this location. TN27 indicated that the only suitable option for replacement parking is at 1-39 Hobson Street. No indication was given regarding the amount of parking that could be created on that site. That site is on the far side of Kensington Road making it less attractive for users of the park and station, and is earmarked for the location of a permanent transmission tower in Option B, which is likely to constrain available parking space. In Option A, the temporary transmission tower on that site would be relocated following construction of the portal onto adjacent VicTrack land, which could potentially free up parking space in legacy.

While it is generally undesirable to have trucks using residential streets to access the business park, the Committee notes that this is only required for vehicles over 3.1 metres in height, with access available from Lloyd Street for vehicles under 3.1 metres. It will be difficult to limit the diversion route to trucks, but the circuitous route and construction activity in Childers Street will detract from the route.

In relation to the ultimate road design, the Committee shares Mr Smithers' view on the location of a cycle path behind angle parking spaces. The provision of a midblock roundabout in Option A is also unusual and provides a low level of safety for cyclists, noting that this is a large truck route into the business park. Presumably the roundabout is being provided to facilitate turning for those cars using the new parallel spaces outside JJ Holland Park. A simpler turning facility, which could incorporate a drop-off facility for South Kensington Station, should be investigated.

Residents will be impacted by the Project in both construction and operation by the loss of parking and shared path along Childers Street and intrusion of truck traffic.

The Committee undertook a daytime inspection of the South Kensington Station and noted its poor standard and lack of amenity. There are no toilet facilities, no vending machine, no staff, limited shelter, limited tactile paving and narrow platforms particularly on the city bound side. The Committee is concerned that the Project may constrain the ability for a future increase in the width of the train platform or implement other improvements should they be deemed necessary to meet standards.

### **5.3.5 Findings**

The Committee finds that further work is needed to resolve design issues for Childers Street and to minimise loss of parking, in consultation with the City of Melbourne. The Committee is satisfied that the EPR are sufficient to facilitate this.

In respect to a preference regarding Option A and B, the Committee prefers Option B, unless more proximate parking can be provided with Option A, as Option B provides a greater replacement of parking on Childers Street and has a lower impact on the Business Park, resulting in less traffic intrusion into the local residential streets.

An upgrade of South Kensington station could be considered as part of this Project to balance the impacts to the community in this Precinct and bring the station up to current standards.

The relevant EPR have been amended accordingly, as Provided in Appendix F.

## 5.4 Precinct 3 – Arden Station

### 5.4.1 Key issues

The Committee considers the key issues relate to:

- truck movement along residential streets
- traffic impacts to business continuity
- parking on Laurens Street.

### 5.4.2 What did the EES say?

Precinct 3 is identified as part of the Arden major development site by the Victorian State Government. It is expected that parts of Laurens Street will need to be occupied for the duration of construction to support construction of the eastern end of the station box.

Precinct 3 will be used to support activities at other construction sites. Truck access would be based on a 24 hour operation 7 days per week to support TBM operations and spoil removal. Trucks may be docked at Precinct 3 as part of a 'call forward' operation at other construction sites. Concentration of activities at this Precinct will reduce impacts at other more constrained and sensitive locations.

There are three truck entries proposed to the Precinct 3 construction site, Laurens Street, Barwise Street, and Arden Street opposite Langford Street. Three local truck routes are identified for trucks to travel between the Laurens Street and Barwise Street entries, and the arterial network:

- Route 1 – Laurens Street, Miller Street, Anderson Street, Victoria Street to Dryburgh Street
- Route 2A – Laurens Street, Queensbury Street to Dryburgh Street
- Route 2B – Laurens Street, Arden Street to Dryburgh Street or Macaulay Road.

No transport modelling has been undertaken for Precinct 3. However, traffic impacts are expected to be minimal, with the EES stating that while there will be some disruption (for example, two percent increase in daily truck movement volumes on the surrounding road network) due to construction traffic, it will be spread over several streets minimising impacts. In addition, the EES indicated that there will be a reduction in the current traffic generated by the site as existing uses cease, offsetting some of the increase.

The EES indicated Arden Station will attract less than 1,000 passenger entries and exits in the AM and PM peak periods in 2031. Fifty bicycle spaces will be provided.

### 5.4.3 Evidence and submissions

Mr Smedley noted that construction truck movements are *“not of a significant nature”* and can be managed across the day. While the construction site is expected to operate 24/7, he advised that if all the trucks were concentrated in 12 hours, then it would average at one truck every two minutes and would be spread across more than one access route. Mr Smedley recommended that Route 1 not be used as a construction route *“as its circuitous nature and localised land use are not conducive to construction truck traffic”*. He considered the EPR are appropriate to manage issues such as parking and truck impacts, and the TTWG is the appropriate group to determine further transport modelling requirements.

Mr Smedley requested further truck traffic data to support his understanding of net traffic impacts in this Precinct (which was acknowledged in TN26, but no data was provided to the Committee). During cross-examination he agreed that construction truck Route 1 was not needed. He noted that the EPR direct trucks to arterial roads which should prevent rat-running through local streets such as Fogarty Street. He would not support a route through Fogarty Street. Limiting trucks to daytime was *“worthy of consideration”*. When asked about the EES suggestion that there were no significant legacy issues in Precinct 3, he stated that the land use change proposed through the Arden Precinct Structure Plan would have broader issues, and the forecasts had not been released at the time of preparing the EES.

The MMRA added EPR NVB during the Hearing. This contained controls on haulage trucks to minimise noise for sensitive receptors. The EPR T1 requirement on truck routes was amended to *“minimise the use of local streets where practicable”*.

VicRoads (S366) was represented on a number of MMRP reference groups and working groups. It submitted that development of the Project will provide transport options with an ability to relieve congestion on key transport routes, enabling a re-assessment of transport priorities and functions of these routes to ensure a balanced transport outcome for all transport users.

Mr Poulson gave evidence that trucks should not use Queensbury Street due to its steep grade, or other local streets.

There are a number of businesses in Precinct 3 that raised concerns regarding transport during the construction phase of the Project resulting from increased traffic and parking. These included Naturelinks Landscape Pty Ltd (S227), Citywide North Melbourne Asphalt (S277), Citywide Services (S170), George Weston Foods (S357), Nick Theodossi Prestige Cars (S84), as well as the North Melbourne Football Club (S25), who noted *“traffic flow is very heavy at peak times, particularly on Arden Street”*.

George Weston Foods operate from a heritage listed building on the east side of Laurens Street, and has a permit for B-double trucks to use Laurens Street to access its site. The company uses a weigh station located within the VicTrack land to the north of its site to weigh laden trucks. Large trucks can enter VicTrack land further to the south to turn and reverse back across Laurens Street into loading docks at George Weston Foods. Mr Coath gave evidence for George Weston Foods, and noted particular concerns related to the increased traffic affecting safety when trucks reverse into loading docks, the impact on staff parking on Laurens Street and the potential loss of use of the weighbridge station.

Citywide run municipal operations on the north side of Arden Street and rely on the arterial road network to provide quick response times for clients. They are primarily concerned with traffic impacts, including potential use of streets by construction trucks to the north of Arden Street, and parking impacts from construction workers.

Mr Kiriakidis for Citywide provided traffic volumes for the area and was critical of the lack of modelling for this precinct given that the data indicated traffic is using Laurens Street as a rat-run to avoid the Arden Street/Dryburgh Street intersection. He suggested that a 2026 scenario be modelled to include land use change with the Arden Macaulay Structure Plan. He said the proposed legacy location of a pedestrian crossing on Laurens Street outside the station may have an adverse impact on the operation of the Arden Street/Laurens Street

intersection. Mr Kiriakidis was satisfied for modelling to be undertaken as an EPR requirement, but was concerned that the station will induce commuter parking demand if not controlled.

Various submitters raised concerns with truck routes through residential streets (S377, S343, S305, S199) and in particular Route 1 via Miller Street. Route 2A was also of some concern.

At the transport conclave Mr Coath and Mr Kiriakidis recommended additional changes to the EPR which were not supported by Mr Smedley and/or adopted by the MMRA. These matters related to call forward operations, an alternate location for the weigh bridge, development of a car parking strategy and the review of various transport and traffic impacts for Precinct 3.

Mr Smedley saw the issues relating to George Weston Foods as a business decision between two third parties and out of the control of the MMRA to resolve. He (and the MMRA) supported the intent to design to relevant standards, but notwithstanding, he considered these matters can be further resolved as part of the TMP.

#### **5.4.4 Discussion**

In relation to truck routes, EPR T1 and EPR NVB contain controls that seek to minimise impacts on local streets, where practical. As Langford Street and Fogarty Street fall under the definition of local streets, the EPR provides reasonable control in relation to these. The control falls short of prohibiting the use of any one road or route. There appears to be no support for Route 1 in Precinct 3, including the MMRA's transport witness. However, the EPR as worded does not prevent its use.

In relation to parking, the Committee agrees that the new train station may result in a change in parking demand in the area as commuters may seek to 'park and ride' and a review of the existing parking management should be undertaken to ensure that the impacts are not unreasonable.

In relation to the impact of the Project on the operations of George Weston Foods, the Committee notes the company is reversing trucks across a public street used for industrial purposes. Traffic along the street is subject to change as businesses come and go and will be subject to significant change as part of the implementation of the Arden Structure Plan. While the Project may result in increased traffic along this street, it remains the responsibility of George Weston Foods to manage the safety of its own operations. The removal of Route 1 via Miller Street will assist in minimising conflict with the Project.

The EES identified that 'call forward' operations may be run from the Precinct 3 construction site to support other construction sites. However, unlike for precincts such as Precincts 4, 5 and 6, it did not indicate on the Construction Traffic Routes Plans that it would require any truck standby areas in Laurens Street. VicTrack own a substantial tract of land at Precinct 3 and should seek to minimise impacts on adjacent land uses through the judicious use of its own site.

Having said that, it must be acknowledged that the site has a significant frontage to Laurens Street and kerbside parking should be equally available to all abutting land uses. While existing businesses opposite the VicTrack land have had unfettered access to this kerb space, conditions can and will change with the intensification of use of the VicTrack land during the Project and future redevelopment of the land. The TDMS under EPR T4 will seek to



encourage employees to shift to public transport during the construction period which may reduce some parking demands.

In relation to the weigh station, the Committee understands that facility is owned by a tenant of the VicTrack land and used under agreement with that tenant. This is not a matter for this Committee.

#### **5.4.5 Findings**

The Committee finds that (new) EPR T2 should formally acknowledge that a route via Miller Street (Route 1) is not a suitable truck route and has recommended additional words to this effect.

The Committee finds that the (new) EPR T2 and EPR B2 contain suitable requirements to ensure that disruption to businesses is minimised.

The relevant EPR have been amended accordingly, as provided in Appendix F.

### **5.5 Precinct 4 – Parkville Station**

#### **5.5.1 Key issues**

The Committee considers the key issues relate to:

- traffic diversions and ‘rat-running’ down residential streets
- emergency vehicle access to the health services precinct
- pedestrian access and safety.

#### **5.5.2 What did the EES say?**

Grattan Street will be closed to traffic for the duration of construction between Royal Parade and Leicester Street. Royal Parade will be reduced to two traffic lanes, plus tram and cycle lanes, in each direction. Bus routes and cyclists will be diverted around the work site. There will be some diversion of pedestrian routes across Royal Parade and Grattan Street but access to the University of Melbourne and hospitals will be maintained.

After construction, Grattan Street will be reopened with one traffic lane in each direction. Right turns from Royal Parade (north) into Grattan Street (west) will be prohibited during and after construction, with the construction of a tram ‘superstop’ at Royal Parade to the north of Grattan Street. Barry Street will remain closed in legacy at Grattan Street (which carries around 18,000 vehicles per day), consistent with the City of Melbourne’s plans.

Construction traffic would arrive via Wreckyn Street, Royal Parade, and Peel Street, utilising local streets including Pelham Street, Berkeley Street, Barry Street, Leicester Street and Bouverie Street and Grattan Street to circulate. Proposed truck standby areas are shown to be located in Grattan Street, Leicester Street, Barry Street, Berkeley Street and Royal Parade.

Swanston Street is predicted to have the most significant increase in traffic due to the Grattan Street closure. Differences with and without construction in 2021 are up to 184 per cent increase with construction (northbound AM peak, north of Grattan Street).

Queensbury Street is predicted to increase by up to 30 per cent and Gatehouse Street by up to 27 per cent (peak direction). Flemington Road north of Grattan Street will experience a drop in traffic due to the Grattan Street closure. Travel demand management would discourage traffic from travelling through the precinct.

During construction, bus routes (routes 401, 402, 403 and 505) using Grattan Street will need to be diverted with several potential alternative routes being considered, with estimated delays of up to four minutes predicted. The construction of a new tram superstop on Royal Parade will have some short term disruption to tram services.

The proposed banning of right turns from Royal Parade into Grattan Street in both directions will reduce tram delays during construction in the AM peak, -92 seconds on journeys from the CBD and -46 seconds to the CBD. However, in the PM peak increased delays are expected during construction from CBD +48 seconds, to CBD +29 seconds.

Investigations are underway to consider improvements for cyclists at the Haymarket roundabout. Additional cyclist infrastructure was recommended along Lygon Street, north of Elgin Street.

Pedestrian routes around the work site need to be managed. The footpath outside the Victorian Comprehensive Cancer Centre (VCCC) will be closed to allow construction of the station entry. A pedestrian/cyclist route will be provided through the construction area on University Square between Leicester Street and Gate 10 on the north side of Grattan Street. Access across Grattan Street will be provided at Berkeley Street.

Peak period usage (two hour) of the three station entries is expected to be in the order of 12,000-13,000 passengers as follows:

- |                                     |             |       |
|-------------------------------------|-------------|-------|
| • VCCC entry                        | 5,000       | (40%) |
| • Royal Parade East                 | 2,700-3,000 | (23%) |
| • University of Melbourne (Gate 10) | 4,100-4,900 | (37%) |

The Victorian Integrated Transport Model (VITM) provided a walking catchment thematic map for the Parkville precinct. Demand for the hospitals sub-precinct was higher north of Grattan Street than south.

### 5.5.3 Evidence and submissions

TN19 provided results of additional technical investigations and analysis around Precinct 4 during construction. The MMRA tested two scenarios for Grattan Street west of Royal Parade: Scenario 1: two-way, Scenario 2: eastbound only. Scenario 2 was preferred as it offered marginally less delay within the model area, optimised accessibility for ambulances accessing Royal Melbourne Hospital and minimised impacts on Gatehouse Street and Haymarket roundabout.

In response to a request from the Committee for analysis on the impact of trams along Royal Parade near College Crescent due to the closure of Grattan Street, TN19 incorrectly identified Cemetery Road West as College Crescent. TN19 proposed two measures to reduce delays to trams at the *“College Crescent[sic]/Royal Parade/MacArthur Road intersection”*:

- a peak period prohibition of right turns from Royal Parade into MacArthur Road
- a decrease in the traffic signal cycle time from 130 seconds to 110 seconds would assist.

TN19 did not include any analysis to support these proposals nor any assessment of wider impacts of these proposals. Mr Smedley supported the recommendations.

TN19 provided data on the change in travel times along Swanston Street, between Grattan Street and Cemetery Road East. The modelling indicated that the closure of Grattan Street would result in increased traffic and delay along this section of Swanston Street. Some peak hour traffic flows will more than double, with delays increasing by up to 100 seconds along the 700 metre section of Swanston Street (AM southbound 65 seconds to 165 seconds). Mr Smedley noted that these increases are considerable and *“any traffic management plan or mitigating works for this area, should look to reduce this delay if at all possible”*.

TN20 was provided in response to issues raised by Mr Smedley in his peer review of the TIA. Travel time analysis was undertaken for three routes, two north-south and one east-west. In response to the information in TN20, Mr Smedley noted:

- i. Royal Parade is expected to increase travel times northbound in the PM peak by around 30%. I believe that this is an acceptable level given the range of construction activity ongoing along this route.*
- ii. College Crescent is expected to considerably increase in travel time by as much as 6 minutes (or 230%). This impact is significant, especially considering that this is one of the few east-west routes through the inner north of Melbourne. ...*

When questioned about the impact on access to the Royal Melbourne Hospital Trauma Centre by private vehicle if the right turn into Grattan Street (west) from Royal Parade was prohibited, Mr Smedley responded that he was not aware whether drivers could turn right into Grattan Street from Flemington Road, as part of an alternate route via the Haymarket roundabout and this access would need to be dealt with as part of the TMP.

Mr Poulson stated that increased traffic in Gatehouse Street and other local streets is not supported by the City of Melbourne. Construction traffic and buses should use other routes. He requested that the right turn from Royal Parade into Grattan Street (west) be maintained for hospital access.

The Walter and Eliza Hall Institute of Medical Research (S373) noted:

*Current traffic management plans do not appear to take into consideration the car park infrastructure access and egress associated with the recently operational Victorian Comprehensive Cancer Centre whose access is via the slip lane in Flemington Road. The removal of right hand turn from Royal Parade onto Grattan Street means southbound traffic is required to utilise the Haymarket roundabout ... This traffic flow creates excessive circulation of traffic ...*

Submitters raised concerns regarding the impact of construction on local traffic flow. The Parkville Association (S294) requested that the TMP be prepared in consultation with local residents and include measures that minimise impacts on Gatehouse Street.

The Graduate Union of the University of Melbourne (the Graduate Union) (S100) raised concern regarding traffic and parking routes, seeking avoidance of Leicester Street, particularly for truck parking. This related to noise concerns and conflict with potential construction works.

Mr Sellars for the University of Melbourne, raised concerns regarding the impact of the closure of Gate 10 on Grattan Street to cars and trucks. TN02 stated that access to the 970

spaces on the campus will be retained at all times, although access from Gate 10 will be limited and 'pedestrianised' during construction. Gate 10 is the University of Melbourne's main vehicular entry and provides access to the South Lawn car park attracting in the order of 1300 vehicular movements (excluding cyclists) over 12 hours. The majority of these movements would need to be relocated to Gate 4 on Swanston Street. Gate 4 currently has limited use by vehicles, with priority given to the heavy pedestrian flow (11,000 pedestrians over 12 hours) onto Swanston Street and the tram superstop, which would conflict with additional vehicular use. The TIA indicated that Swanston Street will be operating at capacity with the closure of Grattan Street.

Prof. Davis gave evidence that the University of Melbourne has a preference to close Grattan Street and Gate 10 to vehicles permanently to facilitate pedestrian access. Responding to questioning by Mr Watters, Prof. Davis stated that the South Lawn car park will probably need to be closed due to constraints with access, which is currently being worked through. The University of Melbourne does not support the use of the University Square car park by construction workers.

The Department of Health and Human Services (S191) (DHHS) expressed concern regarding emergency vehicle access to the Royal Melbourne Hospital, the VCCC and the Melbourne Private Hospital during both construction and post development. It recommended *"consultations be held with Ambulance Victoria operational staff, Melbourne Fire Brigade and Victoria Police during the design phase of the Project to ensure that suitable emergency vehicle access is maintained in the future"*.

Concerns regarding emergency vehicle access to emergency and specialist acute services in Precinct 4 during construction was raised by Melbourne Health and S308.

Submitter S03 raised a concern regarding the loss of a loading zone in Barry Street, and the Graduate Union sought the avoidance of construction vehicles using Leicester Street.

Some submitters were concerned that the TIA did not include an assessment of traffic with the proposed Western Distributor works. VicRoads (S366) submitted that there are a number of proposed major projects within the vicinity of the Project alignment, and *"DEDJTR has developed a working group, consisting of key transport agencies to ensure these projects are delivered in a coordinated manner and the service needs of road and public transport users are maintained"*.

Mr Sellars raised safety and congestion concerns in relation to the proposed temporary pedestrian access across University Square from Leicester Street to Gate 10 on the north side of Grattan Street. Mr McGauran gave evidence that the location and orientation of the Grattan Street entry will influence pedestrian convenience and accessibility.

Mr Smedley supported the principles for consideration of options for diverted bus routes outlined in the PTV letter dated 9 August 2016, accompanying TN20. He recommended a change to EPR T2, to include the need to investigate and implement bus priority measures and intersection improvements, which was adopted.

The University of Melbourne sought to be consulted regarding changes to the bus routes during construction.

TN27 contained animation clips of the Vissim microsimulation traffic model and the STEPS pedestrian model. The STEPS modelling was limited to the Royal Parade/Grattan Street

intersection with station entries on the southwest and northwest corners. The model showed a high volume of pedestrians crossing both Grattan Street and Royal Parade. In particular, the pedestrian flow to and from the VCCC station entry showed a dominant bias towards demand from the north side of Grattan Street.

The University of Melbourne and other submitters requested a station entry on the south side of Grattan Street near University Square to limit the need for students to cross Grattan Street, noting the campus straddles the street almost equally. Alternatively the University of Melbourne sought the closure of Grattan Street. Mr Poulson also called for additional station entries.

Mr Smedley advised that the STEPS pedestrian model was not run for the station entry outside the University of Melbourne Gate 10 as the footpaths are very wide there. The reduction of traffic lanes on Grattan Street will reduce the crossing width limiting pedestrian/vehicle conflict.

Melbourne Health questioned the location of the station entry outside the VCCC and provided data showing that the catchment for that entry would result in a majority of passengers having to cross Grattan Street. Future plans for the Royal Melbourne Hospital include:

- relocating the emergency centre north along Grattan Street (timing 10 plus years)
- creating a tunnel under Royal Parade connecting the hospital to the redeveloped Tri-radiate Building at the University of Melbourne to provide a connection to potential future hospital services on that site.

When questioned regarding the location of the entry outside the VCCC on the southwest corner of Grattan Street and Royal Parade, Mr Smedley acknowledged that STEPS modelling showed a higher catchment to the north. However he had not queried the location of the station entries and he was not aware of the constraints in locating station entries. He noted that it would be important to have easy and safe access across Grattan Street, this he said is provided at the Royal Parade/Grattan Street intersection.

Mr Poulson was concerned that if Grattan Street was limited to one lane in each direction, the reduction in traffic capacity would lead to increased delays. Mr Sellars raised a concern with the legacy concept design of Grattan Street outside the University of Melbourne, which includes widening of the south side footpath, and no change to the north side. Given the existing widths and higher demand along the north side to the station entry, Mr Sellars recommended the widening be on the north side. Mr Sellars noted the legacy design does not reinstate the pedestrian crossing east of Berkeley Street. Given it carries in the order of 300 pedestrians in the peak hour, he recommended it be reinstated in legacy.

With respect to cyclists, Mr Sellars recommended the provision of 'Copenhagen style' bicycle lanes on Grattan Street as a best practice design.

At the transport conclave Mr Sellars recommended additional changes to EPR T1, T5 and T6 (which included an assessment of existing parking demands, uplift in pedestrian and cyclist demands, transport modelling and consultation on bus routes). These were not supported by Mr Smedley, as he considered that they were reasonably covered by existing EPR.

The University of Melbourne requested a number of additional changes to the EPR, some of which were not adopted by the MMRA in its Version 4. These included stakeholder consultation, the timing of reviews of the TMP, a mandatory requirement to consult with car park operators before their car parks are included in the construction worker parking management strategy, and the need to determine what pedestrian comfort levels (referenced in EPR T3) would be appropriate to set as benchmarks.

The Graduate Union requested support for altered emergency evacuation plans and to minimise truck impacts along frontages containing residential facilities.

#### **5.5.4 Discussion**

In relation to the combined impacts of the Project and the proposed Western Distributor Project, the Committee notes VicRoads' submission that this is being addressed by DEDJTR, and that EPR T1 requires the TMP to recognise other Projects concurrently.

The option to keep Grattan Street outside the University of Melbourne closed in legacy, was not considered as a part of the EES. This would have sustaining impacts and is not a matter that the Committee can address. The closure of Grattan Street outside the University of Melbourne during construction will have a significant impact on traffic flows in the region. Grattan Street is a significant east-west link in the Parkville area. It operates at capacity and allows Gatehouse Street traffic to be managed to support a higher level of amenity for residents, as well as providing access to the VCCC and Royal Melbourne Hospital.

The Committee is disappointed that the EES did not quantify traffic volumes on local streets, or identify a list of mitigation works that would be required to ensure a reasonable level of traffic capacity was available with modelling still on-going.

The Committee notes that there will be significant congestion and delay on Swanston Street as a result of the Project. Adding to this is the fate of the South Lawn car park users. The EES did not contain any assessment of the impact of the proposed removal of access from Grattan Street to this car park or other areas within the University of Melbourne. With 970 spaces, it is a significant size, and access to the car park needs to be considered.

While the University of Melbourne indicated that it would consider closing the car park, Mr Sellars did not include that understanding in his evidence. Should the car park remain open it would require access via Gate 4 from Swanston Street if access is not available from Gate 10. The modelling in the EES indicated that Swanston Street is going to be congested and suffer from significantly increased delays without this added traffic. Using Gate 4 for access to the car park would have serious impacts on the safety and capacity of that access for pedestrians, noting Gate 4 connects to the Swanston Street tram superstop.

As a part of the works, it is proposed to prohibit right turns from Royal Parade into Grattan Street towards Flemington Road, to support the location of a new tram stop on the north side of Grattan Street. This right-turn ban, along with the closure of Grattan Street to the east of Royal Parade, will significantly reduce access to the VCCC on-street drop off parking, the Flemington Road car park and the Royal Melbourne Hospital trauma centre parking. Traffic from the north and east will need to use Gatehouse Drive or Haymarket roundabout to reach the hospitals. Should the westbound traffic lane in this section of Grattan Street be closed, vehicles approaching from the Haymarket roundabout will need to travel along Flemington Road and make a U-turn at the Royal Women's Hospital entry to the northwest

of Grattan Street, noting that right-turns from Flemington Road into Grattan Street are already banned. This impact was not assessed in the EES.

The modelling assumed that only 40 vehicles per hour would use Grattan Street westbound. This reflects the imposition of the closure of Grattan Street to the east and the right-turn ban, with the 40 remaining vehicles made up mainly of the diverted buses. This represents a constrained demand, not a real demand. It is worth noting that the analysis looks only at the peak hour travel and not at inter peak travel demands, which would be busier for the hospitals.

To be able to deliver this significant investment in public infrastructure, some tolerance to increased traffic will be required.

EPR T1 requires provision of alternate parking where parking is lost from Grattan Street. No advice is given on how this can be achieved.

Construction of the station entry outside the VCCC will require the removal of the patient drop-off and short-term parking used by hospital visitors. The TMP will need to carefully minimise and manage the impact of this loss.

The potential loss of the South Lawn car park may put pressure on other parking, noting that the South Lawn car park is not operated as a general public or undergraduate car park. This may result in the need to move some drivers to public transport, putting added pressure on trams and buses in the area.

The removal of buses from Grattan Street will result in changes to pedestrian movements. Depending on the outcome, bus passengers may choose to catch a tram or walk to a new bus stop away from Grattan Street. Noting the PTV is yet to resolve this, it is important that the EPR include requirements to address any resulting impacts.

Pedestrian movements between Gate 4 and the Swanston Street tram stop will be impacted by increased traffic along Swanston Street. This will need careful monitoring, and mitigation measures may be required. Should the South Lawn car park traffic be rerouted to Gate 4, this will worsen the situation.

There will be some impacts on public transport during the construction of the Project, and this is unavoidable when delivering a Project of this scale. The long term benefits clearly outweigh any short-term impacts, even considering the duration of the works. EPR T2 provides measures to minimise and manage disruptions associated with the public transport network.

Two station entries have been provided at the western end of the station box. The entry outside the VCCC is connected to the station via a diagonal tunnel under Royal Parade. The Royal Melbourne Hospital was clear that the demand at this entry is generated on the opposite side of Grattan Street, leading to calls to close Grattan Street west of Royal Parade or limit it to eastbound traffic to minimise pedestrian impacts resulting from the location.

The choice of location outside the VCCC was apparently governed by a constraint posed by the operations of the ambulance bays on the northern side of Grattan Street. However, the Royal Melbourne Hospital indicated that it was planning to relocate this facility further north along Royal Parade, with a time frame of 10 years. Mr Smedley did not question the location of the station entries when undertaking his peer review and was unaware of the actual

constraint. Given the Hospital's stated intention to relocate the ambulance facility, such an alternative entrance should be explored.

Mitigating the effects of having this station entry on the south side by partially or fully closing Grattan Street, has longer-term impacts that the Committee believes have not been assessed. It would seem sensible, as suggested by the Royal Melbourne Hospital, to consider creating a dual use tunnel, that could potentially allow full integration of the station with the hospital in a future redevelopment.

Turning to the entry at the eastern end of the station box, the selection of a single entry on the north side of Grattan Street was questioned by submitters. It too is leading to renewed calls to close Grattan Street. The University of Melbourne is no longer focused on the north side of Grattan Street and sees nearly half of its services now located to the south of Grattan Street. The numbers of pedestrians crossing Grattan Street currently meet the threshold for grade separated pedestrian paths. The EES did not provide modelling of future pedestrian movements at this location.

With Grattan Street being excavated to create the station box, consideration could be given to creating a pedestrian tunnel under Grattan Street, similar to the tunnel proposed under St Kilda Road, and providing a station entry on each side of the road.

The University of Melbourne could consider the provision of an elevated pedestrian link over Grattan Street, like those provided between the VCCC and the Royal Melbourne Hospital, to provide safe pedestrian routes linking campus buildings across major public streets. The design of the station entry at the University of Melbourne should ensure that it reflects its role in servicing the local community beyond its campus.

EPR T7 Active transport (operational phase) requires a review of the provision of safe and effective bicycle lanes with the cooperation of the road authority and local council, which should include best practice considerations.

The Committee notes that no analysis was undertaken of the impact of the loss of a traffic lane along Grattan Street for cars to pass right turning traffic into Gate 10. Should the South Lawn car park remain open, or reopen in legacy, this could create further congestion and delay to that already modelled. The South Lawn car park is on the VHR and the impacts of a permanent closure of the South Lawn car park has not been considered in the EES.

The Committee is satisfied that matters raised by Mr Sellars at the conclave in respect of EPR T1 are suitably addressed. With respect to specifying an on-going review of emerging issues in EPR T1, the Committee considers that this can be adequately addressed by the TTWG in approving the monitoring methodology for the TMP.

With regard to EPR T2, the Committee is not convinced that there is a need to specify consultation with key affected stakeholders when determining temporary bus routes. Rather the Committee recommends that the consultation occur with the TTWG so that the TTWG can coordinate the outcomes with the TMP and seek comments from stakeholders as required.

The EES provided no consideration of pedestrian performance levels. The City of Melbourne Walking Plan describes performance levels but provides no guidance on what levels would be appropriate during construction, when lower performance measures may be accepted on a short term basis, providing safety is not compromised. The EPR T3 wording proposed by



the University of Melbourne would enable appropriate performance measures to be established and then used as EPR.

EPR T5 covers the issues related to the need for modelling to underpin legacy road design. The issues of parking management in operation are adequately covered.

EPR T6 is adequate noting the PTV has a responsibility to determine the bus routes and will undertake any necessary consultation.

### **5.5.5 Findings**

The Committee finds that there are gaps in the TIA and modelling undertaken for the EES, however it is satisfied that the EPR includes a number of conditions to ensure this further assessment is undertaken as part of the TMP which will be overseen by the TTWG. The Committee considers EPR TA (now T1) is suitably drafted.

The Committee considers (new) EPR T1 is suitably drafted to require additional transport modelling to the agreement of the TTWG to support a TMP aimed at minimising impacts to local land uses. It has a specific EPR requiring network enhancement projects in Precinct 4 to balance impacts. The TTWG will be responsible for consulting with key affected stakeholders, and includes the City of Melbourne, who are the road management authority for local roads, including Gatehouse Street.

(New) EPR T1 should contain a requirement to minimise loss of parking during construction and replace lost parking at the earliest opportunity to minimise impacts, particularly around the hospitals, noting that EPR T5 was modified during the Hearing to require parking loss to be minimised in legacy. (New) EPR T2 should list Leicester Street in the list of known road closures to be managed, for consistency.

Traffic modelling should consider access to the South Lawn car park both during construction and in operation.

The concern regarding the loss of loading zones is covered by EPR B2, requiring the *“Measures to ensure access to businesses is maintained for customers, delivery and waste”*.

EPR T3 requires further amendment to include a requirement to establish what would be ‘reasonable’ performance levels for pedestrian comfort during construction.

The Committee recommends the MMRA should reconsider the location and number of station entries at Precinct 4. Should only one station entry be provided on the west side of Royal Parade, it should be located to the north of Grattan Street. Consideration should be given to integrating with the future plans of the Royal Melbourne Hospital and the provision of an additional entry on the south side of Grattan Street, near University Square, including a ticket-free tunnel under Grattan Street.

Both the TMP and the legacy design should consider the impacts of the changes to the road layout and connectivity on the users of the hospitals.

The relevant EPR have been amended accordingly, as provided in Appendix F.

## **5.6 Precinct 5 – CBD North Station**

### **5.6.1 Key issues**

The Committee considers the key issues relate to:

- traffic impacts on business continuity
- access for deliveries.

### **5.6.2 What did the EES say?**

With Franklin Street closed, its traffic is expected to primarily divert to Victoria Street. Transport modelling undertaken indicated 60 per cent of traffic could be diverted to Victoria Street before traffic experienced high delays within this Precinct. The EES assigned 20 per cent of the diverted traffic to La Trobe Street. Peak hour clearways are required to accommodate this level of diversion to La Trobe Street without excessive queuing occurring.

A third alternate route around the closure was considered, or broader route beyond the local area for the remaining 20 per cent of traffic currently using Franklin Street, diverting traffic along Victoria Street to Thierry Street and Swanston Street to return to Franklin Street. However, this route is not suitable in the PM peak due to turn bans at Victoria Street. The EES noted that the queue on Victoria Street west approach at Swanston Street in the AM peak would extend back past the next signalised intersection at Bouverie Street.

There would be short-term disruption to tram services on Swanston Street and La Trobe Street (three weekends), to allow for relocation of services and ancillary works. Construction vehicles may cause some limited delays as vehicles exit work sites.

The MMRA advised that where possible, access to businesses and residences would be maintained, but may be severely restricted at times. Cycle lanes will remain open on Swanston Street and La Trobe Street but the closure of Franklin Street will affect cyclists.

Truck standby areas are proposed at two locations:

- Exhibition Street, between La Trobe Street and Victoria Street
- Russell Street, between La Trobe Street and MacKenzie Street (south of Victoria Street).

### **5.6.3 Evidence and submissions**

The MMRA submitted three Technical Notes relating to transport in this Precinct (TN12, TN26 and TN27). With regard to TN12 (Franklin Street legacy), the City of Melbourne requested that Franklin Street east of Swanston Street, not be permanently closed. The Concept Design was modified to allow for one traffic lane in each direction and an east-bound bicycle lane post construction. Access to the loading area under Building 14 at RMIT will be maintained.

TN26 advised that Franklin Street between Victoria Street and Swanston Street carries approximately 6,000 vehicles per day. TN27 contained animation clips of the STEPS pedestrian model at the La Trobe Street/Swanston Street intersection during the AM and PM peak periods.

Mr Poulson noted that the parking lanes along La Trobe Street are too narrow to be used as traffic lanes during peak periods. Therefore, the provision of clearways will not add any

significant capacity. Mr Poulson objected to the provision of truck idling zones within the CBD.

Businesses, such as the Zagame Group (S273) and Aldi Stores (S263), sought continuation of safe and efficient pedestrian and vehicular access to minimise impacts. The unavoidable nature of some disruption was generally acknowledged, and consultation throughout the Project in relation to changes to the road network and accessibility is considered essential.

During the Hearing, EPR T3 was modified to include a requirement for 'wayfinding' information at construction sites to maintain safety during construction. EPR B2 was modified to require a business disruption plan to include *"Measures for supporting affected businesses during construction in accordance with the Business Support Guidelines for Construction such as marketing and promotion, local activation, way-finding programs and upskilling opportunities"*.

The City of Melbourne raised concerns regarding the adequacy of footpaths near the station entries to cater to the changed pedestrian flows in legacy, and the MMRA modified EPR T6 in response.

An opportunity to close Swanston Street outside RMIT between La Trobe Street and A'Beckett Street to cars was raised by Mr Poulson.

#### **5.6.4 Discussion and findings**

The Committee finds that a project of this scale will inevitably result in some impacts to abutting properties and traffic impacts on the surrounding road network. A wide range of EPR have been developed to minimise or mitigate most impacts. In particular, (new) EPR T1 requires a TMP, underpinned by modelling. In Precinct 5, there will be some traffic congestion and delays associated with local road closures. The provision of a TDMS (new EPR T4) will seek to reduce this impact by encouraging the use of alternate travel modes to private car travel, encourage travel at quieter times of the day, and encourage traffic to divert to other routes.

The location of truck idling zones will need the approval of the road management authority and this will be picked up during the preparation of the TMP.

Concerns of local land users relating to way finding, access to loading zones and waste collection are covered by both transport (new) EPR - T1 TMP, (new) EPR T9 waste collection, and EPR B2 business disruption plan.

STEPS microsimulation clips showed significant pedestrian movements near the station. No advice was provided to the level of service or 'pedestrian comfort levels' that should be achieved in design or construction. The Committee recommends (new) EPR T3 be amended to maintain reasonable performance measures and notes that the definition of 'reasonable' will need to be determined in consultation with the TTWG.

It is noted that closing Swanston Street to cars was not considered as a part of the EES. This would have wide impacts and is not a matter that the Committee can address.

The Committee notes that whilst (new) EPR T6 was amended to include a requirement to implement measures to address pedestrian connection at and around stations in response to a concern from the City of Melbourne, the Committee finds that this EPR should include a requirement to consult with the relevant road management authority.

The relevant EPR have been amended accordingly, as provided in Appendix F.

## **5.7 Precinct 6 – CBD South Station**

### **5.7.1 Key issues**

The Committee considers the key issues relate to:

- loss of parking
- restricted access
- accessibility of the underground carpark at the Westin Hotel and Residential Apartments
- traffic impacts due to Flinders Street closures.

### **5.7.2 What did the EES say?**

The EES indicated that the construction of the station would generate approximately 150 truck movements/day operating 24 hours per day, seven days per week within areas of this Precinct. Traffic is proposed to approach the construction site from the south along Batman Avenue and St Kilda Road, and from the west along Flinders Street, using Russell and Exhibition Streets to approach the City Square from Flinders Lane and Collins Street. Truck standby areas are proposed at:

- Exhibition Street, between Flinders Street and Collins Street
- Russell Street, between Flinders Street and Collins Street
- Swanston Street, between Flinders Street and Flinders Lane.

The underground connection to Flinders Street station will require temporary closures of Flinders Street, to allow the tunnels to be constructed using a cut and cover method over a four to six week period. Road closures and associated tram infrastructure works may affect the operation of Flinders Street between Elizabeth and Russell Streets.

Data presented in the EES for the intersection of Flinders Street and Swanston Street indicated that the east approach of Flinders Street (westbound outside Federation Square) carries approximately 18,200 vehicles per day, with approximately half continuing west across the intersection and the most of the remainder turning left towards the Domain. The west approach of Flinders Street (eastbound opposite Flinders Street station) carries approximately 11,600 vehicles per day. Hourly flows on Flinders Street were consistent between 7 AM and 8 PM, although flows on the east approach spike-up during the AM peak period. Access into Swanston Street within this Precinct is limited to authorised vehicles. The intersection of Swanston Street/Flinders Street is operating at saturation levels.

During construction, there will be increased construction traffic in this Precinct with traffic principally occurring outside of peak periods that would *“not materially affect the current operation of the road network”*.

Some limited delays would occur to public transport around site entries. Surface works would need to be carefully managed, as they have the potential to have a major impact on trams on Swanston Street, Melbourne’s tram busiest corridor.

The construction of the station tunnel linking to Flinders Street station would affect all vehicles including trams and buses. The road closure would occur at periods of low seasonal activity to minimise disruption. There will be ancillary disruptions over some weekends. Pedestrian routes will be altered around worksites. Due to high pedestrian and bicycle

numbers and potential conflict with trucks, special consideration is required of the Swanston Street and Flinders Street work site access points.

There are no changes to the road layouts in legacy that would affect network capacity.

The EES stated that the Project would impact a small number of private and public car parks underneath City Square.

The EES included a station entry toward the northern end of the station box at City Square near Collins Street, with a potential additional entry opposite on Swanston Street just south of Collins Street (now abandoned). The City Square entry is expected to accommodate 52 per cent of peak period entries to the CBD South Station, excluding train interchanges.

At the southern end of the station box three entries to Precinct 6 are proposed, one on the west side of Swanston Street, with entry on Flinders Street and one at Federation Square. A pedestrian tunnel will link under Flinders Street into Flinders Street station platforms for interchanging.

Due to predicted population growth, employment and land use changes, there is expected to be approximately 18,000 additional passenger entries/exits at the Flinders Street/CBD South Station for the 2031 Project case compared to 2012.

### **5.7.3 Evidence and submissions**

The MMRA submitted TN13 (D3) outlining the potential for a four to five month closure of the Flinders Street westbound traffic lanes outside Federation Square associated with the construction of a station entry on Federation Square. TN21 (D7) supplemented TN13 outlining potential traffic mitigation measures and alternative traffic arrangements past the construction area. Three alternate arrangements were considered:

- Flinders Street closed to westbound traffic (excluding trams)
- westbound traffic diverted into one of the eastbound lanes
- westbound traffic diverted on to tram tracks.

The full closure to westbound traffic was preferred as it minimises impacts on tram operations and safety. Further work is required on alternative detour routes, including Exhibition Street extension and consideration of tolls on that route. The TDMS would assist in diverting traffic to other modes or bypassing the area.

TN20 noted that the closure of Flinders Street outside Flinders Street station to construct a pedestrian tunnel linking to the CBD South Station would take 6 to 12 weeks and ideally should be undertaken during school holidays to minimise impacts. Constructing the tunnel by closing half the road at a time would take longer and require traffic lanes in one direction at a time to be closed. Coordinating the closure outside Flinders Street station with the half road closure of Flinders Street outside Federation Square to the east could be considered. TN20 stated and included a number of measures could be taken to mitigate the effects of these works.

Mr Smedley gave evidence that while intersection traffic modelling was performed to assess the existing performance of the intersections surrounding the Precinct 6 site, no detailed modelling was performed of the construction impacts. The most significant impacts related to these works are the full or partial closures of Flinders Street. Mr Smedley noted that the broader impacts of the proposed half road closure of Flinders Street outside Federation

Square (TN13 and TN21) have not been adequately investigated and recommended “*Closure of these lane should be considered as a last resort*”. This matter was raised by Mr Smedley at the traffic conclave with the following EPR agreed, but not adopted in the final EPR:

*Flinders Street must be maintained with at least one lane and the tram services operating in each direction unless it can be reasonably demonstrated that any further closures can be appropriately managed without severe disruption and congestion on the network.*

Owners Corporation 3 on plan of subdivision PS 428405M and the owners of the Westin Residential Apartments (the Westin) (S310) submitted that the EES does not create a requirement on the MMRA to provide solutions to manage the impacts of the “*unique*” loss of private car parking in Precinct 6, despite discussions in the EES for replacement car parking in other Precincts. The Westin is located on strata title that includes City Square. The City Square and below ground car park from Flinders Lane are integrated with the structure of the Westin and access to the car parks is shared.

The Westin sought inclusion of a new EPR to ensure that suitable access to parking and replacement storage facilities would be maintained during construction and temporary occupation of City Square. Given the nature of impacts, the Westin sought the completion and implementation of the legacy design for the reinstatement of parking on their site at the earliest opportunity.

The Ross House Association (S182) operates at 247-251 Flinders Lane, and due to its work on social and environmental justice, attracts 70,000 visitors each year. The Association supports the Project, but expressed concern regarding pedestrian access and safety during the construction phase, particularly as Ross House provides services to the disability sector and has many visitors with vision impairment or mobility issues. It sought all ability pedestrian access at all times.

Mr Vorchheimer raised concerns regarding impacts on the Victoria Police operations in Flinders Lane. While this submission was heard in camera by the Committee and is treated as confidential and will not be reported upon, it has been taken into account.

ALE/ALH Group made submissions relating to impact on the Young and Jacksons Hotel. Of concern was the impact on general access and for delivery vehicles. The Group made several EPR recommendations including specifying the timing for EPR TA and T1 to commence in pre-construction. A transport impact report was prepared by Mr Coath, tendered as part of its submission.

#### **5.7.4 Discussion**

The Committee agrees with Mr Smedley that additional investigations are required to ascertain the full impact of the proposed half closure of Flinders Street outside Federation Square. Unlike the closure to the west of Swanston Street, which will be over a limited six week period and scheduled to occur mainly in low traffic periods, the closure to the east is expected to occur for up to five months.

A closure of a major thoroughfare carrying 30,000 vehicles per day can have significant impacts on the surrounding road network if suitable alternate routes are not available. The Committee notes that the TDMS will seek to reduce private vehicle travel particularly within the CBD. The impacts of this can be estimated, with guidance from the current TDMS

operating in Sydney, but is unlikely to fully account for a reduction in capacity of this nature, noting limited alternate routes are available. Notwithstanding this, transport modelling can be adjusted to account for any reductions due to transport demand management.

The Committee disagrees with Mr Smedley that a new EPR should be included to specify that at least one lane westbound be maintained. EPR T2 requires that transport modelling must support any full or partial closure of traffic lanes in Flinders Street, in consultation with the TTWG. The road management authority will need to approve any lane closures.

The Committee agrees with the Westin that the car parking issues it raises warrants attention.

### **5.7.5 Findings**

The Committee finds that there was little consideration given to local parking impacts in the EES. While inner Melbourne is highly walkable and accessible by public transport, there are nevertheless some needs for parking including, disabled, waste collection, deliveries and 'Police Only' vehicle parking. Truck staging zones and construction access could disrupt parking. A parking management plan should be prepared as part of the TMP to ensure that impacts of the construction of the Project on parking are minimised and managed.

The Committee finds (new) EPR T2 is suitably drafted to address concerns regarding impacts on Flinders Street, however it should include provision of a parking management plan for both private and public parking during construction.

The Committee finds (new) EPR T2 is suitably drafted to address concerns regarding impacts on Flinders Street from road closure.

The impact on the Westin is unique and will require suitable solutions to mitigate impacts. EPR SC1 adequately manages the impacts during construction. A new Transport EPR (T10) has been included to ensure that the legacy design includes appropriate reinstatement or replacement of the Westin car park.

The relevant EPR have been amended accordingly, as provided in Appendix F.

## **5.8 Precinct 7 – Domain Station**

### **5.8.1 Key issues**

The Committee considers the key issues relate to:

- alternative location for the Domain station
- the need for a station at Domain
- safety risks associated with construction traffic, particularly students and staff of Melbourne Grammar School
- accessibility to residences and businesses
- emergency vehicle access
- disruption to tram services
- pedestrian access and flow

### **5.8.2 What did the EES say?**

VITM was used to determine the quantum of traffic diverted due to the closure of Domain Road at St Kilda Road and the reduction in traffic to one lane (plus cycle and tram lanes) in

each direction during construction (2021 Construction Case). Vissim microsimulation modelling was undertaken to check the impacts on delay and intersection capacity along the section of St Kilda Road, between Park Street and Toorak Road/Kings Way, including the intersections at each end:

*A comparison of the 2021 Base Case and the 2021 Construction Case indicates a reduction in trips through the Vissim modelled area of approximately 25 per cent associated with the reduction in capacity of St Kilda Road. However, some specific movements through the area indicate a greater or lesser increase or decrease. These OD trips have been used as inputs into the Vissim 2021 Construction model.*

Due to road and lane closures during construction, total completed trips in the Vissim model (two hour AM peak period) would be reduced by 5,160 trips (-28 per cent from 18,190), and in the PM peak, would drop to 4,100 (-23 per cent from 18,200). This includes trips diverted from Domain Road as well as the limited capacity on St Kilda Road through the construction site. The analysis assumes 2,800 peak period vehicles are diverted from St Kilda Road (1,400 vehicles per hour).

Table 8-38 of the TIA outlined potential diversion outcomes which include works in the Kings Way, Canterbury Road-Ferrars Road, Beaconsfield Road and Hoddle Street-Punt Road corridors, as well as TDMS reductions. The measures outlined were estimated to accommodate between 1,700 to 3,000 vehicles over the two hour peak period (850 to 1,500 vehicles per hour). The TIA noted that additional investigations are underway on a number of other potential measures, including a median on Kings Way, between Queens Road and St Kilda Road.

Vissim modelling for the 2015 base case, 2031 No Project case and 2031 Project case indicated a small difference in network parameters, with total completed trips varying by around 2 per cent between scenarios. There was some variation in origin-destination trips through the model. However, if only two lanes are provided in the peak direction (no clearway) then the variation with the Project increased to up to 7 per cent (capacity reduction). The TIA concluded:

*Should the parking lanes be retained in peak periods the operation of St Kilda Road would be less efficient with increased queuing and delays. As the physical network allows for a three-lane operation, it is reasonable to expect that would be the arrangements in Melbourne Metro Legacy Project Case.*

The TIA stated that “Access to businesses and residences at station construction locations would be maintained where possible but some access to some would be severely restricted”. The TIA was prepared under the assumption that emergency vehicle access through each construction site would be maintained at all times. EPR T1 dot-point 16 required the TMP to consult with emergency services and develop suitable measures to ensure emergency service access is not inhibited by construction.

The TIA was prepared under the assumption that pedestrian and cycling connectivity would be maintained during construction where possible. The EPR addressed the connectivity assumption. Bicycle lanes and footpaths would be provided along both sides of St Kilda



Road during construction, although a lower level of service to existing may be experienced by cyclists. In legacy, 50 bicycle parking spaces would be provided at Domain station.

Project construction was assessed as having 'Medium' risk impact on public transport operations. Rerouting the Number 8 tram would adversely affect some current tram users, in particular those to the north and east of Domain Road and Park Street, South Yarra, but would improve access to those closer to Toorak Road.

Peak period travel time data indicated tram travel times through the St Kilda Road construction site would be expected to decrease by up to one minute during construction due to the removal of tram stops. However, the Number 8 tram is expected to have a longer travel time due to delays at the Toorak Road/Kings Way/St Kilda Road intersection, by an extra one to two minutes depending on direction and time of day. Peak period data indicated buses along St Kilda Road are expected to have increased travel times of up to 67 seconds.

EPR T2 requires the contractor to develop and implement measures to minimise disruption to public transport services to the satisfaction of PTV.

Tram routes 55 and 8 will merge permanently as Route 8 in the 2031 scenario, and travel along Park Street, Melbourne to St Kilda Road. This change does not allow a direct comparison of travel times with and without the Project. Impacts on other tram routes and bus routes show small changes of between +13 seconds and -25 seconds, depending on direction and time of day.

The EES stated that there are approximately 390 spaces within the study area with on-street parking provided on nearly all streets, including some loading zones. Parking rates are noted as generally high in the Precinct. The EES noted parking loss as an issue in legacy, stating that around 150 spaces will be lost in the area due to the new tram interchange and reconfiguration of St Kilda Road without service roads. This loss is considered significant but will be offset by *"the provision of a new high capacity rail station that provides connections across the broader metropolitan network together with a clearer road network"*.

The three station entries are concentrated at the city end of the station box at Domain and Albert Roads. The VITM model provided a walking catchment thematic map for Precinct 7, which showed demand to the west of St Kilda Road both north and south of Albert Road, as well as to the east of St Kilda Road. Highest demand blocks extend south to Toorak Road and north beyond Park Street. Peak period usage (two hour) of the three station entries are expected to be in the order of 8,500 passenger movements. The Shrine of Remembrance stop is expected to be used more heavily on weekends and for special events than on weekdays. A pedestrian tunnel will be provided under St Kilda Road, between Albert Road and the Shrine, outside the station ticket gates.

### **5.8.3 Evidence and submissions**

TN20 was provided by the MMRA for sensitivity testing for travel and delay on St Kilda Road if fewer than 1,000 vehicles per hour redistribute to outer routes during construction. The modelling showed limited ability to accommodate additional vehicles, with even a small increase having a large impact on some approach queues, particularly Toorak Road where queuing extended east to Park Street. TN20 provided journey times along St Kilda Road for the 2021 Base, 2021 Construction and 2021 Construction Sensitivity testing, and noted

*“Northbound travel times increase by 70-80 seconds over the Base time in both construction scenarios”.*

TN26 (D7) advised that Domain Road currently carries 10,000 vehicles per day at Dallas Brooks Drive.

TN63 (D227) provided a response to the Committee’s question of how the loss of up to 5,000 vehicle trips in the microsimulation model over the two hour peak period is accounted. In addition to the diversion of St Kilda Road traffic stated in the EES (2,800 vehicles) the remainder would be accounted by loss of east-west movements using Park Street, Domain Road, Kings Way and Toorak Road.

Mr Smedley noted that during construction when St Kilda Road is limited to a single lane in each direction, there will be limited capacity to accommodate additional traffic to that modelled on St Kilda Road. The TDMS will be very important to re-route and re-mode trips. Complementary road works on alternate routes will assist. Mr Smedley referred to the Sydney Light Rail Project as an example of where a comprehensive TDMS is currently working quite well to achieve a reduction of trips in the Sydney CBD.

Mr Smedley was questioned by Mr Tweedie on the loss of 5,000 trips in the peak periods in the microsimulation model between the 2021 base and 2021 construction scenarios. Mr Smedley said some of the trips may start, but not get out in the time period; and acknowledged the loss of completed trips was significant. In relation to TN19, Mr Smedley said:

*This analysis heightens the need for a significant package of mitigation works on the surrounding network to accommodate this traffic, and it supports the need for a comprehensive travel demand management strategy to be implemented if this part of the network is to be able to function appropriately during this construction phase. ...*

*If those trips are successfully diverted away through either Travel Demand Management or other capacity enhancements, then the original analysis indicates that this construction zone will operate at satisfactory levels.*

Further, he advised that:

*The modelling showed that there is forecast to be high levels of diversion around the worksite due to the closures, as well as implementation of transport management measures. The modelling showed that that there was minimal impact on the road network due to the construction activities.*

He understood that alternatives were considered at this location, such as keeping two lanes open, but these would have significantly extended the duration of the works and so draw out the period of congestion and disruption. Consultation undertaken by the MMRA indicated that higher impact over a shorter duration was preferred.

Mr Smedley was questioned regarding the impact of the TDMS at Precinct 7, having consideration to the quantification of volume effects of the mitigation measures outlined in the EES. Mr Smedley noted the TDMS is not only about numbers, it also about informing the public. He agreed that public transport is at capacity on St Kilda Road, and trams and buses will play a part not just here, but across the network. He was satisfied that capacity

constraints would be addressed through the TDMS and network enhancements. Ms McArthur assisted by giving evidence describing what and how a TDMS works, drawing reference to experience in Sydney.

The City of Port Phillip, who strongly support the Project, called for early delivery of complementary projects such as the Park Street Tram link and bicycle network connections to support the TDMS. The City of Port Phillip supported the restriction of St Kilda Road to a single lane in each direction due to it enabling a reduced time period for construction, assisting in minimising the length of time of adverse impacts.

Some submitters (including S311 and S265) recommended that Domain Station be located at the edge of the Shrine Reserve, and noted such a location would remove the major worksite from St Kilda Road. They argued Domain Road could stay open and other local streets would be less impacted. One submitter suggested an alternative location at Fawcner Park.

A number of submitters raised concern regarding ambulance access to local land users. MGS raised a concern regarding access to its fire panels, fire boosters and emergency vehicle access at various locations around the school.

Access for emergency vehicles was raised as a particular issue during construction. In its submission, the Metropolitan Fire Brigade (S316) emphasised the need for ongoing consultation during construction to ensure that it could continue to provide emergency services.

Restricted access for residents, particularly retirees in Precinct 7 was raised by a number of submitters (S330, S240) citing the following concerns:

- emergency vehicle access
- restricted parking for visitors
- difficulty entering and leaving on-site parking
- disabled access.

Submission S153 expressed concern about emergency vehicle access in the block between Bowen Crescent and Kingsway Extension. Alfred Health (S82) was concerned the EES failed to mention the *“possible impact on emergency access to the Alfred despite the significant traffic congestion that will likely occur on St Kilda Rd and potentially other feeder roads in the area during the construction of the Domain Station”*

TN15 outlined additional construction areas in Precinct 7, including Albert Road, Bowen Crescent and Bowen Lane. In response to questions from the Committee, Mr Smedley advised that he is not aware of the length of time that local roads off St Kilda Road would be closed. He did not believe that the traffic modelling took account of these closures and did not know what the local impacts would be.

TN26 advised that Bromby Street will be temporarily reopened at St Kilda Road for left turning traffic to facilitate movements of MGS traffic and access to the school car park from Bromby Street.

Vehicular access to property was a key concern, including restricted access to basement carparks and the temporary loss of car on-street parking for visitors. S96 stated *“the road closures that are planned make it almost impossible to exit our building via Queens Lane”*.

The Botanica apartment building is located on the corner of St Kilda Road and Bowen Crescent. It has two car parking areas, one accessed from St Kilda Road and one from Bowen Crescent, which are not interconnected. Loading is typically undertaken via the St Kilda Road car park as its grade is more suitable than the Bowen Crescent car park, and the main pedestrian entry does not have ramp access. Parking surveys around the Botanica indicated an occupancy level of 65 per cent at lunchtime and around 45 per cent at night. Noting the absence of any parking assessment in the EES, Mr Kiriakidis recommended:

*Construction management plans prepared for Domain Station that require temporary changes to vehicle and pedestrian access are shared with the body corporate representing 400 St Kilda Road to ensure sufficient notification and to ensure that all matters are satisfactorily addressed.*

MGS raised concerns regarding the construction impact on vehicle access, car parking reduction, emergency access, bicycle and pedestrian access and safety and location of tram stops for its 1,100 students and 250 to 300 staff, particularly during examination periods and sporting events. Mr Young for MGS noted that the Project will increase accessibility for the school to rail services for staff and students, allowing some students to change from tram to train and free up capacity of tram services past the school. A mode shift from car is likely.

In relation to the transport modelling in the EES, Mr Young submitted it provided insufficient data to allow him to undertake a full assessment of the risk of traffic congestion impacts as the outputs are only of the “median seed” run. Mr Young questioned the lack of travel time information in relation to traffic diverting around the closure of Domain Road and considered the traffic model to be overly optimistic in its assumption. He noted:

*Assessment of the delays associated with the wider road network leading into the Domain Station precinct is limited to a broad scale model.*

*There has been little consideration with respect to the capacity of the potential diversion routes to accommodate the additional traffic ...*

In relation to parking, Mr Young provided survey data showing parking availability to the east of St Kilda Road. In Domain Road, the parking demand peaked in the morning at 85 per cent, the average demand around the school frontages was 59 per cent. He recommended that parking be maintained for the school along the Domain Road and St Kilda Road frontages during construction.

The Domain Owners Corporation (S190) raised concerns about the loss of parking during construction and its impact on residents, which was not assessed by the EES. It sought the construction zone “be kept to the minimum area possible” and “the IAC should recommend that all possible public parking bays in Albert Road be retained during the construction period”.

TN43 introduced the Residential Impact Mitigation Guidelines for Construction (draft RIMG) (also referenced in EPR SC2 and NVB), which stated with respect to loss of access:

*There may be circumstances where access to residential properties is temporarily restricted for periods of time during construction works.*

*Respite or alternative accommodation will be offered to residents as appropriate where access to or egress from their property (including for*

*vehicles) is temporarily unavailable and adequate alternative access has not been provided.*

Ramsay Health (S295) was concerned about access via Bowen Lane to the medical clinic's car park for parking and ambulances. Parking on Albert Road is important for patient drop-off and pick-up, included for disabled persons.

Melbourne Girls Grammar School expressed concern regarding the removal of the Number 8 tram from Domain Road due to the additional walking distance required to access the tram at Toorak Road. The school sought additional measures to improve safety of students walking along Park Street, South Yarra, such as increased lighting and surveillance. It sought a vehicular drop off area due to heightened construction activity and a potential increase in the number of students being driven to school.

Mac.Robertson Girls High (S61) expressed concern for students crossing Kings Way with the extra traffic and requested a reduced speed limit, crossing supervisor and a student drop-off area to cater for an increase in students being driven to school due to the Project impacts during construction.

PTV submitted there is adequate capacity in the tram network to cater for additional passengers diverted from car travel, citing daily data. PTV noted it will review the need for additional capacity, with new rolling stock becoming available that will release larger capacity trams for Route 8. A bus service will be considered to provide a replacement service to the deviated tram service on Domain Road. Mr Young referred to PTV data that showed peak hour tram patronage at Domain interchange is at, or approaching capacity at times.

EPR TB Waste collection was added by the MMRA during the Hearing to address concerns raised by various submitters, including the Botanica and MGS. This EPR supports EPR B4, which contains a requirement that a Business Disruption Plan be prepared and that it include, amongst other things, measures to ensure access to businesses is maintained for waste removal.

Regarding construction impacts, VicRoads submitted that *"it will be important that any permanent change to the network is considered in the broader network context and informed by the operation of the network during the construction phase"*. Other submitters, (including S288) raised concerns regarding the loss of parking and road design issues in legacy. The replacement of the service roads with a median will significantly reduce parking opportunities and reduce opportunities to undertake U-Turns.

At the transport conclave, Mr Kiriakidis sought an EPR specifically addressing sight distances for vehicles exiting the Botanica's St Kilda Road car park in the legacy design, given the geometry of the road and proposed changes to road layout. Mr Smedley acknowledged the issue but believed the request was too specific and suggested EPR T5 adequately addresses it.

Mac.Robertson Girls High submitted that a station entry be provided at the southern end of the station to facilitate movements of students along Bowen Crescent to its school.

PTV advised that it has not formally made a decision on whether to reinstate the original route for the Number 8 tram and would assess this during the construction stage.

Mr Young recommended a number of changes to the EPR at the transport conclave that have not been adopted by the MMRA. The changes include specific controls to minimise impacts to MGS during construction by ensuring safe and convenient access is available to the school and a requirement to consult with the school on the ultimate decision on the return of the Number 8 tram line to Domain Road.

Mr Smedley did not support these additional recommendations on the basis that they were either too restrictive or already covered adequately by the EPR.

The Botanica sought a number of final changes including the inclusion of a car park management plan in the list of items to be reviewed by the TTWG, the inclusion of Bowen Crescent and Bowen Lane in the list of roads to be managed during construction, suitable access to 400 St Kilda Road at all times, and a Precinct access study during construction.

TabCorp (S265) sought EPR to ensure Bowen Crescent and Bowen Lane remain open for their full length from the Queens Road end and for the repair of any damage to road surfaces.

The EPA (S291) sought the inclusion of additional wording in EPR TB to require minimal change in waste collection times.

#### **5.8.4 Discussion**

The TIA relied on the VITM model and a Vissim microsimulation model limited to the affected length of St Kilda Road within the construction zone. The EES and Technical Notes noted that the Vissim model for the construction scenario loses approximately 5,000 vehicles per peak period, with only 3,000 vehicles per hour accounted for by loss on St Kilda Road. The mitigation measures, including works, travel demand management and peak hour spreading, are reportedly able to cater for between 1,700 to 3,000 vehicles over the two hour peak period. Presumably, the remaining lost vehicles relate to the closure of Domain Road, however where these vehicles are shifted to is not assessed.

The only comment on the impact of the closure of Domain Road and subsequent diversions required for traffic and travel time impacts, other than the Number 8 tram is made in TN20 which suggests that the traffic diversion is included in the VITM model. As noted in TN63, volumes through the Precinct 7 microsimulation model will be different, but more accurate, than from the VITM strategic model.

It is of concern that the microsimulation model for Precinct 7 only included St Kilda Road and not any alternate routes (including Kings Way) that would allow a more accurate assessment of impacts than the VITM model, which should be used primarily for screen line analysis. By comparison, a larger mesoscopic network was modelled for Precinct 4.

The Committee notes that Mr Smedley sought additional assessment of the impact should less traffic deviate from St Kilda Road than modelled via sensitivity testing. However, this testing found that there was limited spare capacity to take additional traffic than that modelled, with significant queuing an outcome. Given that the Vissim model would have stopped adding traffic to the network when it reached capacity, this result is expected.

A list of proposed mitigation measures was provided in Table 8-38 of the TIA, and includes the impacts of peak spreading and other TDM measures as well as works in the Kings Way, Canterbury Road-Ferrars Road, Beaconsfield Road and Punt Road-Hoddle Street corridors.

However, the volume of traffic that the mitigation can account for falls well short of the amount of traffic missing from the Vissim 2021 construction model. The assessment goes on to note that additional investigations are underway for Kings Way. However, no outcome of those investigations was provided to the Committee.

As Mr Smedley advised, *“this is a significant risk and if not managed appropriately could have extensive impacts to the network”*. Consideration may need to be given to the provision of a third ‘tidal flow’ lane to provide suitable capacity. It is noted that the listed mitigation measures would be suitable to cater for the reduction in traffic capacity on St Kilda Road in the legacy state.

The Committee is concerned that despite the assistance of the TTWG over the last 12 months, definitive mitigation measures have yet to be determined to provide reasonable confidence that the traffic impacts as a result of limiting St Kilda Road to one lane in each direction and closing Domain Road, can be reasonably mitigated to an acceptable level.

The Committee was not provided with any assessment of traffic impacts on residents and businesses, and was advised that additional local roads may be closed during construction for unspecified times. One of the potential traffic mitigation measures listed in the EES to assist through traffic would add a further constraint on local access (median island on Kings Way at Queens Lane).

While the Vissim model animation clips showed traffic entering and exiting local areas onto St Kilda Road, this was not reported in the EES or in the Technical Notes. The Vissim model did not include any local intersections with Kings Way. The VITM model does not include local streets.

The Committee expects there to be a significant impact on car parking availability and vehicular accessibility of the local area around Bowen Crescent-Bowen Lane. It notes there may be periods when the Botanica’s St Kilda Rd car park will not be accessible.

EPR T1 TMP is aimed at minimising disruption to affected local users and includes a requirement for additional modelling as well as a monitoring framework. It is noted that the list of roads to be managed in EPR T1, point 1, does not include Bowen Crescent and Bowen Lane. This is at odds with the EPR including Langford Street, North Melbourne that would be similarly affected. Suitable access must be provided to medical facilities such as Ramsay Health.

Parking management will need to be reviewed in the area due to the significant loss of car parking during construction, and in legacy.

EPR SC2 draft RIMG, EPR SC3 Stakeholder and Community Engagement Plan, along with EPR T5 TDMS, will manage community consultation, provide travel advice for the local community and provide for relocation in cases of loss of access. It would be unreasonable to expect a Project of this magnitude and significance to occur without some impacts, including temporary loss of access to driveways.

The rerouting of the Number 8 tram from Domain Road to Toorak Road west will create some inconvenience to users. However, the additional walking distance to Toorak Road is not an unreasonable impact of delivering this Project. A safety review, including disability compliance of the primary pedestrian pathway linking between Domain Road and the new

tram stop on Toorak Road should be undertaken. PTV is appropriately considering the need to provide a local bus service to minimise the impacts.

It is appropriate for PTV and VicRoads to assess the impacts of the temporary re-routing of the tram before making a final decision on whether to return it to Domain Road following construction. In effect, there will be several years of a trial service to enable an evaluation to be carried out before a decision needs to be made.

Trams are expected to be kept operating along St Kilda Road, and the PTV are chartered to monitor the demand and adjust capacity to meet changing needs.

In relation to the early implementation of the Park Street Tram Link, the Committee was provided with insufficient evidence to make a recommendation on whether it should be included in the EPR to assist in mitigating transport impacts.

All land uses generate some need for deliveries and waste removal and it would be expected that plans be put in place to ensure that this can continue. The EES included the issue of delivery and waste collection for businesses under the Business EPR. However, this does not extend to other land uses that rely on vehicular access to property, kerbside parking or public loading zones to undertake deliveries and waste collection. It was not reflected or cross-referenced in the initial transport EPR.

The inclusion of EPR TB on waste within the transport EPR is appropriate. However, the Committee recommends that the list of land uses be omitted to ensure some unlisted land uses are not inadvertently missed, references to business should be changed to properties and the reference to waste disposal locations being removed include where waste disposal locations are obstructed. In relation to the suggested inclusion by the EPA, the Committee considers that this condition may reduce the flexibility of the contractor to provide alternative waste collection rather than improve the EPR. Notwithstanding this the, EPR are sufficiently broad not to discount this as an option.

### **5.8.5 Findings**

The Committee finds that there will be significant impacts on all land uses and users in and around Precinct 7 that the EPR will seek to manage and mitigate. The Transport EPR are, in the main, intentionally broad to focus on outcomes rather than specific procedures. The Committee agrees with the traffic experts that additional modelling is required in the preparation of the TMP. This modelling should include local streets in the Precinct including streets which may attract traffic currently using Domain Road, such as Linlithgow Avenue. EPR T1 should include Bowen Crescent and Bowen Lane in the list of named roads and the EPR have been amended to reflect this.

The Committee is not convinced that the transport assessment has proven that the impact of limiting St Kilda Road to a *“minimum of one lane”* in each direction is acceptable, and recommends a modification to EPR T1 to refer simply to *“two-way traffic”* to reflect this concern and allow a final decision to be made in consultation with the TTWG having consideration to the additional modelling required.

The Committee accepts that it will not be possible to guarantee continuous access to the St Kilda Road car park at the Botanica, and finds that a requirement to replace any private parking lost for any significant time, be included in (new) EPR T1. The draft RIMG will address short term impacts.



In relation to access to Ramsay Health, (new) EPR T1 should be modified to include reference to medical facilities in the Domain Precinct in the provision of suitable routes for vehicles to maintain connectivity for road users.

Regarding parking, the Committee finds that there will be a need for a parking management plan due to the significant changes to parking conditions. The plan should consider the needs of various user groups including disabled and loading bays. The plan would form part of the TMP. (New) EPR T1 should seek to minimise the loss of parking during construction.

In relation to public transport accessibility and the reinstatement of the Number 8 tram, the Committee accepts that the PTV have an ongoing responsibility to provide sufficient and safe public transport capacity that best suits its range of users. A suitable pedestrian route should be provided between the intersections of Domain Road/Park Street and Toorak Road Park Streets to facilitate safe access to the diverted Number 8 tram, in South Yarra.

The relevant EPR have been amended accordingly, as provided in Appendix F.

## **5.9 Precinct 8 – Eastern portal**

### **5.9.1 Key issues**

The Committee considers the key issues relate to:

- accessibility
- increased congestion
- loss of car parking
- upgrade of South Yarra station.

### **5.9.2 What did the EES say?**

Work will be undertaken on a 24 hour 7 day a week basis over 30 months, attracting an average of 100 daily truck trips and a peak average daily trip rate of 134 trips. There will be disruptions to local traffic particularly in Osborne Street, Arthur Street, William Street and Chambers Street.

Truck access will be from Toorak Road and Osborne Street to Siding Reserve, via a new bridge across the Sandringham rail line. This new will bridge remain in legacy to provide pedestrian and cycle access into the reserve from Osborne Street.

Local truck access will be via Toorak Road and Chapel Street, using a series of local roads including Osborne Street, William Street, Arthur Street and Chambers Street. Fawkner Street may also be used.

Shaft access adjacent to Osborne Street may temporarily affect access to residential properties.

The expected truck traffic represents less than a one per cent increase in daily traffic on Toorak Road. No modelling has been undertaken as the data or site observations indicated modelling is not required to support the assessment. It is expected that traffic can be managed effectively with minimal impact.

Works will interrupt train lines that run through South Yarra Siding Reserve over short time periods, ranging from overnight to 16 days.

Trucks accessing the worksite may result in some limited delay to tram movements along Toorak Road. Otherwise there is negligible impact on the reliability of tram and bus services in the area.

Lovers Walk and the William Street Bridge will be removed for the duration of the construction works. Alternative routes for cyclists and pedestrians are less direct and measures would be implemented to direct these movements safely and efficiently around the work sites.

Matters relating to South Yarra station are dealt with in Chapter 20.1.

### **5.9.3 Evidence and submissions**

Mr Hunt gave transport evidence on behalf of the City of Stonnington. He recommended that microscopic and mesoscopic transport modelling be undertaken in the Precinct to ensure the impact of the construction traffic was managed, particularly around the Toorak Road/Osborne Street intersection which he suggested may need to be signalised. Local traffic management treatments will need to be removed to facilitate truck access.

At the conclave, Mr Hunt recommended specific wording in EPR T1 to prevent or minimise trucks using any other local roads except for Osborne Street to Toorak Road. Mr Smedley agreed that Chambers Street and Bond Street were unsuitable as truck routes, but was concerned about specifying particular streets as it may be too restrictive. EPR T1 requires the use of local streets to be minimised where practicable.

Submissions S364 and S19 expressed concern about the impact of loss of parking, increased parking demand from construction workers and increased traffic in local streets, including Arthur Street due to the closure of William Street.

### **5.9.4 Discussion and findings**

The Committee finds that the construction work in this area will result in significant traffic and parking impacts. The EPR have been drafted to manage and mitigate impacts where possible. EPR T1 requires a TMP underpinned by transport modelling, which will establish mitigation and management measures to minimise impacts.

It will not be possible to prevent all trucks from using local streets other than Osborne Street, as some flexibility will be required in what is a constrained area, particularly with construction of the William Street Bridge and rail works to the east.

## **5.10 Precinct 9 – Western turnback**

### **5.10.1 Key issues**

The Committee considers the key issues relate to:

- loss of commuter car parking during construction
- construction route not identified.

### **5.10.2 What did the EES say?**

The TIA for the Western turnback during the construction stage stated:

*The scale of works and the availability of land within the VicTrack property boundary to accommodate the works would result in very limited impact on*

*the traffic operations in the local area. Truck activity is expected to be low and well within the capacity of the local road network.*

EES Map Book (Map 15) indicated that the construction traffic would utilise Cross Street to access the construction sites, noting the construction site area shown does not extend to the southern side of the rail lines. The Map Book indicated that the western section of West Footscray station car park on Cross Street will be occupied during construction.

The TIA stated car parking facilities would need to be maintained during the works or alternate arrangements made for replacement. Options are being investigated to provide replacement parking near the station to minimise impacts on rail patrons driving to the station.

### **5.10.3 Evidence and submissions**

The MMRA modified EPR T1 during the Hearing to include the words “*and minimising the use of local streets where practicable*” when considering potential truck routes as well as requiring consultation with the TTWG on the TMP. A new noise and vibration EPR NVB was added controlling haulage truck routes to minimise impacts.

Maribyrnong City Council (S314) noted that West Footscray is specified as a major construction site, however preferred traffic routes have not been shown. The Maribyrnong City Council sought the opportunity to comment on any proposed construction traffic routes, its submission raised a concern that the Project will place additional demand and stress on available parking within the area, noting the commuter car parks along this corridor need improved controls to minimise impacts on urban amenity and pedestrian safety, in particular, to stop ad hoc and illegal parking.

A range of improvements were identified by Maribyrnong City Council for the area including improved parking controls.

### **5.10.4 Discussion and findings**

Access to the construction site will be required using local roads. The size and quantity of vehicles to be generated by the works is not known and hence its impact cannot be determined. The construction zone will consume a small section of commuter parking and the MMRA has not identified where this could be replaced. (New) EPR T2 is amended to include provision for alternate commuter parking.

The relevant EPR have been amended accordingly, as provided in Appendix F.

## **5.11 Recommendations**

- 3. Investigate an alternate option to locate the Linlithgow Avenue access shaft on the western Linlithgow Avenue carriageway at the northern end of Tom’s Block in Precinct 1.**
- 4. Review the location and number of station entries proposed in Precinct 4 - Parkville station.**

## 6 Land use and planning

Land use and planning impacts are addressed in Chapter 9 of the EES, and in Technical Appendix E.

The draft evaluation objective of the Scoping Requirements in relation to land use and planning at 4.4 is:

*To manage effects on the social fabric of the community in the area of the Project, including with regard to land use changes, community cohesion, business functionality and access to services and facilities, especially during the construction phase.*

The following evidence was called in relation to land use and planning:

- MMRA - Rob Milner of 10 Consulting Group
- RMIT - Hugh Smyth of SJB Planning
- Hobsons Pty Ltd and Karaoke Pty Ltd - Andrew Clarke of Matrix Planning.

Numerous submissions made reference to a range of land use and planning impacts.

EPR LU 1 to 4 specifically dealt with matters relating to land use and planning.

### 6.1 Key issues

The Committee considers the key issues relate to:

- changes to land use from the Project
- support for the 'alternative design' for Precinct 2
- justification for a station at Precinct 7 and use of the 'cut and cover' construction method
- loss of public open space across the Precincts
- opportunities for redevelopment in conjunction with the Project
- operation of the proposed planning controls.

### 6.2 What did the EES say?

Technical Appendix E *provides an assessment of the land use and planning related aspects associated with the construction and operation of the Project, including impacts on land use and built form, land acquisition, access and existing planning controls and approved developments.* The assessment considered:

- the concept and form of the Project
- the Project scoping requirements, and relevant legislation, policy and guidelines applying to the Project
- policy and guidelines applying to the Project
- strategic justification for the Project in planning terms measuring the Project against the State Planning Policy Framework (SPPF) and the Local Planning Policy Framework (LPPF) of the Maribyrnong, Melbourne, Port Phillip and Stonnington Planning Schemes
- the regional context of current and future land use taking account of zones, permits granted and development proposals
- the risk assessment.

Section 9 of the EES dealt with the land use and planning impact assessment and focused on the evaluation objective of managing effects on a precinct-by-precinct basis, particularly:

- potential impact of the Project on land uses, including changes to existing land uses and built form
- planning scheme requirements and strategy
- impacts on land use created by changes in access
- land acquisition (and potential for land use change)
- existing and proposed planning approvals.

Section 9.1 Overview, described the direction and purpose of the review of issues:

*There is a broad diversity of land uses along the Melbourne Metro alignment, including retail, office, residential and education uses in the CBD, industrial uses to the north around the Western portal and Arden station precincts, mixed use residential and commercial uses in North Melbourne and South Yarra, high density commercial, office and residential uses along St Kilda Road and education, health and research uses in Parkville. There are also a number of parkland areas of varying sizes, including JJ Holland Park, University Square, City Square, Federation Square, Domain Parklands, Albert Road Reserve, Fawkner Park and South Yarra Siding Reserve.*

Technical Appendix E presented detailed risk and impact assessments, with the Executive Summary listing the potential consequences of the Project as:

- *Disruption to existing land use and the compliance of the Project with existing state and local planning strategies, policies and frameworks.*
- *Impacts on the built environment within the study area including any constraints to access of properties within the study area.*
- *Extent of land acquisition across each precinct and the study area as a whole.*
- *The risk assessment concluded that mitigation measures could be implemented to reduce most risks to 'Negligible' or 'Low', however, there is one risk identified as 'Medium'.*
- *Acquisition of residential, commercial and retail titles for the Project, resulting in some changes in land use. This includes the strata acquisition of numerous titles across the study area.*

There are a number of properties to be acquired across the Project area, including for temporary occupation as construction and work areas. A number of properties will have strata titles acquired to accommodate the tunnel alignment. The EES noted:

*Land acquisition would be undertaken in accordance with the requirements of the Land Acquisition and Compensation Act 1986 and Major Transport Projects Facilitation Act 2009. Many of the properties proposed for acquisition would be required for temporary construction purposes only and their existing use could be reinstated after construction is complete. Any surplus land would be managed in accordance with the Victorian Government Landholding Policy and Guidelines. This would occur after the end of the construction phase of the Project.*

Technical Appendix E listed the properties proposed to be permanently acquired and/or used for temporary construction purposes for the Project. The assessment described the acquisitions, impacts on land use current and future, and interpreted the risk to shape mitigation measures to be included in EPR.

Precinct 9 has no land acquisition as all work will be carried out within the existing rail reservation. However, Maribyrnong City Council submission criticised the loss of car parking and restricted access during construction works as noted in Chapter 5.

In all other Precincts, the proposed permanent acquisition of land drew critical submissions from owners of properties to be acquired, or from neighbouring owners or occupiers concerned at reduced access, loss of amenity or changed land use patterns. Property acquisition is discussed in Chapter 20.2 of this report.

The most controversial use of land by the Project is the proposed occupation and use of public land across the Project area. These spaces include JJ Holland Park, University Square, City Square, Federation Square, Domain Parklands, Edmund Herring Oval, the South African Soldiers' Memorial in Albert Reserve, Osborne Street Reserve, South Yarra Siding Reserve, Lovers Walk as well as boulevards and roads, some of which have high heritage value.

The risk assessment in Technical Appendix E attached a 'Medium' level risk to the use of public lands and a 'Low' residual risk. Section 9.1 interpreted the outcome as acceptable:

*This is due to the majority of land use and built form impacts being temporary, with recommended Environmental Performance Requirements (which specify the outcomes to be achieved) and proposed mitigation measures capable of reducing all residual risks to 'low' or 'medium'. The land use changes associated with Melbourne Metro generally have the potential to be reinstated post-construction, would provide benefits to existing land uses or would not inhibit these uses.*

Mitigation measures for construction and operation of the Project were drafted in the Technical Appendix and refined as EPR numbers LU1 to LU4. The EPR are aimed at limiting the permanent change of use within existing public open space, minimising the footprints of construction sites and permanent infrastructure on public land, as well as minimising impacts to existing public open spaces and recreational facilities and users of these facilities.

The impact assessment was independently peer reviewed by Mr Milner, and published as Appendix L in Technical Appendix E. Mr Milner stated:

*The Land Use and Planning Report takes as its starting point that the need for the Project has been established and the preferred location of stations and the alignment of the tunnel have been identified by a series of earlier investigations and assessments.*

*The Report is therefore confined to the construction and operational impacts and has, appropriately, taken a risk based approach and an impact based assessment, seeking to minimise the prospect of negative social, economic and environmental impacts.*

He went on to state:

*For the purpose of exhibition of the documentation the reader is provided with what appears to be a carefully considered review of relevant considerations.*

*It is evident through the analysis and commentary that the consultants have gone to some length to identify relevant considerations and evaluate their consequences.*

Relevant conclusions from Mr Milner's Peer Review included:

*A Project of this scale and sweeping implications is bound to incur some long term costs which in this case are measured in relatively small incursions into some public spaces and parks and the acquisition of a number of properties.*

*There will be a considerable short term disturbance to property and access during the construction period but this is a necessary consequence of a construction period on a major Project.*

*The strategic benefits of the overall Project in moving a metropolitan population more effectively between the suburbs and city based jobs and other attractions cannot be over stated.*

*I am satisfied that this Project marks a significant advance in a more sustainable city, sustainable transport and sustainable development.*

*The reliance upon a tunnel has avoided massive disturbance to land use and development. Where the Project connects with above ground land use and development it offers real prospects in fostering the growth and consolidation in preferred locations identified in policy.*

*As noted earlier the only aspect that warrants greater clarification would be which areas and sites are likely to be particularly disadvantaged in the future by the limitations on redevelopment created by the presence of the tunnels.*

### **6.3 Evidence and submissions**

For the MMRA, Mr Milner presented evidence to the Hearing about:

- *The beneficial and adverse strategic land use planning and environmental effects of the Project.*
- *The strategic justification and suitability of the proposed planning scheme amendments in facilitating the MMRP.*
- *Submissions made to the exhibited EES and planning scheme amendments.*

He concluded that:

*From a land use planning perspective the EES and planning scheme amendments for the MMRP are, in the broad, well considered proposals with strategic justification that have minimised land use based environmental costs and risks and will result in a high level of alignment with the relevant planning framework and deliver substantial community benefits.*

*There is a range of complex environmental issues to be addressed as part of the Project construction and this evidence accepts that details may vary the proposal, although this is unlikely to affect the overall land use planning merit.*

*... additional guidelines need to inform the implications and requirements of the proposed DDO.*

The MMRA relied on Mr Milner's evidence in relation to:

- support for the outcomes of the impact assessments and the direction of EPR
- the exemption of the Project from the provisions of the four municipal planning schemes covering the alignment of the tunnels
- setting in place a public display and a submissions process prior to the approval of the relevant development plans by the MMRA or its contractors
- the use of existing tools within the Victoria Planning Provisions (VPP) to apply overlay controls to protect Project assets
- the drafting and publication of a tailored practice note and guidelines to assist in the administration and understanding of the requirements under the DDO, particularly to guide the preparation of permit applications by land owners for development of properties over the tunnel alignment.

Mr Smyth provided evidence for RMIT in relation to the nature and effect of the planning tools to control the Project. He concluded that the statutory tools adopted by the draft PSA are appropriate and that the amendment is strategically justified. He recommended that rights of consultation with key stakeholders such as RMIT be included in the Incorporated Document. He advocated a Standing Advisory Committee be established to provide a forum for determination on the outcome of consultation and to inform the Minister when development and management plans are being approved.

Hobsons Pty Ltd and Karaoke Pty Ltd called Mr Clarke who submitted that a reduction in land available for redevelopment of their site at 1-39 Hobsons Road would reduce the number of housing units proposed for the site, and thus represent a loss of housing stock in the Kensington area, which he argued was contrary to planning policy.

### **6.3.1 Issues arising**

#### **(i) Precinct 2**

Numerous submissions were made about Options A and B in relation to the Western Portal in Precinct 2. Business owners with property affected by acquisition and other impacts in the 50 Lloyd Street Business Estate (S76), S130, S131 and S233 opposed Option A, while individuals and community groups supported Option B (S11, S83, S101, S210, S230, S243, S124, S144, S156, S179, S238, S270, S271, S340). These submissions cited impacts on users of JJ Holland Park and the Kensington Community Leisure Centre, property acquisitions that would displace residents, disrupt the community and negatively change the social fabric of the area. The impact of truck diversions down residential streets amongst other safety and amenity matters were reasons in support of Option B.

Residents of the Kensington South area made presentations at the Hearing and expressed a common theme that through The Project construction stage, the Kensington South



residential area would suffer adverse impacts from works while there was little return in legacy with no improvements planned for the South Kensington Station.

On the other hand, Hobsons Pty Ltd and Karaoke Pty Ltd (S261) supported Option A on the basis that it limits the adverse consequences of the development on the land. Under the Design Concept, the subject land will be temporarily occupied as a work site, which the submitter accepted. However, according to Mr Chiappi and the evidence of Mr Clarke, Option B is opposed because the land would be substantially affected by a loss of development potential. This they submitted, would result from Option B triggering partial acquisition of the land, negative impacts from the changed alignment of the railway line that Option B would bring, and relocation of major electricity infrastructure.

## **(ii) Precinct 7**

Some submitters questioned the need for a station at Domain in Precinct 7 due to changed demographics and the conversion of office space into residential dwellings with an associated decrease of commuters, as well as adequate provision of alternative forms of public transport already available (S213, S214, S313, S306).

Some submitters supported an alternative location for the Domain Station in the Shrine of Remembrance Reserve (Royce Hotel (S288), S265, S311).

Others objected to the proposed 'cut and cover' construction method for the Domain Station due to the adverse amenity impact to the surrounding area and significant tree loss. MGS was "not convinced that cut and cover is optimal for the Project, and in particular for Precinct 7".

Whereas Section 9 of the EES dealing with Land Use and Planning discussed the impacts of works on land use activity generally and open space more particularly, Section 5, Project Development, positioned the Precinct as:

*... of significant strategic importance to the planning and urban development of Melbourne. This area incorporates St Kilda Road, Melbourne's most prominent boulevard and an established higher density residential and commercial precinct, and is surrounded by a mix of high and lower density office, educational and residential uses that generate a significant volume of road, public transport, walking and cycling trips.*

Further, the EES stated:

*The provision of a station at Domain would provide significant connectivity benefits for people seeking to access the St Kilda Road employment and residential precinct and key civic and recreational facilities, relieving the St Kilda Road/Swanston Street tram corridor. It would also be an important interchange station between train and tram services for the area's residential and business catchment.*

## **(iii) Loss of public open space**

The loss of public open space was a concern across a number of Precincts, particularly:

- JJ Holland Park in Precinct 2 (S307)
- Edmund Herring Oval in Precinct 7

- impacts to Fawkner Park (Fawkner Park Children’s Centre, S278, The Hallmark, S283, S289, and City of Melbourne S365) along Precinct 1
- Tom’s Block for Precinct 1 and part of the Domain Parklands in Precinct 7
- South Yarra Siding Reserve and the Osborne Street Reserve in Precinct 8.

Through the Hearing, the MMRA:

- abandoned the use of Fawkner Park for the Project (TN16 and closing submission)
- announced the choice of the under-City Link option for the vertical alignment of the tunnel and the abandonment of Tom's Block for anything but the possibility of a potential secondary access to the TBM in Tom's Block or nearby (TN65 and closing submission)
- confirmed that local council open space strategies and forest masterplans would guide tree planting and restoration works (TN40).

In addition, the MMRA advised that:

- it was considering entering the construction site on Edmund Herring Oval from Dallas Brooks Drive to reduce impacts on the trees along Domain Road, and would make adjustments to the location of the closure point for west-bound traffic on Domain Road (EPR T1)
- at Osborne Street South Yarra, it was considering alternative design approaches to minimise impacts on vegetation along the railway reserve (TN71, TN05, TN51 and closing submission)
- the extent of intrusion into JJ Holland Park would depend upon which option was selected for the location of the Western portal and final design outcomes (closing submission)
- the design of upgrades to the South Yarra Siding Reserve remained under consideration (TN05, D315).

The evidence of Mr Boushel and Mr Jones for the MMRA on social impacts and urban design respectively considered the submissions about open space. While their approach was to consider matters arising in each Precinct, they brought the issue back to a Project base, by making suggested amendments to their initial recommendations to achieve stated goals for the replacement, restitution and enhancement of open space areas.

Mr Boushel referred to changes to the Project advised in relevant technical notes, and suggested suitable EPR such as SC7 *“In consultation with key stakeholders and in accordance with the Urban Design Strategy, relevant statutory approvals and other relevant requirements, re-establish sites impacted by construction works”*. Mr Jones proposed specific provisions in the UDS, including changes arising from the conclave of urban design experts and on basis of technical notes.

#### **(iv) Opportunities for redevelopment in association with the Project**

Submitters from Precinct 6 highlighted opportunities for redevelopment in association with the Project, as well as the need to preserve the heritage values of the area. These included development of public open space adjacent to St Paul’s Cathedral, an upgrade to City Square, Melbourne Anglican Trust Corporation (MATC) (S274), while taking care to protect the Cathedral.

Submissions and presentations were made by property owners about potential over-site development where a new link will be provided to connect CBD South Station to Flinders Street Station. The owners stated a wish to capitalise on the Project development themselves, rather than the MMRA accrue the advantage after compulsorily acquiring the sites (S195, S326, S371 and S379). Other submissions pointed to an opportunity to raise the profile of the Port Phillip Arcade and surrounds as the *"Enterprise quarter"* (S236, S281).

Mr Jones made reference to the provisions of the UDS including in the report of the conclave of urban design experts (D26) and recommended changes to the UDS to read *"In addition to works to build the stations and other aboveground infrastructure and to integrate them into public streets and park reserves, the Project requires consideration of adjacent or oversite building and infrastructure redevelopment — for uses other than Melbourne Metro — on sites acquired for, or affected by, construction of the Project"*.

Submitters raised the opportunity to upgrade existing stations at South Yarra (S35, S44, S164, S181, S185, S328, S362, S363) and South Kensington (S72, S293, S362) as part of the Project. Maribyrnong City Council submitted that the Project presents redevelopment opportunities along the rail corridor leading to West Footscray Station.

The opportunity to provide additional public open space was identified in South Yarra Siding Reserve and Lovers Walk (S65 and S164).

#### **(v) Impacts on Educational and Health establishments and facilities**

Submissions were received from educational and health establishments and facilities, including the University of Melbourne, the Graduate Union, RMIT, MGS, Melbourne Girls Grammar School, Melbourne Health, the Walter and Eliza Hall Institute, Alfred Health and Ramsay Health Care (many of whom presented submissions and/or evidence at the Hearing).

Each noted the need for mitigation measures to protect their on-going functioning.

The University of Melbourne, raised matters about safety and convenience of access to its campus during construction and resolution of station design. For Melbourne Health (S308), relevant matters related to patient and staff safety, pedestrian safety and emergency access.

The importance of these major facilities and services offered in Precinct 4 was acknowledged in the EES, which highlighted potential impacts and the need for controls to minimise those impacts. For example, the siting of Parkville station in Grattan Street at the main pedestrian entry point at Gate 10 presents a problem and an opportunity. One problem is the need to maintain access during the major works proposed to create the station. Attention to access is critical with the cut and cover method of construction requiring the closure of Grattan Street between Royal Parade and Leicester Street for approximately three years, and Barry Street closed and used for construction between Grattan Street and Pelham Street for approximately three years. The opportunity will occur in legacy.

The EES referred to opportunities to improve Precinct 4 through redevelopment of University Square, and facilitating the City of Melbourne's desire to pedestrianise Barry Street. The EES stated there are opportunities to incorporate the station design with the planned development of the University of Melbourne and a better tram, train and bus interchange in this area.

The MMRA closing submission stated this commitment in EPR T5:

*... in respect of the legacy phase of the Project, that any vehicle or pedestrian access altered during construction must be reinstated in accordance with relevant road design standards.*

Ms Brennan and Mr Chiappi for the University of Melbourne noted it is legitimately concerned at impacts on its functioning, and expressed concern at the inability “to judge the magnitude, likelihood or significance of effects or the acceptability of environmental outcomes”. They added “Nor is it possible to conclude that because the University is amongst the beneficiaries of the Project, impacts upon it are necessarily acceptable”. The University advised of its willingness to work directly with the MMRA and the PPRG to assist in achieving a “desirable outcome”.

The Graduate Union expressed its concerns about impacts from construction of the Parkville Station and associated works on the corner of Grattan and Leicester Streets. The Graduate Union is concerned that noise and other impacts will affect the ability to continue to offer accommodation and fellowship to people undertaking study, and on the ability to redevelop the site with a multi-storey building to expand the premises and improve services. Through Mr Wren, the Graduate Union sought commitments that the operations of the premises would be unaffected, including by the construction of a ventilation shaft in Leicester Street which it wants relocated for amenity reasons, and that its proposed redevelopment would not be hindered.

RMIT was represented by Mr McIlrath, with key issues relating to the potential impact of the Project on land uses, changes to existing land uses and impacts on land use created by changes in access, the proposed planning controls and the approvals process. Mr McIlrath put the relevant issue as concern “for the extent of disruption that will occur to RMIT's normal business practices”. He asked the Committee:

*To consider the extent to which adjustments may need to be made (b) to the way adjoining landowners use land in the context of the CBD North Precinct given The CBD North Precinct will not be a pleasant place to live or work for a substantial period of time during the Project. While some residents can be expected to move out in pre-emption of the amenity effects of the Project, RMIT cannot re-locate. The nature of the institution and its economic contribution is such that the MMRP's impacts on RMIT warrant a high level of assessment to strike the appropriate balance.*

A key focus of RMIT's presentations and evidence sought to strike that balance:

- to change the planning controls to be more directive
- to mandate consultation with RMIT in the Community and Stakeholder Consultation Plan
- to insert prescribed standards to be met for noise, vibration and other impacts during construction
- reinstatement of access to ensure RMIT students, staff and visitors can come and go unaffected by Project works.

A new station and changed access patterns at Precinct 5 brought about by road closures and station entrance locations will bring different ways of navigating the Precinct for all users,

including RMIT. Technical Appendix E notes: *“(t)his precinct is dominated by RMIT University, which is the largest land owner in the precinct, with holdings extending between Franklin and La Trobe Streets on the eastern side of Swanston Street. RMIT also owns a number of buildings on the west side of Swanston Street”*. RMIT submitted this makes it a major stakeholder in the Precinct.

The EES described benefits from proposed station entrances on the east side of Franklin Street as *“Improved access to RMIT and other land uses in the area through the provision of a station entrance”* and the benefits from a station entrance at the corner of Swanston and La Trobe Streets meaning:

- *Use of the road reserve does not permanently impact on access arrangements to RMIT and the City Baths.*
- *Improved access to RMIT and other land uses in the area through the provision of a station entrance.*

Acknowledging that access would be limited throughout the Precinct, due to the increase in construction traffic, the EES proposed EPR LU1 to *“Develop and implement measures for construction and operation of Melbourne Metro that aim to minimise impacts to the development and/or operation of existing land uses”*. The EES proposed this will include a TMP to minimise disruption to traffic. RMIT sought a direct role in the formulation of this and other management plans.

MGS and Ramsay Health Care are located in Precinct 7. Melbourne Girls Grammar School is outside the Precinct, but sees its students affected by changes to transport routes. The key issues relate to the extent of works and the long period of activity within and adjacent to the St Kilda Road reservation bringing consequential changes to vehicle and tram routes.

MGS made submissions and called traffic evidence to support the position that the School requires specific and tailored mitigation measures to allow it to function without adverse effects on the ability of students, parents and visitors to come and go to its Wadhurst Campus.

Ramsay Health Care conducts the Albert Road Clinic at 31 Albert Road. It is a surgical hospital comprising 80 rooms and 30 operating suites, with an approved permit to extend the premises.

In its closing submission, the MMRA noted that matters of access are addressed in EPR T1 and T5.

### **6.3.2 Planning controls**

The four municipalities through whose area the Project traverses each made a submission. The Maribyrnong City Council stated its support for the Project noting the limited effect of works at the Western Turnback, but expressing the opportunity to improve the image of the west through catalysed projects.

The City of Melbourne made substantive submissions and provided expert evidence about the impact of the Project and the proposed planning controls.

The Stonnington City Council submissions referred to planning policy to support its advocacy of an integrated railway station at South Yarra and other development.

The Port Phillip City Council submission commented on the form of the proposed controls and submitted changes to the control mechanisms with comments on the operation of the proposed planning tool, including how it should apply to permits issued, but not acted upon. The submission requested the development of a clear pre-application process, and stated:

*... council also notes the need for a clear pre application process as the Design and Development Overlay (DDO) triggers a referral and does not include the actual parameters for sub-surface development. It is recommended the Department establish a clear pre-application process to advise property owners on the potential impacts of the DDO on their property or development.*

*Clarify whether a retrospective planning permit is required where an existing approval has not yet been acted on and the proposal includes sub-surface works that would affect the Melbourne Metro.*

Mr Milner advocated the preparation of a Practice Note and technical guidelines for use by applicants for future development proposals. This position was supported by the MMRA, who said in closing *"These notes and guidelines will inform site specific development and broader land use planning implications."*

## **6.4 Discussion**

### **(i) Precinct 2**

Option A requires the acquisition of numerous properties, some of which have heritage values, and the use of public open space. Submissions focused directly on the negative effects of this option, and were adamant that the proposal will negatively impact on the social fabric of the community. The submitters noted they preferred to maintain their community, avoid disruption to the neighbourhood, avoid impacts on the open space and to support the continued operation of all businesses within the 50 Lloyd Street Business Estate.

Option B repositions the portal within the Council Reserve on the south side of Childers Street further west of the South Kensington Station subway entrance located opposite Ormond Street, with a longer decline structure to enter the tunnel and requiring a widened bridge over Kensington Road. Chapter 5 of the EES stated *"Option A is estimated to cost \$20m to \$30m less than Option B"*.

In its closing submission, the MMRA stated:

*The MMRA does not dismiss or seek to downplay the concerns conveyed by these submitters and accepts the submissions for what they are – the often heartfelt concerns of community members and an expression of their fears and feelings as to the impact that the Project will have on their lives.*

Further, the MMRA:

- noted the strong preference expressed by residents within Kensington in favour of Option B
- recognised the strong community position and accepted that, on certain measures, Option B (or a variant thereof) would generate less environmental impacts than Option A
- stated Option A remains an option for consideration as the technical considerations and cost parameters of both options continue to be refined.

- concluded that it will continue to consult with potentially affected residents in undertaking this assessment if changes to the community and environmental impacts result from its refinement of the two options.

The MMRA noted that *“The Committee’s assessment of the environmental effects of the different options will also inform that assessment”*.

The Committee notes the evidence of Mr Boushel:

*The social risks associated with acquisition are captured in chapter 6 as the displacement of households and diminishment of networks within the surrounding community. The assessment found that following mitigation, the social risk in the Western portal was high for the Concept Design, but low for the Alternative Design Option. The high rating is largely due to the limited availability of equivalent dwellings in the suburb and the close knit nature of the community that would be disrupted.*

Though he stopped short declaring Option B should be preferred, Mr Boushel endorsed proposed EPR SC1 *“Reduce the disruption to residences from direct acquisition or temporary occupation”*. The logic of this EPR supports Option B with its acquisition of fewer existing properties. Mr Jones supported Option B, and (re)stated the support of the conclave on urban design issues, where he agreed *“(t)he Alternative portal location would have lesser impact on urban fabric and uses and is preferred”*. In that report, Mr Jones agreed with Mr Moore, whose evidence stated:

*The EES sets out the relative impacts on residents and businesses of both the Concept Plan and the Alternative Plan. The Alternative Plan has significantly less impact on both residents and businesses. It involves less compulsory acquisition of properties and hence, less disruption and greater certainty to the community as to the legacy of this Project post construction. For these reasons, I support the Alternative Plan over the Concept Plan.*

The Committee agrees that community cohesion can be impacted both negatively and positively by a major infrastructure project. It accepts that as with Fawkner Park, the land use, planning and social impacts on the Kensington South community should be principal reasons that the Concept Design should be varied. The Committee accepts that for the Kensington community, if the Concept Design was to be implemented and properties compulsorily acquired there would be negative social impacts from loss of families and potential for severing of neighbour relationships.

The estimated increase in cost of \$20 to \$30 million dollars is not explained in any material put to the Committee and is not verified. There was no information to convey how the estimate is calculated, including whether the figure was a gross or net cost taking into account savings of not having to acquire as many properties. In any event, the Committee concludes the matter of cost is not a superior consideration over the land use, planning and social impacts.

The Committee concludes that Option A for the location of the Western Portal should be abandoned. It therefore supports Option B.

**(ii) Domain Station**

The Committee is concerned about the impacts of works to establish a station at Precinct 7 in accordance with the Concept Design.

The Committee agrees with submitters that the special boulevard appearance of St Kilda Road, the landscape feature of the Domain Gardens along the St Kilda Road abuttal and the quality and social value of the Albert Reserve justify a studied, careful and methodical approach to restore these elements of open space.

The MMRA undertook arboriculture assessments of all trees in the Precinct and broader area of influence through the Domain Parklands and Albert Road, which complement similar City of Melbourne studies. This information provides an unquestioned folio of detail on a tree-by-tree basis that will allow protection of trees in the first instance, identification of trees that should be protected from works if practicable and those that can be removed if inevitable. The MMRA made concessions in this regard (TN40) and noted it would minimise the removal of trees in the Domain, as much as practicable in this and other precincts.

Submitters stated that the Domain station should be relocated for various reasons, including that the complexion of buildings in the area had changed from office to residential use and thus the need for the station had dissipated. Though the Committee accepts this general position, there is no basis to support the relocation of the station for land use and planning reasons, including changes of use. There is a substantial number of people resident, working, visiting or studying in the Precinct or nearby. Those persons can reasonably be expected to use public transport and likely trains on new lines created by the Project.

**(iii) Loss of public open space**

The Committee supports the MMRA in its response to submissions about avoiding the loss of open space and its aims for reinstatement and restoration, and accepts the approach as a genuine move to minimise impacts on open space.

Submissions confirmed that Melbournians value highly open space in urban areas where recreation space is scarce and/or where there are heritage and landscape values. The number and strength of submissions regarding the passion and feeling for the Domain Parklands, the earnest protestation about the taking of informal open space on Osborne Street in South Yarra, and the desire for upgrading the South Yarra Siding Reserve are evidence of the affection for pleasant places.

The Committee supports the moves by the MMRA to achieve a goal of restoring any loss of public open space and, where land is to be used as a temporary construction site, as is the case in several Precincts, supports early vacation of the site. This is consistent with the direction of TN65.

The Committee supports EPR LU1 which introduces the requirement to avoid, to the extent practicable, temporary and permanent loss of public open space and be designed to maximise the re-instatement potential as well as minimising impacts to existing public open spaces and recreational facilities and the users of these facilities.



**(iv) Opportunities for redevelopment in association with the Project**

The Project runs through a highly urbanised part of the City on an alignment that positions the stations in locations where redevelopment will naturally follow. Development opportunities on Project land no longer required will follow, and Metro stations will act as a catalyst for future development. Referring to Precincts 3, 4 and 6 the EES foresees over-site development occurring above and proximate to the stations, but does not present any options as part of the Project. The EES anticipated that extant planning controls will direct future development and, vice versa, that development will follow in accordance with relevant planning controls.

Submissions were made by some property owners who were concerned that the compulsory acquisition process precluded them from legacy opportunities for over-site development, and the Committee briefly addresses this in Chapter 20.2 of this report.

**(v) Impacts on Educational and Health establishments and facilities**

The Committee notes the submission from DHHS which stated its support for the consultative approach underway at Parkville. Noting that it had participated in meetings of the Parkville Precinct Stakeholder meetings (now PPRG), DHHS stated:

*Together with various levels of representation from hospitals and research facilities ... The department has actively engaged in these Parkville Precinct Stakeholder meetings and provided comment and feedback to the MMRA on the planning, reference design and constructability relating to the potential impacts of the Melbourne Metro Rail Project.*

*The department acknowledges the importance of the Project in providing a new mode of transport to the Melbourne metro area and Parkville precinct and is keen to work with the MMRA to ensure the optimal long term outcome for the Parkville station and the stakeholders, staff and visitors who will use the completed facility. It is recognised that construction activity of this scale will of necessity impact on the operation of Parkville stakeholders. The department wants this impact to be minimised by effective communication, management plans and contractual provisions to ensure that critical hospital and research activities are not adversely affected.*

The Committee accepts the MMRA statements of intent about working to achieve the best outcomes at Precinct 4, noting that it said in closing “*provision for significant stakeholder engagement including relevant public agencies and councils plus the purpose-built reference groups for transport (the TTWG) and Parkville institutions (the PPRG)*”.

The Committee understands the concern of stakeholders about uncertainties of outcomes through a lack of design detail in Parkville and across the Project. However, the Committee accepts that the many issues left for the contractor to resolve when contemplating the construction approach are controlled by the outcomes in the EMF and EPR.

The Committee adopts the philosophy enunciated by DHHS, and accepts that communication and consultation leading to direct action is the means by which the concerns of facility operators can be dealt with.

**(vi) Planning controls**

The key issue relates to the operation of the suite of controls proposed in Amendment GC45 and their appropriateness to achieve the Project. The Committee considered whether the controls are fit for purpose, suitable to provide protection of the created assets such as station entrances and other infrastructure, and whether the controls affect the operation of relevant planning schemes.

No planning expert objected to the aim of the Design and Development Overlay (DDO) to protect the Project assets or its provisions, to require planning permits for certain buildings and works within the DDO boundary which, through preliminary engineering modelling studies, is generally set between 40 and 60 metres from the face of the closest tunnel alignment. The Committee supports the preparation of a relevant Practice Note and supporting technical guideline at the appropriate time to support planning applications on land affected by the DDO. It agrees with Mr Milner, the MMRA, and the City of Port Phillip and others that appropriate guidance would benefit landowners and applicants.

Part of the written and oral evidence of Mr Bennett of the AJMJV on ground movement and future development loading is relevant to the planning controls and the need for permits in circumstances listed in the DDO. Mr Bennett quoted the Future Development Loading report in the EES stating *“the presence of Melbourne Metro is unlikely to prevent future new developments, or future re-developments. However, in some cases, engineering measures would be required to stay clear of the Melbourne Metro assets or to keep the change of loading on Melbourne Metro assets to acceptable levels”*. He repeated that statement in his evidence, saying it was based on his experience dealing with development proposals in the CBD, near the alignment of the tunnels of the Melbourne Underground Rail Loop.

Steps to assist impacted landowners in the DDO boundary include pre-construction condition surveys across buildings and various infrastructure items, the preparation of a Ground Movement Plan under EPR GM3, which requires consultation with stakeholders, and guidelines to show *“if and where the depth of tunnels and soil conditions may constrain the manner of site development and the delivery of planning outcomes”* as recommended by Mr Milner.

The Committee notes the further work to be undertaken as additional information in regard to soil, rock and groundwater conditions becomes available, both through the Detailed design stage and also construction stage of the Project. This work may reduce or expand the extent of the DDO boundary and thus reduce or increase the number of affected properties. The Committee accepts the summary position put by the MMRA that the proposed controls are appropriate, and agrees that:

- identification of the Project in Clause 53 of the Victoria Planning Provisions (VPP) and the exemption of the Project from the usual planning controls of relevant planning schemes is justified
- use of the Incorporated Document
- application of a DDO to identify the alignment of the Project and to control development on land above the alignment is appropriate
- identification of Project areas on maps included in the planning schemes will provide suitable identification and protection of work areas within which construction of scheduled and works may proceed

- use of subsidiary plans such as management plans and the requirement for approval of those plans through a process that checks and endorses actions, including to as high a level as approval by the Minister for Planning, is appropriate
- checks and balances that come from publication of those plans, and the opportunity for input from third parties is an important part of the planning process
- the EPR will provide suitable direction for engagement and methodology for achievement of Project outcomes to enable both the Project to be delivered and for the mitigation of impacts to acceptable levels across the Project area.

## 6.5 Findings

The Committee finds that for land use and planning reasons, and social and community reasons, the Concept Design for the siting of the Western Portal in Precinct 2 is not supported, and Option B is preferred.

The Committee endorses the direction of EPR LU1 as a suitable measure to restore open space and trees across the precincts.

The Committee accepts the MMRA statements of intent on working to achieve the best outcomes in Precinct 4 as evidenced by the establishment of the TTWG and the PPRG. The Committee adopts the intent of the submission by DHHS and accepts that communication and consultation leading to direct action is critical to ensure concerns of facility operators in Precinct 4 can be dealt with and avoided. The Committee understands the concern of stakeholders about uncertainties of outcomes through a lack of design detail in Precinct 4 and across the Project, but finds that the issues for the contractor to resolve have requirements and anticipated outcomes laid down in the control documents.

On the choice of planning instruments, the Committee finds that the suite of planning controls, including the DDO, is appropriate to implement the Project. It supports the preparation of a Practice Note and technical guideline(s) to complement the use and operation of the DDO to provide additional guidance to applicants who will require future planning approvals. The MMRA did not provide a draft of a Practice Note or any guidelines, so this work will need to be undertaken as part of the approvals process for the Project.

The relevant EPR have been amended accordingly, as provided in Appendix F.

## 6.6 Land use and planning recommendations

5. **Prepare a Planning Practice Note with technical guideline(s) to support development applications for land impacted by Schedule 67 to the Design and Development Overlay.**
6. **Adopt Option B as the preferred option for the location of the Western portal in Precinct 2.**

## 7 Social and community

Social and community impacts are addressed in Volume 2, Chapter 10 of the EES, and in Technical Appendix F.

The draft evaluation objective of the Scoping Requirements in relation to social, community, land use and business at 4.4 is:

*To manage effects on the social fabric of the community in the area of the Project, including with regard to land use changes, community cohesion, business functionality and access to services and facilities, especially during the construction phase.*

The following evidence was provided in relation to social and community:

- MMRA - Owen Boushel of AJMJV
- Timothy Offor of Pax Republic Pty Ltd (who was not called to present)
- City of Melbourne - Graham Porteous, Acting Director of City Communities
- City of Melbourne – Dean Griggs, Manager Social Investment.

Other evidence and numerous submissions made reference to a range of social and community impacts.

EPR SC 1 to 7, and 9 specifically dealt with matters relating to social and community.

### 7.1 Key issues

The Committee considers that the key issues relate to:

- the impacts on private and public facilities during construction
- adequacy of community engagement and dispute resolution.

In summarising these impacts, the Committee is cognisant that numerous other issues were raised in relation to social and community matters, but these are more specifically dealt with in the assessment of effects as such impacts relate to land use, planning, business, transport (including access to property, emergency access for vehicles), noise and vibration, historical and cultural heritage, urban design, landscape and visual (including loss of open spaces and trees), and ground movement.

### 7.2 What did the EES say?

The EES and most submitters noted that while the long-term social effects of the Project will provide wide-ranging community benefits, the impact on local communities will result in adverse impacts especially during construction, and more particularly in the South Kensington, Parkville, St Kilda Road and South Yarra areas.

Recognising this, the MMRA embarked upon a high level of community engagement with various stakeholders to explain the EES Concept Design, its impacts, and how impacts might be mitigated and addressed. Notwithstanding this, the EES and the MMRA at the Hearing acknowledged that there will be significant impacts on some communities that may result in people being relocated for periods of time, with some having properties acquired outright.

Technical Appendix F of the EES provided the Social and Community Impact Assessment and it noted that while the Project would bring long-term benefits, a number of the Project

works had the potential to trigger adverse social impacts, particularly during construction. This assessment was undertaken by Mr Boushel of AJMJV, who also presented evidence to the Committee. The EES assessment concluded that:

*With the application of the mitigation and Environmental Performance Requirements recommended in this assessment, the project would manage the potential effect on community cohesion and access to services and facilities, especially during the construction phase. It would also minimise the adverse effects on recreational values as far as is practicable.*

Mr Offor undertook a brief peer review of the impact assessment and concluded that the social impacts were appropriately identified, the methodology was appropriate and in accordance with good practice, and the findings were sufficiently robust. He commented on the EPR and suggested some further revisions, which were generally accepted by the MMRA.

The impact assessment was complemented by various Technical Notes provided by the MMRA in direct response to issues raised by the Committee and others, including:

- TN29 in response to clarification about the extent of the peer review undertaken by Mr Offor
- TN43 about the ways in residents adversely affected by noise and vibration in the construction stage could be provided with mitigation options
- TN44 which establishes the Parkville Precinct Reference Group
- TN46 which provided clarity about communications and stakeholder engagement through an amended EPR SC3, and the enquiry and complaints process
- others with regard to the extent of acquisition, clarification about boundaries, timeframes for the Project, including a high level Gantt chart provided as D53.

### **7.3 Evidence and submissions**

The MMRA did not shy away from the extent of impact the Project will have on some residences, businesses and institutions during the construction stage. In its opening submission (D20), the MMRA noted the “*overwhelming tenor of submissions is supportive of the Project*”, but acknowledged there is “*an understandable level of concern about the impacts of construction in the relatively short term*”. Some parties questioned whether a potential period of up to six to ten years qualified for the phrase ‘in the short term’. The MMRA contended that in operation, the Project is city re-shaping and opined:

*The impositions attributable to the construction phase of the Project are more than offset by the scale and sustainability of the transport, planning and social benefits that will flow from the Project.*

MMRA considered that the metropolitan wide social benefits will maintain and enhance Melbourne’s liveability by:

- providing a modern, reliable and efficient rail system
- relieving crowding on the inner-city tram network
- increasing the potential number and range of social services close to transport options
- providing increasing housing options within train catchments
- contributing to lower levels of car usage

- providing better access to goods and services, sport, cultural and recreation
- improving social inclusion
- improving health outcomes
- providing a lasting urban design legacy.

In his planning evidence, Mr Milner observed that while there were 379 submissions to the Project, he had “... *no sense that the community challenges the intrinsic strategic merit of the project*”. Further:

*Rarely is the community presented with a project offering such wide ranging, strategically significant, social and economic benefits, that will have long term positive consequences for the day to day lives of a high proportion of present and future Victorians, businesses and visitors to the State.*

In presenting his evidence, Mr Boushel noted that the benefits of the Project will not just be to train users, but to all users of the public transport network. He accepted that there will be adverse impacts on many people but considered the social and community EPR address these. In responding to questions from the Committee about whether the trade-offs have been understood and whether the population has been adequately consulted, Mr Boushel responded that there have been two rounds of major consultation about the Project, with significant written material provided, including fact sheets. He agreed however, that it is very difficult for anybody to fully understand what construction means until they experience it.

When asked by Mr Watters whether the social impacts were assessed cumulatively, Mr Boushel suggested such effects would be difficult to assess and there may be less capacity to adapt to change when a community is impacted by multiple impacts. He pointed to the CBD and noted there is a constant changing landscape of construction in many areas at any one time. He noted that one could argue that a Project of this nature could have a lesser impact because there will always be someone in a Precinct and on-site to coordinate work and activities. One of the risks Mr Boushel identified was that some might perceive the city will be “*off limits*” because of the extent of works, road closures and the like.

In addressing the social impacts of noise, apart from acknowledging there will be significant impacts in this regard, Mr Boushel could not identify any studies that examined the long term impacts from noise and disruption on communities.

Mr Offor provided a written evidence statement, but was not called. His report noted the importance of continued engagement with the wider community in minimising the emotional impact brought about by such a significant Project stating that “*uncertainty about process and progress will exacerbate people’s stress and anxiety*” and that “*Demonstrating a commitment to ongoing communication, and a willingness to hear concerns from affected residents, will make the engagement process more productive, and to some extent can lessen the impact for residents*”.

The Committee agrees with the contention that it is important to foster a sense of hope in the community that the Project will be worth the disruption.

The MMRA in its closing submission noted the inevitability of impacts to communities due to the scale, nature and duration of the Project. The MMRA continued to reiterate that

although there would be impacts during construction, the majority of submissions supported the Project. The submissions identified:

*The key social impacts of Melbourne Metro will arise during construction and are associated with:*

- *the disruption and fragmentation of communities during the construction of the Project, particularly as a result of the acquisition of residential and commercial properties;*
- *the closure of Grattan and Franklin Streets and reducing the lanes on St Kilda Road and diverting public transport services around construction areas; and*
- *the occupation of public open space at Domain Parklands, University Square, City Square and Federation Square. Some people would also be disturbed for limited periods of time by ground-borne noise and vibration from tunnelling activities and the excavation of stations in the Parkville, CBD North and CBD South station precincts.*

In acknowledging the impacts, MMRA noted that:

*Continued access to services and facilities during the construction phase would be managed through the traffic management, business disruption and community and business involvement plans required by the recommended Environmental Performance Requirements. The need to maintain access to emergency and medical services in the Parkville precinct has been a key input to the development and design of Melbourne Metro.*

In highlighting its commitment to engage with the community, the MMRA noted that:

*This is not a Project where the MMRA and its representatives could be characterised as having been unresponsive, inattentive or dismissive of the concerns raised by submitters. Viewed objectively, the Committee should be satisfied that while there have been isolated issues raised by a number of submitters, overall the extent of consultation has been pro-active, responsive and professional.*

*Importantly, efforts to engage with stakeholders will not cease once the EES process has been completed.*

While the evidence of Mr Porteous for the City of Melbourne focused on libraries and recreation, it did touch on the social impacts of users of sporting grounds being displaced to other grounds or areas and the sense of loss that some might experience, as well as additional travel time.

Mr Griggs provided a written evidence statement, but he was not called to speak to it. His evidence focused on the issues of displacement of people experiencing homelessness, equity of access, crime prevention and community safety. He suggested that “... people with a disability and their carers can access all areas surrounding the construction sites and on completion of MetroRail, have access to a range of facilities and services”. He made several recommendations, most of which related to wayfinding and communication through targeted engagement and consultation, as well as more specific matters post construction.

The City of Stonnington noted in its original submission that *“The MMRP proposes a prolonged construction (6 years) and 24/7 operations resulting in significant amenity, social, community and business impacts. The proposed mitigation for these impacts are not sufficient”*. Apart from acknowledging amenity impacts due to loss of vegetation in Osborne Street in its primary submission at the Hearing, the City of Stonnington did not pursue these matters.

The City of Port Phillip provided a comprehensive written submission which spoke of managing and mitigating the impacts of construction of the community and business and the process for managing change. The submission detailed what it considered to be the social (and business) impacts and noted the temporal nature of these impacts:

*There are a range of significant, temporary adverse social and business impacts expected from the construction of the project around the Domain precinct, extending into South Melbourne.*

The submission noted key impacts such as loss of areas for recreation, road closures, disruptions due to traffic changes, loss of access, reduced air quality, and noise and vibration impacts. The City of Port Phillip acknowledged there will be unavoidable works, which it said the MMRA and contractors should minimise to every extent possible.

The City of Port Phillip recognised *“... the considerable efforts undertaken by MMRA in engaging with the local community and businesses throughout this process and commends its commitment to continue exploring ways to further reduce impacts as the project progresses”*. It spoke to these matters at the Hearing and affirmed its support for the Project subject to implementation of specific recommendations. In this regard, it provided a table (D155) that set out the recommendations it made through its original submission and an updated status position.

Others expressed concern about the loss of open spaces, including sports grounds, with submission S105 noting:

*As the loss of Edmund Herring Oval arises directly from the Melbourne Metro Project, the Mercantile Cricket Association therefore seeks the intervention of Melbourne Metro with the City of Melbourne to facilitate the relocation of its two clubs to Ross Straw Field. This is in accordance with the requirement on Melbourne Metro under the EES p.10-39 to develop a relocation strategy for sports clubs and other formal users of directly impacted recreational facilities.*

With regard to community engagement, some submitters (S276, S300, S304) expressed dissatisfaction with the level of detail provided by the MMRA during public information sessions. One submitter (S95) seemed concerned that true engagement had not occurred:

*The community engagement phase was seen to be as a marketing campaign ... All questions and concerns we raised were not adequately addressed and all response were of a generic nature.*

Property acquisition was raised in relation to Precinct 2 and was a factor in supporting the alternative design proposal by a number of submitters (S282, S293, The Kensington Association and S340).



HRG Investments (S13) submitted that the EES poses an “*Unconscionable planning blight for an unacceptable period of time*” as the MMRA has not yet determined if it intends to compulsorily acquire the submitter’s land.

Several submitters (S228, S270, S290, S299, S300, S338) called for compensation for property damage during construction, loss of property value during construction or the operation of the tunnel, and loss of rental income during the construction phase. Submitters asked for further information regarding the level of compensation that will be available, how it will be managed and accessed, and when decisions regarding compensation of particular properties would be made. Submitters were concerned by the ‘blight’ continued uncertainty regarding acquisitions would cause (S13, S253).

The North Melbourne Community Group (S228) made a lengthy submission regarding compensation for loss of property value, loss of amenity and property damage both during the construction and once the tunnel is operational. Other submitters from the North Melbourne community expressed significant concern about the overall impact of the Project on its community.

The issue of dispute resolution and a process for complaints was raised by many, (including S100, S278, S289). These submitters requested a hotline for dispute resolution and public queries, citing concerns on how quickly complaints will be addressed and the provision of up-to-date information. Areas of interest ranged from up-to-date traffic information, quick responses to property damage, to information on compensation claims.

Submitter S95 echoed this, requesting the MMRA:

*... establish a responsible group and complaints handling procedure that provides a fair and accessible method of residents to resolve issues.*

Further, S81 submitted:

*Of particular concern to residents and owners around Domain knows what the regulatory framework will be and who will be the independent umpire for complaints or disputes. It seems manifestly unfair to expect individuals to take on major multi-national companies over complaints about noise or vibration without the involvement of an ombudsman or other independent party.*

In expressing concerns about dispute resolution and complaints, Federation Square Pty Ltd (S178) recommended that:

*... the Project be resourced with a dedicated branch that can act as a first point of contact for general queries and concerns that can also respond quickly to issues as they arise. E.g. hotlines, social media and regular briefings.*

Other submitters requested an independent forum for complaints and review of further documentation to ensure a fair and transparent process. RMIT requested that:

*The Minister for Planning appoint a Standing Advisory Committee for the Implementation Phase of the Melbourne Metro Project to advise on the development and review of all documents that are required to be developed and approved under the draft Incorporated Document, so as to provide key stakeholders and adjoining landowners with an independent forum to be heard in relation to the development of documents that could affect the*

*interests of adjoining landowners, that have not been exhibited jointly with the EES, or which cannot be fully addressed in the constraints of the current process.*

This view was shared by the City of Port Phillip who suggested that “... an independent panel or forum could also be set up to assess major changes to the project”.

Many submissions noted the EPR and the attempt for these to be inclusive, but questioned the identity of ‘key stakeholders’ and how these would be properly identified and acknowledged.

RMIT recommended updates to the Social and Community EPR to acknowledge early works.

The Graduate Union provided a number of recommendations to the EPR, many of which related to the opportunity for landholders to have access to a ‘real time’ conditions assessment prior to any works occurring. This view was shared by multiple submitters.

Mr Cicero for the Westin, while contending that the EPR should be referenced in the Incorporated Document, made the following submission at paragraph 4.5 (D248):

*Currently there are no requirements in the Incorporated Document that give notice to interested parties of any document that is made available for inspection or that may be amended without public consultation. Accordingly, it is submitted that a new provision be inserted into the Incorporated Document that requires the Authority to establish a database (whether by internet or otherwise) allowing interested parties to register their interest and receive notification prior to the implementation of, and changes to, referral documents (ie Urban Design Strategy, EPRs, Environmental Management Framework).*

## **7.4 Discussion**

A key theme across all submissions was the impacts of the construction. While many chapters of this report address the technical issues relating to the shared concerns, the social impacts are not so easily addressed. As the City of Port Phillip noted:

*Council recognises that MMRA, in developing the reference design, has focused on reducing the temporary social and business impacts of the project business taking into account a wide range of complex considerations. It is not possible to address one item in isolation without understanding the many other associated issues ...*

The Committee acknowledges that the construction stage of the Project will cause disruption and may result in temporary, and some long term loss of many of the features and qualities that contribute to Melbourne’s liveability.

The Committee notes the broad support for the Project and accepts the proposition outlined by the MMRA that different people will experience the impacts of development in different ways. These changes will cause stress and anxiety as noted in Mr Offor’s evidence, and disrupt the familiar and valued image that many people have of their city, which may diminish liveability for some people. The Committee considers that the lack of detail about design outcomes may mean that the negative (and immediate) impacts will be in sharper focus than the positive (future) ones in many people’s minds.

The Committee accepts that implementing the Project will only be possible with significant impacts on the physical fabric of Melbourne. The Committee notes that this will have impacts upon the social processes and opportunities that are facilitated by this physical fabric.

The Committee observes that the Project enjoys almost universal support in principle from expert witnesses, submitters and the wider community, with the need for the Project largely unquestioned. The Committee agrees with MMRA that change is a constant in the city, and some degree of disruption from construction is to be expected.

However, most submitters and many witnesses raised concerns around the detail of the Project and the construction impacts when considered from personal or collective perspectives. The Committee notes that environmental effects will vary in both duration and intensity, and impacts on an individual will depend on particular needs, cognitive processes, experience, opinion or relationship to the area affected. This diversity is reflected in the variety of concerns raised, and areas of differences in opinion about potential alterations to the Project.

The EPR for social and community have a strong focus on consultation and information sharing. However these need to be further modified to ensure that key stakeholders are properly informed of all works and activities at all stages of the development of the Project.

The submission by RMIT to include early works in the EPR is not supported in the manner suggested, although the Committee has included a new EPR that provides for the MMRA to notify adjoining or nearby property owners of any early works to be carried out. The Committee has noticed various areas in the precincts where works are being conducted and these may have impacts on access in some areas. For these reasons, and to ensure transparency of process, the Committee has added a new EPR SC9 that provides for notice to be given of early works in an area.

The submission made by Mr Cicero regarding a registration process has merit. The Committee considers that interested parties should be able to register their interest and receive relevant updates relating to changes to the Project. While direct notification should continue to occur where there are matters that require such, the Committee has proposed an addition to EPR SC3 that provides for this registration. Mr Cicero suggested the registration opportunity be provided in the Incorporated Document, however the Committee considers it is best placed in the EPR.

The impacts of this Project will be endured by many over a very long period of time. Many submitters expressed significant concern and fear over what might happen to their properties as a result of the construction, particularly in relation to noise and vibration. For these reasons, the Committee considers that any property owner who is located within or has an abuttal to the defined Project Land (as modified once the final plans are resolved) should be provided with the opportunity to have a conditions assessment undertaken of their property (at no cost to them) prior to the pre-construction period.

## **7.5 Findings**

The Committee finds that the impact of the Project on communities in all precincts will vary, but in Precinct 2, 4, 7 and 8 will be significant at times. There will be significant disruption to

daily life through the whole of the construction program and it will affect people in different ways. It cannot be avoided and it may be able to be mitigated – to a certain degree.

The Committee accepts the concerns about social impacts raised by many submitters as a very real issue. The Committee commended the MMRA in its closing at the Hearing for its responsiveness in actively listening to issues raised by submitters and in seeking to try and resolve as many as possible. But it will not resolve or minimise the construction impacts to any great degree.

Meaningful communication is the key to ensuring that impacted residents and businesses are provided with relevant information in a timely and considered manner. It will not be a matter of the MMRA and/or its contractors simply advising what works will be undertaken and when, but providing sufficient information in advance on the extent of each component of work, what the expected impacts might be, the duration of the program, a name and contact number for Precinct Project managers, and the opportunity to input into key Project milestones and reviews as required.

Overall, the Committee finds that in the context of the Project benefits, impacts during the construction stage upon the community will be largely acceptable. The Committee considers changes are required to the EPR to provide affected stakeholders with written notice of early works and to ensure construction sites are re-established consistent with relevant open space master plans. It has added a new clause to EPR SC3 that notes any stakeholders can register to be kept fully informed and automatically advised of any updates.

A key finding is to add a new Social and Community EPR (SC9) that provides written notice to adjoining landholders of any early works to be carried out in a precinct. Such notice should advise of the works to be undertaken, the duration of such works, what local impacts might occur and a contact name and number for further information. This should apply to all precincts and the timing should be noted as 'Early Works'.

In response to the question 'who the key stakeholders are', the Committee considers that any individuals or businesses located within the identified (and final) Project Land as per Maps 1 to 16 attached to the Incorporated Document, and those impacted by the DDO, are the key stakeholders. Additionally, the Committee considers land owners (apart from identified key stakeholders) should be encouraged to register their interest in being provided with Project information on a precinct by precinct basis.

EPR NV6 has a new note that preconstruction surveys should be undertaken not only in the Project area, but where it is predicted that guideline targets will be exceeded.

The relevant EPR have been amended accordingly, as provided in Appendix F.

## 8 Business

Business impacts are addressed in Chapter 11 of the EES, and in Technical Appendix G.

The draft evaluation objective of the Scoping Requirements in relation to business impacts at 4.4 is:

*To manage the effects on the social fabric of the community in the area of the Project, including with regard to land use changes, community cohesion, business functionality and access to services and facilities, especially during the construction phase.*

That objective is common with social, community and land use.

The following evidence was called in relation to business:

- MMRA - Terry Rawnsley of SGS Economics and Planning
- University of Melbourne - Professor Glyn Davis and Professor James McCluskey
- City of Melbourne - Steve Nagle of Council
- TAB Corp - Simon Duck of TabCorp
- The Graduate Union– Dr Kerry Bennett.

Submissions referred to a range of impacts to businesses throughout the construction stage of the Project.

EPR B 1 to 5 specifically dealt with matters relating to business.

### 8.1 Key issues

The Committee considers that the key issues for businesses in the Project area relate to:

- loss of trade due to construction works
- disruption to businesses through impacts to site access, car parking and amenity
- property damage.

### 8.2 What did the EES say?

In Chapter 11, the EES stated a positive case for the Project and the anticipated business impacts, noting that the Project is one of the largest public transport infrastructure projects ever undertaken in Australia that would facilitate the reconfiguration of Melbourne's passenger rail network and benefit business in a number of ways:

- *The ability of businesses to interact with their customers, suppliers and professional services via the public transport network would be enhanced.*
- *New retail and commercial opportunities can be provided in and around train stations and well-connected activity centres.*
- *Reduced commuter time and travel time costs would widen the employee pool available in central Melbourne, enabling better matching of worker skills to jobs and increasing productivity.*
- *Melbourne Metro could transform the business mix of some areas, as improvements in accessibility spark shifts in the locational preferences of firms – especially knowledge-intensive and creative firms.*

- *The Project would provide urban renewal opportunities for business and developers, particularly for over-site development at the CBD North and South stations and surrounding the Arden station.*

Forecasting positive impacts after operation for business along and in the vicinity of the Project's alignment, the EES stated the Project *"would provide direct opportunities for the suppliers of goods and services for the operation and maintenance of Melbourne Metro, change the mix of business in some areas and is predicted to increase annual production by a Gross Value Added of \$10.1 million in 2041"*. The EES noted:

*There would be some adverse impacts on local businesses during the construction of Melbourne Metro, notably the compulsory acquisition of commercial land that supports around 87 businesses and disruptions caused by constructing Melbourne Metro.*

The EES made reference to a number of Project benefits that can be summarised as improved accessibility to the CBD for businesses located outside the city. These include new retail and commercial development opportunities created through higher density residential development in and around train stations and well-connected activity centres; reduced commute times, and a change to the business mix of some areas.

The EES stated that even with most of the Project's construction and operational activities taking place below ground, Project activities would interact with social values and the community in a number of places and that:

*In addition to the businesses displaced as a result of commercial property acquisition, the construction of Melbourne Metro would create temporary disruptions to some businesses in close proximity to work sites as result of changed amenity, traffic disruptions, reductions in passing trade and constrained access for customers, deliveries and staff.*

The EES conceded negative impacts in stating:

*The operations of some businesses in the CBD would be disrupted to a significant extent during construction, with those located near the City Square, in Scott Alley and around the Flinders Street and Swanston Street intersection likely to experience the greatest disruption. Depending on the nature and location of the business, disruption could occur as a result of less foot traffic, reduced access to customers or noise and dust impact*

The EES listed the number of private residential and commercial properties to be acquired for the Project under the Concept Design. Compensation matters would be dealt with in accordance with the *Land Acquisition and Compensation Act 1986*, and the Committee discusses this in Chapter 20.2.

The EES relied upon the expert assessment of impacts from the Project on businesses carried out by SGS Economics and Planning (SGS) (Technical Appendix G). In Section 18, after allocating and assessing Project impacts on a precinct-by-precinct basis, the SGS report estimated potential impacts of the construction phase in dollar terms. The report estimated and totalled what it found were negative Gross Value Added (GVA) impacts. While there are some differences in the figures in the SGS report and Chapter 11 of the EES, the figures show

a decline in GVA for each of the Precincts except for Precinct 9 where no negative impact is assumed given the scale of works and impacts. A total decline of \$80m GVA was predicted.

Further, the SGS report noted the following impacts:

*Once operational, Melbourne Metro is also likely to impact the businesses composition of some precincts with a shift from blue collar to white collar jobs likely particularly at the new Arden station.*

*Whilst there would be localised impacts around the project precincts, overall Melbourne Metro meets the project objectives, as most economic activity lost from the precincts during construction would not be lost from the Melbourne or Victorian economy, but rather displaced to other locations in Victoria.*

*The exception is Parkville, due to the impact on highly sensitive equipment located at the hospitals and research centres.*

The EES noted that to mitigate the impacts, measures were available to avoid or minimise the business impacts from the construction and operation of the Project, and recommended relevant EPR.

A peer review of the SGS work provided in Technical Appendix G by Marianne Stoettrup of Matters More Consulting endorsed the methodology used by SGS. Ms Stoettrup commented on the necessary focus on small businesses, and noted:

*... The residual impact on these individual businesses is therefore likely to be quite high, even though at a Melbourne wide or even CBD level, the risks to business arising from the construction and operation of Melbourne Metro are considered low. In my opinion, the significant impact this would have on the individual business owner should be considered when finalising the proposed Environmental Performance Requirements.*

### **8.3 Evidence and submissions**

In its opening submission, the MMRA restated matters from the EES about opportunities for significant commercial and residential uplift, and the creation of opportunities to strengthen and expand Melbourne's knowledge economy. In its closing, the MMRA acknowledged:

*While Melbourne Metro will deliver numerous benefits to businesses and catalyse urban renewal in inner city areas, construction of the Project may result in impacts to businesses, particularly businesses in close proximity to the new stations and construction sites required for the Project.*

The conclusion put to the Committee was:

*The EES has assessed the Project's impacts on businesses and recommended EPRs and mitigation measures to support and assist businesses during construction. Submitters have concentrated on the impacts of construction activities on their operations, and in particular have raised issues with traffic disruption and congestion, construction noise and vibration, and access to compensation.*

The extent of acquisition was updated through the Hearings as the MMRA announced certain properties were not to be acquired, including one in Precinct 8.

Submissions about effects on the operation of businesses within the Precincts ranged widely to express concerns from operational difficulties and disruption to normal operations due to traffic impacts and access problems, noise and dust, reduced patronage, health and safety concerns through to reductions in and loss of trade. Submissions on these matters came from owners and operators of businesses who stated particular concerns for:

- loss of trade from restricted access for customers caused by traffic restrictions, the installation of hoardings restricting pedestrian movements, all creating perceptions that premises are closed or difficult to access
- loss of tenants in commercial and private premises, especially in the CBD, and Precincts 7 and 8, and consequent inability to relet premises during construction
- inability to draw trade to hotel and accommodation premises, especially in the vicinity of city stations
- cumulative impact of construction activity including noise and truck operations, especially in Precincts 3 and 8, where major construction sites are proposed
- loss of access for routine operational activities, for patient transport use and emergency vehicle access
- lack of detail to enable business planning to capitalise on the Project and/or to manage impacts
- proposed acquisition of businesses and land with associated concern from property owners created by uncertainties whether land will be acquired for the Project
- lack of compensation for loss of trade
- process of acquisition and voluntary purchase of properties by the MMRA
- lack of detail about the proposed business disruption plans and recourse to support packages.

Mr Nagle's evidence for the City of Melbourne focused on impacts from the Project in relation to business, tourism and events in Melbourne. He concentrated on impacts to business ventures and activities conducted by the City as well as with partner organisations for events. He noted the requirement for a Business Disruption Plan to assist businesses cope with impacts. He stated a concern with the focus of the Plan and its targets:

*Use of the word 'business' implies that the plan (will consider all types of business sectors. The scope and diversity of businesses across the municipality will require careful consideration. As an example – the impact to a small hospitality operator on William Street will be different to a retailer along Swanston Street, and different again to a tourism operator who runs a walking tour business through the central city and surrounding suburbs.*

Mr Nagle made useful suggestions for changes to the EPR to deal with businesses and municipal activities, the Committee notes most have been included in the EPR.

Mr Duck gave evidence of potential impacts on the business operations of Tabcorp conducted in Precinct 7. He outlined the nature of operations at the premises and stated that the majority of the company's business was sourced during the Spring Racing Carnival



held each year in Melbourne. He emphasised the critical importance of continuity of utility services to the site to avoid disruption to the services offered nation-wide by Tabcorp.

In response, the Committee notes the MMRA amended EPR SC3 to include reference to:

*Measures to minimise impacts to the development and/or operation of existing facilities including ensuring replacement power, network or other utility services are provided, if necessary and where practicable, where any disruption to such service is likely*

and

*Measures for providing advance notice of significant milestones, changed traffic conditions, interruptions to utility services, changed access and parking conditions, periods of predicted high noise and vibration activities.*

The Zagame Group (S273) submission was typical of submitters concerned at impacts on business operations over an extended period, where it expressed concern:

*... about the potential for adverse operational and customer experience consequences that will emerge over the five year construction period [precinct 4] that may severely impact or threaten the commercial viability of our [Zagame group] business.*

Such concerns regarding loss of trade were attributed to loss of passing foot traffic, noise and vibration deterring patronage, and impacts of dust on goods presented for sale.

The impact of increased traffic and truck movement, as well as road diversions and restricted access was of particular concern to businesses in Precinct 3.

Loss of income was raised as a concern for owners of residential and commercial buildings, particularly in Precinct 5 (S272) and Precinct 6 (S20, S147, S221).

Federation Square submitted that the impact to their business is likely to be significant with impacts upon the 1,700 commercial and community events held at Federation Square each year, the commercial car park, and the 36 on-site tenancies. The tenant operating the events and tour booking service in the Tourist Information Centre stated similar concern (S121). That submission expressed concern at the effects of loss of trade and having to relocate upon the taking of the premises by the MMRA for construction purposes and as a station entry site. Mr Nagle expressed concern for the closure of these premises highlighting the difficulty of finding a suitable relocation site given what he described as "*the unique design, location and service delivery requirements of the service*".

## **8.4 Discussion**

In the EES, the risks associated with the impacts on business are presented as being mostly 'Low' to 'Medium', with few assessed as 'High' risk. The outcome of the risk assessment resulted in EPR that proposed consultation programmes and targeted assistance for businesses affected through construction works.

It is important to note that the foundation of the SGS assessment of risk is a Precinct analysis with the GVA method used to assign estimates of the potential impacts of the Project on businesses, including some outside Precinct boundaries. That is, the analysis takes a broad view of the impacts of the Project on businesses on a Precinct-wide basis rather than

concentrating on impacts on individual businesses. In this way, SGS measured impacts at a macro scale to form conclusions rather than looking at a micro scale.

This methodology is a proper approach producing valid conclusions. However, many business submitters measured impacts from their individual perspectives in lieu of a Precinct approach. They expressed concern about their ability to carry on with business in the event of significant disruption on business operations, and suggested a micro approach may be more relevant.

On this point, the peer review by Ms Stoettrup is direct. Her concern was that the residual impact on individual businesses was likely to be quite high, even though at a Melbourne wide or CBD level, the risks to business arising from the construction and operation of the Project was considered 'Low'. The Committee shares her opinion that the significant impact on the individual business owner should be considered when finalising the EPR. This need for a micro focus was borne out in the evidence of Mr Rawnsley who noted:

*The average profit margin for all businesses is 14.9 per cent. If the impact was to exceed this then, over average, half of all businesses would fail. If the impact was less than 5 per cent very few businesses would fail.*

The Committee notes the submissions by business operators drawing attention to the need for suitable measures to be put in place to anticipate, and then to respond to potential adverse impacts affecting the usual conditions and circumstances within which the businesses operate. The suggestion by Mr Rawnsley that adequate notice of termination of leases be given, and for offers of assistance when the Project causes financial losses to business is critical.

The Committee notes TN45 presented draft proposed Business Support Guidelines for Construction (BSGC) intended *"to address the potential adverse impacts of a temporary nature that construction of the Melbourne Metro may have on businesses in areas close to construction activities"*. Later, TN66 provided an amended Version 2 of the BSGC in response to submissions and evidence, which stated:

*The Business Support Guidelines outline the proactive measures and support services that MMRA and the appointed construction contractors may deliver to support businesses that experience Impacts during construction of the Metro Tunnel.*

*The Guidelines do not create entitlements for businesses affected by Metro Tunnel construction works. The purpose of this document is to provide a framework for Metro Tunnel contractors to address residual impacts on businesses so far as is reasonably practicable and appropriate.*

The changes to the BSGC are more than edits for clarity and word improvement. There is a generous change to the scope from the original draft presented in TN45. Version 2 now states *"The Guidelines apply to businesses which may be adversely impacted due to the proximity of Metro Tunnel construction works"* whereas Version 1 limited assistance to businesses *"which are identified as being adversely impacted ..."*.

The Committee accepts the change in scope. However, to be consistent with language applied in the EPR, the Committee recommends a further amendment to have the BSGC

apply to businesses affected by works undertaken for the Project irrespective of proximity of the works.

There is an important inclusion in Version 2 to establish a process for communicating eligibility to businesses, and a complaints and dispute resolution system which will apply *“in the event that a business operator is not satisfied with the level of support provided by MMRA or appointed contractors, the business would have options available to resolve the matter”*. It proposes the joining of the dispute resolution process offered by the Victorian Small Business Commissioner. The Committee notes the text of clause 4.2 as advising this is *“currently in discussion”*.

An omission from the original draft of the BSGC was the lack of any redress system to allow for review of an outcome negative to a business owner. The Committee supports a process whereby the Victorian Small Business Commissioner can facilitate dispute resolution. Should the discussion about engaging the processes offered by the Victorian Small Business Commissioner be unsuccessful, the Committee commends the adoption of processes for redress consistent with Australian Standard AS/NSZ 10002:2014 Guidelines for Complaint Management in Organisations. Those Guidelines were applied by Mr Offor for consultation and other techniques to assist parties through circumstances created by the Project. To go a step further and adopt another provision of the Guidelines would complete use of this Australian Standard.

The Committee notes the addition of a monitoring process in clause 3 of the Implementation Process set down in Appendix 1 of the Guidelines. The addition of the task for contractors to *“assess the effectiveness of support measures”* will provide continuous benchmarking that may allow added measures to be provided as required, in the event that mitigation has not achieved a goal or standard.

Appendix 2 ‘Example table of potential disruption and support measures’ is an inclusion in Version 2 of the BSGC. The stated aim of the table is to provide *“examples of the types of potential disruption and appropriate support measures that may be offered”*. Acknowledging that the document is for information and conveys examples of situations and support measures, the Committee recommends the wording should make clear that, consistent with the Committee's amended scope of the BSGC, any business of any type *“which may be adversely impacted due to works for the project”* may be offered support measures.

Version 2 of the BSGC continues the non-monetary scheme of support for businesses. The Committee notes the evidence of Mr Rawnsley did not advocate direct financial assistance to businesses across the Project. He did, however, recommend in his evidence certain amended EPR whereby assistance would be provided where food and beverage businesses, research institutions and accommodation businesses (such as City Square Motel) and accommodation providers (rental landlords) can demonstrate impact. He recommended instances where the MMRA might buy out leases of affected businesses or cover relocation costs. Each of those, by definition, would incur monetary payments by MMRA.

Mr Rawnsley further recommended management measures whereby MMRA might negotiate assistance with organisations to cover additional costs during the construction stage of the Project. None of these matters is contained in the BSGC or the EPR. Neither does the Committee recommend they be adopted. However, the Committee believes that

when a business disruption plan is being prepared as proposed in EPR B1, the MMRA should, where requested, assist businesses with the preparation of a business plan to create financial records as at a nominated date. The data would serve as a baseline to show financial movements up or down to establish a basis for any claim for assistance, monetary or non-monetary.

The Committee notes the BSGC will not be written into statutory documents but will have effect through EPR. No change to that status is intended. Ministration of the BSGC will therefore depend upon the goodwill of the parties. Because the BSGC will have broad application, it is important that they be flexible and capable of variation. Subject to minor editing as proposed in the recommendations, the Committee endorses the BSGC.

Following the tabling of Version 2 of the BSGC, the relevant EPR were amended to include specific reference to the type of assistance measures set out and implementation plans. The Business EPR numbers 1 to 5 are the principal requirements to assist businesses. Other EPR dealing with transport, social and community elements plus specific amenity and technical requirements are also aimed at mitigating impacts on businesses.

## **8.5 Findings**

The Committee finds that the Project will produce significant benefits to the state economy from the improvements to the transport system and to businesses in the longer term once the Project is operating. The Committee acknowledges that there is a significant risk to the viability of some businesses that will be affected by construction of the Project.

The methodology used in the assessment of business impacts is a proper approach producing valid conclusions. However, as stated in the peer review of the business assessments, a micro approach may be more relevant to the many business submitters who measured impacts from their individual perspectives. The BSGC are aimed at supporting those submitters and others. The Committee supports the direction of the BSGC but seeks improvements to the package that comprises the BSGC.

While the changes to the BSGC presented as Version 2 are accepted, including the change in the scope subject to the Committee's amendment, other changes should be made. Therefore, recommendations are made to amend the BSGC:

- so they apply to all businesses affected by works undertaken for the Project irrespective of proximity of the works using language consistent with the EPR
- to clarify the scope of Appendix 2, the sample of business types and example impacts used to illustrate mitigation and assistance measures.

The Committee supports the prospect of drawing upon the processes of the Victorian Small Business Commissioner especially for a redress system. Should this not be achieved the Committee commends the adoption of processes for redress consistent with Australian Standard AS/NSZ 10002:2014 Guidelines for Complaint Management in Organisations (EPR EM4). The Committee believes a process for redress is critical.

The Committee proposes that when a business disruption plan is being prepared as proposed in EPR B1, MMRA should, where requested, assist businesses with the preparation of a business plan to create financial records as at a nominated date. The data would serve as a baseline to show financial movements up or down to establish a basis for any claim for assistance, monetary or non-monetary. An amendment to EPR B2 is proposed.

Overall, the EPR to mitigate impacts on businesses are endorsed as a suitable basis for responding to business concerns. However, the Committee finds that further amendments should be made to achieve its goals of making the EPR targeted, clear and focused, and that they allocate defined roles with specified outcomes.

The Committee endorses submissions for continual and proactive engagement and consultation with business stakeholders throughout the construction stage. The Committee endorses the recommendation by Mr Ofor in his evidence statement that the MMRA should ensure communication with potentially affected businesses and property owners is frequent and clearly articulates the process for responding to issues.

The Committee finds that EPR B1 should be amended to provide businesses with adequate notice of the need for relocation caused by the Project including the termination of leases of public or private land where the displacement is a direct consequence of the Project. Further, EPR B2 should be amended to include not-for-profit organisations, and the requirement that a business disruption plan includes providing assistance with the preparation of Business Plans, where requested by businesses likely to be affected by the works to create financial records that may be used to demonstrate impacts from the Project.

The relevant EPR have been amended accordingly, as provided in Appendix F.

## **8.6 Recommendations**

- 7. Adopt the Business Support Guidelines for Construction referenced in Environmental Performance Requirement B2, and amend as follows:**
  - a) Replace paragraph 1 of Clause 2.1 Scope with the words “The Guidelines apply to businesses which may be adversely impacted due to works for the Project.”**
  - b) Delete the heading on column 1, ‘Business type and location’, and insert the words “All businesses affected by works for the Project.”**
  - c) Delete the words ‘Café or restaurant in Domain Road, South Yarra’ in cell 2 of column 1 and insert the words “Food and beverage premises including cafés, take-away food premises and restaurants in all precincts.”**
  - d) Delete the words ‘Clothing retailer in laneway or street adjacent to a construction site in CBD South/North’ in cell 3 of column 1 and insert “Food and beverage premises, retail premises, hairdressers and other shops in CBD South/North”.**

## 9 Air quality

Air quality impacts are addressed in Chapter 12 of the EES, and in Technical Appendix H.

The draft evaluation objective of the Scoping Requirements in relation to air quality at 4.5 is:

*To minimise adverse air quality, noise or vibration effects on the amenity of nearby residents and local communities, as far as practicable, especially during the construction phase.*

The following evidence was provided in relation to air quality:

- MMRA - Shane Lakmaker of AJMJV
- The Botanica - Terry Bellair of CEE Consultants.

A conclave of experts on air quality was held on 22 August 2016.

Numerous submissions referenced a range of air quality impact comments associated with tunnel construction.

EPR AQ 1 to 3 specifically dealt with matters relating to air quality.

### 9.1 Key issues

The Committee considers the key issues relate to:

- potential air quality impacts associated with construction
- dust dispersion predictive modelling
- air particulates (crystalline silica, asbestos fibre and aspergillus spores) need further consideration.

### 9.2 What did the EES say?

The EES included an assessment of existing air quality indicators for the Project area and immediate surrounds, and incorporated this data, together with linked meteorological observations into selected dust dispersion models. Both Project construction and operational stages were appraised in the EES. The air quality assessment was undertaken in accordance with the Victorian State Environment Protection Policy (Air Quality Management) guidance ('SEPP (AQM)').

The two relevant Project construction sites considered for detailed dust generation modelling assessment were Precincts 3 and 7 (based on anticipated higher levels of construction activity and spoil handling volumes). Dispersion modelling used the regulatory pollution model 'AEROMOD' in accordance with guidance provided from the EPA.

EPA routinely monitors air emissions from 10 long-term sites in the region, as well as some shorter-term monitoring at other locations.

The closest relevant and representative, long-term, ambient air quality monitoring sites to the Project are EPA's Richmond and Footscray sites (situated some 2.3 km from Precinct 8 and 4.5 km from Precinct 2 respectively). To date, there has been no Project specific baseline air quality investigations. The Richmond monitoring site was considered representative for the CBD (predominantly residential and commercial land uses surround).

The risk assessment provided estimates of both magnitude of air quality impact (consequence), and risk likelihood. Precincts 3 and 7 were determined to have a higher risk

of increased and sustained construction dust and machine exhaust emissions, where construction activity with Precinct 1, would be suitably managed by tunnel ventilation (with air filtering) and use of personal protective equipment for workers.

The EES indicated that construction sources likely to significantly contribute to dust included general earthworks and soil clearing activities, wheel dust from vehicles, wind generated dust from exposed soil surfaces, on-site concrete batching plants and restoration works for surface areas.

Available dust mitigation measures were described by three categories:

- design controls: physical barriers (screens or wind breaks), rapidly revegetating areas, or the application of water sprays and suppression agents on exposed soil surfaces
- planning controls: planning construction, to concentrate the main dust generating activities away from sensitive receptors
- operational controls: planning construction around the varying adverse meteorological conditions (such as avoiding work on windy and hot days).

The largest dust impacts are expected to be anticipated with the management and disposal of over 2 Million m<sup>3</sup> (in-situ volume) of excavated spoil from the Project (refer to Chapter 16 of this report).

Urban fill from excavated tunnel portals and station boxes may contain a significant proportion of contamination. In most cases, this spoil will be direct-loaded and hauled by covered trucks to assigned off-site disposal locations. Remnant soil stockpiles at construction sites will be managed by wetting down the stockpiles with water sprays, suppressants or by covering them.

Routine operational emissions are expected to include those from tunnel plant and equipment (electrical generators, boilers and heaters), from fuel-engine vehicles associated with operation and periodic maintenance, and tunnel thermal emissions associated with the venting. The EES indicated that these emissions would be negligible to air quality when compared to construction related impacts.

The EES concluded that the Precinct 3 construction site would be unlikely to result in adverse air quality impacts to nearby sensitive receptors. It was indicated however, that as background particulates in this area can vary and occasionally, already do exceed both SEPP (AQM) and NEPM criteria, there is still some potential for exceedances to occur on days similar to conditions when background concentrations are high.

For Precinct 7, modelling indicated that the construction site would be unlikely to result in adverse air quality impacts to the identified nearby sensitive receptors. It was indicated however, that as background particulates in this area can vary, and occasionally currently exceed both SEPP (AQM) and National Environment Protection (Ambient Air Quality) Measure (NEPM) criteria, there is still some potential for exceedances to occur on certain days similar to conditions when background dust concentrations are high.

The EES provided a number of mitigation measures to reduce the impacts of dust on the surrounding community. Table 4 presents a summary of this information.

Table 4 Intended dust generation mitigation measures for Precincts

Management Action Minimise Dust Generation	Precinct							
	2	3	4	5	6	7	8	9
Follow guidance within EPA Publication 480 (1996) - Environmental Guidelines for Major Construction Sites								
Reducing length of haul roads on unsealed surfaces, planning the locations of stockpiles and haul road routes, sealing some sections of haul roads.								
Use of acoustic (noise control) sheds to assist in controlling dust emissions.								
Installing wind breaks around stockpiles and exposed soil surfaces.								
Spraying of exposed surfaces and stockpiles with water.								
Level 2 watering (2 litres per m <sup>2</sup> per hour) on unsealed roads								
Minimising wind erosion across exposed areas, by sealing and vegetating exposed surfaces.								
Managing contaminated soil stockpiles at the construction site by covering with HDPE sheeting or tarpaulins.								
Temporary ventilation facilities at ground surface associated with tunnel excavation to use dust extraction and filtering systems.								
Dust monitoring at designated sensitive receptors would be established, to demonstrate compliance, where a Dust Management and Monitoring Plan would link to such monitoring, to allow modification of construction activity in response to adverse meteorological or environmental conditions.								

**Table Notes:**

	To be implemented at this Precinct from EES and Concept Design discussion
	Not relevant to this Precinct

Mr Roddis of Pacific Environment undertook a peer review of the air quality assessment within the EES. Mr Roddis indicated that *“at this stage in the project design it is difficult to reliably quantify dust emissions from construction activities.”* Further *“Any effects of construction on airborne particle concentrations would generally be temporary and relatively short-lived. Moreover, mitigation should be straightforward, as most of the necessary measures are routinely employed as ‘good practice’ on construction sites. It is therefore usual to provide a qualitative assessment of potential construction dust impacts”*. He noted that with planning across the Concept Design *“the value of the dispersion modelling is principally to identify risks and to recommend appropriate mitigation measures during construction”*.

In relation to managing air quality around areas of contaminated land, Mr Roddis noted *“during construction, it is anticipated that data gathering (and monitoring) would be ongoing for the duration of the Project. In the event where a contaminant is identified and ascertained to require additional mitigation, an appropriate strategy would be developed and implemented by the contractor”*. Mr Roddis concluded that the EES scoping requirement had been suitably covered through the air quality assessment, and that the assessment could be relied upon when developing appropriate mitigation strategies during construction.



## 9.3 Evidence and submissions

### 9.3.1 Evidence

Mr Lakmaker provided evidence on behalf of MMRA. He was the primary author of the EES Air Quality Section 12 and associated EES Technical Appendix H. Mr Lakmaker advised that the main reason why the seven major construction sites were not modelled, was that Precincts 4, 5, 6, 8 and 9 handled notably less spoil volume than Precincts 2, 3 and 7. Due to this and the associated lesser truck movements, it was expected that predicted dust concentrations and fall-out from the models would follow a generally linear response (less dust for those other Precincts). For Concept Design, Mr Lakmaker indicated that further modelling across the other Precincts was not required.

Mr Lakmaker confirmed that EES model predictions for 24-hour PM<sub>2.5</sub> concentrations (where 'PM<sub>2.5</sub>' indicates the collected dust particles with diameters less than or equal to 2.5 µm) were expected to be low. This was linked to the background observations for Melbourne, where PM<sub>2.5</sub> concentrations are also generally low. He noted that in July 2016, the Victorian Government formally adopted the NEPM National Clean Air Agreement. This had some implications in relation to current mandatory criteria for PM<sub>2.5</sub>. In relation to the future goals for PM<sub>2.5</sub> as indicated within the NEPM National Clean Air Agreement, Mr Lakmaker indicated that the goals suggested for Year 2025 have not yet been accepted by EPA and therefore do not apply.

Mr Lakmaker agreed that as respirable crystalline silica (RCS) is a 'Class 3' air quality indicator as described by the SEPP (AQM) (an 'extremely hazardous substance'), the risk to RCS needs to be further assessed.

When questioned in relation to S191 on aspergillus spores in soil, Mr Lakmaker noted that whilst he has not encountered this as an issue on construction with major projects, he had encountered the issue previously in relation to construction works occurring within a building and its impact on indoor air quality. Mr Lakmaker offered that the air quality objectives set by the Australian regulators don't normally describe criteria for a certain population group that may be at increased risk from dust inhalation (such as the elderly or hospital patients with lowered immunity). Instead, the regulators set criteria based around known health effects for the entire population (it was his view that such a risk is implicitly addressed by the existing air quality criteria). He offered that EPR AQ3 suitably covers 'other pollution'.

When queried on the risk of encountering asbestos fibres in spoil and the related air quality risk that this posed, Mr Lakmaker stressed the importance of following EPR C1 for contaminated land and spoil management. He agreed that Victorian guidance on asbestos management in soil and air needs to be followed.

Mr Lakmaker confirmed that with particulate dispersion modelling, he used the suggested guidance provided within the National Pollution Inventory in setting the effectiveness of assumed dust mitigation measures (no Precinct-specific model assumptions for modelling were applied beyond these generic assumptions).

In relation to issues raised by the Botanica, Mr Lakmaker confirmed that while he had included the expected volumes of spoil from the construction of the Domain station box into

the modelling, the actual potential 'point-source' impact from such construction activity at the station box on nearby, sensitive receptors had not been modelled in any detail.

In relation to assessing risk for RCS, Mr Lakmaker indicated that the risk from tunnel venting stacks or points, can be further assessed moving into final design and construction, when there is suitable detail of the approach for each Precinct. Mr Lakmaker indicated that the applicable point source criteria for air quality could be achieved by the Project.

Mr Lakmaker confirmed in relation to deploying mitigation measures under an Air Quality Management System, a combination of 'standard' mitigation measures would work together with a set of 'reactive' measures (such as monitoring for changes in weather conditions and managing dust emissions from the 'visual perspective'). He noted the aspects of air quality risk mitigation and monitoring discussed within the EPR for Precinct 7 needed to suitably translate across all other Precincts. He indicated that each Precinct has certain characteristics (key sensitive receptors and site contaminants), and that baseline air quality sampling would shortly commence at Precinct 3, where the current available data was viewed as having some information gaps.

Mr Lakmaker was questioned about working to the EPA-Protocol for Environmental Management (Publication 1191), as opposed to SEPP (AQM) for PM<sub>10</sub> and PM<sub>2.5</sub> criteria. He offered that due to the nature of the dust emissions sources (generally they are not point sources), the PEM is a more relevant guideline document. The PEM pointed to the use of the NEPM, which are more stringent than what is offered in the PEM or the SEPP (AQM) when considering non-point sources for dust. He indicated that EPA have been involved with consultation for the EES work, which is why these criteria were selected.

When questioned on the applicable air quality standards to an occupational health and safety (OH&S) exposure, Mr Lakmaker responded that as usual OH&S guidance was based around an eight-hour working day, the OH&S guidance was normally considerably higher than the criteria adopted for ambient air. Mr Lakmaker indicated that he was satisfied that the ambient quality criteria established for the Project would satisfy worker OH&S standards for Precinct 5.

Dr Bellair for the Botanica reviewed the proposed EES criteria for dust particulates and generally concurred, however he noted:

*The criteria adopted for dustfall is ... based on the guideline in EPA (Publication 1191 (which is not, however strictly applicable to the Melbourne Metro project)).*

Dr Bellair reinforced the steps required by EPA within SEPP (AQM) for modelling, in predicting particulate dispersion from specific emission sources. He noted that the modelling used dust emission estimates based on the National Pollution Inventory Emission Estimate Technique Manual for Mining (where the estimates allowed for certain dust control measures to be assumed).

Dr Bellair noted that the meteorological input file used with the air modelling was taken from Bureau of Meteorology data for Essendon Airport between 2010 to 2014. He observed that modelling assumed that all dust sources (even in considering wind erosion) were treated as volume-based sources.

Dr Bellair observed that particle dispersion modelling indicated no exceedances for PM<sub>10</sub>, PM<sub>2.5</sub> or dust deposition criteria for Precinct 7. He observed the EES limitations to the air quality modelling, where it was acknowledged that detailed construction layouts were not finalised, where modelling predictions would be required upon updating the Concept Design. He noted that current modelling did not include any inputs from particle emissions associated with tunnel excavation ventilation systems.

Dr Bellair noted that the assessment had not considered the impact of RCS less than 2.5 microns in size, which had the potential to originate from TBMs and road header excavation in forming the tunnels through the Melbourne Formation. Dr Bellair referred to the SafeWork Australia publication on RCS, where construction activities within 'sandstone' materials that included excavation, earth moving and drilling plant operations "*require special attention (from an OHS standpoint) when assessing exposure to RCS*". He pointed out that Schedule A of the SEPP (AQM) classifies RCS as a Class 3 Indicator, and indicated "*this would require much more stringent dust control than those proposed by the EES*". He noted that Schedule A of the SEPP (AQM) specified a design criteria for RCS of 0.00033 mg/m<sup>3</sup> (for a three-minute measurement average).

Dr Bellair noted that in relation to the air dispersion modelling conducted for Precinct 7:

- assumed model emission rates were suitably derived from the National Pollution Inventory Emissions Estimate Technique Manual for Mining (allowing for the implementation of dust control measures)
- actual emission rates for dust can vary widely (from theoretical estimates) on construction sites
- particulate emission inputs from air exhausted from the excavations by mechanical ventilation had not been modelled
- particulate emissions from the station box construction were not incorporated by the current model and that 'worst-case' modelling in the case of the Botanica apartments as a receptor, should have included the modelling of the cut and cover construction
- detail was not available on how the spoil stockpiles were modelled at the construction sites
- the assumed relationship between wind speed and rates of dust erosion from wind was not transparent
- emissions of RCS were not considered.

Dr Bellair noted "*model predictions are generally less reliable when it comes to predicting off-site particulate concentrations and dust deposition rates*", and recommended the establishment of a 'Dust Management and Monitoring Plan' as follows:

- use air dispersion modelling to identify the main dust sources that could impact sensitive receptors
- identify appropriate dust mitigation measures
- require all construction site personnel to immediately advise management if excessive dust emissions are observed
- routinely review weather model predictions (at least two days in advance) to suitably plan dust controls
- pro-actively halt certain site activities across periods of adverse weather conditions.

Dr Bellair recommended establishing suspended particulate monitoring devices (PM<sub>10</sub> and PM<sub>2.5</sub>) at sensitive receptor locations. These monitoring points should be ‘real-time’ enabled, to provide rapid feed-back to construction site management on predicted dust particulate exceedances. Monitoring records should be securely kept and displayed in a fully transparent manner for proof of compliance, and to provide a sound basis for modification of deployed dust control measures.

Dr Bellair recommended that real-time particulate monitoring be integrated with the use of dust deposition gauges (normally sampled each month) at the construction site and surrounding sensitive receptors. The gauges provide a useful measurement of ‘background’ dust deposition rates, and how site construction activity may be adding to the background condition. In relation to dust mitigation measures, he made the point that *“sealing haul roads to reduce dust emissions is not necessarily as effective as well-watering unsealed haul roads during hot, windy conditions ...”*.

Dr Bellair concluded that the EES dispersion modelling conducted did not provide *“an adequate basis for defining a residual air quality risk rating for the Domain Precinct”* (where the EES had rated construction air quality risk as ‘Medium’ for Precinct 7). He provided the following recommendations in relation to Precinct 7:

- further establish if RCS will be an issue, and if so, enact a program of suitable modelling and monitoring to control risk
- additional air dispersion modelling should be undertaken across aspects of tunnel spoil handling and disposal, construction of the station box and prediction of RCS emissions for sensitive receptors
- establishment of a suitable ‘Community Liaison Committee’ that represents key receptors, to regularly meet with Project management across construction..

### **9.3.2 Air quality conclave**

A conclave was held between Mr Lakmaker and Dr Bellair on 22 August 2016 (D37). In relation to the Botanica (Precinct 7), they agreed in part that these apartments will be sensitive to increases in local dust levels.

Mr Lakmaker agreed to adjust EPR AQ1, so management plans list minimum mitigation measures including watering of haul roads, on-site vehicle speed restrictions, clearly marked haul roads, water sprays on stockpiles, minimising material drop-distances when loading to and from stockpiles, use of construction site wind breaks and the modification of site activities in response to adverse weather conditions.

In relation to designing for future point sources (such as tunnel ventilation air discharges with construction) it was agreed that the following design criteria sourced from SEPP (AQM) were to be used in particular, for this risk setting:

- PM<sub>10</sub> = 80 µg/m<sup>3</sup> (one-hour average)
- PM<sub>2.5</sub> = 50 µg/m<sup>3</sup> (one-hour average)
- RCS (as PM<sub>2.5</sub>) = 0.33 µg/m<sup>3</sup> (three-minute average).

In relation to the need for additional dispersion modelling of the Precinct 7 station box excavation, partial agreement was reached around Dr Bellair’s comment that updated modelling was required, to help identify specific air quality concerns related to construction.

In relation to establishing a Community Liaison Committee for the overview of construction dust management, both parties agreed that this would be beneficial.

The experts disagreed that in relation to the suggestion by Dr Bellair, that the air quality assessment was 'not robust', Mr Lakmaker responded:

- effectiveness of the proposed mitigation measures was well documented
- RCS emissions were not anticipated (from existing EES modelling predictions for PM<sub>2.5</sub>)
- expected spoil handling volumes associated with the excavation and construction at the Domain station box were already modelled
- unfiltered dust in air from tunnel ventilation outlets during construction would form a small fraction of total emissions.

Dr Bellair suggested that the modelling did not provide an adequate basis for defining residual risk because it did not consider all potentially significant sources of particulates or potential RCS emissions, nor model a 'worst-case scenario' for the Botanica.

While discharges from construction underground excavation venting may only provide a relatively small volume of discharge in relation to total dust, understanding and management of this issue will have a high influence on risk.

Mr Lakmaker responded to these points, by suggesting:

- construction emissions from tunnel ventilation ducts were expected to form only a relatively small fraction of total particulate emissions. It was considered unlikely that the currently assigned 'Medium' risk ranking for Precinct 7 would alter based on such additional influence
- spoil excavation volumes directly associated with Precinct 7 station box have already been included in the modelling
- RCS emissions were not expected to cause concern given model results for PM<sub>2.5</sub>
- It was expected that the highest construction dust concentrations would be at ground level (air dispersion models are expected to predict lower dust in air concentrations at elevations higher than ground surface level).

In relation to the issues on RCS raised by Dr Bellair that this could be a significant issue given the strict criteria as listed under SEPP (AQM), Mr Lakmaker responded:

- RCS was not considered, as it has not come up as an issue on other similar projects
- EPA have monitored for RCS within Melbourne (Brooklyn and Footscray monitoring sites), where they encountered negligible concentrations (EPA Publication 1444)
- EES modelling for PM<sub>2.5</sub> emissions show that the highest annual average predicted concentration will be of the order of 0.5 to 1 µg/m<sup>3</sup>. This is lower than the applicable SEPP (AQM) design criteria of 3 µg/m<sup>3</sup> (where RCS content making up PM<sub>2.5</sub> is unlikely to be 100 percent).

### 9.3.3 Submissions

#### (i) Threshold issues and Precinct 1 – Tunnels

Impact to air quality during construction from dust, soil disturbance and emissions from equipment was raised as a specific issue by over 60 submitters. Many called for specific measurement and monitoring processes, with a responsive complaint and enforcement process.

EPA (S291) pointed to the need to refer to EPA Publication 480 Environmental Guidelines for Major Construction Sites (1996) for guidance on dust management. EPA recommended that *“as part of the Construction Environmental Management Plan and Site Environmental Improvement Plan that a Precinct – Specific Air Quality Plan is prepared and implemented to manage dust generation during construction”*.

#### (ii) Precincts 2 and 3 – Western portal and Arden Station

Submission (S205) raised concerns regarding an increase in air pollution from tunnel construction. The City of Melbourne indicated that it was *“concerned about impacts on the residential amenity of the area particularly from the proposed 24-hour per day construction activities and truck movement”*. North Melbourne Football Club advised: *“we run a business of elite sport where our athletes undertake most of their training outdoors on the oval. Good air quality is critical in this elite sporting environment”*. Nick Theodossi Prestige Cars (S84) raised a list of concerns with the Project regarding *“dust, mud, dirt and air pollution”*.

#### (iii) Precinct 4 – Parkville Station

The DHHS expressed concern about soil excavation releasing aspergillus spores (that occur naturally in soil) and submitted that although this does not represent a risk to healthy people, it may represent a significant risk to the health of people who are immune-depressed. It requested that the Dust Management and Monitoring Plan for Precinct 4, include air monitoring for aspergillus spores, with specialist appraisal on this data from an infection control specialist. Further, it noted the likely need for additional filtering efforts associated with building air intakes to the various medical facilities, to cope with construction dust.

The University of Melbourne submitted that air quality and air emissions arising from construction activities must be managed to *“ensure the University’s operations are not adversely affected”*. The Graduate Union raised concerns *“about future placement of vertical ventilation shafts that are planned to be built in University Square and the potential impact of air quality”*. It was noted by the Committee that there is currently a disguised vehicle ventilation stack associated with the existing University Square underground carpark near this approximate location.

#### (iv) Precinct 5 – CBD North Station

RMIT requested the need to participate in the development of Project environmental controls which included a Dust Management and Monitoring Plan. RMIT indicated: *“... the EES and EPR require a more detailed consideration in respect to airborne particulates and contaminants generated from the significant increase in heavy vehicles (up to 210 per day) along the proposed heavy vehicle route. In the areas along the routes of the heavy vehicle,*

*there are fresh air intakes for RMIT air handling equipment. Potential increased exhaust emissions entering clean air intakes has the potential to substantially impair indoor air quality for occupants and key sensitive equipment”.*

Submission (S263) raised the potential impact on local amenity and the risk of reduced air quality. This submitter requested that they be included as a stakeholder when developing an air quality management plan for the Precinct.

**(v) Precinct 6 – CBD South Station**

The MATC indicated “The Cathedral’s fabric and fittings are unusually susceptible to damage from dust and vibration, and noise is particularly intrusive in an environment dedicated to prayer and contemplation.” It also submitted:

*In addition it is noted that during excavation substances contained within the excavated soil and resulting dust may interact with the mortar and pointing of the Cathedral’s external stonework, causing deterioration or the need for increased cleaning. Ongoing monitoring of this risk will be required.*

This submitter was “concerned about the long term effects of exposure to the combination of dust, vibration and noise on the fabric of the building, our staff, congregations and visitors”.

Several other submitters raised concerns over the management of dust during construction, including representatives of the Westin, the Residents 3000 Group (S317), and others (S281, S297).

**(vi) Precinct 7 – Domain Station**

MGS raised concerns over the management of dust during construction, including the potential health and safety impacts of excessive dust and the spread of contaminated soil through dust particles. Specific requests included the need for National Association of Testing Authorities accredited, baseline air quality monitoring across ‘TSP and deposited material’ as well as PM<sub>10</sub> and PM<sub>2.5</sub> distribution, and air quality monitoring, appropriately sited ‘peak’ and ‘background’ monitoring stations.

The Domain Owners Corporation indicated in relation to the EES modelling of dust particulates generally indicating that construction would meet air quality criteria “*While this gives us some comfort in this regard, it is a theoretical exercise based on a range of assumptions which may or may not prove to be the case in practice*”. They indicated “*Accordingly we are concerned to ensure that there is an independent regime in place that will monitor air quality outcomes*”.

Several other submissions (S193, S196, S204) raised the aspect of dust generation and a reduction in air quality.

**(vii) Precinct 8 – Eastern portal (South Yarra)**

Submission S12 raised the potential risk of “*friable asbestos dust*” associated with the railway line area works being disturbed. Submission S325 indicated that significant dust generation is likely to occur at the South Yarra Siding construction site. It requested that “*All measures need to be taken to reduce this. Raised dust and pollution are known to cause serious health issues such as serious respiratory issues, exacerbation of asthma and elevate*

*the risk of lung cancer arising as a result of airborne particles*”, and that air quality monitoring results be reported publicly.

## **9.4 Discussion**

The air quality impact assessment from the EES provides the Committee with sufficient information from which to assess the impact of the Project on air quality. Both air quality experts considered that construction dust emissions can be suitably managed and the EES objective for air quality can be achieved. Visual construction dust may prove to be an issue for the Project for certain nearby sensitive receptors, and this will require close management through the EPR and contractors Construction Environmental Management Plans (CEMP).

Further investigation into the potential for RCS will need to be undertaken through detailed design. Current findings suggest the issue cannot be ignored, where risks to surrounding sensitive receptors during construction will only be able to be ascertained, once the locations of tunnel ventilation outlet stacks, details of ventilation air discharges and air filtering mechanisms are known.

In relation to the potential for release of airborne asbestos fibres from construction, Mr Lakmaker offered that this type of risk is normally covered through the consideration of contaminated land and spoil management, where if asbestos presence in fill is an issue, resultant air monitoring controls are deployed, together with the strict management of the spoil.

No significant adverse impacts to regional air quality from the Project are expected. Conservative dust emission predictive modelling for higher risk construction sites, suggested that with the anticipated mitigation measures to be deployed, that air quality can be generally maintained within required criteria to protect human health and the environment.

For the Concept Design, a suitable process of qualitative risk assessment, combined with selective modelling of particulate dispersion behaviour in air from representative Precincts, was undertaken to allow key adverse exposure risks to be identified. These are:

- dust associated with construction poses the highest likely risk
- more significant dust impacts are anticipated to come from the major construction sites at Precincts 3 and 7 (where larger spoil volumes will be managed)
- the following specific forms of air particulates need to be suitably baselined and monitored across construction (with expert OH&S assessment overview), to protect construction workers and surrounding sensitive receptors - RCS (all Precincts), asbestos fibres (when handling asbestos impacted fill for all Precincts) and aspergillus spores (Precinct 4 only).

Air dispersion modelling indicates that particulate concentrations should be manageable with appropriate mitigation measures, however in certain meteorological conditions there may be potential for air quality criteria to be exceeded beyond Project boundaries in the short-term, where dust generation activities will need to be closely planned, monitored and managed.

The EES has committed to a range of well-accepted dust mitigation measures planned for deployment across the Project’s construction sites. Dust prevention and control mitigation measures include design, planning and operational controls, and will form part of a Dust



Management and Monitoring Plan (to be incorporated within the Project's CEMP). This will be guided in part by EPA Victoria (EPA)'s Environmental Guidelines for Major Construction Sites (1996).

## **9.5 Findings**

The Committee finds that the air quality issues associated with construction for the Project can be suitably managed within the regulatory framework as outlined in the EES, the Incorporated Document, the EMF and the EPR.

In this regard, the Committee finds that EPR AQ1 should be amended to provide additional requirements for air modelling for particulate dispersion to include point source construction ventilation discharges, to assess for both dust particulates and RCS.

Further, a specific risk assessment (human toxicology risk) should be conducted for human health, by a suitably qualified professional for the relevant contaminants of potential concern, which currently include dust, RCS, asbestos, aspergillus spores (Precinct 4 only) and possibly other common industrial contaminants within dust (such as metals and polycyclic aromatic hydrocarbons). In addition, the EPR AQ1 should consistently reflect that it relates to dust management and monitoring.

The relevant EPR have been amended accordingly, as provided in Appendix F.

## 10 Noise and vibration

Noise and vibration impacts are addressed in Chapter 13 of the EES, and in Technical Appendix I. Technical Appendix I of the Noise and Vibration Impact Assessment (NVIA).

The draft evaluation objective of the Scoping Requirements in relation to noise and vibration at 4.5 is:

*To minimise adverse air quality, noise or vibration effects on the amenity of nearby residents and local communities, as far as practicable, especially during the construction phase.*

The following evidence was called in relation to noise and vibration impacts:

- MMRA - David Anderson of Acoustic Studio, and John Heilig of Heilig and Partners
- City of Stonnington - Tim Marks of Marshall Day Acoustics
- City of Melbourne - Peter Fearnside of Marshall Day Acoustics
- University of Melbourne - from Matthew Stead of Resonate Acoustics
- RMIT - Tim Marks of Marshall Day Acoustics
- Melbourne Anglican Trust Corporation - Ross Leo of Marshall Day Acoustics
- the Botanica - Neville Goddard of Watson Moss Growcott
- the Domain Owners Corporation - Simon McHugh of Marshall Day Acoustics
- Melbourne Grammar School - Andrew Mitchell of Cogent Acoustics
- the Westin - Matthew Shields of Acoustic Logic
- Legend Properties - Douglas Growcott of Watson Moss Growcott (who prepared an expert witness statement, but did not attend in person to give evidence).

All experts, aside from Mr Growcott, attended a conclave of experts on noise and vibration on 25 August 2016.

Numerous submissions made reference to a range of noise and vibration impacts both during construction and operation.

EPR NV 1 to 18 and NVA and NVB specifically concern matters relating to noise and vibration.

### 10.1 Key issues

The Committee considers that key issues relate to:

- the management of construction noise impacts
- guideline targets versus mandatory limits for construction and operation
- appropriate airborne construction noise targets
- the definition and management of unavoidable works
- night-time inaudibility criteria and sleep disturbance
- vibration impacts on people, property, sensitive equipment and bio-resources
- electromagnetic interference (EMI)
- construction noise mitigation for affected residents
- noise from fixed infrastructure during operation

- noise and vibration from trains during operation

## **10.2 What did the EES say?**

The EES Chapter 13 and the NVIA, EES Technical Appendix I assessed noise and vibration from construction and operation of the Project in each of the nine Precincts.

The NVIA noted the assessment was based on the Concept Design, it considered the predictions contained in it to be conservative and further independent assessment including noise predictions, measurements and validation of results would be required.

### **10.2.1 Noise criteria**

Section 3 of the NVIA Legislation, Policy and Guidelines listed the various publications used to inform the development of the EPR and management framework for controlling noise and vibration impacts. Table 3-1 in the NVIA listed the legislation and policy documents used to develop criteria, the implications for the Project and showed that approvals are required in relation to unavoidable work and blasting.

### **10.2.2 Methodology**

The NVIA described the methodology used to assess impacts of noise and vibration. Baseline noise and vibration levels were measured at selected locations in each Precinct and appropriate criteria were determined.

For airborne construction noise assessment, EPA 1254 criteria were used. For construction vibration, the NVIA nominated guideline targets in relation to damage to buildings and infrastructure, human comfort, and sensitive equipment.

Predictions were made to determine whether compliance could be achieved at both residential and non-residential receivers such as hospitals. Where it was predicted that limits or guideline targets would be exceeded, mitigation and management options were identified and recommended.

Mitigation measures for controlling construction noise and vibration impacts included a suite of work practices as required by EPA 1254 and the use of acoustic construction sheds and noise barriers. Management measures included communication with affected stakeholders and offers of alternative accommodation.

Airborne noise from trains near the Western and Eastern portals was assessed in accordance with the Victorian Passenger Rail Infrastructure Noise Policy, April 2013 (PRINP) which sets investigation thresholds for redevelopment of existing rail infrastructure. Where these thresholds are exceeded, options for avoiding, minimising and mitigating noise should be considered. Ground-borne noise and vibration from trains operating in the tunnel was also assessed. Where criteria were not achieved, mitigation measures such as the use of high performance attenuated track and noise barriers was nominated.

### **10.2.3 Construction noise and vibration impacts**

Predictions were made of airborne noise, ground-borne noise and vibration levels expected from tunnelling activities, construction works and blasting (Precinct 4 only) to both residential and non-residential receivers.

The results indicated:

- ground borne noise and vibration due to tunnelling and or other works would exceed nominated human comfort criteria in Precincts 1 through 8
- vibration criteria in relation to sensitive equipment and sensitive receivers would be exceeded in Precinct 4 with some isolated exceedances in Precinct 5
- criteria for airborne noise and building damage during construction would not be exceeded with appropriate mitigation measures in place
- no exceedances in Precinct 9.

In areas where vibration and ground-borne noise targets would be exceeded, the NVIA suggested that mitigation measures include the use of appropriate work practices where feasible and a thorough consultation and notification process, together with offers of temporary respite, if required.

For Precinct 4, which is home to many highly sensitive land uses such as hospital wards, bio-resources facilities and research and educational facilities that operate highly sensitive research equipment, the NVIA contemplated ongoing detailed consultation with key affected stakeholders as a mitigation measure.

The NVIA did not specifically assess noise from construction traffic and spoil trucks but noted that truck movements will generally be restricted to normal working hours. It raised the prospect of building mitigation works such as improved glazing for residents that may be impacted by truck noise.

#### **10.2.4 Operation**

The operational stage of the Project includes operation of trains through the tunnels, at the portals within existing rail corridors, and operation of fixed infrastructure, such as cooling and ventilation equipment.

The assessment in the NVIA was based on the operational timetable anticipated for 2036, 10 years after the opening of the Project. For the operational stage, compliance with all noise and vibration criteria was predicted provided appropriate mitigation was in place.

### **10.3 Evidence and submissions**

There were numerous submissions that addressed the impact of noise and vibration and many of these requested an independent assessment and monitoring process for noise and vibration issues throughout the construction of the Project, along with a process for complaint resolution.

#### **10.3.1 MMRA**

The following additional material relating to noise and vibration was produced by the MMRA after the exhibition of the EES and before the Hearing commenced:

- TN43 and TN43A (D21)
- TN54 (D70)
- new EPR NVA (Version 1) (D18)
- new EPR NVB (Version 1) (D18).

TN43 and the associated attachment TN43A contained the draft RIMG. This document described noise mitigation measures and noise threshold requirements for residential

receivers to be eligible for building mitigation and/or temporary relocation. EPR NVA (NV19) concerned the establishment of the PPRG. EPR NVB (NV20) introduced a requirement for the preparation of a Construction Noise Vibration Management Plan (CNVMP) and included additional measures to minimise truck noise impacts.

Version 4 of the EPR resolved some of the key issues related to noise from fixed plant to non-residential receivers and potential damage to heritage places and infrastructure from construction vibration.

The MMRA submitted that control of operational noise from the Project did not present any significant issue, and would be relatively straightforward to control and assess. However, the MMRA accepted that during the construction stage there would be instances of disruption and occasions of significant impacts on the community. The MMRA accepted that such impacts needed to be mitigated and controlled as much as possible and practicable.

The MMRA submitted that those closest to the works locations (such as the University of Melbourne and RMIT) would suffer the most significant disruption, but these organisations would ultimately derive the most benefit from the Project. It expected the long term gain for these parties would outweigh any negative consequences of the impacts of noise and vibration experienced while the Project was being constructed.

It was submitted that the EPR were not about avoiding impacts altogether, but rather were concerned with managing impacts. The proposal to establish the PPRG was put forward as an example of an effective proposal to manage noise and vibration impacts on affected parties in that precinct.

The MMRA recognised the particular interests of RMIT but did not consider it appropriate for RMIT to be part of the PPRG (as requested by RMIT in submission). Instead the MMRA indicated it would take a case managed approach, using direct engagement, including fortnightly meetings with RMIT. The MMRA suggested that further EPR could be developed to formalise this approach and other interest groups could be accommodated through the EPR.

In regards to management of the disruption, the MMRA contended that mitigation measures “*outside the box*” were required.

The MMRA submitted that it was appropriate for the EPR to adopt EPA 1254 because:

- it was a Victorian document
- it had been used as the basis for noise controls for other major projects, such as the East West Link
- there was no evidence to show that it had failed to achieve good noise control, or to protect the community from adverse noise impacts from major projects.

Mr Anderson gave evidence for the MMRA and explained his role was to peer review the NVIA as it related to construction airborne noise, and operational noise and vibration. He found that the criteria was appropriate, the noise modelling competent and appropriate for the Concept Design, but that more detail was required regarding daytime construction noise impacts, procedures for respite and feasibility of noise attenuation for fixed plant. He stated that these requirements were addressed in subsequent revisions of the NVIA.

Dr Heilig gave evidence for the MMRA in relation to vibration from tunnelling and other construction works, and addressed the purpose of the relevant EPR. He recommended

amendments to some EPR including a requirement to consider VHR buildings, requirements for additional condition surveys and monitoring programs.

With regard to eligibility for condition surveys, Dr Heilig explained that two options were generally available. One was to survey all properties located within a certain distance from the works and the other was to survey properties where the assessment had predicted the trigger level would be reached. Dr Heilig supported the trigger level approach, but accepted that the task of condition surveys could be onerous, and modelling may not have occurred to allow identification of all affected properties. He was concerned that using the distance option may overreach the required survey area.

### **10.3.2 Councils**

Mr Fearnside gave evidence for the City of Melbourne and Mr Marks gave evidence for the City of Stonnington. Both witnesses raised concerns with the reliance on EPA 1254 to manage construction noise especially in relation to daytime trigger levels and the definition of “unavoidable works”. Mr Marks highlighted that an assessment of sleep disturbance had not been performed in the NVIA.

For construction vibration criteria for human comfort, Mr Marks suggested the selected criteria based on Vibration Dose Value (VDV) was inappropriate. He recommended the use of Root Mean Square (RMS) velocity criteria contained in International Standard ISO 10137:2007, Bases for design of structures – Serviceability of buildings and walkways against vibrations (ISO 10137:2007) (D72). Mr Marks stated that VDV was difficult to predict and was not suitable as a tool for monitoring trigger levels. Mr Fearnside did not suggest any change to EPR NV9 which specifies the VDV criteria.

With regard to the draft RIMG, Mr Fearnside stated that the provisions needed to be more generous. He referenced the Crossrail (UK) mitigation scheme as a good example. Mr Marks considered that the threshold limits in the draft RIMG were too high but had not formed a view of what thresholds would be appropriate for the RIMG.

For the operational stage, both Mr Fearnside and Mr Marks considered it best practice to install high attenuated track as this would essentially future proof the city and reduce the cost of building future sensitive areas over the railway.

### **10.3.3 Educational institutions**

Mr Marks gave noise and vibration evidence for RMIT. Mr Marks considered that EPA 1254 was inadequate, as it only provides thresholds for residential receivers, has no daytime thresholds and no detailed definition of unavoidable works. Mr Marks recommended the use of NSW guideline documents to manage construction noise impacts as they are comprehensive, robust and effective.

RMIT distributed a document Rules of Engagement, New Academic Street (NAS) Project RMIT, Melbourne Campus (D117), which described contractor responsibilities for the NAS construction Project. Section 6.3 Noisy Works of this document nominated the following limits for noise and vibration:

- *Continuous noise occurring for longer than 3 minutes in a 15-minute period should not exceed 65dBA (slow weighted)*
- *Non-continuous noise not to exceed 70dBA (slow weighted)*

- *Continuous vibration occurring for longer than 3 minutes in any 15-minute period should not exceed 0.01 inch/second*
- *Non-continuous vibration not to exceed 0.05inch/second.*

Mr Marks accepted that teaching spaces could operate if construction noise levels were above 45dBA as recommended in the NSW documents, but above 65dBA the noise levels may be intrusive to speech communication. He accepted that the NAS criteria for vibration was higher than the American Society of Heating Refrigerating and Air Conditioning Engineers (ASHRAE) curves. Mr Marks suggested that operational vibration could pose significant long term risks to RMIT and recommended additional detailed assessment.

Ms Brennan expressed concerns regarding the sensitivity of Precinct 4, the nature of impacts particularly during construction, and the suitability and timing of mitigation measures. The University of Melbourne understood the desire of the MMRA to maintain flexibility in the EPR, but argued that the delivery of the contract will be by the contractor not the MMRA and there must be some obligation on the contractor to avoid and minimise impacts. Ms Brennan advised that the EPR needed specificity and must set clear expectations for the contractor.

Mr Stead gave evidence for the University of Melbourne and provided comments and recommendations to EPR. These included a requirement for daytime threshold targets for the University of Melbourne, a requirement for a proactive approach to mitigation for vibration sensitive equipment and additional notes regarding baseline measurements and monitoring.

Mr Stead recommended that the effect of electromagnetic interference (EMI) on sensitive equipment and mitigation options for EMI be considered.

Mr Mitchell gave evidence for MGS. He identified airborne noise as the greatest concern for MGS, as high noise levels had the potential to impact on learning activities in classrooms. He stated that appropriate criteria for educational institutions was not contained in EPA 1254 but could be sourced from NSW Interim Construction Noise Guidelines (ICNG). Mr Mitchell was supportive of EPR NV1 referencing EPA 1254 and specifying additional limits and measures in the CNVMP, and of the airborne noise section of the new EPR NVB (NV20). He considered that the internal targets for airborne construction noise provided in EPR NV5 were thresholds rather than mandatory limits.

Mr Mitchell accepted the vibration dose criteria provided in EPR NV9 and considered that monitoring could be performed by measuring peak particle velocity (PPV) derived from the VDV as suggested by Dr Heilig. He considered that operational limits for ground-borne noise and vibration should be mandatory as if criteria were exceeded, mitigation measures would be limited.

#### **10.3.4 Residential owners corporations**

Mr Goddard gave evidence for the Botanica. He raised similar issues to other experts in relation to the use of EPA 1254 including the lack of daytime threshold levels and the lack of definition for “unavoidable works”. He considered that the Committee could review all relevant guidelines and pick and choose the best elements to manage construction noise. Mr Goddard recommended the draft RIMG adopt trigger levels, similar to those used by Crossrail. He thought the use of temporal allowance timeframes made sense but suggested

shorter time frames be adopted. He considered that a comprehensive and detailed Project time line was essential to assist residents in making decisions.

Mr McHugh gave evidence for the Domain Owners Corporation. His presentation (D180) provided an overview of the Crossrail Project and mitigation scheme where airborne construction noise was identified as the most significant impact. He raised concerns about EPA 1254 especially relating to the lack of daytime thresholds and the definition of “unavoidable works”. Mr McHugh was also concerned with the draft RIMG content and how it would be triggered, and recommended the RIMG apply to all night-time work including “unavoidable works”.

Mr Shields gave evidence for the Westin and advised that most of the concerns of the Westin had been addressed in Version 3 EPR. He recommended that unavoidable works be addressed via the CNVMP which should define unavoidable works and indicate the quantum of such works.

Mr Shields was concerned with the size, scale and lack of information regarding the Precinct 6 acoustic shed construction, and recommended that an independent external review be required to ensure the shed will work as proposed. He recommended that the Westin be specifically identified as a monitoring location and that additional glazing be installed at the Westin before construction begins, regardless of what the noise predictions indicate. Mr Shields considered that construction vibration criteria for human comfort based on VDV was acceptable, but in practice monitoring should be performed based on PPV.

### **10.3.5 Melbourne Anglican Trust Corporation**

The MATC provided a submission which raised concerns regarding building damage to the pipe organ mosaic floor and stained glass windows at St Paul’s Cathedral due to construction vibration, and the loss of peace and tranquillity within the Cathedral during construction.

Mr Leo gave evidence for the MATC and raised concerns in relation to EPA 1254 as this document provides no guidance for acoustically sensitive non-residential areas, does not provide day time threshold levels and does not adequately define “unavoidable works”. He recommended that in situ measurements be taken, a full geotechnical survey be performed and vibration monitoring be conducted during construction. In addition, the construction monitoring vibration regime should include setting alarm levels at 75 to 80 per cent of threshold values. If levels reached this point, construction in this area should cease to allow assessment to be conducted.

It was recommended that truck stabling areas needed to be identified to ensure that services would not be affected by truck noise.

### **10.3.6 Other parties**

Over 100 submissions specifically raised noise and vibration impacts from construction activities as a key concern. Many submitters near Precinct 2 (S19, S266) were concerned about noise associated with the TBM launch and retrieval operations, and significant heavy vehicle noise from trucks associated with spoil removal and construction especially during the night-time period.

Property damage due to vibration, particularly for older or heritage buildings, was raised as a concern by many submitters including the National Trust of Australia (S332). In addition,



many submitters requested property condition report surveys be conducted prior to construction works commencing and requested a clear avenue for compensation in the event of damage be established (\$299).

The impact of noise and vibration on the various health facilities in the Parkville Precinct was raised by Melbourne Health. In relation to medical procedures, concern was expressed that vibration from the TBM could affect surgery being undertaken in the Royal Melbourne Hospital operating theatre suite adjacent to Royal Parade, and that this may create a need to reschedule operations. The DHHS submitted that the *“Victorian Comprehensive Cancer Centre has vibration sensitive equipment in below ground levels which could be affected by vibration”*. Melbourne Health were concerned that the majority of the Royal Melbourne Hospital buildings predated the introduction of Australian building standards (1989) and therefore submitted *“the impact of construction on them is unknown”*.

Businesses which provide short term accommodation, such as City Gate Hotel and the Graduate Union which provides student accommodation were concerned about disruption to their business, and highlighted that they were not covered by the proposed draft RIMG.

The National Gallery of Victoria and the Arts Centre wanted to ensure that its special use areas such as galleries, art storage facilities and concert hall and performance areas were not adversely affected by construction noise. The Arts Centre was concerned that operation of trains may impact Hamer Hall, which was designed to achieve very low background noise levels.

Ongoing noise and vibration impacts from the operation of the Project mainly focused on the North Melbourne area. Several submitters called for deeper tunnelling in this area to reduce noise impacts when the tunnel is operational, with comparisons made to the depth of tunnelling undertaken for the NSW West Rail Link Extension.

### **10.3.7 Noise and vibration conclave**

The noise and vibration conclave produced a document (D63) that attempted to identify points of discussions, and matters that were agreed or not agreed.

While the Committee does not question the efforts or the good intentions of those experts involved, that conclave was not a wholly successful process. In particular, the conclave document produced was ultimately the subject of much discussion during the Hearing, and some considerable debate as to its contents.

There were differing views amongst the experts as to precisely what had, and what had not been agreed. Several of the experts suggested that the conclave document was produced under some time pressure, and consequently did not provide a full or accurate representation of the matters that were discussed or agreed.

The above difficulties led to some largely unhelpful exchanges between the parties and the witnesses as to how the conclave document should be interpreted, and what matters should have been regarded as *“agreed”* or *“not agreed”*. Ultimately, this debate was of little assistance to the Committee, which, despite the ambiguities contained in the conclave document, was, after Hearing the evidence and submissions, able to gain a clear understanding of the various positions of the experts, and the basis for the views they held.

## 10.4 Discussion and findings

The Committee recognises that both residential and non-residential uses in each Precinct may be significantly impacted by noise and vibration from construction activities and as such the EPR must provide certainty that such impacts can be mitigated and managed appropriately.

The NVIA has demonstrated that with appropriate mitigation measures noise and vibration from operation will meet nominated standards, and the EPR must adequately prescribe the relevant standards to be achieved.

The following sections discuss key unresolved issues raised in regards to noise and vibration from construction and operation and how these should be appropriately mitigated or managed.

### 10.4.1 Construction noise management

There are currently no statutory rules or regulations in Victoria that specifically regulate noise and vibration from construction activity. This can be contrasted to the SEPPs that exist to regulate noise from Commerce, Industry and Trade (SEPP N-1) or Music Noise from Public Premises (N-2), or the regulations that apply to Residential Noise.

Instead, EPA has published guidelines or protocols that are designed to assist in controlling the impacts of noise and vibration from construction activity. For the Project, the EPA's position is that EPA 480 and EPA 1254 be used as the basis for the management framework for noise and vibration amenity effects.

EPA 480 applies to major construction projects and is designed to provide contractors and developers with best practice measures to reduce environmental impacts. The guideline does not include specific noise or vibration limits.

EPA 1254 does not specifically apply to large infrastructure projects such as this, but neither does it specifically exclude them. The guideline provides a schedule with quantitative noise limits for the evening period and notes that night-time works must be inaudible unless they are unavoidable works in which case no noise limits apply. There are no noise limits for day time works provided they occur within normal working hours as specified in the schedule.

In the exhibited EPR, NV1 directed that construction noise be managed by reference to EPA 1254. The suitability of EPR NV1 and the sole use of EPA 1254 to manage construction noise was a central issue at the Hearing and discussed by the experts who attended the noise and vibration conclave (D63). D63 recorded the following as a "*comment/recommendation*":

*A number of strong arguments were presented to replace EPA 1254 with alternative guidelines that prescribed construction noise limits for all time periods, including daytime. The conclave agreed that noise limits recommended in Department of Environment and Climate Change NSW Interim Construction Noise Guidelines (ICNG) or the City of Melbourne Noise and Vibration Management Guidelines (MCC) should be considered. There also needs to be consistency in defining the day, evening and night period. The panel should consider this issue and advise accordingly.*

The NSW Interim Construction Noise Guidelines (ICNG) (D71) is a comprehensive document that is used to manage construction works that are regulated by the Department of

Environment and Climate Change NSW. The guide focuses on the application of work practices to minimise construction noise impacts, rather than merely achieving numerical limits. The document describes a quantitative assessment method (which would apply to this Project) provides “*management noise levels*” for residential uses (which apply during and outside of standard working hours) and for other sensitive land uses (such as classrooms, hospitals and places of worship) which apply when these properties are being used. In addition, impacts on commercial and industrial premises are considered.

The Committee notes that the NVIA referenced this document in Section 3.1, Table 3-1 and used it to provide guidance for the ground-borne construction noise targets adopted for the Project.

The Transport for NSW (TfNSW) Construction Noise Strategy 2012 (D71) is another comprehensive document providing practical guidance on how to minimise the impacts of construction noise and vibration generated during transport projects. The document is said to address the requirements of the NSW ICNG and to provide strategies consistent with the recommendations of the NSW ICNG. The NVIA referenced the 2011 version of the TfNSW in Section 4.9.2, and used this document to provide guidance for the proposed additional mitigation measures, including offers of alternative accommodation, which are proposed to be applied to the Project.

The City of Melbourne Noise and Vibration Management Guidelines provide details of work practices to minimise noise and vibration impacts, and contains target noise levels for works taking place within normal working hours. The guidelines do not apply to civil infrastructure works and in general contain similar information to that found in the NSW documents.

During the Hearing, the MMRA stated that in a meeting held on 2 December 2015, the City of Melbourne had agreed that the guidelines should not apply to this Project, a proposition not challenged. Given this, and in view of the general consistency between the contents of these guidelines and the NSW guidelines that are identified above, the Committee forms the view that these guidelines are only of limited assistance and relevance to a determination of the most appropriate means by which to control impacts from noise and vibration from the construction of the Project.

While giving evidence, Mr Anderson acknowledged that the NSW ICNG provided a better regime of management than EPA 1254 and when questioned, he stated that he would not strongly object if the Committee adopted the NSW ICNG.

All experts raised common concerns with EPA 1254 related to lack of daytime thresholds, uncertainty regarding the definition of unavoidable works and no consideration of non-residential areas. Mr Fearnside, Mr Leo, Mr Goddard, Mr Mitchell and Mr Shields considered that EPA 1254 could be referenced in EPR NV1, and reference to the NSW documents could be made in the CNVMP. Mr Marks and Mr McHugh recommended that NV1 remove all reference to EPA 1254 and refer to the CNVMP.

Having heard and considered the expert witness reports, evidence and submissions, the Committee concludes that EPA 1254 does not provide a sufficiently comprehensive framework for the management and mitigation of airborne construction noise from the Project. In simple terms, more guidance and control is needed. In addition, EPA 1254 is

weighted towards protecting residential receivers. The Committee considers that the interests of non-residential receivers must also be considered.

The Committee accepts that the EPA is the statutory body responsible for protecting the environment in Victoria, and the EPA has endorsed the use of EPA 1254 in managing construction noise impacts for the Project. However, the Committee considers EPA 1254 is not the complete answer.

The Committee finds that EPA 1254 is not sufficient in and of itself, to adequately manage and mitigate the impacts of airborne construction noise from the Project. The Committee recognises that the NSW ICNG and the TfNSW Construction Noise Strategy documents provide a significantly more robust, rigorous and comprehensive guideline for the management of construction noise and vibration impacts generally, and that the contents of these documents would be of significant assistance in the management and mitigation of noise and vibration impacts from construction.

EPR NV1 in Version 4 was modified to augment EPA 1254 with the additional requirements of the CNVMP which must be prepared in accordance with EPR NVB (now NV20). The Committee considers that this is an appropriate mechanism by which to include reference to the NSW documents and recommends a minor amendment to the wording of this EPR.

The Committee finds that appropriate reference to the NSW documents, in addition to EPA 1254, in the EPR will ensure that the CNVMP will be required to consider and address the following:

- threshold noise levels for residential uses
- threshold noise levels for non-residential uses
- sleep disturbance at residences
- a procedure for defining and approving “unavoidable works”
- a comprehensive set of work practices
- guidelines for community consultation
- methods for evaluating performance and requirements.

The Committee is satisfied that EPR NV1 and NVB (NV20) can be amended to achieve the appropriate outcome in relation to the management and mitigation of construction noise.

The relevant EPR have been amended accordingly, as provided in Appendix F.

#### **10.4.2 Construction noise and vibration targets – mandatory or guideline**

The MMRA consistently maintained in its submissions and cross examination of expert witnesses that any limits referenced in the EPR for construction noise and vibration should not be mandatory limits, but rather operate as guideline threshold levels that would trigger management actions and mitigation if exceeded.

A mandatory noise or vibration limit is one that cannot be exceeded in any circumstances. The MMRA argued that the imposition of mandatory limits was undesirable for the Project, and that such limits were neither necessary, nor practical. The MMRA pointed out that the noise limits in EPA 1254 were not mandatory, and that, equally, while the NSW ICNG and the TfNSW Construction Noise Strategy provide noise management levels for the day period as well as out of hours work, those levels are clearly defined as management levels, not mandatory limits.

Many of the expert witnesses including Mr Anderson, Dr Heilig, Mr Marks, Mr McHugh and Mr Mitchell ultimately expressed the view (or conceded in cross-examination) that construction noise and vibration targets should be expressed as guideline, discretionary levels and not mandatory targets. Only Mr Stead for the University of Melbourne held a firm view that the construction vibration limits in the EPR should be mandatory limits.

The Committee finds that the adoption of construction noise and vibration level targets as guideline levels rather than mandatory targets is appropriate for the Project.

The NVIA illustrates there will be some instances when the construction noise or vibration targets identified in the various guidelines that have been presented are likely to be exceeded. The NVIA accepts that, in such circumstances, additional mitigation measures which may include changing work practices, consultation, notification, localised treatment and temporary respite, should be then required.

The Committee accepts that this is the appropriate method of control for the Project. Setting guideline levels (which should not be exceeded) is important to help guide the development of construction plans, and in designing mitigation measures. However some flexibility is required to address circumstances where these limits either cannot practicably be met, or where there is an overall benefit in allowing for exceedance for a short period (such as, where overall construction times may be able to be reduced as a consequence).

Further, the Committee recognises that if construction targets were mandatory limits, there may be occasions where the Project construction would need to be ceased and in the worst case, could not continue. This would not be a desirable outcome for the Project, having regard to its significance and long term benefits.

The relevant EPR have been amended accordingly, as provided in Appendix F.

#### **10.4.3 Construction noise targets for non-residential areas**

The NSW ICNG provides management noise levels applicable to non-residential sensitive land uses such as educational facilities in Section 4.1.2 Table 3. Section 4.1.3 provides external guideline targets for industrial premises, offices and retail outlets. For other sensitive premises not listed in the table such as theatres and child care centres, Section 4.1.3 provides a procedure for determining appropriate criteria. The procedure involves identifying noise sensitive affected properties and determining suitable criteria based on AS 2107 Acoustics – Recommended design sound levels and reverberation times for building interiors.

Guideline internal noise levels for bio-resources areas which are housed in several University of Melbourne buildings in Precinct 4, are included in the 'Code of Practice for the Housing and Care of Laboratory Mice, Rats, Guinea Pigs and Rabbits', Department of Primary Industries 2004.

Mr Anderson suggested that noise levels for non-residential areas as shown in NSW ICNG should be adopted and included in the relevant EPR. Mr Stead suggested that criteria could be taken from NSW ICNG, the MCC Guidelines or AS2107 and suggested applying the AS2107 satisfactory levels plus 5dB. Mr Mitchell was satisfied with the criteria proposed in NSW ICNG.

EPR NV5 was amended to include a management level of 45dBA (internal) for teaching spaces. The Committee considers that the adoption of this noise target should address the concerns of educational institutions such as RMIT, the University of Melbourne and MGS. RMIT submitted that construction works in Franklin Street would have significant impacts on teaching and research spaces, especially in Building 14. The Committee notes that the management level proposed for the Project is significantly less than the target of 65dBA adopted for the NAS Project. Mr Marks' evidence was that the proposed management level of 45dBA could be exceeded and not significantly affect the function of teaching spaces, but that a noise level above 65dBA may affect speech intelligibility.

In addition, RMIT is in an area of high ambient noise levels and it is possible that the proposed internal target of 45dBA is already exceeded in some areas. The proposed EPR NV5 takes ambient noise levels into consideration when considering the management levels. There will be some cases where the ultimate internal level will be higher than those nominated in the EPR.

The Committee recognises that the adoption of the internal management targets will require the contractor to apply all feasible and reasonable work practices to meet the target. Where the target is not predicted to be achieved, the affected party would be informed and consultation and further management actions would need to be negotiated.

The Committee finds that there is merit in adopting the management noise levels for sensitive land uses from the NSW ICNG that have not already been included in the table of guideline noise targets shown in Version 4 EPR NV5. The inclusion of these will provide management levels for buildings and recreational spaces such as St Paul's Cathedral, Christ Church in South Yarra and the recreation areas at MGS.

The Committee finds Section 4.1.3 of NSW ICNG to be a worthwhile inclusion in the EPR, as adopting this procedure will ensure that a variety of important sensitive areas along the Project alignment such as the National Gallery of Victoria, the Arts Centre, the Graduate Union and others are considered when assessing construction noise impacts.

The Committee finds that construction noise levels in bio-resources areas can be adequately managed by EPR NV13. The EPR should be amended to include the appropriate noise measurement parameters ( $L_{Aeq}$  and  $L_{Amax}$ ) for clarity.

The relevant EPR have been amended accordingly, as provided in Appendix F.

#### **10.4.4 Unavoidable works**

The evidence and submissions related to noise and vibration indicated a high level of concern about the concept of unavoidable works and a high degree of concern that the allowances that are contained in EPA 1254 for unavoidable works could be misused by contractors to justify extending noisy construction activities into night-time periods where it is convenient, rather than essential to do so.

Both EPA 1254 and the NSW ICNG make provision for carrying out unavoidable works or “out of hours work”. In each case, the definition of such works requires a judgement to be made as to whether works meet the definition of those terms. Unavoidable works is defined in EPA 1254 as follows:

*Unavoidable works are works that cannot practicably meet the schedule requirements because the work involves continuous work — such as a concrete pour — or would otherwise pose an unacceptable risk to life or property, or risk a major traffic hazard.*

The NSW ICNG definition of works that can be undertaken outside standard hours is as follows.

*The five categories of works that might be undertaken outside the recommended standard hours are:*

- *the delivery of oversized plant or structures that police or other authorities determine require special arrangements to transport along public roads*
- *emergency work to avoid the loss of life or damage to property, or to prevent environmental harm*
- *maintenance and repair of public infrastructure where disruption to essential services and/or considerations of worker safety do not allow work within standard hours*
- *public infrastructure works that shorten the length of the Project and are supported by the affected community*
- *works where a proponent demonstrates and justifies a need to operate outside the recommended standard hours.*

*In the last two categories, the proponent should provide the relevant authority with clear justification for reasons other than convenience, such as to sustain operational integrity of road, rail and utility networks. The relevant authority may be the same as the government organisation undertaking the works.*

This contemplates that the relevant authority would ultimately make a decision as to whether or not out of works can be undertaken, and should be provided with clear justification as to why such works should be permitted.

In regards to unavoidable works the EPA recommended that “a clear rationale is established to ensure works considered to be Unavoidable Works meet the definition as outlined in EPA Publication 1254.” Further, the EPA recommended that the information associated with determining unavoidable works should be made public.

During questioning, Mr Anderson expressed the opinion that the Independent Environmental Auditor would make the decision about whether works were unavoidable. Although most of the other noise experts expressed concern about the potential for unavoidable works to be abused by a contractor, none provided clear recommendations of the best way to manage works that are truly unavoidable, or to suggest any practical, alternative method of identifying and/or approving such works.

The Committee shares the concern raised by many of the experts. The Committee finds that some of the uncertainty around unavoidable works will be removed by the requirement of

the EPR to adopt the contents of the NSW ICNG, which has a more detailed description of works that might be allowed outside of standard working hours.

The Committee considers that the remaining uncertainty regarding such works can be adequately managed by the adoption of Mr Anderson's suggestion that a suitable independent arbiter (such as the Independent Environmental Auditor) be required to determine what works can be regarded as unavoidable, to approve such works and is required to make the information concerning those determinations and approvals publicly available as recommended by the EPA. The Committee finds that EPR NVB (NV20) should be amended to include these requirements.

The relevant EPR have been amended accordingly, as provided in Appendix F.

#### **10.4.5 Night-time impacts**

EPA 1254 calls for night-time construction work other than unavoidable work to be inaudible in any habitable room of an affected residence. Inaudibility criteria poses many difficulties as it is a subjective criterion and the assessment of whether the criteria is achieved must be undertaken inside the affected residence.

The NVIA in Appendix A Section 2.3 sought to demonstrate that the inaudibility criteria could be achieved by using several assumptions to determine an appropriate external night-time guideline noise level. The assumptions are set out in NVIA Appendix A, Section 2.3 as summarised:

- typical ambient noise in a bedroom is 30dB  $L_{Aeq}$
- if construction noise level inside the bedroom was 10dB less than ambient, that is 20dB  $L_{Aeq}$ , this would be inaudible
- typical loss from outside to inside through an open window is 15dB so an external guideline noise level of 35dBA would be inaudible
- if external construction noise at the residence is at least 10dB below the external ambient noise level then it is likely to be inaudible.

Based on the above, the MMRA proposed a night-time guideline noise level of the greater of 35dBA, or 10dB below the ambient noise level  $L_{Aeq}$ .

However, the Committee considers the last listed assumption (as above) to be flawed and is not convinced that the EES has demonstrated that the inaudibility criteria will be achieved. Generally, to ensure inaudibility is achieved, the guideline noise level should be 10dB below the background noise level  $L_{A90}$ , not the ambient noise level.

Mr Anderson was questioned about the predicted noise levels at a few residential locations and whether the predicted levels would comply with the inaudibility criteria. He was unable to comment, but acknowledged that inaudibility criteria are generally derived from background noise levels  $L_{A90}$ , not ambient noise levels  $L_{Aeq}$ . The evidence statements and peer review reports of Mr Fearnside, Mr Marks and Mr McHugh in Appendix A stated that background noise levels  $L_{A90}$  are generally used to derive inaudibility criteria.

In Chapter 13 of the EES, Table 13-15 details the measured background noise levels in some areas of each Precinct and the proposed night-time construction guideline noise levels. In some cases, the guideline noise levels shown are significantly higher than the existing background noise levels. For example, in Precinct 1, the night-time background noise levels



are listed as 40 to 44dB  $L_{A90}$ . The proposed guideline noise level for construction is 58dBA at 250 St Kilda Road which is 14 to 18dB higher than the background noise level. In Precinct 6 the night-time guideline level of 55dBA is 11 to 15dB higher than the listed background noise level of 40 to 44dBA.

Construction noise at the nominated levels in a low background environment is unlikely to result in inaudibility in nearby residences.

The Committee finds that the EES has not adequately demonstrated that the night-time inaudibility criteria set out in EPA 1254 can be achieved. However, the Committee recognises that further noise modelling and assessment as required by EPR NV3 must be performed to demonstrate compliance with all EPR. Consequently, the Committee anticipates that the appropriate construction guideline noise levels required to meet inaudibility will be determined as part of EPR NV3. In addition, there is a requirement in the EPR to validate the noise predictions and achievement of inaudibility criteria must be verified during the validation and monitoring stage.

The NVIA at Section 1.3, identifies sleep disturbance as a potential adverse impact of noise on the community, but no assessment of sleep disturbance was undertaken.

Under questioning, Mr Anderson accepted that sleep disturbance was an issue that needed to be addressed, but thought the most appropriate response was now contained in the new EPR NVB (NV20). This EPR requires the preparation of a CNVMP, and contains a section on haulage to limit heavy vehicle movements to normal working hours where practicable and to minimise noise from truck movements. Mr Anderson conceded that truck noise deserved more attention and a requirement for truck noise assessment could be included in EPR NV3. He considered that practical management was more important than including a sleep disturbance guideline in the EPR.

The Committee accepts that the EPR NVB (NV20) haulage section provides for practical management of truck movements for the night-time period.

Further, the Committee has recommended that the NSW ICNG be referenced within the EPR. This document requires an assessment of sleep disturbance as part of the quantitative assessment and, as a consequence, would expect that the potential for sleep disturbance will need to be considered as part of the CNVMP. However, to ensure this occurs, the Committee finds that EPR NV3 should be amended to expressly include a requirement to assess sleep disturbance.

The relevant EPR have been amended accordingly, as provided in Appendix F.

#### **10.4.6 Ground-borne noise**

Ground-borne noise may be generated by the TBM and by other construction activities. In the EPR, guideline levels for ground-borne noise for residential receivers have been taken from the NSW ICNG. EPR NV11 required these noise levels to be applied at residences, sleeping areas in hospital wards, student accommodation and hotel rooms. Some of the experts expressed concern about the disconnect between the ground-borne noise allowance for night periods, and EPA 1254 which requires noise to be inaudible at night.

Under cross examination, both Mr Fearnside and Mr Marks accepted that the proposed ground-borne noise limits were appropriate and reasonable and that EPA 1254 inaudibility

criteria should not apply to ground-borne noise. Mr Mitchell suggested that the evening ground-borne limit of 40dBA for residential receivers should be adopted as the day-time limit for teaching spaces and offices. Mr Stead stated that appropriate noise levels needed to be achieved to allow occupied spaces to reasonably function.

In the EPR NV11, the MMRA included the following:

*Implement management actions, as determined in consultation with potentially affected land owners, where ground-borne noise levels unreasonably limit usage in educational institutions such as lecture theatres.*

A specific daytime limit for ground-borne noise for educational institutions has not been included, but the Committee expects that this would be determined through the consultation process required by this EPR.

The Committee finds that EPR NV11 should adequately manage the impact of ground-borne noise on residential receivers, sensitive non-residential receivers and educational institutions.

The relevant EPR have been amended accordingly, as provided in Appendix F.

#### **10.4.7 Construction vibration**

Construction vibration thresholds for damage to buildings and infrastructure, including heritage or sensitive buildings have been taken from German Standard DIN4150. The choice of this criteria was accepted by all witnesses.

##### **(i) Damage to heritage assets**

EPR NV2 specifically addressed construction vibration effects to Commonwealth Heritage listed properties. The noise and vibration conclave participants were of the view that the requirements of NV2 should be extended to include other buildings such as the Melbourne Town Hall, Melbourne City Baths and St Paul's Cathedral. Mr Mitchell expressed the view that there should be a requirement for preconstruction condition/dilapidation surveys of heritage buildings at MGS.

Dr Heilig recommended reproducing NV2 as a new EPR for other heritage listed buildings. Mr Fearnside and Mr Leo were both asked whether this recommendation and the new EPR CHA addressed their concerns regarding heritage structures. Both acknowledged that this was acceptable.

The EPR now includes an amended CH2 a new CHA and NVB (NV20) points 7 to 10. These EPR require the identification of potentially affected heritage places, require condition assessments to be undertaken for these buildings, ongoing monitoring and the identification of measures to mitigate and avoid damage to these buildings.

The Committee is satisfied that the amended and new EPR adequately protect heritage places.

##### **(ii) Damage to other buildings including residential**

Several submitters asked for condition surveys to be performed prior to construction works commencing, so that any structural damage from vibration could be identified and addressed.

EPR GM3 calls for the development and implementation of a Ground Movement Plan for both the construction and operational stages of the Project. The plan would include the identification of mitigation measures and monitoring requirements. EPR GM4 requires pre-construction condition surveys to be undertaken at assets predicted to be impacted by ground movement. EPR NV6 details the vibration guideline targets for structures and references EPR NVB (NV20) which requires management of construction vibration impacts.

The Committee finds that pre-construction condition surveys should be offered to all properties located within the Project area, and to any properties outside the Project where guideline targets for vibration on structures are predicted to be exceeded. The Committee is satisfied that with the addition of notes to EPR NV6 regarding this proposed eligibility criteria, the suite of EPR will ensure that condition surveys will be performed at buildings where there is potential for damage.

### **(iii) Criteria for human comfort**

Construction vibration criteria for human comfort have been taken from British Standard 'Guide to evaluation of human exposure to vibration in buildings' BS6472-1:2008 and are expressed in terms of a VDV. Many expert witnesses questioned whether the VDV criteria was appropriate as a threshold target for human comfort, and instead proposed criteria based on Root Mean Square (RMS) velocity or Peak Particle Velocity (PPV).

Dr Heilig's opinion was that criteria should be drawn from peer reviewed standards or guidelines and considered BS6472-1:2008 which recommends the dosage value criteria as being well referenced within the industry. Dr Heilig gave evidence that the Australian Standard AS2670.2:1990 Evaluation of human exposure to whole-body vibration - Continuous and shock-induced vibration in buildings (1 to 80 Hz) (AS2670.2:1990) which provided criteria based on RMS velocity had been withdrawn. He therefore considered that it was not appropriate to use its criteria.

In TN64, Dr Heilig set out a detailed response clarifying why the VDV criteria proposed had been selected, the reasons for which included:

- choice of criteria was consistent with BS6472-1:2008 which was the most current of the British and ISO standards
- BS6472-1:2008 presented a consistent methodology for evaluating vibration impacts on people and was based on the most current research into human response to vibration
- there were benefits for using a common metric for assessing all vibration sources
- there were commercially available data loggers that can record VDV.

The Committee notes, however, that with respect to the East West Link Project, Dr Heilig considered the VDV criteria to be problematic, and that this is recorded in the following excerpt of the East West Link Tunnel Vibration Report<sup>1</sup>.

*The vibration dosage method is considered noticeable more difficult to administer, monitor, model and assess. In addition, the method requires calculation over longer periods (16 hours for a daytime assessment and eight*

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<sup>1</sup> East West Link Tunnel Vibration Report V10 Section 4.1 page 13, September 2013 Heilig and Partners

*hours for an evening assessment) and cannot be readily calculated with many of the existing seismographs that are presently in use in Australia.*

*As the guideline values and methods provided in the Australian Standard AS2670.2 are relevant for identifying criteria for continuous vibration, a criteria based on a vibration level expressed in mm/s is preferred over the more complicated vibration dosage method.*

In addition, Dr Heilig provided a written technical response to queries raised in the East West Link Assessment Committee Inquiry<sup>2</sup> reiterating concerns with the complexity of the VDV criteria, the difficulty of measuring VDV and stating AS2670.2:1990 provided the most appropriate performance criteria. The Committee notes, however, that shortly after this advice was given, Australian Standard AS2670.2:1990 was withdrawn on 15 April 2014.

Mr Marks expressed the view that criteria should be based on RMS velocity because VDV is difficult to estimate and predict and cannot be immediately quantified or assessed. Mr Marks believed that appropriate criteria could be drawn from ISO10137:2007.

The MMRA argued that Dr Heilig's evidence should be preferred, in part because of his extensive experience in tunnel construction.

As part of closing submissions from the City of Stonnington, a letter prepared by Mr Marks was provided to the Committee<sup>3</sup> (D346), which contained recommendations for EPR. In regards to NV9, the EPR relating to assessing vibration for human comfort in terms of VDV, Mr Marks made the following remarks:

- the use of VDV is not consistent with BS6472-1:2008 as the standard states it is not primarily used for construction
- human comfort is almost always assessed using RMS vibration and not PPV with no known assessment criteria of PPV for human comfort
- measurement of RMS allows for prompt response
- modern equipment can measure RMS vibration without complex analysis
- RMS vibration criteria should be used for the assessment of human comfort.

Although Mr Marks stated that PPV criteria are not used for human comfort, the Marshall Day peer review reports that were prepared for the Cities of Melbourne and Stonnington, RMIT, MATC and the Domain Owners Corporation all contained the following in Appendix B, part B1 criteria, fourth bullet:

- support for the use of PPV criteria in lieu of VDV
- a statement that NSW guidelines acknowledge PPV criteria is best for impulsive sources
- examples of PPV criteria being used in the Sydney Southwest and Northwest Metro EIS studies
- statement that the FTA handbook<sup>4</sup> also provides criteria in RMS and PPV
- acknowledgement that British Standard BS5228-2:2009 states that PPV could be used to provide guidance on human response.

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<sup>2</sup> Letter to Clayton Utz dated 4 March 2014

<sup>3</sup> Letter for City of Stonnington, 3 October 2016.

<sup>4</sup> Federal Transit Administration, Transit Noise and Vibration Impact Assessment, May 2006

The Committee considers that the assessment criteria must adequately protect the personal amenity of those affected by construction vibration and must be assessable in real time to allow for timely mitigation and management measures to be implemented, if required. However, the conflicting information and evidence it has received on this issue makes it difficult to determine the most appropriate criteria to adopt.

The Committee notes that the experts for two of the more significantly affected residential apartment buildings, (Mr Goddard for the Botanica and Mr Shields for the Westin) accepted the VDV criteria as being appropriate. Mr Shields indicated that the proposed method of monitoring vibration using an equivalent PPV value (as per note 2 of EPR NV9) would be acceptable. This view was shared by Mr Mitchell for MGS.

In addition, the Crossrail project was said by many experts to provide an appropriate benchmark for a project of this type. The Committee notes that after the Crossrail project undertook a review of available vibration criteria for human comfort<sup>5</sup>, the VDV criteria was ultimately selected as the most appropriate criteria by which to assess construction vibration impacts.

In view of the above, the Committee finds the selected VDV criteria for the assessment of human comfort related to construction vibration to be acceptable criteria for the Project.

#### **(iv) Criteria for sensitive equipment**

Submissions made by parties in Precinct 4 expressed concerns that excessive vibration could render sensitive equipment unusable, detract from research results and potentially affect funding of projects. The University of Melbourne and RMIT were of the view that vibration limits should be mandatory criteria. The issue of mandatory limits has already been discussed and dealt with earlier.

EPR NV10 details the requirements for sensitive equipment and the version discussed at the conclave included the following:

*Implement management actions if the following ASHRAE equipment vibration Guideline Targets or measured background levels (whichever is higher) are exceeded for vibration-sensitive equipment during construction and operation at Parkville and CBD North stations.*

Discussions at the noise and vibration conclave suggested that management actions should be required if guideline targets are expected to be exceeded. This would provide a proactive rather than reactive approach. Dr Heilig accepted this amendment and recommended the following additional notes related to manufacturer's specifications, baseline measurements and monitoring with alarm levels:

- *The proponent may undertake consultation with the users and agree alternative Guideline Targets*
- *Equipment manufacturer specifications shall be adopted where available. The appropriateness should consider the time and use and background vibration*

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<sup>5</sup> Crossrail Technical Report Assessment of Noise and Vibration Impacts Volume 1 of 8, Introduction, Scope and Methodology, 17 February 2005.

- *Background vibration shall be measured in accordance with environmental test requirements*
- *During the construction phase, a continuous monitoring program shall be adopted (to the asset owner approval), with asset owner access to monitoring data using a 75% alert and a not to exceed limit approach.*

EPR NV10 has been modified to account for the recommended proactive approach to management actions and some additions suggested by Dr Heilig have been included.

The Committee recognises that a proactive rather than reactive approach to mitigating vibration effects is preferred and considers that additional notes suggested by Dr Heilig worthy of inclusion in the EPR.

The Committee finds that the EPR, when considered as a whole, provide sufficient safeguards to ensure that, where such vibration levels are exceeded, this will only occur after consultation with affected organisations, and the adoption of appropriate measures to mitigate as far as possible the adverse impacts of those exceedances.

The Committee finds that EPR NV10 should be amended to include all the additional notes recommended by Dr Heilig.

#### **(v) Bio-resources**

Noise limits for bio-resources are taken from the 'Code of Practice for the Housing and Care of Laboratory Mice, Rats, Guinea Pigs and Rabbits' (Department of Primary Industries 2004) and included in EPR NV13. However, no guideline limits for vibration are contained in the Code of Practice.

At the noise and vibration conclave, and later in his evidence, Mr Stead expressed the view that vibration levels should be kept to less than 75µm/s (equivalent to the ASHRAE VC-A curve plus 50 per cent).

Mr Stead's written evidence (S318) referred to a power point presentation entitled 'Turnkey 2016, Construction Monitoring in an Animal Facility: Investigating Noise, Vibration, and Stress Levels in Rats' (Gladys Unger, Marc Newmark, Acentech and Jeremy Beech, Ipsn Bioscience, Inc). The presentation refers to a threshold level of 2,000 µinches per second (0.05mm/s) and a notification level of approximately 3,200 µinches per second (0.08mm/s), but provides no definitive recommendation for appropriate vibration levels for bio-resources.

Under questioning, Mr Stead acknowledged that he did not know the basis upon which the nominated levels in the presentation were set, and agreed that it was problematic to recommend a standard for vibration in the absence of clear justification for those levels. It was suggested that appropriate levels were best determined through discussions between the University of Melbourne and the MMRA, a proposition to which Mr Stead agreed.

The Committee finds that although no documented guidelines for vibration criteria apparently exist, the impacts of vibration on bio-resources needs to be considered. Accordingly, EPR NV13 should be amended to require consideration of vibration thresholds for bio-resources, with those levels to be determined through consultation between MMRA and relevant stakeholders.

**(vi) Blasting**

Blasting has been identified as a possible method of construction in Precinct 4 only. The use of blasting may reduce overall construction duration and severity of vibration and ground-borne noise associated with the station box excavation.

The University of Melbourne is concerned about impacts to bio-resources and sensitive equipment, especially where the equipment may need recalibration. Some health facilities may also be impacted.

The NVIA, Section 10.5.1.4 considered the impacts from controlled blasting and stated that it was not always practicable or possible to meet limits for vibration sensitive equipment during blasting events. One of the stated benefits of blasting was that each event is of short duration, so affected equipment would not be unusable for lengthy periods of time.

Several management measures were identified including reducing charge weights, providing localised isolation for equipment or relocating equipment. Dr Heilig considered that recalibration of equipment should also be part of the suite of mitigation measures.

The University of Melbourne submitted that the contractor must be obligated to meet the level and has instead suggested the following note to EPR NV12 *“Vibration at sensitive equipment shall not exceed levels which would require recalibration”*. However, the Committee notes that, based on the information provided in the NVIA, it is unlikely that this could be achieved, and that consequently blasting would likely be prohibited.

The Committee recognises the benefits of controlled blasting as described in the NVIA in assisting to reduce the overall construction time.

The Committee accepts Dr Heilig’s proposition that recalibration can be one of the mitigation measures used for sensitive equipment, and finds that the impacts from blasting can be managed provided a comprehensive consultation framework is in place.

The Committee finds that Version 4 EPR NV12 is acceptable.

The relevant EPR have been amended accordingly, as provided in Appendix F.

**10.4.8 Electromagnetic interference**

Mr Stead gave evidence regarding the effect of EMI on sensitive equipment at the University of Melbourne and raised concerns of such interference occurring during both construction and operation.

The University of Melbourne provided comments related to the EPR Version 2 which included new EPR for EMI sensitive equipment.

From the evidence provided by Mr Stead, the Committee recognises that EMI has the potential to affect the operation of sensitive equipment. The Committee finds that the adoption of the proposed EPR in relation to EMI will minimise and mitigate the effects of EMI during construction and operation. Two new EPR, EMI1 and EMI2 have now been included in Appendix F.

The relevant EPR have been amended accordingly, as provided in Appendix F.

### 10.4.9 Residential Impact Mitigation Guide

Additional mitigation measures for residential receivers are covered in TN43 and attachment TN43A, which presented the draft RIMG developed by the MMRA. The draft RIMG includes threshold limits and temporal threshold requirements, which determine when various mitigation measures should be offered to affected residences. When these limits and thresholds are met or exceeded, mitigation measures such as acoustic treatment at the receiver, or respite from noise through the provision of alternative accommodation would be offered to residents. Several non-residential submitters pointed out the draft RIMG was specifically tailored for residential areas and provided no respite for commercial premises.

The draft RIMG in Sections 3.1 and 3.2 proposes the following trigger levels for airborne construction noise. These levels and mitigation measures are sourced from the TfNSW Construction Noise Strategy with the addition of 'acoustic treatment' as a mitigation option. For airborne construction noise, the draft RIMG offers building treatment when construction noise exceeds the evening and night background noise levels by more than 30dBA. Alternative accommodation is offered when the construction noise exceeds the night-time background noise level by more than 30dBA.

The additional temporal threshold requirements that must be achieved are as follows:

*As noted above, offers of building mitigation acoustic treatment and of alternative accommodation are subject to additional temporal threshold requirements.*

- *Building mitigation acoustic treatment will be considered only if it is predicted that noise will be exceeded by 30dB(A) for at least 40 days out of any 6-month period.*
- *Alternative accommodation will be considered only if the relevant criteria for airborne noise are predicted to be exceeded for more than 2 consecutive nights.*

For ground-borne noise, alternative accommodation is offered when this noise exceeds the night-time background by more than 10dB for more than two consecutive nights.

Item 4 of the conclave report noted concern from all experts with the draft RIMG. It was generally not considered to be entirely adequate or appropriate. Several expert witnesses referred the Committee to the noise mitigation measures adopted by the Crossrail project (described in Crossrail Information Paper D9-Noise and Vibration Mitigation Scheme - D93). The Crossrail scheme covers airborne construction noise.

Mr Marks provided the Committee with a paper 'Construction Noise Control Program and Mitigation Strategy at the Central Artery/Tunnel Project 1999' (D109) which explained the mitigation strategy used at the 'Big Dig Project' in Boston. Mr Marks supported the concept of a residential mitigation process but considered the draft RIMG to be inadequate. He suggested that noise would be intrusive at levels below the draft RIMG trigger levels. However, Mr Marks acknowledged that the additional temporal requirement for alternative accommodation in the draft RIMG (that is exceedance of trigger levels more than two consecutive nights), was more generous than that provided for Crossrail.

Mr Marks stated that all the tabled residential mitigation documents (draft RIMG, Crossrail, Big Dig) were different and he had not formed a view on the preferred method. Mr Marks



advised that guidance could be sought from the TfNSW page 18. This provides the airborne noise triggers for additional mitigation measures. The Committee notes that these are the same triggers provided in the draft RIMG.

Many experts including Mr Goddard and Mr Shields considered that the draft RIMG trigger for airborne noise was excessive.

Mr McHugh provided a comprehensive overview of the Crossrail project and its mitigation scheme. Mr McHugh was concerned that the draft RIMG would not be triggered if works were unavoidable. The MMRA clarified that the RIMG would apply to all works undertaken for the Project.

Slide 17 of Mr McHugh's presentation (D180) is reproduced as Figure 3, and provides recommendations for trigger levels and threshold requirements. These are based on the trigger levels used for Crossrail, but with the applicable time periods adjusted to meet EPA definitions of day, evening and night.

Proposed Criteria					
Day	Period		Averaging time, T	Noise insulation trigger level	Temporary re-housing trigger level
Monday – Friday	Day	0700-1800	11 hrs	75	85
	Evening	1800-2200	4 hrs	65	75
	Night	2200-0700	1 hr	55	65
Saturday	Day	0700-1300	5 hrs	75	85
	Evening	1300-2200	4 hrs	65	75
	Night	2200-0700	1 hr	55	65
Sunday and Public Holidays	Day	N/a	N/a	75	85
	Evening	0700-2200	1 hr	65	75
	Night	2200-0700	1 hr	55	65

Trigger is the higher of the absolute level or existing  $L_{Aeq, t} + 5$  dB for NI or existing  $L_{Aeq, t} + 10$  dB for TRH

Temporal criteria is 10 working days out of any 15 consecutive days or 40 in six consecutive months


**MARSHALL DAY**  
Acoustics 

Figure 3 Summary of Crossrail (UK) trigger levels and thresholds for residential mitigation

Mr McHugh stated that the recommended threshold of 10 working days out of 15 consecutive days captured intense short term works and explained that an exceedance in any of the nominated time periods within a 24-hour period was counted as 1 day.

Tables 5 and 6 provide a comparison of the Crossrail triggers as recommended by Mr McHugh, with the draft RIMG triggers for two specific locations.

The Committee has calculated the trigger levels that would apply under the draft RIMG at Osborne Street, South Yarra and at the Domain Apartments. These are based on the measured background noise levels provided in the NVIA, Appendix F. For simplicity, the

averaging times over which the construction noise is measured is not provided and the day, evening and night-time periods are as per the EPA definition.

The Crossrail trigger is the higher of the absolute number or the  $L_{Aeq} + 5\text{dB}$  for noise insulation and  $L_{Aeq} + 10\text{dB}$  for alternative accommodation. The measured  $L_{Aeq}$  levels at Osborne Street and The Domain have also been taken from the NVIA, Appendix F.

Table 5 Comparison of mitigation triggers for Osborne Street

Time period	Measured ambient noise	Noise insulation		Alternative accommodation	
	$L_{Aeq}$	Crossrail (higher of absolute or $L_{Aeq} + 5$ )	Draft RIMG	Crossrail (higher of absolute or $L_{Aeq} + 10$ )	Draft RIMG
Day	57	75	No trigger	85	No trigger
Evening	56	65	76	75	No trigger
Night	54	59	74	65	74

Table 6 Comparison of mitigation triggers for The Domain Apartments

Time period	Measured ambient noise	Noise Insulation		Alternative accommodation	
	$L_{Aeq}$	Crossrail (higher of absolute or $L_{Aeq} + 5$ )	Draft RIMG	Crossrail (higher of absolute or $L_{Aeq} + 10$ )	Draft RIMG
Day	64	75	No trigger	85	No trigger
Evening	63	68	83	75	No trigger
Night	59	64	77	69	77

The draft RIMG proposed no building treatment or alternative accommodation if daytime construction noise levels were considered excessive, nor did it offer alternative accommodation as a mitigation measure if evening noise thresholds were considered excessive. This is consistent with recommendations in the TfNSW Construction Noise Strategy.

The trigger levels in the draft RIMG for acoustic treatment/noise insulation are significantly higher than those in the Crossrail document, especially in the night-time period. For this period, the draft RIMG trigger levels for noise insulation are 15dB higher than the Crossrail targets at Osborne Street and 13dB higher at The Domain Apartments.

For alternative accommodation, the draft RIMG targets are 9dB higher at Osborne Street and 8dB higher at Precinct 7 than the trigger levels proposed by Crossrail.

The draft RIMG threshold requirements provided building mitigation works if the trigger level was predicted to be exceeded for at least 40 days out of any six month period. Alternative accommodation would be considered if the trigger levels were exceeded for more than two consecutive nights.

The Crossrail thresholds were for trigger levels to be exceeded for 10 or more working days in any 15 or for 40 days out of any six month period.

It is noted that the Boston 'Big Dig Project' referenced by Mr Marks had night-time trigger levels based on the existing average maximum noise level  $L_{10}$  and that the threshold requirement was ongoing night-time construction noise for at least two months. The actual trigger levels used in this Project were not available in the document provided by Mr Marks.

The Committee acknowledges that the more than two consecutive nights threshold proposed by the draft RIMG, is more generous than the thresholds provided for Crossrail and the Boston 'Big Dig Project', but must make a judgement as to whether this compensates for having significantly higher airborne noise triggers. This is a difficult judgement to make and the Committee received only limited assistance on this from the expert witnesses, a fact recognised by the MMRA in its closing statement:

*It is noted, finally, that there has been a distinct lack of consensus in expert opinion concerning what changes, if any, should be recommended in respect of the RIMG. Mr Marks, for instance, provided a number of different standards but indicated that he had not formed a view about which he preferred. Other witnesses criticised aspects of the RIMG without suggesting any clear or coherent amendments to it. One matter on which all of the experts did agree, however, was that the implementation of a RIMG was a worthy initiative.*

The MMRA submitted that the threshold criteria would adequately protect the amenity of residential receivers, and said in paragraph 431 of its closing statement:

*In MMRA's submission, the Committee should ultimately conclude that:*

- a) The formalisation and implementation of a RIMG is a particularly positive step in respect of the protection of residential amenity;*
- b) It will provide a further (and important) level of assurance that, where measures cannot be implemented to mitigate noise impacts at the source of emissions, measures will be implemented at the receiver;*
- c) The measures identified in the discussion draft are appropriate (and, importantly, extend to offers of alternative accommodation and building works); and*
- d) The threshold criteria specified are adequately protective of amenity, and will provide meaningful respite to the most affected residential receivers.*

The Committee is, however, not convinced that the airborne construction noise trigger levels provided in the draft RIMG will adequately protect residential amenity.

The Committee finds that with regard to airborne construction noise, the trigger levels and threshold requirements taken from Crossrail and adjusted for the EPA day, evening and night periods as presented by Mr McHugh should be adopted for the Project.

The Committee is satisfied that the draft RIMG guidelines relating to ground-borne noise and the associated temporal threshold are acceptable.

The relevant EPR have been amended accordingly, as provided in Appendix F.

#### **10.4.10 Role of the Parkville Precinct Reference Group**

EPR NVA (NV19) establishes the PPRG and lists relevant agencies to be involved in this group. The EPR does not define the role and function of the group which is described in TN44. Dr Heilig suggested the PPRG would play a major role in identifying affected equipment and sensitive receivers, options for mitigation, and would provide information to assist in the development of the CNVMP. He suggested that EPR NVA (NV19) should state the function of the PPRG.

The MMRA stated that the PPRG would have an independent chair and reiterated this in its closing submission

*In MMRA's submission the PPRG, headed by an independent chair, will play an important role in facilitating meaningful consultation of the type identified above. It is the appropriate forum within which these types of issues can be addressed and, contrary to the submissions of the University, it should be considered a particularly positive attribute of the management framework proposed pursuant the EPRs. This was certainly the attitude expressed by Dr Goodier on behalf of Melbourne Health in submissions to the Committee.*

The Committee finds that EPR NVA (NV19) should be amended to reference TN44 so that the role of the PPRG is clearly defined, and includes the requirement to appoint an independent chair.

The relevant EPR have been amended accordingly, as provided in Appendix F.

#### **10.4.11 Operation**

##### **(i) Airborne noise from trains**

The NVIA has demonstrated that airborne noise levels from trains will not exceed the PRINP investigation thresholds at Precinct 9.

At the Western Portal, noise modelling has been performed for both the Concept Design (Option A) and the Alternative Design (Option B). The results indicated that mitigation measures will be required for both construction options.

For Option A, a barrier approximately 4.5m high and 150m long will be needed as shown in the NVIA, Section 8.5.2.1.1 Figure 8.2. Option B will require a barrier approximately 3m high and 75m long as shown in the NVIA, Section 8.5.2.1.1 Figure 8.3.

At the Eastern Portal in Precinct 8, barriers of 2.5-3m in height will be required to protect dwellings in Arthur and William Streets. The NVIA identified upper levels of dwellings at 4 William Street, 10 William Street, and 1 and 3 Arthur Street as not being adequately protected by the recommended barriers. Mitigation measures such as upgrades to the building façade have been recommended for these dwellings. Item 20 of the conclave report notes that a suitable internal noise target should be included in EPR NV15 to allow appropriate design of these proposed off-site target measures.

Mr Anderson stated that a target of  $50\text{dB}_{\text{L}_{\text{Amax}}}$  was discussed at the conclave and agreed that an internal design target should be included in the EPR. Under cross examination from the MMRA, Mr Marks conceded that  $50\text{dB}_{\text{L}_{\text{Amax}}}$  is not an obligation under the PRINP. The

MMRA stated that this proposed internal limit is normally applied to new buildings adjacent to railway lines.

The Marshall Day Acoustic peer review reports in Section C1.1 discussed the basis of the proposed 50dB $L_{Amax}$  target and recommended internal noise level targets for bedrooms and living areas and for structure borne noise as follows:

*The investigation thresholds are not design criteria. Should the thresholds be exceeded, the following airborne and structure-borne noise criteria are nominated recommended by MDA to further assess the impact of passenger rail noise.*

- *Maximum noise levels of trains should not exceed 50 dB  $L_{Amax}$  in bedrooms.*
- *Any structure-borne noise component should not exceed 40 - 45 dB  $L_{Amax}$*
- *Maximum noise levels of trains should not exceed 60 dB  $L_{Amax}$  in living areas.*

According to the NVIA, the barriers have been designed to allow investigation thresholds of the PRINP to be achieved at most dwellings. EPR NV15 does not specifically state that the investigation thresholds have been used as the design targets.

The Committee agrees with the comment in Item 20 of the conclave report pertaining to the adoption of an internal noise target and finds that appropriate targets should be adopted. The Committee is satisfied that the internal targets for bedrooms and living areas proposed by Marshall Day Acoustics are appropriate.

The Committee finds that EPR NV15 should be amended to clearly state that the investigation thresholds of the PRINP are to be used as the design targets to inform the ultimate barrier height and configuration and should include reference to appropriate internal targets.

## **(ii) Ground-borne noise and vibration**

Ground-borne noise from the operation of trains within the tunnel may affect areas near the proposed tunnel alignment. Guideline noise limits are derived from the NSW EPA document Rail Infrastructure Noise Guideline May 2013 (RING) which provides levels applicable to residential and schools, educational uses and places of worship.

The NVIA (Section 3.3.3 Table 3-19) proposed ground-borne noise criteria for other non-residential receivers not defined in the NSW EPA document including hospitals and concert halls.

Vibration guideline targets have been sourced from the NSW EPA document Assessing Vibration: A Technical Guideline and are based on the VDV. The NVIA at Section 3.3.4.1, Table 3-20 details the adopted preferred and maximum VDV levels for residences, offices, schools, educational institutions, places of worship and workshops.

The NVIA in note 5 of Table 3-20 indicated that guideline targets for sensitive equipment will be the same as those that apply to construction vibration detailed in Section 3.2.4 Table 3-9. These limits are provided in EPR NV10 which applies to both construction and operation stages.

Submissions made by the North Melbourne Community Group and other residents in this area (S142, S207 and S250) expressed concern about ground-borne noise and vibration from the tunnel operation. They considered the tunnel alignment to be too shallow in this area and questioned whether appropriate criteria for ground-borne noise and vibration had been adopted. The North Melbourne Community Group considered that vibration from trains should be defined as continuous vibration rather than intermittent, which would result in different criteria being applied.

The proposed criteria for ground-borne noise have been sourced from the NSW EPA Rail Infrastructure Guideline. Section 2.5 page 13 states the following in relation to ground-borne noise:

*Limited research into the impacts of ground-borne noise is available, and information on practices applied overseas is also scarce. From a review of available material it appears the factors that can affect reaction to ground-borne noise include:*

- *the level of the noise*
- *how often it occurs*
- *whether an area is already exposed to rail noise and*
- *whether the area affected has a low-density of development (e.g. low-density residential) with associated low levels of ambient noise.*

*It appears reasonable to conclude that ground-borne noise at or below 30dB  $L_{Amax}$  will not result in adverse reactions, even where the source of noise is new and occurs in areas with low ambient noise levels. Levels of 35–40 dB  $L_{Amax}$  are more typically applied and likely to be sufficient for most urban residential situations, even where there are large numbers of pass-by events.*

The criteria for operational vibration from trains have been sourced from the NSW document, *Assessing Vibration, A Technical Guideline 2006*, and British Standard BS6472-1:2008 *Guide to evaluation of human exposure vibration in buildings*. The NSW document provides the following definition for intermittent vibration:

*Intermittent vibration can be defined as interrupted periods of continuous (e.g. a drill) or repeated periods of impulsive vibration (e.g. a pile driver), or continuous vibration that varies significantly in magnitude. It may originate from impulse sources (e.g. pile drivers and forging presses) or repetitive sources (e.g. pavement breakers), or sources which operate intermittently, but which would produce continuous vibration if operated continuously (for example, intermittent machinery, railway trains and traffic passing by). This type of vibration is assessed on the basis of vibration dose values in Table 2.4.*

The proposed ground-borne noise and vibration criteria for operation adopted for this Project were not disputed by expert witnesses, but there was some discussion as to whether the criteria should be guideline targets or mandatory.

Mr Pitt for MGS put the proposition to Mr Anderson that there was “*nothing in principle against having EPR that state mandatory criteria.*” Mr Anderson considered that construction noise limits should not be mandatory but did not object to the principle of mandatory operational limits.

The conclave document at items 22 (EPR NV17) and 23 (EPR NV18) recommended that criteria for operational and ground-borne noise and vibration be mandatory. In addition to the conclave comment, several experts including Mr Marks, and Mr Mitchell accepted that construction limits were guideline targets but recommended mandatory limits for ground-borne noise and vibration due to operation. Mr Mitchell explained that there are limited mitigation measures available to reduce ground-borne and vibration from train operation if limits are exceeded.

This view is supported by the NSW EPA Rail Infrastructure Guideline, Section 2.5:

*Ground-borne noise differs from airborne noise because the actions available to reduce or avoid it are more limited. For example, airborne noise can often be reduced by actions such as closing windows, improving the acoustic insulation of the building façade or relocating noise-sensitive activities in the building to a location more remote from the noise source. These actions are likely to be relatively ineffective against ground-borne noise, because the noise is emitted by the building structure itself.*

*Retrospective measures to mitigate ground-borne noise generation can be more difficult and expensive than air-borne noise mitigation. This is because the ability to apply these measures can be restricted by the amount of head-room available in a tunnel or the ability of the track-bed to accommodate additional mitigation. It is therefore important to ensure that an adequate level of mitigation is applied during the design and construction of underground rail Projects.*

PTV endorsed the use of the guideline documents selected to determine criteria for ground-borne noise and vibration but did not support prescriptive compliance limits.

The MMRA submitted in its closing that vibration and ground-borne noise can be adequately mitigated, and do not consider it necessary to adopt mandatory limits:

*It was recommended, also, that EPRs NV17 and NV18 should impose mandatory requirements. MMRA contends that this should not be the case given the relatively high ambient levels (of both noise and vibration) modelled along the alignment, which may result in some of the threshold levels already being exceeded under current conditions (such that strict compliance may not be possible).*

The NVIA has demonstrated via noise monitoring that some areas along the alignment have high external ambient noise levels. Internal noise levels were measured at several locations (NVIA Appendix F Section F3.2) including five residential dwellings. Baseline measurement of vibration were also made, but only in terms of PPV. The VDV and existing ground-borne noise levels were not measured.

Although the MMRA statement may hold true, no evidence was presented to the Committee to validate these assumptions.

EPR NV18 relating to vibration guideline targets for operation takes the existing background levels into account, as the criteria is for the higher of the listed VDV values or the background levels. This should alleviate the concerns stated by the MMRA.

The NVIA demonstrated that compliance with the proposed limits can be achieved through the selection of appropriate track form. Compliance with limits for sensitive equipment in both Precincts 4 and 5 has been shown to be achieved. Mr Anderson suggested that EPR NV10 which deals with vibration to sensitive equipment be amended to add requirements for the design assessment for operation which included a 5dB safety factor.

The Committee considers that as the assessment has shown that vibration targets can be achieved, the adoption of these targets as mandatory limits for operation is reasonable and appropriate.

The Committee finds the proposed criteria adopted for operational ground-borne noise and vibration are appropriate and considers that the adoption of these criteria as mandatory limits is justified for the reasons provided by Mr Mitchell and in the NSW EPA Rail Infrastructure Guideline.

In making this finding the Committee notes that Mr Anderson accepted that there was *“nothing in principle against having EPR that state mandatory criteria”* in relation to operation.

The mandatory criteria would also apply to existing sensitive equipment and bio-resources areas, as covered by EPR NV10 and NV13. Consequently, the Committee finds that the additional notes for EPR NV10 recommended by Mr Anderson are not required.

The Committee finds that ground-borne noise and vibration targets for operation be adopted as mandatory criteria and that EPR NV10, NV13, NV17 and NV18 be amended accordingly.

The Committee considers that the adoption of the ground-borne and vibration limits for operation as mandatory enforceable limits should also assist in addressing the concerns of the North Melbourne residents.

The relevant EPR have been amended accordingly, as provided in Appendix F.

## **10.5 Noise and Vibration Recommendations**

- 8. Redraft the Residential Impact Mitigation Guidelines to adopt the trigger levels and thresholds shown in Figure 3 at Chapter 10.4.9 of this report.**



## 11 Historical cultural and Aboriginal heritage

Historical cultural and Aboriginal heritage impacts are addressed in Chapters 14 and 15 of the EES, and in Technical Appendices J and K. The assessment of the historical cultural heritage impact in Technical Appendix J is referred to as the Historic Heritage Impact Assessment (HHIA).

The draft evaluation objective of the Scoping Requirements in relation to historical cultural and Aboriginal heritage at 4.6 is:

*To avoid or minimise adverse effects on Aboriginal and historic cultural heritage values.*

The following evidence was provided in relation to historical cultural heritage impacts:

- MMRA - Peter Lovell of Lovell Chen and John Patrick of John Patrick Pty Ltd
- City of Melbourne - John Briggs of John Briggs Architects.

There was a conclave of experts on historical cultural heritage on 19 August 2016. Evidence provided by the MMRA in relation to planning issues by Mr Milner was relevant to the way heritage was to be protected throughout the Project.

EPR AH1, CH 1 to 22 and CHA specifically dealt with matters relating to historical cultural and Aboriginal heritage. New NVB, NV2, NV3, NV6, NV7, NV18, GM2, GM3, GM4, GM5, and GM6 dealt with noise and vibration and ground movement issues, which related to heritage places.

### 11.1 Project wide threshold issues

#### 11.1.1 Key issues

The Committee considers the key issues relate to:

- the process to avoid or minimise adverse effects on heritage places and to ensure that heritage issues are addressed in Project delivery
- the potential for impacts to heritage places from vibration and ground movement during construction and operation stages
- the identification of historical archaeological potential and the management of archaeological impacts.

#### 11.1.2 What did the EES say?

##### (i) Process for protecting cultural heritage values

The EES acknowledged that the Project would extend through areas with high concentrations of heritage places, including precincts, buildings, structures, gardens, landscapes, monuments and archaeological sites. Heritage places that were subject to statutory controls at Commonwealth, State and local levels were identified and listed in HHIA Appendix F.

The EES noted that approvals required under the *Heritage Act 1995* and the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth) (*EPBC Act*) 1999 apply to the Project. The *Heritage Act 1995* applies to places and objects on the VHR and archaeological sites on the VHI, as well as all archaeological sites more than 50 years of age.

Pursuant to the *EPBC Act*, the Minister determined that the proposed Project was “*not a controlled action if undertaken in a particular manner*” to avoid significant vibrational impacts to the Commonwealth Heritage listed structures within the Victoria Barracks site in St Kilda Road. This was addressed with EPR NV2.

Numerous places with site-specific and precinct-based Heritage Overlays (HO) normally controlled through the four municipal planning schemes were within the proposed Project area. Some sites would be affected by the Melbourne Planning Scheme Environmental Significance Overlay (ESO) Schedule 2.

The Incorporated Document exempted Project works from the planning permit triggers in the four planning schemes, provided the works were within the defined Project Land and carried out in accordance with conditions set out in the Incorporated Document. The exemptions apply to places in HOs and the ESO for infrastructure related to the Project pursuant to s4.1 of the Incorporated Document. Any subsequent development, for example above stations, is subject to normal planning provisions.

The Incorporated Document sought to meet the draft evaluation objective for historical cultural heritage by reference to EPR. The EPR were designed to reduce risks to historical cultural heritage, identified in the HHIA as being:

- physical impacts on heritage places and sites
- visual impacts associated with permanent infrastructure and development at or in proximity to heritage places and sites
- disturbance or removal of archaeological sites (both identified and unknown)
- damage to heritage places from construction vibration or ground settlement.

The EES concluded that with mitigation measures implemented, most risks could be reduced to residual ratings of ‘Very Low’, ‘Low’ or ‘Medium’.

The residual risks that remained ‘High’ with some adverse impacts that could not be fully mitigated and a high likelihood rating of ‘Almost Certain’ were as follows:

- demolition of four graded residences within Kensington Precinct HO9 (Precinct 2)
- demolition of railways workshops buildings proposed for a HO (Precinct 3)
- demolition of five graded buildings in the Flinders Gate Precinct HO505 (Precinct 6)
- relocation of the South African Soldiers’ Memorial (VHR H1384) and loss of trees on the site (Precinct 7).

The EES concluded that “*notwithstanding these residual ratings, the impacts associated with these risk pathways are not considered to be of such severity as to be considered unacceptable in heritage terms, particularly in the context of a Project of this scale*”.

**(ii) Potential impacts to heritage places from vibration and ground movement during construction and operation stages.**

In the assessment of both construction and operational vibrations, the EES stated that relevant standards and/or guidelines commonly adopted in such assessment processes were applied. In the case of operational vibration, the EES found that compliance with the criteria

for human comfort vibration infers compliance with the criteria for building damage as it is less onerous.

For ground settlement, the assessment was based on the combined use of a predictive modelling process with consideration of typical building or structure ground movement tolerances. This was informed by initial geological analysis to determine the geological and hydrogeological setting combined with consideration of structural type, current condition and the potential for differential settlement across the structure. The HHIA stated that the requirements for survey and vibration monitoring in EPR NV2 for Victoria Barracks aligned with the requirement associated with heritage places for the whole Concept Design.

The HHIA found that, to the degree that it was possible to predict impacts on heritage places, both the noise and vibration assessment and the ground movement impact assessment concluded that the potential risk for damage to heritage places was 'Low' to 'Very Low'. Both assessments were predicated on certain construction methodologies being adopted and, should these methodologies vary, the potential for damage may also vary. In some cases, it was anticipated that exceedances may occur with regard to the relevant standards or modelling and, in these cases, targeted mitigation was proposed. The mitigation options ranged from varying the construction speed to changing the nature of the construction methodology. In all cases, both assessments concluded that a pre-condition survey and strict monitoring regime should be implemented.

The HHIA recommended that a survey and monitoring process for heritage places would include:

- investigation and analysis of the building structure, including consideration of footing type and foundation conditions
- analysis of the vulnerability of fabric to damage or failure because of construction vibration and/or ground movement
- determination of mitigation measures to remove or diminish the potential for adverse impacts because of construction vibration and/or ground movement
- installation of a monitoring system to detect construction vibration and/or ground movement and associated monitoring programme
- in the event of damage, documentation and undertaking of rectification works in accordance with accepted conservation practice and in accordance with the requirements of the relevant heritage authorities.

The HHIA noted for heritage places, it was particularly important that in the event of damage, rectification works are consistent with the heritage values of the affected place. It stated that for the purposes of management of the potential impacts of construction vibration and ground movement, the definition of heritage places was:

- *places that are subject to statutory heritage controls under the EPBC Act, the Heritage Act, the Planning and Environment Act, and*
- *places identified as of heritage value but not currently subject to statutory heritage controls, including graded buildings not subject to HO controls.*

**(iii) The identification of historical archaeological potential and the management of archaeological impacts.**

The EES acknowledged that wherever ground disturbance works were to occur, there was the potential for impact on known and unknown archaeological sites and relics. The HHIA addressed the issue of historical archaeology through predictive modelling. For sites identified as significant, archaeological management plans were required to ensure that the research potential was fulfilled in accordance with inclusion on the VHI.

However, the HHIA stated that there was a need for awareness of historical archaeology more generally across the Concept Design, particularly for the potential discovery of unknown sites or relics of significance. The report recommended development of a Project-wide protocol to ensure appropriate actions (stop work, reporting and investigation and/or monitoring) were undertaken consistent with the requirements of the *Heritage Act 1995*. This was included as EPR CH6.

### **11.1.3 Evidence and submissions**

**(i) Process for protecting cultural heritage values**

Mr Milner was asked about the Project's processes for protecting heritage, and stated that there was appropriate guidance for heritage given effect through the planning controls. He said that he recommended justification in the Development Plan as part of the Incorporated Document:

*The Incorporated Document, at Clause 5.1, stipulates the form of plans to be included in a Development Plan. These plans would describe the proposal(s) with justification for the merits of the plans being a response to the Urban Design Strategy.*

*The level of detail shown in Development Plans might be similar to the requirements for a development permit and include scaled drawings.*

In response to questions about a Development Plan, Mr Milner agreed that it might be fair to say that more detail and "additional colouring in" might be required to say what is in the Plan and the process and timing. When questioned about s4.1 of the Incorporated Document which effectively overrides provisions in Planning Schemes, Mr Milner stated that his view was that policies and controls in the schemes would be reflected in the Incorporated Document. The Committee indicated that the design of all built form was still to be approved. However, Mr Milner's view was that there was no need to replicate policies at this level because there was a high level of scrutiny through the EES followed by the Development Plan process with consultation.

Mr Townsend asked Mr Milner about the process to ensure that the Development Plans replicated issues considered under the P&E Act and the procedure to link the Development Plan with the Concept Design. Mr Milner responded that there was a cascading of plans under the Incorporated Document. Mr Townsend asked about the suspension of third party appeal rights in relation to heritage. Mr Milner deferred to Mr Lovell and stated that he was not sure why heritage would need to be singled out. When asked about how development would be controlled, Mr Milner stated that station development was captured in the Project and that zones and overlays from the planning schemes would apply beyond the Project in

2028. Before this, the Development Plans would manage the process with the Minister to decide and Councils given an opportunity to comment.

The City of Port Phillip and other submitters, requested that the requirements for Development Plans be expanded to include other plans, such as Heritage Management Plans (HMP). In response, the MMRA stated there was no requirement for Development Plans to include additional plans, such as HMPs because they were already addressed through the Incorporated Document Clause 5.2 which required an EMF and compliance with EPR. The MMRA submitted that the EPR adequately addressed heritage requirements.

As part of its request for further information (D21), the Committee requested:

- *a summary of the specific mitigation measures (including design) in the HHIA and advice whether these will be implemented and if so, how these would be incorporated into Project approvals if they are not specified in Environmental Performance Requirements.*
- *clarification on whether the risk ratings provided for risks HHO1 to HHO35 assume the implementation of these mitigation measures.*

In response (TN33), the MMRA advised that the mitigation measures provide guidance as to how the relevant EPR could be achieved and some included an additional level of detail to assist in interpreting and complying with the EPR. However, the mitigation measures were not intended to be prescriptive and *“it would be more appropriate for these to be referenced as ‘possible mitigation measures’ rather than ‘proposed mitigation measures’ as they appear in the HHIA.”* The MMRA stated:

*For places that are not listed in the VHR or the VHI, it would be expected that consideration would be given to the possible mitigation measures specified in the HHIA in assessing compliance with the EPRs.*

*The residual risk ratings for HHO1 to HHO35 in the HHIA assume that a level of mitigation can be achieved. While it is anticipated that the possible mitigation measures in the HHIA may be adopted in many cases, it is also possible to achieve compliance with the EPRs with alternative mitigation measures or measures that are not identical to those proposed in the HHIA.*

In a further request for information the Committee asked for (D114):

*... further information on the mechanism to ensure that consideration is given to the possible mitigation measures specified in the HHIA when making future decisions with respect to the Project about heritage places that are not listed in the Victorian Heritage Register or the Victorian Heritage Inventory.*

The MMRA responded in TN67 that EPR CH2 was amended in Version 3 to address this matter. Prior to construction commencing, the amended EPR CH2 required the preparation and implementation of a HMP, *“which must identify the mitigation measures to be adopted to avoid or minimise impacts on the cultural heritage values of heritage places.”* The MMRA advised that the mitigation measures contained in the HMP would be determined by the contractors and were likely to be consistent with those identified in the HHIA. The mitigation measures would apply to places and objects listed on the VHR, sites listed on the VHI and places subject to HO.

In its closing submission, the MMRA asserted that *“overall, the impacts of Melbourne Metro on heritage and historic values have been assessed under the HHIA and by Mr Lovell as not being significant.”*

In MMRA’s submission, where matters fell under the auspices of a separate statutory process, like the *Heritage Act 1995*, it was inappropriate to attempt to supplant or to replicate these processes by the EPR. It was inappropriate to seek to fetter the statutory powers of responsible government agencies via the EPR.

At the heritage conclave Mr Briggs for the City of Melbourne recommended the following EPR inclusions which were not supported by Mr Lovell:

- additional EPR CH2-A: *“Where adverse impact upon heritage assets, or heritage significance, is anticipated then readily understandable reasoned explanation of the imperative(s) necessitating the anticipated detriment, as well as the constraints upon options for avoidance of the adverse impact, are to be provided for evaluation against the heritage detriment”*
- additional EPR CH2-B: *“Require that design briefs are to be developed wherever new built presence is to be introduced to a heritage place, or may impact upon the setting of a heritage place, articulating the heritage characteristics, appearance and significant features and providing readily understandable reasoned explanation of the anticipated relationship between the introduced presence and the heritage place”*
- amended CH9: To the satisfaction of Heritage Victoria, the responsible authority *“and in consultation with the relevant Council”*, ensure new development is responsive to heritage places in terms of height, massing, form, façade articulation, and materials, *“and in character, appearance and expression. New built form introduced into a heritage place or likely to have impact upon the setting of a heritage place is to demonstrably a complement to, and in keeping with, the character and appearance of the heritage place to ensure the visual appreciation of the heritage place is concerned”*
- additional EPR GM1-C: *“Provide for Independent Audit of potential structural impacts on heritage assets due to vibration and ground movement including review of the outcomes of GM1-GM5 and provided for consultation with concerned owners of the heritage assets with the independent auditors. This would particularly be required for the City Baths and for the Melbourne Town Hall”*
- reference to Conservation Management Plans (CMP) for specific places and an additional EPR CH22 for street fabric and infrastructure.

The National Trust submitted the following EPR amendments:

- EPR CH1 should include a reference to any relevant CMPs for heritage places to be affected
- EPR CH18 should be amended make the eastern Domain station entry *“recessive”* rather than *“as recessive as possible”*. It had minor concerns about the subjective usage of an appropriate setting for the Macpherson Robertson Memorial Fountain.

The Graduate Union sought more clarification under EPR CH2:

- *Prepare and implement a Heritage Management Plan (HMP) informed by a full inventory of heritage places that shall include a description of the place, its significance and its condition which must ...*
- *Full details of how the EPRs CH1-CH22 are to be addressed.*

It supported Mr Briggs' wording from the heritage conclave for CH2 but sought additional information about the means by which the impact would be redressed.

Heritage Victoria (D268 and D331) noted that many EPR in Version 3, which had read "... to the satisfaction of Heritage Victoria" had been amended to read "... in consultation with Heritage Victoria". It noted that the EES does not override the statutory approval provisions of the *Heritage Act 1995*. Heritage Victoria was concerned that the wording may suggest that the proponent's obligations under the Act were minimised.

To emphasise the ongoing requirement for written approval to be obtained from the Executive Director of Heritage Victoria for all works to any place in the VHR, Heritage Victoria requested an EPR noting this requirement. In addition, Heritage Victoria sought changes to EPR CH2 for a direction that the input of an experienced heritage practitioner be sought, and to EPR CH3 to change the Technical Note referred to, as it was redundant and in the process of being updated.

Mr Townshend explained the use of the revised term "*in consultation with*" Heritage Victoria as a deliberate way to avoid confusing the role of the EPR with the statutory role under the *Heritage Act 1995*.

## **(ii) Vibration and ground movement impacts**

The MMRA noted that the EES assessment found the risk of damage to heritage places because of construction vibration and ground settlement was 'Low' to 'Very Low', and was "*particularly concerned to ensure that impacts on places listed in the VHR will be avoided or minimised.*" The MMRA acknowledged that this was a major concern for many submitters.

The MMRA stated that the relevant EPR managed the risks with the overarching EPR CH2 which required impacts to be avoided or minimised. These EPR included CHA, NV2, NV3, NV4, NV6, NV14, GM3, GM4, and GM6.

Heritage Victoria highlighted that there were 36 places included in the VHR which may be impacted by the Project. Because the construction works do not directly involve these places, there is no trigger under the *Heritage Act 1995* to require a permit. Heritage Victoria noted EPR NV2 had been applied for constructional vibration to Victoria Barracks under the *EPBC Act*, and requested similar measures to monitor and mitigate impacts for VHR places. MMRA stated that this was unnecessary and unwarranted. Mr Lovell recommended a specific EPR to address vibration and ground movement impacts on heritage places on the VHR (new EPR CHA).

While acknowledging the risk from ground settlement was of 'Negligible' to 'Minor Impact', Heritage Victoria recommended that EPR for ground settlement cross reference the requirements for monitoring and reacting to impacts on heritage places in a similar way for vibration. The MMRA addressed this through new NVB (the CNVMP which includes

requirements for identifying sensitive receptors, modelling impacts and implementing strategies to address potential impacts) and GM2 to GM6 (inclusive).

Many submissions raised concerns regarding the impact of vibration on heritage buildings and the need for assessments of building integrity before any works commence. They queried whether condition assessments were to be undertaken prior to works commencing. Another key issue raised was the process for addressing rectification of damage to heritage places should this occur, including the responsibility for, and cost of, such works.

#### **11.1.4 Discussion**

The Committee supports the approach to heritage summarised by the MMRA in its closing submission. It agrees that matters under the *Heritage Act 1995* should not be confused or replicated by processes in the EPR. It accepts that places in the VHR and VHI can be addressed by the normal statutory processes.

The Committee agrees with Heritage Victoria that the wording “*in consultation with Heritage Victoria*” may create confusion with the statutory role. It believes that this confusion was not adequately addressed by the MMRA in EPR CH1. The reference to “*all necessary heritage permits*” under the Act is too limited. There is more to the Act than permits for VHR places, for example, the requirement for consents for the VHI and the obligations arising from any archaeological sites over 50 years of age. The Committee considers that the need for compliance under the *Heritage Act* may need emphasis in other EPR, particularly the rectification requirements in relation to ground movement and vibration. For this reason, the Committee recommends amendment of the wording in several EPR.

The Committee considers that there is varying and confusing terminology within EPR regarding “*heritage places*,” “*buildings or structures*,” “*heritage structures or places*,” and “*heritage buildings*.” The Committee recommends that the term “*heritage places*” is used as this would be consistent with the *Burra Charter* and cover the range of types of places, including buildings, trees, monuments, landscapes, archaeological sites and others. Further, it recommends that “*heritage places*” are defined as places with statutory heritage protection.

By applying this definition, the Committee consciously excludes places without heritage protection. Although the EES assessed places which may have heritage value but were not subject to statutory controls, the Committee considers that it is appropriate to limit the heritage EPR to those places with statutory heritage controls. In making this recommendation, the Committee is cognisant of places, like the former railway sheds in Precinct 3 and the remnant post and fence on the corner of Royal Parade and Grattan Street in Precinct 4, which have no heritage controls but were valued by submitters. It is the Committee’s view that these places can be the subject of specific EPR but they are not included in “*heritage places*.” It may be that new places are included in statutory lists during the duration of the Project. The Committee is mindful that St Kilda Road (VHR H2359) was added to the Register after the EES was exhibited and that the HHIA found some sites of potential heritage value, including the Burke and Wills Monument.

The Committee notes that the MMRA sought to restrict compliance with some EPR to places on the VHR, rather than including those in the HO. The Committee does not find merit in this approach. It contradicts the advice of Mr Lovell regarding management of the potential



impacts of construction vibration and ground movement on heritage places, although Mr Lovell appeared to deviate from this view in his oral evidence to the Committee.

The overarching principle is the protection of all heritage fabric during the Project. The degree of significance (at State or local level) will be a factor in the approach, along with the degree of sensitivity of the heritage fabric. The Committee believes that heritage EPR should generally apply to heritage places but the approach in meeting the EPR may deviate depending on the level of statutory control, amongst other things. The term 'heritage places' is appropriate for EPR relating to Noise and Vibration and Ground Movement (See Chapters 10 and 15 of this report). The Committee accepts that the EPR New CHA addressed many submitter's concerns, however, it should be applied to ground movement as well as vibration.

The Committee accepts that the mitigation measures in the HHIA are only one way of achieving compliance with EPR. Nevertheless, it found the HHIA was an excellent resource in terms of mitigation measures discussed. The Committee understood that the MMRA sought to make contractors employ the same or similar mitigation measures to meet EPR by the introduction of the requirement for a HMP in EPR CH2. However, the Committee considers that this issue has not been successfully resolved to date.

Several submitters sought clarification on the contents of a HMP. The Committee is mindful that the term HMP is sometimes used interchangeably with CMP or Management Plan. There does not appear to be a standard definition of a HMP but there are accepted industry guides to CMP; such as the Heritage Council of Victoria, *Conservation Management Plans: Managing Heritage Places – A Guide*, 2010 and J.S. Kerr's *The Conservation Plan*. The CMP guide, and other industry publications like the *Illustrated Burra Charter*, generally promote the CMP as a document based on 'the *Burra Charter* process' that is: understanding the cultural significance of a place, developing policy based on this understanding, and managing a heritage place in accordance with that policy.

The MMRA's intention was that the HMP address "*the mitigation measures to be adopted to avoid or minimise impacts on the cultural heritage values of heritage places*" (TN67). This would not normally be implied using the term HMP. The industry, including Heritage Victoria, more commonly refer to a Heritage Impact Statement (HIS) as a report that determines whether a proposed development will impact on a place's historic cultural heritage values, and if so, how these impacts might be avoided or mitigated.

Several submitters sought clarification of the status of the HMP (now referred to as the HIS) and argued that it should be included in the Development Plan. It was MMRA's position that a Development Plan must include items set out at c5.1.3 of the Incorporated Document, including how the development will be in accordance with the UDS (required by c5.3.3) and the relevant EPR (c5.2.7).

The UDS refers to the planning schemes in reference documents. Mr Jones stated that it implied consistency or compliance with reference documents if a proposal was in accordance with the UDS. This view was similar to Mr Milner's opinion that policies and controls in the schemes would be reflected in the Incorporated Document.

Some EPR specifically required compliance with the UDS. EPR LV1 regarding permanent and temporary works, and EPR LV2 regarding renewal of public spaces, have heritage

implications and must comply with the UDS. This would appear to imply compliance with the heritage policies in the planning schemes as reference documents in the UDS.

EPR LU4 was more explicit and the Committee considers that this EPR would be of assistance with new development within HO precincts, like the Flinders Gate Precinct (HO505), because the heritage policies in the planning schemes would apply.

However, this process does not address changes within HO precincts that do not involve new structures, for example alteration of a graded place within the HO or the cumulative impacts of change within a HO precinct. It recommends that the requirement for a HIS be included in EPR CH2.

### **11.1.5 Findings**

The Committee finds that the MMRA's approach to heritage in the EPR can be supported, however there are some matters which require clarification. It agrees that EPR CH1 is the appropriate place to emphasise compliance with the *Heritage Act 1995* but finds that additional reference is required in some EPR.

The Committee considers that EPR should apply to any works which impact on heritage places, so the qualification 'main works or shafts' for example in EPR CH4 and CH5, is not warranted. The term 'works' should be consistently applied.

It finds that the term 'heritage places' should be consistently used in EPR and defined in EPR glossary to mean places with statutory heritage protection. There may be differences in the way EPR are applied to a heritage place depending on its level of significance, as evidenced by inclusion in the VHR, VHI or the HO, but the overarching heritage principles are the same.

The Committee finds that the use of the term 'heritage places' is appropriate for EPR NV6 and GM3, rather than the restriction to VHR places only. The Committee considers that the EPR for Noise and Vibration and Ground Movement, as amended in this report, are suitable to address heritage places. However, it finds that the EPR New CHA should be updated so that it applies to ground movement as well as vibration.

The Committee supports MMRA's amendment of EPR CH2 to require an explanation of mitigation measures for heritage but considers that further clarity in terminology and purpose is required. Clarity about approval of mitigation measures is needed. It considers that new development within a HO precinct would be addressed by EPR LU4 but that a HIS is needed to address all impacts to a heritage place. The HIS will demonstrate how a Development Plan intends to address heritage issues and provide a mechanism for comment on mitigation measures prior to approval.

The relevant EPR have been amended accordingly, as provided in Appendix F.

## **11.2 Precinct 1 – Tunnels**

### **11.2.1 Key issues**

The Committee considers the key issue relates to the location of EAS structures in Queen Victoria Gardens adjacent to Linlithgow Avenue, and Tom's Block.

### **11.2.2 What did the EES say?**

The HHIA found that the proposed EAS structures in Queen Victoria Gardens adjacent to Linlithgow Avenue or Tom's Block would have an adverse heritage impact through tree removal for construction works and the visual impact of the proposed permanent above ground structure set within the parkland. However, these impacts would be localised within the broader Domain Parklands (VHR H1772). The HHIA preferred the Tom's Block location. It made recommendations for changes to the construction work sites, for the reinstatement of landscapes where affected, and for the approach to detailed design of the permanent structures to minimise the impacts. For all works in the Domain Parklands, the HHIA advised that it was important to prepare an archival record of the affected areas.

The HHIA stated that there were unlikely to be any archaeological impacts associated with works for either location.

### **11.2.3 Evidence and submissions**

After the EES, it was determined that, if an EAS was needed, it would be for temporary purposes only during construction. Mr Lovell's position remained that a shaft could be accommodated without a major adverse impact on heritage values, although the Queen Victoria Gardens option was least preferred because of its potential visual impact on the setting of the King Edward VII memorial. MMRA's position was that impacts were reduced because of the temporary nature of the structure and that EPR were adequate to manage heritage impacts.

At the conclave (D25), the agreed preference was for the Tom's Block option rather than Queen Victoria Gardens. Mr Brigg's view was that alternative siting locations within Tom's Block should be investigated in conjunction with further consideration of footprint, size, character and requirements such as hard stand. This was not supported by Mr Lovell who considered that the current location within Tom's Block was acceptable.

The City of Melbourne submitted that a shaft in the proposed Linlithgow Avenue site would have significant impacts on the Queen Victoria Gardens precinct and views of the Lady Clarke Rotunda. Mr Moore suggested the exploration of an alternate site for the Linlithgow Avenue shaft opposite the Queen Victoria Gardens site, utilising the western carriageway of the southern leg of Linlithgow Avenue (where Linlithgow Avenue forks on three sides of the small triangular piece of parkland). The City of Melbourne proposed that this carriageway be closed permanently and the land incorporated into Tom's Block, as referenced in the UDS at s4.1.1e. This was strongly supported by the National Trust.

### **11.2.4 Discussion**

Although the shaft will now be temporary, the Committee considers that the heritage impacts should be avoided or minimised. It supports the alternate location submitted by the City of Melbourne and agrees with the views of the National Trust.

### **11.2.5 Findings**

The Committee finds that it would be preferable to provide the temporary EAS within the carriageway proposed to be closed by the City of Melbourne. If this is not possible, it concurs with the conclave finding that Tom's Block would be a better location than the Queen Victoria Gardens. However, the Committee finds that further resolution of the

location is required to minimise impacts on Tom's Block, even given the temporary nature of the EAS. The Committee rejects the Queen Victoria Gardens location put forward in the EES Concept Design.

The relevant EPR have been amended accordingly, as provided in Appendix F.

### **11.3 Precinct 2 – Western portal**

#### **11.3.1 Key issues**

The Committee considers the key issue relates to the demolition of nine residences within the Kensington Precinct (HO9) (Concept Design) or the proposed demolition of a single ungraded residence (Option B) within the Precinct.

#### **11.3.2 What did the EES say?**

The Concept Design included demolition of nine residences within the Kensington Precinct (HO9) in the Melbourne Planning Scheme. Of these, four were D-graded residences in a Level 3 streetscape at 1 to 5 Childers Street and 133 Ormond Street Kensington. The HHIA preferred Option B which would not require demolition of graded buildings but involved the demolition of a single ungraded residence with no heritage impact. It found that the loss of the four graded buildings was an adverse heritage impact, but did not compromise the core heritage values of the precinct. The HHIA stated that the impact could not be mitigated, however, it recommended recording the buildings.

#### **11.3.3 Evidence and submissions**

The City of Melbourne recommended Option B which avoided demolition of the four heritage-graded houses within HO9. It stated that the existing D-graded buildings were not of high individual heritage significance but collectively they formed an important edge to the Kensington Precinct HO9. Mr Briggs stated that Option B should be adopted. Many other submitters expressed a strong preference for Option B on heritage and other grounds, including the National Trust and South Kensington residents.

While Mr Lovell preferred Option B to avoid impacts on heritage values, his evidence was that the Childers Street residences made less of a contribution than would be the case if the residences were located more centrally.

#### **11.3.4 Discussion and findings**

The Committee finds that Option B for the Western Portal in Precinct 2 is strongly preferred on heritage grounds.

The relevant EPR have been amended accordingly, as provided in Appendix F.

### **11.4 Precinct 3 – Arden Station**

#### **11.4.1 Key issues**

The Committee considers the key issues relate to:

- demolition of former railways workshops buildings and whether relocation or salvage was justified
- the significance of the Flax Store, which was not assessed in the HHIA

- possible demolition of a small pumping station to Moonee Ponds Creek in Langford Street.

#### **11.4.2 What did the EES say?**

The Concept Design included the demolition of former railways workshops buildings at 173-199 Laurens Street which were proposed for HO controls. The HHIA found that there was an adverse heritage impact but that it was an appropriate mitigation measure for the buildings to be recorded prior to demolition and for interpretation to be provided.

The HHIA noted that a small brick pumping station to Moonee Ponds Creek located in Langford Street, which formed part of a proposed HO precinct may need to be demolished for the proposed new electrical supply substation. It recommended retention of the structure if possible and recording if it was demolished.

#### **11.4.3 Evidence and submissions**

The City of Melbourne noted that it had (unsuccessfully) sought a PSA to include, amongst other things, the land at 173-199 Laurens Street in the HO as early examples of railway buildings. It recommended that the buildings be incorporated into station infrastructure, or options explored for removing and reusing them elsewhere within Precinct 3.

Mr Briggs gave evidence that the complex of railway sheds was of historic and aesthetic value at a level that warranted conservation. In his view Mr Lovell's recommendation for interpretation and archival recording prior to demolition would not adequately compensate for the loss of this complex. He submitted that there should have been an investigation of alternative solutions to avoid the impact. Mr Briggs submitted that the Flax Seed Store Shed to the west of the railways workshops buildings was overlooked and not assessed in the HHIA. He claimed it may have been an emergency grain store from World War II and, along with the railway sheds, it should be considered for integration into the redevelopment of the precinct. Mr Briggs noted that this would be "*of substantial public benefit both aesthetically and in imparting historical continuity to the present rail project*".

The National Trust shared Mr Briggs' view about the railways buildings, and noted that the former Victorian Railways Carpenters Shop had undergone sensitive adaptive reuse "*making a positive contribution to this important urban renewal precinct*". It was the National Trust's view that:

*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 Lovell had revisited the site and responded that there were other buildings on the site that were "*broadly contemporary with the former Carpenters Shop and of an equal level of heritage interest.*" He believed that relocation of buildings or salvage of fabric could be considered and that the existing EPR were adequate.

#### **11.4.4 Discussion and findings**

The Committee agrees that the former railway sheds and potentially other sheds in Precinct 3 have some heritage value and their retention is preferred. However, given that they have

no statutory heritage protection and are part of an area undergoing major change, it agrees with Mr Lovell that their significance does not warrant retention at all costs.

The Committee finds that the possibility of dismantling and re-erecting the building in the vicinity should be explored but, if not feasible, Mr Lovell's recommendation for archival recording and interpretation is acceptable.

The Committee finds that EPR CH11 is satisfactory for the Langford Street pumping station.

The relevant EPR have been amended accordingly, as provided in Appendix F.

## **11.5 Precinct 4 – Parkville Station**

### **11.5.1 Key issues**

The Committee considers the key issues relate to:

- the loss of elm trees in Royal Parade and the reinstatement of the avenue
- potential impacts on the three University of Melbourne VHR sites
- whether station infrastructure would be sympathetic to heritage values
- management of the City Ford Archaeological area
- archaeological potential on the University of Melbourne land.

### **11.5.2 What did the EES say?**

The HHIA concluded that Royal Parade (VHR H2198) would be impacted by the removal of 10 elm trees associated with the proposed new tram stop in Royal Parade and consequent changes to road functional layouts. It proposed the re-establishment of the boulevard layout and visual character through replanting of trees and maintenance of the arrangement of medians to roadways as far as was possible. It noted that three trees could not be reinstated in the same location, however trees could be replanted in close locations, resulting in localised reconfiguration of the avenue plantation. The HHIA acknowledged that this would reduce the intactness of the place and the aesthetic experience, particularly when entering from the south, but found it was a relatively localised change considering the scale and extent of Royal Parade.

The HHIA stated that no heritage controls apply along Grattan Street where some elms are proposed for removal as the Carlton Precinct (HO1) is only on the south of Grattan Street. The HHIA identified three trees on the Exceptional Tree Register within the University of Melbourne grounds that are close to the northern boundary of the Project area, but does not discuss any impact to them.

The Parkville station site abuts several VHR-registered places, including three University of Melbourne sites. The HHIA found that impacts on these sites were limited and related to the proximity of the works to the buildings. It found that the impacts could be managed or mitigated, and station entrance structures should be sympathetic to the heritage context. The station box will be near the Main Entrance Gates, Pillars and Fence (VHR H0918) and may require dismantling and reconstruction of heritage fabric. The station box will be close to the Gatekeeper's Cottage (VHR H0919), and the HHIA required a setback of no less than 8 to 10 metres (EPR CH13). The design of the entry would need to achieve a sympathetic relationship with the Vice Chancellor's House (VHR H1103).

The HHIA advised that new structures within the Carlton Precinct should be designed to avoid or minimise impacts on cultural heritage values. The HHIA found that construction of new above ground infrastructure could be managed by EPR CH1 and CH9. The loss of relatively young trees in the northern part of University Square was not found to be a heritage impact.

For the City Ford Archaeological area (VHI H7822-2340), the HHIA found that management under the *Heritage Act 1995* was appropriate. It noted that there was historical archaeological potential within the grounds of the University of Melbourne.

Although it determined that the remnant bluestone pillar and cast iron fencing at the corner of Grattan Street and Royal Parade did not meet the threshold for local significance, the HHIA recommended the integration of this feature into the design for the station entry and surrounds in consultation with the University of Melbourne (EPR CH16).

### **11.5.3 Evidence and submissions**

The impact of the new station on heritage values of the Royal Parade boulevard were raised by the Parkville Association. Submissions highlighted the loss of elms in Royal Parade and Grattan Street as having an adverse impact on cultural heritage values (including S128, S294, S318, S332, S364 and S365). Map 6 attached to TN40 showed eight of the ten elms to be removed in Royal Parade were likely to need replacing within 10 years in any event.

The National Trust accepted that the useful life expectancy of the elms was limited and that block replacement may be the most appropriate option. However, it highlighted the importance of works to Royal Parade not reducing or limiting the soil available to reinstate advanced specimens in the same location. The National Trust supported potential widened central medians which will facilitate replacement of elms currently missing from the Royal Parade avenue. In the National Trust's view, the elms must be reinstated in a way that comprehensively retains the existing regular spacing of trees that form the Avenue.

MMRA argued that specific EPR were developed to address the impact on heritage landscapes. MMRA highlighted EPR CH12 which required the replacement of Royal Parade elms with appropriate species, re-establishment of the boulevard formation and provision of suitable soil conditions to facilitate the growth of the new trees.

MMRA's position on the location of the Parkville station was that the final design of the entrance and locations would be undertaken in consultation with other parties. MMRA stated that the UDS Guidelines at s4.4.3e provided guidance for the location of station entries which should be designed as parts of key entries to the campus, "*while being respectful to the heritage context*".

The National Trust was concerned with trees on the University of Melbourne grounds. It supported retention of maximum plantings around the three VHR listed items, pointing out that the proposed 10 metre buffer around the Gatekeeper's Cottage provided potential to retain large elm in front of the house if the Tree Protection Zone was adequately protected.

The University of Melbourne was "*generally comfortable*" that minor heritage impacts to places on the VHR and HO could be effectively managed but drew attention to places where archaeological values may be present.

Mr Lovell submitted that an archaeological management plan should be prepared for the Gatekeeper's Lodge Historical Area site as it is recommended for inclusion in the VHI for its archaeological values.

The University of Melbourne stated "*the re-erected section of fence and gatepost may also have potential heritage value and may warrant retention and reinstallation in a suitable alternative location*". The MMRA included EPR CH16, which requires the integration of the bluestone pillar and cast iron fencing into the design for the station entry and surrounds in consultation with the University of Melbourne to address this issue.

#### **11.5.4 Discussion and findings**

The Committee finds that the heritage impacts for Precinct 4 can be adequately managed by the EPR (including amendments proposed by the Committee) and statutory processes under the *Heritage Act 1995*.

The Committee agrees that the fence and gatepost at the corner of Royal Parade and Grattan Street does not make the threshold for local significance.

The relevant EPR have been amended accordingly, as provided in Appendix F.

### **11.6 Precinct 5 – CBD North Station**

#### **11.6.1 Key issues**

The Committee considers the key issues relate to:

- impacts on the City Baths and RMIT Building 9
- impacts on heritage values from new visible infrastructure
- management of historical archaeology.

#### **11.6.2 What did the EES say?**

The HHIA concluded that there would be few direct impacts on heritage places in this Precinct. It found that there will be a visual impact of the new station entry and ventilation shaft within the road reserve in proximity to the City Baths and RMIT Building 9, however, this could be mitigated through care in detailed design.

While construction vibration and ground settlement were Project-wide issues, it noted that works were proposed near numerous heritage buildings in this precinct. The HHIA drew attention to the potential for damage to the City Baths from excavation and underground works, including an adit below the building. It found that the Project could adequately manage these risks.

The management of historical archaeology was highlighted as a key issue in the central city. For the Latrobe Street entrance, the destruction and removal of the following three sites would be required: 204-206 La Trobe Street (VHI H7822-2128), 208-210 La Trobe Street (VHI H7822-2129) and 377-391 Swanston Street/188-196 La Trobe Street (VHI H7822-2130). The development of archaeological management plans to the satisfaction of Heritage Victoria under the *Heritage Act 1995* would be required. The same requirement would apply to 22-44 A'Beckett Street (VHI H7822-2082) as an alternate design option for the construction work site. The HHIA found that this was an adequate management process.



### 11.6.3 Evidence and submissions

The City of Melbourne raised concerns about potential impacts on the structural integrity of the City Baths. It suggested that this warranted preventative remedial action to address the structural integrity prior to the main construction program to ensure the protection of the Baths. The National Trust supported this view.

Mr Briggs submitted that the visual impact on the City Baths from the new station entry had not been appropriately considered, and he proposed amendments to EPR CH9 and new EPR CH2B to address this.

### 11.6.4 Discussion and findings

The Committee finds that impacts of the CBD North Station on the historic heritage significance of Precinct 5 can be adequately managed by the EPR (including amendments proposed by the Committee) and statutory processes under the *Heritage Act 1995*.

The relevant EPR have been amended accordingly, as provided in Appendix F.

## 11.7 Precinct 6 – CBD South Station

### 11.7.1 Key issues

The Committee considers the key issues relate to:

- impacts of works on heritage places
- impacts on views to St Paul's Cathedral
- whether the degree of change in the Flinders Gate Precinct would be sympathetic to heritage values
- relocation of the Burke and Wills statue
- oversite development
- management of historical archaeology.

### 11.7.2 What did the EES say?

The HHIA noted that this Precinct was highly sensitive with a concentration of heritage places, many included in the VHR. Flinders Street Station (VHR H1083) was directly impacted by works to connect to the underground CBD South Station. The HHIA determined this connection would require the removal of significant fabric but, with care in detailed design, the adverse impact on heritage values would be modest. The Concept Design included the demolition of non-original shop fronts and internal works to accommodate escalators to illustrate how the connection could be made. The HHIA found that a proposal to use the existing carpark at St Paul's Cathedral (VHR H0018) as a temporary public open space could be pursued with no adverse heritage impacts, subject to appropriate design.

While construction vibration and ground settlement were Project-wide issues, the HHIA noted that works were proposed close to numerous heritage buildings in this Precinct. The location of adits below St Paul's Cathedral was highlighted. The HHIA found that these issues could be managed appropriately with the existing EPR.

The visual impact of new station infrastructure in proximity to VHR-listed buildings and within the Flinders Gate Precinct (HO505) was a heritage impact, as was the sensitivity of potential visual impacts on views to St Paul's Cathedral from Federation Square. The HHIA advocated management of these heritage impacts through sensitive design.

The HHIA noted that careful management was required for the potential heritage impacts of alterations to existing heritage buildings because of demolition and development. This included the Nicholas Building (VHR H2119) to make good the existing connections to 27-29 Swanston Street, the potential for the north wall of the Young & Jackson's Princes Bridge Hotel (VHR H0708) to be exposed as part of the station design, and the use of the former carriageway to 222-224 Flinders Street (C graded within Flinders Gate Precinct) for pedestrian access.

The HHIA concluded that excavation and establishment of major construction work sites directly abutting VHR-registered buildings and graded buildings within HO precincts could be managed. The HHIA concluded that the Project would result in the demolition of some graded buildings in the Flinders Gate Precinct, including the Port Phillip Arcade, 224-226 Flinders Street, (D Graded). It made recommendations for its interpretation as part of the redevelopment, including recording and the relocation of the Charles Bush sculpture. The HHIA found that the other buildings to be demolished made a minor contribution to the HO precinct, and stated that, while not mitigating the loss, they would be recorded prior to demolition.

The relocation of the Burke and Wills Statue from the City Square (currently within the Flinders Gate Precinct HO505 but assessed by the HHIA as potentially of State significance) was a heritage impact which could be managed by the Project.

The management of historical archaeology was highlighted, where evidence of Melbourne's earliest post-contact history may be uncovered. The HHIA concluded that destruction of five VHI sites in Swanston Street (referred to as the Swanston Street Archaeological Area) and one in Flinders Street would occur. The development of archaeological management plans to the satisfaction of Heritage Victoria under the *Heritage Act 1995* would be required to appropriately manage these impacts.

### **11.7.3 Evidence and submissions**

#### **(i) Flinders Street Station**

The National Trust submitted that works to Flinders Street Station should be undertaken in accordance with the *Flinders Street Station Conservation Management Plan*, Lovell Chen 2010. The submission noted that the remains of Princes Bridge Station are located underneath Federation Square and included in the VHR extent of registration for Flinders Street Station.

#### **(ii) Flinders Gate Precinct**

Submitters raised concerns regarding impacts to heritage values, including MATC, ALE Group, Port Phillip Arcade and surrounds, Melbourne Heritage Action (MHA) and the Nicholas Building.

As part of a request for further information (D21), the Committee requested "*an assessment of the cumulative historic heritage impacts within precincts.*" For the Flinders Gate Precinct, Mr Lovell responded in TN33 that "*overall, assuming care in detailed design, the cumulative impact is not one which would compromise the heritage values of the precinct.*" He highlighted there would be extensive demolition on Swanston Street "*but the streetscape here is less cohesive and can readily accommodate change.*" He stated that the proposed

locations of the north station entry in the City Square and the south-western entry in Federation Square were “*contemporary public spaces and the heritage sensitivities are limited.*” Mr Lovell’s assessment was:

*The gateway aspect of the precinct, with a strong heritage presentation to the south on Flinders Street and key relationship to Princes Bridge and Flinders Street Station, would be maintained. Flinders Street Station, St Paul’s Cathedral and Young and Jackson’s Hotel would still dominate and hold this key intersection.*

Several submissions (including S195, S335, S359, S365) opposed the demolition of graded buildings within the Flinders Gate Precinct. The National Trust conceded the loss of the Port Phillip Arcade, acknowledging that it was required for pedestrian access, and “*that priority has been given to preserving older heritage places in the immediate vicinity.*” It supported the EPR to record the building and incorporate the Charles Bush sculpture into the new design. MHA adopted the same position and urged that the stylised sailboat sculpture on the internal gate be retained.

MHA sought retention of 27-29 Swanston Street, a 1940 extension to the Coles Store which then occupied the ground floor of the Nicholas Building. The EES highlighted its architecturally distinctive design and association with the architect Harry Norris, who was also the architect for the Nicholas Building. MHA argued that its significance had not been fully examined and its demolition “*should be avoided if at all possible.*” The submission on behalf of the Nicholas Building stated that the basement was connected under both buildings along with interdependent systems. It wanted acquisition of 27-29 Swanston Street to be confined to the basement and below, leaving the ground and upper floors and highlighted this action would protect the windows on the south elevation of the Nicholas Building, as well as to maintain the commercial viability of the building.

The City of Melbourne noted that the station infrastructure would lead to a loss of heritage values, and stated “*that the attribute of the Flinders Gate Heritage Precinct and the significance of the Port Phillip Arcade can be referenced in the design of the station entry and above ground development.*”

The National Trust highlighted that the works, including demolition and new buildings, structures and landscaping, have the potential to impact on the values of the whole Flinders Gate Precinct. The National Trust’s view was that this must be addressed through sensitive detailed design which is sympathetic with the Precinct’s heritage values.

Several submitters raised concerns about the impacts of adjacent new development on heritage places, like the Nicholas Building. MHA was concerned that a large L-shaped, new development site would wrap around Young and Jackson’s Hotel. It stated that “*if it were to be taller than a few storeys would inevitably dominate what is possibly the most important gateway into Melbourne, which has not changed, apart from signage, since the construction of the SEC building in 1930.*” MHA felt that future development of this site should be restricted to low height.

A lack of clarity about the extent of the land required for construction and the impact on adjacent heritage buildings was of concern. The ALE/ALH Group highlighted the importance of Cocker Alley between the Dangerfield building at 222-224 Flinders Street and the hotel.

The National Trust agreed with Mr Lovell's assessment that the Dangerfield building should have a higher heritage grading. It urged that the building be retained in full with the carriageway used for pedestrian access and conservation works to be undertaken. The Ross House submission expressed similar concerns due to proximity to the Port Phillip Arcade and the station site.

The MMRA stated that buildings within the Flinders Gate Precinct, the HHIA concluded that EPR CH3, CH6, CH7 and CH14. were appropriate to address the expected heritage impacts.

### **(iii) St Paul's Cathedral**

The MATC submission and others raised concerns about the visual impact of station infrastructure on views to St Paul's Cathedral. The Concept design showed a station entrance between the eastern and western shards at Federation Square. The construction of any new structures within this existing open space was opposed by the City of Melbourne, MATC, National Trust and others. The City of Melbourne preferred the use of the existing shard structure for the station entrance. The MMRA indicated that it had reviewed the viability of a rebuilt western shard as a station entry however, the acceptability of the outcome would depend on the detailed design. The MATC highlighted the importance of views to the Cathedral from Princes Bridge.

The MATC proposed that the redesign of the City Square "*maintains the north south axial view towards the Cathedral.*" The City of Melbourne recommended that the smaller City Square entrance to the south should not be on the alignment of the central axis of the Cathedral and ventilation structures should be consolidated into the station entrances.

The MMRA acknowledged the importance of views to the Cathedral, Mr Lovell's evidence noted "*the addition of modest low level structures on either the Federation Square site or on the City Square is unlikely to have an adverse heritage impact.*" The MMRA stated that the impacts of new structures on views to St Paul's Cathedral would be determined at detailed design stage.

### **(iv) Burke and Wills Monument**

The Burke and Wills Monument is owned by the City of Melbourne and is to be relocated. The Burke and Wills Historical Society Inc (S269) submitted that the statue should be relocated to the Royal Society of Victoria (RSV) as the Society organised the Burke and Wills expedition, farewelled Burke and his party, and the remains of Burke and Wills were laid in state in the Society's hall prior to Australia's first state funeral in 1863. This submission was supported by the RSV and the National Trust.

The City of Melbourne acknowledged these views but felt that broader consultation was required about the final location. It submitted "*it would be premature if not inappropriate for a long term decision to be made through the EES process at this time.*"

The MMRA was not opposed to the relocation of the monument but stated that it was a matter for the asset owner. The monument would be protected during relocation, if needed, by EPR CH15 and EPR CH4. If the monument was retained in situ during works, EPR CH5 required appropriate protection measures.

#### **11.7.4 Discussion**

Many of the heritage issues raised for this Precinct have been discussed in the Project wide threshold issues, including managing change in the Flinders Gate Precinct and the impacts of vibration and ground movement on heritage places.

With regard to the impacts of construction adjacent to heritage places, the Committee considers that the physical impacts could be adequately addressed in an amended EPR CH5. However, it highlights the importance of ensuring ongoing viability for compatible uses of heritage places. The Committee shares submitters' concerns about the potential vulnerability of places like the Nicholas Building, Ross House and Young and Jackson's Hotel which will be surrounded by construction. It notes that the MMRA has been involved in detailed discussions with owners and occupiers, and the Committee believes that the EPR adequately provides ongoing consultation as the detailed design progresses.

The Committee agrees that it would be preferable to retain 27-29 Swanston Street above basement level because of its design and relationship with the Nicholas Building. Particular care should be afforded to Cocker Alley and the Dangerfield Building at 222-224 Flinders Street.

The Committee finds merit in the submissions about the potential relocation of the Burke and Wills Monument but the final location is not a matter to be determined through this process. The Committee supports the retention of views to heritage places, especially the iconic views of St Paul's Cathedral from Federation Square, Princes Bridge and the City Square. It notes that the new station infrastructure should be subservient to the landmark qualities of these heritage places.

#### **11.7.5 Findings**

The Committee finds that impacts of the CBD South Station on the historic heritage significance of Precinct 6 can be adequately managed by the EPR (including amendments proposed by the Committee) and statutory processes under the *Heritage Act 1995*.

The relevant EPR have been amended accordingly, as provided in Appendix F.

### **11.8 Precinct 7 – Domain Station**

#### **11.8.1 Key issues**

The Committee considers the key issues relate to:

- eastern entry on the Shrine of Remembrance
- station entry on the South African Soldiers' Memorial, including relocation of the Memorial, and impacts on Albert Reserve
- tree removal and other works, including on Domain Parklands, Shrine of Remembrance, St Kilda Road and the Edmund Herring Oval
- proposed alternative location of the Station on the Shrine Reserve.

#### **11.8.2 What did the EES say?**

The Concept Design included new station entries at the edge of the Shrine Reserve (VHR H0848) and the South African Soldiers' Memorial (VHR H1374) on the triangular Albert Reserve. For the Shrine Reserve, the HHIA recommended that a low-key design approach

would minimise the physical impacts and visual presence of the entry, and ensure no adverse impact on the whole of the registered heritage place.

The HHIA concluded that co-location of the station entry with the South African Soldiers' Memorial presented a more significant heritage challenge. It found that the memorial would need to be removed and reinstated and that the Concept Design would have a significant adverse impact. It noted that there were additional significant components of Albert Reserve, including the Windsor Oak, the Fire Wheel tree plaque, the Cockbill Memorial Drinking Fountain and other mature trees, such as the perimeter elms. There was a strong preference to retain the monument on this site with an appropriate siting and setting. The HHIA recommended that an improved outcome might be achieved through reconfiguration and enlargement of the Albert Reserve. It said that, only if it is not possible or feasible to provide an appropriate setting on this site, should relocation of the monument from the reserve be considered. If this occurred, it could have the benefit of avoiding 'double handling' during relocation (dismantling and storing prior to reconstruction) and reduce the risk of physical damage.

The HHIA found there was little adverse impact in the Shrine Reserve or the Domain Parklands (VHR H2304) due to a temporary construction site on the Edmund Herring Oval. It recommended that if the area was refined to avoid the loss of two mature elms, then the use would have no adverse heritage impact.

The HHIA noted that there would be significant construction impacts concentrated within the St Kilda Road reserve, particularly the loss of avenue trees. St Kilda Road was added to the VHR after the EES was completed but treated as potentially of State significance in the report. The recommended mitigation measures for St Kilda Road included the reinstatement of the boulevard treatment and replanting of avenue trees. However, the HHIA identified key issues in relation to St Kilda Road, being the visual impact of new above ground structures (station entry, tram stop and others) and the impact on the potential to re-establish trees consistent with the traditional boulevard layout.

The HHIA identified that possible temporary relocation of the Tram Shelter in St Kilda Road (VHR H1869) may be required. It would be preferable to retain and protect the building in its current location but careful relocation and reinstatement could be achieved in accordance with accepted conservation standards.

There are three related VHI sites within Precinct 7. The HHIA found the design would require the destruction and removal of the former St Kilda Road Cable Tram Engine House Track Precinct site (H7822-2220) and possible damage to the former St Kilda Road Cable Tram Engine House (H7822-224). The St Kilda Road reserve archaeological area (H7822-2341) which extends from Park Street to Kings Way has potential for the destruction of archaeological remains. It recommended that the historical archaeological impacts be mitigated by the realisation of the research potential and management under the *Heritage Act 1995*.

### **11.8.3 Evidence and submissions**

#### **(i) Station entrances**

Many submitters were concerned with the impacts of construction and proposed station entrances. The potential impacts on the Shrine Reserve included tree removal, loss of

landscape, and visual intrusion of the new entrance and other structures. S193 said *“The loss of trees and the visual beauty of the Shrine precinct is an affront to the memory of the soldiers remembered there”*. The Shrine Trustees (S249) indicated their support for the Project but stated:

*The surface impact of proposed design and infrastructure treatments must always be sympathetic to the Shrine and its environs, taking into consideration its significance, iconic status and reverence.*

Mr Briggs submitted that the visual impact on the Shrine Reserve from the new entry was higher than the ‘minor’ category in the HHIA Risk Register, and he proposed amendments to EPR CH9 and new EPR CH2-B to address this.

Mr Lovell’s evidence was that relatively limited tree removals were proposed in the Shrine Reserve, with the majority being juvenile specimens and no dedicated trees to be lost. He considered that the proposed station entry was remote from the Shrine building and *“with further design refinement, it is considered that an appropriate design can be achieved in this location.”* Mr Lovell acknowledged that there would be a change in some views into the Shrine Reserve, including views to the Macpherson Robertson Fountain, but stated that the impact does not impose on the key axial views of the Shrine.

In closing submissions, the MMRA contended that there were sufficient measures in place to appropriately protect the Shrine Reserve, referencing CH1, CH17 and CH18.

The National Trust sought an amendment to EPR CH18 to make the entry *“recessive”* rather than *“as recessive as possible”*. The Trust expressed concerns about the subjective usage of an *“appropriate”* setting for the Macpherson Robertson Memorial Fountain in this EPR.

For the Albert Reserve station entry, submitters concerns included the temporary removal and reinstatement of the South African Soldiers’ Memorial and the Cockbill Memorial Drinking Fountain, removal of trees, including the loss of the Windsor Oak, and the design of the proposed station entry. Concerns were raised whether an appropriate setting for the reinstated Memorial within the Albert Reserve could be achieved was a major issue. The City of Port Phillip is the Committee of Management for the Albert Reserve and the owner of the South African Soldiers’ Memorial and the Cockbill Drinking Fountain. The City of Port Phillip considered that the Memorial should be retained in its present location.

The City of Port Phillip’s comment that *“the memorial should not be surpassed, as the focus of the site, by the station entrance”* was supported in Submission 370. The City of Port Phillip that it planned to enhance the passive recreation use of Albert Reserve by the closure of the southern arm of Albert Road, thereby enlarging the extent of parkland but still permitting limited vehicular access for residents of the adjacent towers.

Since the EES, a CMP for the South African Soldiers’ Memorial (D155) was completed on behalf of the City of Port Phillip and referenced by MMRA in a revision to EPR CH17. The CMP revised the VHR statement of significance to include additional elements of significance at State and local level within the Albert Reserve. The CMP provided detailed policies, including contemplation of the Project implications, and recommended that, even if temporarily relocated, the memorial should be reinstated to this location. Detailed recommendations were provided for the trees, drinking fountain and other significant

elements. The CMP did not support the enlargement of the Reserve proposed by the City of Port Phillip, it noted that:

*the original and ongoing use of Albert Reserve as a place of recreation contrasts with the Memorial which calls for solemn remembrance of past sacrifice. This has been the case since the Memorial was erected in the 1920s, and is part of the complexity of the site. It is not impossible for contrasting uses to coexist comfortably with each other, and subtly delineated zoning of the reserve can contribute to this.*

These tensions between recreation and remembrance were reflected in submissions made to the Committee. Some local residents were concerned with retaining the amenity of the Reserve and expressed 'a degree of ownership' of the memorial. Submission S190 stated "*local residents have a strong connection to the park and the memorial*" and supported Council's submissions.

The National Boer War Memorial Association (S375) submitted that the current site was no longer an appropriate location for commemorative ceremonies, and had been unable to adequately host past Empire Day ceremonies. In its assessment, the setting of the site has been compromised by surrounding development and heavy vehicular traffic. It felt that, even if the Reserve was enlarged, it would not be appropriate as a focal point for commemorative services or contemplation. The Association submitted that the Memorial should be relocated to a more conducive setting within the Shrine Reserve as "*this Memorial should be placed where it will form part of the historical progression of Victoria's military monumental heritage.*" However, the Association acknowledged that the Shrine Trustees would not consider relocation of the Memorial to the Shrine Reserve without the City of Port Phillip supporting it.

In its closing submission, the MMRA stated that EPR CH17, CH19 and AR1 responded to the key issues raised by submitters in relation to the Memorial.

## **(ii) Tree removal**

Heritage Victoria's submission considered that the impact on mature trees from the Project would be extensive and that measures should be taken to reduce the number of trees lost and ensure the replacement of all removed trees. Permit approvals would be required for tree removal in VHR places in Precinct 7, including the Domain Parklands, the Shrine Reserve, South African Soldiers' Memorial and St Kilda Road. The concern about tree loss was echoed by many individual submitters, as well as the National Trust.

Throughout the Project there were varying references to the number of trees to be removed. TN40 included the MMRA's reply to the Committee's request for clarification of this issue and other tree related matters. Map 12 attached to TN40 depicted that of the trees potentially impacted by the proposal within the boundary of Precinct 7, about 60 were likely to need replacing within 10 years and about 145 were not. The distribution of the trees likely to need replacing within 10 years showed about 22 trees concentrated between Domain Road and Bromby Street on the north side of St Kilda Road, with some other groupings on the St Kilda Road frontage of Albert Reserve, in patches on the south side between Dorcas and Park Streets, and in the median strip in this area. Further west of the



station precinct, only two trees out of 14 to be removed on St Kilda Road were likely to need replacement in the next 10 years.

Questions were raised about the extent of tree removal and replacement that would have occurred independently of the Project. TN72 referenced the *City of Melbourne South Yarra Urban Forest Precinct Plan 2013-2023* (D52) which identified areas where trees would require replacement in the next ten years, including St Kilda Road. Notably, Map 1 of the same document identified St Kilda Road as an area where “*timing (is) not determined by Precinct Plan.*” The City of Melbourne stated it had plans to progressively roll out a tree replacement program for the aging elm trees along the full length of St Kilda Road. Elms will be replaced with elms as per established policy and this could be integrated with tree replacement for the Project.

Mr Patrick gave evidence that:

*There are potential benefits from components of the proposed works, in that it will achieve the introduction of a new generation of planting into two of Melbourne’s most iconic heritage locations, being Royal Parade, Parkville and the St Kilda Boulevard. In both locations, the Project offers the opportunity for a phased replacement of trees in a way that will carry these plantings and their Heritage significance forward into the next century. It is my opinion that the proposed works should form the first stage of a broader review applied to these Heritage sites including the preparation of a Heritage Master Plan for each site, allowing for on-going phased replacement to sustain their heritage significance into the future.*

However, the City of Port Phillip submitted “*there are no benefits from an arboricultural perspective, and the duration of impact has been estimated in the vicinity of 20-30 years*”.

Many submitters (S59, S68, S81, S89, S365 and others) expressed concern about extensive tree removal on St Kilda Road and sought minimisation of losses. Submissions were made by residents (including D171, D188, D189, D190 and D191) detailing the impact on the aesthetic qualities of St Kilda Road and its iconic status as “*Melbourne’s Grand Boulevard.*” The statement of significance for St Kilda Road states it “*is of aesthetic significance as an iconic boulevard which has been recognised as a place of beauty and a visually outstanding element in Melbourne’s urban landscape*”.

Mr Patrick emphasised that the tree losses currently documented represented a ‘worst-case’ scenario, and in response to submissions, stated that:

*St Kilda Road tree losses to a great degree pre-empt City of Melbourne replacement, losses are to be minimised and a new masterplan for St Kilda Road will ensure planting conforms with the expectations of Heritage Victoria, City of Port Phillip and City of Melbourne policies (See EPRs AR1, AR2, CH20).*

Mr Patrick responded to suggestions made by submitters (S17, S190, S268 and others) to transplant and re-plant the trees by explaining that such techniques have a relatively low success rate. His view was that it was an expensive practice and preferable to plant young, vigorous trees with a secure future contribution.

The National Trust stated that it would expect that “*any tree removal in this location would be demonstrated to be completely unavoidable.*” It considered it was essential “*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”.*

For all tree removals, MMRA considered that EPR AR1 was important as it required potential tree impacts to be reviewed at the detailed design stage to ensure maximum tree retention. The MMRA argued that the EES was an assessment of the worst-case scenario.

There was agreement between the arboricultural experts that block planting was the best method of tree replacement for avenues. The National Trust provided the Committee with the example of Finlay Avenue elms in Camperdown (VHR H0647) where *“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”.*

In closing, the MMRA stated that EPR AR3, CH1 and CH20 would mitigate the cultural heritage impacts associated with tree removal from St Kilda Road.

The City of Melbourne supported the option for access to Edmund Herring Oval via Dallas Brooks Drive to allow the retention of two mature elms and it sought a specific EPR for this purpose. It noted that there would be no need for a haul road to go through retained elms, further reducing the potential impact to mature trees partly on the Shrine Reserve.

### **(iii) Alternative proposals**

Many submissions raised the prospect of an alternative station location on the western edge of the Shrine Reserve (S349, S343, S276, S265, S202 and D188, D189, D190) or an alternative construction technique to allow for a deeper station. The MMRA responded that changing the construction methodology would still not make it possible to eliminate surface impacts and would increase the length of time for disruption. It noted that St Kilda Road would need to be reconfigured regardless of the construction approach adopted because of the relocated and longer Domain tram stop, vertical transportation to the station, and the provision of above ground infrastructure supporting the station.

MMRA stated in closing that the prospect of locating the station within the Shrine Reserve was considered and ultimately dismissed in developing the Concept Design:

- *It was dismissed principally on the basis that this configuration would encroach upon the Shrine Reserve, which is listed on the Victorian Heritage Register ...*
- *Relocating the station in the manner suggested by the submitters would have significant impacts upon the cultural heritage significance of the Shrine and its environs by increasing the extent of built form incursion within the Shrine Reserve and by requiring the removal of a greater number of trees within the Reserve ...*
- *The Shrine of Remembrance Trustees have advised MMRA that they are opposed to any proposal to relocate the station to within the Shrine Reserve for these reasons. EPR CH18, which requires that the siting and design of the Domain Station entrance be as ‘recessive as possible,’ is directed toward minimising the impact of Melbourne Metro on the cultural heritage significance of the Shrine. The position advanced by the submitters is entirely inconsistent with this outcome....*

MMRA tabled an email from the Shrine CEO (D361) which stated *“whilst the views of Trustees are unknown at this time, it is reasonable to anticipate they would not be favourable”*.

#### **11.8.4 Discussion**

##### **(i) Station entrances**

The South African Soldiers’ Memorial CMP provides excellent guidance, particularly in establishing a hierarchy of significant features, including trees, and providing policies to protect them. The Committee supports views expressed in the CMP that the best outcome is for the Memorial to be returned as the focus of the Albert Reserve with an appropriate setting. The Committee agrees with the findings of the CMP that the triangular form of the Reserve should be preserved and remain visibly legible. If additional space is required to accommodate the station entrance, this should be understood as another layer or occupy peripheral space. While the Committee understands that the City of Port Phillip is considering enlarging the Reserve, and the HHIA suggests this may help the setting of the Memorial, this must be done without the loss of understanding of the historic extent of the Reserve. The Committee finds that the heart of the Albert Reserve should be the South African Soldiers’ Memorial with priority given to the heritage attributes.

The Committee is sympathetic to the position of the National Boer War Memorial Association that the Albert Reserve is no longer appropriate for commemorative ceremonies. This problem, as the Association pointed out, predates the Project. However, the Committee believes that relocation would detract from the cultural significance of the heritage place as the monument was designed for the Reserve, and the Reserve contains a collection of heritage items, including the associated Windsor Oak. It may be that the South African Soldiers’ Memorial is suited to smaller scale contemplative activities but larger ceremonies, which have gained in popularity, may need to be coordinated with the Shrine or the Domain Boer War Memorial. Relocation of the memorial to accommodate the Domain Station entrance is not a desirable outcome and should be viewed as a last resort.

##### **(ii) Tree removal**

The Committee is concerned about how the Domain station could be achieved whilst managing significant heritage impacts in St Kilda Road. It agrees with Mr Lovell’s assessment that the key issues are how the traditional boulevard layout and avenue could be reinstated, given the physical and visual impacts of new above ground structures and changes to the functional layout.

The Committee sought advice from the MMRA *“how it is proposed to reinstate tree cover including to reinstate the characteristic boulevard appearance of St Kilda Road created by four rows of trees in the vicinity.”* In response TN65 stated:

*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.*

How this will be achieved remains an issue. In comparison, the Committee highlights consideration of how Precinct 6 could be connected to Flinders Street Station which was

explored in some depth in the HHIA. Although it will require a permit under the *Heritage Act 1995*, the Committee accepts that it is likely to be achieved satisfactorily.

The Committee is concerned about the approach of justifying the tree removal and replanting in terms of all trees along St Kilda Road needing replacement within 10 years and block planting being the preferred method. While this may be true, without the Project, the Committee heard evidence that the avenue trees would be replaced progressively by the City of Melbourne. TN40 showed that many trees did not need replacing in the next 10 years. The Committee believes that the extent of loss of avenue trees proposed by the Project exceeds the planned replacement program.

### **(iii) Alternative proposals**

The Committee does not have sufficient information to allow it to assess the alternative proposals for a different construction technique or for relocating the Domain Station box to the edge of the Shrine Reserve.

MMRA stated it had considered the Shrine Reserve location for the station footprint and rejected it on heritage grounds. The Committee agrees that relocation as proposed by submitters would mean further encroachment on the VHR-listed place, result in the removal of a greater number of trees in the Shrine Reserve and not meet the current EPR CH18. However, the Committee was provided with no indication of the scale of these impacts in comparison to the Concept Design. It is not known if the heritage impacts would be greater than that already contemplated for the Albert Reserve and St Kilda Road (both on the VHR) or how it compared to the over CityLink tunnel proposal which was abandoned part way through the Hearing (TN65).

### **11.8.5 Findings**

The Committee finds that proposals for new entries to Precinct 7 at the edge of the Shrine Reserve and at the South African Soldiers' Memorial on the triangular Albert Reserve will be determined in accordance with the *Heritage Act 1995*. The Committee considers that EPR (with recommended amendments) are appropriate to avoid, manage or mitigate impacts of the Project for these places. Both sites will rely on the minimising of the construction footprint, retention of significant fabric and reconstruction of the heritage place and its setting to a high standard to retain heritage values.

The Committee is not satisfied that Precinct 7 could be constructed in the manner the EES indicated whilst managing significant heritage impacts in St Kilda Road. It finds that there are outstanding issues how the traditional boulevard layout and avenue could be reinstated, given the physical and visual impacts of new above ground structures and changes to the functional layout. It agrees with TN65 that input from Heritage Victoria, Councils, VicRoads, Yarra Trams and PTV will be required. It considers that these issues should be addressed with all relevant parties in the HIS process, and this is addressed in the revision to EPR CH20.

The relevant EPR have been amended accordingly, as provided in Appendix F.

## **11.9 Precinct 8 – Eastern portal**

The Committee considers the key issue relates to works within the Toorak Road (west of William and Claremont Streets) Precinct (HO150). The HHIA highlighted that most works occurred in the rail reserve south of Toorak Road. While significant, it found that there

would be little or no adverse impact on the heritage values of the HO precinct. The historical association between the railway and Toorak Road would be undiminished. The HHIA found that, while features like the rail lines, the Toorak Road Bridge and Lovers Walk were long standing, their fabric had not been identified as significant. The William Street Bridge incorporates earlier fabric, but was not considered to be significant.

The Committee agrees with the HHIA assessment, and finds that there would be little or no heritage impacts in Precinct 8 from the Project.

### **11.10 Precinct 9 – Western turnback**

The Committee considers the key issue relates to the retention of the Cross Street Electrical Substation (HO192).

The HHIA noted that the establishment of the construction site for the western turnback included the site of the Substation, a place of local heritage significance in the Maribyrnong Planning Scheme. It recommended that the building be retained and protected during works. The National Trust supported the HHIA recommendation.

The Committee agrees with the HHIA assessment and finds that the Cross Street Electrical Substation should be retained and protected during works.

### **11.11 Aboriginal heritage**

#### **11.11.1 Key issues**

The Committee considers the key issue in relation to Aboriginal cultural heritage is potential impacts to known and previously unknown sites of significance.

#### **11.11.2 What did the EES say?**

Technical Appendix K stated that:

*For the construction of stations, portals and other structures near the ground surface, as well as disturbance within construction work areas, the potential to destroy, reduce or intrude upon Aboriginal heritage is largely unknown.*

In relation to specific precincts the EES stated “works would have the potential to adversely impact on the unknown Aboriginal cultural heritage values”. Further, in relation to Precinct 8, the EES stated that:

*The following works would have the potential to adversely impact on one previously unknown Aboriginal Place within this precinct during the construction phase of Melbourne Metro:*

*Construction work site at South Yarra Siding Reserve.*

In relation to design or other available measures to mitigate potential effects, the EES relied on the CHMP as follows:

*The CHMP would identify any Aboriginal cultural heritage values within the activity area so that recommendations for the minimisation of impacts to these can be provided ... The Conservation Management Plan*

*would also provide contingency plans for the discovery of Aboriginal cultural heritage material during investigation and construction works.*

Overall, the EES determined that the Project would meet the evaluation objective and have limited impact on Aboriginal cultural heritage. This is due to:

- the significant ground disturbance which has occurred in the proposed construction areas
- the majority of the works being below depths with potential for archaeological deposits containing Aboriginal cultural material
- the CHMP will assist in identifying the potential nature and extent of any unknown Aboriginal cultural heritage and contain contingency plans if any material is discovered during construction.

### **11.11.3 Evidence and submissions**

The Committee requested further information on how the draft evaluation objective would be met if the impacts to Aboriginal cultural heritage are largely unknown (D2). In response, the MMRA submitted TN34 (D21), which stated that whilst impacts were *“largely unknown due to the inability for test excavation to take place ... the likelihood is generally considered low across the Project due to the legacy of extensive urban development”*. The Technical Note elaborated on recommendations and contingencies provided in the draft CHMP, which included:

- an unexpected finds policy
- salvage works or excavation to be completed at sites where ground surface impacts may occur to newly identified places
- process of identification of Aboriginal cultural material during historical or archaeological excavations as there is likely to be overlap in the areas where cultural heritage is found.

The Technical Note outlined the approval process of the CHMP requiring sign off from the Secretary to the Department of Premier and Cabinet under the *Aboriginal Heritage Act 2006* as there is no RAP identified under the Act.

In its closing submissions, the MMRA reiterated the requirement for an approved CHMP prior to construction commencing and the separate nature of the approvals process for the CHMP. It indicated the CHMP is proposed *“for submission to the Secretary to the Department of Premier and Cabinet in late 2016 to early 2017”*.

In MMRA’s submission, *“compliance with the approved CHMP will be a requirement of the EPR”* which *“will ensure that adverse effects on Aboriginal cultural heritage will be avoided, and if not avoided, minimised and appropriately managed during construction of the Project.”*

Councils did not raise Aboriginal cultural heritage as an issue.

The submission from Spacerepublica (S225) raised concerns that the Project does not comply with the *Traditional Owner Settlement Act 2010* and the *Charter of Human Rights and Responsibilities Act 2006* as the Project has not promoted reconciliation. Spacerepublica submitted that one of the new metro stations be *“allocated exclusively to the Traditional Owners”* (D229) and recommended a memorandum of agreement to this effect.

#### **11.11.4 Discussion**

Native title in Victoria is dealt with under the *Traditional Owner Settlement Agreement Act 2010*. This Act provides for out-of-court settlement of native title and allows the State Government to recognise traditional owner groups and their rights over Crown land. Settlement packages can include a range of aspects under the Act including funding agreements to undertake economic development activities and land agreements which provide for grant of land in freehold title.

The Committee understands there is currently no such agreement affecting the Project area. Such an agreement would formalise who the Traditional owners for the land would be, and how they should be involved in decision-making affecting such land.

The *Aboriginal Heritage Act 2006* deals with the protection of Aboriginal cultural heritage. RAP have responsibilities under the *Aboriginal Heritage Act 2006* with respect to the management and protection of cultural heritage. There are currently no designated RAP for the Project area and therefore, the MMRA consulted with a number of groups as outlined in Technical Appendix K. Final sign off will be provided by the Secretary of the Department of Premier and Cabinet in accordance with the Act.

In the absence of a formal Traditional Owners Settlement Agreement and RAP(s) for the Project area, it would be difficult for the MMRA to enter into an agreement as envisaged by Spacerepublica. Further, it is inappropriate for such an agreement to attempt to usurp the legislative frameworks set out in the relevant Acts. Whilst the MMRA should be encouraged to continue consulting with relevant stakeholders, including Traditional owners, the type of agreement proposed is impractical.

In relation to the potential for significant effects to Aboriginal cultural heritage, the Committee accepts that due to the urban nature of the Project area, the likelihood of identifying Aboriginal cultural heritage material is low. The Committee further accepts that the Project cannot proceed without an approved CHMP and that approval of the CHMP is a process which may be undertaken after the Minister for Planning's Assessment under the EE Act. The Environment Effects Advisory Note *Aboriginal cultural heritage and the environment effects process* (August 2007) sets this process out as "pathway 2".

#### **11.11.5 Findings**

The Committee finds that once a CHMP has been finalised and approved, any potential effects to Aboriginal cultural heritage will be acceptable.

## 12 Urban design, landscape and visual

Urban design, landscape and visual impacts are addressed in Chapter 16 of the EES, and in Technical Appendices L and M.

The draft evaluation objective of the Scoping Requirements in relation to urban design at 4.3 is:

*To protect and enhance the character, form and function of the public realm and buildings within and adjacent to the Project alignment, and particularly in the vicinity of Project surface structures, having regard to the existing and evolving urban context.*

and at 4.9 is:

*To avoid or minimise adverse effects on landscape, visual amenity and recreational values as far as practicable.*

The following evidence was called in relation to urban design, landscape and visual issues:

- MMRA - Ronald Jones of Jones and Whitehead Pty Ltd
- City of Stonnington - Steven Schutt of Hansen
- City of Melbourne - Rob Moore of Council
- University of Melbourne - Rob McGauran of MGS Architects
- the Graduate Union - Eli Giannini of MGS Architects

A conclave of experts on urban design was held on 22 August 2016. All experts, aside from Ms Giannini for the Graduate Union attended.

Numerous submissions referred to a range of landscape and visual impacts.

EPR LV number 1 to 3 specifically dealt with matters relating to urban design. New LV4 dealt with reusing and recycling resources used as temporary and transitional installations.

### 12.1 Project wide issues

The Committee considers the key issues relate to:

- design oversight and review
- degree of certainty and prescription offered by the UDS
- management of change
- optimising the transformational potential of the Project.

#### 12.1.1 What did the EES say?

The UDS (EES Technical Appendix M) articulated a vision to create “A legacy of outstanding rail stations and associated public spaces that put people first, contribute to Melbourne’s reputation for design excellence, and deliver an overall substantial benefit in terms of urban quality for Melbourne, for the transport network, and for local areas influenced by the project”.

The UDS focused on the design of public streets and spaces at ground level and the relationships of infrastructure and other development with those spaces. It outlined a process for design and implementation of the Project that will undergo expert peer review



during development and finalisation. It set out what the design should achieve in terms of performance standards, but it did not specify design solutions.

Section 1.1.2 of the EES articulated the benefits of the Project, and acknowledged that significant disruption will be unavoidable. Section 16.1 of the EES acknowledged that there would be adverse impacts on many high profile and valued locations along the route of the Project. In particular, the loss of City Square and *“potentially moderate to high visual impacts for recreational users of a number of open spaces and civic spaces during construction, including JJ Holland Park, University Square, Queen Victoria Gardens, Domain Parklands (western edge) and Fawkner Park”*. Section 7.5 of Technical Appendix R acknowledged it could take 20 to 30 years following planting to establish a high quality semi-mature canopy to replace lost trees.

Section 1.1.2 of the UDS recognised that *“in transforming the rail network, Melbourne Metro will also transform Melbourne more widely by altering travel patterns and affecting how people use and perceive the city over time”*. It further stated that:

*... across this spectrum ranging from major interventions to subtle insertions, the Project must deliver overall substantial benefits in terms of urban quality for Melbourne, for the transport network, and for local areas influenced by Melbourne Metro.*

Section 1.2 of the UDS sought to ensure that the Project’s landscape and visual impacts realised opportunities to maximise its positive contribution to Melbourne and the city’s reputation for design excellence. Section 1.4 of the UDS established the importance of an inclusive design process, quoting the noted urban planning theorist Jane Jacobs that *“cities have the capability of providing something for everybody, only because, and only when, they are created by everybody”*.

The UDS did not address temporary works and transitional measures, other than in Section 3.5.

### **12.1.2 Evidence and submissions**

Many witnesses and submitters acknowledged the potential of the Project to transform the city. Mr McGauran gave evidence that *“This metro has the potential to brand Melbourne”* and submitter S281 noted the Project was a *“historic opportunity”*. Several witnesses, including Mr Moore and Mr McGauran, supported the level of design expectations articulated in the UDS, but were concerned that the EES did not provide adequate certainty that the stated standard of design would be realised.

Others emphasised the importance of ensuring the MMRA was not *“judge and jury”* on the evaluation of the urban design values of the plans. Mr Moore noted that *“an independent review process was absolutely critical”*. These views were echoed in the urban design conclave (D26) which stated an independent reviewer should *“Review recommendations from (a) Urban Design Reference Group and (b) Victorian Design Review Panel and advise and ensure the PPP contractor has adequately and appropriately responded to recommendations of these two groups”*.

The conclave noted that the process should accommodate and respond *“to future stakeholder inputs into the resolution of designs for areas affected by the Project”*. In its response to section 2 of the conclave report (TN57) the MMRA stated:

*An expert panel for architectural and urban design will also be established, alongside legal, commercial and technical to assist in this process and the Urban Design Strategy will be an important document in this assessment.*

Various submitters (S255, S294 and S364) stressed the importance of a collaborative urban design process to assist in achieving high quality design.

Mr Jones gave evidence that the conclave agreed about the aims and objectives of the study, the refinements to the UDS and EPR and the importance of getting the process right. However, he accepted that there was disagreement about the scope and level of prescription the strategy should embody. He agreed it would be more appropriate if the guidelines stated that they “*must achieve*” rather than they “*should achieve*”. He noted that if the UDS had a higher level of prescription, it would increase confidence and enforceability, but it would be less flexible. Mr Schutt expressed the view that drawings and other representations would assist the UDS to show how urban design principles may be applied to a site.

AILA (S255) recommended that the Landscape and Visual EPR be revisited and strengthened with more detailed and defined measures to provide more certainty that the high standard of design expressed in the UDS would be realised. With regard to managing change, there was concern that disruption due to construction, loss of open space, loss of trees, the erosion of other valued qualities and the long duration of the construction stage may adversely affect the city’s valued liveability.

Mr Moore emphasised the importance of liveability. Several submitters (S250, S183 and others) raised concerns that the construction of the Project will detract from the city’s liveability, will erode the sense of identity of the city, and “*put the city on hold*”

Mr Jones recognised the community might feel a degree of “*shock value*” brought about by the cumulative effect of such a significant level of disruption at high profile and valued locations. Under cross-examination, he agreed that this issue had not been considered in the UDS. A number of submissions (S142, S196, S226, S309, S330, S352 and others) noted that the construction impacts of the Project would be distressing.

Mr Jones and Mr Moore alluded to the potential of high quality temporary interventions and programmed events to mitigate against the detrimental impacts of the construction. Some submitters stressed the importance of temporary features being of a high standard of design (S183, S274, S255) and others raised concerns about the potential of poorly designed temporary features to further erode liveability (S231, S244, S264, S274, S310).

Several submitters raised concerns about the impact of construction of the Project on the city’s tree-scape (S172, S254, S333 and others). Submission S226 noted that trees were a “*symbol of continuity*” and a “*signature feature*” of the city.

Mr McGauran noted the potential of the spaces and the activities around them to become “*collaborative places to wait and interact with other people*”. He invited the Committee to consider placemaking in the design and management of open space. Mr Moore invited the Committee “*not to forget delight*” in outlining what may be achieved with this Project and to avoid “*plonk art*” which he defined “*as irrelevant and unrelated pieces of art that could be anywhere*”.

AILA submitted that the Project represents an unparalleled opportunity to create a “*landscape of liveability*” and ensure Melbourne’s future liveability derives from green infrastructure to a greater degree and on grey (mechanical) infrastructure to a lesser degree. It stated that the Project provided an opportunity to think holistically about design and blur the lines between landscape architecture, urban design and architecture.

Submissions S235, S236, S281 raised the opportunity to address the lack of green space and play opportunities in the city. Submitter S281 spoke of the potential of good planning and urban design to support public health.

TN73 noted that EPR LU4 requires the Project to meet the MMRA’s Creative Strategy, which states “*In order for the city-shaping benefits of the Melbourne Metro Project to be fully realised, infrastructure and public places need to be designed with a focus on the end user and how these spaces will support civic life*”. The Creative Strategy seeks to:

- a. *Retain and promote Melbourne’s reputation as a vibrant, creative, smart city during the construction phase;*
- b. *Engage with and respond to local practitioners and communities to facilitate creative opportunities during the construction phase;*
- c. *Enhance customer experience by engaging the public; and*
- d. *Deliver design excellence that reflects the unique character of Melbourne.*

Several submitters sought to be consulted on the design process. These included RMIT, the Graduate Union, the MATC and Federation Square. The Royal Botanic Gardens Victoria (S254) sought to be consulted on the final design of the stations and surrounds. The Residents of Albert Tower requested a “*thorough consultation and review process*” of the final design.

### **12.1.3 Discussion**

The Committee supports the inclusive tone of the UDS and considers that it is important to ensure the design process is accessible and transparent to stakeholders and the wider community, and is sensitive to diverse needs and perspectives about what represents good design. The Committee notes that application and interpretation of the controls requires balancing and reconciling many competing design considerations to achieve optimal outcomes. The Committee concurs with the view expressed in the urban design conclave “*that the process for managing the procurement of designs is as important as documented design guidelines*”.

The Committee commends the MMRA for responding to concerns raised in the conclave and in submissions, and committing to establishing an expert panel for urban design and architectural matters, and for recognising that “*the oversight of the Office of the Victorian Government Architect (OVGA) is important*”. The Committee notes that the audit process outlined in TN57 stresses the importance of the UDS, but the EPR make no mention of the oversight to be provided by the OVGA. However, the OVGA must be called upon to review the draft Development Plans under the Incorporated Document at 5.1.4

The UDS acknowledged that the challenge is not just to realise a good Project but to do so in a way that realises the potential to improve the city more broadly. The scale and character of this Project will fundamentally change many people’s experience of the city and add to

the iconic images that will define Melbourne. The Committee further notes the design of the stations and surrounding open spaces can help to reconcile the diverse needs of the community to look upon open space as places to meet, enhance the perceived appeal and importance of active and public transport, and play an important role in setting the standard for design elsewhere in the City.

The Committee considers that community consultation in the design process is an imperative of good design. The Committee supports the commitments made by MMRA to design *“public spaces that put people first”* and to deliver design excellence. It further observes the ambition of the UDS to *“to contribute to Melbourne’s reputation for design excellence in the public realm, not only at special sites but in everyday spaces too”*. The Committee consider that this commitment should extend to temporary, as well as permanent interventions.

The Committee notes that hoardings and acoustic sheds will be a significant feature in Melbourne for the duration of the Project. Section 16.7.1 of the EES flags the importance of aesthetically designed hoardings and other measures to mitigate the detrimental impacts of the construction of the Project. Section 3.5 of the UDS requires *“an attractive presentation to surrounding areas”* is maintained and incorporates a guideline to *“Design all enclosures, hoardings, screens and other temporary features to create a positive visual presentation to prominent sites, busy pedestrian areas and key tourism precincts”*. The Committee observes TN73 recognises the potential of these features to provide an outlet and medium for creativity and provides the potential for community upskilling, and empowerment.

#### **12.1.4 Findings**

The Committee finds that elaborating the responsibilities of the independent reviewer would ensure a more thorough exploration of the design potential of the Project and engender more confidence in the design process. The Committee finds that the review process to be managed by the OVGAs should be given further authority to test emerging proposals from the PPP contractor. Assessment of design proposals should include placemaking to ensure programmatic opportunities are incorporated.

The Committee concurs that a consistent, independent and multi-disciplinary approach to assessing the proposals in all precincts can ensure a high standard of design across all aspects of the Project.

The Committee recognises the work of the MMRA to ensure a high standard of landscape and urban design will be met by the Project. It commends the responsiveness shown by the MMRA in accepting many of the proposals arising from the urban design conclave. The Committee notes the high level of support given to the UDS by the expert witnesses. It further understands the importance of leaving a high degree of flexibility for the contractor to decide how they are to meet these expectations. The Committee acknowledges the uncertainty expressed by some submitters about the final designs. The flexibility of process and an absence of drawings or plans is difficult for some to comprehend.

The Committee believes that it is important that the community be kept informed of the design process, contribute to the setting of the brief for the detailed design of the spaces and places associated with the Project, and participate in the design development of these places. There is no doubt that the lack of certainty about what will get built, both

permanent and temporary structures, has contributed to (and will continue to contribute to) people's anxieties regarding impacts. The UDS should address the process by which the community will be engaged. In addition, the Committee considers that the ongoing engagement strategy for the Project will need to demonstrate that it represents an evolution and enhancement of the city's image and identity. This requires that from the earliest stages of the process, the changes that people see in valued shared spaces will be of the highest standard of design sensitivity and impacts explained carefully.

The Committee considers that the role of public art is important in the design of permanent infrastructure and should be considered early in the design process.

The Committee acknowledges the responsiveness of the MMRA to community concerns about the impact of the Project on the city's liveability. The temporary treatments to screen the construction activity or activate stubs of adjoining open spaces can have significant impacts on the perceived character of valued and high profile locations, and may have a legacy impact on the image and identity of the city. Consequently, the Committee finds that the UDS should place a greater emphasis on the role of transitional and temporary measures to ensure the affected sites and areas can continue to contribute positively to quality of life experiences and opportunities the city offers, even if they may be altered from previous conditions. The Committee considers that these temporary and transitional measures represent a considerable commitment of resources and may create assets that can be re-used. The new EPR LV4 is recommended to develop and implement a plan to consider the re-use of temporary landscape and other features.

The Committee considers that the Project can offer the wider community a diverse range of opportunities to participate in designing, constructing, maintaining and replacing temporary features. The Committee notes the commitment to a Creative Strategy to achieve this outcome (TN73).

The Committee concurs with evidence from the MMRA, several witnesses and submitters that it is a "*city shaping Project*" that offers many benefits and opportunities to enhance quality of life. These opportunities may make it possible to address a wide range of structural and detailed issues in the city while safeguarding and enhancing existing valued qualities. The Committee acknowledges the UDS compiles and reconciles a wide range of other objectives.

The Committee considers that the design of the stations and surrounding open spaces will play an important role in setting the standard for design elsewhere in the city. It agrees with AILA's contention that the Project represents an unparalleled opportunity to enhance the contribution that green infrastructure makes to supporting Melbourne's future liveability. The Committee recommends that the UDS emphasise the contribution and importance of green infrastructure in supporting liveability.

The Committee makes a number of modifications to the UDS and EPR to support its findings.

## **12.2 Precinct 2 – Western portal**

The Committee considers that key issues relate to:

- relative impacts of the two portal options
- impacts on the recreation and landscape values of JJ Holland Reserve

- legibility and sense of safety at South Kensington station during the construction phase.

### **12.2.1 What did the EES say?**

The EES outlines two options for the location of Precinct 2, Option A and B. Technical Appendix M stated that in either option, the Project works will be integrated with improvements to the entry to South Kensington station and surrounds to enhance access and amenity. Key guidelines include:

- contribute to visibility of the station entry, without dominating views from JJ Holland Park or visually overwhelming the scale of nearby houses
- avoid creating encumbrances upon future medium-density residential infill development of remnants of the acquired properties at the northwest of the Childers Street/Tennyson Street intersection
- provide a forecourt to the station entry incorporating seating, lighting, bicycle parking, and car parking for JJ Holland Park users.

The EES identified that construction of the Project will affect the landscape values of JJ Holland Reserve, although it would not affect the park directly. Approximately 50 trees and one row of large callistemon shrubs would need to be removed in this precinct, mainly along the south side of Childers Street and at the south east end of Ormond Street.

### **12.2.2 Evidence and submissions**

The evidence of the City of Melbourne, the urban design conclave findings, and many local submitters expressed a strong preference for Option B.

Submitters were concerned with the difficulty that the Concept Design would cause for access to South Kensington Station and/or for movement around the area generally. Others expressed concerns about the impacts on the use and enjoyment of JJ Holland Park.

### **12.2.3 Discussion**

The nine dwellings on Childers Street that would be removed under Option A overlook the entrance and approaches to South Kensington Station. They offer a degree of passive surveillance in an area where it is otherwise limited. The demolition of these homes will erode the attractive and valued character of the local neighbourhood. The Committee notes the EES is silent on the legacy condition of the lots to be demolished to facilitate Option A.

The Committee observes that the single land lot to be demolished in Option B is located opposite the entrance to South Kensington Station and is indicated in the EES as a future development site. The Committee notes the location of the lot, its size and shape create significant potential for a design response that provides a landmark that enhances the sense of arrival and contributes to passive surveillance of the station entrance.

The Committee considers that varying the alignment of the new road to be created in Option B could facilitate the provision of a forecourt.

### **12.2.4 Findings**

From a visual and landscape perspective, the Committee supports Option B as it represents improved outcomes for Childers Street. Option B minimises disruption and intrusion,

ensures that passive surveillance of the entry to South Kensington station will be maintained and a sense of arrival enhanced with the redevelopment of the lot adjacent to the station.

### **12.3 Precinct 3 – Arden Station**

The Committee consider that key issues relate to:

- the impact of flood protection measures on the accessibility, visual amenity and useability of the area adjoining the station access point
- the location and treatment of the substation.

#### **12.3.1 What did the EES say?**

The UDS suggested that Precinct 3 should provide a catalyst for development of the area, and an objective of the station design is to facilitate significant urban renewal in the Arden Precinct. It stated that the design needs to consider the flood-prone nature of the VicTrack land and surrounding areas, taking note of the existing Land Subject to Inundation Overlay (LSIO), overland flood paths, and predicted future increases in flood levels and frequencies due to climate change.

Chapter 16, Section 10.1 stated that approximately 120 trees would require removal from the publicly owned (VicTrack) land on the west side of Laurens Street. The key views of the area that will be affected will be the elevated section of Queensberry Street near Dryburgh Street. It further stated that most of these trees are environmental weeds.

The Concept Design identified three possible sites for an electricity substation.

#### **12.3.2 Evidence and submissions**

TN67 stated that Precinct 3 will be protected from fluvial flooding by the construction of a levee through which access can be gained through floodgates, but is silent on the design and location of these floodgates in relation to the station entrance. The MMRA closing submission stated that an excellent urban design outcome would arise from the combined effect of consultation with relevant agencies and the implementation of the EPR and UDS.

TN70 considered the advantages and disadvantages of the three options for the location of the substation, favouring Option 1 (north of Arden Street). Mr Moore gave evidence that this was his least favoured location, citing its long interface with Langford Street as a particular concern.

#### **12.3.3 Discussion**

The Committee considers that the design and location of floodgates and levee walls will require careful attention in order to reconcile flood protection roles with the aspiration stated in 4.3b of the UDS *“to ensure presence, ease of access, legibility and connectivity”* to the station. EPR LU2 requires *“a plan for the design and construction of Arden station to be developed and implemented that adopts an integrated approach to urban design and planning. The design must include integrated water sensitive urban design and management of the extent of flooding across the site”*.

Integrating the substation at Langford Street (the MMRA’s preferred location) into the streetscape presents particular challenges, given the area required for the substation will be in the order of 2,000 square metres. The Committee recognises that detailed design of the

substation may minimise its impact on Langford Street as indicated in TN70, but note this is not reflected in the EPR.

#### **12.3.4 Findings**

The Committee accepts the position of the MMRA that the requirements of good urban design and flood protection can be found by a combination of consulting with relevant agencies and considering the relevant EPR and strategies.

The Committee accepts that the loss of tree canopy in Precinct 3 would affect visual amenity. However, the amended EPR as recommended will ensure that the loss of canopy will be minimised and a new landscape, better suited to the emerging precinct can take its place in as short a time as possible.

The Committee accepts the MMRA contention that the detailed design of the substation may minimise its impact on Langford Street, and recognises that the recently announced Arden Precinct Structure Plan process should address this issue.

### **12.4 Precinct 4 – Parkville Station**

The Committee consider that key issues relate to:

- relationship of the station entrance to the University of Melbourne campus
- location of the station entrances in relation to Grattan Street and Royal Parade
- location, design and arrangement of above ground infrastructure and its impact on the streetscape
- future role of Grattan Street
- loss of trees and construction effects on trees in Grattan Street and Royal Parade.

#### **12.4.1 What did the EES say?**

Section 16.11.1 of the EES stated that there would be a high residual impact on trees in this Precinct because of construction activities. Section 4.4.2 of the UDS includes objectives to ensure the new station provides a catalyst for the new civic heart for City North, the University of Melbourne and biomedical precinct, and enhance Grattan Street as a public transport, pedestrian and cycling corridor.

The UDS further stated that two entries to the station will be located on university grounds. One is proposed at the northeast corner of Royal Parade and Grattan Street and adjoining the Tri-radiate and Howard Florey medical buildings. The other is near Grattan Street opposite Barry Street, between the Gatekeeper’s Cottage and the Tri-radiate building, in an area presently highly landscaped.

The EES indicated significant traffic calming on Grattan Street, which will reduce to one trafficable lane in each direction, with the majority of the increased footpath width located on the south of Grattan Street. Section 4.4.3 of the UDS stated an objective of the urban design works is to *“maximise the southern footpath width to create space for the station infrastructure and to make more generous provision for pedestrian movement”*. Section 4.4.4 of the UDS stated an objective of the design works in the precinct *“is to preserve and support options to improve University Square as per the City of Melbourne’s current plans”*.



### 12.4.2 Evidence and submissions

Mr McGauran gave evidence that *“The Royal Parade and Grattan Street corridors have long been known for their distinctive avenue characteristics and in particular to the University interface in Grattan Street and Royal Parade”*. In relation to the entrance to the eastern station on Grattan Street, Mr McGauran argued that it should be located south of Grattan Street in University Square, where it may better serve the expected development in that area. In his words, it *“should not have a sense of a northern bias”*. However, Mr Moore said in cross-examination that in the future, a station entrance in University Square may become more appropriate, but as it stands, one at the north of Grattan Street was more appropriate.

In relation to integration of the different parts of the area, Mr McGauran recommended:

*A key element of the plan should be the decommissioning of Grattan Street for all but local traffic with potentially that some areas particularly those along the central University Square and south entry spine, should be entirely dedicated to Public transport and Active transport networks and modes.*

Mr McGauran highlighted the Parkville Masterplan, which incorporates a *“principle to strengthen the landscape connection between the centre precinct, university square, Lincoln Square and surrounding urban areas”*. Plans at Sections 5 and 5.9 of the masterplan indicate an *“Open Space Corridor”* that links the different parts of the University of Melbourne across Grattan Street. Section 4.4.2e of the UDS stated a design guideline on Grattan Street is to *“Minimise the carriageway width while providing for local vehicular traffic and appropriate kerbside space for bus stops, loading, taxis, and emergency vehicles including ambulances”*.

In relation to station infrastructure, Mr McGauran expressed the view that the separated entry, vent and plant room indicated on the Concept Design potentially compromised wayfinding and the capacity to undertake placemaking. He suggested that grouping these structures would overcome such problems.

Ms Giannini stated her concern that station infrastructure in this area may adversely affect the proposed existing and future plans for redevelopment of the Graduate Union buildings.

Submission S364 raised concerns about the loss of open space at University Square, while S128 expressed concerns about the loss of trees on Royal Parade.

### 12.4.3 Discussion

The Concept Design indicated both of the station entries to the east of Royal Parade would be located on the north side of Grattan Street. The eastern station entry opposite University Square maximises convenience for the northern section of the University of Melbourne, however, it would require the removal of significant and valued landscape. It may express a sense that it was a station for the University of Melbourne rather than the wider Precinct. Furthermore, the absence of a widened footpath near the station (as proposed to the south of Grattan Street) constrains the design opportunities to provide an appropriate presence to the station and minimise landscape impacts.

The Committee consider these issues may be more readily addressed if the entrance was located on the southern side of Grattan Street. Furthermore, a southern location provides a greater potential to co-locate the entrance with other infrastructure to create a co-ordinated landmark composition. However, the EES did not consider a station to the south

of Grattan Street and available information does not permit a definitive view to be formed about the relative merits of an entrance to the south or the north of Grattan Street. This position is consistent with the findings in Chapter 5 of this report.

The Committee notes that the extent to which Grattan Street is a barrier and divides the area is a function of its trafficked character. The envisaged traffic calming and narrowing will diminish this trafficked character, and the relative advantages and disadvantages of the entrance being north or south of it becomes less important. The Committee notes the rationale for widening the footpath on the southern side of Grattan Street but considers that the proposed station entrance north of Grattan Street will only intensify pedestrian movements on that side of the street. Furthermore, a widened footpath to the north provides greater opportunity to create an appropriate setting for the station entry that reconciles the diverse urban design aspirations.

The Committee notes that the location indicated on the Concept Plan for the station entrance north of Grattan Street is adjacent to the envisaged north-south open space corridor that will link the University of Melbourne across Grattan Street to University Square, as outlined in the Parkville Masterplan. EPR SC7 will require the contractor to consult and re-establish open space reserves to ensure they are designed in accordance with relevant masterplans.

#### **12.4.4 Findings**

The Committee finds that loss of tree canopy on Royal Parade, Grattan Street and to a lesser extent University Square would adversely affect visual amenity. However, the proposed amendments to the EPR (in particular CH12, CH17 and AR3) will ensure that the loss of canopy and landscape quality will be minimised and a new landscape, better suited to the emerging precinct can take its place in as short a time as possible.

If the station is to have an inclusive presence and impact, the proposed station entrance north of Grattan Street should be designed to unambiguously present primarily southwards to the street and not inwards to the University of Melbourne. As far as possible, this entrance should be located and designed to minimise impact on the landscape in the University of Melbourne grounds adjoining Grattan Street.

The traffic calming and narrowing of Grattan Street will diminish the extent to which it is a barrier. However, the Committee finds that the widened footpath should be located on the north side of Grattan Street to better facilitate the pedestrian volumes on that side of the road. A widening of the pedestrian crossing, landscape and signage improvements along the line of the north-south corridor are encouraged to enhance the pedestrian permeability of Grattan Street.

The Committee concurs with Mr McGauran's evidence that above ground infrastructure should be grouped and integrated in order to minimise intrusion into the streetscape.

The relevant EPR have been amended accordingly as provided in Appendix F.

#### **12.5 Precinct 5 – CBD North Station**

The Committee considers that key issues relate to:

- relationship of the station entrance to Franklin Street
- future role of Swanston Street and Council Lane

- streetscape impacts of above ground infrastructure.

### **12.5.1 What did the EES say?**

The EES located the entrances to the station on Franklin Street and La Trobe Street. Additional ventilation and maintenance access would be provided in A'Beckett Street between Stewart Street and Swanston Street.

Section 4.5 of the UDS recognised that development was occurring in an area of significant and rapid change. It stated *"The station entry at La Trobe and Swanston streets will be integrated into an over site development that supports the animation and amenity of adjoining street spaces, and that makes a positive civic architectural contribution to the precinct"*. For the Franklin Street entrance, objectives were to *"Improve Franklin Street as a pedestrian and cyclist link across the north side of the CBD and connect pedestrians from the station entry into local streets and to other transport services in Swanston Street"*.

The EES Map Book at Map 7 Concept Design Operation indicates the closure of east-west Council Lane CL0112.

### **12.5.2 Evidence and submissions**

Mr Moore gave evidence that *"The station entry on Franklin Street will need to be sensitively integrated into the overall vision for the street. Equally, above ground infrastructure in the form of escape stairs and ventilation shafts will need to be integrated into the design of the street"*. He spoke of the importance of lanes such as Council Lane CL0112 and their reliance on active frontages to be successful.

### **12.5.3 Discussion**

The Committee notes that the area proposed for the main entrance to the station on the corner of Latrobe and Swanston Streets experiences significant and growing pedestrian activity.

The Committee considers the loss of Council Lane CL0112 will reduce permeability, and result in increased congestion which will detract from the appeal of walking through this part of the city.

### **12.5.4 Findings**

The Committee finds that the desirability of the proposals outlined by Mr Moore to ensure the design of Franklin Street provides a high amenity pedestrian link from the station towards the Queen Victoria Market. The Committee notes that EPR SC9 was amended to support this objective and requires the development of a plan to utilise part of the Franklin Street road reserve for public open space post-construction in consultation with the City of Melbourne. Plans must be in accordance with the UDS, a position which the Committee supports.

The Committee concurs with Mr Moore's evidence that above ground infrastructure should be grouped to minimise intrusion into the streetscape and optimise opportunities to create a suitable design response for the Precinct, the station and the associated landscape improvements.

The Committee finds that specific references to achieving a high standard of design at the Precinct 5 acoustic shed, and emphasising the interpretive role of temporary interventions may assist in achieving an optimal outcome.

The Committee agrees that distributing pedestrian flows is important and finds that retaining Council Lane CL0112 will play a role in supporting the area to accommodate pedestrian activity.

## **12.6 Precinct 6 – CBD South Station**

The Committee consider that key issues relate to:

- loss of open space during the construction phase
- visual impact of temporary structures

### **12.6.1 What did the EES say?**

The UDS stated that Precinct 6 would have three major entry locations:

- near the northwest corner of Swanston and Flinders Streets on freehold land
- in Federation Square between the eastern and western most shards
- in City Square.

There will be emergency access and ventilation structures at street level.

City Square will be closed to community use in the construction stage and the site will be occupied by an acoustic shed. Exhibited EPR SC4 stated a requirement to provide alternative open space in consultation with the City of Melbourne.

Exhibited EPR LV1 stated:

*The design shall avoid or minimise visual impacts on sensitive receptors and maintain broader landscape character values ... (at) St Paul's Cathedral, Federation Square, City Square and Flinders Street Station.*

Section 4.6.1 of the UDS outlined the intention to increase permeability in the Cocker Lane sub-precinct, providing links between Swanston Street, Flinders Lane and Flinders Street.

### **12.6.2 Evidence and submissions**

Submitters S274, S317, S372, S304, S365 and others expressed concerns about the loss of public open space at City Square. The MATC stated that it was open to using part of Chapterhouse Lane as a replacement open space. In evidence, Mr Boushel stated that Chapterhouse Lane could provide a great public space. Mr Moore agreed this could be a good public space, subject to appropriate landscaping, lighting, street furniture and activation of the surrounding edge. He noted that discussions had commenced with adjoining landowners.

Ms Pollard for Federation Square stated that the “*structure and spaces within Fed Square have become the heartbeat of Melbourne*”. Speaking in relation to the proposed station entry between the two shards, Mr Moore advised the Committee that he did not support a station entry on Federation Square as it would most likely obstruct key views. He stated that with appropriate design, the temporary acoustic shed on City Square could in itself provide a landmark for the city that was an icon of design excellence.

Mr Lamour-Reid for the MATC expressed the view that the hoardings provided an opportunity to “*tell the stories*” of the Cathedral. He suggested that a new City Square should be designed to allow improved views of the Cathedral from within the Square.

In relation to the southwest station entrance, Mr Moore gave evidence that “*MMRA UDS Ref 4.6.1 Cocker Alley Sub-Precinct (p68-71) provides an excellent commentary with design guidelines for this important sub-precinct. In particular, I draw the IAC’s attention to Objective 5 (p70) that recommends ‘complementary civic and community purposes’.*” He said he would support a proposal for:

*... civic and community (including cultural) uses to be accommodated in the above station development on this important site in the heart of the city and at this key hub around Flinders Street Station/Federation Square/St Paul’s Cathedral precinct. This could potentially accommodate a new Melbourne Visitors Centre and a City Library.*

Submitters S147 and S281 spoke of their sense of attachment to the area and its liveability.

### **12.6.3 Discussion**

Precinct 6 very sensitive location from an urban design, landscape and visual amenity perspective. The hoardings and acoustic sheds will significantly influence the character of the area and the city for an extended time. It will be important that these not only protect the safety and amenity of the adjoining residents and passers-by, but take every opportunity to make a positive contribution to the experience of the area.

The Committee agrees with Mr Moore that the acoustic shed is of a scale and in a location where it would be possible to create an icon for the city. This represents a significant design challenge and would need to reconcile a range of technical and aesthetic considerations. The ongoing prominence of Melbourne’s existing icons, many of them historic buildings, would need consideration. The Committee concurs with the MATC that the hoardings and other structures provide an opportunity to tell the story of what is and was there.

The Committee supports the intention of the MMRA to prepare a Creative Strategy that may facilitate the wider Melbourne community to contribute to creating icons for the city and telling and sharing the city’s stories.

The Project will affect open spaces and the settings of City Square, Federation Square and the grassed area between Swanston Street and St Paul’s Cathedral. These spaces have a very high profile and contribute significantly to the image and identity of the city. Furthermore, temporary works will affect key viewpoints of several of the architectural icons of the city, including Federation Square, St Paul’s Cathedral, Flinders Street Station and Young and Jackson’s Hotel.

The displacement of open space to a temporary space in Chapterhouse Lane will present challenges attracting visitation given its location away from most pedestrian desire lines, its use as a car park and the lack of overlooking that may contribute to it feeling unsafe, particularly at night. However, the dramatic setting between the Cathedral and the adjoining building, the obvious potential for landscape improvements and ongoing discussions with the City of Melbourne to activate the space suggest it could help accommodate some of the uses that would otherwise occur in City Square.

The Committee agrees that the views between Federation Square's two 'shards' of St Paul's Cathedral are important, and that locating the station entry in this position may adversely affect the relationship between Federation Square and the City. Measures to minimise this intrusion, such as making the station entrance less intrusive, present a challenge in reconciling this with the objective of giving the station an appropriate presence.

The intention to increase pedestrian permeability and amenity in the Cocker Alley sub-precinct reflects and improves the contribution that laneways already make to Melbourne's character and identity. However, the Committee notes that this will present significant challenges of managing development in an area with an established community and many heritage buildings. The Committee considers that the UDS acknowledges the extent of these challenges. The proposals to include civic uses in this area have merit, however, the Committee observes that this is not in the scope of the Project.

#### **12.6.4 Findings**

The Committee finds that reference to the potential of the Precinct 6 acoustic shed and interpretive role of temporary interventions may assist in achieving a positive urban design outcome. The design and management of the temporary open space at Chapterhouse Lane will require a placemaking approach to ensure the space is considered sufficiently safe and attractive to attract visitation. The EPR LV1-4 adequately address measures to enhance spaces such as City Square during construction and operation.

The Committee supports the inclusion of the passenger entrance to the station in a remodelled western shard. If this proves not to be possible, the Committee suggests the station entrance be as recessive as possible with minimal impact on the ground plane of St Paul's Cathedral Court.

Extending Cocker Lane through to Flinders Street will increase pedestrian permeability and distribute pedestrian flows in a congested area. The improvements in visual amenity envisaged in the UDS has the potential to enhance the contribution that Melbourne's laneways make to the character of the City.

### **12.7 Precinct 7 – Domain Station**

The Committee considers that key issues relate to:

- location of the station box
- visual impacts due to tree removal
- relationship between the station entries, the Shrine and South African Soldiers War Memorial
- streetscape impact of above ground infrastructure.

#### **12.7.1 What did the EES say?**

The construction of Domain station would require reconstruction of St Kilda Road and much of Albert Reserve. This would require displacing at least temporarily, the South African Soldiers War Memorial and require the removal of a large number of trees.

The EES noted the wider community concerns that these temporary and permanent changes may affect the character of the area, and included the following objectives within the UDS:

- *Maintain or recreate a generally symmetrically balanced layout, with regular kerb alignments typically set parallel to the road's centreline, and large canopy trees.*
- *Design the island tram stop/interchange as a high quality public space with a formal design character that complements the boulevard setting.*
- *Arrange tram overheads to minimise visual clutter and to allow for tree planting.*

The UDS stated that objectives of the reinstatement works include those *“to protect and enhance St Kilda Road's formal boulevard character”* and *“Respect and integrate with the heritage values and civic character of the area”*. Guidelines include *“complement St Kilda Road's formal boulevard character”* and *“Maintain the South African Soldiers War Memorial's formal visual links to St Kilda Road and the Shrine of Remembrance”*. Another guideline is *“Minimise impacts on views from within the Shrine Reserve, especially from the forecourts and steps, rooftop viewing terrace, and the ‘ring road’ at the base of the Shrine”*.

### **12.7.2 Evidence and submissions**

In its submission, the City of Port Phillip recognised the EES was *“a good start”*, but raised the following concerns:

- impact on the St Kilda Road boulevard
- need to retain the Windsor Oak
- need to provide an appropriate setting for and minimising impacts on the South African Soldiers War Memorial, returning it to its existing location whilst realising opportunities *“to ensure that the future design of the precinct provides a suitable setting and a respectful environment for the memorial and associated ceremonial activities”*
- use of temporary interpretive material in the Precinct to communicate the significance of the Precinct and the memorial
- resolve an alternative location or treatment for the mechanical chiller plant such as co-location with an existing building or new development, or underground.

Mr Moore gave evidence that the construction of the station box would mean *“St Kilda Boulevard would radically change”*. However, his view was that these changes could happen in a way that ensured the new station was properly integrated into the boulevard.

The sensitivity of the area was expressed by many submitters, for example S313 noted that it is *“... fundamental that the construction must be handled with consideration to the potential destruction and devastation of St Kilda Road that will occur if a deep cavern method is not implemented”*. Other submitters expressed concerns about the impact of tree removal on the attractiveness of St Kilda Road (S343, S336, S333, S330, S284, S283 and others). Others expressed concern about impacts on the use and enjoyment of Albert Reserve (S196, S311, S260, S190, S379).

The Committee notes that TN15 extended the area needed for construction, TN17 provided further detail about the service structures within Albert Road, which would be located at the southern end of Albert Reserve, and TN65 advised *“where trees are to be removed, they will be replaced with super-advanced trees (which are approximately 3 metres in height)”*.

### 12.7.3 Discussion

Precinct 7 is a high profile, sensitive and valued site with a very high quality landscape. It contains memorials of great emotional value that require respectful and solemn settings.

In relation to the optimum size for replanting trees, the Committee notes the opinion of Mr Shears that larger stock has a lower rate of survival. Consequently, a balance is required to minimise the impact by replanting trees that are of a significant size that provide an immediate impact, but not so big that they are likely to have a high failure rate.

The location for the Domain Station box indicated in the EES would require the removal of the South African Soldiers War Memorial, the likely removal of many trees and the loss of Albert Reserve during the construction stage. In the operation stage, the reinstated memorial is likely to be located close to a busy entrance to the station. It is the Committee's view that this could present significant issues in reconciling the need to give the station entrance an appropriate presence whilst providing an appropriately solemn and respectful setting for the memorial.

Measures to minimise this intrusion risks failing to provide it with an appropriate level of presence. The Committee considers that the level of activity and the traces that users leave behind (for example bicycles, litter, and numbers of people moving past) may detract from the memorial's setting, irrespective of the size of the entry structure. The Committee notes this challenge is not insurmountable, however, it is a challenge which may be less significant and more efficiently met if the station was located further from the memorial.

The Committee questions the MMRA's rationale to dismiss the option of locating the station underneath the Shrine Reserve, to minimise incursion into that heritage landscape, as the preferred option has major implications for heritage and landscape values.

### 12.7.4 Findings

The Committee finds that while the three metre "*super advanced*" trees proposed in TN65 are not in keeping with Mr Shears advice that such trees be in the order of six to seven metres, it accepts that trees of this height represent the best balance of instant impact and long term contribution to the area's landscape values.

The overall landscape and heritage sensitivity of Precinct 7 presents significant challenges if aspirations of the UDS are to be achieved in this Precinct. The Committee finds that specific references to achieving a high standard of design at the Domain station acoustic shed, with reference to image and identity of the area, may assist in achieving an optimal outcome.

There may be the opportunity to review the location of the proposed Albert Reserve station entrance as the design process progresses.

The Committee's recommended changes to the UDS and EPR should assist in this regard.

## 12.8 Precinct 8 – Eastern portal

The Committee considers that key issues relate to:

- loss of recreational values of Siding Reserve and Osborne Street Reserve
- loss of amenity to adjacent dwellings during the construction stage
- potential created by reinstatement of Siding Reserve and Lovers Walk to improve open space provision, connectivity and existing structural issues



- car park to Arthur Street adjacent to the proposed alignment of the railway.

### **12.8.1 What did the EES say?**

The EES identified community concerns that temporary and permanent changes may affect the character of areas surrounding the proposed infrastructure. It acknowledged the loss of recreational values of Siding Reserve, the importance of Lovers Walk as a link between Chapel Street and Toorak Road with South Yarra Station, the contribution made by the existing landscape, and loss of amenity to adjacent dwellings during the construction stage.

The EES described key challenges for Lovers Walk included reconciling residential privacy and security, with providing passive surveillance to deter vandalism and increase personal safety. It referenced the City of Stonnington's structure and framework plans for the locality, which identified the need for upgraded open space and new connections to improve access, safety and passive surveillance in this Precinct. The aims of the UDS in relation to the Precinct were:

*The area of the Eastern Portal will be an integrated open space and transport corridor in a high quality landscaped setting that maximises and enhances public open space and improves rail, pedestrian and cycle linkages while complementing neighbouring built form and the public realm.*

The EES envisaged improving access to the reserve with a new bridge from Osborne Street. Section 4.8 of the UDS has a guideline to *"provide a design response that facilitates a connection from the South Yarra Siding Reserve to a future public plaza on Toorak Road"*.

### **12.8.2 Evidence and submissions**

Mr Schutt gave evidence that Siding Reserve *"is a highly valued and utilised open space within a densely-developed precinct, albeit one which is severely compromised in terms of access"*. He noted that trees in and around the reserve *"contributed strongly to the amenity of the Reserve, through the provision of shade, shelter from wind and a visual backdrop of canopy vegetation"*.

Mr Schutt presented a landscape concept plan for the area, based on the Chapel ReVision Structure Plan, endorsed by the City of Stonnington. His evidence was that key landscape and visual impacts associated with the construction stage of the Project included:

- demolition of dwellings in William Street
- demolition and reinstatement of the William Street Bridge
- establishment of works sites in Siding Reserve, Osborne Street Reserve and Lovers Walk
- widening of the existing rail corridor and construction of retaining walls and other structures
- construction of an EAS and the TBM retrieval shaft in the Osborne Street Reserve
- potential removal of 218 trees.

Mr Schutt noted that the UDS suggested that the area of the Eastern Portal *"will be an integrated open space and transport corridor in a high quality landscaped setting that maximises and enhances public open space and improves rail, pedestrian and cycle linkages while complementing neighbouring built form and the public realm"*.

The urban design conclave did not reach agreement on the question of whether a proposed plaza as advocated by Stonnington City Council linking the Siding Reserve and Toorak Road was within the scope of the Project, with Mr Jones dissenting. Under cross-examination, Mr Jones agreed that a plaza may be desirable.

Mr Schutt noted that Lovers Walk had *“compromised levels of amenity and safety”*. He noted the objective identified within the Structure Plan for Lovers Walk to *“Improve passive surveillance and sightlines along Lovers Walk by ensuring new development overlooks this space and fencing used along the way considers safety and aims to be graffiti proof”*.

Submitters (S115, S116 and others) conveyed emotional impacts, including potential amenity and landscape impacts, that may be experienced by local residents in close proximity to the Project in this Precinct.

Some submitters stated concerns about the loss of visual amenity in the area generally, and Osborne Street reserve specifically, because of tree removal, installation of sound walls and other construction impacts including the installation of ventilation and other structures (S266, S325, S352). The Committee inquired about the potential to retain trees along the eastern side of Osborne Street, to which the MMRA responded through TN71:

*There is limited potential to reduce the impact on trees on Osborne Street between Toorak Road and the south side of the vehicle access bridge. There may be potential to reduce the impact on trees on Osborne Street south of the vehicle access bridge.*

In closing, the MMRA stated that the tunnel ventilation structures near Osborne Street would be reduced to three metres in height.

A number of submitters (S19 and others) raised concerns about an existing car park in Arthur Street and plans to replace it post construction.

### **12.8.3 Discussion**

The Committee notes that parties generally agreed that the creation of a plaza and direct links between Toorak Road and Siding Reserve would have merit, significantly improving connections between Chapel Street and Toorak Road, and accessibility to open space and South Yarra Station. The Committee accepts that this link is outside the scope of the Project.

The Committee notes that Lovers Walk provides a link between Toorak Road and Chapel Street, however it is perceived as unsafe and creates a conflict with privacy and amenity of some adjoining residences. The urban design conclave recommended this link be improved by widening *“Lovers Walk, as appropriate and where possible, to support its role as a major shared path”*. However, the Committee believes that Lovers Walk is intrinsically less suitable to link Toorak Road and Chapel Street than a link through Siding Reserve, as Lovers Walk creates a conflict between the need for privacy for adjoining residences and the need for surveillance of the walk. Furthermore, it is questionable how creating a major shared path on the Lovers Walk alignment is compatible with its valued landscaped character. The Committee notes that the reinstatement of Siding Reserve raises potential to increase the usable size and quality of the open space.

The Committee notes the efforts made by the MMRA to accommodate community concerns, and supports EPR SC7 that requires the re-establishment of *“sites impacted by construction works to be generally in accordance with open space master plans”*.

In relation to Osborne Street, the Committee notes the compound nature of loss of visual amenity that is likely to significantly impact upon the liveability of the area.

In relation to the car park on Arthur Street, the Committee notes that the MMRA had not intended a drawing presented to the community (D313) as a statement of design intent, as outlined in its closing submission. However, it does raise an issue of how the plan is to respond to the loss of car-parking places on Arthur Street.

#### **12.8.4 Findings**

The Committee considers that the proposed plaza and link as advocated by Mr Schutt could meet objectives of improving access to South Yarra Station and meet a wide range of other desirable planning objectives.

The Committee considers that achieving amenity improvements to Lovers Walk will require regrading, backfilling and installation of noise walls that would necessitate the removal of the valued vegetation. Furthermore, providing overlooking from surrounding properties may not be possible without redevelopment of some properties and/or a loss of valued vegetation. However, the Committee notes that if the plaza was constructed and a level, well-illuminated path offering good sight lines is created linking Chapel Street to Toorak Road and South Yarra Station, then Lovers Walk may become redundant. The Committee considers this could be a positive legacy outcome from the Project.

In relation to Osborne Street, the Committee finds that the design process should seek early reinstatement of landscape character and incorporation of sound walls that are of high aesthetic value, and which incorporate a significant degree of planting. The Committee’s view is that there will be significant amenity and landscape impacts during the construction stage of the Project on the residents of Osborne Street. Better designed hoardings, temporary landscape treatments and maximum tree retention where possible will help to minimise this impact.

In relation to Arthur Street, further investigation is needed to determine if a car park is required to replace the car park lost with the works to the railway line.

### **12.9 Urban design, landscape and visual recommendations**

#### **9. Amend the Urban Design Strategy as follows:**

- a) **Add a fifth point under 2.1 under ‘Designs must be sustainable ... They must be:’ to read *“designed to utilise green infrastructure to support a high standard of amenity.”***
- b) **Add a new Objective 5 in Section 3.1 to read *“Recognise and enhance the importance placed on active transport.”***
- c) **Add a third dash point in the Design Guidelines at 3.2 at No 11 ‘Incorporate public art in appropriate places’ to read *“Integrate site responsive art into the project design, facilitating playful interaction and seating opportunities and located to optimise the legibility of the surrounding area.”***

- d) Add a new dash point under 3.5c3 to read “permanent infrastructure elements of the Project such as station entries, portals, vents and access shafts need to be co-located where possible and incorporate public art and other activities that contribute to the wider public realm.”
  - e) Add a new statement as the first sentence of 3.5 after the heading ‘Design to help manage construction impacts’ to read “*The Project requires careful consideration of its impact on the places where the construction activities are located.*”
  - f) Add a final dot point to the paragraph commencing ‘Construction processes need to ...’ to read “*The potential of these temporary features to achieve broader objectives. These include improving visual amenity, facilitating wider engagement in the planning and design processes, creating a canvas for the creative community and wider community to express and develop their creativity and create design icons that can contribute to the image and identity of the city.*”
  - g) Amend the fifth dash point under 3.5c4 to read “*Provide opportunities to convey information about the history of the site and the Melbourne Metro ...*”
  - h) Add a new dash point under 3.5c4 to read “*Recognise the potential of the acoustic sheds, in particular those at CBD North, South and Domain to be designed to contribute to the image and identity of the City.*”
  - i) Include the Melbourne Metro Rail Authority Creative Strategy as a Reference Document at 3.5d.
  - j) Replace 4.4.3e.1 to state: “*Design the station entries as entrances orientated to the wider Parkville community. Provide a high quality arrival experience, meeting places and direct, legible connections to the north south spine that extends across Grattan Street.*”
  - k) Add a new design guidelines at 4.4e to read “*Maximise the northern footpath width to create space for the station infrastructure and to enhance provision for pedestrian movement.*”
  - l) Add a second paragraph to 5.2 ‘Design review and advice’ to read “*Supplement the VDRP/Urban Design Reference Group process to ensure it includes experts in sustainability, public art, accessibility, health and place making.*”
  - m) Add the following words at the end of the second paragraph in 5.2 to read “*... to ensure the PPP contractor had adequately responded to recommendations of the Urban Design Reference Group.*”
10. Amend the Concept Design to retain Council Lane CL0112.
  11. Ensure that future plans to reinstate South Yarra Siding Reserve facilitate the opportunity to provide an accessible link to the south side of Toorak Road.
  12. Install temporary landscape treatments with other urban design, landscape and visual treatments along the length of the Osborne Street Reserve during the construction stage to enhance its function as a treed open space area, and to provide better visual and noise protection for the adjacent residents.

## 13 Surface water

Surface water impacts are addressed in Chapter 17 of the EES, and in Technical Appendix N.

The draft evaluation objective of the Scoping Requirements in relation to surface water at Section 4.8 is:

*To protect waterways and waterway function and surface water and groundwater quality in accordance with statutory objectives, to identify and prevent potential adverse environmental effects resulting from the disturbance of contaminated or acid-forming material and to manage excavation spoil and other waste in accordance with relevant best practice principles.*

The following evidence was provided in relation to surface water:

- MMRA - John McCrann of AJMJV
- City of Melbourne - Barry Fox of Council.

EPR SW1 and SW2 specifically dealt with matters relating to surface water. Specific issues related to aquatic ecology and river health are covered separately within Chapter 17 of this report.

### 13.1 Key issues

The Committee considers the key issues relate to:

- risk of inundation by extreme riverine flood (fluvial) events or extreme local (pluvial) events
- integration with the existing Melbourne Underground Rail Loop
- risks to the waterways
- diversion of pluvial flood waters from up-gradient catchments
- collection and treatment of stormwater run-off from construction sites and permanent structures.

### 13.2 What did the EES say?

#### 13.2.1 Study area

The study area for flood and water quality assessment extended along the entire Project alignment, to account for the possibility of flooding into the tunnels and stations from pluvial flooding, as well as considering the risk of impact from fluvial flooding in association with the major waterways, being the Maribyrnong River, Moonee Ponds Creek and the Yarra River.

#### 13.2.2 Waterway existing condition descriptions

The Maribyrnong River is located some 700m to the west of Precinct 2. The area immediately surrounding Precinct 2 is subject to fluvial flooding, where there is typically at least a 12-hour warning period in advance of a flood peak.

The proposed construction site is located at Precinct 3, approximately 65m from Moonee Ponds Creek. Precinct 3 is subject to flooding from either:

- flows that are in excess of the capacity of the creek channel
- inflows from local sub-catchments on either side of Moonee Ponds Creek.

Due to its relatively small catchment, fluvial flood from the creek to Precinct 3 would typically produce only a one to two-hour warning period in advance of the flood peak. Any loss of current creek floodplain storage from the placement of a construction site, or permanent structure would result in increases to flood flow rates and flood levels.

The Yarra River is located approximately 120m to the south of Precinct 6, where it may pose a potential flood impact to Precincts 6 and 8, as well as flood risk to the existing Melbourne Underground Rail Loop tunnel portal entrances, located near the eastern side of Flinders Street Station and Federation Square (with potential therefore to cross-link Yarra River flood waters into the Projects tunnels at Precinct 5).

As well as Precinct 6, flooding from the Yarra River has the potential to impact upon areas near Precincts 7 and 8. The Yarra River would typically produce a two to three-day warning period in advance of its flood peak for these areas.

### **13.2.3 Impact assessment approach**

Investigations to establish suitable baseline conditions for the Project area included hydrologic modelling (flood and stormwater flow system input estimating) and hydraulic modelling (estimating resulting flood levels and extents). The impact assessment of aspects across Project early works, construction and operation, worked to the general flood level guidance of a one per cent 'Annual Exceedance Probability' (AEP) event, or sometimes termed as a '100-year Annual Recurrence Interval (ARI)'.

Both the existing baseline conditions and predicted Year 2100 conditions were investigated for flood risk to surrounding areas from the Project. Predicted Year 2100 conditions make allowance for expected increases in rainfall intensity and sea level rise from climate change.

The EES indicated many of the risk aspects for the Project have potential surface water flood risks with an associated 'Rare' or 'Unlikely' likelihood rating (such as a 0.1 percent AEP or 0.01 percent AEP flood event).

#### **(i) Precinct 1 – Tunnels**

The EES noted that as the TBM-driven tunnel sections between stations and portals are underground, there is no anticipated direct impact on waterways (for either construction or operation).

The Project tunnels may be subject to flooding via connection with the City Loop rail tunnels and the underground cross-connection at Precinct 5 during construction. The City Loop tunnel portal most susceptible to flood from the Yarra River is located on the rail line between Flinders Street Station and Parliament station. This portal is at risk from fluvial flood in an event more frequent than Year 2100 (considering climate change impact), one per cent AEP. For this scenario, the EES indicated that the Project's tunnels have the potential to be quickly inundated (within hours). An applicable mitigation measure would be the use of an automated flood gate, retro-fitted to this susceptible existing portal. Additional flood immunity risk assessments will need to be conducted in the detailed design to determine if additional mitigation measures are required for the other City Loop portals.

Considering Project operation, the EES indicated that once detailed design mitigation measures are enacted, ensuring that permanent tunnel structures are not obstructing riverine flood or pluvial flood flows, there are no significant surface water impacts from

flood expected. For the assumed tunnel water-tightness estimates (Chapters 14 and 15 of this report), some relatively small amounts of groundwater may enter the underground tunnel system, requiring collection and suitable disposal. Such water is proposed to be pre-treated to remove litter and dissolved organic compounds, then disposed to either sewer or the stormwater system under approvals from either the relevant water authority or the EPA.

**(ii) Precinct 2 – Western portal**

Much of this Precinct is subject to flooding from the Maribyrnong River, where there are several locations covered by a LSIO. The EES called up the requirement for Precinct 2 to be designed to protect against flooding from the Maribyrnong River.

In considering how tunnel construction may impact upon flood plain drainage flows, the predicted loss of flood plain storage from the construction site would require provision of up to 9,000m<sup>3</sup> of compensatory flood water storage. The final location for this storage will be established in consultation with Melbourne Water.

It is expected that none of the Precinct 2 infrastructure works under the operational stage would obstruct flows along major floodway paths. For drainage run-off collected from the tunnel's decline structure, this water would be pumped to the local drainage system at a controlled discharge rate. As such, the EES indicated a local drainage storage capacity (tunnel operation) of some 180m<sup>3</sup> would need to be provided. It may be feasible to combine this collected water storage with compensatory flood storage. The final location and type of storage will be determined with detailed design.

The Concept Design discussed the alternative 'Option B' design for Precinct 2. If this alternative is adopted, the EES suggested that a slightly less compensatory fluvial flood storage volume of approximately 7,000 m<sup>3</sup> would be required.

**(iii) Precinct 3 – Arden station**

Considering construction, and the potential for station box and connected tunnel flooding, these could fill rapidly (within hours), posing pre-mitigation measures risk to worker safety and Project disruption. Mitigation measures could include combination treatments, where for lesser and more frequent flood level rises, a retaining wall or barrier system may be deployed, coupled with an associated flood warning system linked to the Moonee Ponds Creek catchment flood warning system, where emergency management measures and worker evacuation procedures trigger at a determined flood level. The station box would result in some loss of flood plain storage, where the EES indicated that up to 6,000m<sup>3</sup> of compensatory storage may need to be provided. The EES proposed to lower ground surface levels at the southern end of the VicTrack land to provide this storage.

The EES suggested that raising-up the station entrances and tops of emergency access points and other surface penetrating infrastructure to a level such that the Year 2100 0.1 per cent AEP flood level (or 1,000-year ARI), would provide suitable flood protection (to be further confirmed with detailed design). The EES noted that flood warning times for Moonee Ponds Creek are relatively short (one to two hours), where floodwaters can rise rapidly. This will require well-designed mitigation measures for both construction and operation. The permanent station structures are expected to result in a relatively smaller loss to flood plain storage, which is considered readily accommodated in the local area on publicly-owned land.

Regarding the electrical sub-station for the Project, the EES noted that this would be sited within the Moonee Ponds Creek flood plain, under the Concept Design. This sub-station may require a relatively small and easily accommodated compensatory flood plain storage volume (estimated at less than 200m<sup>3</sup>).

Alternatively, co-locating the sub-station with the Metro Trains Melbourne traction sub-station would require approximately 400m<sup>3</sup> of compensatory flood plain storage, while locating it south of Precinct 3 would require approximately 250m<sup>3</sup> of compensatory flood plain storage.

**(iv) Precincts 4 and 5 – Parkville station and CBD North station**

Precincts 4 and 5 are covered together by the EES, as they present similar surface water impact issues. Project components that may have some amount of impact to surface waters include construction sites, station structures that lie above ground surface, and associated pedestrian station entrances.

Considering construction, both station boxes may have the potential from some flood inundation via minor overland surface water flows. The EES indicated that this could be easily avoided through use of small constructed barriers to intercept these surface flows, and to shed these from the station box. For both Precincts, direct rainfall is considered the most likely source of stormwater run-off and the EES suggested the use of standard major works site construction management measures will minimise the impact of diverted water flows into down-gradient stormwater drainage systems.

Considering tunnel operation, the EES indicated that there may be potential for pluvial flood inundation of these stations via the pedestrian entrances. By raising up these station entrances and adjusting the finished height of other associated minor surface openings, this risk should be suitably mitigated (further flood immunity risk assessment into detailed design will examine this).

**(v) Precinct 6 – CBD South station**

The EES stated that surface waters would be impacted in this Precinct by the construction of cavern-mined station entrances and the construction sites. The station will impact directly on the two existing City of Melbourne stormwater drains located in Swanston Street. The EES suggested that a significant inundation event could occur with relatively little warning (tens of minutes), posing a significant risk to construction workers and the Project. To suitably mitigate such a risk, surface excavations should be protected from local stormwater flows through either raising up the entrances, or by constructing small barriers (bundling) around them. Direct rainfall run-off from the construction work sites will flow eventually into the Yarra River, via the adjacent stormwater drainage system.

Considering operation, the EES stated that potential flooding of Precinct 6 and its adjoining sections of the tunnels could occur from the Yarra River. Such inundation could rapidly fill the tunnels and stations within a short time-period. The EES indicated that the Concept Design has set the pedestrian entrances for CBD South Station to a level considered very close to, or above the Year 2100 0.01 percent AEP Yarra River flood level (posing a 'Very Low' flood risk).



**(vi) Precinct 7 – Domain station**

The EES indicated that the northern end of the station box will extend across the western end of Domain Road, near the St Kilda Road intersection. Domain Road serves as an overland surface flow pathway for pluvial flows exceeding piped stormwater capacity, sourced from a moderately-sized catchment on the north side of Domain Road. These flows currently discharge across St Kilda Road, running off to the south and west along Park Street, Albert Road and Owen Lane (towards Albert Park Lake).

The EES indicated that the area around the intersection of Albert Road and Kings Way is subject to pluvial flooding from the Hannah Street Main Drain. This area is subject to flood from 'breakaway' flows associated with the Yarra River, downstream of Princes Bridge under certain extreme events. The EES indicated that Yarra River flood modelling indicated the area surrounding the station (including its entrances) is not subject to flooding from this source, for events up to and including Year 2100, 0.01 per cent AEP event (allowing for climate change).

Considering construction, proposed mitigation measures against pluvial flooding include the provision of retaining walls or similar barriers to prevent inundation to the station box. The EES pointed out that such a diversion or shedding of these surface drainage flows would result in an increase in surface water flows towards Bowen Crescent (where due to the steepness of Bowen Crescent, it is expected that this should result in a negligible increase in overland water flow depth). The EES considered that more extreme events could be mitigated by designing an appropriate combination of barrier heights and flow diversion areas with sufficient capacity working in combination.

With operation, there is potential for station inundation from the same type of overland flows as discussed above (from Domain Road to the east). The EES indicated that the overland flow water depth at the proposed Domain station entrances would be relatively shallow, where the flooding potential could be mitigated by the raising-up of these entrances and other related station ground surface openings (which in turn should not significantly result in an increase to overland flow depths elsewhere).

**(vii) Precinct 8 – Eastern portal**

The tunnel portal is situated close to both the Prahran Main Drain and the Yarra Street Outfall Drain. The EES suggested that the Eastern portal would be immune from a Yarra River flood for a year 2100, 0.1 per cent AEP event (1,000 year ARI event), which complies with Melbourne Water's flood immunity requirements. Additional flood immunity assessment work is proposed with detailed design, to determine if this level of flood immunity is sufficient for the Project, where for an event that provides a flood level higher than this, there would be between two to three days of warning. A flood warning system would be implemented for the Project, which would link in with existing Yarra River catchment flood warning systems. The EES suggested that flood prevention work for the portal could consist of flood prevention 'stop logs' (stored at the portal area), to be manually installed across the portal in advance of such an extreme flood event.

The EES indicated it would be unlikely that Project construction would significantly impact of pluvial flood flows or levels associated with either the Prahran Main Drain or the Yarra Street Outfall Drain. These systems however, have potential to inundate the rail cutting across

both construction and operation. It is expected that the portal would have pluvial flood immunity from either drainage system for the case up to a Year 2100 0.5 per cent AEP flood event, but more extreme pluvial flood events could potentially inundate the portal (however the resultant impact is expected to be negligible, representing a 'Low' risk).

During Project operation, flooding of the tunnels portals from the Yarra River poses a risk for extreme flood events. A local drainage storage of some 60m<sup>3</sup> was estimated from the EES to provide for the collection, treatment and suitable disposal (or re-use) of storm water drainage run-off from the tunnel decline structure.

#### **(viii) Precinct 9 – Western turnback (West Footscray)**

The EES stated that there are no continuous overland flows across the entire rail reserve under a one per cent AEP flood event (existing conditions), which indicated that any works within the rail reserve would not obstruct overland surface water flows. The loss of storage would be negligible. Construction site stormwater run-off towards Stony Creek should be managed by using standard major works site construction management measures.

#### **13.2.4 Peer review of EES study**

Peer review of the EES with respect to surface water and hydrology was undertaken by Mr Fuller of Deep River Associates. With respect to impacts from the Project upon existing flood hydrology, Mr Fuller indicated:

- the EES methodology was consistent with guidance for local floodplain management and Australian risk management standards
- the EES relied to some degree on third party flood modelling, but these other modelling studies had been subject to peer review by Melbourne Water, and that such studies involved a sufficiently independent evaluation of hydrology and hydraulics to support their conclusions
- the EES showed that with mitigation measures, the risk of change to local flooding across the Project's construction was reduced from an initial (unmitigated) risk rating of 'Medium to Low' to 'Low to Very Low', with the key contributing mitigating measure the provision for compensatory flood storage
- for operation, risks from altered flood levels and velocities were rated as 'Low to Very Low' with similar mitigation measures (compensatory storage).

With Project operation, Mr Fuller noted that key fluvial flood risks were associated with safety to either rail system commuters or rail workers; and disruption to rail system operations. The EES mitigation measures to cater for such risks, included the installation of full-height tunnel entrance flood gates that could cater for the largest conceivable flooding risk. These measures were considered by Mr Fuller as being appropriate as an action against uncertainty associated with fluvial flood risk and the major disruption that it could potentially cause. Mr Fuller indicated that if such mechanical types of mitigation measures (automatic flood gates) were proposed, there would be the need for an associated, regular maintenance program and emergency response testing program.

#### **13.3 Evidence and submissions**

Mr McCrann of AJMJV appeared on behalf of MMRA. In relation to EPR SW1 and providing for a suitable level of flood immunity, Mr McCrann recommended in relation to Precinct 8,

the use of full height and width automatic flood gates, and advised *“I am satisfied that EPR SW1 establishes an appropriate framework to ensure that appropriate flood protection measures will be incorporated within the final design of the Project”*.

Regarding EPR SW2 and compensatory flood storage locations for Precincts 2 and 3, Mr McCrann indicated consultation with Melbourne Water continued, and was confident that suitable storage could be provided.

Mr McCrann provided comment to those offered by Mr Fuller on the requirement for consistency between run-off volumes and peak flow rates across the various impact assessments related to surface waters, and noted:

- the Aquatic Ecology and River Health Assessment focused on relatively frequent surface run-off events (more frequent than fifty percent AEP), where these had the greatest potential for an impact to receiving waters
- for the Surface Water Impact Assessment, this instead, focused on rare and extreme run-off and flood events (equal to or greater than one per cent AEP), as these had the greatest potential to inundate stations and tunnels, or to cause a flood risk to surrounding areas.

Mr McCrann provided responses to various submissions, (including S12, S70, S76, S180, S237, S226, S240, S260, S267, S283, S289, S308, S315, S365, S367 and S377), noting EPR SW1 and AER1 would adequately address surface water flooding and water quality concerns. EPR SW2 would ensure existing flooding conditions were not adversely impacted as it addresses the potential diversion of stormwaters. Regarding the detailing of works to enhance flood protection, rather than maintaining the status quo, Mr McCrann offered that EPR SW2 adequately addressed this issue.

He pointed out that EPR SW2 calls up consultation with stakeholders and relevant water authorities. He indicated that there may be some merit in a ‘case-by-case’ dilapidation survey of existing drainage assets, if they interacted with the Project and related drainage.

Mr Fox appeared on behalf of the City of Melbourne, and advised that the Project was almost entirely located within either ‘High’ or ‘Extreme’ rated flood risk catchments. He considered that the EES was generally deficient in proposing how it would contribute to an overall reduction in flood risk to the surrounding catchments, where the Project should set a ‘benchmark’ on how to improve upon stormwater management solutions, by integrating these into the design to reduce flood risk.

Mr Fox indicated it would be important to implement climate change related flood risk mitigation measures early into the Project (where Melbourne was currently vulnerable to this potential increased flood risk). He requested that each of the five stations should incorporate stormwater retention and re-use systems, to reduce cumulative flows to downstream areas of known flood risk, aiming to achieve a targeted 20-year ARI capacity in all drains relocated as part of the Project’s early works (with climate change allowance). He suggested the following key Project objectives should apply:

- EPR SW2 should aspire to improve upon flood risk within surrounding catchments and not just maintain flood risk to existing levels
- assist in ameliorating climate change impacts to the City of Melbourne, through inclusion of flood mitigation systems with development

- the Project should leave a lasting environmental legacy to users of the new rail infrastructure and the City of Melbourne
- stations should be designed to achieve a '5-star Green Rating' with provisions made for reducing potable water demand through use of collected stormwater
- provision of 'Integrated Water Cycle Management' and water sensitive urban design (WSUD) principles
- stormwater and drainage design should be sensitive to the goals and targets of the adopted strategies and policy used by the City of Melbourne.

A conclave between the two experts was conducted on 25 August 2016 where they agreed to amendments of EPR SW2, AE7 and the new SW3. Further, for Precinct 2, the stormwater detention tank for controlled discharge of runoff from the decline structure to the local drainage network, is to be at an agreed location, within land controlled by the rail authority. For Precinct 3, the general compensatory storage basin design provided by Mr McCrann should satisfy the requirement for stormwater retention covering high intensity rainfall events.

The experts disagreed on the following:

- that one of the 'alternative design' locations for the electrical substation be adopted in favour of the Concept Design option, to satisfy EPR AE5 (it was agreed that this expected impact to Moonee Ponds Creek from the Concept Design, or those alternative design options east of Moonee Ponds Creek were a similar order of magnitude)
- forming an additional EPR relating to the upgrade of the existing 1,200mm diameter City of Melbourne drain for the Flinders Street underpass at Precinct 6 (and extending this drain's reconstruction to its Yarra River discharge point).

Melbourne Water did not provide a submission but the MMRA tabled a document (D91) from it expressing its views about the Project. Melbourne Water noted it was generally satisfied with the EES and the inputs related to its infrastructure, and offered "*broad and in-principle support*". Melbourne Water suggested:

- adopting the CSIRO convention in calibration models in anticipation of a sea level rise of 0.8m and increase in rainfall intensity of 32 per cent by Year 2100
- flood-event actuated 'plugging' at tunnel portal entrances to achieve absolute flooding immunity, and options for constructing emergency earth bunds or a sand-bag wall were not operationally practical
- for Precinct 6, stormwater drain flooding zone, the Project should not cause any new adverse detrimental effect
- for Precinct 7 construction, provision be made for the conveyance of all piped and surface drainage, to avoid an additional flood risk to St Kilda Road, with Albert Park Lake as the preferred receiver of any additional surface water drainage
- for the North Yarra Sewer Main, the Concept Design indicates the outer diameter of the tunnels passing at some 3m vertical separation from this asset
- for the South Yarra Sewer Main, this section of sewer will be relocated (due to Domain station) and diverted parallel and to the south of the existing sewer alignment, where the replacement sewer section is to be "*structurally independent and fully isolated from the effect of the Project*"

- sensitivity of the sewer disposal network needs to be recognised (both in control of water volumes and composition sent to sewer).

For general stormwater management and water efficiency, Melbourne Water observed that *“the general approach to Project design is consistent with Best Environmental Management Practice processes”*.

## **13.4 Discussion**

The Committee notes the comprehensive nature of the surface water investigations and impact assessment completed to date. Suitable referral to key legislative controls and associated guidance have been identified and referred to, where this guidance has been confirmed through the key water authorities. The Project’s tunnels, entrance portals and stations need to be designed and suitably protected against both fluvial and pluvial flood types. This protection should apply across both construction and operation.

In relation to surface water quality, the EES stated that no direct significant impacts on water quality are anticipated to the three significant waterways traversed by the Project’s alignment, nor other associated waterways linked to the metropolitan stormwater drainage system (Albert Park Lake or Stony Creek). Station construction area footprints at Precinct 2, 3, 6 and 7, do not significantly intrude onto waterways, where no significant construction activity is planned within their immediate vicinity. TBM tunnelling is not expected to significantly impact surface waters.

MMRA are yet to specify a final flood immunity standard, and may choose to adopt a higher flood immunity standard than currently required by Melbourne Water. The updated flood immunity assessment to occur with detailed design will help to guide this decision. The EES indicated the selection of a final design flood immunity standard should be considered outside the scoping requirement of the EES.

With tunnel operation, collected stormwater drainage from structures located aboveground or open to rainfall (such as station and tunnel portal entrances, or decline structures) will require treatment, with controlled, licenced discharge into surrounding local water drainage network. The use of WSUD principles will assist in minimising impacts to surface waters.

### **13.4.1 Project risk to main waterways**

The main waterways within and surrounding the Project area (Maribyrnong River, Moonee Ponds Creek and the Yarra River) should not be significantly impacted by either the Project’s construction or its long-term operation.

The suggested condition from the City of Melbourne *“For all Precincts, Prior to commencement, a stormwater drainage system incorporating integrated management design principles must be submitted to, and approved by the responsible Authority”*, was understood to normally be a requirement when considering approvals for new private developments. The Committee notes that this agreement has been generally described within EPR SW2, where a minor adjustment edit has been recommended.

### **13.4.2 Project risk to surrounding local drainage systems**

In a similar manner to the protections discussed for the main waterways, local drainage areas will be protected from collected stormwater flows from the Project area across both

construction and operation, through capture, storage, treatment and the approved engineered release of this water into the surrounding local stormwater drainage system or sewer system.

Each Precinct across construction and operational stages is to have suitable surface controls established for the well-designed interception, diversion and down-gradient placement of surface waters, which flow towards the Project area from up-gradient, local pluvial catchment areas.

### **13.4.3 Flood risk to the Project**

The risk of fluvial flood to the Project from the three major waterways is considered as a very rare event, where the consequences if left unmitigated would be significant, both to human life and Project infrastructure. To achieve a high level of flood immunity across both construction and long-term operation, the tunnel portals and stations are to be designed to provide both suitable height and flood water retention barriers, to at least meet, if not better, a 0.001 AEP flood. The risk of pluvial flood risk from high intensity rainfall events in a similar manner will be suitably reduced.

For Precinct 2 and tunnel operations, without mitigation measures built into the detailed design for extreme flood events, the tunnels could fill rapidly from extreme event flood waters (where the warning time for such a flood peak event is relatively short - within hours). Mitigation of this risk is likely to require the integrated installation of automatically-triggered flood prevention gates.

For tunnel operation and the aspect of extreme pluvial flooding (overland surface water flows from high-intensity local rainfalls), the EES and expert opinion indicates that this can be suitably provided for in detailed design, through ensuring that station entrances and related servicing infrastructure to the station access points are suitably raised-up, to provide the required flood immunity level (which is to be determined by MMRA).

### **13.4.4 Water use initiatives**

Smart water storage, treatment and re-use options are proposed to be planned into the detailed design, integrating WSUD principles, which have been acknowledged by Melbourne Water and the City of Melbourne, and are covered in the EPR.

## **13.5 Findings**

The Committee finds that the surface water components for the Project should be suitably managed within the regulatory framework established by the Victorian *Water Act* 1989, *EP Act* 1970 (*EP Act*), *SEPP – Waters of Victoria*, the Incorporated Document, the EMF and EPR. Risk assessments discussed through the EES and the Hearing indicated that currently identified surface water-related risks to and from the Project are generally grouped as being between 'Very Low to Low', assuming proposed mitigation measures are deployed.

Further investigation, monitoring and modelling for surface water needs to be undertaken in detailed design, in consultation with relevant stakeholders to ensure that all key risks are identified, understood and suitably managed.

The potential range of surface water management issues that have been identified from the EES and through the Hearing for the Project's Concept Design are not unusual for this type of

major urban tunnelling project. Generally, there are suitable and available mitigation treatments to address the identified risks.

The Committee considers that some of the suggested changes to the EPR as provided in Appendix F should provide a robust, yet flexible set of environmental controls (capable of including innovation) relating to surface water protection for all Project stages.

The relevant EPR have been amended accordingly, as provided in Appendix F.

## 14 Groundwater

Groundwater impacts are addressed in Chapter 18 of the EES, and in Technical Appendix O.

The draft evaluation objective of the Scoping Requirements in relation to groundwater at 4.8 is:

*To protect waterways and waterway function and surface water and groundwater quality in accordance with statutory objectives, to identify and prevent potential adverse environmental effects resulting from the disturbance of contaminated or acid-forming material and to manage excavation spoil and other waste in accordance with relevant best practice principles.*

The following evidence was provided in relation to groundwater:

- MMRA – Hugh Middlemost of Hydrogeologic
- City of Melbourne - Barry Fox of Council
- Melbourne Grammar School - James Hargreaves of Meinhardt

There was a conclave of experts held on 19 August 2016 (D27).

EPR GW 1 to 5 specifically dealt with matters relating to groundwater.

### 14.1 Key issues

The Committee considers the key issues relate to:

- groundwater drawdown
- migration of known and unknown nearby groundwater contamination.

### 14.2 What did the EES say?

Detailed description of the groundwater investigation and monitoring methods used, and a description of groundwater modelling of the Project's impact across both construction and operational stages is included in EES Technical Appendix O.

Hydrogeological investigations documented groundwater conditions and a preliminary risk of impact assessment for groundwater dependent assets and other influenced aspects (for construction and operation stages for the Project). From the identification and risk rating for potential impacts, various means to protect groundwater beneficial uses and other groundwater-influenced impacts were considered. From this information, EPR and associated mitigation measures were recommended.

#### 14.2.1 Key risks of groundwater impact

The EES identified that during construction stage, higher-risk impacts applied. Groundwater drawdown altering hydraulic gradients and flow, causing existing chemical contamination plumes to migrate (precluding existing or future beneficial groundwater uses, and causing chemical vapour migration through the subsurface, posing explosive or health exposure risks). This was the highest risk (ranked 'Medium' with pre-mitigation measures) for Precinct 5, where groundwater is to be drained by some 22m with excavation.

If mitigation measures were not deployed across construction, groundwater levels would likely reduce at locations of existing groundwater bores and aquifer recharge bores (such as



with CityLink tunnel operation). Increase in groundwater inflows to excavations and consequential drawdown would cause an increase in consolidation settlement within sediments. Other lower rated risks included:

- drawdown of groundwater may cause an increase in acidification of groundwater, due to oxygen exposure in Melbourne Formation rock
- potential for aquifer damming from the tunnels
- groundwater drawdown could cause an impact on the health of groundwater dependent vegetation including some mature trees
- potential for tunnel construction or operation to impact on nearby surface water features
- tunnels intercepting groundwater contamination requiring treatment and suitable dispose of such water.

#### **14.2.2 Suggested risk mitigation measures**

The EES indicated that well-established underground construction control measures are proposed, which include:

- using well-suited design and construction methods, with the ability to adapt tunnelling methods through varying geology
- applying sub-surface 'grout-proofing' around tunnel structures
- aquifer injection bores, to counter groundwater drawdown and depressurisation of sediments.

The EES noted that a Groundwater Management Plan (GMP) was critical in achieving objectives for setting comprehensive monitoring requirements and 'trigger levels' for mitigation measures.

A decision was made at the Concept Design stage to suitably 'tank' (make effectively watertight) all submerged tunnel structures. This is to ensure that across long-term operation, groundwater inflows and drawdowns are minimised.

The EES assumed that the bored twin tunnels (most of Precinct 1) would be tanked almost immediately following excavation. A 'Haack' Rating of 3 is proposed for these tunnels across the alignment<sup>6</sup>. Groundwater inflows under TBM-formed tunnels are expected to be negligible during construction and operation.

For other Precincts where excavations are planned to be constructed by 'cavern-mined' methods, using staged road header mining or other similar methods (Precincts 5 and 6, Swanston Street connection between Precincts 5 and 6, as well as other smaller cross-passages and service tunnels), it is likely that there will be such an amount of short-term groundwater drawdown at these areas when constructed, that the areas need to be assumed as 'fully drained' (groundwater is drawn-down to an effective level at the excavation, matched near the base of that excavation). Once construction of these excavations is completed, they are then planned to be suitably tanked to a Haack Rating of 2, so that with tunnel operation, groundwater levels should tend to recover, close to pre-construction groundwater levels.

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<sup>6</sup> Haack Ratings are from 1 to 5, with Haack Rating 1 indicating complete watertightness, Haack Rating 2 substantially dry, Haack Rating 3 capillary wetting, Haack Rating 4 weak trickly water and Haack Rating 5 allowing trickling water.

For areas of proposed open cut, or cut and cover construction (Precincts 2 and 8, and associated rail track decline structures) and station box constructions at Precincts 3 and 7, these excavations will result in relatively short-term, yet significant groundwater drawdown, where following construction and tanking (proposed Haack Rating of 2), groundwater levels should recover into the operation stage. Precinct 4 is to be constructed to a Haack 3 Rating, due to the particular geology at this location.

### **14.2.3 Independent peer review**

The MMRA provided the Committee with updated information from that within the EES on groundwater (TN08), including various reports from Golder Associates dated July and August 2016. A peer review of the EES and TN08 was undertaken by Mr Middlemis, who:

- endorsed the impact assessment methodology and agreed that potential residual risks (following assumed mitigation measures) were either rated as 'Low' or 'Very Low' (pre-mitigation measures appraisal)
- noted the hydrogeological investigations and groundwater modelling as consistent with 'best practice' for the Concept Design
- observed that some 'Class 2' elements were still incorporated in the model, where while being suitable for Concept Design, will need further refinement
- agreed that tanking of structures would provide in general, very small groundwater inflows and related drawdowns across Project operation
- agreed that the risk for aquifer damming from tunnel structures rated as 'Low'
- agreed that for construction, more notable risks were associated with depressurisation of Coode Island Silt could cause settlement where encountered across paleovalleys
- agreed that construction dewatering may result in the migration of groundwater contamination plumes for Precinct 5, which could impact on third-party groundwater users or receptors.

Mr Middlemis acknowledged the EPR and mitigation measures (such as grout-proofing of the subsurface and temporary aquifer injection bores) were consistent with the EES scoping requirements. He indicated that considerable additional hydrogeological investigations are required (leading to detailed design and construction), including:

- hydrogeological field investigations (such as longer-term aquifer pumping tests and groundwater monitoring)
- updated numerical groundwater modelling:
  - include an assessment of transient aquifer behaviour
  - updated model application for cumulative impact prediction across detailed design elements
  - use the updated model to test for effectiveness and optimise anticipated risk mitigation measures.
- detailing of the GMP.

## **14.3 Evidence and submissions**

### **14.3.1 Evidence**

Mr Middlemis supported the proposed EPR and indicated they are considered, robust, applicable and warranted. He noted the EPR were designed to mitigate impacts across

stages of design, construction and operation, to investigate detected changes in the understanding of the Project and risk, and to confirm that mitigation measures are sufficient. EPR GW2 described future requirements for the groundwater model which should be:

- developed across detailed design, under independent review to the Australian Groundwater Modelling Guidelines
- updated across Project stages, to address more comprehensively, transient groundwater response and aquifer-specific storage parameter values, as well as the prediction of cumulative groundwater impacts
- further assess for uncertainty on model understanding and predictions.

Mr Fox supported EPR GW4 which relates to the sewer disposal of collected tunnel groundwater by 'Tradewaste Agreement' (outlined in the Groundwater Disposal Strategy). Mr Hargreaves indicated that for Precinct 7, risks associated with groundwater had been suitably identified, except for:

- construction predictions of groundwater inflows to the excavation, of up to 150m<sup>3</sup> of water per day (and predicted groundwater drawdowns) near MGS buildings
- lack of evaluation of the potential groundwater level 'rebound' likely to arise post-construction, from a planned replacement of the South Yarra Sewer Main. Replacement of this sewer could result in a net long-term increase in local groundwater level, posing a risk to existing underground structures (such as basements or underground carparks).

The groundwater conclave resulted in agreement that:

- the EES groundwater assessment methodology, results and interpretations, was appropriate
- for Precinct 7 and the consideration of long-term aspects for groundwater (such as the effect of replacing the South Yarra Sewer Main), *"the results are generally appropriate, and that the operational assessment at Domain Precinct has not evaluated in detail the rebound effects that would arise due to reduced groundwater drainage into the replaced Sewer"*
- the EPR were generally adequate for Concept Design.

In relation to the EPR, both generally and for Precinct 7, the conclave report noted *"Hargreaves asserts that the groundwater EPR for Domain precinct need revision to take into account the rebound issue"* while *"Middlemis asserts that the EPR are adequate to address Domain precinct rebound issues at detailed design"*.

### **14.3.2 Submissions**

The EPA indicated that main environmental risks were with the potential mobilisation of contaminated groundwater plumes during construction, and the migration of contaminated groundwater along tunnel structures, or intersecting with other sub-surface structures. Such tunnel works would either intersect contaminated groundwater or interfere with groundwater flow. The EPA indicated it is aware of contamination beneath a former industrial site close to Precinct 5, and that it was possible for mobilised contaminated groundwater to intersect other sub-surface structures (causing vapour exposures). It indicated *"EPA supports a rigorous establishment of baseline conditions through monitoring as a critical stage in developing the mitigation measures and detailed design of the Project."*

*The assessment of risk should also be assessed immediately prior to and during construction works*”, and recommended:

- additional site-specific data be collected across key groundwater parameters to better inform the risk assessment and development of mitigation measures prior to construction
- in developing the CEMP and Site Environment Implementation Plan (SEIP), that Precinct-specific GMP be adopted
- tunnel infrastructure should be suitably tanked, where any collected tunnel groundwater is treated for disposal in accordance with EPA policy.

In its final submission on EPR, the EPA sought some refinements to EPR GW3 which were not adopted by the MMRA that related to ‘beneficial uses’ and the interaction with the EPA in determining the GMP.

Many submitters were concerned about the potential for ground settlement due to groundwater drawdown and called for monitoring, clear communication and consultation protocols. These included Anglican Church of Australia – Christ Church, North Melbourne Football Club, Federation Square, MGS, the Ross House Association, MATC and G12+. The MGS requested to be advised of the proposed method for disposal of groundwater inflows to tunnel infrastructure and on any findings from implementation of the GMP that could potentially impact its premises.

The North Melbourne Community Group represented the concerns of some 90 residents, and pointed out that the planned tunnel alignment calls up “*a very shallow tunnel*”, under what is predominantly a residential area, with concerns of potential structural damage (homes and basements) and potential impacts to mature trees. S109 noted:

*The soils at Arden Station and along the North Melbourne tunnel segment are of high permeability (lots of voids in the soils) and varying, which are very vulnerable for large ground settlement and differential settlement, damaging the ground and houses, during the construction and operation.*

The South Kensington Residents contended:

- proposed cut and cover construction for the tunnel portal would impact both residential and commercial buildings from ground heave and settlement
- JJ Holland Park was subject to potential settlement risk
- Concept Design ‘Option A’ was inferior to ‘Alternative Option B’, where risks to existing structures could be mitigated, with tunnel cut and cover and the TBM retrieval shaft located further to the west (no surrounding buildings).

Submission S23 raised concerns about the impact of the tunnel under the Yarra River and related long-term maintenance concerns. The submitter referred to the previous CityLink-Burnley Tunnels experience, where significant groundwater inflows to constructed tunnels occurred, requiring long-term aquifer reinjection. This submission raised the issue of settlement under existing bridges and sensitive infrastructure items.

The University of Melbourne considered groundwater drawdown from construction could pose a risk, where existing contaminated groundwater plumes located near the Parkville Campus for the University may migrate into its land. They sought an EPR to address contaminated groundwater migration, consultation during the preparation of the GMP, and

communication protocols in the event of issues occurring. RMIT was generally satisfied with groundwater impacts, although it sought the EPR include *“a site-specific risk assessment, monitoring and development of relevant controls for RMIT impacted properties.”*

The Arts Centre Melbourne requested an improved understanding of the expected temporary impact from tunnel construction and groundwater drawdown on their building assets, and of related impact mitigation strategies.

## **14.4 Discussion**

The Committee notes the comprehensive nature of the groundwater investigations and models that have been completed to-date for the Concept Design, which provide extensive information to assess the impact of the Project on groundwater. Suitable referral to key legislative controls and associated guidance have been identified and referred to by the EES.

### **14.4.1 Groundwater drawdown and recovery effects**

Appropriate investigation, monitoring and modelling of the subsurface and groundwater needs to be undertaken in close integration with detailed design, construction and operation so that all key risks are identified, understood and suitably managed. Groundwater monitoring and modelling should be used to expose errors in either the understanding of groundwater conditions and the implication on the design, construction and operation of the tunnel. MMRA have confirmed that such additional groundwater investigations, monitoring and modelling is ongoing.

The risk assessments completed to-date have indicated groundwater-related risks to and from the Project are generally grouped between ‘Very Low to Low’, without the completion of detailed design and the deployment of mitigation treatment contingencies. The Committee agrees with this conclusion, although it acknowledges that to address currently identified data-gaps in the understanding of risk, detailed design needs to be completed. This will include additional investigations, monitoring and modelling of the Project and its effect on groundwater.

Groundwater can seep into excavations for underground structures, which if unmitigated, can result in groundwater drawdown surrounding tunnel structures across both construction and operation (but particularly through construction). This groundwater drawdown, if left unmitigated in certain settings, may result in an impact to groundwater dependent assets such as surface water bodies, groundwater dependent mature trees and existing groundwater bore users or operators (such as CityLink).

The Haack ratings that formed part of the concept design response to minimise groundwater drawdown impacts are not specified in the EPR but would provide clear performance measurement criteria to be followed.

For areas of proposed open cut, or cut and cover construction (Precincts 2 and 8, and associated rail track decline structures) and station boxes at Precincts 3, 4 and 7, these excavations will result in a relatively short-term, yet significant groundwater drawdown, where following construction and tanking (general proposed Haack Rating of 2), groundwater levels should recover into the operation stage (it is noted that Precinct 4 is planned to be designed for a Haack Rating of 3 due to particular geological conditions). This is reflected in Table 7.

Table 7 Summary of Haack Rating Tunnelling Watertightness – Permissible Daily Inflows

Haack Tightness Rating	Moisture Characteristics	Intended Use	Watertightness Descriptive Definition	Permissible Daily Leakage Water Quantity (litres/sq. m for a reference length of 100 m)
1	Completely dry	Storerooms and workrooms, restrooms.	The wall of the tunnel lining must be so tight, that no moist patches are detectable on the inside.	0.01
2	Substantially dry	Frost-endangered sections of traffic tunnels; station tunnels.	The wall of the tunnel lining must be so tight, that only slight, isolated patches of moisture can be detected on the inside (observed as discolouration). After touching such slightly moist patches with a dry hand, no traces of water should be detectable on it. If a piece of blotting paper or newspaper is placed upon a patch, it must on no account become discoloured as a result of moisture absorption.	0.05
3	Capillary wetting	Route sections of traffic tunnels for which Tightness 2 is not required	The patches of moisture reveal that the wall all of the lining must be so tight that only isolated, locally restricted patches of moisture occur. Restricted patches of moisture reveal that the wall is wet, leading to a discolouration of a piece of blotting paper or newspaper if placed upon it – but no trickling water is evident.	0.1
4	Weak trickling water	Utility tunnels	Trickling water is permitted at isolated spots and locally.	0.2
5	Trickling water	Sewage tunnels		0.5

**Table 1 Notes:** Haack (1991) 'Water Leakages in Subsurface Facilities: Required Watertightness, Contractual Matters, and Methods of Redevelopment', Tunnelling and Underground Space Technology, Vol. 6, pp 273-282, 1991.

### (i) Possible impact to groundwater users

EES investigations and expert advice suggested that due to the groundwater levels in the study area and the presence of relatively lower permeability paleovalley sediments, it is unlikely that groundwater along the Project alignment contributes significantly to major the waterway flows.

For the existing CityLink groundwater system recharge bores situated near the Project alignment, groundwater modelling of the combined unmitigated impacts for Precinct 6 and the Linlithgow Avenue EAS, gave a predicted groundwater drawdown of less than 1 metre at the most sensitive CityLink bores. Such a drawdown may impact on the effective aquifer recharge rate that these injection bores need to work to for the maintenance of aquifer pressure within paleovalley sediments.

EPR GW1, GW2, GW3 and GW5 set out suitable monitoring and mitigation controls to ensure that the detailed design would achieve acceptable groundwater drawdowns at both the CityLink bores and other confirmed groundwater users (if impacted by the Project).

Relevant water authorities within Victoria often provide a 'rule of thumb' control on the level of resultant aquifer drawdown that may impact a groundwater user as defined above. This rule assesses the potential reduction in saturated groundwater bore screen within the

aquifer. If the length of saturated bore screen is not reduced by any more than 10 per cent from the aquifer impact, it is generally viewed as being an acceptable impact.

**(ii) Possible impact to inter-connected surface water bodies**

EES investigations and expert advice suggested that due to the groundwater levels in the Project area and the presence of relatively lower permeability paleovalley sediments, it is unlikely that groundwater along the Project alignment will contribute significantly to the major waterway flows.

With the previous construction of the CityLink tunnels, it was observed that the larger ornamental (eastern) ponds within the Royal Botanic Gardens responded with reduced water levels due to groundwater drawdown. The Project tunnels are proposed to pass these same ponds approximately 700m to the west, where the tunnels through this zone will be TBM-bored. The Committee considers that due to the separation distance involved and other factors, the protection of this groundwater dependent asset can be suitably managed through proposed mitigation measures.

EPR GW1 to GW5 set suitable monitoring and mitigation controls to ensure the protection of various surface water bodies across both the Project and study areas.

**(iii) Possible impact from long-term change in groundwater level (South Yarra Sewer Main)**

The EES discussed that re-construction of the South Yarra Sewer Main will be required where it runs near the proposed tunnel alignment near the south end of the Domain Station box (Precinct 7). The subsequent realignment and repair of this 100 year aged sewer main is likely to result in this repaired section being more watertight. Following the completion and tanking of the Domain Station box into operation, groundwater levels could potentially rise-up to levels that are higher than what currently apply at this location.

Evidence on behalf of MGS indicated that some building basements within MGS may not have been previously structurally designed to cope with buoyancy effects from such a water table intrusion. This type of risk can be catered for through EPR GW1, GW2, GW3 and GW5, which set out suitable monitoring and mitigation controls, and provide for predictions for longer-term groundwater recovery associated with such an event (and associated mitigation measures for groundwater control, if deemed to be required).

**(iv) Station boxes and shafts – consideration for buoyancy uplift on tanked structures**

The Committee questioned the MMRA on the aspect of buoyancy effects on certain underground structures for the Project, and a response was provided in TN74, with key findings including:

*In certain cases (particularly for the Station Boxes), the results of the buoyancy assessment indicated that the self-weight of the walls, slabs and roofs of the structure were insufficient to alone resist buoyant uplift.*

*To address these issues, the design of each Station Box has included the provision of tension piles. These piles are heavily reinforced concrete elements that extend down from the base slabs into the ground.*

**(v) Possible acidification impact from groundwater drawdown**

The potential for acid sulphate contributing soil or rock that may be present along the alignment to contribute to the release of acid and dissolved metals into groundwater, following groundwater drawdown and exposure of soil and rock formations to oxygen, has been thoroughly assessed through the EES investigations.

Groundwater EPR GW1 to GW5 provide a suitable control framework to understand and control groundwater drawdown effects associated with this risk, which is currently estimated as 'Low'.

**14.4.2 Migration of surrounding legacy groundwater contamination**

Associated with groundwater drawdown (which results in a regime change in the shape and slope of the water table), there is the risk of where existing groundwater chemical contamination at areas in, or close to the Project alignment may be present. Groundwater EPR includes monitoring and mitigation measures to control groundwater drawdown, therefore controlling the ability for such contaminants to migrate and impact upon surrounding areas (EPR GW1, GW2, GW3 and GW5).

For contaminated groundwater that inflows into the tunnel excavations and structures, this collected water will require a high level of understanding on water quality, capture and containment. Disposal of water to sewer under a Tradewaste licence with the responsible Water Authority is the likely treatment scenario. It is expected that for both the predicted inflow volumes, as well as the incumbent dissolved salt loading in the water, an agreement can be reached with the water authorities for licenced water disposal. EPR GW4 is the main control for this aspect, and is supported by EPR GW2, GW3 and GW5.

**14.4.3 Consolidation settlement from aquifer drawdown or depressurisation**

Significant ground movement associated with groundwater drawdown and the associated consolidation settlement of sediments could occur wherever tunnel infrastructure (cavern-mined tunnels, station boxes, shafts and portals) is constructed, close to paleovalley areas. EPR GW1, GW2, GW3 and GW5 set suitable monitoring and mitigation measures to assist with the control of groundwater drawdown, and controlling the depressurisation of compressible sediments, to avoid excessive ground movements.

**14.4.4 Potential for aquifer damming from tunnel infrastructure**

Based on the Concept Design, the potential for tunnel structures to create an effective 'dam' or barrier to disrupt and significantly alter groundwater flows, both down-gradient and up-gradient of the tunnel alignment has been assessed as 'Low'. EPR GW1, GW2, GW3 and GW5 provide suitable monitoring and modelling measures to further confirm this risk understanding.

**14.5 Findings**

The Committee finds that the groundwater for the Project should be suitably managed within the regulatory framework established by the EP Act, SEPP– Groundwaters of Victoria, the Incorporated Document, the EMF and EPR.

The risk assessments completed to-date have indicated groundwater-related risks to and from the Project are generally grouped between 'Very Low to Low' with the current



understanding (without the completion of detailed design and the assumed deployment of mitigation treatment contingencies). The Committee agrees with this conclusion, although it acknowledges that to address currently identified data-gaps in the understanding of risk, detailed design needs to be completed. This will include additional investigations, monitoring and modelling of the Project form and its effect on groundwater, where the associated risks shall be further confirmed.

The Committee considers that some of the suggested changes to the EPR proposed from witnesses and submitters have merit and several of these (where applicable) have been integrated into the EPR. Provided these EPR are closely understood and followed, they should provide a robust, yet flexible set of environmental controls (capable of including innovation) relating to groundwater protection for all future Project stages.

The Committee concludes that:

- TBM-bored tunnel construction is to be water tightness Haack Rating 3
- Application of diaphragm main support wall construction with toe-grouting of these diaphragm walls for those Station Boxes where sediments are located (Precinct 3 and Precinct 7)
- Tanking all other key tunnel structures to Haack Rating 2 (except for Precinct 4, which will be to Haack Rating 3).

Some additional modifications to the Groundwater EPR are required to address this and are included in Appendix F. In particular, EPR GW1 is amended to reflect that for the case of existing, registered groundwater bore users, for the assessment of a tolerable groundwater drawdown criteria, drawdown level should not exceed the point where the available average saturated aquifer thickness of the bore is reduced by further than 10 per cent. EPR GW2 is amended to ensure that the groundwater model geometry set-up (node and grid network of model and layering definition), is to be accurately matched into the Project's detailed design excavation geometry.

The relevant EPR have been amended accordingly, as provided in Appendix F.

## 15 Ground movement and land stability

Ground movement and land stability impacts are addressed in Chapter 19 of the EES, in Technical Appendices O and P.

The draft evaluation objective of the Scoping Requirements in relation to ground movement at 4.7 is:

*To avoid or minimise adverse effects on land stability that might arise directly or indirectly from project works.*

The following evidence was called in relation to ground movement:

- MMRA - Anthony Bennett of AJMJV
- Melbourne Grammar School - James Hargreaves of Meinhardt
- The Graduate Union - Stephen Payne of Bonacci Group
- The Westin - David Doolan of 4D Workshop.

EPR GM 1 to 6, specifically dealt with matters relating to ground movement and land stability.

### 15.1 Key issues

The Committee considers that the key issues relate to:

- potential ground movement impacts on existing buildings and infrastructure during tunnel construction and operation
- presence of significantly varying and complex geology along the alignment, creating challenges and risks for tunnelling which can increase settlement impacts
- implicit key assumptions made by the Concept Design that affect predictive modelling outcomes and risk of impact predictions.

### 15.2 What did the EES say?

Extensive geotechnical and hydrogeological investigations were conducted in the EES. These document fill, soil, rock and groundwater conditions for the study area to allow a preliminary risk assessment across ground movement and land stability aspects for the Project. The study area was wider than the Project area to account for ground movement generated through groundwater drawdown.

The following potential ground movement mechanisms were considered with the EES impact assessment:

- underground excavation-induced ground movement (TBM-bored, or cavern-mined tunnels and cross-passages)
- open-cut, excavation-induced ground movement (shafts, cut and cover)
- consolidation settlement (from groundwater drawdown, or the placement of new fill loads onto sediments)
- slope instability, where existing rail line slope cuttings require widening.

The EES conducted separate estimates across various ground movement mechanisms for the Concept Design for important buildings or structures, or where geology posed a higher risk of ground movement. Where a range of ground movement mechanisms were possible at a

location, various potential ground movement predictions were superimposed together. It indicated many buildings, particularly those with shallow footings, are already subject to seasonal movements, from the shrinking and swelling of clay soils. The EES acknowledged that buildings and structures respond differently to various forms of ground movement, depending on size, type of design, material, footing style and general flexibility.

#### **(i) Development of preliminary assessment inputs and models**

The impact assessment considered ground movement from both excavation-induced settlement and consolidation settlement from dewatering. Preliminary assessment inputs included interpreting current geology and hydrogeology knowledge into a 'Conceptual Site Model' and estimating preliminary input parameters for predictive numerical computer models (considering construction techniques and geology).

Chapter 14 of this report describes how hydrogeological modelling provided predictions for groundwater inflow and drawdown/depressurisation across both tunnel construction and operation stages. This allows estimates to be made for consolidation settlement from compressible sediment depressurisation.

The modelling output of excavation-induced settlement was then assessed, to describe a 'Potential Zone of Influence'. Potential Zones of Influence have been mapped out within the EES for the various Precincts (EES Figures 19-1 to 19-5).

#### **(ii) Impact assessment**

In assessing potential impacts from ground movement, the EES considered buildings, infrastructure (rail and trams), utilities, parklands and waterways. The impact assessment classed buildings and structures across three step-wise 'Levels of Assessment': 1 to 3, where detailed assessment of the impact (such as a building) depended on the estimated level of risk resulting from the initial (Level 1) assessment (if the risk estimate was suitably low, such as to provide a 'Negligible' risk rating, further consideration was not continued). Section 5.3 within EES Technical Appendix P describes this approach.

Those aspects that initially rated the highest risk as 'Medium' (pre-mitigation measures) included:

- staging of excavations during construction:
  - disrupting rail lines (Precinct 2 and tunnels between this portal and Precinct 3)
  - disrupting tram lines (Precinct 6)
  - damaging Telstra tunnels (Precinct 6)
- tunnelling methods encountering higher rock strength than expected
- varying geology (paleovalleys) causing construction delays and tunnelling adjustments, leading to increased ground movement
- TBM tunnelling causing 'ground heave' from excessive TBM face pressurisation for shallow cover areas.

Where pre-mitigation risk predictions were considered as unacceptable within the EES, Project-specific EPR were assigned as a recommendation to reduce risk predictions to what was considered an acceptable level.

### (iii) Independent peer review from EES

An independent peer review of the EES ground movement and land stability assessments was undertaken by Dr Bennet. Dr Bennet indicated that the impact assessment across buildings and structures had been suitably assessed for the Concept Design. Regarding TBM tunnelling and settlement predictions based on volume face loss assumptions, Dr Bennet indicated that the EES assumptions “*were reasonable in terms of the current intended construction methods*”. Dr Bennet observed that the EES looked at impacts from the operational stage of the Project, as well as for construction. He offered that the targeted Project ratings for tunnel structure water-tightness were “*internationally accepted*”.

Dr Bennet highlighted the requirement for stakeholder engagement to be advanced to establish suitable acceptability criteria. He noted that “*There are major services and infrastructure which are of State importance in proximity to the Project and attention to this detail is essential*”. Key stakeholder liaison was suggested for:

- CityLink – Project interface and the elevated Western By-Pass piers
- City Loop (Melbourne Underground Rail Loop) - Project interface
- CBD Telstra cable tunnels
- West Melbourne Terminal station and associated transmission towers
- major utility services, including high -pressure gas main at JJ Holland Park
- Melbourne Water, including North Yarra Sewer and South Yarra Sewer mains.

Dr Bennet’s review of the relevant EPR pointed out that the assumed mitigation measures considered in the impact assessment to be deployed across various buildings, civil infrastructure, utilities and parklands, were not clearly translated into the EPR.

## 15.3 Evidence and submissions

### 15.3.1 Evidence

MMRA provided the Committee with updated information to the existing EES, relating to additional geotechnical and hydrogeological studies through TN08. Mr Bennett appeared on behalf of MMRA. He noted model predictions from the EES used rock formation response parameters to excavations and loadings that were matched to moderate rock strain levels (where a lower rock stiffness modulus applies). These same modelling parameters may not be appropriate for use when establishing deformation behaviour models under Future Development Loadings (where lesser rock strains may apply).

Mr Bennett pointed out that in relation to conducting suitable engagement with various stakeholders, but particularly, owners of major infrastructure assets, EPR GM3 sets a process for consultation as part of the GMP. Mr Bennett conducted the additional review of the Project’s ‘Geological Long Section’, the associated bore log data to this (TN08) and the Interpreted Geological Setting EES Summary Report, Golder Associates (1 August 2016). He noted for the tunnelling section between Precincts 5 and 6, two main differences had evolved from the Conceptual Site Model originally developed for the Concept Design:

- more weathered rock was noted to greater depth, and more information on rock structure extent had become available (resulting in Melbourne Formation rock estimated strength and stiffness over the planned extent of cavern-mining being less than previously assumed)

- additional investigations found a ‘paleo-channel’ feature “filled with clay” between Flinders Lane and Flinders Street (previously the Conceptual Site Model assumed ‘weathered rock’ at this location).

Mr Bennett indicated that, to maintain ground stability in these weaker ground conditions, ground support systems would need to be both stronger and stiffer than previously assumed. He referred to TN24, which discussed potential changes to ground support to meet EPR for ground movement. He indicated that additional computer numerical modelling checks were conducted to assess this change in both assumed ground condition and proposed tunnel support. He offered “*The modelling indicates that the net effect of these changes are minor in terms of ground movement at buildings, and thus by inference, the impacts on adjacent buildings at the surface are also not changed significantly from the EES assessments*”.

Mr Bennett noted that some implications from additional field testing had not yet been analysed to allow revision of ground movement calculations, but it was expected that proposed mitigation measures associated with the management of groundwater drawdown “*would be equally effective under the current conditions as anticipated under the EES assessment*”. He stated that the previous assessment of effects of ground movement would remain appropriate.

Mr Bennett noted that EPR GM1 requires an evolving Conceptual Site Model to be maintained to reflect new data and understanding of conditions, such as the additional information expected from the to-be-completed St Paul’s Cathedral 30-day aquifer pumping test. He indicated that his review of the potential design changes would not alter his original assessment that the types of impacts from ground movements would be similar to those described by the EES. He advised the EPR would form an appropriate governing framework.

Mr Bennett commented on TN11 in relation to the proposed tunnelled link (an adit) for underground high-voltage electrical cables from the Franklin Street shaft to CBD North station. He reviewed the proposed construction approach for this adit, which passes beneath the City Baths at a depth of approximately 25m below ground surface. In relation to potential differences in predicted ground movement, if the adit was considered in isolation as an effect feature, due to its depth, it was estimated that the feature would lead to an elastic surface settlement of approximately less than 4mm. He offered that if this was matched to settlement predictions from the Concept Design, the previously determined Potential Zone of Influence whilst slightly altering in its extent, would not extend into existing buildings that had been previously determined as being outside of this zone.

Mr Bennett indicated “*the EPRs would remain an appropriate framework within which to govern the construction of the Project. The EPRs describe good practice for the management of ground movement in a way that is not limited by particular geology or construction type.*”

In responding to questions, Mr Bennett said the proposed EPR would provide sufficient robustness to cope with changes in design, and in dealing with significant alteration in either Project vertical infrastructure alignment or plan (sideways) alignment shifts. Suggested EPR changes offered by Mr Bennett to apply to EPR GM4 covered:

- sharing and record-keeping of information in relation to pre- and post-condition assessments for buildings and structures

- ensuring suitable stakeholder engagement activities via the Community and Stakeholder Engagement Management Plan.

In response to concerns raised by several submitters about the shallow tunnel depth under North Melbourne, the MMRA pointed out that the tunnel vertical alignment here must meet a set of functional requirements including:

- recognition of topography
- recognition of local geology and hydrogeology
- targeted plan locations and preferred depth of linking stations considering engineering cost to construct, and other longer-term logistical factors (such as people-moving out of the tunnels).

The MMRA advised that most of the testing investigations and modelling of this lower-cover tunnel area to-date suggests that tunnel construction using the TBM-bored approach will not result in unacceptable levels of ground movement. It indicated that significantly increasing tunnel depth in this area would require the significant lowering of either, or both Arden Station and Parkville Station, where this is not a desirable outcome for many construction-based factors (the base of Arden Station sits within water-charged, soft, compressible sediments) or other operational factors. The MMRA submitted that *“the lowering of tunnel depth in North Melbourne is highly undesirable”*.

For Precinct 7 in relation to submissions requesting a cavern-mining approach for Domain station, the MMRA noted:

- cavern-mining construction would require a significant number and size of construction areas at the ground surface
- the station cavern would need to be lowered to encounter suitably improved rock conditions than required under a cut and cover method
- the relatively deep weathering of the Melbourne Formation would require the station platform to be lowered by 15m for a mined-cavern approach
- to this increased depth it would not be desirable for similar construction cost, and operational and logistical reasons (as stated for Precinct 3)
- it would cause considerably larger amounts of tunnel spoil to be generated out of this Precinct (with associated higher truck movements)
- construction for the station would take up to four to six months longer.

MMRA reinforced in its closing submission *“Cut and cover construction should be considered the most likely and practical method available for Domain”* and suggested *“the Committee should reject any proposal that cavern construction be mandated as the preferred construction technique, and should instead preserve design flexibility and innovation through the tender process”*.

In his evidence, Mr Payne advised that the Graduate Union premises is susceptible to ground settlement that could result from both ground movement and vibration impacts from the Project. He suggested further issues to be addressed include:

- key stakeholder discussions
- use of ‘real-time’ monitoring for easy access of rapid feed-back ground movement measurements with time across construction

- consideration of active mitigation measures before Project construction commences, including fill strengthening below shallow footings, or underpinning of the structure's footings into underlying rock.

Mr Doolan of 4D Workshop appeared on behalf of the Westin, which is integrated structurally with the City Square car park, and stated:

- the cavern-mined excavation will extend to estimated depths of between 15m to 35m below ground and into the City Square property
- there is no other detail of planned underground construction methods within the EES for locations close to the Westin, apart from general reference to the use of "soldier piles or similar retaining walls" for localised ground support
- the shared basement's perimeter retaining wall system currently relies on the basement and ground plane floor slabs to provide a permanent lateral restraint to the retaining walls (where these slabs act as 'props', taking and sharing load from the perimeter retaining walls).

Mr Doolan expected that construction will require demolition of a portion of the existing basement carpark beneath City Square. This will have potentially significant structural loading implications on the Westin building (out-of-balance lateral forces caused by demolition required to be taken-up elsewhere by the building or by unsupported retaining walls). Mr Doolan commented that the Westin building shares its eastern retaining wall boundary with the adjacent Regent Theatre, and this retaining wall was designed to share lateral loads from ground surcharge on the Regent Theatre side. This raises the potential for any redistribution of lateral loads across the Westin building to impact upon the Regent Theatre, which is a more brittle masonry structure.

Mr Doolan suggested that under-mining of existing pad footings supporting the Westin building may occur along its western edge, as the proposed base-level for cavern-mining is well below this existing pad-footing level. He indicated that detailed design will need to consider associated risks with ground movement on the Westin building, in particular ground movement prediction and land stability covering lateral restraint of the existing buildings and integral retaining wall systems, consideration against the undermining of existing building footings, and anticipated ground movements.

### **15.3.2 Submissions**

The issue of ground movement and land stability was a related concern to the issue of groundwater impacts. Ground movement concerns were listed by over 40 submitters, with key issues being potential for property damage, compensation for any damage and for property reports to be undertaken prior to works, including Federation Square, the MATC and others (S221, S370, S222, S326 and S367).

Heritage Victoria indicated that the Project alignment passes either under or close to many places included in the VHR where 36 of these include structures that may be impacted. A significant number of these are located between CBD - North station and the southern end of the Princes Bridge. It indicated "*Although the EPR for Noise and Vibration, Ground Settlements and Historical Cultural Heritage provide comprehensive directions toward mitigating impacts on places in the Victorian Heritage Register, Heritage Victoria advocates more clarity around the mitigation measures, particularly in regard to vibration and ground*

*settlement to limit the possible risk of impact*". The Shrine of Remembrance Trustees requested a detailed pre-and post-condition survey be conducted for its Memorial.

Melbourne Health raised concerns that given the age of the majority of its hospital buildings, the currently assigned EES risk rating of 'Negligible to Minor' for ground movement damage was considered to be too low. Melbourne Health was particularly concerned about the impact of TBM tunnelling immediately adjacent to its structures on Grattan Street, and called for use of detailed building condition surveys to protect structures.

RMIT pointed out that from the EES, a total of 25 ground movement impacts were identified from the risk assessment, where eight of these were directly applicable to RMIT (most these eight risks were initially rated as 'Medium', but when mitigation measures were assumed, risk ratings dropped back to a typically 'Low' rating). RMIT requested it be engaged in discussions with MMRA to firm-up acceptability criteria for its buildings and structures.

The Melbourne Arts Centre raised concerns for temporary impacts during construction to buildings (Hamer Hall and the Theatres Building) associated with groundwater drawdown. It sought to understand the proposed techniques and mitigation strategies earmarked for implementation. This submission requested that as soon as possible, actual measurements should be undertaken (survey and building condition) to understand Project impacts. The Centre questioned that if performance monitoring showed implemented mitigation measures were not proving effective, what additional mitigation measures could be introduced to ensure no impact to buildings.

The G12+ raised concerns about the choice of cut and cover construction versus the cavern-mined option in Precinct 7. It expressed concern across the issues of building condition surveys, the standards or criteria that would apply when assessing for building damage, the complaints procedure that followed from incurred building damage, the monitoring regime to be enacted across construction, and how this would be proven as an independent process. Many submitters requested pre-condition building surveys be undertaken.

The Anglican Church of Australia raised concerns about its surrounding ancillary buildings/school in relation to building damage from ground movement.

Submission S266 questioned the possibility of high risk of damage to their recently renovated building which is in close proximity to the TBM retrieval shaft in Precinct 8. This submitter requested a building condition survey be undertaken. Submissions S08 and S09 raised concerns regarding general ground movement and associated physical impacts onto property. Submission S12 raised land slippage. Submissions S59 and S369 raised concerns about structural impacts from tunnelling and called for building condition surveys.

Submissions S155, S250, 258 and S285 (all within North Melbourne) raised concerns about proposed shallow tunnel depth and potential structural damage to existing property buildings. S258 and S285 called up the need for building condition surveys and S258 called for suitable stakeholder communications plan for residents. Submissions S299 to S301 raised concerns of the tunnel alignment and shallow depth and settlement impacts. These submissions called for closer community engagement. The North Melbourne Football Club expressed concern regarding potential property damage from tunnel construction.

Submitters from Precinct 3 raised concerns over the impact of the tunnel alignment and shallow tunnel depth on land stability, ground movement and in some cases, called for



building dilapidation surveys (S23, S95, S109, S119, S134, S142, S146, S155, S203, S207, S216, S217, S220, S253, S299, S300, S301, S228, S327 and S350). The North Melbourne Community Group requested condition reports for all homes within the area of construction prior to works commencing, with a commitment for prompt compensation for any property damage.

## **15.4 Discussion**

### **15.4.1 Ground movement and instability across construction**

Concerns for adverse impacts to buildings and civil infrastructure from the community are widespread when considering ground movement risk. Ground movement can occur through either excavation-induced settlement, consolidation induced settlement from groundwater dewatering or the impost of new surface loads onto underlying compressible sediments, or from vibration-induced settlement (such as within a relatively loose fill).

Most concern relates to the ground movement and associated impacts that are anticipated to occur across what is a relatively extended Project construction period. In certain situations, this concern is well-justified (where current EES risk assessment indicates a 'Moderate' risk of impact, even with the deployment of proposed mitigation measures during construction). Significant planning and care will be required to ensure that settlement damage is controlled and not exacerbated by either construction or the incorrect use of proposed mitigation measures. Mostly, this concern is minimised given the proposed construction methods, planned mitigation measures and setting.

EPR GM3 requires a GMP to be developed which will address the location of structures that may be susceptible to ground movement, and provide further definition of the currently assumed Potential Zone of Influence moving to detailed design.

### **15.4.2 Managing impacts to buildings and infrastructure**

The general process used through the EES for assessing impacts to buildings, civil infrastructure, services and parklands is sound, and is one commonly deployed for many international recent tunnelling projects. The adopted general risk management framework allows for various iteration cycles across the appraisal of buildings and infrastructure as additional Project information continues to feed-in (improving the understanding of impact risk). MMRA noted it is an even-handed, risk-driven process, which uses the same general approach, regardless of building or structure age, or ownership, heritage significance or depth to the nearby tunnel excavation or open excavation. If the process identifies that buildings or structures are potentially at risk, this leads into a more detailed analysis, to improve the risk understanding. This then allows (as detailed design progresses) for more suitable risk mitigation measures to be designed and implemented for construction.

The Committee notes the vertical constraints posed by a tunnel alignment through North Melbourne and that this gives rise to a heightened risk of impacts and uncertainty for residents. However, the Committee accepts the evidence that the risks are acceptable in the context of the Project. It considers the EPR provide a sound framework for managing any impacts, noting pre and post condition surveys of potentially affected buildings and structures as well as mitigation works planned.

### 15.4.3 Monitoring and verification studies

The effects of Project construction will require close monitoring of key indicators across the construction period and into operation. This may include hydrogeological conditions, rock stress fields, ground surface and sub-surface movements, building or structure movements and observations for any structural or functional distress to buildings or structures. Monitoring results should be used in a 'feed-back loop' to better inform, calibrate predictive models and verify, or improve upon the assumptions for the Project's design, selection of construction method and selected monitoring and impact mitigation measures.

EPR GM1 to GM5 provide primary guidance on these requirements.

### 15.4.4 Requirements for flexibility with EPR

It is important to have carefully-crafted, yet adaptable EPR for ground movement and land stability that promote a robust, yet innovative design and construction approach. They must be able to deal with changes between the Concept Design, detailed design and Project construction and operation stages. MMRA indicated in closing that the relevant EPR must:

- address updated and changing geological and hydrogeological conditions as interpreted and modelled
- establish a reliable monitoring baseline and continued monitoring regime, across critical influencing factors (such as groundwater levels) as well as performance outputs (responses such as ground movement and building distress observations)
- provide for establishment of suitable structural and functional condition surveys for potentially impacted buildings, structures, services or utilities along the Project alignment (prior to construction)
- establish a range of potential mitigation measures fully documented within plans to ensure that agreed performance criteria for buildings and other structures are not exceeded
- establish a continued and suitable monitoring program across soil, rock and groundwater into the construction stage
- set requirements for any required rectification works (post-construction).

## 15.5 Findings

The Committee finds that the management of ground movement and land stability for the Project can be suitably managed within the regulatory framework established by the EP Act, P&E Act, the Incorporated Document, the EMF and the relevant EPR. The Committee finds the investigations and modelling undertaken for the Concept Design are appropriate for the assessment of potential impacts from ground movement and land instability. The proposed EPR for ground movement and land stability guide suitable procedures which:

- establish a suitable conceptual site model
- predict ground movement for the detailed design, based upon the construction methodology
- assess the effects of ground movements on building and other structures, and whether these effects are acceptable (with key stakeholder consultation)
- prepare risk mitigation measures tailored to the various Precincts

- establish existing conditions for the Project (pre-construction), including the state of buildings and structures, ground movement and hydrogeology
- monitors for ground movement as construction proceeds, with comparison of ground movement performance to original predictive models (detailed design)
- instigates corrective actions, if such monitoring indicates responses outside of original model predictions
- provide repairs to damage caused by construction.

Critical data-gaps must be addressed through the detailed design period leading to construction, to ensure that implemented mitigation measures across identified potential impacts to buildings, civil infrastructure and utilities are suitable, well-designed and effective in meeting assumed risk control targets. The importance of continually involving key stakeholders who own or operate the buildings, structures, services, utilities and parklands/waterways that may be subject to a ground movement risk was raised as a strong requirement, moving through the detailed design and construction stages for the Project. This requirement is suitably included throughout EPR GM2 to GM6.

The Committee finds the potential range of ground movement and instability issues identified from the EES and through the Hearing for the Concept Design are not considered unusual for this type of major urban tunnelling project. Generally, there are suitable and available mitigation treatments to address the identified risks.

The Committee agrees that the residual risks from ground movement and land stability are generally low. Notwithstanding, the Committee acknowledges that to address currently identified data-gaps in the understanding of Project risk, the detailed design component of the Project needs to be completed. This requires additional geotechnical and hydrogeological investigations, monitoring, building/structure conditions surveys and modelling, which all need to be undertaken in close integration with detailed design, construction and operation. This process will allow key risks to be further confirmed, understood and suitably managed.

The EES impact assessment assumed some implicit mitigation measures associated with Project components, which according to Dr Bennet, had not been clearly translated into the EPR. To avoid any future misunderstanding, these assumptions should be fully understood, so that future designers and contractors for the Project are aware of the base assumptions from the risk appraisal of the Concept Design. Moving to detailed design, other innovative design and construction methods may be allowed across Project components, provided they at least performance-match these original base assumptions in the EES when looking at outcomes for groundwater inflow to structures, drawdown and ground settlement.

The Committee considers that suggested changes to the EPR proposed from experts and submitters have considerable merit and several of these (where applicable) have been included in the EPR. Provided these EPR are closely understood and followed, they should provide a robust, yet flexible set of environmental controls (capable of including innovation) relating to protection from ground movement and land instability for all future Project stages. The Committee finds that the modification to EPR GM2, which recognises assumed mitigation measures from both the EES and post-EES, will ensure risks to ground movement and instability remain low to negligible.

The relevant EPR have been amended accordingly, as provided in Appendix F.

## 16 Contaminated land and spoil management

Contaminated land and spoil management are addressed in Chapter 20 of the EES, and in Technical Appendix Q.

The draft evaluation objective of the Scoping Requirements in relation to contaminated land at 4.8 is:

*To protect waterways and waterway function and surface water and groundwater quality in accordance with statutory objectives, to identify and prevent potential adverse environmental effects resulting from the disturbance of contaminated or acid-forming material and to manage excavation spoil and other waste in accordance with relevant best practice principles.*

The MMRA provided evidence from David Coutts of AJMJV.

EPR C 1 to 4, specifically dealt with matters relating to contaminated land.

### 16.1 Key issues

The Committee considers that the key issues relate to:

- potential contamination of fill along the alignment
- risk of legacy groundwater contamination along the alignment
- management of the handling and disposal of significant volumes of tunnelling spoil
- management of ground gases and chemical vapours in the subsurface.

### 16.2 What did the EES say?

#### 16.2.1 Typical contaminants

Extensive investigations were undertaken for the EES and Concept Design identifying a number of contaminants. The EES provided a detailed description of the Project's investigation and monitoring methods conducted to-date, and a risk-based description of the Project's anticipated impacts across construction and operation stages.

Sites within Precincts 2 and 3 have a long history of land reclamation and industrial land use, which may have resulted in land contamination (soil, groundwater and associated vapour emissions). Typical soil contaminants in the Project area may include petroleum hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), chemical solvents and metals. Fill impacted with asbestos containing materials or asbestos fibre should be expected and appropriately planned for during Project demolition, construction and excavation works.

Certain underground geological formations along the alignment have been identified, which are expected to have a higher probability to produce acid sulphate soil (in the case of Coode Island Silt) or rock (in the case of relatively fresh, Silurian-aged, Melbourne Formation siltstone). Disturbance and oxidation of this material can produce sulphuric acid discharge. In other geological formations, such as paleovalley sediments at Precincts 2 and 3, and near the Yarra River crossing, there are naturally occurring sources of organics and associated potentially hazardous ground gases (methane, carbon dioxide and hydrogen sulphide).

In urban areas which have been subject to historical industrial or manufacturing land uses, there are areas of significant soil and groundwater contamination from both petroleum hydrocarbons and chemical solvents. These chemicals can easily move from a pure 'separate' phase, 'absorbed' phase in soil, or a 'dissolved' phase in groundwater, to produce a 'vapour' phase into the subsurface (such as volatile organic compounds). Disturbance to either soil or groundwater can result in the production of, and rapid migration of these gases/vapours into various items of underground infrastructure.

### **16.2.2 Spoil Management Strategy**

The EES indicated that spoil (soil or rock) from the Project will require removal off-site as there are generally no available on-site options to re-use the projected large spoil volumes.

#### **(i) Spoil management**

Project spoil will need to be both classed and managed as waste in accordance with the EPA Industrial Waste Resource Guidelines. EPA's Waste Management Hierarchy applies in guiding spoil disposal options. Waste avoidance (minimising the amount of produced spoil from tunnelling) is the most preferred management action, where actual disposal of the spoil (such as what may occur with licensed, off-site landfill disposal) is the least preferred.

The EES Spoil Management Strategy set requirements for the contractor to develop a Spoil Management Plan to manage and monitor aspects of spoil generation, handling, testing categorisation, storage and disposal. The EES indicated that this would be an over-arching plan, with various sub-plans covering:

- acid sulphate soil and rock management
- contaminated soil management
- plans for associated monitoring for spoil handling and disposal.

#### **(ii) Clean fill re-use**

For Clean Fill, provided the material meets the requirements as set out in EPA's Industrial Waste Resource Guidelines, the following potential re-use options may apply:

- bulk infill for quarry rehabilitation (northwest and southeast metropolitan area)
- engineering fill for future infrastructure projects
- concrete, aggregate and brick production
- daily cover soil or capping material for landfill cells

With these above-listed potential uses, the onus is on the waste generator to demonstrate to the EPA that the deployed re-use will not affect the receiving environment.

#### **(iii) Disposal of prescribed industrial waste**

The EES recognised EPA's Industrial Waste Resource Guidelines in managing Prescribed Industrial Waste (PIW). It outlines the reasoning on why several of the potential listed options within EPA's Waste Hierarchy are very limited for the Project due to its urban footprint. The EES pointed out that with the disposal of materials to off-site licensed landfills (the least desirable option in the Waste Hierarchy), the major environmental impacts related to these landfills are associated with the considerable volumes of municipal putrescible waste that enters them, where, if the respective volume of contaminated soil from the

Project are compared to this much larger putrescible waste volume, it should not be viewed as a significant additional impact to the community.

The EES position in relation to treating contaminated soils as a waste stream resource, rather than taking the non-preferred option of landfill disposal, noted for significant volumes of contaminated soil ear-marked for waste disposal, EPA Publication 1589 requires an assessment of practicable accessibility regarding treatment of the waste soil versus landfill disposal. This assessment requires aspects of treatment technical applicability, treatment cost and logistical matters to be considered.

Of the commercial facilities that treat contaminated soils in Victoria, the EES indicated most of these *“are mainly focussing on the thermal treatment of organic contaminants in the soil”*. There are 18 licensed landfills within the Melbourne metropolitan Melbourne, where four of these (located to the north-west of the CBD) are licensed to accept ‘Category C’ PIW. One of these landfills (Lyndhurst) is currently able to receive ‘Category B’ PIW. None of these landfills can directly receive ‘Category A’ PIW (where pre-treatment is normally required).

EPA statistics were provided for waste soil disposal to landfill from Year 2000 onwards, and showed a rate varying from 250,000 to 630,000 tonnes per year. The EES stated *“The north-west landfills currently all have significant capacity to take waste soils”*. The EPA noted that tunnel excavations through fill may encounter asbestos containing materials. This waste needs to be suitably managed in accordance with Worksafe Victoria OH&S regulations and the EPA’s Industrial Waste Resource Guidelines.

#### **(iv) Disposal of acid sulphate soil and rock wastes**

The EES pointed to EPA’s Waste Acid Sulphate Soils Industrial Policy (Publication 655.1) for the suitable management of these wastes. The EES indicated the potential for an on-site treatment for acid forming materials may be limited due to site logistical constraints (a space-restricted, sensitive urban environment). As such, it is more likely that such waste materials will need to be suitably transported to an off-site facility, where *“this off-site facility would be required to have an EPA-approved Environmental Management Plan”*. Further *“There are a number of facilities in the metropolitan Melbourne area that could accept the type and quantity of waste acid sulphate soil that the Project may generate”*. For waste acid sulphate soil, four options were listed in the EES to manage this off-site.

#### **(v) Temporary stockpile areas**

The EES indicated that it may be necessary, whilst undesirable (if spoil characteristics are unknown, or the spoil cannot be removed off-site at a point in time for logistical reasons) to temporarily stockpile acid waste spoil on-site. The Spoil Management Strategy from the EES indicated *“based around excavation and removal to an off-site location in an expeditious manner (a staged approach involving stockpiling prior to off-site re-use or disposal is not being planned)”*. For logistic purposes, temporary waste soil stockpiling areas are proposed at all construction sites across the Precincts, with significantly larger temporary stockpiling areas designated for Precincts 2, 3 and 7. The EES flagged the establishment of these temporary stockpiling areas is likely to require EPA approval.

**(vi) Site remediation of contaminated soil**

Consistent with the Waste Hierarchy, the EES indicated that where encountered soil contamination, either adjacent to or below the Project alignment does not pose an unacceptable risk to human health or the environment, it may be left in-situ. If contaminated land either on, or within the vicinity of the Project area is determined to restrict beneficial uses of that land, the EES indicated that the land will require management to reduce contamination risks to an acceptable level. The EES pointed to several mitigation measures that could be deployed to reduce the risk of residual contamination to human health and the environment (such as capping-off contamination, to disrupt available exposure pathways to receptors). The EES pointed to the NEPM (1999 and 2013), which provide guidance across the preferred order of management options, where the most preferred approach is for an on-site treatment of the contamination.

**16.2.3 Impact assessment**

The EES estimated that for the management of TBM spoil, up to 613,000m<sup>3</sup> of spoil will be generated from this excavation method, which is unlikely to pass through urban fill zones. It is expected that TBM spoil will not create any 'Category A, B or C' waste, with spoil expected to classify as either Clean Fill (65 percent), or acid sulphate soil or rock (35 percent). For this spoil management, temporary stockpiles are expected to be established at three main material staging areas, being Precincts 2, 3 and 7 under an EPA approved EMP. Soil will be classified before being disposed off-site.

The EES anticipated that tunnel construction between Precincts 2 and 3, (and within the tunnel stretch in the vicinity of the Yarra River between Precincts 6 and 7) may cause disturbance, and intersect ground gases such as methane and hydrogen sulphide from sediments. Within the actual tunnel structures, gas migration is expected to be generally limited by the type of tunnel lining to be deployed (relatively impermeable to gas ingress). Tunnel ventilation across both construction and operation is expected to significantly dilute any minor gas or vapour ingress. The EES indicated that during tunnel construction, if gas or vapour is encountered under a strict air monitoring and OH&S protection regime, tunnelling methods can be adjusted (such as pressurisation of the TBM face and surrounds). The EES indicated that between the tunnel stretch from Precincts 4 to 5, there is a significant contamination groundwater site nearby (the former Carlton United Brewery). This site has documented contamination from both petroleum hydrocarbons and chlorinated solvents.

EES investigations of groundwater from monitoring wells detected dissolved volatile organic compounds in groundwater that may be associated with this land, or perhaps from other surrounding sites that may be subject to contamination. Further investigation of this risk is proposed. The expected risk of impact from gases or vapours either to or from the Project are anticipated from the EES to be 'Low' and EPR are proposed to deal with these risks.

**(i) Precinct 2 – Western portal**

Precinct 2 tunnel construction works include excavations for the tunnel decline structure and cut and cover tunnel segments, piled structures, and the TBM shaft.

The EES indicated the Project area is predominantly on VicTrack land, where surrounding lands have a history of industrial use ranging from abattoirs, soap and candle manufacturing, manure and bone works, glue works and flour milling. Land reclamation occurred in this

area in the late 1800s, where significant in-fill was placed across what were former marsh and swamp areas. The EES stated there is high potential to encounter legacy industrial contamination in both soils and groundwater (including asbestos).

The EES suggested that with the presence of Coode Island Silt, there is some potential for ground gases to be disturbed during construction. The EES indicated *“Specific mitigation measures could be incorporated into the remedial options assessment and health, safety and environmental plans for the management of hazardous substances developed by the Contractor to meet the recommended EPR”*.

The EES indicated that groundwater quality is relatively poor, with high total dissolved solids concentrations and notable dissolved concentrations of ammonia, iron and manganese. It indicated across construction approximately 10 to 45m<sup>3</sup> per day of groundwater inflow may occur, requiring treatment/management. The EES indicated that legacy contamination in shallow groundwater adjacent to the construction area may be drawn into the tunnel excavation and structure, where it will require suitable collection and treatment for licensed disposal to sewer.

#### **(ii) Precinct 3 – Arden Station**

Precinct 3 construction works cover the tunnel excavation, TBM launch site and station box construction at Precinct 3, which is expected to be constructed by the cut and cover ‘bottom-up’ method.

The EES indicated a large portion of this land was reclaimed from low-lying swamp land in the late 1800s, and since that time has been generally subject to heavy industrial usage (rail yards, concrete batching production, grain and stockfeed storage, flour milling and biscuit manufacture). More recent land uses have included light to heavy industrial industries such as automotive repair facilities, fuel service stations, workshops, printing works, concrete and asphalt manufacturing plants, foundries and mills. There is high potential to encounter legacy industrial contamination in both soils and groundwater which could include asbestos.

The estimated distribution of spoil and associated waste material types for Precinct 3 is shown in Table 13-1, Technical Appendix Q. These volumes may prove to be highly variable, both in type and contamination profile. With the presence of Coode Island Silt, the EES indicated there is some potential for ground gases to be disturbed during the construction stage, that could result in a short-term release of gas and associated odour (as in Precinct 2).

The EES indicated that groundwater for this Precinct is generally shallow and quality is relatively poor, with high total dissolved solids concentrations and notable dissolved concentrations of metals and metalloids, cyanide, fluoride, nitrite and ammonia. The EES suggested that with construction, groundwater inflows of between 125 to 185m<sup>3</sup> per day will require collection, treatment and management for licensed disposal from the station box (potential legacy contamination).

#### **(iii) Precinct 4 – Parkville Station**

Precinct 4 construction works cover the tunnel excavation, station box and underground pedestrian connections for Parkville station. The station box is expected to be constructed by the cut and cover ‘top-down’ method.



The EES indicated that historically this land has been used as the Melbourne 'Hay and Pig Markets', as well as other industries (such as galvanising facilities, timber merchants and furniture manufacture). The distribution of spoil and associated waste types for Precinct 4 is shown within Table 13-1, Technical Appendix Q.

No site-specific groundwater contamination plumes or volatile organic compounds have been identified from the EES investigations. The EES indicated that within a search radius of one kilometre from Precinct 4, records show up to at least six contaminated groundwater sites documented by EPA, as Groundwater Quality Restricted Use Zones (where dissolved volatile organic contaminants or other contaminants are known to be present).

The EES indicated that groundwater in the Precinct is relatively deep (between depths of 8m to 12m below ground surface level), where groundwater will be encountered with construction. Groundwater quality is poor with total dissolved solids ranging between 8,000 mg/L to 12,000 mg/L. The EES indicated that Parkville Station will be designed for a 'Haack Rating 3' water tightness class (as opposed to Haack Rating 2 for other station boxes), mainly due to the siltstone geology, where groundwater inflows and resultant drawdown influence is estimated to be on a relatively lower scale.

#### **(iv) Precinct 5 – CBD North Station**

Precinct 5 construction works cover the tunnel excavation (cavern-mined), underground pedestrian connection to Melbourne Central station and Franklin Street shaft construction.

The EES indicated that historically this land has been used for a variety of commercial, educational and residential uses, as well as for transport infrastructure. Noted uses included previous industrial and commercial activities, including factories, saw mills, timber yards, lead works and foundries. The former Melbourne Hospital (built in the 1860s) was located across the city block bounded by Lonsdale, Russell, Swanston and Little Lonsdale Streets. The former brewery site was located near the northwest corner of Swanston and Victoria Streets. This site is a documented large contaminated groundwater site, which has an EPA Groundwater Quality Restricted Use Zone (with documented petroleum hydrocarbon and chlorinated hydrocarbon solvent impacts to groundwater). There are at least three significant groundwater contamination sites (each with a Groundwater Quality Restricted Use Zone), which have been identified close to (within a one kilometre radius) this Precinct. The distribution of spoil and associated waste types for Precinct 5 is shown within Table 13-1, Technical Appendix Q.

Groundwater investigations indicated various concentrations of dissolved volatile organic compounds, as well as dissolved nitrate (where the nitrate was estimated by the EES to be possibly sourced from either leaking sewers or drainage infrastructure). The EES suggested that the proposed cavern-mined construction method is likely to result in groundwater inflows of between 210 to 480m<sup>3</sup> per day, which will require collection, contamination treatment and management for licensed disposal. As this is to be a drained structure across the construction period, significant groundwater drawdowns are anticipated, which will have the potential to force the migration of other surrounding contaminated groundwater plumes into this excavation.

**(v) Precinct 6 – CBD South Station**

Precinct 6 construction works cover the tunnel excavation (cavern-mined), underground pedestrian connection to Flinders Street station and Federation Square. The pedestrian access points are expected to take the form of access shafts, located at the northeast corner and southwest corner of the cavern station.

The EES indicated that historically these lands have been used for a variety of commercial, educational, and residential uses, in addition to transport structures (such as tram stops). The distribution of spoil and associated waste types for Precinct 6 is shown within Table 13-1, Technical Appendix Q. Most of the fill and soil material to be excavated with the development of Precinct 6 should classify as Clean Fill, where a smaller proportion is expected to classify as a PIW, due mainly to metals. At the base areas of the station box, fresher Melbourne Formation siltstone is expected to be encountered, which may be classified as acid sulphate rock.

There are no known nearby contaminated groundwater plumes from published or available records within the immediate search area, where no significant impacts from contaminated groundwater or soil gases and vapour-phase contamination are expected. Groundwater investigative sampling in this area encountered dissolved ammonia, sodium, chloride, magnesium and fluoride.

The EES suggested that the proposed cavern-mined construction method to be deployed is likely to result in groundwater inflows of between 175 to 450m<sup>3</sup> per day, which will require collection, contamination treatment and disposal management. Significant construction groundwater drawdowns are anticipated, which will have potential to migrate other surrounding groundwater plumes into this excavation.

**(vi) Precinct 7 – Domain Station**

Precinct 7 construction works covers the excavations for TBM launching and retrieval as well as the station box.

The EES indicated that the station box for Precinct 7 will be constructed by cut and cover methods using a mixture of 'bottom-up' and 'top-down' methods. The distribution of spoil and associated waste types for Precinct 7 is shown within Table 13-1, Technical Appendix Q.

There are no known contaminated groundwater plumes from published or available records within the immediate search area, where no significant impacts from contaminated groundwater or soil gases and vapour-phase contamination are expected. Groundwater investigative sampling encountered dissolved metals/metalloids (arsenic, iron, manganese, magnesium, molybdenum, nickel and selenium), as well as other inorganics such as ammonia, fluoride, sulphate, chloride and sodium.

The EES suggested that construction for Domain station is likely to result in groundwater inflows of between 125 to 185m<sup>3</sup> per day, which will require collection, contamination treatment and disposal management. Significant groundwater drawdowns are anticipated, which will have potential to force migration of any other surrounding groundwater plumes to this excavation.

**(vii) Precinct 8 – Eastern portal**

Precinct 8 construction works covers the excavations for widening of the existing rail corridor and placement of retaining walls, the tunnel decline structure, TBM shaft, EAS and related services and infrastructure.

The EES indicated that there is limited Project investigation data of the quality of soil and groundwater at the portal area (due to the busy operational nature of this railway land). It is anticipated that shallow soils may contain those contaminants typically encountered on railways lands which include petroleum hydrocarbons, PAHs, metals and asbestos. The distribution of spoil and associated waste types for Precinct 8 is shown on Table 13-1, Technical Appendix Q.

There are a significant number of surrounding groundwater contamination source sites nearby to the portal, where groundwater sampling has previously reported dissolved metals, volatile organic compounds and separate-phase oil (or otherwise known as 'non-aqueous phase liquid'). The EES indicated that any lowering of the groundwater table within the area of the portal may result in a cone of groundwater drawdown forming, drawing any surrounding nearby groundwater contaminants towards the area. Any legacy contamination within shallow groundwater, adjacent to the construction area that is drawn into the excavation area will require suitable collection and treatment for licensed disposal. Vapour-phase impacts resulting from the presence of both dissolved volatile organic compounds within groundwater and non-aqueous phase liquid contamination may need to be managed under a specific OH&S plan.

**(viii) Precinct 9 – Western turnback**

Precinct 9 construction works are anticipated to be limited for this area (compared to other Precincts) and covers the construction of a new railway platform with other modifications to the concourse area at West Footscray station with a new rail track and turnouts provided. The EES indicated that the expected volumes of spoil to be generated from works are significantly smaller compared to other Precincts.

It is anticipated that shallow soils may contain those contaminants typically encountered on railways land petroleum hydrocarbons, PAHs, metals and asbestos. The EES indicated that no significant management requirements are anticipated in relation to contaminated regional groundwater or soil gases or vapour. Any shallow perched groundwater as encountered, may require management and disposal (relatively small volumes expected).

**16.3 Evidence and submissions****16.3.1 Evidence**

Mr Coutts noted the key risk aspects relating to contaminated land and spoil management:

- non-natural contaminated spoil (fill), particularly at the Precinct 2, eastern portal and Precinct 3 and throughout the CBD, where there has been a long history of potentially contaminating land use activities
- naturally occurring, potentially acid sulphate soil, associated with the presence of specific geological formations, such as Coode Island Silt, Werribee Formation and Brighton Group, that may become oxidised during construction

- with these formations most likely to be found at Precinct 2, Precinct 3 and Precinct 8 and in sections of the tunnels between Precinct 6 and Precinct 8
- interception of contaminated groundwater and/or vapour in the immediate vicinity of the Project boundary during construction, with potential exposure risks to workers and the environment.

Mr Coutts conducted an additional review of two Golder Associates reports and indicated:

- a total of 2,032,000m<sup>3</sup> of spoil (in-situ volume) would be generated by the Project (with 613,000m<sup>3</sup> to come from TBM tunnel spoil, 103,000m<sup>3</sup> from the two tunnel portals, and 1,316,000m<sup>3</sup> from station excavations
- of the above volume, a combined total of 48,500m<sup>3</sup> of spoil would be associated with acid sulphate soil (Coode Island Silt)
- with respect to acid sulphate rock, of the above volume, 568,000m<sup>3</sup> of this material would come from excavations within the Melbourne Formation siltstone

Mr Coutts provided the Committee with an adjusted summary of tunnel spoil volume estimates, and concluded from additional investigations the additional work provided “*an increased level of confidence in the estimation of the waste volumes and categorisation*”. He noted that the additional Project investigations had increased overall data confidence from ‘Low’ to ‘Medium’, based around the estimations for the ‘High’ volume case in-situ volume estimates. Further, the additional data provided “*an increased level of confidence in the assessment of risks and requirements for mitigation from contaminated soil, groundwater, vapour and ground gases*”.

Mr Coutts indicated that the additional post-EES investigations did not alter any previous risk profiling for the Project with respect to contamination or spoil management, and that there was no requirement to alter any of the associated EPR. He advised:

- anticipated volumes of tunnel spoil can be suitably accommodated within the existing waste management facilities in greater Melbourne
- with respect to the anticipated volumes of contaminated spoil classed as PIW, over 70 percent of this sits within the lowest ‘Category C’, where this a minor amount of the highest ‘Category A’ anticipated
- presence of asbestos containing material had been confirmed within certain fill zones to be excavated
- for acid forming rock, (representing most of potential acid forming materials to be excavated), this is more prevalent when below a typical depth of 25m from ground surface level, when it is then excavated or disturbed.

With respect to groundwater contamination, Mr Coutts observed:

- low dissolved concentrations of volatile organic compounds were noted in groundwater in Precincts 4 and 5
- within an area of one kilometre from the Project boundary, there are at least 28 EPA defined Groundwater Quality Restricted Use Zones (two in the Project area).

He concluded that there are anthropogenic sources of groundwater contamination located across the Project area, which are likely to be encountered and managed during tunnel construction and operation.

In relation to investigation for potential vapours and soil gases, Mr Coutts noted that additional post-EES investigations had indicated methane gas at Precinct 3. There was presence of solvent vapour emanating from contaminated fill at Precinct 3 (this fill is expected to be removed by the Project in association with station box excavation). Mr Coutts suggested that ground gases are unlikely to present an ongoing risk to sensitive receptors, and indicated that with respect to vapours associated with the large contaminated site at the former Carlton United Brewery in Precinct 5, further groundwater investigations were already underway for improved risk evaluation.

Mr Coutts summarised that additional investigations continue across the Precincts to further improve upon the general understanding of contamination distribution, risk appraisal and planning for Project mitigation measures. The EPR associated with contamination and spoil management were considered as appropriate, where some amendments had been suggested to the exhibited EPR C3 (and subsequently adopted by the MMRA).

### **16.3.2 Submissions**

The EPA recommended that further site-specific data be collected to identify and mitigate against the following risks:

- *the disturbance of potential and actual acid sulphate soils during construction; and*
- *the storage, transportation, treatment and disposal of excavated contaminated materials.*

The EPA encouraged the maximum re-use of materials on-site, with appropriate off-site management of contaminated soil or rock, where they pointed out the requirement to closely follow the guidance within the *Environment Protection (Industrial Waste Resource) Regulations, 2009*. It observed that “*there are ongoing environmental risks associated with groundwater during Project operations. Risks associated with vapour penetrating the Project infrastructure are included*”.

The EPA recommended that as part of the general CEMP and SEIP, Precinct-specific GMP be developed and implemented to suitably manage groundwater impacts, including the risk of mobilisation and migration of contaminated groundwater.

Submissions S243, S247, S248 and S286 proposed the adoption of ‘Option B’ for Precinct 2, and suggested transporting produced tunnel spoil, by way of mechanical conveyor line, to a loading point alongside the Maribyrnong River for barged disposal into Port Phillip Bay.

The City of Melbourne pointed out that flood mitigation and contamination remediation are issues that VicTrack and government agencies will need to address in Precinct 3, to facilitate the proposed urban renewal of the Arden Macaulay area.

The University of Melbourne provided the following concerns:

*The lowering of groundwater levels as a result of construction activities associated with the Project creates a risk that existing contaminated groundwater plumes located near the Parkville campus will shift to the University Land, beneath existing structures. There are at least six groundwater quality restricted use zones within a one-kilometre radius of Parkville Station. The potential impacts of plume migration include the*

*preclusion of groundwater beneficial uses and the potential vapour intrusion into underground structures. ...*

The University of Melbourne submitted that the EPR be amended to require assessment of the potential for groundwater contamination migration, require consultation in the preparation of a GMP involving construction activities which may have an impact on its land, and include communication protocols. Further:

*... where the University is at risk of adverse impacts from spoil management and the temporary on-site stockpiling of contaminants, the EPRs should require the University to be involved in developing any site Spoil Management Plans and Construction Environment Management Plans*

RMIT contended that groundwater drawdown was the primary risk exposure pathway for its campus with respect to contaminated groundwater plumes ingressing with construction dewatering, associated with the potential movement of these contamination plumes under its properties (precluding certain beneficial uses of the groundwater and exposing staff and students to potential chemical vapour impacts). RMIT offered modifications to the GW EPR, many of these relating to contamination identification and management.

Federation Square requested further information on details associated with the management and handling of contaminated land and soil likely to impact on its site operations. It submitted that *“While it is acknowledged that the Project will have stringent controls in place, it is foreseeable that there will be instances that will require additional scrutiny”*. It requested to be provided with greater detail in relation to local management of clean fill and prescribed waste within the precinct, as well as ongoing consultation.

The Westin argued that the EPR do not provide sufficient remedial measures if tunnel spoil was mis-managed, and underground tunnelling in this area could include *“the ability to convey spoil and dirt through the tunnel to a localised site outside of the City for extraction”*.

Residents 3000 Inc suggested potential safety concerns from the trucking of tunnel spoil from the station cavern, and recommended an alternative construction method (through use of connecting tunnels to evacuate spoil, as opposed to removal from mined-cavern construction shafts), which would enable spoil to be conveyed outside of the CBD area.

## **16.4 Discussion**

The Committee notes the comprehensive investigations in planning for contaminated land and tunnel management which have been completed to-date, which extensive information with which to assess the impact of the Concept Design. Legislative controls and associated guidance have been identified and referred to in planning for contaminated land and spoil management.

### **16.4.1 Excavations in variable urban fill – potential hazardous substances**

Surrounding potential exposure pathways to sensitive receptors (humans and the environment) for contaminants associated with fill need to be closely examined. This will require the use of various site monitoring and contamination techniques to check across these potential pathways, to ensure they are closed or suitably restricted by mitigation measures, such that they do not pose a significant risk to humans or the environment. Such monitoring or sampling techniques may include dust monitoring and sampling, real-time

monitoring for chemical vapour presence in air, and visual appraisal of the excavated fill for consistency and signs of change.

#### **16.4.2 Requirements for handling, stockpiling and treatment of spoil**

The EES stated *“The largest potential environmental impacts relevant to contaminated land are associated with the generation, handling, storage, treatment and disposal (and or re-use) of spoil”*. The Project is anticipated to encounter and disturb large volumes of both natural and fill materials (currently estimated at over 2 million m<sup>3</sup> as an in-situ volume), which the Committee understands may pose a significant logistical issue.

The MMRA pointed out while the scale of the spoil volume is relatively large, discussions with various off-site treatment facilities within logistical range of the Project for transport and spoil processing indicate that the issue can be managed. Importantly EPA have been involved in this planning process with MMRA for off-site spoil disposal, where it has indicated that proposed EPR were *“reasonable and practicable”*.

#### **16.4.3 Temporary stockpiling areas for tunnel spoil**

The EES indicated that areas within the Project for construction will be used for some temporary stockpiling of tunnel spoil. Any inappropriate estimating of tunnel spoil volumes, testing classification for contamination status, cartage, placement and final end-treatment of spoil has the potential to lead to adverse impacts on human health and the environment.

#### **16.4.4 Contaminated groundwater**

Project investigations indicated there are a significant number of existing contaminated groundwater sites (or chemical ‘plumes’ in the groundwater) close to the Project area. These contaminated groundwater sites typically can consist of an inorganic impact (metals or nutrient overload (like nitrate) and potentially an organic impact (where this can originate from historical fuel or oil storage, or the historical use of industrial solvents, such as that used in dry cleaning industries).

Significant Project groundwater drawdowns are proposed, associated with station construction and to a lesser extent the tunnel portals (for instance with the proposed CBD North and South station construction, it is estimated that groundwater levels will require draining and lowering by up to approximately 22m). This dewatering which is likely to occur for up to at least two to three years with construction will create localised change to the groundwater flow regime. This change can result in contaminated groundwater plumes migrating towards the Project area, which will effectively form a groundwater collection ‘sink’ during construction at certain areas.

This action is likely to result in the need for the Project both across its construction and operational stages to be able to collect, manage, treat and dispose of contaminated waters.

The discussed changes in the groundwater flow and level regime which are expected through portions of the Project area and immediate surrounds, have the potential to alter the current groundwater contamination status of both documented (known) and unknown (not known to the EPA) contaminated sites in the area. This has the potential to alter the availability of groundwater and preclude certain beneficial uses associated with groundwater to humans and the environment. Changes to the groundwater chemical plumes can alter associated soil vapour balance.

### 16.4.5 Ground gases and vapour

Ground gases (such as methane) have the potential to be generated from sediments such as Coode Island Silt, where this may be encountered across either tunnel boring or station and portal excavations across construction. Methane gas has been confirmed as being present in Precinct 3.

Subsurface vapours (such as volatile organic compounds) emanating from existing contaminated soil or groundwater sites, either within or nearby to the Project area, can be mobilised through construction dewatering operations, causing a localised change to the groundwater flow direction with lowering of the water table.

Existing subsurface vapours may be physically displaced (forcing them to migrate elsewhere) from adjacent Project construction activities, such as:

- TBM air pressurisation (provided at the excavation face of the TBM in weaker soils for improved soil support during tunnelling)
- subsurface formation pressure grouting ('grout-proofing') when constructing the tunnels or station boxes
- pressure injecting fresh water into underlying aquifer systems to recharge aquifers that become depressurised from construction activity.

Ground gases and soil vapour have the tendency to migrate rapidly through preferred migration flow pathways in the subsurface rock, soil and overlying fill. Both have the tendency to accumulate to higher concentrations within underground spaces and voids, closer to the ground surface (such as underground utility pits, cellars and basements), where they can either:

- form a potentially explosive atmosphere for particular conditions of vapour concentration, oxygen and an ignition source
- they may form into toxic concentrations to both humans and other organisms (such as either volatile organic compounds or carbon dioxide).

## 16.5 Findings

The Committee finds that management of contaminated land and associated tunnel spoil for the Project should be suitably managed within the regulatory framework established by the EP Act, SEPP - Prevention and Management of Contamination of Land, the NEPM, the Incorporated Document, the EMF and EPR related to contaminated and spoil management.

Additional investigation, sampling and monitoring of subsurface fill, soil, rock, groundwater and ground gases/vapour needs to be undertaken in close integration with detailed design, construction and operation, so that all key risks are further identified, understood and suitably managed. MMRA have confirmed that additional investigations and monitoring across this discipline are continuing.

The potential range of contaminated land and spoil management issues identified from the EES and continuing through Project detailed design process are not considered unusual for this type of major urban tunnelling exercise. Generally, there are suitable and available mitigation treatments to address identified risks.

Risk assessments discussed through the EES and the Hearing indicated that currently identified land contamination and spoil management risks to and from the Project are



generally grouped as being between 'Very Low to Low' as a starting estimate (without the completion of detailed design, but assuming the deployment of future most-likely mitigation treatment contingencies). The Committee agrees with this conclusion, although it acknowledges that to address currently identified data-gaps in the understanding of risks from contamination, detailed design needs to be completed, where additional targeted contaminated land investigations, monitoring and modelling of the Project will be conducted.

The Committee finds that EPR C1 should be amended to include applicable regulatory requirements and to identify the nature and extent of spoil (clean fill and contaminated spoil) across all Precincts (and including additional spoil allowances from detailed design findings, such as tension piles added, to counter station box buoyancy effects).

The EPR will generally provide a robust and flexible set of environmental controls (capable of including innovation) relating to the suitable management of contaminated land and produced spoil for all future Project stages.

The relevant EPR have been amended accordingly, as provided in Appendix F.

## 17 Biodiversity

Biodiversity impacts are addressed in Chapter 21 of the EES, and in Technical Appendices T and U.

The draft evaluation objective of the Scoping Requirements in relation to biodiversity at 4.10 is:

*To avoid or minimise adverse effects on native terrestrial and aquatic flora and fauna, in the context of the Project's components and urban setting.*

The City of Melbourne provided evidence from Associate Professor Nick Williams of the University of Melbourne (who was not called to present). The MMRA did not provide evidence in relation to biodiversity.

EPR AE1 to 7 and FF1 to 3 specifically dealt with matters relating to biodiversity. EPR AR3 and NV4 addressed biodiversity impacts.

### 17.1 Key issues

The Committee considers the key issues relate to:

- potential impacts on terrestrial ecology due to the removal or disturbance of native or exotic habitat
- potential impacts to aquatic ecology through impacts to water quality specifically Moonee Ponds Creek.

### 17.2 What did the EES say?

#### 17.2.1 Terrestrial ecology

Chapter 21 of the EES described a highly urbanised environment with most original biodiversity values having been *“significantly disturbed, modified or destroyed”*. Due to the highly modified nature of the environment potential impacts are considered to be *“negligible”*.

In terms of threatened terrestrial flora and fauna species, the EES identified one threatened flora species, small burr-grass (*Tragus australianus*) which has been recorded within one kilometre of the proposed Project area but concludes it is *“highly unlikely”* to actually be present within the proposed Project area due to the environmental disturbance that has already occurred.

One threatened fauna species, the Grey-headed flying fox is known to forage in the proposed Project area in Fawkner Park and the Domain Parklands. A further two threatened fauna species, the Powerful Owl and Grey Goshawk were considered *“likely”* and *“possibly”* present within the proposed Project boundary however the areas impacted by the Project are *“not considered prime breeding areas for these species”*.

The Environmental Risk Register (Technical Appendix B) identified six possible risks related to terrestrial ecology. These included risks related to:

- potential and certain removal of trees (TE1, TE2, TE5), some which may provide habitat for the grey-headed flying fox in Fawkner Park (TE3) or roosting habitat for a variety of bird species (TE6)

- potential loss of vegetation or landscaping which may impact on non-critical habitat for birds (TE4).

With the implementation of proposed EPR FF1 to FF3, residual risks were considered to range from “Low” to “Very low”.

### 17.2.2 Aquatic ecology

As discussed in Chapter 13 the Project will involve tunnelling under both the Yarra River upstream of Princes Bridge and Moonee Ponds Creek downstream of Arden Street. Whilst these crossings will have no anticipated direct impacts on waterways, nearby open construction sites for portals, stations and the Western turnback have the potential for runoff stormwater to waterways within and beyond the proposed Project area. These waterways include the Yarra River (near Precinct 6), Moonee Ponds Creek (Precinct 3), Maribyrnong River (Precinct 2), Albert Park Lake (Precinct 7), Stony Creek (Precinct 9).

All of these waterways are described as “*highly modified*” in the EES and water quality is “*generally poor*”. The EES included an assessment of available records of aquatic fauna for each waterway, an assessment of the likelihood of EPBC-listed species existing in the area and an assessment of likely migratory species and their movements.

For the Yarra River, the Australian Grayling is considered “*likely*” to occur in the study area and both the Australian fur seal and Common dolphin were considered to “*possibly occur*” albeit only as an occasional visitor. Remaining identified EPBC-listed species were considered “*very unlikely*” to occur. The FFG-listed, Australian mudfish is also considered to migrate through the Yarra with juveniles moving upstream between September and December and larvae being swept to sea between June and August.

The Environmental Risk Register (Technical Appendix B) identified 12 possible risks related to aquatic ecology. These include stormwater runoff reducing water quality, accidental discharge of untreated surface waters, disturbance of river banks, disruption to fish passage, changes to river flow patterns due to groundwater drawdown and potential for contaminated water to enter Moonee Ponds Creek.

With the implementation of proposed EPR AE1 to AE7, residual risks were considered to range from “Low” to “Very low”.

## 17.3 Evidence and submissions

In its closing submissions, the MMRA reiterated the “*significantly disturbed*” nature of original biodiversity in the Project area and the likely negligible impacts. The MMRA rejected recommendations from the City of Melbourne for further investigations such as bird monitoring, stating that “*City of Melbourne has since agreed with MMRA’s position*”.

Assoc Prof William’s evidence tendered by the City of Melbourne focused on Precinct 3 and the adjacent Moonee Ponds Creek. While citing a “*long industrial history*” resulting in a “*low biological value*”, he observed a number of medium sized Eucalypt species in Precinct 3, which he considered may be providing important resources for native birds and should be retained if possible.

In describing the vegetation by the Moonee Ponds Creek immediately adjacent to Precinct 3, Assoc Prof Williams described “*areas of saltmarsh and shrubland dominated by native species*”. Further downstream he described “*more extensive saltmarshes and reed beds*”

which he considered could be classified as Ecological Vegetation Class (EVC) 9 Coastal Saltmarsh or 10 Estuarine Wetland which are considered endangered in the bioregion. The EES described this vegetation as EVC 992 “*waterbody fresh*” which does not appear to have a status (Figure 5-1 of Technical Appendix T).

Assoc Prof Williams stated that the diversity of habitats present on Moonee Ponds Creek coupled with their location creates a “*hotspot for avian biodiversity*” that is “*likely to be an important biodiversity corridor*”. In light of this, he identified an opportunity for the Project to enhance the area “*rather than preventing its realisation*” by relocating the existing substation and re-siting it with the new electrical substation in an alternate location away from Moonee Ponds Creek. This would, in his opinion, enable the existing site to be released for “*revegetation, biodiversity conservation and passive recreation purposes*”.

In relation to mitigation measures and the EPR, Assoc Prof Nick Williams recommended:

- a bird monitoring program for construction activities in Precinct 3 with trigger levels for further mitigation if a decline is observed
- additional EPR to address potential noise and vibration impacts to terrestrial biodiversity adjacent to the Precinct 3 (e.g., avoiding breeding periods, noise walls)
- additional EPR to address potential impacts from light pollution on biodiversity.

Despite this, in its response to the Version 3 EPR the City of Melbourne did not request any changes to the aquatic or terrestrial ecology EPR.

No other Councils called evidence or presented submissions with respect to biodiversity.

Naturelinks Landscape Management Pty Ltd noted that “*all trees within the construction zone have been earmarked as likely to be impacted*”. The submission explained the effort undertaken by the company to reinstate local vegetation in the area and the “*great returns of native birdlife*” that had occurred in response. It submitted that “*where practicable, any trees be preserved*” with specific concern raised for the River Red gum tree (AP072) which they described as a “*significant specimen*” which “*provides great habitat, and possibly pre dates European settlement of the area*”.

## **17.4 Discussion**

In relation to the classification of vegetation by the Moonee Ponds Creek immediately adjacent to Precinct 3, the Committee notes the source of data for Figure 5-1 is the Department of Environment, Land, Water and Planning (DELWP), 2015. The Committee understands DELWP were involved in the Technical Reference Group for the Project whose role included providing advice on the adequacy of technical studies and the main EES report prior to its release for public exhibition. There is not proposed to be any removal of native vegetation along the banks of the Moonee Ponds Creek, and the proposed EPR intended to protect aquatic ecology will ensure best practice measures are implemented to protect water quality in this area. Such measures will protect aquatic fauna species as well as adjacent vegetation.

In relation to light pollution, the Committee accepts that detrimental impacts to biodiversity from light pollution are well known. EPR LV3 requires the development of measures to minimise light spillage during construction. This EPR is aimed at minimising landscape and

visual amenity impacts on adjacent neighbourhoods, parks and community facilities. The Committee considers minimising light spillage for these amenity impacts during construction will minimise impacts on biodiversity.

There is not proposed to be any removal of native vegetation along the banks of the Moonee Ponds Creek, and the proposed EPR intended to protect aquatic ecology will ensure best practice measures are implemented to protect water quality in this area. Such measures will also protect adjacent vegetation.

The Committee notes that EPR LV3 requires the development of measures to minimise impacts from light spillage during construction but considers that light spillage as a consequence of the Project poses a minimal biodiversity risk.

In relation to noise and the suggestion for bird monitoring, the Committee considers the field assessment and review of records undertaken for Technical Appendix T were robust enough to conclude the Project area does not support any critical habitat for significant or threatened species. It therefore considers further monitoring and/or noise mitigation measures directed towards preventing impacts to birds is not warranted. In addition, the Committee considers the EPR to address noise from the perspective of amenity will reduce any impacts to fauna.

In relation to re-siting the electrical substation, the Committee considers that there is an opportunity to improve the current situation by relocating the substation together with the proposed Arden electrical substation at a new location. Having said that, the Committee considers that EPR to implement emergency flood management measures will appropriately manage risks to surface water quality and that the use of the existing substation land for biodiversity or recreational purposes is outside the scope of the Committee's Terms of Reference.

In relation to submissions calling for the retention of the River Red gum tree in Precinct 3 A072, the Committee accepts the assessment in Technical Appendix T that from a biodiversity perspective, loss of indigenous trees at this site will have a "*negligible consequence in relation to terrestrial ecology*", however the Committee does recommend the retainment of this River Red gum (A072).

## **17.5 Findings**

The Committee finds that in the context of the urban environment, the proposed EPR are acceptable to manage the potential impacts.

## 18 Arboriculture

Arboriculture impacts are addressed in Chapter 16 and 21 of the EES, and in Technical Appendices R and S. There was no draft evaluation objective in the Scoping Requirements relating to arboriculture, however of most relevance is the landscape objective:

*To minimise adverse effects on landscape, visual amenity and recreational values as far as practicable.*

The following evidence was provided in relation to arboriculture:

- MMRA - John Patrick of John Patrick and, David Galwey of Tree Dimensions
- City of Melbourne - Ian Shears of Melbourne City Council.

An expert witness conclave was held on 19 August 2016.

EPR AR1 to 5 specifically dealt with matters relating to arboriculture.

### 18.1 Key issues

The Committee considers the key issues to be addressed relate to:

- tree loss, primarily related to the landscape and heritage values of the trees to be removed within the Victorian Heritage listed St Kilda Road boulevard, Royal Parade, Tom's Block and within Grattan Street
- assessment of the useful life expectancy (ULE) of trees, replacement and management of trees and compensation matters.

### 18.2 What did the EES say?

The EES suggested that there will be approximately 900 trees removed as part of the Project. This number has been reduced by approximately 117 as a result of changes to the Project put forward by the MMRA.

The Project and associated infrastructure potentially interacts with trees at locations where works at, or close to, ground level would occur, including proposed stations, substations, and EAS. The construction of the Project will result in loss or damage to trees in the public realm for construction sites, construction access and temporary services.

Many of these areas are within some of inner Melbourne's most highly valued avenues and parks including the Domain Parklands and the Shrine Reserve, Royal Parade and Grattan Street, Swanston Street and St Kilda Road and Albert Reserve.

#### Precinct 1 - Tunnels

Map 9 of 15 Concept Design-Construction in the Map Book presented an EAS which may be required in the Domain Parklands. Technical Appendix R stated *"The requirement for access to the EAS from Linlithgow Avenue may potentially require the permanent loss of trees in the parkland for emergency vehicle access to the shaft"*.

#### Precinct 2 - Western portal

Precinct 2 is characterised with road reserves recently planted with juvenile species, and maturing brush box (*Lophostemon confertus*) and scattered larger specimens, such as a narrow-leaved peppermint (*Eucalyptus nicholii*) and spotted gum (*Corymbia maculata*).

The EES noted that approximately 50 trees and one row of large callistemon shrubs would need to be removed in this Precinct, mainly along the south side of Childers Street and at the south east end of Ormond Street. Nine of these were identified by the arborist as being Medium and Long Term Viability (MLTV) trees.

Both options for Precinct 2 require a similar number of trees and shrubs to be removed.

### **Precinct 3 - Arden Station**

The EES stated that approximately 120 trees, predominantly pepper corn trees and various gums, would require removal from the publicly owned (VicTrack) land on the west side of Laurens Street. Technical Appendix R stated that a mature River Red gum Tree AP072 (*Eucalyptus camaldulensis*), is located near the Laurens Street frontage within the VicTrack land and is proposed to be removed. Within the public realm, a single street tree (a London Plane tree) in Laurens Street (A002) is proposed to be removed as well as potentially four street trees in Langford Street.

### **Precinct 4 - Parkville Station**

The EES stated that there would be a “*high residual impact on trees in this precinct because of construction activities*”. These include the 22 visually dominant trees within the Grattan Street road reserve between Royal Parade and Leicester Street that would need to be removed to facilitate the cut and cover construction of the station box. Nine of these trees are large elms identified as MLTV trees. Within Royal Parade, in the area immediately north and south of the Grattan Street intersection, 10 VHR listed elms would require removal.

To accommodate the station entries within the University of Melbourne land and the University Square worksite, Technical Appendix R stated that:

*Thirty nine trees within the southern boundary of the University of Melbourne (all but one are MLTV trees) and 73 trees in total in the northern end of University Square above the underground car park and Barry Street road reserve would also require removal. Of these, 59 of the University Square trees are identified as MLTV trees due to their assessed ULE and age, however the plantings within University Square are modestly scaled and many have generally performed poorly.*

### **Precinct 5 - CBD North Station**

A total of 40 trees (including 24 of MLTV) would be removed from Franklin Street road reserve and the eastern end of A’Beckett Street (within the construction zone) as well as six trees on the corner of Swanston and La Trobe Streets (for station entrances).

No trees would be removed along Swanston Street in this Precinct.

### **Precinct 6 - CBD South Station**

The EES stated 24 trees (including 21 trees of MLTV, mostly Plane trees) will be removed from Precinct 6. This includes all the trees within the City Square and five trees on the western side of Swanston Street.

### **Precinct 7 - Domain Station**

The EES stated that “*there would be a high residual impact on trees in this precinct as a result of construction activities*”. The proposed station will require the removal of up to 223 trees with almost half identified in the EES as MLTV trees.

All trees within the St Kilda Road construction zone will be removed including mature Plane trees in the central median of St Kilda Road between Park Street and Toorak Road, as well as trees within part of the Shrine of Remembrance Reserve and the Albert Reserve. Trees in the central median of Albert Road, south of Albert Reserve, would require removal as part of the construction zone. Two trees on the southern boundary of the Edmund Herring Oval would require removal to provide construction vehicle access.

### **Precinct 8 - Eastern Portal (South Yarra)**

Construction would require the removal of 218 trees in this Precinct which include various species and sizes. The EES stated that approximately 100 of these trees have short life spans and would possibly require removal in the near future regardless of the Project, whilst 81 trees are of MLTV. The most significant of these trees is a mature palm (which could be transplanted) and a sugar gum which the EES stated should be retained and protected in the northern part of the South Yarra Siding Reserve.

Along the rail corridors, approximately 191 trees will be removed including Peppercorn trees, Elm and Robinia suckers, and Tree of Heaven (*Ailanthus altissima*), which is a declared noxious weed.

## **18.3 Evidence and submissions**

### **18.3.1 Removal of trees from the public realm**

The MMRA recognised that tree removal is a highly emotive issue, and that although a large number of trees are to be removed for the Project, this number is reduced by the Project being mostly underground and constructed by a TBM, rather than cut and cover for much of the Project. The MMRA and its expert arborist Mr Patrick suggested that the number is most likely to be reduced during detailed design as intended in EPR AR1.

During the course of the Hearing, the MMRA submitted that modifications to the Concept Design reported in TN14 (Swanston Street), TN16 (Fawkner Park), TN55 (EAS) and the EES have significant tree “*savings*”, which include the following:

- sixty nine trees in Fawkner Park
- sixty trees in Domain Parklands which will no longer be removed to pass over the CityLink tunnel
- two trees on Swanston Street will be retained due to the properties located at 65 and 67-73 Swanston Street no longer being required for acquisition.

Numerous submitters questioned the need to remove mature trees across the Project area. The MMRA stated in closing that “*it is necessary to remove mature and over mature trees to maintain the viability and character of streetscapes, and this is beneficial for management of the urban forest*”. Mr Patrick made reference to City of Melbourne’s *Urban Forest Strategy* that identified mature and over mature trees that required replacing in the next 10 years.

Mr Shears from the City of Melbourne stated in his evidence that:



*The City's open spaces, park networks and urban forest are highly valued by the community and provide fundamental environmental, social, cultural and economic contributions to Melbourne. These 'green infrastructure' components are critical elements of Council's response to rapidly growing population and a changing climate ...*

*... the liveability of Melbourne and the health and wellbeing of residents, workers and visitors is fundamentally linked to the green infrastructure of the city, and highlights the need for its preservation and enhancement as part of the construction processes and outcomes of the MMRP.*

The MMRA noted *"In relation to whether trees should be replaced individually, over time or by replacement of boulevard planting in blocks, there is substantial agreement that block replanting is the appropriate technique to be employed"*.

Friends of the Elms (S128) as well as other submitters urged mature tree loss to be avoided as much as possible, particularly elm trees.

Mr Shears stated that he noted through the EES that in places such as Parkville, Domain and Tom's Block, the residual risk remains high as the level of consequence cannot be further mitigated with EPR. Mr Shears urged that all trees be *"accurately surveyed, and all impacts and removals should be determined after TPZs are applied to each tree and then encroachment percentages determined"*.

### **Precinct 1 – Tunnels**

In regard to the proposed EAS between Precinct 6 and Precinct 7, the City of Melbourne raised concerns with both proposed locations – the Linlithgow EAS and the Tom's Block EAS – because of impacts to the landscape both from tree removal and the construction activity itself. The City of Melbourne stated that an EAS would represent the only surface level structure into Tom's Block which is not consistent with other park infrastructure and that this is *"an unacceptable precedent"*. Council's submission suggested that *"locations adjacent or on existing roads are preferred as they reduce the need for hardstand areas thereby minimising impacts. Options may include a location in Tom's Block adjacent to Linlithgow Avenue, rather than in the centre of the park, or within the road reserve itself"*.

Mr Patrick stated that the EAS location in Tom's Block is preferred over the EAS location within the Queen Victoria Gardens.

MMRA submitted TN55 which confirmed that the Project no longer required an EAS after further consultation with the Metropolitan Fire Brigade, however the MMRA submitted that they still might require the site at Linlithgow Avenue for a temporary secondary access to the TBM for tunnelling.

With regard to the issue of the duration of the impact of the loss of trees from the public realm, Mr Patrick stated that the mitigation should be primarily focused on replanting and re-establishing amenity to the streetscape.

The Domain Parklands are identified in the City of Melbourne *Open Space Strategy* as having a Capital City and State level role. The City of Melbourne stated *"such open spaces are 'iconic and synonymous with the character and identity of Melbourne and often used to stage activities and events of international, national, state and metropolitan importance"*.

## **Precinct 2 – Western portal**

Mr Shears did not make specific comment on this precinct in his evidence.

Mr Patrick stated that trees within this precinct to be removed are predominantly juvenile street trees within the Childers and Ormond Street road reserves and that their removal would have a “*modest impact*” within this precinct. Submissions S239, S282 and S144 raised concerns about the removal of trees on amenity values within Childers Street.

## **Precinct 3 – Arden Station**

In Precinct 3, MMRA stated a number of trees are to be removed, many of which many are environmental weeds. The MMRA submitted that the removal of environmental weeds, whether mature or immature, has beneficial outcomes. Mr Patrick stated that the remnant River Red gum is the only significant tree in this precinct to be removed.

The City of Melbourne was concerned about the removal of trees on fauna and recommended that the River Red gum close to Laurens Street be retained. It stated:

*This area will be developed in the future and it will be desirable to retain as many trees as possible to allow mature trees to be present for the future redeveloped area ...*

*The retention of trees on this land would contribute to the urban ecology and visual landscape of this urban renewal area.*

## **Precinct 4 – Parkville Station**

The University of Melbourne and S128 urged that more trees be retained within Precinct 4, particularly on the University of Melbourne land. The Heritage Victoria submission noted the heritage values of the trees in Royal Parade and Grattan Street.

The MMRA suggested that in University Square, 57 trees within the Project construction footprint are identified for replacement in the draft City of Melbourne ‘University Square Master Plan’. That is, these trees would have been removed to achieve the desired outcome of the Master Plan.

In his evidence, Mr Patrick stated “*the cumulative impact of removal of blocks of trees from Grattan Street, and trees from Royal Parade will significantly impact on the amenity values of the precinct streetscape*”.

The City of Melbourne submitted that the “*proposed tree removals in the University Square would be in line with future City of Melbourne planned works and are of low concern*”. However, Council stated “*The most significant impact is the removal of 10 Royal Parade Elms ... it is submitted that during the final planning stage every option is exhausted to ensure the minimum amount of trees would require removal*”.

## **Precinct 5 – CBD South Station**

MMRA submitted that the use of mined construction methodology for the station boxes significantly reduces the potential impact of loss of Plane trees from Swanston Street.

S317 raised concerns with the removal of up to five spotted gums within City Square.

### **Precinct 7 – Domain Station**

Precinct 7 drew the greatest number of submissions relating to tree loss. These submissions were predominantly from residents and resident groups as well as the National Trust. A number of submitters expressed concerns about the impact of tree removal on the attractiveness of St Kilda Road (S317, S356, S349, S343, S313, S240, S336, S333, S330, S284, S283 and others).

Submissions relating to Precinct 7 expressed concerns with the construction methodology of cut and cover rather than mined cavern, and suggested that the mined cavern method would potentially allow the trees on St Kilda Road and Albert Road to be retained.

### **Precinct 8 – Eastern portal**

Mr Galwey of Tree Dimensions for the MMRA assessed the landscape value in the South Yarra Siding Reserve as low because there is no significant canopy cover in this area and no theme of plantings. The northern part of the reserve has been used to stockpile materials for the railway as it is VicTrack land.

As part of his evidence, Mr Galwey corrected his assessment in the EES that up to 218 trees to be impacted or removed, to up to 306 trees may be impacted or removed. The change in numbers is a result of counting tree EP217 as one (approximately 50 *Ailanthus* trees, which are a declared noxious weed) and Tree EP218 as one (approximately 40 *Acacia* trees). Mr Galwey stated that these additional trees are self-sown and weedy in nature.

When asked by Mr O'Farrell for Stonnington City Council what the value of the trees in the Osborne Street Reserve is for the community, Mr Galwey responded that the *"landscape adds quality to the amenity of this area"*. Submissions from local residents were received that requested that trees be retained where possible to minimise amenity loss and open space values (S91, S135, S162, S266, S354).

The Committee requested clarification from the MMRA about the potential to retain trees along the eastern side of Osborne Street to assist with ameliorating amenity and landscape impacts to the residents of Osborne Street. The MMRA responded with TN71 which advised there is limited potential to reduce the impact on trees on Osborne Street between Toorak Road and the south side of the vehicle access bridge, however there may be potential to reduce the impact on trees on Osborne Street south of the vehicle access bridge.

Mr Galwey's evidence was that there is no particular planting theme in the Siding Reserve, which includes mostly native plantings with relatively low amenity value. The City of Stonnington manages the Reserve but does not own the land. He suggested that trees such as the Canary Island Date Palm could be readily transplanted.

For Precinct 8, Mr Galwey suggested that the *"Project provides an opportunity to greatly improve the landscape amenity of South Yarra by planning and constructing a landscape that provides access to green space and tree canopy cover"*. In conclusion, he stated that although not as big of an impact as St Kilda Road trees to be removed, there will still be amenity impacts on local residents within this Precinct.

#### **18.3.2 Useful life expectancy (ULE)**

The Committee requested clarification from the MMRA about the significance of the divergence between the City of Melbourne's Useful Life Expectancy (ULE) assessments for

many Plane trees within the Project area against the field assessment undertaken as part of the arborist study in Appendix R of the EES. The MMRA submitted that the assessments undertaken for the EES by arborists from Mr Patrick, assessed the ULE of trees as “higher” than those ascribed by the City of Melbourne.

MMRA submitted TN40, which stated:

*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.*

The Committee requested 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 and 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.

TN40 stated that the measures and strategies employed to ensure that replacement trees will not all approach the end of their useful life at the same time have been guided by the urban forest strategies of the Cities of Melbourne, Port Phillip and Stonnington as well as any specific provisions for places included on the VHR, where in most cases a like-for-like replacement strategy is required (for example Royal Parade elm trees).

As part of TN40, the MMRA suggested:

*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.*

*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.*

The arboricultural assessments assessed 336 trees as having a ULE of up to 10 years, consisting of the 331 trees identified in the EES 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* identified as needing replacement. The MMRA said that to understand this figure in context, 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.

During cross-examination by the MMRA, Mr Shears suggested that this replacement strategy was not correct and that City of Melbourne would undertake extensive community consultation on replacing trees along St Kilda Road.

The MMRA in closing suggested that Mr Shears position is contrary to the clear strategic directions established by the Council's *Urban Forest Strategy* and the urban forest precinct plans. Those documents make it plain that the strategy and plans are used by the City of Melbourne to guide tree planting and greening in City streets.

### **18.3.3 Tree management and replanting**

Mr Shears stressed the importance of planning to ensure there was an adequate supply of trees of the right height to optimise instant impact and to minimise the long-term risks associated with more mature stock. A concern about adequate availability of trees was made in submission S289.

Some submitters suggested that trees be stored and replanted after works have been completed. The MMRA stated that the preferred approach of both Mr Patrick and Mr Galwey is for the "*planting of new, vigorous young trees that can make a secure future contribution to the landscape rather than replanting mature and over mature vegetation*". Mr Shears agreed that other than for Palm trees, the replanting of new trees is preferable.

In TN40 and TN65, the MMRA responded to arboriculture concerns. TN40 stated "*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*".

The MMRA stated (TN65) that:

*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.*

*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.*

*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.*

Furthermore, the MMRA outlined changes to EPR AR2 based on Mr Galwey's evidence in its closing submission in order to minimise the period of diminished landscape value. This

change requires *“the installation of irrigation to ensure the ongoing supply of water to tree root zones, especially during their establishment stage”*.

With regard to the duration of impact, Mr Patrick provided the example of Swanston Street that demonstrates that within 20 to 30 years following planting, a high quality semi-mature canopy can be established.

Mr Offor advised *“The best mitigation for the emotional impact of tree removal is a requirement that MMRP developers must effectively prosecute the case for the removal, which includes demonstrating that significant efforts are being taken to limit the number of trees affected”*.

EPR AR3 requires the establishment of trees to replace loss of canopy cover and to achieve canopy size equal to, or greater than, healthy, mature examples of trees removed in accordance with relevant policies and strategies including the City of Melbourne’s *Urban Forest Strategy*, *South Yarra Urban Forest Precinct Plan* and *Carlton Urban Forest Precinct Plan*.

EPR AR4 requires the implementation of Tree Protection Plans in accordance with *AS4970-2009 Protection of Trees on Development Sites* and is important for addressing potential impacts on trees by protecting those trees that are not being removed from being damaged.

#### **18.3.4 Compensation**

The issue of compensation for tree loss was submitted by the City of Melbourne including the need for EPR AR5 to be amended to add the following:

*For CoM 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.*

An expert witness conclave of the two arborists did not reach agreement on the matter of compensation as Mr Patrick stated that he had not been asked to review the financial value of trees as part of his assessment for the EES, and therefore could not comment on value or payment. From the City of Melbourne’s view, it is their policy to assess financial values of trees and for the City of Melbourne to be compensated for tree removals.

The MMRA opposed such an amendment to the EPR and submitted that such a charge on the Project has no statutory basis. The MMRA said in closing:

*The ‘associated costs’ of a tree are determined under valuation guidelines published by the Melbourne City Council ‘Urban Forest – Tree Valuations’ (undated). Neither the policy nor the valuation guidelines identify the statutory basis for the imposition of charges by the City of Melbourne for tree removal on public land. Additionally, pursuant to s 258 of the MTPFA any local law is inoperative to the extent that it is inconsistent with the Project authority’s exercise of its powers in relation to a declared Project and declared Project area.*

The City of Port Phillip submitted that *“trees within the Domain Precinct have an amenity value of approximately \$10 million which has been calculated from the 103 trees which range from ‘semi-mature’ to ‘over mature’ with an average Diameter at Breast Height (DBH)*

of 100cm for each tree". The amenity calculation used by the City of Port Phillip is an agreed method used by the Cities of Melbourne and Stonnington.

## **18.4 Discussion**

### **18.4.1 Removal of trees from the public realm**

There will be a number of significant and heritage listed trees removed during the construction of the Project. The Committee notes that this is understandably an emotive issue for the community, stakeholders and residents that value these trees for their amenity, landscape and environmental values, and the contribution they make to the image and identity of the City.

Throughout the EES documentation, key mitigation for tree removal includes replanting of trees, restoration of the continuity of the tree-lined avenues within precincts, re-establishment of canopy cover and restore landscape values as quickly as possible in accordance with such plans and policies as the City of Melbourne's *Urban Forest Strategy*.

The Committee accepts the further mitigation strategies in Mr Patrick's evidence that includes preparation of precinct-specific tree protection plans in conjunction with construction management plans to ensure:

- impacts are assessed against accurately surveyed tree locations and detailed construction drawings
- construction site vehicle movements, set-down areas and craning locations can be identified
- low level details such as services installation to stations, temporary access and services can be implemented using tree sensitive methodologies.

The Committee notes through submissions from the MMRA and in Mr Patrick's evidence, the proposed extent of tree removal can be put into context by recognising that in 2014 the City of Melbourne managed approximately 70,000 trees in public spaces, including parks and street trees. Via its tree management programme, the City of Melbourne currently removes 1,000 trees per annum and plants 3,000 per annum.

The MMRA suggested that the proposed works for the Project represent a single year of tree removals within the City of Melbourne. The MMRA stated that because many are over-mature, the recruitment of replacement trees by the Project contributes to a process that the City of Melbourne would itself be implementing.

The Committee appreciates that there are trees associated with the Project works that would have been removed regardless of the Project by the City of Melbourne's own tree policy. However, it does not accept that this necessarily includes the VHR listed avenues of trees. The Committee agrees with Mr Shears that although the EES broadly advocates for the protection and retention of trees, there is insufficient consideration of the significant contribution that trees make to the city through their amenity and landscape value, the provision of ecosystem services or the mitigation of the urban heat island effect.

#### **Precinct 3 – Arden Station**

The Committee considers that the River Red gum (tree A0072) should be retained if possible as it is close to Laurens Street and has ecological and amenity value. The Committee considers that steps should be taken to protect and retain as many of the street trees in

Laurens Street as is practicable. Among those, tree A002 is recommended to be retained, if possible, to assist in maintaining the amenity of that streetscape.

### **Precinct 7 – Domain Station**

With regard to the area that may still be required in Tom’s Block for temporary access, the MMRA and City of Melbourne should continue its discussions on alternative sites within this area that could be supported.

### **Precinct 8 – Eastern Portal**

The number of trees to be removed in this Precinct, although not of biodiversity or heritage significance, is significant in terms of the amenity and landscape impacts on the surrounding streetscapes. The impacts of construction on this community will be significant and any measures to minimise amenity impacts are warranted, particularly along Osborne Street where the residents will be subject to both noise and visual impacts during construction and re-establishment of the reserve.

#### **18.4.2 Tree management and replanting**

The Committee notes that the duration of impact from the removal of trees due to the Project would be considerable, with Technical Appendix R acknowledging it would take 20-30 years following planting to establish a high quality semi-mature canopy. The Committee notes that there are a number of measures within the UDS that need to be considered in any replanting programs as part of the Project

For trees removed in the Domain Parklands, St Kilda Road and within Precinct 4, the Committee understands that further assessment and approvals will be required from Heritage Victoria because these trees are on the VHR.

It is noted that for Precincts 4 and 7 where trees are to be removed, mitigation will primarily be focused on replanting and re-establishing amenity to the streetscape. The Committee acknowledges that it will take time to re-establish canopy cover, restore the continuity of tree-lined streets and replant trees in public open spaces and. Notwithstanding, the Committee considers it important to remediate work sites as soon as practicable.

EPR AR1 requires the further evaluation of trees at the detailed design stage to provide for maximum tree retention and for tree protection plans to be prepared which identify trees to be removed or retained and the conditions of the trees to be removed. A tree replacement programme will be implemented as part of the plan in consultation with the relevant stakeholders including the City of Melbourne, Heritage Victoria and the Shrine Trustees.

EPR AR3 requires the replanting of trees to achieve canopy size equal to, or greater than healthy, mature examples of the trees that are removed and in accordance with relevant local Council policies and strategies such as the City of Melbourne’s *Urban Forest Strategy*.

The Committee is generally satisfied with the EPR proposed by the MMRA for the management and retention of trees. The Committee notes TN65 states “*where trees are to be removed, they will be replaced with super-advanced trees (which are approximately 3 metres in height)*”.

The Committee recommends a new EPR AR6 that protocols should be established for the use of advanced and super-advanced trees to re-establish canopy and valued landscape



character that balances long term viability and instant impact. These protocols should be developed in consultation with the Cities of Melbourne, Port Phillip and Stonnington, the Shrine Trustees, the University of Melbourne, Heritage Victoria and others as applicable. Adoption of this EPR will ensure that appropriate age, height and tree species are selected for replanting.

The Committee is satisfied with the relevant EPR for the management and retention of trees.

### **18.4.3 Compensation**

The Committee understands the submissions put forward by both the City of Melbourne and City of Port Phillip in regard to the desire for monetary compensation to be paid to these Councils for tree loss. However, it considers that such a matter is of local Council policy and should be left for negotiation between the relevant Councils and the MMRA.

To make good the tree loss, EPR AR3 states that trees will replace loss of canopy and achieve canopy size equivalent (or greater than) healthy, mature examples of the species in Melbourne. EPR AR5 requires a bank guarantee or bond.

The Committee considers that retention and replacement strategies within the EPR provide adequate non-monetary compensation for tree loss, notwithstanding the loss of heritage and landscape value, which is a separate matter and discussed elsewhere.

## **18.5 Findings**

There will be impacts to trees, and in some areas, this is a very high impact. Mitigation such as re-assessment during detailed design and replanting will assist with minimising the impacts. In regards to the EPR AR1-5, both experts agreed that they were adequate to reduce impacts from tree removal from the Project.

In relation to the optimum size for replacement trees, the Committee notes that the larger the stock, the greater potential problems with the long-term survival of the trees, as noted by Mr Shears. Consequently, a balance is required to minimise the impact on this generation by planting trees that are of a significant size whilst minimising any negative impacts on future generations that may diminish their enjoyment of the iconic St Kilda Road boulevard.

While the three metre “*super advanced*” trees proposed in TN65 are not in keeping with Mr Shears advice that super advanced trees are in the order of 6 to 7 metres, the Committee accepts the MMRA’s contention that trees of this height of a minimum of three metres represent the best balance of instant impact and long term contribution to the areas landscape values. The Committee’s recommendation for a new EPR AR6 provides resolution on this matter.

The EPR assist in mitigating the impacts of tree removal across all precincts. While a number of trees are nearing their useful life expectancy and would require replacement in the future, there would still be a residual impact during construction particularly in Precincts 4 and 7.

The Committee finds that the amenity impacts, which include removal of trees from Osborne Street in Precinct 8, warrants the exploration by MMRA of retention of as many trees in the Osborne Road Reserve as possible.

The Committee supports the retention of the River Red gum (Tree ID A0072) within Precinct 3, and Tree A002 in Laurens Street, as well as where possible, trees within the Osborne Road Reserve within the Precinct 8 as part of amenity mitigation for residents and the local community.

The relevant EPR have been amended accordingly, as provided in Appendix F.

## 19 Greenhouse gas

Greenhouse gas impacts are addressed in Volume 3, Chapter 22 of the EES, and in Technical Appendix V.

There was no draft evaluation objective in the Scoping Requirements relating to greenhouse gas.

No evidence was provided in relation to greenhouse gas (GHG), however there were some written submissions.

EPR GHG1 and GHG2 specifically dealt with matters relating to greenhouse gas.

### 19.1 Key issues

The two key issues discussed in the EES in regards to greenhouse gas were the level of emissions expected both during the construction and the operation of the Project, and the proposed abatement techniques.

### 19.2 What did the EES say?

The EES stated that majority of construction GHG emissions are found in the embodied emissions of construction material, fuel consumption from construction plant and equipment and trucks. During operation, the most significant source of GHG emissions during operation is from the traction energy of train operation, followed by the energy required at stations, tunnels, portals and EAS.

The EES proposed to mitigate the impacts of GHG emissions during the construction and operational phase by employing 'best practice GHG abatement techniques'. The EES estimated that will reduce CO<sub>2</sub>-e emissions:

- during construction to 543 kilotonnes of CO<sub>2</sub>-e, a reduction of 15 per cent from the business as usual scenario
- during operation to 48 kilotonnes of CO<sub>2</sub>-e during the first year of operation and 38 kilotonnes of CO<sub>2</sub>-e/annum after 20 years of operation, a reduction of 30 to 35 per cent from the business as usual scenario.

The use of best practice GHG abatement will be stipulated through a Sustainability Management Plan (EPR GHG1, with monitoring and reporting at GHG2) with associated sustainability performance targets. These targets are:

- a minimum overall score of 70 in the *Infrastructure Sustainability Council of Australia – Infrastructure Sustainability* rating system
- a minimum five star rating against the Green Star (*Green Building Council of Australia*) 'Design' and 'As built' certification for stations.

These are applicable in both the construction and operation stage and will be a mandatory contract requirement.

Further, the Project is expected to lead to significant improvements in capacity for public transport and will move more people out of cars and onto passenger rail, with an associated decrease in GHG emissions from road transport of 74kt CO<sub>2</sub>-e per annum (at 2046).

### 19.3 Evidence and submissions

The Cities of Port Phillip and Stonnington submitted that the Sustainability Principles did not include clear and specific Project targets. The City of Port Phillip requested further details on how the sustainability targets will be achieved and made two specific recommendations in their submission regarding greenhouse gas:

*Recommendation 30: Provide further information relating to the specific targets and strategies for each category under the ISCA [Infrastructure Sustainability Council of Australia] and Green Star rating tools.*

*Recommendation 31: Aim for a zero net emissions target through a public tender process for renewable energy, along with proscribed targets for each potential source of emissions.*

In addition to the City of Port Phillip, the Clean Energy Council (S345) and Submission S337 called for more ambitious greenhouse gas emission reduction goals, including a zero net emissions target.

TN77 (D352) submitted by the MMRA discusses the sustainability targets of the Project, including reductions in greenhouse gas emissions. This Technical Note detailed sustainability targets, including energy reduction targets and materials and waste targets that seeks to reduce the embedded greenhouse gas emissions in materials used. Attachment A to TN77 addressed the issues raised in submissions, with the MMRA advising the Committee that:

- the potential for contractors to seek ‘easy wins’ in meeting sustainability targets is mitigated by specific sustainability targets
- achieving Passivhaus accreditation is unfeasible as this certification is typically only applicable to sealed buildings
- a recommendation for a net zero emission target is unfeasible due to the nature of the Project
- additional measures will be investigated during the detailed design process.

### 19.4 Discussion

Submitters called for the inclusion of GHG targets in the EPR to provide greater transparency of the GHG aims. The EPR does include reference to three rating tools, including a project specific tool and the Committee accepts the MMRA’s submission that achieving Passivhaus accreditation is unfeasible.

Given the Project will improve the public transport network in the long term and will encourage some mode shift from carbon intensive private vehicle travel, the overall impact of GHG emissions is acceptable.

### 19.5 Findings

The Committee finds that the Project has proposed methods for reducing GHG emissions during the construction phase of the Project and supports the use of best practice abatement measures and mandating compliance with the Sustainability Management Framework.

The Committee supports EPR GHG1 and GHG2 as provided in Appendix F.

## 20 Other matters

### 20.1 South Yarra Station

#### 20.1.1 Introduction

The matter of a Melbourne Metro station at South Yarra was raised as an issue early in the Hearing. The City of Stonnington submitted that the Project should include a station at South Yarra, and this omission is a missed opportunity for increased connectivity in the metropolitan rail network. Conversely, the primary position of the MMRA was that a second station at South Yarra was not justified. Further, PTV and the MMRA submitted that a second station at South Yarra has a poor cost benefit ratio in an area that is, and will continue to be, well served by public transport.

In closing, the MMRA referred to the draft *30-Year Infrastructure Strategy*, released by Infrastructure Victoria on 4 October 2016 and the recommendation that a second station at South Yarra not proceed as the *“benefits do not appear to outweigh the costs, and noting that South Yarra is already very well served by public transport”*.

The City of Stonnington took issue with this reference late in the Hearing process and requested a written right of reply, which was afforded to it by the Committee.

#### 20.1.2 City of Stonnington

At the Directions Hearing, the City of Stonnington sought a direction from the Committee requesting the MMRA provide any documents that informed the MMRA’s decision not to include a new station at South Yarra as part of the EES and consequently in its scope of works. The City of Stonnington later withdrew this request as they were provided with the following documents by the MMRA:

- MMRA (2015) *South Yarra Station Options Assessment*
- PTV, *Melbourne Metro Rail Project – South Yarra Metro Station Customer Outcomes and Economic Assessment Report* (2015)
- AJM, *South Yarra MM Platforms – Technical Options Study* (2015).

Notwithstanding, on 29 July 2016 the Committee directed the City of Stonnington to provide a written submission outlining the basis for its contention that the Project be modified to include a new station at South Yarra, detailing why it was said that this matter fell within the scope of the Committee’s Terms of Reference (D06). In response to this direction, the City of Stonnington outlined its submission that a station at South Yarra is required:

- a. The Metropolitan Rail Network, in terms of network opportunity and connectivity at South Yarra will be detrimentally impacted by the Project.*
- b. The ability to make multi-modal connections at South Yarra will be detrimentally impacted by the Project. (D99)*

The City of Stonnington noted its support for the Project, but contended that it suffers from *“short-sightedness”*, and the decision not to build a station at South Yarra is a *“wasted opportunity”*. It submitted the following in support of a station at South Yarra:

- the existing South Yarra station is the busiest railway station outside of the City loop

- South Yarra is strategically located and provides an important multi-modal interchange
- population in the area is predicted to grow
- the Project is not a true 'metro-style rail system' if intersecting train lines do not connect.

The City of Stonnington submitted that the issue of a second South Yarra station was raised in submissions, and therefore the Committee is obligated to consider the matter (D16). It said the Committee is required to *"investigate and consider all submissions made to the Inquiry in relation to any matter relevant to the Inquiry's investigation or consideration of the EES"*. The City of Stonnington took issue with the lack of supporting evidence and information from MMRA and PTV in relation to the omission of station at South Yarra as part of the Project.

In closing, the City of Stonnington invited the Committee to conclude that MMRA had adequately explained nor defended its assertion that a new station at South Yarra was not justified, citing a lack of supporting information, the lack of expert evidence called in relation to the matter and that experts were 'told' not to consider the matter. Stonnington also submitted the EES *"fails to provide transparency"* and there was no way for an independent person to test the assertions made in regards to this matter.

The City of Stonnington was afforded a right of reply to the MMRA's closing submission that referenced the 30 Year Infrastructure Strategy released by Infrastructure Victoria on 4 October 2016 (D363). The City of Stonnington submitted that the Infrastructure Victoria assessment of the need for a station at South Yarra relied upon evidence that was not independent nor transparent, and were *"guilty of merely regurgitating in a circular fashion the so-called 'justifications' for excluding the integration of South Yarra"* (D368). In addition, it argued the 30 Year Infrastructure Strategy makes reference to the possible future need of a station at South Yarra, however this option is precluded in the current design which is seen as an obvious flaw in the assessment option by Infrastructure Victoria.

Mr McDougall gave evidence for Council with regard to transport. He discussed the benefits of a second station at South Yarra and provided commentary on the Business Case. Mr McDougall stated that the omission of a new station at South Yarra will mean projected passenger demand will not be able to be met, network connectivity will worsen and the new connectivity provided by the Project will not be directly accessible to South Yarra.

### **20.1.3 MMRA**

The MMRA advised the Committee that the matter of a second station at South Yarra was assessed prior to development of the EES, but was not included in the Project and therefore not addressed in the exhibited EES. The MMRA provided three background scoping documents that were used in the assessment. The *South Yarra MM Platforms – Technical options study* (D56) listed four options for a Melbourne Metro platform at South Yarra Station, with costs ranging from \$700 million for Option 1 to \$970 million. Only two of these options would provide a direct interchange between Project platforms and the existing South Yarra station. All options had varying impacts on residential properties, open space and commercial businesses.

Further, the *South Yarra Station Options Assessment* (June 2015) prepared by the MMRA recommended that the Project not include a station at South Yarra due to its cost, because the economic case for the station was poor. It noted South Yarra is already well serviced by public transport, it would add travel time to over 100,000 commuters and it would have significant additional disruption for the local community. In addition, the *Melbourne Metro Rail Project – South Yarra Metro Station Customer outcomes and economic assessment report* (June 2015) prepared by PTV concluded that the benefits of a new station at South Yarra were low compared to the cost of construction, and would result in a small net benefit to customers. It was for these reasons that the MMRA did not include a station at South Yarra and why it was not included as part of the Project or assessed as part of the EES.

The MMRA's primary position during the Hearings was that the inclusion of a second station at South Yarra was not included in the exhibited EES, and that accordingly its impacts had not been assessed in the EES. The MMRA submitted that the significant costs of a new station at South Yarra could not be justified by reference to its likely benefits (D349). PTV adopted a similar response to the MMRA.

The MMRA further submitted that "*future proofing*" the Project so as to allow for a new station at South Yarra would require significant design changes, including redesign of the horizontal alignment, with consequent negative implications for the Project's business case. The MMRA contended that South Yarra is, and will continue to be, well served by public transport options, and therefore future proofing for a station at South Yarra is unnecessary and unwarranted.

In closing, the MMRA referenced the draft *30-year Infrastructure Strategy* (October 2016) that "*specifically recommends against proceeding with a second station at South Yarra, principally because the benefits do not appear to outweigh the costs, and noting that South Yarra is already very well served by public transport*". The MMRA contended the submission put forward by the City of Stonnington was not rigorous as it did not consider the implications of constructing a new station in the context of the entire metropolitan network.

The MMRA submitted that the Committee should conclude that the City of Stonnington had failed to demonstrate that the inclusion of a station at South Yarra is a matter relevant to the Committee, or that even if it were, that such a station is warranted.

#### **20.1.4 PTV**

PTV responded to the City of Stonnington's assertion that the Project should include a station at South Yarra by submitting that a station at South Yarra would not deliver significant community benefit in relation to the cost. PTV tabled a briefing prepared for the Minister for Public Transport in June 2015 (D104) that recommended the Project proceed without a station at South Yarra as this would "*increase the cost and disruption ... far beyond the benefits offered*". The briefing was based upon the findings of the *South Yarra Options Assessment* (2015).

PTV submitted that the option of a connection at South Yarra had undergone detailed consideration by Government and it had been determined that the public transport benefits of a new South Yarra station were outweighed by the significant additional costs of that new station (D161). Further, it submitted that the public transport needs of the South Yarra

community will continue to be met in the long term without a new station, whilst accepting that the existing station will require an update in due course.

PTV maintained that it had considered the inclusion of a station at South Yarra as part of the broader metropolitan transport network and submitted that the submissions and evidence of the City of Stonnington did not “*consider the broader metropolitan transport network and the associated opportunities, constraints and priorities for services and infrastructure across Melbourne and Victoria*”. PTV argued that the area is already well served by a range of public transport options, and that a second station is unnecessary. In response, the City of Stonnington argued that a station at South Yarra would bring great benefit to the transport network as it would provide many connections to other parts of the network.

### **20.1.5 Other submitters**

Individual submitters, including S44, S164, S181 and S185 and Newmark Capital (S362) called for connectivity with the Project at South Yarra, citing reasons including high passenger demand, increasing residential densities in the area as a result of new development, and the opportunity to increase connectivity. Submitters saw the omission of an additional station as a “*lost opportunity*” (D247) that will diminish the public transport accessibility of the area. In addition, several submitters (S35, S44, S164) took the opportunity to comment on the current condition of the existing South Yarra station, calling for an urgent need to upgrade to the station to accommodate the higher demand for services.

### **20.1.6 Discussion and findings**

The matter of a connection with the Project at South Yarra was raised in submissions and presentations, and was and therefore will be addressed to by the Committee. In doing so, the Committee is prepared to accept that it is a matter that could be regarded as falling within the scope of its Terms of Reference, and will proceed on the basis that it is a relevant matter for consideration. It has therefore had regard to the submissions and evidence that has been presented to it on this issue.

The crux of the argument appears to be the question of value for money and net community benefit, with the position of the MMRA and PTV being that the significant funds required for the new station would be better spent elsewhere where they will achieve a relatively greater benefit. Conversely, the City of Stonnington and other submitters see the omission of a connection at South Yarra as a lost opportunity.

The City of Stonnington focused upon the localised impacts of a station at South Yarra and did not consider the broader implications of this on funding for public transport at the State level. The weight of submissions and evidence received by the Committee lead it to conclude that it is likely that a station at South Yarra would not achieve a significantly high cost benefit ratio to justify its inclusion as part of the Project. While it is clear that there are some benefits associated with the addition of a new station at South Yarra, the same could be said for virtually any new railway station in metropolitan Melbourne. Ultimately the Committee has not been persuaded that the benefits of a new South Yarra station are such as to justify its inclusion as part of this Project, having regard to its likely cost.

However, the Committee accepts that the relative cost/benefit ratio of a new, additional station at South Yarra may change over time, and accordingly, the Committee considers that



the design and construction of the Project should not preclude the ability to include such a station as part of the metropolitan network at some time in the future.

In view of the above, the Committee does not recommend that a new station at South Yarra be considered or included as part of the Project. However, the design stage of the Project should seek to ensure that if possible, the option of providing for such a station at some time in the future should not be precluded.

## 20.2 Property acquisition

The Committee received submissions seeking recommendations regarding the extent of the title to their properties that should be acquired for the Project, including from:

- McDonald's Australia Pty Ltd and Northwest Investments Pty Ltd (S195 and D290) who are the owner and tenant respectively of the land at 9 – 11 Swanston Street. They contended that only the sub-surface portion of the title should be acquired
- Oscard Pty Ltd (S379 and D288) the owner of the property at 21 Swanston Street, who contended that the property should not be acquired or, if it was, that they should be given a right of first refusal when it was disposed.

The Committee will not make these recommendations. There are two broad reasons for this. First, the role of the Committee is essentially, to advise on the impacts of the Project, whether it can achieve acceptable outcomes, and what frameworks should be established to manage those impacts.

In the case of acquisitions, there is already an established framework for the management of those impacts. Section 112 of the *Major Transport Projects Facilitation Act 2013* confers a power to compulsorily acquire land on the project authority of an approved project. Section 113 then provides that where land is acquired, the provisions of the *Land Acquisition and Compensation Act (LACA)* apply.

In enacting these sections and utilising the process established by the LACA, Parliament has demonstrated a clear intention that there should be a uniform acquisition and compensation process applicable to all major transport projects in Victoria. In these circumstances, the Committee considers that it is neither useful nor appropriate to seek to supplement or alter that framework for the purposes of a specific project.

Second, the Committee is of the view that it should not seek to micromanage the Project delivery process. The power to make acquisitions is conferred on the Project authority. In exercising that power, the Committee anticipates that the Project authority will be acting on the best information available to it at the time, including any more advanced design proposal for the Project. The Committee considers that it should not seek to pre-empt the MMRA's judgment in circumstances where the Concept Design will continue to evolve.

The above does not mean that it will never be appropriate for a Committee to make recommendations in relation to acquisitions. Where an acquisition raises broader strategic issues – like a loss of community cohesion, a loss of public open space or significant heritage impacts – then it would be appropriate for the Committee to make comment (as, for example, in relation to consideration of Options A and B in Precinct 2). This is because of the broader strategic issues raised, not because of the acquisitions *per se*.

In any event, the Committee is not convinced on the submissions made that the recommendations sought should be made:

- In the case of 9 – 11 Swanston St, the submitters contended that the acquisition of the above-ground title was unnecessary. Nothing in the MTPF Act confines the power to acquire to acquisitions which are absolutely necessary. The material available to the Committee suggests that, even if acquisition is not necessary, it may be desirable from a pragmatic perspective, given the difficulties the continued operation of the convenience restaurant is likely to pose.
- In the case of 21 Swanson St, the fundamental concern of the submitter appeared to be the adequacy of the compensation they would receive, given the purposes for which the land was acquired. The Committee does not consider this is a matter for it. The Committee must assume that the compensation available under the LACA is fair value. As to the issue of first refusal, the Committee considers this is properly a matter for the MMRA once it has finished with the land.

In saying this, the Committee notes there is nothing to prevent the submitters from continuing to engage in dialogue with the MMRA in the hope of settling upon a mutually agreeable solution. The Committee does not consider it has any role to play in that dialogue.

Some submitters (including Newmark Capital S362 and D247) raised issues whether compensation either was or might be available to them under s169 of the *Major Transport Project Facilitation Act 2013*.

Whether or not compensation is available under s169 raises complex factual questions which, on the submissions, the Committee is not in a position to resolve. Moreover, the Committee is not the proper body to do so. Section 169(2) provides that a claim under that section is to be dealt with as if it were a claim under s47 of the LACA. As such, the proper body for resolving such a claim is the MMRA in the first instance, with a right of appeal to either the Supreme Court or the Victorian Civil and Administrative Tribunal.

As such, the Committee can say nothing further about these issues. If a submitter considers they have suffered loss, then they should seek appropriate legal advice and take such steps as they consider appropriate.

## **PART C: INTEGRATED ASSESSMENT**

## 21 Environmental Management Framework

The EMF including the recommended EPR is addressed in Chapter 23 of the EES.

The draft evaluation objective of the Scoping Requirements in relation to the EMF is:

*To provide a transparent framework with clear accountabilities for managing environmental effects and hazards associated with construction and operation phases of the Project, in order to achieve acceptable environmental outcomes.*

No specific evidence was provided in relation to the EMF although many submitters and witnesses made comments and suggestions for modifications to the EPR.

EPR Environmental Management (EM) numbers 1 to 3 within the EES specifically dealt with matters relating to the EMF. An additional EPR EM4 has been included in the Committee's version, which deals with stakeholder engagement and complaints management.

### 21.1 What is the EMF for the Project?

As stated in the EES, the EMF provides a transparent and integrated governance framework to manage environmental impacts as described in the EES for the design, construction and operational phases of the Project. The EMF includes EPR that define the Project-wide environmental outcomes that must be achieved during design, construction and operation of the Project (regardless of the design solutions adopted).

The EMF is required as a condition (Clause 5.2) of the Incorporated Document titled 'Melbourne Metro Rail Project' which sets out planning controls for the Project under each relevant planning scheme (Melbourne, Port Phillip, Stonnington and Maribyrnong). Compliance with the EMF and the EPR is required under the Incorporated Document (Clause 5.2.7) and is proposed to be enforced by the MMRA on behalf of the State through the contractual arrangements for delivery of the Project.

The detail of various clauses of the Incorporated Document attracted some submissions and commentary, but it was generally endorsed as the key planning tool to deliver the Project, a position which the Committee accepts.

Figure 23-3 within the EES presents an overview of the EMF.

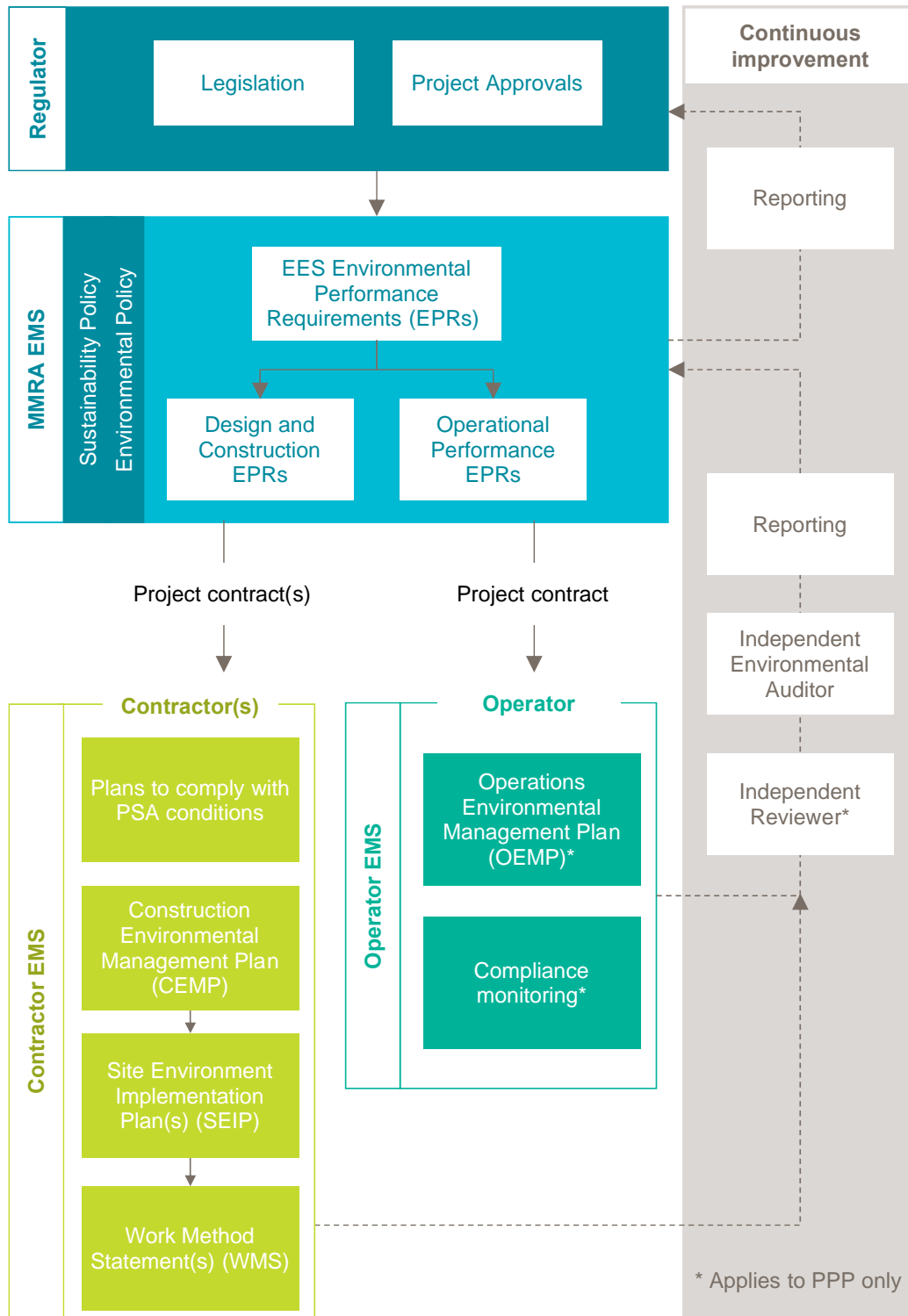


Figure 4 Environmental Management Framework Overview

The EMF and EPR have been developed through the EES, the Hearing process, and consultation between the MMRA and various submitters and stakeholders, to address the identified environmental risks and impacts of the Project.

The revised EMF tabled at the Hearing (D360) described the core role of the EMF as follows:

*The performance-based approach that forms the Environmental Performance Requirements aims to achieve outcomes that provide a net community benefit, while allowing for a delivery model with sufficient flexibility to encourage innovation by the private sector to determine how any recommended Environmental Performance Requirements would be achieved. The EMF outlines clear accountabilities for the delivery and monitoring of the achievement of the Environmental Performance Requirements so that the environmental effects and hazards of the Project would be managed.*

*Design and management measures incorporated into the Concept Design assessed through the EES, together with implementation of and compliance with the EMF and the Environmental Performance Requirements would ensure compliance with statutory requirements during design, construction and operation. The contractual arrangements for delivery of the EMF and Environmental Performance Requirements would be in the form of Project Contracts between MMRA and the contractors delivering the different parts of Melbourne Metro.*

The Project Contractor/s are required to comply with the EMF and EPR. The specific issues addressed in the EPR are set out in Clause 5.2.1 of the Incorporated Document. The EPR are intended to operate alongside any statutory controls such as the P&E Act, *Heritage Act 1995*, *Aboriginal Heritage Act 2006* and the EP Act.

The MMRA and submitters including RMIT, University of Melbourne, City of Melbourne, City of Port Phillip, Citywide Services and North, MGS, the Botanica, the Domain, TabCorp, the Graduate Union, Heritage Victoria, EPA Victoria, PTV, the ALE/ALH Group, and S90, S250, S207, S142 provided the Committee with revised versions of the EPR for consideration. The Committee has considered these revised EPR as well as the associated issues raised during the Hearing when providing its recommended version of the EPR at Appendix F.

## **21.2 Key issues**

The key issues relate to how the EMF and associated EPR as exhibited in the EES is translated in the Incorporated Document and whether the Incorporated Document requires amendments to include further elements of the EMF, such as strengthened reference to the EPR. The EMF itself was not the subject of submissions, rather the EPR that are a component of the EMF (refer to Figure 4) were heavily scrutinised. Notwithstanding, the Committee provides its findings on the revised EMF further in this Chapter.

The EPR are a critical element of the EMF and of successful Project compliance with applicable environmental legislation, policy and standards, and for the delivery of the Project. There was much attention throughout the Hearing process on refinement of the EPR as discussed in preceding chapters of this report.

The Committee considers the key issues with the EPR are:

- whether the EPR should be referenced within the Incorporated Document
- the scope of the EPR and whether they address the full range of issues likely to be encountered in Project construction and implementation
- whether the EPR should be more prescriptive

- how the EPR should be implemented during Project delivery.

With regard to the Incorporated Document specifically, the key issues related to the form and extent of community consultation, and whether the EPR should be included as part of it.

## **21.3 Evidence and submissions**

### **21.3.1 Referencing of EPR in the Incorporated Document**

Version 1 of the EPR was tabled on Day 1 of the Hearing (D18) and then Version 2 on Day 10 (D82). Versions 3 of the EPR (D206) was tabled by the MMRA on Day 25 and on the final day of the Hearing, the MMRA tabled its final Version 4 (D365). The MMRA's Version 4 included all of its previously accepted changes to the EPR, as well as any further changes as a result of further consideration and submissions received during the Hearing.

The MMRA, both in opening and closing submissions, put forward the case as to why the EPR should not be included in the Incorporated Document. The MMRA referred to the East West Link project, assessed under the MTPF Act, being the only Victorian Project where EPR have been included in an Incorporated Document. The MMRA stated that:

*... it is excessively restrictive to fix the EPR into the planning scheme, as it potentially poses a significant administrative burden and time delay should the EPR need to be amended. It is not reasonable to assume that every required amendment to the EPR will meet the threshold for Ministerial intervention under s20(4) of the Planning and Environment Act 1987 to facilitate a planning scheme amendment without a public hearing ... The potential delay ... would be excessive given the detailed impact assessment set out in the EES and before this Panel ...*

The MMRA strongly resisted the inclusion of the EPR within the Incorporated Document and emphasised that the regime established for the Project strikes the right balance between clarity and flexibility, and contended it addresses all of the key impacts of the Project.

RMIT, City of Melbourne, University of Melbourne, City of Port Phillip, G12+, S91 and others submitted that the EPR be referenced and included as an Appendix within the Incorporated Document. Reasons put forward by the City of Melbourne why this should occur included the need for transparency and accountability:

*Incorporating this provision will improve transparency by making the EPRs more readily accessible. It will also assist in the protection of the standards contained in the EPRs by requiring an amendment to the Incorporated Document should an EPR be sought to be imposed that increases environmental impacts or risks.*

*A similar issue was addressed in the Assessment Committee Report for the East West Link (Eastern Section) Project:*

#### *17.4.3 Referencing of Performance Requirements*

*The Performance Requirements are proposed to be applied contractually between the successful contractor and LMA.*

*Given that many of the Performance Requirements are a direct result of responding to planning issues and go to the essence of Project impacts and delivery, the Committee does not consider applying the Performance Requirements solely through this contractual pathway is appropriate.*

*The Committee is making recommendations on the Incorporated Document in the relevant Planning Schemes which effectively authorise the Project to proceed, along with the other Applicable Approvals.*

*Thus the Committee considers that there should be a stronger and direct link between the planning instruments and the Performance Requirements. The Committee considers that the best way to do this would be to include or link the final Performance Requirements to the Incorporated Document.*

*The Committee considers this would:*

- *Provide a more transparent approach to ensure the Project is delivered within the agreed Performance Requirements;*
- *Assist more effective enforcement action where Project implementation is not meeting Performance Requirements; and ....'*

In its reasoning as to why the EPR should be located within the Incorporated Document, the City of Port Phillip stated:

*The EES and proposed planning scheme amendment provides the basis for Project design and planning approvals. It is critical that sufficient accountability is included and that changes over the life of the Project are properly managed to ensure that community confidence is maintained. Council recommends a number of clarifications and changes ... to ensure that community interests are safeguarded ...*

*It is acknowledged that the Project may evolve over its lifespan. However, there is a critical need to provide criteria in the Incorporated Document against which any changes can be assessed ...*

*... Council considers that maintaining a current version of the EPRs on the Metro Melbourne website does not provide an adequate level of certainty for the community. The performance requirements should be included in the Incorporated Document for transparency.*

*The EPRs should be included as an appendix to the Incorporated Document to elevate their status and embed them as requirements (noting this approach was used in the East West Link Incorporated Document) ...*

The G12+ Group agreed with the rationale put forward by the City of Port Phillip:

*there is a fundamental need to ensure that the planning controls facilitating implementation of the Project carry sufficient weight within the planning scheme. In order to achieve this, we agree with the suggestion in the City of Port Phillip's submission to include the Environmental Performance Measures ... as appendices to the Incorporated Document.*



### 21.3.2 Scope of the EPR

Although the matters identified in the EPR were generally agreed, submissions were largely around the detail of particular EPR, including what had been agreed at the various expert conclaves. The details on these matters are discussed in other chapters of this report and recommendations made as appropriate regarding specific EPR. An example is noise and vibration where RMIT, University of Melbourne and Melbourne Health submitted that various changes were required within the EPR to adequately address vibration to sensitive equipment.

The University of Melbourne requested EPR dealing with the impacts of EMI, which have now been included. Others sought detail on EPR specific to their sites such as the Westin whom sought specific EPR to deal with ownership of land in the legacy phase; the Botanica sought particular outcomes in respect of reinstatement of its vehicle access in a specified manner; and a number of traders in the CBD sought greater certainty for delivery and access.

The MMRA posed a set of questions relevant to assessing whether the EPR as presented were appropriate, including:

- *Do the EPRs properly respond to the environmental impact that is to be managed?*
- *Do the EPRs establish an appropriate benchmark in respect of delivery of the Project?*
- *Do the EPRs properly provide for the preparation and implementation of appropriate management plans where necessary?*
- *Do the EPRs properly provide for (or sit within a framework which properly provides for) consultation with stakeholders and affected persons?*
- *Are the EPRs sufficiently robust to account for changes from the Concept Design and within the Project Boundary?*
- *Do the EPRs properly acknowledge their relationship with other EPRs?*

The MMRA urged the Committee to consider these questions in its analysis of the EPR when making recommendations.

### 21.3.3 Should the EPR be prescriptive?

The MMRA contended that the EPR are performance-based and, where appropriate, specify the limits to be met and processes to be followed to achieve acceptable environmental outcomes. The MMRA contended that the EPR should generally describe the outcomes to be achieved without prescribing the manner in which they are to be achieved. The MMRA stated that the exceptions to this principle arise in circumstances where particular outcomes can only be achieved in particular ways or where a particular process is integral to the realisation of Project objectives.

The MMRA emphasised that the EPR had the following attributes:

- (a) *The EPRs are well-organised according to identifiable impacts, respond coherently to the prescribed evaluation objectives, and are properly cross-referenced to other relevant EPRs;*

- (b) *The outcomes to be achieved pursuant to the EPRs are expressed to an appropriate degree of specificity in each case. ... This approach is appropriate for a Project of this scale where much of the impact will be relatively temporary in nature, will differ from precinct to precinct, and will manifest in different ways throughout the course of the construction program;*
- (c) *Where EPRs set compliance levels or guideline targets, they do so in clear terms, and adopt best-practice and commonly accessible measures;*
- (d) *The EPRs are properly linked to the Incorporated Document;*
- (e) *The EPRs (and in turn the EMF) include strong checks and balances, including requirements in respect of reporting, independent auditing, independent review, monitoring and supervision;*
- (f) *The EPRs include a clear and strong emphasis on consultation with relevant agencies, key stakeholders, the affected community, and the broader community; and*
- (g) *The EPRs make provision for significant stakeholder engagement including relevant public agencies and councils plus the purpose-built reference groups for transport (the TTWG) and Parkville institutions (the PPRG).*

Some submitters, including the Councils, Universities and various individuals, preferred more prescription in the EPR and suggested this allowed for better accountability and transparency for stakeholders.

No specific evidence on the EPR was called, but a number of experts for various parties made particular recommendations on technical issues. For example, the noise and vibration conclave recommended a number of changes to the EPR over the course of the Hearing. A matter that remained unresolved between the MMRA and others was the need for defined day time noise limits and which guideline/s (for example the Victorian EPA Publication 1254 or the NSW ICNG) should be used. These changes have been considered in the Assessment chapters of this report and findings made accordingly.

In TN41, the MMRA suggested that if EPR were to be more prescriptive, there is the potential risk that better ways of designing and delivering the Project would not be pursued by contractors as formal changes to approvals would need to be pursued to vary mitigation measures, which would then cause time delays and add cost. The MMRA stated “*the flexibility in the means of meeting performance standards as set out in the EPRs is an important aspect of government procurement in achieving overall value for money*”.

#### **21.3.4 How will EPR be implemented?**

Submissions raised concerns how the Project would be implemented and how the various plans, including the Development Plans within the Incorporated Document would be managed both for construction and the Project legacy, specifically regarding compliance with the various plans called up within the EPR. The Committee sought clarification from the MMRA how the EPR will be implemented throughout the Project, including for early works.

The MMRA responded with TN41 and TN68 that clarified the revised Incorporated Document (D358) now includes Appendix 2 'Approval of Plans' which identifies the relevant plan, the entity responsible for approving the relevant plan, and the relevant provision that calls up the requirements for the plan. TN68 explained that the first level of the plan hierarchy identified in the Appendix table is 'Strategic Framework and Development Plans'. These plans and strategies are key documents for the Project, and comprise the UDS, the Development Plans, the Early Works Plans and the EMF. The approval of these plans will be key decisions, which set the framework and direction for the overall Project. As reflected in the Incorporated Document, the Minister for Planning is responsible for approval of these key documents for the Project, which the EPR are a component of.

The MMRA's position is that it is appropriate for the Minister to approve these documents if the Minister is satisfied with them, whilst leaving the detailed implementation of those documents to Project proponents and their contractors. A number of these plans will be the subject of review and approval by the Independent Reviewer (who will have the required level of expertise for this role) under the PPP contract. The Independent Environmental Auditor will review other plans.

In response to the issue regarding implementation and compliance with the EPR, the MMRA stated in TN68 that that:

*In all cases, by virtue of the requirement to comply with the EPRs and the provisions of the Incorporated Document, contractors performing works under the plans are both accountable for meeting their requirements and subject to enforcement measures to ensure compliance.*

A number of submitters raised concerns about how the EPR were to be implemented, with S142 stating, "*The language lacks precision and creates neither enforceability nor accountability*".

In TN41, the MMRA suggested that through the Minister for Planning's endorsement of the EMF (and any future material amendments) at Clause 5.2 of the Incorporated Document, this provides accountability that the MMRA and its contractors undertake, and act on the results of the EMF reporting, auditing and review activities.

Another issue raised by the Committee and some submitters regarding implementation was to clarify the role of the Reviewer and the Independent Environmental Auditor. The Committee requested advice from the MMRA as follows through D114:

*Clarification on the role of the Independent Environmental Auditor with the PPP components of the Project for the stations and tunnels including specifics of the limits of those components and whether, in specifying the requirements for an independent auditor, MMRA is referring to an auditor within the meaning of the Environment Protection Act 1970 or simply an 'auditor' more broadly.*

MMRA's response in TN69 stated that for the Project:

*... an Independent Environmental Auditor will also be appointed to undertake audits of the Project activities to verify compliance with the EMF (which contains the Environmental Performance Requirements ("EPRs")), environmental management plans, and approval conditions.*

*The Independent Environmental Auditor would audit key plans, as required by the Incorporated Document, for compliance with the EPRs.*

*The role of the Independent Environmental Auditor is therefore additional (and separate) to the Independent Reviewer. The Independent Environmental Auditor responsibilities include:*

- *Prior to commencement of work, verify that the contractor has complied with each relevant EPR;*
- *Conduct audits of the contractor's works to verify compliance with the CEMP, OEMP, EMF and EPRs;*
- *Review the contractor's performance against the EPRs; and*
- *Prepare audit reports containing the results of audits.*

*... The audit reports would facilitate the continuous improvement of environmental management in respect of the Project activities.*

### **21.3.5 Other matters relating to the Incorporated Document**

The Committee received submissions about the opportunities for further consultation post approval of the Project through the provisions of the Incorporated Document. This related to the preparation and finalisation of the Development Plan and Early Works Plans, and changes to the EMF. Principally the submissions related to the opportunity for parties to comment on these, and the timing of which comments could be made.

The Incorporated Document generally provided for 14 days for any external comments, and these were largely from the OVGA and other Government agencies such as VicRoads, PTV and Heritage Victoria. The Councils and other institutions sought the opportunity to provide comments on these plans, as well as a change to the Incorporated Document to extend the timeframes either to 21 or 28 days. The other issue raised related to more specificity to the words through the deletion of “*generally in accordance*” to “*in accordance*”.

## **21.4 Discussion**

The approach of the Project EES of assessing a Concept Design rather than a detailed Project means the EMF and the EPR become critical in determining how the eventual Project can be delivered within an acceptable environmental framework. The Committee understand that the EPR are a product of the EMF and that the EMF itself needs to be approved by the Minister for Planning as detailed in Clause 5.2.6 of the Incorporated Document. As mentioned, the EMF was not the subject of submissions, rather submissions focused on the substance and contents of the EPR. It is important to note that, in the overall assessment framework, the Incorporated Document is the planning control that replaces a framework that may have otherwise existed within the planning scheme itself, or as planning permit conditions.

The Committee is satisfied with the MMRA's clarification of the differing roles of the Independent Environmental Auditor and the Independent Reviewer as described in TN69.

### **21.4.1 Referencing of the EPR in the Incorporated Document**

The EPR are proposed to be applied contractually between the successful contractor/s and the State of Victoria (or the MMRA). The MMRA resisted the notion of including the EPR in

the Incorporated Document for the reasons set out in its opening and closing submission, as outlined in Chapter 21.3.1 of this report

The MMRA is correct that the EWL Project was the first and only Project where the performance requirements were recommended by that Committee to be included or linked within the Incorporated Document, although the Linking Melbourne Authority resisted this approach.

The Committee agrees that a strong link between the Incorporated Document and the EPR is important. However, the Committee believes that in the case of this Project, there is a direct link between the Incorporated Document and the EPR through the revised Incorporated Document at Clauses 5.2, in particular clauses 5.2.5, 5.2.6, 5.2.7 and Appendix 2 'Approval of Plans'. The Committee agrees with the East West Link Committee that applying performance requirements via the contractual arrangements may not be appropriate, but in the case of this Project, the EPR are more detailed, have had extensive revision to incorporate numerous submitters concerns, and the Incorporated Document has been strengthened at Clause 5.2 of the EMF to more clearly show the link between the EMF, EPR and the various management plans to be approved.

The Project is also differentiated from the East West Link Project as this Project has general overwhelming support from the community and stakeholders, whereas the East West Link Project did not. The East West Link Project was assessed under the MTPF Act rather than the EE Act, and the culmination of the East West Link assessment process was the grant of all relevant permissions required in respect of that Project, which is not the case for this Project.

The Committee tends to agree with the MMRA that where EPR are framed only on high-level terms, their incorporation as part of the Incorporated Document may be more appropriate. Where, however, those EPR prescribe both high-level objectives and more detailed and specific outcomes or implementation measures, they are better suited to being linked to the Incorporated Document rather than incorporated within it. The Committee agrees with Mr Townshend that if the EPR were to be included as a table directly within the Incorporated Document, then they would need to be written in a different way.

#### **21.4.2 Scope of the EPR**

The Committee received helpful submissions about further amendments to the EPR. Notwithstanding, many recommendations for change to the EPR had their genesis in individual circumstance and were focused on achieving a particular individual benefit. The Committee prefers to stay at a higher level with EPR that are targeted, have clarity of language so they are simply expressed and focused, are clear in their purpose and intent (including whether they are mandatory or discretionary).

Generally, the Committee considers that the EPR (as revised) identify and address an appropriate range of issues and management measures that might be expected for a major project such as this in a highly urbanised environment. There is some difficulty in being overly confident that such an approach will be effective when the Committee is assessing a Project that has not been provided any detailed design regarding technical delivery or what elements of the Project will look like, and it is based upon a concept only. Notwithstanding, the Committee has considered this difficulty in its approach to the revised EPR.

Submissions, evidence and discussions relating to specific EPR are provided throughout this report and are not repeated here, however the Committee provides its version of the EPR at Appendix F which incorporates many of the suggested changes from the MMRA and other submitters whom provided their suggested changes to the Committee.

Of note, as it relates to the EMF, the Committee has included a new EPR EM04 which builds upon the EPR already included in Version 4 regarding stakeholder consultation and a process for complaints management. The Committee is of the mind that stakeholder consultation and complaints management is a higher order matter that needs to be elevated and crosses all EPR and aspects of the Project, which is why it has been given prominence in the Environmental Management 'EM' EPR.

### **21.4.3 Should the EPR be prescriptive?**

The Committee understands the MMRA's desire that the EPR are worded in such a way to allow for a high level of flexibility in order for the successful contractor(s) to include innovative design and construction techniques. However, similar to the Assessment Committee for East West Link, this Committee does not consider such flexibility is always the preferable approach in a highly urbanised environment where the community, key stakeholders and decision makers have not yet seen a detailed design. This Project has many elements to it including vent shafts, stations, the tunnelling works, road works/changes to traffic conditions, new bridges, TBM launch sites and others, all of which have no design plans yet available. There is very little certainty as to what the Project will look like and how it will be delivered, other than the Project concept area and precincts, and that the construction period for the Project will be approximately six to 10 years.

The Committee sees benefit in a mixture of prescriptive (for example set noise and vibration limits) and flexibility in providing a revised set of EPR.

### **21.4.4 How will the EPR be implemented?**

Implementing the construction and operational stages of the Project through effective adherence to a set of EPR is not without its difficulties. There is a long list of various plans and actions that need to be prepared and approved prior to construction commencing (early works, tunnel and stations) including a range of stakeholder consultations.

Although the EPR are not proposed to be included in the Incorporated Document, the Committee's concerns with implementation and enforcement are somewhat alleviated through the role of the Independent Environmental Auditor and Independent Reviewer, including the reporting of the Independent Environmental Auditor.

The Committee is satisfied that through Clause 5.1 of the Incorporated Document, the Minister for Planning approves various Development Plans providing the Minister the opportunity to confirm that the detailed design suitably implements the EPR as well as the UDS and considers the views of key agencies and stakeholders with either statutory or strategic interest in the Project works at various locations. These Development Plans will be made available for public inspection (Clause 5.1.4(c)) and a summary of consultation and responses to issues raised during the consultation will be provided to the Minister as part of the Development Plan approval process (Clause 5.1.5).

The Committee is mindful that its recommended version of the EPR builds upon the issues raised by various submitters, and has attempted to achieve the appropriate balance between too much prescription and too much flexibility in preparing the Committee's recommended version at Appendix F.

#### **21.4.5 Other matters relating to the Incorporated Document**

In the main, the Committee considers that the public submission and hearing process for this EES is the key opportunity for interested stakeholders to provide its views on any aspect relating to the Project. The 379 submissions received and the 33 Hearing days ensured that all relevant matters were able to be raised and considered. The contributions made by many parties has ensured a better and more robust outcome for all aspects of the Project. This is acknowledged by the Committee and was acknowledged by the MMRA in its closing.

However, as the Project is at Concept Design stage, and as there is much more to be done to reach the final design stage, the Committee considers some additional input by relevant stakeholders is warranted. This is not to say that all aspects of the Project should or could be opened up for further review or hearing. The Committee notes the submissions of some parties, including RMIT and the Cities of Stonnington and Port Phillip that sought an Advisory Committee type process to ensure an independent review on further matters. It is a matter for the Minister for Planning to consider at a later date if he wishes to implement a further process in the form of a Standing Advisory Committee or similar.

It does however support the Incorporated Document providing the opportunity for further input and review of the Development Plans for each precinct and the Early Works Plans through the opportunity to provide written comments to the Minister for Planning on each of these. Further, in the light of submissions made about the timeframes, the Committee endorses a timeframe for all aspects of 15 business days from the time of notice on the Project website and through a daily newspaper.

It goes without saying that such notices and the Project website must be carefully managed to ensure that interested parties can access these in a timely manner. In this regard, the Committee recommends that EPR SC3 be modified whereby interested stakeholders can register their details so that they are automatically advised of any matter affecting the Precinct or any matter Project wide, including opportunities to comment on the Development Plan or Early Works Plan.

### **21.5 Findings**

With regard to the EMF, the Committee accepts Version 4 tabled by the MMRA (D360) as it reflects the changes made to the Incorporated Document (D358), the EPR (D365) and the advice within TN41, TN68 and TN69. The Committee agrees that the EMF is a sound and robust framework for managing the environmental effects of the Project during its construction and operational stages.

The Committee finds that the MMRA has responded to a numerous requests for changes to the EPR during the course of the Hearings, and is commended for doing so. The Technical Notes provided by the MMRA greatly assisted the Committee in its understanding of a number of matters, and provided clarity around roles, responsibilities and implementation of the EMF and EPR.

In response to the questions about EPR posed by the MMRA, the Committee provides the following in response:

***Do the EPRs properly respond to the environmental impact that is to be managed?***

The EPR adequately respond to the environmental, social and economic impacts that have been identified in the EES, and provide appropriate actions and controls to minimise impacts from the Project during construction and operation.

***Do the EPRs establish an appropriate benchmark in respect of delivery of the Project?***

The Committee agrees with the MMRA that the EPR need to be focused on describing the environmental outcomes to be achieved rather than prescribing the manner in which they should be achieved. The EPR need to provide an adequate level of assurance that appropriate environmental standards will be achieved without unnecessarily limiting innovation in design or implementation, and in this regard the Committee finds that the EPR as modified in Appendix F establish an appropriate benchmark in respect of Project delivery.

***Do the EPRs properly provide for the preparation and implementation of appropriate management plans where necessary?***

The Committee finds there are a number of relevant plans that are required under various EPR that help to identify mitigation measures as the detailed design of the Project becomes available. Importantly, construction of the Project cannot commence until such plans are prepared and approved and in some instances, reviewed by the Independent Environmental Auditor.

***Do the EPRs properly provide for (or sit within a framework which properly provides for) consultation with stakeholders and affected persons?***

There are provisions in the Incorporated Document and in the EPR, including SC3 and EM04, that provide for adequate stakeholder and community consultation. The EPR make provision for significant stakeholder engagement including relevant agencies and councils as well as having purpose-built reference groups for transport (the TTWG) and Parkville institutions (the PPRG) that the Committee has recommended have independent chairs. The invitation to provide written comments within 15 business days provides sufficient opportunity for ongoing third party engagement.

***Are the EPRs sufficiently robust to account for changes from the Concept Design and within the Project Boundary?***

The EMF and the EPR include strong checks and balances including reporting requirements, various management plans, independent environmental auditing, independent review and monitoring. The EPR apply to the approved Project and are approved by the Minister for Planning as part of the EMF.

***Do the EPR properly acknowledge their relationship with other EPR?***

The Committee finds that the EPR properly acknowledge their relationship with other EPR and that the Committee's recommended version makes it clear up front that the EPR are not to be read in isolation.

The amended Committee version of the EPR is found in Appendix F and should be applied to the Project and incorporated into the EMF.



***Incorporated Document***

Additionally, the Committee supports the opportunity for stakeholders to comment on relevant Development Plans and Early Works Plans for a 15 business day period. The amended Committee version of the Incorporated Document is found in Appendix E and should be applied to the Project.

## 22 Integrated assessment

This part of the report provides the Committee's integrated assessment of the Project and its summary of responses to the matters raised in the Terms of Reference.

### 22.1 Integrated assessment

The Committee's Terms of Reference, at clause 14d include that the following relevant matters are included in its report:

- i. The likelihood and significance of environmental effects (impacts) of the project including any design and construction options documented in the EES ...*
- ii. ...*
- iii. Having regard to the draft evaluation objectives in the EES Scoping Requirements, the Inquiry's own conclusions on the effects of the project and relevant public submissions what design and construction options for the various project components are the most suitable for meeting the project outcomes and at the same time delivering an appropriate balance of environmental, economic and social outcomes.*

The EES framework, EMF, draft evaluation objectives and risk assessment process are discussed in Chapter 4 and technical chapters in Part 2, Chapters 5 to 20 of this report.

Overall, the Committee considers the evaluation objectives adopted by MMRA in the EES to be generally satisfactory. A new objective has been included with regard to electromagnetic interference.

The risk assessment approach, based upon AS/NZS/ISO 31000:2009 Risk Management is sound and is similar to that undertaken for other EES projects in Victoria. The structure of the EMF and use of EPR to capture environmental performance outcomes for construction and operation are appropriate to minimise environmental, economic and social impacts.

The Committee is satisfied these have been adequately tested by the Concept Design such that the Project can be delivered meeting environmental performance outcomes set by the EPR, with monitoring and review by the Independent Reviewer and Independent Environmental Auditor.

Table 8 summarises the Committee's findings and provides an integrated assessment with regard to the evaluation objectives being met for the Project. In the integrated assessment, where the Committee refers to the Incorporated Document and EPR, it is intended to refer to these documents as amended by the Committee in Appendices E and F.

Table 8 Integrated assessment

Draft evaluation objective and Relevant EPR	Committee's integrated assessment Relevant Chapters of this report
<p><b>Transport connectivity</b> –To enable a significant increase in the capacity of the metropolitan rail network and provide multimodal connections, while adequately managing effects of the works on the broader transport network, both during and after the construction of the Project</p> <p><b>T1- 11</b></p>	<p>The Committee accepts the evidence and submissions that the Project will enable a significant increase in the capacity of the rail network and provide multi-modal connections. It expands upon Melbourne's public transport network and is a city-shaping.</p> <p>There will be significant disruption to road transport during construction, particularly in and around Precincts 4, 5, 6 and 8, and there is a need for more modelling to determine the suite of network enhancement projects to cater for changed traffic conditions.</p> <p>The role of the TTWG is essential in meeting the transport connectivity objective and the appointment of an independent chair will assist in its transparency. The operation of the TTWG is an important element in ensuring further modelling and mitigation measures are undertaken to provide reasonable confidence that the traffic impacts associated with the Project in a number of precincts are minimised to the extent practicable.</p> <p>With regard to the Domain Precinct, the Committee finds that provision for two-way traffic on St Kilda Road during construction is required and is reflected in the EPR.</p> <p>With respect to Western portal Options A and B, on transport grounds, the Committee prefers Option B, as it returns a larger number of car parking spaces to Childers Street.</p> <p>The Committee finds that further consideration should be given to the location and number of station entries at Parkville, to best suit future pedestrian patterns.</p> <p>The Committee has recommended the MMRA investigate an alternate option to locate the Linlithgow Avenue access shaft on the western Linlithgow Avenue carriageway at the northern end of Tom's Block.</p> <p>The Committee finds that the option of providing a new station and connection to the Project at South Yarra sometime in the future would further enhance the ability for multi-modal connections and should not be precluded.</p> <p>Overall, it is considered that the EPR are sufficient to manage the environmental effects of the works on the broader transport network and that the evaluation objective of transport connectivity can be met. The Committee accepts the EES conclusion that impacts on transport connectivity would largely be confined to local networks during construction.</p> <p><b>Chapters 2 and 5</b></p>

Draft evaluation objective and Relevant EPR	Committee's integrated assessment Relevant Chapters of this report
<p><b>Built environment</b> – To protect and enhance the character, form and function of the public realm and buildings within and adjacent to the Project alignment, and particularly in the vicinity of Project surface structures, having regard to the existing and evolving urban context.</p> <p><b>LU1 - 4</b></p>	<p>The Committee accepts the Project has the potential to impact on the very fabric of Melbourne. The Committee considers improvements and measures in the EPR and UDS will appropriately minimise these impacts and have the potential to realise the opportunities of the project to enhance living spaces.</p> <p>If a temporary emergency access structure is required, it should be located within the eastern carriageway of Linlithgow Avenue.</p> <p>With respect to Western portal Options A and B, from a visual and landscape perspective, Option B offers superior outcomes and the Committee recommends that it be the option that should be adopted.</p> <p>The sensitivity of Domain precinct presents significant challenges to achieving the aspirations of the UDS and the UDS will be a critical component in achieving the built environment objective for the Project.</p> <p>The Committee finds that through the EPR and the UDS, the impacts to the built environment can be minimised and that the UDS provides opportunities for enhancement of the built environment in the legacy of the Project.</p> <p><b>Chapter 12</b></p>
<p><b>Social, community, land use and business</b> – To manage the effects on the social fabric of the community in the area of the Project, including with regard to land use changes, community cohesion, business functionality and access to services and facilities, especially during the construction phase.</p> <p><b>B1 - 5, S1 - 9</b></p>	<p>The impact of the Project during construction on communities in all precincts should not be underestimated. There will be significant disruption to daily life through the whole of the construction program and it will affect people in different ways. It cannot be completely avoided but it may be able to be mitigated – to a certain degree.</p> <p>The Committee accepts the Project, once operational, will produce significant benefits to the state economy and to residents, businesses and institutions. The Committee acknowledges construction activities may present significant impacts to social fabric and individual business viability. Appropriate mitigation of social and business effects relies largely on meaningful communication throughout the construction phase of the project and an appropriate process for redress for business impacts.</p> <p>Overall, the Committee finds that in the context of the Project benefits, impacts during the construction stage upon the community will be largely acceptable and the suite of controls and strengthened stakeholder engagement through revised EPR and Incorporated Document are appropriate to implement the Project.</p> <p><b>Chapters 6 to 8</b></p>

Draft evaluation objective and Relevant EPR	Committee’s integrated assessment Relevant Chapters of this report
<p><b>Amenity</b> – To minimise adverse air quality, noise or vibration effects on the amenity of nearby residents and local communities, as far as practicable, especially during the construction phase.</p> <p><b>AQ1 - 3, GHG1- 2, NV1 -20</b></p>	<p>The Committee considers the EPR will mostly minimise adverse amenity effects on nearby residents, communities, businesses and facilities.</p> <p>Noise and vibration will have impacts on residents, businesses and institutions to varying degrees, however it is accepted that for the most part, adherence to the relevant noise and vibration guidelines / levels can be met and that where those levels cannot be met, that mitigation measures are sound. The Committee also accepts the EES conclusion that air quality and vibration during operation are not expected to create amenity issues and that where required, permanent noise treatments to protect a small amount of properties near the tunnel entrances would be designed in accordance with relevant policy.</p> <p>Dust is noted to be the biggest air quality issue and there may be times of exceedances of particulate matter, particularly that related to ‘nuisance’ dust fall-out. However, the Project’s mitigation measures as proposed in the EES and EPR provide assurance that the general risk to human health and amenity objectives can be met.</p> <p><b>Chapters 9 and 10</b></p>
<p><b>Electromagnetic interference</b> – To ensure potential EMI impacts of the Project are understood and managed.</p> <p><b>EMI1 - 2</b></p>	<p>Whilst the EES failed to assess potential impacts from EMI, the Committee is satisfied the new EPR are appropriate to identify and manage any issues from EMI, particularly to sensitive equipment.</p> <p><b>Chapter 10</b></p>

Draft evaluation objective and Relevant EPR	Committee's integrated assessment Relevant Chapters of this report
<p><b>Cultural heritage</b> – To avoid or minimise adverse effects on Aboriginal and historic cultural heritage values</p> <p><b>AH1, CH1 - 23</b></p>	<p><u>Historic</u></p> <p>The Committee considers that the Project will impact a number of heritage places but that adequate measures have been put in place to ensure that adverse effects are avoided or minimised as much as possible. It considers that impacts to heritage places from vibration and ground movement during construction and operation stages can be managed. Many heritage processes will be managed under the <i>Heritage Act 1995</i> and the Committee considers that the Heritage Impact Statement (HIS) will address places in heritage overlays.</p> <p>With respect to the temporary EAS in Precinct 7, the Committee finds from a heritage perspective the preferable location would be within the carriageway proposed to be closed by the City of Melbourne. If this is not possible, the Committee considers that with further work to minimise impacts, Tom's Block may be acceptable. The Committee rejects the Queen Victoria Gardens location put forward in the EES Concept Design.</p> <p>With respect to Western portal Options A and B, Option B is strongly preferred on heritage grounds.</p> <p>In relation to the Domain Station, the Committee considers that there are issues regarding how heritage values can be maintained given the physical and visual impacts of new above ground structures and changes to the functional layout. The MMRA is urged to continue to seek opportunities to minimise impacts within this Precinct, and to further review the design process.</p> <p><u>Aboriginal cultural heritage</u></p> <p>The Committee is satisfied the CHMP process under the <i>Aboriginal Heritage Act 2006</i> will ensure this objective is met.</p> <p><b>Chapter 11</b></p>
<p><b>Land stability</b> – To avoid or minimise adverse effects on land stability that might arise directly or indirectly from Project works</p> <p><b>GM1 - 6</b></p>	<p>The Committee concludes potential effects on ground movement and land stability can be suitably managed. The EES impact assessment indicated assumed pre-emptive mitigation measures for the Project's construction, which should be implemented to ensure that detailed design will achieve the same level of estimated risk (or lower) as currently assumed in the Project Concept Design and EES.</p> <p><b>Chapter 15</b></p>

Draft evaluation objective and Relevant EPR	Committee's integrated assessment Relevant Chapters of this report
<p><b>Landscape, visual and recreational values</b> – To avoid or minimise adverse effects on landscape, visual amenity and recreational values as far as practicable</p> <p><b>AR1 - 6, LV1 - 4</b></p>	<p>The Committee agrees with the conclusion in the EES that there would be some adverse effects on landscape and visual values during construction. These would be temporary, although of several years duration at some locations. These impacts would be the result of tree removals, overlooking of construction work sites and activities.</p> <p>With respect to open space, the Committee acknowledges there will be impacts, in some areas such as City Square, significant impacts. The EPR are however adequate to minimise these impacts to an acceptable level and the UDS will ensure appropriate design for all components of the Project.</p> <p>With respect to trees, the Committee acknowledges there will be impacts, and in some areas such as the Domain, significant impacts. The EPR are however adequate to minimise these impacts to an acceptable level. Amenity impacts in Osborne Street in Precinct 8 warrant particular effort to retaining as many trees as possible.</p> <p>The form and detail of construction method in the Domain precinct should be further reviewed to ensure that as many trees can be retained during the construction phase and as referred to in heritage, further work is required to understand the legacy impact of changes to the heritage place of St Kilda Road.</p> <p><b>Chapter 12</b></p>
<p><b>Hydrology, water quality and waste management</b> – To protect waterways and waterway function and surface water and groundwater quality in accordance with statutory objectives, to identify and prevent potential adverse environmental effects resulting from the disturbance of contaminated or acid-forming material and to manage excavation spoil and other waste in accordance with relevant best practice principles.</p> <p><b>C1 - 4, GW1 - 5, SW1 - 2</b></p>	<p>The Project will require just over 2 million m<sup>3</sup> (in-situ volume) of excavated spoil to be removed and disposed to suitable off-site facilities, over the course of the construction period. There will be some associated impacts across most Precincts, but more particularly to Precincts 3 and 7 (mainly dust related). Due to the urban environment, contaminated soils will no doubt be encountered however, appropriate mitigation measures and existing policy will ensure minimal, if any impact to sensitive receptors from such materials.</p> <p>Potential impacts to the three main watercourses are deemed negligible from the construction and operation of the Project. Appropriate flood mitigation measures have been identified. Capture and treatment of stormwater run-off from the Project will be suitably addressed, using standard construction procedures, often used with major projects. The Committee agrees with the conclusion in the EES that a risk assessment based on modelling of the final detailed design must be carried out to confirm that flooding is appropriately addressed, and structures must be designed to minimise the potential for flood and stormwater flows to carry any contaminants from the Project to surface water bodies.</p> <p>The tunnel alignment generally targets the top portion of the Melbourne Formation siltstone for its setting, to avoid wherever possible, the passing through of significant layers of acid-forming materials. All tunnel structures that will be submerged within groundwater are to be tanked.</p> <p>The Committee concludes potential effects on hydrology, water quality and contaminated land can be suitably managed.</p> <p><b>Chapters 13, 14 and 16</b></p>

Draft evaluation objective and Relevant EPR	Committee's integrated assessment Relevant Chapters of this report
<p><b>Biodiversity</b> – To avoid or minimise adverse effects on native terrestrial and aquatic flora and fauna, in the context of the Project's components and urban setting.</p> <p><b>AE1 - 7, FF1 - 3</b></p>	<p>The highly developed urban landscape along the Project's alignment means that many areas have a long history of disturbance and have been cleared of native vegetation.</p> <p>The Committee finds that in the context of the urban environment, the proposed EPR are acceptable to manage the potential biodiversity impacts.</p> <p>The Committee finds that the EES satisfactorily addresses the EES objective.</p> <p><b>Chapter 17</b></p>
<p><b>Environmental Management Framework</b> – To provide a transparent framework with clear accountabilities for managing environmental effects and hazards associated with construction and operation phases of the Project, in order to achieve acceptable environmental outcomes.</p> <p><b>EM1 - 4</b></p>	<p>With the assessment of a Concept Design rather than a detailed Project, the EMF and EPR are critical in determining how the Project can be delivered within an acceptable environmental framework. Subject to the amendments recommended in this report, the Committee considers the EMF and EPR will achieve acceptable environmental outcomes. The Committee considers the EPR are sufficiently linked via the EMF in clause 5.2 of the Incorporated Document.</p> <p>The roles of the Independent Reviewer and Independent Environmental Auditor are also important in providing a transparent framework with clear accountabilities for managing environmental effects of the Project.</p> <p>The Incorporated Document and Community and Stakeholder Engagement Management Plan ensures key documents will be available on the Project website and that interested stakeholders can register to receive information on planned construction activities in a timely fashion.</p> <p><b>Chapters 4, 21, 22</b></p>

## 22.2 Response to Terms of Reference

The Committee was provided with Terms of Reference to guide its assessment of the EES in its role as both Inquiry and Advisory Committee. The following outlines how the Terms of Reference have been addressed.

The Committee has undertaken a detailed review of the EES, technical appendices, draft PSA and submissions received in relation to these. In doing so, the Committee has investigated and considered matters listed in paragraphs 14b(i) to (vii) of the Terms of Reference.

The Committee acting in its joint role as Inquiry and Advisory Committee conducted a Hearing. As much as possible, hearings were conducted in public with there being a limited number of 'closed' sessions being held in relation to confidential submissions.

The Terms of Reference set out a number of matters, which the Committee's report is to address. These are listed with references in Table 9.



Table 9 Response to Terms of Reference

Relevant paragraph	Term of reference requirement	Chapter of report that addresses this requirement
14d.	Description of the proceedings conducted	1.3, 1.5
14d.	List of those making a submission or consulted	Appendices B and C
14d. (i)	The likelihood and significance of environmental effects (impacts) of the project including any design and construction options documented in the EES.	Part B and with integrated assessment in Part C
14d. (ii)	Whether the project is capable of achieving acceptable environmental outcomes in the context of applicable legislation, policy, strategies and guidelines.	Part B and with integrated assessment in Part C
14d. (iii)	Having regard to the draft evaluation objectives in the EES Scoping Requirements, the Inquiry's own conclusions on the effects of the project and relevant public submissions, what design and construction options for the various project components are the most suitable for meeting the project outcomes and at the same time delivering an appropriate balance of environmental, economic and social outcomes.	Part B with integrated assessment in Part C
14d. (iv)	Any modifications to the project that are needed to prevent or minimise adverse environmental effects of the Project, having regard to any standards, objectives and guidelines established under relevant legislation.	Consolidated recommendations in Executive summary based on recommendations in Parts A, B and C.
14d. (v)	Any conditions which might need to be imposed on any approval given for the Project under Victorian law which are necessary to achieve acceptable environmental outcomes under the applicable legislation and/or policy.	Consolidated recommendations in Executive summary based on recommendations in Parts A, B and C
14d. (vi)	The proposed framework for environmental management of the Project, including any Environment Management Plan(s) required in association with an approval given under Victorian law.	Chapter 21
14d. (vii)	The effectiveness of proposed mitigation measures in reducing identified risks to residual levels presented in the EES.	Part B with integrated assessment in Part C
14d. (viii)	The extent to which the analysis in the EES demonstrates whether relevant proposed Environmental Performance Requirements can be met.	Consolidated recommendations in Executive summary based on recommendations in Parts A, B and C
15c.	Advice as to whether the draft PSA is an appropriate means by which to facilitate and implement the Project, and any recommendations it might have in relation to the statutory framework to be established for the Project.	Chapters 3, 6 and 21



## Appendix A Terms of Reference

### Terms of Reference

#### Melbourne Metro Rail Project – Inquiry and Advisory Committee

**An Inquiry pursuant to section 9(1) of the *Environment Effects Act 1978* (EE Act) and an Advisory Committee pursuant to section 151 of the *Planning and Environment Act 1987* (PE Act) are appointed to jointly consider and report upon the Melbourne Metro Rail Project, in accordance with these Terms of Reference.**

The combined Inquiry and Advisory Committee is to be known as the **Melbourne Metro EES Inquiry and Advisory Committee (IAC)**.

#### Background

1. The Melbourne Metro Rail Project broadly comprises:
    - a. two nine-kilometre rail tunnels from Kensington to South Yarra to connect the Sunbury and Cranbourne-Pakenham railway lines, to be used by electric trains and generally following an alignment, which can be described from west to east as passing:
      - under Arden and North Melbourne to Grattan Street; then
      - under the vicinity of South Carlton, Swanston Street, Queen Victoria Gardens, St Kilda Road, Fawkner Park and Toorak Road;
    - b. western portal is generally in the vicinity of South Kensington Station, with realignment of the existing Sunbury Line tracks to form an at-grade junction with the Project tracks;
    - c. new underground stations at:
      - Arden, proposed to be located east of CityLink within government owned land;
      - Parkville, proposed to be located generally under the Grattan Street road reserve, east of the intersection of Royal Parade, and including train-tram interchange;
      - CBD North, proposed to be located generally under the Swanston Street road reserve, generally between Franklin Street and Latrobe Street, and including interchange access to Melbourne Central Station;
      - CBD South, proposed to be located generally under the Swanston Street road reserve generally between Collins Street and Flinders Street, and including interchange access to Flinders Street Station and Federation Square; and
      - Domain, proposed to be located generally under the road reserve of St Kilda Road and Albert Road, and including a train-tram interchange.
    - d. eastern portal is generally south of South Yarra Station, with the project tracks tying into the existing Cranbourne-Pakenham Line tracks west of Chapel Street; and
    - e. relevant ancillary temporary and permanent works to support the construction and operation of the tunnels, stations and interchanges, including turnbacks and emergency access shafts for safety purposes in a number of locations as required, which may include Fawkner Park and the Domain parklands.
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2. The Project proponent is the Melbourne Metro Rail Authority (MMRA), which has been established as an administrative office of the Department of Economic Development, Jobs, Transport and Resources (DEDJTR).
  3. On 3 September 2015 the works proposed to be undertaken by the MMRA for the purposes of the Project were declared by Order to be “public works”, pursuant to section 3(1) of the EE Act.
  4. Section 4(1) of the EE Act provides that before commencing any public works to which the EE Act applies, the proponent must cause an Environment Effects Statement (EES) to be prepared and submitted to the Minister for assessment of the environmental effects of the works.
  5. On 24 November 2015 a further Order was made to exclude certain specified works from the declaration of public works made on 3 September 2015, and thereby exclude those specified works from the requirement to prepare an EES.
  6. The order made on 3 September 2015 also specified procedures and requirements for the preparation of the EES in accordance with section 3(3) of the EE Act.
  7. Pursuant to the order made on 3 September 2015:
    - a. Draft scoping requirements were prepared and placed on public exhibition between 13 October 2015 and 4 November 2015;
    - b. Having considered the public comments in relation to the draft scoping requirements, final scoping requirements were approved by the Minister for Planning on 11 December 2015.
  8. As the proponent, the MMRA has been responsible for preparing the EES and its appendices and undertaking all stakeholder consultation in the course of that process.
  9. A draft planning scheme amendment affecting the Maribyrnong, Melbourne, Port Phillip and Stonnington Planning Schemes (the draft PSA) has been published with the EES. The draft PSA has been prepared by MMRA. The draft PSA is intended to facilitate the implementation of the Project.
  10. MMRA propose that the Minister for Planning will be the planning authority for the amendment.
  11. The draft PSA proposes:
    - a. The Project would be exempt from the requirement to obtain a planning permit, provided that the use and development for the purposes of the Project complies with the conditions and requirement set out in an ‘Incorporated Document’.
    - b. A Design and Development Overlay which will apply over the area affected by the Project as a means of protecting the delivery of the Project and the resultant infrastructure into the future.
  12. Pursuant to the order made on 3 September 2015 the EES will be exhibited for a period of 30 business days for public comments.
  13. The Inquiry has been appointed on 10 April 2016 under section 9 (1) of the EE Act to consider the environmental effects of the proposal. The membership of the Inquiry is:
    - a. Kathy Mitchell (Chair)
    - b. Geoff Underwood (Deputy Chair)
    - c. Craig Barker
    - d. Jenny Donovan
    - e. Mandy Elliott
    - f. Kate Partenio
-

## **Inquiry**

### *Terms of Reference*

#### 14. The Inquiry is to:

- a. Review:
  - i. The EES and technical appendices; and
  - ii. Any public submissions received in relation to the EES as part of the exhibition process;
- b. Investigate and consider:
  - i. The potential magnitude, likelihood and significance of adverse and beneficial environmental effects of the Project;
  - ii. Potential modifications to the Project and/or environmental management measures that are needed to address likely adverse effects or environmental risks;
  - iii. The overall significance of likely adverse effects and environmental risks of the project, relative to likely benefits of the project, within the context of applicable legislation, policy, strategies and guidelines;
  - iv. The assessment contained in the EES and technical appendices of each of the potential specific environmental effects in light of the Order and the Scoping Requirements, and any mitigation measures, or performance requirements contained in the EES to address the identified environmental effects;
  - v. The adequacy and/or appropriateness of the proposed environmental management framework for the works, including but not limited to a consideration of the environment performance measures or other mitigation measures contained in the EES;
  - vi. Whether acceptable environmental outcomes can be achieved by the Proposal overall, both with and without potential modifications or environmental management measures;
  - vii. All submissions made to the Inquiry in relation to any matter relevant to the Inquiry's investigation or consideration of the EES; and
  - viii. Any matter reasonably incidental to the matters set out in paragraphs 14(b)(i) to (vii) above.
- c. Conduct a hearing to hear from MMRA and any submitters as though the Inquiry:
  - i. is a Panel for the purpose of section 160 of the PE Act – ie the Inquiry
    1. is to conduct its hearings in public unless a submission is of a confidential nature; and
    2. has the power to make orders excluding a person from proceedings who does an act referred to in section 169 of the PE Act
  - ii. is an advisory committee conducting a hearing for the purposes of section 152(1) and (2) of the PE Act.
- d. Provide a report to the Minister containing a description of the proceedings conducted by the Inquiry (including a list of those making a submission or consulted), and findings and recommendations in relation to its investigations and considerations referred to above, including but not limited to the following specific matters:
  - i. The likelihood and significance of environmental effects (impacts) of the project including any design and construction options documented in the EES.
  - ii. Whether the project is capable of achieving acceptable environmental outcomes in the context of applicable legislation, policy, strategies and guidelines.
  - iii. Having regard to the draft evaluation objectives in the EES Scoping Requirements, the Inquiry's own conclusions on the effects of the project and relevant public submissions,

what design and construction options for the various project components are the most suitable for meeting the project outcomes and at the same time delivering an appropriate balance of environmental, economic and social outcomes.

- iv. Any modifications to the project that are needed to prevent or minimise adverse environmental effects of the Project, having regard to any standards, objectives and guidelines established under relevant legislation.
- v. Any conditions which might need to be imposed on any approval given for the Project under Victorian law which are necessary to achieve acceptable environmental outcomes under the applicable legislation and/or policy.
- vi. The proposed framework for environmental management of the Project, including any Environment Management Plan(s) required in association with an approval given under Victorian law.
- vii. The effectiveness of proposed mitigation measures in reducing identified risks to residual levels presented in the EES.
- viii. The extent to which the analysis in the EES demonstrates whether relevant proposed Environmental Performance Requirements can be met.

### **Advisory Committee**

15. The Advisory Committee is appointed pursuant to section 151 of the PE Act.

#### *Terms of Reference*

16. If the Project is to proceed, the MMRA proposes an amendment to the various planning schemes which apply to the land affected by the Project. The MMRA has prepared a draft planning scheme amendment. The Advisory Committee is to:

- a. Review:
  - i. The draft PSA; and
  - ii. Any public submissions received in relation to it;
- b. Conduct a hearing to hear from MMRA and any submitters that wish to be heard concerning the draft planning scheme amendment. The hearing is to be conducted:
  - i. in accordance with the relevant provisions of the PE Act (including section 152 of the PE Act); and
  - ii. jointly with the Inquiry hearing in relation to the EES insofar as is appropriate and possible; and
- c. Provide a report to the Minister containing the Advisory Committee's advice as to whether the draft PSA is an appropriate means by which to facilitate and implement the Project, and any recommendations it might have in relation to the statutory framework to be established for the Project.

### **Miscellaneous**

#### *Submissions*

17. Submissions to the IAC are public documents unless otherwise directed by the IAC.
18. Submissions to the IAC will be retained for five years from the appointment of the IAC, or longer if otherwise directed by the IAC.

#### *Quorum*

19. The IAC will meet and conduct hearings when there is a quorum of at least four of its members present including the IAC Chair or the Deputy Chair.

#### *Time of parties appearing before the Inquiry/Advisory Committee*

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20. The IAC may limit the time of parties appearing before it.

*Timing of Report*

21. The IAC is to submit its report to the Minister within 30 business days of the last hearing day.

*Fees and Costs of Inquiry/Advisory Committee*

22. The members of the IAC will receive the same fees and allowances as a Senior Panel Chair appointed under Division 1 of Part 8 of the *Planning and Environment Act 1987*.

23. All costs of the IAC, including expert advice, technical administration and legal support, venue hire, accommodation, recording proceedings and other costs will be met by the MMRA.

*Technical, Legal and Administrative Support*

24. The IAC may seek advice from experts where it considers this is necessary. Any such advice must be publicly disclosed.

25. The IAC may retain legal counsel to assist it.

26. Planning Panels Victoria is to provide administrative support to the IAC.

27. The IAC may also engage additional technical and administrative support as required.

*signed by*

**Richard Wynne MP**

**Minister for Planning**

Date: 23/5/2016

**Appendix A – Other Information**

***Project Managers***

1. Day to day liaison for matters regarding the Inquiry process can be made to Planning Panels Victoria, on phone: (03) 9223 5317 or email: [planning.panels@delwp.vic.gov.au](mailto:planning.panels@delwp.vic.gov.au).
  2. Day to day liaison for matters regarding the EES process can be made to the Impact Assessment Unit in Department of Environment Land Water and Planning (DELWP) on phone (03) 8392 5503 or email [impact.assessment@delwp.vic.gov.au](mailto:impact.assessment@delwp.vic.gov.au).
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## Appendix B Submitters to the EES

No.	Submitter
1	Test submission
2	Wayne Richard Oliver
3	Mirko Angele
4	William Melville McIntosh
5	Graham Leahy
6	Bistro Gitan
7	Andrew Gurney
8	Michael Koodak
9	Robert John Dixon
10	Christopher John Riches
11	Therese Ann Fitzgerald
12	Rodger and Wendy Allgood
13	HRG Investments Pty Ltd
14	Jenny Barrett
15	Damien Beare
16	Damien Beare
17	Rod Cordell
18	Michael Younes
19	Thomas Howgate
20	Jessica Cerejo
21	VicTrack
22	Clear Edge
23	Andrew Ryan
24	Emmy Chung
25	North Melbourne Football Club
26	Mia Greves
27	Michiko Smith
28	Bradford Moffat
29	Michelle Foster
30	Adrian Yesuratnam
31	Hadyn Sharples
32	Jason Ng
33	Rowan Smith

No.	Submitter
34	Marie Ryan
35	Dean Raleigh
36	Marie Ellen
37	Champion Part Pty Ltd
38	Ray St James
39	Kaye Allan
40	Ruby Horton
41	Owners Corporation 11 Anderson St 446492
42	Melissa Fyfe
43	Grace Horton
44	James Robinson
45	Kym Raverty
46	Bruce Alexander Grant
47	Rendina Real Estate
48	Joshua Cetin
49	Timothy Brooks
50	Christopher Marsden
51	David John Thornely
52	David John Thornely
53	Jeff Willcox
54	Georgina Paterson
55	Sarah Fairweather
56	Geeti Persson
57	Susan Fletcher
58	Dajaanu Pty Ltd trading as City Square Motel
59	Madeleine Jenkins
60	Interdisciplinary Conservation Science Research Group, RMIT University
61	The Mac.Robertson Girls High School
62	Craig Hudson
63	Tom McCallum

No.	Submitter
64	Peter Atkins
65	Southend Projects Pty Ltd
66	Geeti Persson
67	Mary Simcic
68	Barbara Thornely
69	Beverley Dunn
70	Wilma Smith
71	Jarrod Sawers
72	Christopher Shearer
73	Tony Smith
74	Nola Peacock
75	Susan Patricia Long
76	Samuel Hurst
77	Ian Smart
78	Ray Lomasney
79	Ruth McConchie
80	Judy Anderson
81	Linda Bardo Nicholls
82	Alfred Health
83	Dennis Kennedy
84	Nick Theodossi Prestige Cars
85	Z Transport Group Pty Ltd
86	Janine Mackenzie
87	Mark Miller
88	Minister For Planning
89	Timothy George Fitton
90	Rachael Palmer
91	Angela Burge
92	Jacqueline Hammond
93	Damien Hammond
94	Srecko (Mike) Planinc
95	Nicholas King and Amy Leonard-King
96	Barbara Thornely
97	Francesca Sciarretta
98	John Colquhoun

No.	Submitter
99	Roger Wilson
100	The Graduate Union of The University of Melbourne Inc.
101	Adam Murchie
102	Frances Lamb
103	David Muir
104	Winston Chong
105	Alexander Samuel Kahn
106	Evan and Julia Lucas
107	Cheryl Leanne Baker
108	Christopher C Fellows
109	Guanlin You
110	Toni Lois Green
111	Digby Charles Christian Drew
112	Vanessa Forrest
113	Scott James Charles
114	Catherine and Matthew Fritsch
115	Edward James Klein
116	Simon Elchlepp
117	Youngah Yun
118	Frances Duckett Dumaresq
119	Justin Dowd
120	Naomi Fennell
121	Australian Visitor Centres trading as Best of Victoria
122	Melanie Lobb
123	William Raymond Wood
124	Kensington Association
125	Rebecca Smith
126	Julie Willis
127	Neil Richard Tonkin
128	Friends of the Elms Inc.
129	Ryan Staggard
130	Kelly Greer
131	Sharon Weedon
132	Camruss Pty Ltd

No.	Submitter
133	City of Port Phillip
134	Ross Patrick William Miller
135	Melbourne Hebrew Congregation Inc
136	Andrew Hollow
137	Christine Jiawen Loh
138	Serafina Ruffolo
139	Kerrie Gilbert
140	Fiona Norman
141	Owners Corporation 444563/B
142	Mark And Zoe Cassar
143	Ania Hampton
144	Kensington Flemington Junior Sports Club
145	Peter Higgs
146	Adam Cocks
147	Lai Lee Tan
148	Jingxian Zhang
149	Emma Lucas
150	Bronwyn Thomas and Trieu Huynh
151	Eve Norton McGlashan
152	Mark Potter
153	Marcia Fleet
154	Graeme Andrew Webb
155	Sanna Heinola
156	Holy Rosary Primary School
157	Tom Bayford
158	Jacqueline Van Heerden
159	Christ Church South Yarra
160	Above Left Distributors and Agencies Pty Ltd
161	Linda Ethell
162	Catherine Mitchell
163	Irwin Stockfeeds
164	Peter And Sharon Robertson
165	Deb Wilson
166	National Gallery of Victoria

No.	Submitter
167	Witold Mikiewicz
168	Philip Rain
169	Carolyn Hughes
170	Citywide Service Solutions Pty Ltd
171	Kenneth Date
172	Marilyn Parsons
173	Kang Ahu
174	Bruce W Jenkins
175	Joan Leyland
176	Simone Kohler
177	John Dixon Robinson
178	Federation Square Pty Ltd
179	Kensington Neighbourhood House
180	RMIT University
181	William Anthony Murray
182	Ross House Association
183	Ann and Ian Wicks
184	Wonderbao
185	Anthony Daniele
186	Allard Shelton Pty Ltd
187	Margaret Bradbeer
188	Patricia Ann West
189	Patrice Raselli Marriott
190	The Domain Owners Corporation
191	Department of Health and Human Services
192	Rebecca Lewis
193	Andrew Peters
194	Djurdjica Kesic
195	McDonald's Australia Limited
196	Helen Denise Kent
197	Justin O'Meara
198	Keith Joshi
199	Rae and John Bennett
200	Elizabeth Doak
201	David Cotton

No.	Submitter
202	Paula Morgan
203	Michael and Rina Mordaunt
204	Peter James Anderson
205	Suzanne Dobbinson
206	Jennifer Boyle
207	Angela Williams
208	Trevor Rahill
209	Trevor Jensen
210	Vincent Ryan
211	Daniel Del Rio McCormick
212	Raife Cameron
213	Malcolm Angus Cameron
214	Darcy Cameron
215	Angus Cameron
216	David Blake
217	Michelle Fink
218	David Ian Macgowan
219	Russell Keays
220	Ross Kelly
221	Sentigini Pty Ltd
222	The Oxford Scholar Hotel
223	Peter Donnellan, Thi Ai Kien Dang and Susan Thuy Linh Dang
224	Michel Dubois
225	Spacerepublica
226	Domain Hill Owners Corporation
227	Naturelinks Landscape Management Pty Ltd
228	North Melbourne Community Group
229	Simon Mathams
230	Bronwen Jefferson
231	The GPT Group
232	Nina Ross
233	CJ Scott Pty Ltd
234	Deborah Flint
235	Margaret Alice Bray

No.	Submitter
236	Simon Pockley
237	Chep Palleano
238	A group of South Kensington residents
239	Matthew Hammond
240	Owners Corporation 348427V of 400 St Kilda Road Melbourne 'The Botanica'
241	Stanley Herbert Deed
242	Carolyn Catterson
243	Charles McHugh
244	Barbara Thornely
245	Elena Makkhyu
246	Bistro Gitan
247	Patrick Say
248	Craig Went
249	Shrine of Remembrance
250	Dusanovic family
251	Sean Deany
252	Peter Anthony Catterson
253	Stephen Cross and Natalene Muscat
254	Royal Botanic Gardens Victoria
255	Australian Institute of Landscape Architects
256	Marilyn Wane
257	City of Stonnington
258	Katerina Stephanou
259	MDB Investment Trust
260	Lisa Gabrielli
261	Hobsons Pty Ltd and Karaoke Pty Ltd
262	Alexander Macdonald
263	ALDI Supermarket
264	Joseph Christopher Ayres
265	James Hayton
266	Jonathan Forbes
267	Karen Joy Baynes
268	Residents of Albert Tower

No.	Submitter
269	Burke And Wills Historical Society Inc.
270	Lisa Whiffen
271	Kensington Community Children's Co-operative
272	PDG Corporation Pty Ltd
273	Zagame Group Pty Ltd
274	Melbourne Anglican Trust Corporation
275	Public Transport Victoria
276	Stephanie Anderson
277	Citywide North Melbourne Asphalt
278	Hayden Rattray
279	Malcolm Wesley Wrest
280	Melbourne Metro Rail Authority
281	Dev Kevat
282	Simon Russo
283	The Hallmark
284	Michele Tan
285	Catherine Pavlidis
286	Andrew Mcilwain
287	Charlor Pty Ltd trading as Rydges on Swanston
288	Royce Hotel
289	George and Maureen Swinburne
290	Teresa Poore
291	EPA Victoria
292	Paul Jeffrey Tanner
293	Chris Coomber
294	Parkville Association Inc.
295	Ramsay Health Care
296	Professor Maurice Eisenbruch
297	Irene Elizabeth Goonan
298	Royal Domain Plaza Owners Corporation PS419703E
299	Chunfai Yu
300	Anson Yu

No.	Submitter
301	Paul Yu
302	Ethan Hammond
303	Yarra Trams
304	Eliana Alfonso
305	Christian Mazzarino
306	John Tabart
307	Nicholas John Gamble
308	Melbourne Health
309	Barry Scott
310	Owners Corporation PS428405M
311	Robert Brunner
312	Tedd Warden
313	Karina Reynolds
314	Maribyrnong City Council
315	Viera Suran
316	Metropolitan Fire Brigade
317	Residents 3000 Inc.
318	The University of Melbourne
319	Promenade, City Condos and Princeton Residents' Group
320	Heritage Victoria
321	Arts Centre Melbourne
322	Thomas Stephen Harley And Sarah Margaret Trudy Kennedy
323	Anne Adams
324	Denise Weir
325	Tennessee Leeuwenburg
326	ALE Property Group
327	Geoff Leach
328	Susie Strain
329	Steven Unthank
330	Heather Heath
331	Ken Oag
332	National Trust of Australia (Victoria)
333	Fiona Reed
334	Felicity Mcallister

No.	Submitter
335	Melbourne Heritage Action
336	Tim Shannon
337	Kingsley Slipper
338	Dajaanu Pty Ltd trading as City Square Motel
339	Mr Malcolm Ninnis
340	Peter Giudice
341	Jonathan
342	Katherine Judge
343	Fiona Reed
344	RACV
345	Clean Energy Council
346	Lorraine Parker
347	Evelyn Fryer
348	Pratap Acharya
349	Promenade, City Condos and Princeton Residents' Group
350	Quang Dang To
351	Owners Corporation 410325K
352	Ronald Keny and Nola Lillian Hutchins
353	Duplicate
354	Nicolas Thomas
355	Anne Elizabeth Lurie
356	Duplicate
357	George Weston Foods
358	Melbourne Girls Grammar
359	Duplicate
360	COMFORTiD.com Pty Ltd
361	BNC Pty Ltd
362	Newmark Capital
363	Duplicate
364	Robin Anthony Vowels
365	City of Melbourne
366	VicRoads
367	Melbourne Grammar School

No.	Submitter
368	Tabcorp Holdings Limited
369	Lillian Brown
370	G12+
371	Slater & Gordon Lawyers
372	Legend Properties Pty Ltd
373	The Walter and Eliza Hall Institute of Medical Research
374	Claire Sorati
375	National Boer War Memorial
376	Metropolitan Planning Authority
377	Build Corp Commercial
378	Confidential
379	Oscard Pty Ltd

## Appendix C Parties to the Hearing

Submitter	Represented by
Minister for Planning	Adrian Finanzio SC, with Emma Pepler of Counsel
EPA Victoria	German Ferrando-Miguel and Madhvi Betigeri
Melbourne Metro Rail Authority	Michelle Quigley SC and Chris Townshend SC, with Barnaby Chessell and Marita Foley of Counsel, instructed by Tim Power of Herbert Smith Freehills, who called the following expert witnesses: <ul style="list-style-type: none"><li>- Rob Milner of 10 Consulting Group in land use planning</li><li>- Peter Lovell of Lovell Chen in heritage</li><li>- David Galwey of Tree Dimensions in arboriculture</li><li>- John Patrick of John Patrick in arboriculture</li><li>- Ron Jones of Jones and Whitehead in urban design</li><li>- John McCrann of AJMJV in surface water</li><li>- Hugh Middlemis of Hydrogeologic in groundwater</li><li>- Shane Lakmaker of AJMJV in air quality</li><li>- David Coutts of AJMJV in contaminated land</li><li>- Sean Smedley of Smedley Technical and Strategic in transport</li><li>- Rose McArthur of AJMJV in transport</li><li>- Dave Anderson of Acoustic Studio in airborne and operational vibration</li><li>- John Heilig of Heilig and Partners in construction vibration</li><li>- Terry Rawnsley of SGS Economics and Planning in business impact assessment</li><li>- Owen Boushel of AJMJV in social impacts</li></ul>
Public Transport Victoria	Stuart Morris QC of Counsel, instructed by Sophie Osborn and Jeff Lynne of Ashurst Lawyers with Andrew Collings of PTV

Submitter	Represented by
City of Melbourne	<p>Matthew Townsend of Counsel, instructed by Hunt and Hunt, with Karen Synders of Council, who called the following expert witnesses:</p> <ul style="list-style-type: none"> <li>- Peter Fearnside of Marshall Day Acoustics in noise and vibration management</li> <li>- Haig Poulson of Council in engineering</li> <li>- Ian Shears of Council in arboriculture, parks and open space</li> <li>- Steve Nagle of Council in business and tourism</li> <li>- Barry Fox of Council in surface water, ground water and stormwater.</li> <li>- Graham Porteous of Council in social and community impacts</li> <li>- Rob Moore of Council in urban design</li> </ul>
City of Port Phillip	Claire Ferres Miles of Council
City of Stonnington	<p>Peter O'Farrell of Counsel, instructed by Kim Piskuric of Harwood Andrews, with Anthony De Pasquale of Council, who called the following expert witnesses:</p> <ul style="list-style-type: none"> <li>- William McDougall in transport planning</li> <li>- Steven Schutt of Hansen in landscape and open space</li> <li>- Stephen Hunt of Cardno in traffic</li> <li>- Tim Marks of Marshall Day Acoustics in acoustics and vibration</li> </ul>
Graduate Union of the University of Melbourne	<p>Chris Wren QC of Counsel, who called the following expert witnesses:</p> <ul style="list-style-type: none"> <li>- Eli Giannini of MGS Architects in architecture</li> <li>- Stephen Payne of Bonacci Group in engineering</li> <li>- Dr Kerry Bennett of The Graduate Union</li> </ul>
Jonathan Forbes	
Royal Melbourne Institute of Technology	<p>Barnaby McIlrath of Maddocks, who called the following expert witnesses:</p> <ul style="list-style-type: none"> <li>- Hugh Smyth of SJB Planning in planning</li> <li>- Tim Marks of Marshall Day in acoustics and vibration</li> </ul>
Melbourne Anglican Trust Corporation	<p>James Lamour Read of Planisphere, with Revd Dr Andreas Lowe, who called the following expert witness:</p> <ul style="list-style-type: none"> <li>- Ross Leo of Marshall Day Acoustics in acoustics</li> </ul>
Victoria Planning Authority	Kate Alder and Emily Mottram



Submitter	Represented by
University of Melbourne	Susan Brennan SC and Paul Chiappi of Counsel, instructed by Rigby Cooke Lawyers, who called the following expert witnesses: <ul style="list-style-type: none"> <li>- Professor Glyn Davis of Melbourne University</li> <li>- Professor James McCluskey of Melbourne University</li> <li>- Matthew Stead of Resonate Acoustics in acoustics</li> <li>- Jason Sellars of GTA Consultants in traffic</li> <li>- Rob McGauran of MGS Architects in architecture</li> </ul>
Peter Anderson	
Christ Church South Yarra	Revd Dr Richard Treloar
National Trust of Victoria	Anna Foley
The Hallmark Owners Corporation 501271A	George Swinburne (for himself and the Owners Corporation)
Melbourne Heritage Action Group	Tristan Davies
Australia Institute of Architects	Jon Shinkfield
Naturelinks Landscape Management	Patrick Deasey
Anthony Daniele	
Burke and Wills Historical Society	David Dodd
National Boer War Memorial Association	William Woolmore, Lt Colonel Graham Lockwood and Lt Colonel Ian George
National Gallery of Victoria	Lucy Hastewell
Arts Centre Victoria	Chris King
Legend Properties Pty Ltd	Paul Chiappi of Counsel, instructed by Phillip Leamann of Tisher Liner FC Law
Hobsons Pty Ltd and Karaoke Pty Ltd	Paul Chiappi of Counsel, instructed by Phillip Leamann of Tisher Liner FC Law, who called the following expert witness: <ul style="list-style-type: none"> <li>- Andrew Clarke of Matrix Planning in urban planning</li> </ul>
Owners Corporation 'The Botanica'	Paul Chiappi of Counsel, instructed by Nick Sutton of Planning and Property Partners, who called the following expert witnesses: <ul style="list-style-type: none"> <li>- Terry Bellair of Environmental Science Associates in air quality</li> <li>- John Kiriakidis of GTA Consultants in traffic and transport</li> <li>- Neville Goddard of Watson Moss Growcott in acoustics and vibration</li> </ul>
G12+ Group of Owners Corporations	Cameron Gentle, Hansen Partnership

Submitter	Represented by
The Domain Owners Corporation	Cameron Gentle, Hansen Partnership, with Paul Connor of Counsel, who called the following expert witness: - Simon McHugh of Marshall Day Acoustics
City Wide North Melbourne Asphalt	Paul Chiappi of Counsel
City Wide Service Solutions	Paul Chiappi of Counsel, instructed by Planning and Property Partners, who called the following expert witness: - John Kiriakidis of GTA Consultants in traffic engineering
Mike Planinc	
Promenade/City Condos/Princeton Residents Group	James Hayton and Timothy Fitton
Timothy Fitton	
Christopher Fellows	
Fiona Reed	
James Hayton	
Winston Chong	
Tennessee Leeuwenburg	
William McIntosh	
Domain Hill Owners Corporation	Richard St John
Helen Kent	
Tedd Warden	
Residents of Albert Tower	Lou Raunik
Ronald and Nola Hutchins	
James Robinson	
Nicolas Thomas	
Roger and Wendy Allgood	
Thomas Howgate	
Peter and Sharon Robertson	
Joseph Ayres	
Fawkner Park Children's Centre	Hayden Rattray
Owners Corporation OCSP444563B	Basil Jenkins
Malcolm and Darcy Cameron	
Maurice Eisenbruch	
Thomas Harley and Sarah Kennedy	
Group of South Kensington Residents	Matthew Hammond
Kensington Association	Rilke Muir

Submitter	Represented by
Vincent Ryan	
Charles McHugh	
Dennis Kennedy	
Therese Fitzgerald	
Adam Murchie	
North Melbourne Community Group	Steve Cross, Rachael Palmer, Leona Dusanovic
Michael and Rina Mordaunt	
Angela Williams	
Ross Miller	
Leona Dusanovic	
Geoff Leach	
David Macgowan	
Spacerepublica	Justin Marden
Tony Smith	
Mercantile Cricket Association	Alex Kahn
Russell Keays	
Metropolitan Transport Forum	Tom Melican
Parkville Association	Helen Weston
Mac.Robertson Girls High	Toni Meath
Melbourne Grammar School	Ian Pitt QC of Best Hooper Solicitors, who called the following expert witnesses: <ul style="list-style-type: none"> <li>- Brett Young of Ratio in traffic</li> <li>- James Hargreaves of Meinhardt in engineering</li> <li>- Andrew Mitchell of Cogent Acoustics in acoustics</li> </ul>
HRG Investments Pty Ltd	Ian Pitt QC of Best Hooper Solicitors
Zoe and Mark Cassar	
Rydges on Swanston	Emma Barnes of Planning Studio Pty Ltd
Newmark Capital Ltd	John Cicero of Best Hooper Solicitors
Owners Corporation 3 on plan of subdivision PS 428405M and the owners of the Westin Residential Apartments – ‘The Westin’	John Cicero of Best Hooper Solicitors, who called the following expert witnesses: <ul style="list-style-type: none"> <li>- Matthew Shields of Acoustic Logic in acoustics and vibration</li> <li>- David Doolan of 4D Workshop in building design and engineering</li> </ul>
George Weston Foods	David Deller of Counsel, instructed by Chris Schulz of Allens Solicitors, who called the following expert witness: <ul style="list-style-type: none"> <li>- Chris Coath of GTA Consultants in traffic</li> </ul>

Submitter	Represented by
Nick Theodossi Prestige Cars	Peter Bazzani of Bazzani, Scully and Priddle
Irwin Stock Feeds	Gavin Anderson
Federation Square	Sharon Pollard
Tabcorp Holdings Limited	Jane Sharp of Counsel, instructed by Meg Lees of Gadens, who called the following expert witness: - Simon Duck of Tabcorp Holdings in IT delivery
COMFORTiD.com Pty Ltd	Erwin Boermans and Klaas Visser
Ross House Association	Amber Moore
Oscard Pty Ltd	Mark Bartley of HWL Ebsworth
McDonalds Australia Limited and North-West Investments Pty Ltd	Michelle Blackburn of Corrs Chambers Westgarth
ALE/ALH Group	Emily Gerrard of Allens Solicitors
Slater and Gordon	Manisha Blencowe
PDG Corporation and Zagame Group	Peter Soding of Tixxis Pty Ltd
Aldi Stores	Andrew Henderson
GPT Group	Bernard McNamara of BMDA Development Advisory, with William Kwong
Robert Brunner	
Development Kevat	
Lisa Whiffen	
Diana Angele	
Simon Pockley	
Lai Lee Tan	
Margaret Bray	
Dajaanu Pty Ltd/City Square Motel	Rita Kumar
Melbourne Health	Gareth Goodier with Samantha Plumb
Ramsay Health Care	Jane Pickworth
Melbourne Girls Grammar	Christian Lawless

## Appendix D Document list

No.	Date	Description	Presented by
1	26 July	Further Information Request from the Committee to Melbourne Metro Rail Authority (MMRA) (13 July 2016)	Kathy Mitchell, Chair of the Committee
2	26 July	Further Information Request from the Committee to MMRA (25 July 2016)	Kathy Mitchell
3	26 July	MMRA Technical Notes (1 - 18)	Chris Townshend QC of Counsel, MMRA
4	26 July	Direction sought by Stonnington City Council	Peter O'Farrell of Counsel, Stonnington City Council
5	05 Aug	Stonnington City Council's response to Direction 19 of the Committee's Directions (5 Aug 2016)	Kim Piskuric of Harwood Andrews Lawyers, Stonnington City Council
6	10 Aug	The Committee's letter of response to Stonnington City Council (10 Aug 2016)	Kathy Mitchell
7	12 Aug	MMRA Technical Notes (19 - 24 and 26)	Tim Power of Herbert Smith Freehills, MMRA
8	16 Aug	Site inspection itinerary – Day 1	Alister Campbell, MMRA
9	16 Aug	Plans of Subdivision, Westin Hotel and residential apartments	Graeme Blackman, the Westin
10	17 Aug	Site inspection itinerary – Day 2	Alister Campbell, MMRA
11	17 Aug	MMRA site inspection presentations (Day 1 and 2)	Michelle Quigley QC of Counsel, MMRA
12	17 Aug	RMIT City Campus map	Barnaby McIlrath of Maddocks, RMIT
13	17 Aug	Site visit map from City of Stonnington	Kim Piskuric
14	17 Aug	Site visit maps from City of Melbourne	Karen Snyders, City of Melbourne
15	18 Aug	The Committee's request for technical advice	Kathy Mitchell
16	19 Aug	Response from Stonnington City Council regarding South Yarra Station	Kim Piskuric
17	22 Aug	Index to responses to the Committee's requests for further information	Michelle Quigley
18	22 Aug	MMRA recommended Environmental Performance Requirements (EPR) Version 1	Michelle Quigley
19	22 Aug	Presentation - EPA	German Ferrando-Miguel, EPA
20	22 Aug	MMRA Opening Submission	Michelle Quigley
21	22 Aug	MMRA Technical Notes (25, 27 - 46)	Michelle Quigley
22	22 Aug	Copy of Planning Provisions as exhibited	Michelle Quigley

No.	Date	Description	Presented by
23	22 Aug	University of Melbourne letter regarding VPELA presentation	Rhodie Anderson of Rigby Cooke Lawyers, University of Melbourne
24	22 Aug	Melbourne Metro Rail Project (MMRP) - Key issues week 1	Michelle Quigley
25	23 Aug	MMRP Expert Witness Conclave – Historical heritage	Michelle Quigley
26	23 Aug	MMRP Expert Witness Conclave – Urban design	Michelle Quigley
27	23 Aug	MMRP Expert Witness Conclave – Groundwater	Michelle Quigley
28	23 Aug	Presentation - Public Transport Victoria (PTV)	Stuart Morris QC of Counsel, PTV
29	23 Aug	PTV interactive maps	Stuart Morris
30	23 Aug	Key references for PTV slides – MMR project rationale presentation	Stuart Morris
31	23 Aug	What are PTV's objectives and functions?	Stuart Morris
32	23 Aug	Melbourne Metro Business Case (Feb 2016)	Michelle Quigley
33	23 Aug	Rob Milner's PowerPoint presentation	Michelle Quigley
34	23 Aug	Melbourne Metro Business Case (Feb 2016) Summary Document	Michelle Quigley
35	23 Aug	Melbourne Metro Rail Project Incorporated Document (22 Aug 2016)	Michelle Quigley
36	23 Aug	MMRP Expert Witness Conclave – Arboriculture	Michelle Quigley
37	23 Aug	MMRP Expert Witness Conclave – Air Quality	Michelle Quigley
38	23 Aug	MMRP Expert Witness Conclave – Traffic and Transport	Michelle Quigley
39	23 Aug	Extracts from Plan Melbourne	Peter O'Farrell
40	24 Aug	The Committee's request for technical advice	Kathy Mitchell
41	24 Aug	MMRA Technical Note (47)	Michelle Quigley
42	24 Aug	Presentation of Peter Lovell – Historical heritage	Michelle Quigley
43	24 Aug	Presentation of John Patrick – Arboriculture	Michelle Quigley
44	24 Aug	Presentation of David Galwey – Arboriculture	Michelle Quigley
45	25 Aug	Confidential submitter	David Vorcheimer of HWL Ebsworth Lawyers
46	25 Aug	Confidential submitter	David Vorcheimer
47	25 Aug	Confidential submitter	David Vorcheimer
48	25 Aug	Best Hooper letter regarding Melbourne Grammar School	Ian Pitt QC, Melbourne Grammar School
49	25 Aug	Submission - Minister for Planning	Adrian Finanzio SC of Counsel, Minister for Planning
50	25 Aug	MMRA Technical Note (48)	Michelle Quigley
51	25 Aug	Urban Forest Strategy 2012-2032 (City of Melbourne)	Michelle Quigley

No.	Date	Description	Presented by
52	25 Aug	South Yarra Urban Forest Precinct Plan 2013-2023 (City of Melbourne)	Michelle Quigley
53	25 Aug	MMRA Technical Note (49)- MMRP Gantt Chart – Summary program	Michelle Quigley
54	25 Aug	Presentation of Ronald Jones – Urban design	Michelle Quigley
55	25 Aug	Presentation of Hugh Middlemis – Hydrogeology and modelling	Michelle Quigley
56	25 Aug	South Yarra Station documents received by Stonnington City Council	Michelle Quigley
57	25 Aug	Presentation of John McCrann – Surface water	Barnaby Chessell of Counsel, MMRA
58	25 Aug	MMRP Expert Witness Conclave – Surface water	Barnaby Chessell
59	26 Aug	Expert evidence report - Douglas Growcott	Alan Goldstone of Tisher Liner FC Law, Legend Properties Pty Ltd
60	26 Aug	Presentation of Shane Lakmaker – Air quality	Barnaby Chessell
61	26 Aug	Presentation of David Coutts – Contaminated land	Marita Foley of Counsel, MMRA
62	26 Aug	MMRA Technical Note (51)	Michelle Quigley
63	29 Aug	MMRP Expert Witness Conclave – Noise and Vibration	Chris Townshend
64	29 Aug	MMRA Technical Note (50)	Chris Townshend
65	29 Aug	MMRP – Key issues week 2	Chris Townshend
66	29 Aug	Central City Urban Forest Precinct Plan 2013-2023	Chris Townshend
67	29 Aug	Presentation of Shaun Smedley – Traffic and transport	Chris Townshend
68	29 Aug	Presentation of Rose McArthur – Traffic demand management	Barnaby Chessell
69	30 Aug	MMRA Technical Note (53)	Chris Townshend
70	30 Aug	MMRA Technical Note (54)	Chris Townshend
71	30 Aug	EPA Pub. 1254 (2008); NSW Construction Noise Strategy (2012); NSW Interim Construction Noise Guideline (2009); Noise and Vibration Management Guidelines, City of Melbourne.	Kathy Mitchell
72	30 Aug	AS/NZ 2107:2000; Vic Passenger Rail Infrastructure Noise Policy (2013); DIN4150-3 (1999-02) Structural vibration – Effects of vibration on structures; BS 6472-1:2008 Guide to evaluation of human exposure to vibration in buildings; ISO 10137 Bases for design of structures.	Barnaby Chessell
73	30 Aug	Presentation of David Anderson – Acoustics	Chris Townshend
74	31 Aug	MMRA Technical Note (52)	Chris Townshend
75	31 Aug	Presentation of John Heilig – Vibration	Chris Townshend

No.	Date	Description	Presented by
76	31 Aug	BS7385-1:1990 Evaluation and Measurement for vibration in buildings – Part 1; BS7385-2: 1993 Evaluation and Measurement for vibration in buildings – Part 2; BS7385-2: 1993 Evaluation and Measurement for vibration in buildings. Guide to damage levels from ground borne vibration.	Barnaby Chessell
77	31 Aug	Presentation of Anthony Bennett – Ground movement	Chris Townshend
78	1 Sept	Presentation of Terry Rawnsley – Business impact	Michelle Quigley
79	1 Sept	Presentation Owen Boushel – Social and community impact	Michelle Quigley
80	5 Sept	Stonnington City Council – Outline of matters	Kim Piskuric
81	5 Sept	MMRA Technical Note (55) - Emergency access shafts	Michelle Quigley
82	5 Sept	MMRA Recommended EPR Version 2	Chris Townshend
83	5 Sept	City of Melbourne – Opening submission	Matthew Townsend of Counsel, City of Melbourne
84	5 Sept	Peter Fearnside Presentation – Noise and Vibration	Matthew Townsend
85	5 Sept	East West Link (Eastern Section) Comprehensive Impact Assessment, report of Peter Fearnside	Chris Townshend
86	5 Sept	Graduate Union of the University of Melbourne - Opening submission	Chris Wren QC of Counsel, Graduate Union
87	5 Sept	Presentation of Haig Poulson – Traffic	Matthew Townsend
88	5 Sept	Presentation of Rob Moore – Urban design	Matthew Townsend
89	5 Sept	Presentation of Barry Fox – Surface water	Matthew Townsend
90	6 Sept	Letter from Manchester Unity Building Owners Corporation to Kathy Mitchell (30 Aug 2016)	Kathy Mitchell
91	6 Sept	Melbourne Water Submission	Michelle Quigley
92	6 Sept	MMRA Technical Note (56) - Updated draft Planning Scheme Amendment	Michelle Quigley
93	6 Sept	Crossrail information paper	Matthew Townsend
94	6 Sept	Presentation of Ian Shears – Arboriculture, parks and open space	Matthew Townsend
95	6 Sept	Parkville Urban Forest Precinct Plan (2015-2025)	Nick Tweedie SC of Counsel, for the Committee
96	6 Sept	Presentation of Steve Nagle – Business and tourism	Matthew Townsend
97	6 Sept	Presentation of Graham Porteous – Social and community	Matthew Townsend
98	07 Sept	South Yarra Station pedestrian counts (2016)	Peter O'Farrell
99	07 Sept	Submission - Stonnington City Council	Peter O'Farrell
100	07 Sept	South Yarra Station pedestrian counts (2015)	Peter O'Farrell
101	07 Sept	City of Stonnington forecast, (id consulting)	Peter O'Farrell
102	07 Sept	Presentation of William McDougall – Transport planning	Peter O'Farrell



No.	Date	Description	Presented by
103	07 Sept	Extract from MMRP Business Case	Stuart Morris
104	07 Sept	Briefing to Minister for Public Transport	Stuart Morris
105	07 Sept	Route 8 Load Profiles - Metlink Origin Destination Survey 2011	Stuart Morris
106	07 Sept	Presentation of Stephen Hunt – Traffic	Peter O’Farrell
107	08 Sept	Presentation of Stephen Schutt – Urban design	Peter O’Farrell
108	08 Sept	Presentation of Tim Marks – Acoustics and vibration	Peter O’Farrell
109	08 Sept	Construction noise control program – Central artery tunnel project	Tim Marks of Marshall Day Acoustics, City of Stonnington
110	08 Sept	Commonwealth of Massachusetts construction noise control	Tim Marks
111	09 Sept	Graduate Union of the University of Melbourne - Opening Submission, The Graduate Union Annual Report 2015-2016, Stephen Payne Presentation – Structural Engineering Town Planning Application plans for Graduate Membership and House – MGS September 2016	Chris Wren
112	12 Sept	Letter from Dr W Birch, The Royal Society of Victoria to the Committee (5 Sept 2016)	Kathy Mitchell
113	12 Sept	Andrew Clarke – Statement of planning evidence	Phillip Leaman of Tisher Liner FC Law, Hobsons Pty Ltd and Karaoke Pty Ltd
114	12 Sept	Matters for further consideration and/or clarification from the Committee to MMRA (12 Sept 2016)	Kathy Mitchell
115	12 Sept	Submission - Jonathan Forbes and Kathy Dalton	Tom Pikusa of Counsel, Jonathan Forbes and Kathy Dalton
116	12 Sept	Presentation – Jonathan Forbes and Kathy Dalton	Tom Pikusa
117	12 Sept	RMIT submission and documents	Barnaby McIlrath
118	12 Sept	Letter from Tim Power, Herbert Smith Freehills to Barnaby McIlrath, Maddocks Lawyers (9 Sept 2016)	Barnaby McIlrath
119	12 Sept	Emails between Herbert Smith Freehills and Maddocks Lawyers regarding RMIT (9 Sept 2016)	Michelle Quigley
120	12 Sept	Appendix C – Comparison of Construction Noise and Vibration Criteria Applied in Environmental Statements; Comparison of Operational Noise and Vibration Criteria Applied in Environmental Statements; and Comparison of Formal Noise and Vibration Commitments and Undertakings for Various Projects	Nick Tweedie
121	12 Sept	Presentation of Tim Marks – Acoustics and vibration	Barnaby McIlrath
122	12 Sept	Measurement and Prediction of Construction Vibration Affecting Sensitive Laboratories, Paper No.13, Acoustics 2011	Tim Marks of Marshall Day Acoustics, for RMIT
123	12 Sept	General vibration assessment	Tim Marks

No.	Date	Description	Presented by
124	12 Sept	Vibration calculations	Chris Townshend
125	13 Sept	RMIT supplementary submissions – Attachments	Barnaby McIlrath
126	13 Sept	RMIT supplementary submissions	Barnaby McIlrath
127	13 Sept	St Paul's Cathedral submission – Executive Summary	James Larmour Reid of Planisphere, Melbourne Anglican Trust Corporation
128	13 Sept	Letter from Ian Wakeley (Wakeley Pipe Organs) to Dr Andreas Loewe (St Paul's Anglican Church)	James Larmour Reid
129	13 Sept	Letter from Christopher Potter to St Paul's Cathedral	James Larmour Reid
130	13 Sept	Presentation of Ross Leo – Acoustics and vibration	James Larmour Reid
131	13 Sept	Draft Arden Vision and Framework	Kate Alder, Victorian Planning Authority
132	13 Sept	VPA Presentation – Planning the Arden Precinct	Kate Alder
133	14 Sept	Prof Glyn Davis AC presentation	Susan Brennan QC, University of Melbourne
134	14 Sept	Presentation of Prof Jim McCluskey	Susan Brennan
135	14 Sept	Presentation of Matthew Stead – Noise and vibration	Paul Chiappi of Counsel, University of Melbourne
136	14 Sept	Matthew Stead curriculum vitae	Paul Chiappi
137	14 Sept	Confidential document	Chris Townshend
138	14 Sept	Confidential document	Chris Townshend
139	15 Sept	Submission - Legend Properties Pty Ltd	Kathy Mitchell
140	15 Sept	Technical Note (57) – Urban Design Strategy	Michelle Quigley
141	15 Sept	MCC walking plan - App 6 pedestrian comfort level	Paul Chiappi
142	15 Sept	Extracts of East West Link (Eastern Section) Project Assessment Committee Report (30 May 2014)	Susan Brennan
143	15 Sept	Recommended Incorporated Document - University of Melbourne	Susan Brennan
144	15 Sept	Recommended EPR - University of Melbourne	Susan Brennan
145	16 Sept	The Revd Dr Richard Treloar – Presentation	Revd Dr Richard Treloar, Christ Church South Yarra and Christ Church Grammar School
146	16 Sept	Memorandum from Jason Sellars (GTA Consultants 19 Aug 2016)	Susan Brennan
147	16 Sept	Variations to Documents 143 and 144 respectively	Susan Brennan
148	16 Sept	Resonate Acoustics University of Melbourne vibrations, noise and EMI preliminary survey report (3 June 2016)	Barnaby Chessell
149	16 Sept	University of Melbourne Building 181 Level 2 plan	Susan Brennan
150	16 Sept	Extracts of The University of Melbourne construction contracts	Susan Brennan

No.	Date	Description	Presented by
151	16 Sept	Submission - The University of Melbourne	Susan Brennan
152	16 Sept	University Square draft master plan 2016 – City of Melbourne	Marita Foley
153	19 Sept	RMIT letter to the Committee regarding further clarification	Barnaby McIlrath
154	19 Sept	Adopted version of Stonnington Amendment C172	Kim Piskuric
155	19 Sept	City of Port Phillip various documents including South African Soldiers Memorial Conservation Management Plan	Claire Ferres Miles, City of Port Phillip
156	19 Sept	Letter to Kathy Mitchell from Tony Raunic, Hunt and Hunt regarding City of Melbourne matters	Tony Raunic of Hunt and Hunt, City of Melbourne
157	19 Sept	Submission - National Trust	Anna Foley, National Trust of Australia (Victoria)
158	19 Sept	Submission The Hallmark Owners Corporation (OC 501271A) and George and Maureen Swinburne	George Swinburne
159	19 Sept	Submission - The Burke and Wills Historical Society	David Dodd, The Burke and Wills Historical Society
160	19 Sept	Submission - National Gallery of Victoria (NGV)	Lucy Hastewell, NGV
161	20 Sept	PTV Outline of submission	Stuart Morris
162	20 Sept	Submission - PTV	Stuart Morris
163	20 Sept	Submission - Hobsons Pty Ltd and Karaoke Pty Ltd	Paul Chiappi of Counsel, Hobsons Pty Ltd and Karaoke Pty Ltd
164	20 Sept	Addendum to John Kiriakidis evidence statement (City Wide Service Solutions)	Paul Chiappi of Counsel, representing City Wide Service Solutions
165	20 Sept	Extracts from <i>Major Transport Projects Facilitation Act 2009</i>	Paul Chiappi, Hobsons Pty Ltd and Karaoke Pty Ltd
166	20 Sept	Proposed Development Plans	Andrew Clarke, Matrix Planning for Hobsons Pty Ltd and Karaoke Pty Ltd
167	20 Sept	Incorporated Plan Overlay (Schedule 2), Melbourne Planning Scheme	Rupert Watters of Counsel, for the Committee
168	20 Sept	MMRA Technical Note (58) - SoundPLAN noise modelling for airborne construction noise	Chris Townshend
169	21 Sept	Email from Rob Deutscher to the Committee (19 Sept 2016)	Rob Deutscher
170	21 Sept	Revised page 10 of John Kiriakidis evidence	Paul Chiappi, City Wide Service Solutions
171	21 Sept	Submission - The Botanica	Paul Chiappi, the Botanica
172	21 Sept	SEPP Air Quality Management (AQM)	Barnaby Chessell
173	21 Sept	PEM SEPP (AQM) Mining and Extractive Industries	Barnaby Chessell
174	21 Sept	Volume source locations used in Aermod modelling	Barnaby Chessell
175	21 Sept	Aermod input files (Domain)	Terry Bellair, the Botanica

No.	Date	Description	Presented by
176	21 Sept	Presentation of John Kiriakidis – Traffic	Paul Chiappi
177	21 Sept	Photographs – flooding along St Kilda Rd	Paul Chiappi
178	21 Sept	Submission - G12+	Cameron Gentle of Hansen Partnerships, G12+
179	21 Sept	Presentation - Domain Owners Corporation	Cameron Gentle
180	21 Sept	Presentation of Simon McHugh - Acoustics	Paul Connor of Counsel, Domain Owners Corporation
181	21 Sept	Extract EPA Enquiry 2015	Simon McHugh of Marshall Day Acoustics, Domain Owners Corporation
182	21 Sept	Extract Whitechapel Environment Statement	Simon McHugh
183	21 Sept	Gant chart, hourly programme diaphragm wall construction	Simon McHugh
184	22 Sept	Submission - City Wide North Melbourne Asphalt	Paul Chiappi, City Wide North Melbourne
185	22 Sept	Submission - City Wide Service Solutions Pty Ltd	Paul Chiappi, City Wide Service Solutions Pty Ltd
186	22 Sept	Presentation of John Kiriakidis – Traffic	Paul Chiappi
187	22 Sept	Submission	Mike Planinc
188	22 Sept	Submission	James Hayton
189	22 Sept	Submission	Tim Fitton
190	22 Sept	Submission	Christopher Fellows
191	22 Sept	Submission	Fiona Reed
192	22 Sept	Submission	William McIntosh
193	22 Sept	Submission	Winston Chong and Tennessee Leeuwenburg
194	23 Sept	National Boer War Memorial Association notes	Kathy Mitchell
195	23 Sept	Submission- Domain Hill Owners Corporation	Richard St John
196	23 Sept	Submission	Helen Kent
197	23 Sept	Submission	Tedd Warden
198	23 Sept	Submission	Nola and Ronald Hutchins
199	23 Sept	Submission	James Robinson
200	23 Sept	Submission	Nicolas Thomas
201	23 Sept	Submission	Roger and Wendy Allgood
202	23 Sept	Submission	Peter and Sharon Robertson
203	23 Sept	Submission	Thomas Howgate

No.	Date	Description	Presented by
204	23 Sept	Submission	Joseph Ayres
205	26 Sept	Version 3 EPR's (marked up version)	Michelle Quigley
206	26 Sept	Version 3 EPR's (clean version)	Michelle Quigley
207	26 Sept	Incorporated Document (26 Sept marked up version)	Michelle Quigley
208	26 Sept	Incorporated Document (26 Sept clean version)	Michelle Quigley
209	26 Sept	MMRA Response to submissions relating to the proposed draft Planning Scheme Amendment GC45 (PSA)	Michelle Quigley
210	26 Sept	MMRA Technical Note (59) – Respirable crystalline silica	Michelle Quigley
211	26 Sept	MMRA Technical Note (60) – Early works	Michelle Quigley
212	26 Sept	MMRA Technical Note (61 – Lloyd Street temporary access ramp	Michelle Quigley
213	26 Sept	MMRA Technical Note (62) – Groundwater	Michelle Quigley
214	26 Sept	Presentation – Group of South Kensington Residents	Matthew Hammond
215	26 Sept	Kensington Community Network – minutes 11 Aug 2016	Vincent Ryan
216	26 Sept	Presentation	Charles McHugh
217	26 Sept	Clause 66.01-2, Melbourne City Council Planning Scheme	Dennis Kennedy
218	26 Sept	Submission – North Melbourne Community Group	Steve Cross
219	26 Sept	Submission – Rina and Michael Mordaunt	Michael Mordaunt
220	26 Sept	Presentation – Angela Williams	Angela Williams
221	26 Sept	Submission	Angela Williams
222	26 Sept	Presentation	Ross Miller
223	26 Sept	Presentation – Mihaljo Dusanovic and Vesna Rak- Dusanovic	Vesna Dusanovic
224	26 Sept	Submission – Mihaljo Dusanovic and Vesna Rak- Dusanovic	Vesna Dusanovic
225	26 Sept	Presentation	Geoff Leach
226	27 Sept	National Boer War Memorial Association Executive Summary	William Woolmore
227	27 Sept	MMRA Technical Note (63) – Domain precinct traffic modelling	Chris Townshend
228	27 Sept	Exhibits	David MacGowan
229	27 Sept	Presentation – Spacerepublica	Justin Marden
230	27 Sept	Presentation	Tony Smith
231	27 Sept	Presentation – Mercantile Cricket Association	Alec Kahn
232	27 Sept	Presentation	Russell Keays
233	27 Sept	Submission – Parkville Association Inc	Helen Weston
234	27 Sept	Mac.Robertson Girls High School letter to the Committee (27 Sept 2016)	Toni Meath
235	27 Sept	MMRA letter to community (1 June 2016)	Vincent Ryan
236	28 Sept	Graduate House and MMRA Interface Management EES Issues Register	Michelle Quigley

No.	Date	Description	Presented by
237	28 Sept	Melbourne Grammar School outline of Submissions	Ian Pitt, Melbourne Grammar School
238	28 Sept	Melbourne Grammar School plans	Ian Pitt
239	28 Sept	Planning Property Report 1 Domain Road, Melbourne	Ian Pitt
240	28 Sept	Heritage Victoria Victorian heritage database place details (1 Sept 2016)	Ian Pitt
241	28 Sept	Heritage Victoria Victorian heritage database place details (1 Sept 2016) Diagram 19	Ian Pitt
242	28 Sept	HRG Investments outline of Submissions	Ian Pitt, HRG Investments Pty Ltd
243	29 Sept	Letter from Hunt and Hunt Lawyers to the Committee requesting direction (16 Sept 2016)	Kathy Mitchell
244	29 Sept	MMRA Technical Note (64)	Chris Townshend
245	29 Sept	Steven Unthank paper	Michelle Quigley
246	29 Sept	Submission	Mark and Zoe Cassar
247	29 Sept	Submission - Newmark Capital	John Cicero, Best Hooper Lawyers, Newmark Capital
248	29 Sept	Submission - Owners Corporation 3PS 428405M (the Westin)	John Cicero, Best Hooper Lawyers, the Westin
249	29 Sept	Plan of subdivision PS428405M	John Cicero
250	29 Sept	Part 7 – Protection of adjoining property Building Act 1993	John Cicero
251	29 Sept	Form 13 Section 173 agreement X233303D	John Cicero
252	29 Sept	Recommended EPR - Newmark and the Westin	John Cicero
253	29 Sept	Recommended Incorporated Document – Newmark and the Westin	John Cicero
254	29 Sept	MMRA Technical Note (65)	Michelle Quigley
255	3 Oct	MMRA Technical Note (66)	Michelle Quigley
256	3 Oct	Submission - : George Weston Foods Limited	David Deller of Counsel, George Weston Foods
257	3 Oct	Presentation of Chris Coath – Traffic	David Deller
258	3 Oct	Variations to Submission 357 – Traffic expert evidence	David Deller
259	3 Oct	Submission - Nithe Pty Ltd and Ralena Pty Ltd	Peter Bazzani of Bazzani, Scully, Priddle Solicitors, Nick Theodossi Prestige Cars
260	3 Oct	Statement - Nicholas Theodossi	Peter Bazzani
261	3 Oct	Submission - Irwin Stockfeeds	Gavyn Anderson
262	3 Oct	Submission - Federation Square Pty Ltd	Sharon Pollard

No.	Date	Description	Presented by
263	3 Oct	Submission - Tabcorp Holdings Limited	Jane Sharp of Counsel
264	4 Oct	Recommended EPR - Rachael Palmer, Tom Cosic, Mihajlo Dusanovic and family	Rachael Palmer
265	4 Oct	Recommended Incorporated Document and EPR – Tabcorp	Meg Lee, Gaden Lawyers
266	4 Oct	Recommended EPR – The Domain Owners Corporation	Ken Roche
267	4 Oct	Recommended EPR - The Graduate Union of The University of Melbourne Inc.	Kerry Bennett
268	4 Oct	Recommended EPR – Heritage Victoria	Martin Zweep
269	4 Oct	Recommended EPR - EPA	Tim Eaton
270	4 Oct	Recommended EPR – Nicolas Thomas	Nicolas Thomas
271	4 Oct	Recommended EPR – Mark and Zoe Cassar	Mark and Zoe Cassar
272	4 Oct	Recommended Incorporated Document – City of Port Phillip	Tom Courtice
273	4 Oct	Recommended EPR – PTV	Jeff Lynne of Ashurst Australia, PTV
274	4 Oct	Recommended Incorporated Document and EPR - Angela Williams	Angela Williams
275	4 Oct	Recommended Incorporated Document and EPR - RMIT	Barnaby McIlrath
276	4 Oct	Presentation - Comfort ID	Erwin Boermans
277	4 Oct	Presentation - Ross House Association	Amber Moore, Ross House Association
278	4 Oct	Submission - Ross House Association	Amber Moore
279 - 287		No documents	
288	4 Oct	Submission - Oscard Pty Ltd	Mark Bartley of HWL Ebsworth Lawyers, Oscard Pty Ltd
289	4 Oct	Extract from Melbourne Metro Business Case	Mark Bartley
290	4 Oct	Submission - McDonald's Aust Ltd and North-West Investments Pty Ltd	Michelle Blackburn of Corrs Chambers Westgarth, McDonald's
291	4 Oct	EES Figure 54: Changes to Pedestrian Network, Construction	Michelle Blackburn
292	4 Oct	EES Figure 6-8 Precinct 6 – CBD South Station (Concept Design)	Michelle Blackburn
293	4 Oct	Submission - Jonathan Forbes and Kathy Dalton	Tom Pikusa
294	4 Oct	Submission - ALE Property Group and ALH Group (Young and Jackson Hotel)	Emily Gerrard of Allens, Young and Jackson Hotel
295	4 Oct	Recommended EPR – Young and Jackson Hotel	Emily Gerrard
296	4 Oct	Young and Jackson Hotel, Traffic and Transport Review, GTA consultants	Emily Gerrard
297	4 Oct	Young and Jackson Hotel Victorian Heritage Database Report	Emily Gerrard

No.	Date	Description	Presented by
298	4 Oct	Aerial photographs; EES Map book extract Map 9 of 16; EES Map Book extract Map 8 of 15	Emily Gerrard
299	4 Oct	Submission – Slater and Gordon	Manisha Blencowe, Slater and Gordon
300	4 Oct	Submission - 501 Swanston Street	Peter Soding, Tixxis Pty Ltd, PDG Corporation and Zagame Group
301	4 Oct	Photographs	Peter Soding
302	4 Oct	Submission	Robert Brunner
303	4 Oct	Submission - Melbourne Central (GPT Group)	Bernard McNamara of BMDA Development Advisory, GPT Group
304	5 Oct	Submission	Julie Ding
305	5 Oct	Presentation notes - Young and Jackson Hotel	Emily Gerrard
306	5 Oct	Recommended EPR – CityWide	Mark Naughton of Planning and Property Partners, City Wide
307	5 Oct	Recommended EPR - City of Melbourne	Nick Sissons of Hunt and Hunt lawyers, City of Melbourne
308	5 Oct	Confidential Document	University of Melbourne
309	5 Oct	Recommended EPR - Slater and Gordon	Manisha Blencowe, Slater and Gordon
310	5 Oct	Submission	Lai Lee Tan
311	5 Oct	MMRA Technical Note (68) – Planning	Michelle Quigley
312	5 Oct	MMRA Technical Note (69) – Independent auditor	Michelle Quigley
313	5 Oct	MMRA Technical Note (70) – Arden Precinct	Michelle Quigley
314	5 Oct	Confidential document	Michelle Quigley
315	5 Oct	MMRA presentation to South Yarra residents (13 September 2016)	Michelle Quigley
316	5 Oct	Email from Walter and Eliza Hall Institute of Medical Research (5 Oct 2015)	Steve Droste, Walter and Eliza Hall Institute
317	5 Oct	Email from Ross House (5 Oct 016)	Amber Moore
318	5 Oct	Melbourne Grammar School basement plans	Ian Pitt
319	5 Oct	Submission	Margaret Bray
320	5 Oct	Submission - City Square Motel	Rita Kumar
321	5 Oct	Presentation - Melbourne Health	Gareth Goodier, Melbourne Health
322	6 Oct	Graduate House and MMRA Interface Management EES Issues Register	Kerry Bennett



No.	Date	Description	Presented by
323	6 Oct	Email from MMRA in response to Julie Ding's email to the Committee	Michelle Quigley
324	6 Oct	MMRA Technical Note (67) - Urban design / heritage	Michelle Quigley
325	6 Oct	MMRA Technical Note (71) - Trees in Osborne Street, South Yarra	Michelle Quigley
326	6 Oct	MMRA Technical Note (72) - Clarification of impacts on trees	Michelle Quigley
327	6 Oct	MMRA Technical Note (73) - MMRA Creative Strategy	Michelle Quigley
328	6 Oct	MMRA Technical Note (74) - Station boxes and shafts	Michelle Quigley
329	6 Oct	Recommended Incorporated Document – University of Melbourne	Susan Brennan
330	6 Oct	Recommended EPR – The Botanica	Joel Snyder of Best Hooper, the Botanica
331	6 Oct	Revised cover letter - Heritage Victoria	Martin Zweep
332	6 Oct	University of Melbourne EPR amendments not adopted in Version 3	Susan Brennan
333	6 Oct	Recommended EPR - EMI1 and EMI2 – University of Melbourne	Susan Brennan
334	6 Oct	University of Melbourne Parkville Master Plan 2008	Susan Brennan
335	6 Oct	City of Melbourne Closing Submission	Matthew Townsend
336	6 Oct	Recommended Incorporated Document - City of Melbourne	Matthew Townsend
337	6 Oct	Recommended EPR - City of Melbourne	Matthew Townsend
338	6 Oct	Peter Doherty Institute Construction Management Plan Approval – Stage 1	Matthew Townsend
339	6 Oct	Peter Doherty Institute Construction Management Plan Approval	Matthew Townsend
340	6 Oct	Peter Doherty Institute Construction Management Plan Approval	Matthew Townsend
341	6 Oct	City of Melbourne Memorandum Construction Traffic Management Plan Advice	Matthew Townsend
342	6 Oct	Peter Doherty Institute - Traffic Management Plan	Matthew Townsend
343	6 Oct	Myer Emporium Development Construction Management Plan Approval – Stages 1 – 5	Matthew Townsend
344	6 Oct	The Emporium Melbourne Construction Management Plan	Matthew Townsend
345	6 Oct	Stonnington City Council Closing Submission	Peter O'Farrell
346	6 Oct	Marshall Day Acoustics Response to Noise and Vibration EPR Version 3	Peter O'Farrell
347	7 Oct	Recommended EPR - EPA	German Ferrando-Miguel
348	7 Oct	Melbourne Grammar School baseline noise and vibration monitoring report	Ian Pitt
349	7 Oct	MMRA Closing Submission	Michelle Quigley

No.	Date	Description	Presented by
350	7 Oct	MMRA Technical Note (75) - Air quality	Michelle Quigley
351	7 Oct	MMRA Technical Note (76) – Surface water	Michelle Quigley
352	7 Oct	MMRA Technical Note (77) – Approach to sustainability	Michelle Quigley
353	7 Oct	MMRA Technical Note (78) – Acquisition of Unit 1/8 William St, South Yarra	Michelle Quigley
354	7 Oct	MMRA Technical Note (79) – Response to request by RMIT regarding revenue estimate	Michelle Quigley
355	7 Oct	Index to responses to the Committee’s requests for further information	Michelle Quigley
356	7 Oct	Index to MMRA Technical Notes	Michelle Quigley
357	7 Oct	Incorporated Document – MMRA 7 Oct version	Michelle Quigley
358	7 Oct	Incorporated Document – MMRA 7 Oct version (tracked changes)	Michelle Quigley
359	7 Oct	Project Land plans	Michelle Quigley
360	7 Oct	Draft Environmental Management Framework, MMRA	Michelle Quigley
361	7 Oct	Email from Shrine of Remembrance to MMRA	Michelle Quigley
362	7 Oct	MMRA response to submissions table	Michelle Quigley
363	7 Oct	Extract from Infrastructure Victoria Report	Michelle Quigley
364	7 Oct	East West Link Project - exhibited Incorporated Document (Sept 2013)	Michelle Quigley
365	7 Oct	Revised EPR MMRA Version 4	Chris Townshend
366	10 Oct	Matthew Shields presentation notes	Joel Snyder
367	10 Oct	Matthew Shields curriculum vitae	Joel Snyder
368	14 Oct	Stonnington City Council reply Submission regarding Infrastructure Victoria	Peter O’Farrell

## **Appendix E Amended Incorporated Document**



# Melbourne Metro Rail Project

## Incorporated Document

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21 November 2016

Incorporated Document in the Melbourne, Port Phillip, Stonnington and Maribyrnong Planning Schemes pursuant to section 6(2)(j) of the *Planning and Environment Act 1987* (Vic).

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## 1. INTRODUCTION

- 1.1 This document is an Incorporated Document in the Schedule to clause 81 of each of the Melbourne, Port Phillip, Stonnington and Maribyrnong Planning Schemes (**Planning Schemes**) and is made pursuant to section 6(2)(j) of the *Planning and Environment Act 1987* (Vic).
- 1.2 This document gives effect to specific controls for the Melbourne Metro Rail Project (**Project**) pursuant to clause 52.03 in the Planning Schemes.
- 1.3 The controls in this Incorporated Document prevail over any contrary or inconsistent provisions in the Planning Schemes.

## 2. PURPOSE

The purpose of this Incorporated Document is to permit and facilitate the use and development of the Project Land described in clause 3 below for the purposes of the Project, in accordance with clauses 4, 5 and 6 of this Incorporated Document.

## 3. LAND DESCRIPTION

This Incorporated Document applies to the land described as Project Land for the Melbourne Metro Rail Project on Maps 1 to 16 at Appendix 1 (**Project Land**).

## 4. CONTROL

- 4.1 Despite any provision to the contrary or any inconsistent provision in the Planning Schemes, no planning permit is required for, and no provision in the Planning Schemes operates to prohibit, control or restrict:
    - a) the use or development of the Project Land in accordance with this Incorporated Document; or
    - b) the creation, variation or removal of an easement or covenant within or over the Project Land, for the purposes of, or related to, constructing or maintaining the Project or using any aspect of the Project infrastructure to operate passenger train and tram services.
  - 4.2 The Project infrastructure to which this control applies includes, but is not limited to:
    - a) *Railways*, including twin railway tunnels, about 9km long, between South Kensington and South Yarra, and tunnel portals at those locations
    - b) Underground and above-ground railway lines between and adjacent to the tunnel portals
    - c) Underground *Railway stations, Retail premises* and support structures at Arden, Parkville, CBD North, CBD South and Domain
    - d) Above ground *Railway station* works and modifications at West Footscray railway station
    - e) Ventilation structures and systems
    - f) *Utility installations* and services to construct and operate any aspect of the Project, including any Project infrastructure and the operation of passenger trains or trams. Such services include traction energy, communications and rail operating systems
    - g) *Tramways*
    - h) Emergency and maintenance access shafts and infrastructure
-

- i) Bridges, transport interchanges and road works
- j) Earthworks and related structures, kerbs, channels, water quality and soil treatment structures or works, retaining walls, noise and screening barriers, cuttings, batters and fill associated with the Project
- ~~k) Any works or Project infrastructure described in the Environment Effects Statement for the Project.~~

4.3 ~~Ancillary activities to~~ The use and development of the Project Land for the purpose of, or related to, the Project includes, but ~~are~~ is not limited to:

- a) Development and use of construction laydown areas for construction purposes
- b) Removing, destroying and lopping trees and vegetation
- c) Demolishing and removing buildings, fixtures, structures and infrastructure
- d) Constructing or carrying out works for excavation, fences, temporary barriers, noise attenuation walls, stabilisation, creating bunds or mounds, landscaping, shared use paths, wetlands or ground treatment
- e) Creating or altering access to a road in a Road Zone, Category 1 to the satisfaction of the relevant road authority
- f) Constructing and using temporary site workshops and storage, administration and amenities buildings
- g) Manufacturing any materials required for the Project within the Arden precinct
- h) Constructing and using temporary access roads, diversion roads and vehicle parking areas
- i) Displaying construction, directional and business identification signage
- j) Carrying out of preparatory works including, but not limited to, those set out in clause 5.6 of this Incorporated Document
- k) Subdividing and consolidating land
- l) Altering or relocating rail lines, tram lines and *Utility installations*
- m) Any activity, buildings or works that ~~which~~ the Minister for Planning confirms in writing is ~~ancillary~~ for the purposes of the Project. ~~or use of Project infrastructure.~~

4.4 Land uses in italics have the same meaning as in clause 74 of the Planning Schemes.

4.5 This control is subject to the conditions in clause 5 of this Incorporated Document.

## 5. CONDITIONS

The use and development of the Project Land permitted by this Incorporated Document must be undertaken in accordance with the following conditions:

### 5.1 Development Plans

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- 5.1.1 Subject to clause 5.6, a Development Plan must be prepared to the satisfaction of the Minister for Planning for development that relates to each of the following: ~~relating to each of:~~
- a) Western tunnel portal
  - b) Eastern tunnel portal
  - c) Arden Station
  - d) Parkville Station
  - e) CBD North Station
  - f) CBD South Station
  - g) Domain Station
  - h) Rail turnback at West Footscray Station
  - i) Any other above-ground ~~tunnel access and / or ventilation structures~~ works or structures that are part of the Project.
- 5.1.2 A Development Plan must address surface works ~~of that are associated with~~ each of the items listed in clause 5.1.1 above. A Development Plan for a station must address underground areas from the station entrance to the ticket gate.
- 5.1.3 A Development Plan must include:
- a) A site layout plan/s
  - b) Architectural, landscape and public realm plans and elevations including lighting, signage, pedestrian access, bicycle access and other ancillary facilities
  - c) An explanation as to how the Development Plan demonstrates that the use and development (including materials and external finishes) will be in accordance with the Urban Design Strategy as required by clause 5.3.3 of this Incorporated Document and with relevant Environmental Performance Requirements as required by clause 5.2.7 of this Incorporated Document;
- 5.1.4 Prior to submission of a Development Plan to the Minister for Planning for approval under clause 5.1.7, a draft Development Plan must be:
- a) Provided to the Office of the Victorian Government Architect and relevant Council/s for consultation.
  - b) Where relevant, provided to the Roads Corporation, Public Transport Development Authority, Melbourne Water and Heritage Victoria for consultation.
  - c) Made available for public inspection and comment on a clearly identifiable Project website for 154 business days. The website must set out details about the entity and contact details to which written comments can be directed during that time and specify the time and manner for the making of written comments.

A notice must be published in a newspaper generally circulating in the area to which the Development Plan applies informing the community of the matters set out in clause 5.1.4c).

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- 5.1.5 A Development Plan submitted to the Minister for Planning for approval under clause 5.1.7 must be accompanied by any written comments received under clause 5.1.4 and a summary of consultation and response to issues raised during the consultation.
- 5.1.6 Before deciding whether to approve a Development Plan under clause 5.1.7, the Minister for Planning must consider all written comments [received under clause 5.1.4](#) and the consultation and response summary provided under clause 5.1.5.
- 5.1.7 A Development Plan must be approved by the Minister for Planning prior to the commencement of any development relating to an item in clause 5.1.1, [except for Early Works that are carried out in accordance with clause 5.4](#).
- 5.1.8 For land to which a Development Plan applies, development must be carried out **generally** in accordance with an approved Development Plan.
- 5.1.9 A Development Plan may be prepared and approved in stages or parts, and may be amended from time to time to the satisfaction of the Minister for Planning. The Minister must require an application for approval of an amendment to a Development Plan to comply with the requirements of ~~any or all of~~ clauses 5.1.3, 5.1.4, 5.1.5 and 5.1.6 if the Minister ~~believes~~ [determines that](#) the amendment would have a significant effect on the environment or ~~requires~~ [if the amendment proposes](#) a change to the Environmental Performance Requirements approved under clause 5.2.

## 5.2 [Environmental Management Framework](#)

- 5.2.1 Prior to the commencement of any buildings or works associated with the Project (including Early Works under clause 5.4), an Environmental Management Framework (EMF) must be prepared for the Project or any stage or part of the Project. The EMF must include Environmental Performance Requirements addressing the following areas and any other relevant matters ([Committee note: change to be alphabetical and listed as per the Committee recommended EPR](#)):
- a) Transport
  - b) Land use and planning
  - c) Social and community
  - d) Business
  - e) Air quality
  - f) Noise and vibration
  - g) Historical cultural heritage
  - h) [Urban design, landscape and visual](#)
  - i) Aboriginal heritage
  - j) Surface water
  - k) Ground water
  - l) Ground movement
  - m) Contaminated land and spoil management
  - n) Biodiversity
  - o) [Arboriculture](#)
  - p) Greenhouse gas
- 5.2.2 The EMF must set out the process and timing for development of Construction Environment Management Plan/s, Site Environment Implementation Plan/s and Transport Management Plan/s as relevant to any stage or part of the Project, including process and timing for consultation with relevant Council/s, Heritage Victoria, the Roads Corporation, Melbourne Water, Public Transport Development Authority, ~~and~~ the Environment Protection Authority, [and key affected stakeholders](#) as relevant.
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- 5.2.3 The EMF must identify the entity responsible for approval of each plan required under this Incorporated Document or the Environmental Performance Requirements, **generally** in accordance with the table in Appendix 2 to this Incorporated Document.
- 5.2.4 The EMF must identify requirements for monitoring, reporting and auditing of compliance with the Environmental Performance Requirements, this Incorporated Document, and each plan set out in the table in Appendix 2 to this Incorporated Document.
- 5.2.5 The EMF (including the Environmental Performance Requirements) submitted to the Minister for Planning for approval under clause 5.2.6 must be accompanied by a statement explaining any differences between ~~that submitted it, and the that submitted EMF and the [Note: reference to be updated following Ministerial assessment]~~ EMF including contained in the Minister's Assessment of the Environment Effects Statement under s 8C of the Environment Effects Act 1978. Environmental Performance Requirements proposed in the Melbourne Metro Rail Project Environmental Effect Statement (2016) as refined through the Inquiry and Advisory Committee process and Minister for Planning's assessment of the Environment Effects Statement.
- 5.2.6 The EMF must be submitted to and approved by the Minister for Planning and may be prepared and approved in stages or parts and may be amended from time to time with the approval of the Minister for Planning.
- 5.2.7 The use and development for the Project must be carried out in accordance with the approved EMF and the approved Environmental Performance Requirements.

### 5.3 Urban Design Strategy

- 5.3.1 Prior to the submission of Development Plans, an Urban Design Strategy must be submitted to and approved by the Minister for Planning. The Urban Design Strategy may be prepared and approved in stages or parts and may be amended from time to time with the approval of the Minister for Planning.
- ~~5.3.2 An Urban Design Strategy submitted to the Minister for Planning for approval under clause 5.3.1 must be accompanied by a statement explaining any differences between that submitted Urban Design Strategy and the [Note — reference to be updated following Ministerial assessment] Urban Design Strategy proposed in the Melbourne Metro Rail Project Environmental Effect Statement (2016) as refined through the Inquiry and Advisory Committee process and Minister for Planning's assessment of the Environment Effects Statement.~~
- 5.3.3 The use and development for the Project must be carried out in accordance with the approved Urban Design Strategy.

### 5.4 Early Works Plans

- 5.4.1 Early Works identified in the Environment Effects Statement for the Project as Early Works may be carried out before a Development Plan is approved, provided that the Minister for Planning has approved an Early Works Plan for such works.
- 5.4.2 Early works for the Project identified in the Environment Effect Statement include:
- a) Utility service relocation and protection of utility assets;
  - b) Site preparation works, including demolition works, removal or relocation of trees and monuments, minor road / transport network changes; and
  - c) Works for construction of shafts at CBD North and CBD South station precincts.
- 5.4.3 An Early Works Plan must be approved by the Minister for Planning prior to the commencement of any works to which that Early Works Plan relates. It must include site layout plan/s and demonstrate an explanation as to how the Early Works Plan ~~will be~~ is in accordance with any relevant approved Environmental Performance Requirements ~~as~~
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~~required by clause 5.2.7~~ and the approved Urban Design Strategy ~~as required by clause 5.3.3 of this Incorporated Document.~~

- 5.4.4 A draft Early Works Plan must be provided to relevant Council/s for consultation and, where relevant, to the Roads Corporation, Public Transport Development Authority, Melbourne Water, Heritage Victoria, ~~and~~ affected utility service providers and any key stakeholders. A person or body who has been provided with a draft Early Works Plan must provide any comments on the draft plan within 15 business days of receipt.
- 5.4.5 An Early Works Plan submitted to the Minister for Planning for approval under clause 5.4.3 must be accompanied by any written comments received as a result of the consultation that is required under clause 5.4.4, ~~and~~ together with a summary of that consultation and response to issues raised during the consultation ~~process under clause 5.4.4.~~
- 5.4.6 Before deciding whether to approve an Early Works Plan, the Minister for Planning must consider ~~all~~ any written comments that have been received from any person or body in accordance with clause 5.4.4 and the consultation and response summary provided under clause 5.4.5.
- 5.4.7 An Early Works Plan may be prepared and approved in stages or parts and may be amended from time to time to the satisfaction of the Minister for Planning. The Minister must require an application for approval of an amendment to an Early Works Plan to comply with the requirements ~~of any or all~~ of clauses 5.4.3, 5.4.4, 5.4.5 and 5.4.6 if the Minister believes the amendment would have a significant effect on the environment or requires a change to the Environmental Performance Requirements approved under clause 5.2.
- 5.4.8 For land to which an Early Works Plan applies, development must be carried out generally in accordance with an approved Early Works Plan.

## 5.5 Native Vegetation

- 5.5.1 Native vegetation offsets for the removal of native vegetation to construct the Project must be provided in accordance with the Permitted Clearing of Native Vegetation - Biodiversity Assessment Guidelines (Department of Environment and Primary Industries, September 2013).

## 5.6 Preparatory Works

- 5.6.1 Preparatory works for the Project may commence before the plans and other matters listed in sub-clauses 5.1 to 5.5 are approved.
- 5.6.2 The preparatory works permissible under this sub-clause for the Project include, but are not limited to:
- a) Works, including vegetation removal, that would not require a permit under the provisions of the relevant Planning Scheme that, but for this Incorporated Document, would apply to the relevant land
  - b) Investigations, surveys, testing and preparatory works to determine the suitability of land
  - c) Creation of construction access points
  - d) Establishment of environmental and traffic controls
  - e) Fencing and temporary barriers to enable preparatory works.
- 5.6.3 For the avoidance of doubt, preparatory works permitted under this clause 5.6 do not include excavation of shafts or station caverns, or tunnelling of railway tunnels.

## 5.7 Availability of approved plans

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- 5.7.1 A current version of each of the following approved plans must be available on a clearly identifiable Project website until commencement of public train operations through the tunnels:
- a) Each Development Plan approved under clause 5.1;
  - b) Environmental Management Framework (including Environmental Performance Requirements) approved under clause 5.2;
  - c) Urban Design Strategy approved under clause 5.3; and
  - d) Each Early Works Plan approved under clause 5.4.

## **6. EXPIRY**

- 6.1 The control in this Incorporated Document expires if any of the following circumstances applies:
- a) The development allowed by the control is not started by 31 December 2018;
  - b) The development allowed by this control is not completed by 31 December 2028; or
  - c) The use allowed by the control is not started by 31 December 2028.
- 6.2 The Minister for Planning may extend these periods if a request is made in writing before the expiry date or within three months afterwards.
-

## Appendix 1 – Project Land

[MAPS 1 TO 16]

*[\(Not included but must be updated to reflect the final details of the Project Land\)](#)*

### Appendix 2 – Approval of plans

Document	Approved by	Relevant provision
<b>Strategic framework and Development Plans</b>		
Environmental Management Framework, including Environmental Performance Requirements.  Prepared by MMRA.	Minister for Planning	Incorporated Document clause 5.2.
Urban Design Strategy  Prepared by MMRA.	Minister for Planning	Incorporated Document clause 5.3.
Early Works Plans  Prepared by Early Works Contractor for works contemplated by clause 5.4 of the Incorporated Document.	Minister for Planning	Incorporated Document clause 5.4.
Development Plans  Prepared by each Contractor to the extent relevant to their works.	Minister for Planning	Incorporated Document clause 5.1.
<b>Management of broad impacts</b>		
Construction Environmental Management Plan  Prepared by each Contractor to the extent relevant to their works.	State of Victoria as party to the relevant contract (Melbourne Metro Rail Authority)  For PPP, also approved by Independent Reviewer	Incorporated Document clause 5.2.  Also referenced in EPR EM2 proposed in the Melbourne Metro Rail Project Environment Effects Statement (2016) as refined through the Inquiry and Advisory Committee process.
Site Environment Implementation Plan  Prepared by each Contractor to the extent relevant to their works.	State of Victoria as party to the relevant contract (Melbourne Metro Rail Authority)  For PPP, also approved by Independent Reviewer	Incorporated Document clause 5.2.  Also referenced in EPR EM2 proposed in the Melbourne Metro Rail Project Environment Effects Statement (2016) as refined through the Inquiry and Advisory Committee process.

Document	Approved by	Relevant provision
<p>Transport Management Plan/s (T1) as required by the Incorporated Document.</p> <p>Prepared by each Contractor to the extent relevant to their works.</p>	<p>State of Victoria as party to the relevant contract (Melbourne Metro Rail Authority)</p> <p>For PPP, also approved by Independent Reviewer</p>	<p>Incorporated Document clause 5.2 in respect of Transport Management Plan/s.</p> <p>EPR T1 proposed in the Melbourne Metro Rail Project Environment Effects Statement (2016) as refined through the Inquiry and Advisory Committee process requires Transport Management Plan/s which would address management of broader scale potential transport impacts.</p>
<p>Operations Environmental Management Plan.</p> <p>Prepared by PPP Contractor.</p>	<p>State of Victoria as party to the relevant contract (Melbourne Metro Rail Authority)</p> <p>For PPP, also approved by Independent Reviewer</p>	<p>See EPR EM1 and EM2 proposed in the Melbourne Metro Rail Project Environment Effects Statement (2016) as refined through the Inquiry and Advisory Committee process.</p>
<p>Business Disruption Plan.</p> <p>Prepared by each Contractor to the extent relevant to their works.</p>	<p>State of Victoria as party to the relevant contract (Melbourne Metro Rail Authority)</p> <p>For PPP, also approved by Independent Reviewer</p>	<p>See EPR B2 proposed in the Melbourne Metro Rail Project Environment Effects Statement (2016) as refined through the Inquiry and Advisory Committee process.</p>
<p>Community and Stakeholder Engagement Management Plan.</p> <p>Prepared by each Contractor to the extent relevant to their works.</p>	<p>State of Victoria as party to the relevant contract (Melbourne Metro Rail Authority)</p> <p>For PPP, also approved by Independent Reviewer</p>	<p>See EPR SC3 proposed in the Melbourne Metro Rail Project Environment Effects Statement (2016) as refined through the Inquiry and Advisory Committee process. To set out requirements and process for community and stakeholder engagement including to implement the Business Disruption Plan.</p>
<p>Construction Noise and Vibration Management Plan.</p> <p>Prepared by each Contractor to the extent relevant to their works.</p>	<p>State of Victoria as party to the relevant contract (Melbourne Metro Rail Authority)</p> <p>For PPP, also approved by Independent Reviewer</p>	<p>See EPR NVB proposed in the Melbourne Metro Rail Project Environment Effects Statement (2016) as refined through the Inquiry and Advisory Committee process.</p>
<b>Technical plans</b>		
Plans required by the Environmental Performance Requirements, other than the plans specifically		

Document	Approved by	Relevant provision
<p>listed above, will be approved as follows:</p> <ul style="list-style-type: none"> <li>• <i>For Early Works, Rail Infrastructure Alliance</i> (Eastern and Western Portals and Western Turnback) <i>and Rail Systems Alliance</i> (the high capacity signaling, rail systems integration and commissioning) these plans would be approved by the State of Victoria as party to the relevant contract (Melbourne Metro Rail Authority); and</li> <li>• Where prepared by the <i>PPP Contractor</i> (Tunnels and Stations package), these plans would be reviewed and commented on by both the State of Victoria (Melbourne Metro Rail Authority) and the Independent Reviewer under the PPP review procedures, and written confirmation provided that the plan complies with all statutory approvals, the Incorporated Document and the Environmental Performance Requirements.</li> </ul>		





# Appendix F Amended Environmental Performance Requirements

Notes:

Evaluation objectives have been removed however are to remain in the approved version  
Where the Committee has not recommended any changes to a particular EPR that EPR is not included in the Table below but should be in the final version .

## Environmental Performance Requirements

The following EPR refer to the Melbourne Metro Rail Project as defined in the Incorporated Document.

Note – All EPRs need to be considered when developing mitigation strategies.

### Environmental Performance Requirement ID:

<a href="#">EM</a>	<a href="#">Environmental Management Framework</a>	<a href="#">FF</a>	<a href="#">Flora and Fauna - Terrestrial</a>
<a href="#">ACH</a>	<a href="#">Aboriginal Cultural Heritage</a>	<a href="#">GHG</a>	<a href="#">Greenhouse Gas</a>
<a href="#">AE</a>	<a href="#">Aquatic Ecology and River Health</a>	<a href="#">GW</a>	<a href="#">Groundwater</a>
<a href="#">AR</a>	<a href="#">Arboriculture</a>	<a href="#">GM</a>	<a href="#">Ground Movement and Land Stability</a>
<a href="#">AQ</a>	<a href="#">Air Quality</a>	<a href="#">LU</a>	<a href="#">Land Use and Planning</a>
<a href="#">B</a>	<a href="#">Business</a>	<a href="#">NV</a>	<a href="#">Noise and Vibration</a>
<a href="#">C</a>	<a href="#">Contaminated Land and Spoil Management</a>	<a href="#">SC</a>	<a href="#">Social and Community</a>
<a href="#">CH</a>	<a href="#">Cultural Heritage (Historical)</a>	<a href="#">SW</a>	<a href="#">Surface Water</a>
<a href="#">EMI</a>	<a href="#">Electromagnetic Interference</a>	<a href="#">T</a>	<a href="#">Transport</a>

### Overarching EPR - Environmental Management Framework

EPR no.	Environmental Performance Requirement	Precinct	Timing
Environmental Management Framework (EM)			
EM1	<p><del>Develop a program to set out the process and timing for development of an Environmental Management System (EMS), Construction Environmental Management Plan (CEMP), Site Environment Implementation Plans (SEIP), Operations Environmental Management Plan (OEMP) and other plans as required by the Environmental Performance Requirements and as relevant to any stage of the project.</del></p> <p>The process for development of and implementation of the EMS, the CEMP the SEIP and OEMP must include consultation with Councils, Heritage Victoria, the Roads Corporation, Melbourne Water, Public Transport Victoria, the Environment Protection Authority and other stakeholders as relevant. These consultation processes must be described in the program.</p> <p><a href="#">Prepare and implement an Environmental Management System (EMS) that is certified to ISO 14001:2015 Environmental Management Systems – requirements with guidance for use for construction and operation.</a></p>	All	<p><del>Design/ Construction Operation</del></p> <p><a href="#">All</a></p>
EM2	<p><del>Prepare and implement an Environmental Management System that is certified to ISO 14001:2015 Environmental Management Systems – requirements with guidance for use for construction and operation.</del></p> <p>Prepare a Construction Environmental Management Plan (CEMP), Site Environment Implementation Plans (<a href="#">SEIP</a>), Operations Environmental Management Plan (OEMP) and other plans as required by the Environmental Performance Requirements (<a href="#">EPR</a>) and as relevant to any stage of the Project.</p>	All	<p><del>Design/ Construction/ Operation</del></p> <p><a href="#">All</a></p>

	<p><u>Develop a program to set out the process and timing for development of an EMS, CEMP, SEIP, OEMP and other plans as required by the EPR and as relevant to any stage of the Project.</u></p> <p><u>The process for development of and implementation of the EMS, the CEMP the SEIP and OEMP must include consultation with Councils, Heritage Victoria, the Roads Corporation, Melbourne Water, Public Transport Victoria (PTV), the Environment Protection Authority (EPA) and other stakeholders as relevant. These consultation processes must be described in the program. Plans are to be reviewed in accordance with the EMF.</u></p> <p>The CEMP should be prepared in accordance with EPA Publication 480, Environmental Guidelines for Major Construction Sites (EPA 1996).</p>		
EM3	<p>Appoint an Independent Environmental Auditor to audit proposed plans, as required in the Incorporated Document, <u>so as to ensure for</u> compliance with the <del>Environmental Performance Requirements</del> EPR and to undertake environmental audits of compliance with the approved CEMP, SEIP, OEMP (the OEMP is for <u>Public Private Partnership</u> (PPP) Only), <del>Environmental Performance Requirements</del> EPR and approval conditions.</p>	All	Construction / <u>Operation</u>
<u>EM4</u>	<p><u>Prior to works commencing, develop and implement a process for the recording, management and resolution of complaints from affected stakeholders consistent with Australian Standard AS/NZS 10002: 2014 Guidelines for Complaint Management in Organisations.</u></p> <p><u>The complaints management system must be consistent with the Community and Stakeholder Engagement Management Plan required under EPR SC3 and consistent with the Proponent and Contractors' own EMS'.</u></p>	<u>All</u>	<u>All</u>

#### Specific EPRs

EPR no.	Environmental Performance Requirement	Precinct	Timing
Aquatic Ecology and River Health (AE)			
AE2	<p>Best practice sedimentation and pollution control measures must be applied to protect waterways in accordance with Best Practice Environmental Management: Environmental Guidelines for Major Construction Sites – EPA publication 480 (1996) and in accordance with an approved <del>CEMP construction environmental management plan.</del></p> <p><u>Control m</u> Measures should include: vehicle wheel wash and rumble bars at worksite egress points, appropriate placement of material stockpiles and chemical storages, covered loads, street sweeping and water quality monitoring, where required.</p>	All	Construction
AE3	<p>During construction, discharge <u>all</u> tunnel, station box and portal construction water to sewer.</p> <p>Where groundwater interception during construction is predicted to occur, dewatering is to be managed so that groundwater is not released to stormwater or sensitive surface water bodies (refer to Environmental Performance Requirement GW4).</p>	All (except Western turnback)	Construction
AE5	<p>Design the Arden electrical substation (as per SW1) <u>so that it is appropriately protected against floodwaters during operation, in order</u> to provide appropriate protection against floodwaters during operation, to prevent the release of contaminants to Moonee Ponds Creek.</p>	3 – Arden station	Design / Operation
AE6	<p>During operation, discharge tunnel drainage water to sewer, unless otherwise agreed by EPA and Melbourne Water <u>and in compliance with SEPP (Waters of Victoria).</u></p> <p>Where groundwater interception during operation is predicted to occur, disposal is to be managed so that <u>no</u> contaminated water is <del>not</del> released to stormwater or <u>to</u> sensitive surface water bodies (refer to Environmental Performance</p>	1 – Tunnels	Operation

	Requirement GW4).																				
AE7	<p>Fully integrate the stormwater treatment system into the design of all <del>precincts</del> portals to ensure that <u>any</u> stormwater entering a receiving water body complies with SEPP (Waters of Victoria). <del>The best practice performance objectives for achieving compliance with SEPP (Waters of Victoria) during the operations phase are described below:</del></p> <table border="1"> <thead> <tr> <th>Pollutant type</th> <th>Receiving water objective</th> <th>Current best practice performance objective<sup>(1)</sup></th> </tr> </thead> <tbody> <tr> <td>Suspended solids (SS)</td> <td>Comply with SEPP (not to exceed the 90th percentile of 80 mg/L)<sup>(2)</sup></td> <td>80% retention of the typical urban annual load</td> </tr> <tr> <td>Total phosphorus (TP)</td> <td>Comply with SEPP (base flow concentration not to exceed 0.08 mg/L)<sup>(3)</sup></td> <td>45% retention of the typical urban annual load</td> </tr> <tr> <td>Total nitrogen (TN)</td> <td>Comply with SEPP (base flow concentration not to exceed 0.9 mg/L)<sup>(3)</sup></td> <td>45% retention of the typical urban annual load</td> </tr> <tr> <td>Litter</td> <td>Comply with SEPP (No litter in waterways)<sup>(2)</sup></td> <td>70% reduction of typical urban annual load<sup>(4)</sup></td> </tr> <tr> <td>Flows</td> <td>Maintain flows at pre-urbanisation levels</td> <td>Maintain discharges for the 1.5 year ARI at pre-development levels</td> </tr> </tbody> </table> <p>Notes</p> <ol style="list-style-type: none"> <li>Best practice performance objectives are based on the Best Practice Environmental Management Guidelines for Urban Stormwater – CSIRO.</li> <li>An example using SEPP (Waters of Victoria), general surface waters segment.</li> <li>SEPP Schedule F7 – Yarra Catchment – urban waterways for the Yarra River main stream.</li> <li>Litter is defined as anthropogenic material larger than five millimetres.</li> </ol> <p>Sedimentation and pollution control measures must be applied to protect waterways and habitat areas such as periphery surrounding Moonee Ponds Creek in accordance with industry best practice. This shall include water quality monitoring, where required.</p>	Pollutant type	Receiving water objective	Current best practice performance objective <sup>(1)</sup>	Suspended solids (SS)	Comply with SEPP (not to exceed the 90th percentile of 80 mg/L) <sup>(2)</sup>	80% retention of the typical urban annual load	Total phosphorus (TP)	Comply with SEPP (base flow concentration not to exceed 0.08 mg/L) <sup>(3)</sup>	45% retention of the typical urban annual load	Total nitrogen (TN)	Comply with SEPP (base flow concentration not to exceed 0.9 mg/L) <sup>(3)</sup>	45% retention of the typical urban annual load	Litter	Comply with SEPP (No litter in waterways) <sup>(2)</sup>	70% reduction of typical urban annual load <sup>(4)</sup>	Flows	Maintain flows at pre-urbanisation levels	Maintain discharges for the 1.5 year ARI at pre-development levels	All	Operation
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Flows	Maintain flows at pre-urbanisation levels	Maintain discharges for the 1.5 year ARI at pre-development levels																			
<b>Arboriculture (AR)</b>																					
AR1	<p>During detailed design, review <u>any</u> potential tree impacts and <u>achieve the maximum possible</u> <del>provide for the maximum</del> tree retention on both public and private land, <u>including retaining all</u> <del>also having regard to</del> valuable habitat linkages or corridors where practicable.</p> <p><u>Comply with any requirements of Heritage Victoria if the trees are on the VHR.</u></p> <p>Prior to construction of main works and shafts, develop and implement a plan in consultation with the relevant local council that identifies all trees in the <u>Project Area</u> which covers:</p> <ul style="list-style-type: none"> <li>Trees to be removed or retained</li> <li>Condition and significance of the trees to be removed</li> <li>Options for temporary re-location of palms and reinstatement at their former location or another suitable location.</li> </ul>	All	Design / Pre-construction																		

	The plan should include a tree removal protocol <a href="#">established in consultation with the City of Melbourne, the City of Port Phillip, the City of Stonnington, the Shrine of Remembrance and Shrine Trustees, University of Melbourne and Heritage Victoria as applicable</a> that includes a process for MMRA approval of trees prior to removal.		
AR2	Reinstate quality soils to sufficient volumes to support long-term viable growth of replacement trees. Ensure ongoing supply of water to tree root zones, especially during their establishment stage. Employ water sensitive urban design principles (WSUD) <del>principles</del> where possible.	All	Construction/ <a href="#">operation</a>
AR3	<p>Re-establish trees to replace loss of canopy cover and achieve canopy size equal to (or greater than) healthy, mature examples of the <a href="#">removed</a> species in Melbourne. Consult with the City of Melbourne, the City of Port Phillip, the City of Stonnington, the Shrine of Remembrance and Shrine Trustees, University of Melbourne and Heritage Victoria as applicable. <del>Policy documents that should be referenced to re-establish trees and valued landscape character include:</del></p> <p><a href="#">When re-establishing trees, regard should be had to the following documents where relevant:</a></p> <ul style="list-style-type: none"> <li>• The City of Melbourne’s Tree Retention and Removal Policy 2012 (excluding sections 8.2 and 8.3) and Urban Forest Strategy, South Yarra Urban Forest Precinct Plan, Central City Urban Forest Precinct Plan, Carlton Urban Forest Precinct Plan and Kensington Urban Forest Precinct Plan</li> <li>• The City of Port Phillip’s Community Amenity Local Law No. 1 and Greening Port Phillip – An Urban Forest Approach</li> <li>• The City of Stonnington’s General Local Law 2008 (No 1) and City of Stonnington Street Tree Strategy</li> <li>• Any associated precinct plans</li> <li>• Specific policies of the Domain Parklands Conservation Management Plan, for trees within Domain Parklands</li> <li>• Shrine of Remembrance Conservation Management Plan (Lovell Chen, 2010) or any future review and the Shrine of Remembrance Landscape Improvement Plan (<del>R</del>ush Wright Associates, 2010)</li> <li>• South African Soldiers Memorial Conservation Management Plan (<del>in</del> <a href="#">preparation</a>, Context, 2016)</li> <li>• The preferred future character of the University of Melbourne, for trees in the grounds of the University of Melbourne.</li> </ul> <p>The re-establishment of trees must also consider the contribution <a href="#">that the replacement trees can make</a> to <a href="#">the</a> creation of habitat corridors and linkages where <a href="#">this is</a> possible.</p>	All (except Western turnback)	Construction
AR4	<p>Prior to <a href="#">commencement of</a> construction <del>commencing</del> of <a href="#">any main</a> works <del>or shafts</del> in affected areas, prepare and implement Tree Protection Plans for each precinct in accordance with AS4970-2009 Protection of Trees on Development Sites. <del>The plans must respond to</del> <a href="#">addressing</a> the detailed design and construction methodology of the Project <a href="#">and ensure that trees proposed to be retained are adequately protected from the impact of construction or related activities.</a></p> <p><del>Within Precincts 1, 4 and 7 a Tree Protection Plan must be developed for each heritage place as relevant to the satisfaction of Heritage Victoria or the responsible authority.</del></p> <p><a href="#">A Tree Protection Plan must be developed for each heritage place in consultation with Heritage Victoria or the relevant council (as applicable).</a></p>	All (except Western turnback)	Construction
<a href="#">AR6</a>	<a href="#">Establish protocols to govern the use of advanced and super-advanced trees, where such use is appropriate to re-establish canopy and valued landscape character in a way that balances long term viability with immediate impact. These Protocols are to be developed in consultation with the City of Melbourne, the City of Port Phillip, the City of Stonnington, the Shrine of Remembrance and</a>	All (except Western turnback)	<a href="#">Construction</a>

	<a href="#">Shrine Trustees, University of Melbourne, Heritage Victoria and other stakeholders as appropriate.</a>		
<b>Air Quality (AQ)</b>			
AQ1	<p>Develop and implement plan(s) for dust management and monitoring, in consultation with EPA and the owners of key sensitive equipment or locations, to minimise and monitor the impact of construction dust and advise the community of the plan, in accordance with the Community and Stakeholder Engagement Plan (EPR SC3).</p> <p>The plan must:</p> <ul style="list-style-type: none"> <li>• Set out air quality criteria and outline the justification for those criteria for above ground construction works</li> <li>• Be informed by air modelling of construction activities, which should identify the main dust sources and <a href="#">the location of</a> sensitive land uses. <a href="#">Air modelling for particulate dispersion must include construction ventilation discharges, and assess for both dust particulates and respirable crystalline silica.</a></li> <li>• <a href="#">A specific risk assessment (human toxicology) should be conducted for human health, by a suitably qualified professional, for any possible airborne contaminants of potential concern, including: dust, respirable crystalline silica, asbestos, aspergillus spores (Precinct 4 only) and any other common industrial contaminants within dust (such as metals and polycyclic aromatic hydrocarbons).</a></li> <li>• Describe the proposed <del>air quality</del> <a href="#">dust management and monitoring</a> system including (but not limited to): <ul style="list-style-type: none"> <li>– Routinely reviewing weather model predictions</li> <li>– Continuous monitoring and real-time alert systems in the event of measured exceedances</li> <li>– Protocols for record-keeping</li> <li>– Protocols to ensure that site personnel advise the site manager if excessive dust emissions are observed</li> </ul> </li> <li>• Describe the <a href="#">mitigation</a> measures that <del>would</del> <a href="#">will</a> be implemented to ensure compliance with air quality criteria.</li> <li>• Address monitoring requirements for key sensitive receptors, including (but not limited) to: <ul style="list-style-type: none"> <li>– Residential and commercial properties, including ACMI</li> <li>– Hospitals and research facilities within the Parkville precinct</li> <li>– Heritage listed places sensitive to dust including St Pauls Cathedral and the Melbourne City Baths</li> <li>– Universities, including The University of Melbourne and RMIT</li> <li>– Schools, including Melbourne Grammar School (South Yarra Campus) and Christ Church Grammar School</li> <li>– The Arts Centre Melbourne and National Gallery of Victoria</li> </ul> </li> </ul> <p>Public parks and outdoor public recreational areas including the Shrine of Remembrance Reserve and JJ Holland Reserve.</p>	All	<a href="#">Detailed design / Construction</a>
<b>Business (B)</b>			
B1	<p>Reduce the disruption to businesses from direct acquisition or temporary occupation of land, and work with business and land owners to endeavour to reach agreement on the terms for possession of the land.</p> <p><a href="#">Provide businesses with adequate notice of any need for relocation, which is caused by the Project including the termination of leases of public or private land where the displacement is a direct consequence of the Project.</a></p>	All	<a href="#">Design/ Construction</a>

B2	<p>Prepare a business disruption plan consistent with the Community and Stakeholder Engagement Management Plan (SC3) to: <del>manage potential impacts to non-acquired businesses, commercial property owners and to engage with local councils, businesses, property owners and the community throughout construction.</del></p> <ul style="list-style-type: none"> <li>• <a href="#">Manage potential impacts to non-acquired businesses, commercial property owners and not-for-profit organisations</a></li> <li>• <a href="#">Ensure appropriate engagement with local councils, businesses, property owners and the community throughout construction.</a></li> </ul> <p>The plan <del>shall</del> <b>must</b> outline the stakeholder engagement measures for each precinct and shall include:</p> <ul style="list-style-type: none"> <li>• <del>Timely information</del> <a href="#">Adequate notice</a> <del>on</del> <b>of</b> key Project milestones</li> <li>• <a href="#">Details of any c</a>Changes to traffic and parking conditions and duration of impact</li> <li>• A Project construction schedule developed in coordination with transport authorities and local councils and in consultation with businesses to minimise cumulative impacts of this and other projects</li> <li>• Plans for notifying customers of proposed changes to business operations, including the setting of suitable timeframes for notification prior to commencement of works</li> <li>• Measures to ensure access to businesses <del>are is-</del> maintained for customers, <del>delivery-deliveries</del> and <a href="#">consistent with T8</a> waste removal, unless there has been prior engagement with affected businesses (including mutually agreed mitigation measures as required). These measures could include the installation of directional and business signage to assist customers and agreed protocols for engaging with service providers (i.e. deliveries, collections, etc)</li> <li>• <a href="#">Assistance with the preparation of Business Plans where sought by businesses likely to be affected by construction to create financial baselines that may be used to demonstrate impacts from the Project.</a></li> <li>• Process for registering, management and resolution of complaints from affected businesses consistent with Australian Standard AS/NSZ 10002:2014 Guidelines for Complaint Management in Organisations.</li> <li>• Measures for supporting affected businesses during construction in accordance with the Business Support Guidelines for Construction such as marketing and promotion, local activation, way-finding programs and upskilling opportunities.</li> </ul>	All	<a href="#">Design/ Pre-construction / Construction</a>
B5	Develop a stop work contingency plan for Class 1 emergencies (as defined in the <i>Emergency Management Act 2013</i> ) in consultation with medical institutions in the Parkville precinct in the event that Melbourne Metro construction works are required to cease <a href="#">as a result of any such emergency</a> .	4 – Parkville station	Design / Construction
	<del>Also refer to the following Environmental Performance Requirements for 'Business': T1, SC2, SC3, LU1, AQ1, NV1</del>		
<b>Contaminated Land and Spoil Management (C)</b>			
C1	<p>Prior to construction of main works or shafts, prepare and implement a Spoil Management Plan (SMP) in accordance with MMRA's Spoil Management Strategy and <a href="#">any</a> relevant regulations, standards <del>and or</del> best practice <a href="#">guidelines</a>. <del>guidance</del>. The SMP <del>shall</del> <b>must</b> be developed in consultation with the EPA. The SMP will include but is not limited to the following:</p> <ul style="list-style-type: none"> <li>• Applicable regulatory requirements</li> <li>• Identifying the nature and extent of spoil (clean fill and contaminated spoil) <del>across all precincts</del></li> <li>• Roles and responsibilities</li> </ul>	All	Construction

	<ul style="list-style-type: none"> <li>• Identification of management measures for handling and transport of spoil for the protection of health and the environment</li> <li>• Identification, design and development of specific environmental management plans for temporary stockpile areas</li> <li>• Identifying suitable sites for re-use, management or disposal of any spoil</li> <li>• Monitoring and reporting requirements</li> <li>• Identifying locations and extent of any prescribed industrial waste (PIW) and <a href="#">the method for</a> characterising PIW spoil prior to excavation</li> <li>• Identifying suitable sites for disposal of any PIW.</li> </ul> <p>The SMP shall include sub-plans as appropriate, including but not limited to an Acid Sulfate Soil and Rock (ASS/ASR) Management Sub-Plan (Refer to C2).</p>		
C2	<p><a href="#">Prior to the commencement of construction of the project, and in consultation with the EPA, pP</a>prepare and implement an Acid Sulfate Soil and Rock (ASS/ASR) Management Sub-Plan prior to construction of the Project as a sub-plan of an overarching SMP in accordance with the <a href="#">Industrial Waste Management Policy (Waste Acid Sulfate Soils) 1999, EPA Publication 655.1 Acid Sulfate Soil and Rock and relevant (EPA)</a> regulations, standards and best practice guidance and in consultation with the EPA. This sub-plan <del>must will</del> include the general requirements of the SMP and also:</p> <ul style="list-style-type: none"> <li>• Identify locations and extent of any potential ASS/ASR</li> <li>• Characterise ASS/ASR spoil prior to excavation</li> <li>• Identify and implement measures to prevent oxidation of ASS/ASR wherever possible</li> <li>• Identify suitable sites for re-use, management or disposal of any ASS/ASR.</li> </ul>	All	Construction
<b>Cultural Heritage (Historical)</b>			
CH1	<p>Design permanent and temporary works to avoid or minimise impacts on the cultural heritage values of heritage places.</p> <p>Consult, as required, with Heritage Victoria and/or the <a href="#">relevant local council responsible authority</a> (as applicable).</p> <p>Note:-: <del>the Project must meet the requirements of the All necessary heritage permits are to be obtained as required under the</del> Heritage Act 1995</p>	All	Detailed design
CH2	<p>To avoid or minimise impacts on the cultural heritage values of heritage places:</p> <ul style="list-style-type: none"> <li>• Prepare and implement a <del>Heritage Management Plan (HMP), which must identify the mitigation measures to be adopted to avoid or minimise impacts on the cultural heritage values of heritage places</del> <a href="#">Heritage Impact Statement (HIS) in consultation with Heritage Victoria or the responsible authority (as applicable). The HIS must identify the heritage values of the place, the degree of significance of component parts, how proposed works will affect the heritage values, the mitigation measures to be adopted to avoid or minimise impacts on heritage values and any possible heritage benefits.</a></li> <li>• Perform works in accordance with the following noise and vibration and ground movement <del>Environmental Performance Requirements</del> EPR as related to heritage places: <del>New NVA</del> <a href="#">NV20, NV2, NV3, NV6, NV7, NV11</a> GM2, GM3, GM4, GM5, GM6</li> <li>• <a href="#">Undertake condition assessments of heritage places prior to commencement of construction where located within the identified vibration and ground settlement zones of sensitivity and monitor as per NV6, GM4 and GM5.</a></li> <li>• Should damage occur to a <del>heritage place building or structure in the Victorian Heritage Register or that is subject to a Heritage Overlay</del> as a result of works, undertake rectification works in accordance with accepted conservation practice (with reference to the Australia ICOMOS Burra Charter 2013) with input from a qualified heritage <del>practitioner</del> <a href="#">practitioner</a> and in</li> </ul>	All	Detailed design / Construction

	consultation with the land owner and <a href="#">relevant</a> local Council for places in a local Heritage Overlay, or with the written approval of the Executive Director of Heritage Victoria for places included in the Victorian Heritage Register.		
CH3	Prior to construction, undertake archival photographic recording in accordance with Heritage Victoria's specification for the archival photographic recording of heritage places <del>and objects</del> where heritage places are to be demolished or modified <del>or their setting is to be impacted by works. The archival recording is to be provided to Heritage Victoria for places in the VHR and the relevant local council for places included in the Heritage Overlay.</del>	All	Pre-construction
CH4	Prior to the construction of <del>main works or shafts</del> that affect heritage structures or places, where it is proposed to dismantle, store and reconstruct heritage fabric, develop detailed methodology in accordance with the Australia ICOMOS Burra Charter <a href="#">2013</a> and in consultation with Heritage Victoria or the land owner or <a href="#">relevant</a> local council (as applicable) where heritage fabric is required to be dismantled, stored and reconstructed.  Work is to be documented and overseen by an appropriately qualified <del>conservation heritage practitioner</del> <a href="#">practitioner</a> .  <a href="#">Prior to dismantling, develop interpretative material for display while the heritage fabric is not visible.</a>	All	<del>Prior to construction, reinstatement at an appropriate time during or after the main construction works</del>  <a href="#">Pre-construction</a>
CH5	Prior to construction of <del>main works or shafts</del> <a href="#">which may directly or indirectly that</a> affect heritage <del>structures or</del> places, develop and implement appropriate protection measures for heritage places and <a href="#">their settings</a> . <del>objects including sculptures, memorials, monuments and associated heritage fabric where retained in proximity to works.</del> This is to be done in consultation <a href="#">with the land owner, and Heritage Victoria or the land owner</a> or <a href="#">relevant</a> council (as applicable).	All	Pre-construction
CH6	In consultation with Heritage Victoria <a href="#">and as required by the Heritage Act 1995:</a> <ul style="list-style-type: none"> <li>Develop archaeological management plans to manage disturbance of archaeological sites and values affected by the Project.</li> <li><a href="#">Undertake investigation in accordance with the Guidelines for Investigating Historical Archaeological Artefacts and Sites, Heritage Victoria 2014 (as amended or updated)</a> <del>and to the satisfaction of the Executive Director, Heritage Victoria.</del></li> </ul> <a href="#">Develop and implement a protocol for managing previously unidentified historical archaeological sites discovered during Project works.</a>	All	Pre-construction
CH7	<del>Develop and implement a heritage interpretation strategy as part of detailed design as a whole which seeks to explore historical and Aboriginal cultural heritage themes. This must include (but not be limited to) the exploration of opportunities for interpretation at Arden station (referencing the use of this land for railways workshops and sidings), and at CBD South station (referencing the Port Phillip Arcade and the early Port Phillip Club Hotel).</del>  <a href="#">In consultation with Heritage Victoria for places in the VHR and VHI or the relevant local council and/or Aboriginal Victoria (as applicable), develop and implement, in consultation with stakeholders, a heritage interpretation strategy which explores historical and Aboriginal cultural heritage themes.</a>	All	Design / Construction
CH9	Ensure new development is responsive to heritage places in terms of height, massing, form, façade articulation, <del>and</del> materials <a href="#">and impacts on their settings and key views</a> .	All	Detailed design
CH11	Retain and protect Langford Street pumping station <del>(part of proposed Moonee Ponds Creek and Infrastructure Precinct)</del> as part of the design for the new substation.	3 – Arden station	Detailed design
CH12	<a href="#">In consultation with VicRoads, Heritage Victoria and/or the relevant local council,</a> <del>R</del> replace removed Elm trees in Royal Parade as part of <del>p</del> project delivery using appropriate species and re-establish the boulevard formation <a href="#">and heritage values</a> .	4 – Parkville station	Construction



	<u>Provide suitable soil conditions to facilitate the growth of new trees to reach the size of the existing mature trees in the boulevard.</u>		
CH15	In the event <del>that</del> of temporary or permanent relocation of the Burke and Wills Monument from its current site is required, resolve the final location of the monument in consultation with the City of Melbourne prior to the commencement of construction. (See <del>Environmental Performance Requirement EPR CH4</del> )	6 – CBD South station	Detailed design
CH17	Replace removed trees as part of Project delivery in accordance with relevant policy documents and to <del>re-establish valued landscape character</del> <u>retain heritage values</u> and in consultation with the City of Melbourne, the City of Port Phillip, NV1 <u>Heritage Victoria</u> , the Shrine of Remembrance and Shrine Trustees (as applicable). Policy documents are as follows: <ul style="list-style-type: none"> <li>• <u>Any Conservation Management Plan adopted by those bodies, including:</u></li> <li>• Domain Parklands Conservation Management Plan 2016 and the Domain Parklands Masterplan <del>(in preparation)</del> <u>(when completed)</u></li> <li>• Shrine of Remembrance Conservation Management Plan (Lovell Chen, 2010) or any future review and the Shrine of Remembrance Landscape Improvement Plan (Rush Wright Associates, 2010)</li> <li>• South African Soldiers Memorial Conservation Management Plan (Context, 2016)</li> </ul>	1 – Tunnels 7 – Domain station	Construction
CH18	<u>To the satisfaction of Heritage Victoria</u> 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 Shrine of Remembrance Reserve, <u>in consultation with the City of Melbourne, the Shrine of Remembrance and Shrine Trustees (as applicable) and Heritage Victoria.</u>  The design needs to allow for the maintenance of an appropriate setting to the Macpherson Robertson Memorial Fountain.	7 – Domain station	Detailed design
<u>CH19</u>	<del>In consultation with Heritage Victoria:</del>  Prior to dismantling the South African Soldiers Memorial, in consultation with City of Port Phillip and <u>Heritage Victoria</u> develop interpretive material to display in the precinct until the monument is restored.  For detailed design, in consultation with City of Port Phillip and <u>Heritage Victoria</u> review the siting and design of the western Domain station entry to ensure the South African Soldiers Memorial and other components of the Albert Reserve retain their heritage values <u>including an appropriate setting.</u> <del>has an appropriate landscaped setting if relocated on this site.</del> If no appropriate setting can be established, consider options for relocation of the memorial to an alternative site.	7 – Domain station	Detailed design
CH20	In consultation with VicRoads, Heritage Victoria and <del>for</del> relevant local councils, replace <del>removed any</del> trees in St Kilda Road <u>that must be removed in a manner which will re-establish the boulevard formation and retain heritage values.</u>  <u>Resolve the physical and visual impacts of new above ground structures and changes to the functional layout with input from Heritage Victoria, relevant local council, VicRoads, Yarra Trams and PTV in the Heritage Impact Statement (HIS).</u>	7 – Domain station	Detailed design
CH22	Ensure that, where impacted by <del>P</del> project works, street fabric and infrastructure is conserved and/or accurately reconstructed <u>in consultation with the relevant local council.</u>	All	Construction
<u>CH23</u> <del>NEW CHA</del>	<del>Before tunnelling commences:</del>  • Consider the construction noise and vibration modelling required by EPR NV3 <u>and review the ground movement plan required by EPR GM3,</u> and identify heritage places <del>on the Victorian Heritage Register</del> that may be vulnerable to <del>degradation damage</del> <u>as a result of vibration</u> from construction and identify appropriate mitigation measures to prevent damage to heritage places <del>from</del>	All	Construction

	<p><del>vibration.</del></p> <ul style="list-style-type: none"> <li>Conduct pre-construction condition surveys of heritage places identified in the modelling as potentially being vulnerable to <del>degradation, damage as a result of vibration,</del> to record structural condition and structural integrity prior to the commencement of tunnelling.</li> <li>Implement the identified mitigation measures to prevent damage to heritage places <del>from vibration in consultation with Heritage Victoria and the relevant local council (as applicable).</del></li> <li>Conduct vibration monitoring at the heritage places that may be vulnerable to <del>damage degradation</del> to assess the actual <del>impacts vibration</del> from construction works.</li> </ul> <p>If the vibration monitoring demonstrates <del>the condition of that a</del> heritage places <del>may be has been, or may be, damaged degraded</del> as a result of vibration, ground vibration must be reduced until the risk of vibration related <del>degradation damage</del> is assessed as acceptable.</p> <p><u>Construction techniques must also seek to limit as far as practicable ground movement to avoid causing damage to heritage places, (see also EPR GM3, GM4, GM5 and GM6).</u></p>		
<b>Electro Magnetic Interference (EMI)</b>			
EMI1	<p>During detailed design:</p> <ul style="list-style-type: none"> <li>undertake a Project wide Electro Magnetic Interference (EMI) assessment for existing infrastructure, systems and equipment <del>considering that considers:</del> <ul style="list-style-type: none"> <li>Baseline conditions</li> <li>Stakeholder requirements</li> <li>Manufacturer specifications of sensitive equipment</li> </ul> </li> <li><del>The Any</del> electromagnetic emissions generated by moving metallic objects which may alter magnetic fields and the operation of any electrical or electronic equipment to be used during construction and operation of the Project</li> <li>Undertake baseline monitoring <del>in accordance with of</del> sensitive equipment <del>in accordance with any relevant</del> manufacturer environmental test requirements, where available.</li> <li><del>Determine Agree</del> operational EMI limits <del>in consultation with sensitive with</del> equipment owners having regard to equipment manufacturer environmental specifications where available and background EMI levels</li> <li>If EMI limits are expected to be exceeded, <del>either</del> as a result of the construction and/or operation of the Project, design mitigation measures, in consultation <del>and agreement with</del> with equipment owners, <del>so as</del> to minimise impact on sensitive equipment in accordance with 'best practice' industry standards.</li> </ul>	All with focus on 4 – Parkville station 5 – CBD North station	Design
EMI2	<p>Prior to <u>commencement of</u> construction and operation, prepare and implement an Electro Magnetic Compatibility (EMC) Management Plan that includes the following (but is not necessarily limited to):</p> <ul style="list-style-type: none"> <li><del>Considers An assessment of the likely the</del> electromagnetic emissions generated by the Works</li> <li><del>Identifies Identification of-</del> sensitive equipment <del>that might be affected by those electromagnetic emissions</del> and the <u>proposed</u> management measures</li> <li>Includes a testing strategy in accordance with equipment specifications to monitor performance of appropriate management measures</li> <li><u>Identification of possible works to sensitive equipment to avoid adverse impacts</u></li> <li><del>Outlines a A</del> program for regular auditing of electronic and electrical systems</li> </ul>	All with focus on 4 – Parkville station 5 – CBD North station	Construction / Operation

	<p>during the construction, testing and commissioning.</p> <ul style="list-style-type: none"> <li>• <del>Outlines</del> Remedial action <a href="#">to be undertaken</a> if EMI limits are not met during the construction, testing, commissioning and operation of the Project.</li> </ul>		
<b>Flora and Fauna - Terrestrial (FF)</b>			
FF1	Where <a href="#">the removal of 'unavoidable'</a> native vegetation is ' <a href="#">unavoidable</a> ' (as defined under relevant policy) <del>needs to be removed</del> , meet the requirements of the <i>Permitted Clearing of Native Vegetation – Biodiversity Assessment Guidelines</i> .	All	Construction
FF2	Develop and implement measures to avoid the spread or introduction of weeds and pathogens during construction, including vehicle <a href="#">and equipment</a> hygiene.	All	Construction
<b>Greenhouse Gas (GHG)</b>			
<b>Ground Movement and Land Stability (GM)</b>			
GM2	Design and construct the permanent structures and temporary works to limit ground movements to within appropriate acceptability criteria (to be determined in consultation with relevant stakeholders, local councils and land managers <a href="#">and which builds upon the assumptions and mitigation measures presented in the EES</a> ) for vertical, horizontal, and angular deformation as appropriate for Project activities during the construction and operational phase.	All	Design / Construction / Operation
GM3	<p>Develop and implement a Ground Movement Plan for construction and operational phases of the Project that:</p> <ul style="list-style-type: none"> <li>• Addresses the location of structures/assets which may be susceptible to damage by ground movement resulting from Melbourne Metro works, having particular regard to <del>places listed on the Victorian Heritage Register</del> <a href="#">heritage places and EPR CH2</a>.</li> <li>• Identifies appropriate ground movement impact acceptability criteria for buildings, utilities, trains, trams and pavement after consultation with the various stakeholders</li> <li>• Identifies mitigation measures to ensure acceptability criteria can be met</li> <li>• Identifies techniques for limiting settlement of buildings and protecting buildings from damage. Where these may apply to heritage places, they should be developed in consultation with Heritage Victoria and the relevant council (as applicable).</li> <li>• Addresses additional measures to be adopted if acceptability criteria are not met such as reinstatement of any property damage. <a href="#">For heritage places, refer to EPR CH2</a>.</li> <li>• Establishes monitoring ground movement monitoring requirements for the area surrounding proposed Melbourne Metro works and at the location of various structures/assets to measure consistency with the predicted model</li> <li>• Consult with land and assets owners that could potentially be affected and where mitigation measures would be required.</li> </ul>	All	Construction / Operation
GM6	For properties and assets affected by ground movement, undertake any required repair works. <a href="#">For places on the VHR, consultation with Heritage Victoria and the relevant local council is to occur (as applicable)</a> .	All	Construction
<b>Groundwater (GW)</b>			
GW1	<p>Design the tunnel and underground structures so that they minimise changes to groundwater levels during construction and operation to minimise impacts on groundwater dependent values, ground movement and contamination plume migration.</p> <p><a href="#">In the case of existing, registered groundwater bore users, for the assessment of a tolerable groundwater drawdown criteria, drawdown level should not exceed the point where the available saturated aquifer thickness of the bore is reduced by</a></p>	All	Design

	<a href="#">further than 10 per cent.</a>		
GW2	<p>Develop a groundwater model <del>in</del> <a href="#">through</a> a process that involves ongoing referral to the Independent Environmental Auditor consistent with the Australian Groundwater Modelling Guidelines (Barnett et al, 2012). Apply the model for the detailed design phase to predict impacts associated with any changes to construction techniques or operational design features proposed during detailed design, and reconfirm that the Environmental Performance Requirements and mitigation measures are sufficient to mitigate impacts from changes in groundwater levels, flow and quality.</p> <p>The groundwater model should be updated to address comprehensively; transient calibration, aquifer specific storage parameter values and their justification, prediction of cumulative impacts during construction and uncertainty assessments.</p> <p><a href="#">Ensure that the model geometry set-up (node and grid network of model and layering definition) is accurately matched into the Project's detailed design excavation geometry.</a></p> <p>Undertake monitoring during construction to ensure that predictions are accurate and mitigation measures are appropriate.</p>	All	Design / Construction
<b>Land Use an Planning (LU)</b>			
LU1	<p>Develop and implement a plan for construction and operation of Melbourne Metro that has <del>the as its purpose of</del> <a href="#">minimising impacts on to the development and/or operation of</a> existing land uses, including <a href="#">by</a>:</p> <ul style="list-style-type: none"> <li>Limiting the <a href="#">extent of any</a> permanent change of use within existing public open space</li> <li>Minimising <a href="#">the</a> footprints of construction sites and <a href="#">any</a> permanent infrastructure <a href="#">which is to be located</a> on public land</li> <li><del>The location and design of</del> <a href="#">Locating and designing</a> all Project works to avoid, to the extent practicable, <a href="#">any</a> temporary and permanent loss of public open space and be designed to maximise the re-instatement potential <a href="#">of that land.</a></li> <li>Minimising impacts to existing public open spaces and recreational facilities and the users of these facilities, including (but not limited to): JJ Holland Park, University Square, the Melbourne City Baths, City Square, Federation Square, the Shrine of Remembrance and the Shrine Reserve, Domain Parklands, Edmund Herring Oval, and the Albert Road Reserve</li> <li>Minimising the impacts to existing residential areas by locating new above ground infrastructure, such as electrical substations in appropriate locations considering adjoining properties and exploring the co-location of rail infrastructure facilities where practicable.</li> </ul> <p>Such measures must be developed in consultation with affected land managers for public land.</p>	All	Construction / Operation
LU2	<p>Development of the Project is to be generally in accordance with the relevant Open Space Master Plans (including but not limited to, the Domain Parklands, and University Square Master Plans, <a href="#">Chapel ReVision Structure Plan</a>) in designing and constructing above-ground infrastructure for the tunnels.</p> <p>Consultation must occur with land managers and/or agencies responsible for the implementation of the relevant Open Space Master Plans.</p>	All	Design / Construction
LU4	<p>Develop and implement a plan to ensure the design <a href="#">of the Project</a> meets the Melbourne Metro Urban Design Strategy and relevant planning schemes that considers:</p> <ul style="list-style-type: none"> <li>Permanent above ground structures</li> <li>Temporary structures adopting principles of the Growing Green Guide 2014 including green walls, roofs and facades, where practicable</li> <li>the MMRA Creative Strategy</li> </ul>	All	Design

	<ul style="list-style-type: none"> <li>Wayfinding, signage and advertising for above ground elements of the Project</li> </ul> <p><a href="#">The strategies must be developed in consultation with relevant local councils and land managers.</a></p> <p>(See EPR LV1)</p>		
<b>Landscape and Visual (LV)</b>			
LV1	<p>Develop and implement a plan for the design of permanent and temporary works in consultation with <a href="#">relevant</a> local councils and the Office of Victorian Government Architect to comply with the Melbourne Metro Urban Design Strategy. Avoid or minimise to the extent practicable, visual impacts <a href="#">in both duration and intensity on</a> sensitive receptors <a href="#">and heritage places</a>, and maintain broader landscape character and <a href="#">heritage precinct values</a>, particularly in relation to:</p> <ul style="list-style-type: none"> <li>Tunnels: Queen Victoria Gardens, Tom's Block</li> <li>Western Portal: JJ Holland Park</li> <li>Parkville Station: University of Melbourne, Victorian Comprehensive Cancer Centre, Royal Melbourne Hospital, University Square</li> <li>CBD North Station: Royal Melbourne Institute of Technology, the State Library and State Library Forecourt</li> <li>CBD South Station: St Paul's Cathedral, Federation Square, City Square and Flinders Street Station</li> <li>Domain Station: The Shrine of Remembrance, Shrine of Remembrance Reserve, Albert Road Reserve, Domain Parklands</li> <li>Eastern Portal: South Yarra Sidings Reserve and Osborne Street.</li> <li><a href="#">A'Beckett Street open space</a></li> <li>Existing habitat corridors within and proximate to Moonee Ponds Creek, if the alternate substation site adjacent to the Moonee Ponds Creek is selected</li> </ul> <p>Consult with University of Melbourne in relation to location and design of station entries on University land.</p>	All	Construction / Operation
LV2	<p>Develop and implement a plan in consultation with the Office of Victorian Government Architect, local councils and other land managers to comply with the Melbourne Metro Urban Design Strategy to re-establish and enhance <del>where appropriate</del> public open space, recreation reserves and other valued places disturbed by temporary works. <a href="#">Some of these are heritage places and further consultation will be required.</a></p> <p>The plan must include, but not be limited to a methodology and timeframe for storage, reinstatement or replacement of existing public art, monuments and public infrastructure such as poles (including banner poles), bins, and other street furniture such as wayfinding signage (including signage hubs)</p> <p><del>The plan should also include exploring opportunities for renewal of public spaces for the benefit of communities beyond resident groups, including visitors, business owners and commuters. The plan should include a timeframe for re-establishment of public open space recreation reserves and other valued places disturbed by temporary works.</del></p> <p><a href="#">The plan should include a timeframe for re-establishment of public open space, recreation reserves and other valued places disturbed by temporary works and should also include exploring opportunities for renewal of public spaces for the benefit of communities beyond resident groups, including visitors, business owners and commuters.</a></p>	All	Design / Construction
LV3	<p>Prior to construction, develop measures to minimise light spillage during construction to protect the amenity of adjacent neighbourhoods, parks and community facilities. Lighting for operation <del>would</del> <a href="#">must</a> be designed in</p>	All	Construction

	accordance with council requirements and relevant standards.		
<a href="#">LV4</a>	<a href="#">Develop and implement a plan to consider the re-use of temporary landscape and other temporary features or structures.</a>	<a href="#">All</a>	<a href="#">Pre-construction/Construction</a>
<b>Noise &amp; Vibration (NV)</b>			
NV1	Manage construction noise in accordance with EPA Publication 1254 Noise Control Guidelines <a href="#">and as specified in the</a> Construction Noise and Vibration Management Plan prepared under NV20B*.	All	Construction
NV2	<p>For construction works conducted between CBD South station and Domain station, comply with the requirements of the Notification of Referral Decision for the Melbourne Metro Rail Project (EPBC 2015/7549, dated 22 September 2015) under the EPBC Act for vibration monitoring and measurement, as follows:</p> <p>Conduct pre-construction dilapidation surveys of the nearest Commonwealth Heritage listed structures to the construction activity, including the Former Guardhouse (Block B), to record structural condition and structural integrity prior to commencement of tunnelling</p> <ul style="list-style-type: none"> <li>• Conduct vibration monitoring at the commencement of tunnelling in geological conditions that are similar to those at Victoria Barracks in order to quantify the actual tunnel boring machine vibration characteristics (level and frequency) for comparison to the values derived from the literature and the German DIN (DIN 4150) target</li> <li>• Conduct continuous vibration monitoring at the nearest Victoria Barracks heritage structures to the construction activity, including the Former Guardhouse (B Block), to assess the actual tunnelling vibration for acceptability, taking into account both the vibration frequency and condition of structures, until monitoring of vibration at the Former Guardhouse (B Block) shows measurements equivalent to preconstruction vibration readings at the Former Guardhouse (B Block)</li> <li>• If monitoring conducted according to the above demonstrates the condition of heritage structures may be degraded as a result of vibration, ground vibration must be reduced by adjusting the advance rate of the tunnel boring machine until monitoring of vibration at the Former Guardhouse (B Block) shows consistent measurements equivalent to preconstruction vibration readings at the Former Guardhouse (B Block).</li> </ul> <p>(See EPR <a href="#">CHA-CH23</a>)</p>	1 – Tunnels (between CBD South station and Domain station)	Construction
NV3	<p>Appoint a suitably qualified acoustic and vibration consultant to predict construction noise and vibration (through modelling) and update the modelling to reflect current construction methodology, site conditions and specific equipment noise and vibration levels (this will require noise and vibration measurements). The model would be used to determine appropriate mitigation to achieve the Environmental Performance Requirements.</p> <p><a href="#">The model must consider airborne noise to residential and non-residential receivers, ground-borne noise, sleep disturbance at residences, blasting vibration and vibration. The model must include the parameters as detailed in the NSW ICNG Section 4.5.</a></p> <p>The acoustic and vibration consultant <del>will</del> <a href="#">must</a> also be required to undertake noise and vibration monitoring to assess levels with respect to <a href="#">any</a> Guideline Targets specified in the Environmental Performance Requirements. Where monitoring indicates exceedances of Guideline Targets, apply appropriate management measures <a href="#">must be implemented</a> as a soon as possible.</p> <p>The acoustic and vibration consultant will document the modelling and mitigation investigation in a Construction Noise and Vibration Assessment Report for review by the Independent Environmental Auditor- <a href="#">This report must</a> <del>which shall</del> provide the basis for the development of the construction noise and vibration management plan required under EPR NV20B*.</p>	All	Construction

	For heritage places see EPR <a href="#">New CHA-CH23</a>							
NV4	Prepare and implement a communications plan to liaise with potentially affected community stakeholders and land owners regarding potential noise and vibration impacts. The plan shall include procedures for complaint management <a href="#">as per EM4</a> . In developing the plan, consult with relevant <a href="#">local</a> councils, EPA Victoria, the Parkville Precinct Reference Group and RMIT.	All	Construction					
NV5	<b>Airborne Construction Noise Guideline Targets (Internal)</b>		All	Construction				
	Implement management actions if construction noise is predicted to <a href="#">or does</a> exceed the internal noise levels below for Highly Sensitive Areas (based on AS/NZS 2107:2000) and a noise sensitive receptor is adversely impacted.							
	Highly Sensitive Area	Maximum Internal Construction Noise Level L <sub>Aeq, 15 mins</sub>						
	Intensive Care Wards	45						
	Operating Theatres	45						
	Surgeries	45						
	Wards	40						
	<a href="#">Classrooms at schools and other educational institutions</a>	<a href="#">45</a>						
	<a href="#">Places of worship</a>	<a href="#">45</a>						
	<a href="#">Active recreational areas (characterised by sporting activities....)</a>	<a href="#">External noise level 65dBA</a>						
	<a href="#">Passive recreation centres....</a>	<a href="#">External noise level 60dBA</a>						
	<a href="#">Community centres</a>	<a href="#">Depends on intended use. Refer to max levels in AS2107</a>						
	<p><a href="#">For other sensitive areas not listed above (including but not limited to theatres, concert halls, child care centres), the methodology described in Section 4.1.3 of the NSW ICNG should be adopted to identify and determine noise guideline targets for other sensitive receivers.</a></p> <p>Notes:</p> <p>If construction exceeds the internal noise levels above:</p> <ul style="list-style-type: none"> <li>Consider the duration of construction noise</li> <li>Consider the existing ambient noise levels</li> <li>Consult with the owner or operator of the noise sensitive receptor</li> <li>Consider any specific acoustic requirements of specialist space</li> </ul> <p><del>to determine whether a noise sensitive receptor is adversely impacted and whether management actions are required.</del></p> <p><del>(See EPR Environmental Performance Requirement New NV20B*(subclause 3)).</del></p>							
NV6	<b>Vibration Guideline Targets for Structures</b>		All	Construction				
Implement management actions if, due to construction activity, the following DIN 4150 Guideline Targets for structural damage to buildings (for short-term vibration or long-term vibration) are not achieved.								
<b>Short-term vibration on structures</b>								
Type of structure	<table border="1"> <thead> <tr> <th colspan="3">Vibration at the foundation, mm/s (Peak Component Particle Velocity)</th> </tr> </thead> <tbody> <tr> <td>1 to 10 Hz</td> <td>10 to 50 Hz</td> <td>50 to 100 Hz<sup>1</sup></td> </tr> </tbody> </table>	Vibration at the foundation, mm/s (Peak Component Particle Velocity)			1 to 10 Hz	10 to 50 Hz	50 to 100 Hz <sup>1</sup>	Vibration at horizontal plane of highest floor at all frequencies mm/s (Peak Component Particle Velocity)
Vibration at the foundation, mm/s (Peak Component Particle Velocity)								
1 to 10 Hz	10 to 50 Hz	50 to 100 Hz <sup>1</sup>						

	Type 1: Buildings used for commercial purposes, industrial buildings and buildings of similar design	20	20 to 40	40 to 50	40			
	Type 2: Dwellings and buildings of similar design and/or occupancy	5	5 to 15	15 to 20	15			
	Type 3: Structures that have a particular sensitivity to vibration e.g. heritage places	3	3 to 8	8 to 10	8			
	<p>Notes</p> <p>1. It may be necessary, in accordance with New NVB*(6), to modify the guidelines targets for particular structures following the completion of pre-construction condition surveys.</p> <p>2. At frequencies above 100 Hz, the values given in this column may be used as minimum values.</p> <p>3. Vibration levels marginally exceeding those vibration levels in the table would not necessarily mean that damage would occur and further investigation would be required to determine if higher vibration levels can be accommodated without risk of damage.</p> <p>4. For civil engineering structures (e.g. with reinforced concrete constructions used as abutments or foundation pads) the values for Type 1 buildings may be increased by a factor of 2.</p> <p>5. Short-term vibration is defined as vibration which does not occur often enough to cause structural fatigue and which does not produce resonance in the structure being evaluated.</p> <p>6. <a href="#">Pre-construction surveys must be performed at all properties located within designated Project Area, and at properties where it is predicted that guideline targets will be exceeded</a></p>							
	<b>Long-term vibration on structures</b>							
	<b>Type of Structure</b>	<b>Vibration Velocity, mm/s (Peak Component Particle Velocity) in horizontal plane at all frequencies</b>						
	Buildings used for commercial purposes, industrial buildings and similar design	10						
	Dwellings and buildings of similar design and/or occupancy	5						
	Structures that have a particular sensitivity to vibration, e.g. heritage places	2.5						
	<p>Notes</p> <p>1. It may be necessary, in accordance with New NVB*(6), to modify the guidelines targets for particular structures following the completion of pre-construction condition surveys.</p> <p>2. Vibration levels marginally exceeding those in the table would not necessarily mean that damage would occur and further investigation is required would be required to determine if higher vibration levels can be accommodated without risk of damage.</p> <p>3. Long-term vibration means vibration events that may result in a resonant structural response.</p> <p>4. <a href="#">Pre-construction surveys must be performed at all properties located within designated Project Area, and at properties where it is predicted that guideline targets will be exceeded.</a></p>							
NV7	<b>Vibration Guideline Targets for Above-ground Utility Assets and Infrastructure</b>					All	Construction	



	<p>Undertake condition assessments of above ground utility assets and infrastructure, including (but not limited to) the Arden Street Bridge and Princess Bridge, to establish construction vibration limits <a href="#">in consultation</a> with <a href="#">the</a> asset owners.</p> <p>Monitor vibration during construction to demonstrate compliance with the relevant vibration guideline targets under NV6. Take remedial action if limits are not met.</p> <p>(See Environmental Performance Requirement New <del>CHA*</del>) <a href="#">CH23</a></p>																
NV10	<p><b>Sensitive Equipment Guideline Targets</b></p> <p>Implement management actions <a href="#">(which may include source mitigation)</a> if equipment manufacturer specifications or measured background levels (whichever are higher) are expected to be <a href="#">or are</a> exceeded for vibration sensitive equipment at the Parkville and CBD North precincts <a href="#">during construction</a>.</p> <p><a href="#">For operation, the manufacturer specifications or measured background levels (whichever are higher) must not be exceeded.</a></p> <p>Where equipment manufacturer specifications are not available for vibration, adopt the applicable ASHRAE Equipment Vibration Guideline Targets:</p> <table border="1"> <thead> <tr> <th>Equipment requirements</th> <th>Curve</th> </tr> </thead> <tbody> <tr> <td>Bench microscopes up to 100x magnification; laboratory robots</td> <td>Operating Room</td> </tr> <tr> <td>Bench microscopes up to 400x magnification; optical and other precision balances; co-ordinate measuring machines; metrology laboratories; optical comparators; micro electronics manufacturing equipment; proximity and Projection aligners, etc</td> <td>VC-A</td> </tr> <tr> <td>Microsurgery, eye surgery, neurosurgery; bench microscope at magnification greater than 400x; optical equipment on isolation tables; microelectronic manufacturing equipment such as inspection and lithography equipment (including steppers) to 3mm line widths</td> <td>VC-B</td> </tr> <tr> <td>Electron microscopes up to 30,000x magnification; microtomes; magnetic resonance images; microelectronics manufacturing equipment such as lithography and inspection equipment to 1mm detail size</td> <td>VC-C</td> </tr> <tr> <td>Electron microscopes at magnification greater than 30,000x; mass spectrometers; cell implant equipment; microelectronics manufacturing equipment such as aligners, steppers and other critical equipment for phot-lithography with line widths of ½ micro m; includes electron beam systems</td> <td>VC-D</td> </tr> <tr> <td>Unisolated laser and optical research systems; microelectronics manufacturing equipment such as aligners, steppers and other critical equipment for photolithography with line widths of ¼ micro m; includes electron beam systems</td> <td>VC-E</td> </tr> </tbody> </table> <p>Notes</p> <ol style="list-style-type: none"> <li>Background vibration and noise must be measured in accordance with equipment environmental test requirements.</li> <li>Monitoring must be undertaken in accordance with equipment specifications to demonstrate compliance, and monitoring locations be determined in consultation with</li> </ol>	Equipment requirements	Curve	Bench microscopes up to 100x magnification; laboratory robots	Operating Room	Bench microscopes up to 400x magnification; optical and other precision balances; co-ordinate measuring machines; metrology laboratories; optical comparators; micro electronics manufacturing equipment; proximity and Projection aligners, etc	VC-A	Microsurgery, eye surgery, neurosurgery; bench microscope at magnification greater than 400x; optical equipment on isolation tables; microelectronic manufacturing equipment such as inspection and lithography equipment (including steppers) to 3mm line widths	VC-B	Electron microscopes up to 30,000x magnification; microtomes; magnetic resonance images; microelectronics manufacturing equipment such as lithography and inspection equipment to 1mm detail size	VC-C	Electron microscopes at magnification greater than 30,000x; mass spectrometers; cell implant equipment; microelectronics manufacturing equipment such as aligners, steppers and other critical equipment for phot-lithography with line widths of ½ micro m; includes electron beam systems	VC-D	Unisolated laser and optical research systems; microelectronics manufacturing equipment such as aligners, steppers and other critical equipment for photolithography with line widths of ¼ micro m; includes electron beam systems	VC-E	<p>4 – Parkville station</p> <p>5 – CBD North station</p>	<p>Design / Construction / Operation</p>
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	<p>operators of sensitive equipment (See Environmental Performance Requirement <del>New NVB*(19-iv))</del> NV20</p> <p>3. <a href="#">The proponent may undertake consultation with the users and agree alternative Guideline Targets.</a></p> <p>4. <a href="#">During the construction phase, a continuous monitoring program shall be adopted (to the asset owner approval), with asset owner access to monitoring data using a 75% alert and not to exceed limit approach.</a></p>				
NV13	<p><b>Bio-Resources and Sensitive Research</b></p> <p>Implement management actions where the following guideline targets are expected to be <u>or are</u> exceeded for areas housing bio-resources:</p> <ul style="list-style-type: none"> <li>Background noise should be <del>kept</del> below 50 dB <u>L<sub>Aeq</sub> (15min)</u> and should be free of distinct tones (internal)</li> <li>Short exposure should be <del>kept to</del> less than 85 dB <u>L<sub>Amax</sub></u> (internal).</li> </ul> <p>Notes</p> <p><a href="#">1. The nominated levels are guideline targets when applied to construction noise but are mandatory limits that must not be exceeded with regard to operational noise.</a></p> <p>2. The levels above should take into consideration the frequency threshold for the Bio-resource under consideration.</p> <p>3. Higher levels may be acceptable if it can be shown that the Bio-resource under consideration is exposed to higher levels and is not adversely impacted by them.</p> <p>4. Noise includes airborne and ground-borne born noise at the sensitive receptors.</p> <p>5. Consider the existing ambient noise levels when assessing predicted exceedances.</p> <p>6. During the construction phase, a continuous monitoring program shall be implemented in accordance with EPR NVB 19(iv).</p> <p><a href="#">7. Consideration given to adopting a vibration limit in agreement with the MMRA and stakeholders.</a></p>	<p>4 – Parkville station</p> <p>5 – CBD North station</p>	Construction / Operation		
NV14	<p>Appoint a suitably qualified acoustic and vibration consultant to <a href="#">assess and predict</a> noise and vibration and determine appropriate mitigation <a href="#">measures necessary</a> to achieve the Environmental Performance Requirements. The acoustic and vibration consultant <del>would also be required to</del> <a href="#">must</a> undertake commissioning noise and vibration measurements to assess levels with respect to the Environmental Performance Requirements.</p> <p>The acoustic and vibration consultant <del>shall</del> <a href="#">must</a> prepare an Operation Noise and Vibration Report for review by the Independent Environmental Auditor, which documents the predictions and mitigation measures during commissioning.</p>	All	Operation		
NV15	<b>Victorian Passenger Rail Infrastructure Noise Policy (PRINP)</b>		All	Operation	
	Avoid, minimise or mitigate rail noise where the following PRINP (April 2013) Investigation Thresholds are exceeded during operation:				
	Time	Type of Receiver			Investigation Thresholds
	Day (6am – 10pm)	Residential dwellings and other buildings where people sleep including aged persons homes, hospitals, motels and caravan parks  Noise sensitive community buildings, including schools, kindergartens, libraries			65 dBL <sub>Aeq</sub> and a change in 3 dB(A) or more  or 85 dBL <sub>Amax</sub> and a change in 3 dB(A) or more
Night (10pm – 6am)	Residential dwellings and other buildings where people sleep including aged persons homes, hospitals, motels and caravan parks	60 dBL <sub>Aeq</sub> and a change in 3 dB(A) or more  or 85 dBL <sub>Amax</sub> and a change in 3 dB(A) or more			

	<p>Notes</p> <ol style="list-style-type: none"> <li>If an investigation shows that the thresholds are not exceeded, then no further action is considered under the PRINP.</li> <li><a href="#">The investigation thresholds of the PRINP are to be used as the design targets for the barrier heights and configuration</a></li> <li><a href="#">If the PRINP thresholds cannot be achieved with the installation of barriers or other on-reservation treatment then off-reservation treatment such as upgrades to residential building facades must be considered. Such treatment should be designed to meet the following internal noise levels</a> <ul style="list-style-type: none"> <li><a href="#">Maximum noise levels of trains should not exceed 50dB L<sub>Amax</sub> in bedroom</a></li> <li><a href="#">Maximum noise levels of trains should not exceed 60dB L<sub>Amax</sub> in living areas</a></li> </ul> </li> <li>L<sub>Amax</sub> is defined as maximum A-weighted sound pressure level and is the 95 percentile of the highest value of the A-weighted sound pressure level reached within the day or night.</li> <li>For Melbourne Metro the location of assessment is at 1m from the centre of the window of the most exposed external façade.</li> </ol>										
NV16	<p><b>Noise from Fixed Plant</b></p> <p>For operation, noise from fixed plant associated with Melbourne Metro shall:</p> <ul style="list-style-type: none"> <li>Comply with State Environment Protection Policy (Control of Noise from Commerce, Industry and Trade) No. N-1 (SEPP N-1).</li> <li>Where SEPP N-1 does not apply, comply with the Satisfactory Recommended Design Sound Levels as defined in AS/NZS 2107 for the following sensitive <del>uses</del> <a href="#">areas</a>: <ul style="list-style-type: none"> <li>Teaching spaces</li> <li>Laboratories</li> <li>Conference rooms</li> <li>Libraries</li> <li>Music studios</li> <li>Operating Theatres / Surgeries</li> <li>Wards / Recliners</li> <li>Performance spaces / Galleries</li> <li>Places of worship</li> </ul> </li> </ul> <p>If the existing background noise level within any of the above <del>spaces</del> <a href="#">areas</a> exceeds the Maximum Recommended Design Sound Level in AS/NZS 2107, then noise from the fixed plant associated with the Melbourne Metro Project <del>shall</del> <a href="#">must</a> not exceed the existing background levels within these spaces at the commencement of operation.</p> <p>This does not apply to <a href="#">noise generated by</a> trains and/or trams.</p>	All	Design / Operation								
NV17	<p><b>Ground-borne Noise <a href="#">Limits</a> for Operation</b></p> <p><del>Where operational ground-borne noise trigger levels are predicted to be exceeded for sensitive occupancies a shown in the table below (trigger levels are based on eth Rail Infrastructure Noise Guideline, 17 May 2013 (RING), assess feasible and reasonable mitigation to reduce noise towards the relevant ground-borne noise trigger level.</del></p> <p><a href="#">The following operational ground-borne noise limits must be achieved:</a></p> <table border="1"> <thead> <tr> <th>Sensitive land use</th> <th>Time of day</th> <th>Internal noise trigger levels</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Residential</td> <td>Day (7am-10pm)</td> <td>40 dB<sub>L<sub>ASmax</sub></sub> and an increase in existing rail noise level by 3 dB(A) or more</td> </tr> <tr> <td>Night (10pm-7am)</td> <td>35 dB<sub>L<sub>ASmax</sub></sub> and an increase in existing rail noise level by 3 dB(A) or more</td> </tr> </tbody> </table>	Sensitive land use	Time of day	Internal noise trigger levels	Residential	Day (7am-10pm)	40 dB <sub>L<sub>ASmax</sub></sub> and an increase in existing rail noise level by 3 dB(A) or more	Night (10pm-7am)	35 dB <sub>L<sub>ASmax</sub></sub> and an increase in existing rail noise level by 3 dB(A) or more	All	Operation
Sensitive land use	Time of day	Internal noise trigger levels									
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	Night (10pm-7am)	35 dB <sub>L<sub>ASmax</sub></sub> and an increase in existing rail noise level by 3 dB(A) or more									

	Schools, educational institutions, places of worship	When in use	40-45 dBL <sub>ASmax</sub> and an increase in existing rail noise level by 3 dB(A) or more																															
	Hospitals (bed wards and operating theatres)	24 hours	35 dB(A) L <sub>ASMax</sub>																															
	Offices	When in use	45 dB(A) L <sub>ASMax</sub>																															
	Cinemas and Public Halls	When in use	30 dB(A) L <sub>ASMax</sub>																															
	Drama Theatres	When in use	25 dB(A) L <sub>ASMax</sub>																															
	Concert halls, Television and Sound Recording Studios	When in use	25 dB(A) L <sub>ASMax</sub>																															
	<p>Notes</p> <ol style="list-style-type: none"> <li>RING provides trigger levels for residential and schools, educational institutions and places of worship, but does not provide guidance on acceptable ground-borne noise levels for other types of sensitive receivers. Ground-borne noise trigger levels for other types of sensitive occupancies have been devised based on RING and industry knowledge.</li> <li>Specified noise levels refer to noise from heavy or light rail transportation only (not ambient noise from other sources).</li> <li>Assessment location is internal near to the centre of the most affected habitable room.</li> <li>L<sub>ASmax</sub> refers to the maximum noise level not exceeded for 95% of the rail pass-by events.</li> <li>For schools, educational institutions, places of worship the lower value of the range is most applicable where low internal noise levels is expected.</li> <li>The values for performing arts spaces may need to be reassessed to address the specific requirements of a venue.</li> </ol>																																	
NV18	<p><b>Vibration Guideline Targets Limits for Operation</b></p> <p><del>During operation, achieve the Guideline Targets (based on Table 1 in BS6472-1:2008) or background levels (whichever is higher) for vibration as follows:</del></p> <p><u>During operation the following limits or background levels (whichever is higher) must be achieved (based on Table 1 in BS6472-1:2008) for vibration as follows:</u></p> <table border="1"> <thead> <tr> <th rowspan="3">Location</th> <th colspan="4">VDV (m/s<sup>1.75</sup>)</th> </tr> <tr> <th colspan="2">Day 7:00am to 10:00pm</th> <th colspan="2">Night 10:00pm to 7:00am</th> </tr> <tr> <th>Preferred Value</th> <th>Maximum Value</th> <th>Preferred Value</th> <th>Maximum Value</th> </tr> </thead> <tbody> <tr> <td>Residences</td> <td>0.20</td> <td>0.40</td> <td>0.10</td> <td>0.20</td> </tr> <tr> <td>Offices, schools, educational institutions, places of worship</td> <td>0.40</td> <td>0.80</td> <td>0.40</td> <td>0.80</td> </tr> <tr> <td>Workshops</td> <td>0.80</td> <td>1.60</td> <td>0.80</td> <td>1.60</td> </tr> </tbody> </table> <p>Notes</p> <p><del>1—The Guideline Targets are non-mandatory; they are goals that should be sought</del></p>				Location	VDV (m/s <sup>1.75</sup> )				Day 7:00am to 10:00pm		Night 10:00pm to 7:00am		Preferred Value	Maximum Value	Preferred Value	Maximum Value	Residences	0.20	0.40	0.10	0.20	Offices, schools, educational institutions, places of worship	0.40	0.80	0.40	0.80	Workshops	0.80	1.60	0.80	1.60	All	Operation
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	<del>to be achieved through the application of feasible and reasonable mitigation measures.</del>		
	<del>21.</del> Compliance with these values implies no structural damage due to operation.		
<b>New</b> <b>NVA*</b>  <a href="#">NV19</a>	Establish a Parkville Reference Group comprising of <a href="#">an independent chair</a> , relevant government agencies including MMRA, PTV, VicRoads, the Victorian Department of Health and Human Services, Ambulance Victoria, Yarra Trams, and key institutions in the Parkville Precinct <a href="#">as detailed in MMRA Technical Note 044 Parkville Precinct Reference Group (19 August 2016) document number 21 and tabled 22 August 2016.</a>	4 – Parkville	Construction
<b>New</b> <b>NVB*</b>  <a href="#">NV20</a>	<p><b>Construction Noise and Vibration Management Plan</b></p> <p>Develop and implement a Construction Noise and Vibration Management Plan (“CNVMP”) in consultation with EPA Victoria and the relevant councils. The CNVMP must be informed by the modelling undertaken by the acoustic and vibration consultant in accordance with NV3 and must include (but not be limited to):</p> <p><b>General</b></p> <p>(1) identification of sensitive receivers along Melbourne Metro’s alignment;</p> <p>(2) details of construction activities and an indicative schedule for construction works, including the identification of key noise and/or vibration generating construction activities (based on representative construction scenarios, including at ancillary facilities) that have the potential to generate noise and/or vibration impacts on surrounding sensitive receivers.</p> <p><b>Airborne noise <a href="#">targets</a></b></p> <p>I. <a href="#">For residential dwellings, the airborne noise targets in EPA1254 are to be adopted with the addition of the daytime management levels specified for airborne noise at residences during recommended standard hours in Part 4.1.1 of the NSW Interim Construction Noise Guidelines (ICNG) with the hours amended to correspond to the EPA1254 hours as shown in the table below.</a></p>		
	<b><a href="#">Time of Day</a></b>	<b><a href="#">Management level</a></b>	
		<b><a href="#">LAeq (15 min)</a></b>	
	<a href="#">7am-6pm Monday to Friday</a> <a href="#">7am-1pm Saturdays</a>	<a href="#">Noise affected level (see notes)</a> <a href="#">Background LA90 +10dB</a> <a href="#">Source: NSW ICNG Chapter 4.1.1 Table 2, page 12</a>	
	<a href="#">7am-6pm Monday to Friday</a> <a href="#">7am-1pm Saturdays</a>	<a href="#">Highly affected level (see notes)</a> <a href="#">75dBA</a> <a href="#">Source: NSW ICNG Chapter 4.1.1 Table 2, page 12</a>	
	<a href="#">6pm -10pm Monday to Friday</a> <a href="#">1pm-10pm Saturdays</a> <a href="#">7am-10pm Sundays and public holidays</a>	<a href="#">Noise level at any residential premises not to exceed background noise by:</a> - <a href="#">10 dB(A) or more for up to 18 months after project commencement</a> - <a href="#">5 dB(A) or more after 18 months</a> <a href="#">Source: EPA 1254 Section 2</a>	
	<a href="#">10pm-7am Monday to Sunday</a>	<a href="#">Noise inaudible within a habitable room of any residential premises</a> <a href="#">Source: EPA 1254 Section 2</a>	
	<a href="#">Notes:</a> <a href="#">The noise affected level represents the point above which there may be some community reaction to noise.</a>		

<p><u>Where the predicted or measured LAeq (15 min) is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details</u></p> <p><u>The highly noise affected level represents the point above which there may be strong community reaction to noise. Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account:</u></p> <ol style="list-style-type: none"> <li>1. <u>times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences</u></li> <li>2. <u>if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times</u></li> </ol> <p>II. <u>The management levels specified for airborne noise at other sensitive land uses in Part 4.1.23 NSW ICNG and shown in EPR NV5 are to be adopted</u></p> <p>III. <u>For other sensitive commercial and industrial uses not listed in for other NSW ICNG Part 4.1.2, the methodology provided in NSW ICNG Part 4.1.3 must be adopted to identify and determine targets affected uses</u></p> <p><u>Mitigation Measures</u></p> <p>(3) identification of reasonable and practicable measures to be implemented to manage construction noise impacts <del>having regard to</del> <u>in accordance with:</u></p> <ol style="list-style-type: none"> <li>i) <u>EPA Publication 1254 Noise Control Guidelines</u></li> <li>ii) <u>NSW ICNG (excluding Part 5, and Part 7.2.1 which relates to pre-approval documentation relevant to NSW) and TfNSW Construction Noise Strategy (but with Section 7 construction hours as per EPA1254 and excluding Part 8, Appendix A)</u></li> <li><del>ii) the airborne construction noise guideline targets (internal) specified in NV5</del></li> <li><del>iii) The management levels specified for airborne noise at other sensitive land uses in Part 4.1.2 NSW Interim Construction Noise Guidelines</del></li> </ol> <p><del>The management levels specified for airborne noise at other sensitive land uses in Part 4.1.2 NSW Interim Construction Noise Guidelines</del></p> <p><del>the approach in Part 2.3 of the NSW Interim Construction Noise Guidelines when scheduling and planning for out of hours works (including unavoidable works)</del></p> <ol style="list-style-type: none"> <li>(4) any management actions to be implemented if predicted noise levels exceed, <del>for an extended period of time,</del> the guideline targets specified in NV1 or NV5 (or any additional guideline targets specified in accordance with subclause 3 above);</li> <li>(5) any measures to be implemented in accordance with the MMRA Residential Impact Mitigation Guidelines including (but not limited to) mitigation measures for out of hours works (including unavoidable works) where predicted noise levels exceed the noise levels specified in the Residential Impact Mitigation Guidelines.</li> <li>6) <u>include quantitative assessment methods and work practices as identified in NSW ICNG and TfNSW Construction Noise Strategy</u></li> </ol> <p>Vibration: Structures</p> <ol style="list-style-type: none"> <li><del>(7)</del> Identification of any alternate vibration guideline targets to those specified in NV6, NV7 or NV8 deemed necessary and/or appropriate to protect the structural integrity of structures based on pre-construction condition surveys, undertaken in accordance with New CHA, GM4 and NV7 (or as otherwise required to assess the impact of vibration on structures along the alignment)</li> <li><del>(8)</del> identification of reasonable and feasible measures to be implemented to</li> </ol>		
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	<p>manage construction vibration impacts in accordance with the:</p> <ul style="list-style-type: none"> <li>(i) vibration guideline targets for structures specified in, or otherwise determined in accordance with, NV6\</li> <li>(ii) (construction vibration limits for above and below ground utility assets determined in accordance with NV7</li> <li>(iii) vibration guideline targets for <del>under</del> below ground infrastructure specified in, or as otherwise determined in accordance with NV8</li> </ul> <p>(9) any management actions to be implemented if predicted vibration levels exceed, for an extended period of time, the guideline targets specified in NV6, NV7, or NV8, or otherwise determined in accordance with NVB*(6)</p> <p>(10) specific heritage measures where relevant in accordance with CH2.</p> <p>Vibration and Ground-borne Noise: Human Comfort</p> <ul style="list-style-type: none"> <li>(11) identification of reasonable and practicable measures to be implemented to manage construction vibration and ground-borne noise impacts in accordance with the: <ul style="list-style-type: none"> <li>(i) vibration dose values for human comfort specified in NV9 (which may be expressed as peak particle velocity rates for the purposes of the CNVMP)</li> <li>(ii) ground-borne (internal) noise guideline targets for amenity specified in NV11</li> </ul> </li> <li>(12) any management actions to be implemented if predicted vibration or ground-borne noise levels exceed, for an extended period of time, the guideline targets identified in NV9 or NV11</li> <li>(13) any measures to be implemented in accordance with the Residential Impact Mitigation Guidelines including (but not limited to) mitigation measures for out of hours works (including unavoidable works) where ground-borne noise levels are predicted to exceed the ground-borne noise construction targets specified in the Residential Impact Mitigation Guidelines.</li> </ul> <p>Vibration and Ground-borne Noise: Sensitive Equipment and Bio-resources</p> <ul style="list-style-type: none"> <li>(14) identification of reasonable and practicable measures, to be determined following consultation with the Parkville Precinct Reference Group and RMIT, to be implemented to manage construction vibration and ground-borne noise impacts in accordance with the: <ul style="list-style-type: none"> <li>(i) vibration sensitive equipment guidelines specified in, or as otherwise determined in accordance with NV10</li> <li>(ii) bio-resource guideline targets specified in, or as otherwise determined in accordance with NV13</li> </ul> </li> <li>(15) any management actions to be implemented if predicted vibration or ground-borne noise levels exceed, for an extended period of time, the guideline targets identified in NV10 or NV13</li> </ul> <p><b>Blasting</b></p> <ul style="list-style-type: none"> <li>(16) if blasting is proposed, an assessment of the potential noise and vibration impacts associated with blasting activities, and the identification of measures to ensure compliance with Australian Standard AS2187.2-2006 as specified in NV12</li> <li>(17) any measures to be implemented in accordance with the Residential Impact Mitigation Guidelines</li> </ul> <p>Community Consultation</p> <ul style="list-style-type: none"> <li>(18) details of all community consultation measures to be implemented in accordance with NV4 and SC2 including: <ul style="list-style-type: none"> <li>(i) any precinct-specific community consultation measures; and</li> <li>(ii) the establishment of measures concerning complaints management.</li> </ul> </li> </ul> <p><b>Haulage</b></p>		
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	<p>(19) operational procedures and controls that minimise truck noise, including, but not limited to, consideration of the following:</p> <ul style="list-style-type: none"> <li>(i) Where reasonable and practicable, limit heavy construction vehicle movements to Normal Working Hours (as defined by the EPA) providing this limitation does not include vehicles essential to maintaining construction operations;</li> <li>(ii) Where practical, select different traffic routes to limit the amount of accelerating and braking, prioritise routes with existing heavy vehicle usage where possible, and avoid local roads (e.g. residential streets), particularly for 24-hour activities;</li> <li>(iii) Install 'no engine braking' signs on designated routes;</li> <li>(iv) Ensure trucks are fitted with mufflers that comply with the original equipment manufacturer specifications and relevant EPA in-service noise requirements;</li> <li>(v) Enforce speed restrictions on all construction vehicles;</li> <li>(vi) Complete regular maintenance checks of road surfaces and trucks;</li> <li>(vii) Implement temporary changes to traffic light sequences on designated routes to minimise trucks starting and stopping at junctions;</li> <li>(viii) Monitor construction vehicle driver behaviour;</li> <li>(ix) Identify locations for trucks to idle pending arrival at construction sites;</li> <li>(x) Minimise the need for trucks to reverse and require the use of broadband reverse alarms;</li> <li>(xi) Address to the extent practicable noise from any truck wash required <a href="#">for as vehicles leaving</a> construction sites (particularly at night).</li> </ul> <p><b>Monitoring</b></p> <p>(20) mechanisms to ensure effective monitoring of noise and vibration associated with construction in accordance with NV3, including:</p> <ul style="list-style-type: none"> <li>(i) vibration and noise measurement methodologies for monitoring both baseline and construction levels, including details of the parameters to be obtained, the measurement equipment, parameters to be recorded, and relevant standards to be adhered to for the collection and analysis of data;</li> <li>(ii) baseline and construction noise and vibration monitoring locations;</li> <li>(iii) the most critical periods, whether determined separating distance or ground conditions, and the duration of monitoring periods;</li> <li>(iv) specific measures, to be determined following consultation with relevant stakeholders, with respect to sensitive equipment and biological resources (which must, where practicable, include continuous monitoring during construction);</li> <li>(iv) how the results of monitoring would be recorded, reported, and interpreted.</li> </ul> <p><b>Unavoidable Work</b></p> <p><a href="#">(21) For unavoidable work:</a></p> <ul style="list-style-type: none"> <li>I. <a href="#">Approval for unavoidable works can only be granted by the environmental auditor</a></li> <li>II. <a href="#">Details of unavoidable works including the type of work, equipment to be used and duration of works must be made publicly available</a></li> </ul>		
<b>Social and Community (SC)</b>			
SC1	<p>Reduce <a href="#">as far as is practicable</a> the disruption to residences from direct acquisition or temporary occupation through measures such as:</p> <ul style="list-style-type: none"> <li>• Using a case-management approach for all Project interactions with affected landowners</li> </ul>	All	Pre-construction



	<ul style="list-style-type: none"> <li>Appointing a social worker, buyers' advocate or equivalent to assist households with special needs <u>to</u> manage the transition</li> <li>Taking into account relative vulnerability and special needs of occupants</li> <li>Purchasing properties early when supported by the landowner.</li> </ul>		
SC3	<p><a href="#">Community and Stakeholder Engagement Management Plan</a></p> <p><del>Prior to main works and shaft construction, d</del> Develop and implement a Community and Stakeholder Engagement Management Plan <a href="#">prior to main works and shaft construction</a>, to engage potentially affected stakeholders <a href="#">individually or through groups such as the Parkville Precinct Reference Group</a> and advise them of the planned construction activities, Project progress, mitigation measures and intended reinstatement measures where applicable. This plan should integrate all Project activities that potentially impact on community and business operations <a href="#">as well as to provide for and direct</a> a well-coordinated communication and engagement process. The plan must include:</p> <ul style="list-style-type: none"> <li>Measures to minimise impacts to the development and/or operation of existing facilities including ensuring replacement power, network or other utility services are provided, if necessary and where practicable, where any disruption to such service is likely</li> <li>Measures for providing advance notice of significant milestones, changed traffic conditions, interruptions to utility services, changed access and parking conditions, periods of predicted high noise and vibration activities</li> <li>Measures for communicating the design and results from environmental monitoring programs (e.g. vibration, noise, dust, ground movement).</li> <li>Process for informing landowners about pre-condition property survey (as stated in GM4)</li> <li>Process for registering, managing and resolving complaints consistent with Australian Standard AS/NSZ 10002:2014 Guidelines for Complaint Management in Organisations.</li> <li>Measures to address any other matters which are of concern to potentially affected stakeholders through the construction of the Project.</li> </ul> <p>The plan must consider each precinct and station location in detail. Stakeholders to be consulted relevant to each precinct and considered in the plan include <del>(but are not limited to):</del></p> <ul style="list-style-type: none"> <li>Local councils</li> <li>Land managers</li> <li>Potentially affected residents</li> <li>Potentially affected businesses</li> <li>Recreation, sporting and community groups and facilities</li> <li>Royal Melbourne Hospital, Victorian Comprehensive Cancer Centre, Peter Doherty Institute and other health and medical facilities</li> <li>The University of Melbourne</li> <li>● RMIT University</li> <li>Melbourne Grammar School</li> <li>Other public facilities in proximity.</li> </ul> <p><a href="#">Any interested stakeholder must be able to register their contact details to the Project webpage through the Community and Stakeholder Engagement Management Plan to ensure they are included and automatically advised of planned construction activities, Project progress, mitigation measures and intended reinstatement measures where applicable.</a></p>	All	Pre-construction/ <a href="#">construction</a>
SC7	In consultation with <a href="#">relevant local Councils and</a> key stakeholders <del>including local councils</del> , and in accordance with the Melbourne Metro Urban Design Strategy,	All	Design / Construction

	<p>relevant statutory approvals and other relevant requirements:</p> <p>a) improve community access to open or recreational space within the CBD by identifying potential opportunities to return as much land as possible used for construction to permanent public open space at City Square and Federation Square;</p> <p>b) re-establish sites impacted by construction works, to be generally in accordance with <a href="#">adopted</a> open space master plans, <a href="#">and conservation management plans (where appropriate)</a>, including (but not limited to):</p> <ul style="list-style-type: none"> <li>• Childers Street, Kensington</li> <li>• JJ Holland Park</li> <li>• Royal Parade and Grattan Street, Parkville</li> <li>• City Square</li> <li>• Federation Square</li> <li>• The south western entrance of the proposed CBD South station</li> <li>• St Kilda Road boulevard</li> <li>• Edmund Herring Oval</li> <li>• Osborne Street Reserve</li> <li>• South Yarra Sidings Reserve</li> <li>• Lovers Walk</li> <li>• <a href="#">A'Beckett Street open space</a></li> <li>• The South African Soldiers Memorial.</li> </ul> <p>(See Environmental Performance Requirement LV2 and LU2.)</p>		
<a href="#">SC9</a>	<a href="#">Provide written notice to adjoining landholders of any early works to be carried out in a precinct. Such notice must advise of the works to be undertaken, the duration of those works, what local impacts might occur and a contact name and number for further information.</a>	<a href="#">All</a>	<a href="#">Early Works</a>
<b>Surface Water (SW)</b>			
SW1	<p>For all Precincts (with the exception of the western turnback) design permanent and temporary works and, if necessary, develop and implement emergency flood management measures for the tunnels, tunnel portals, access shafts, station entrances and Arden electrical substation to provide appropriate protection against floodwaters and overland stormwater flows.</p> <p><del>This would</del> <a href="#">The design of these works must</a> be informed by a flood immunity risk assessment that considers a range of events, and to the requirements and satisfaction of Melbourne Water and/or the relevant council.</p> <p><a href="#">The flood immunity risk assessment referred to above must address all portal areas (or other flood entry points) for the existing Melbourne Underground Rail Loop, or similar secondary infrastructure items that may allow for flood entry into the project.</a></p>	All (except western turnback)	Construction / Operation
SW2	<p>For all precincts:</p> <ul style="list-style-type: none"> <li>• Maintain existing flood plain storage capacity potentially impacted by the Project, to the requirements and satisfaction of the responsible waterway management authority</li> <li>• Permanent and associated temporary construction works must not increase flood levels <a href="#">to a degree</a> that <a href="#">would</a> result in an additional flood risk to the requirements and satisfaction of the responsible waterway management authority</li> <li>• Ensure permanent and associated temporary works do not increase flow velocities that would potentially affect the stability of property, structures or assets, and/or result in erosion during operation or construction, to the</li> </ul>	All	Construction / Operation

	<p>requirements and satisfaction of the responsible waterway management authority</p> <ul style="list-style-type: none"> <li>Undertake modelling of the design of permanent and temporary works to demonstrate the resultant flood levels and risk profile to the satisfaction of the responsible waterway management authority</li> <li>Ensure that the stormwater design associated with the Project is undertaken to the requirements and satisfaction of the responsible waterway management authority</li> <li><a href="#">For all Precincts, prior to commencement, a stormwater drainage system incorporating integrated management design principles must be submitted to, and approved by the relevant local council</a></li> <li>Adopt WSUD and integrated water <a href="#">cycle</a> management principles, as required through the Melbourne Metro Urban Design Strategy.</li> </ul>		
<b>Transport (T)</b>			
<p><b>New</b> <del>T</del> <b>A</b> <u>T1</u></p>	<p><b>Traffic and Transport Working Group</b></p> <p>MMRA to establish the Traffic and Transport Working Group (TTWG) comprising <a href="#">of an independent chairperson</a>, relevant representatives from MMRA, PTV, road management authorities, relevant councils, relevant public transport providers and other relevant agencies as required.</p> <p>The TTWG will be responsible for reviewing and providing feedback on:</p> <ul style="list-style-type: none"> <li>Transport management plans</li> <li>Relevant designs and methodologies for monitoring implementation of Transport Management Plans</li> <li>Transport modelling and proposed transport network upgrades to mitigate the transport effects of constructing the Project.</li> </ul> <p>The Group must also:</p> <ul style="list-style-type: none"> <li>Invite other key affected stakeholders to present or attend where matters specific to those stakeholders in the relevant precincts are being discussed or addressed; <del>and</del></li> <li>Advise those key affected stakeholders of potential impacts and proposed traffic and transport mitigations, and consider stakeholders' responses on these matters for in providing feedback on the transport management plan(s) required under EPR <del>T</del><a href="#">T2</a>.</li> </ul>	All	Construction
<p><del>T1</del> <u>T2</u></p>	<p><b>Road Transport (Construction Phase)</b></p> <p><del>Develop a transport management plan(s) in consultation with the TTWG and implement the plan(s) to minimise disruption to affected local land uses, traffic, car parking, on road public transport, pedestrian and bicycle movements and existing public facilities during all stages of construction:</del></p> <p><del>The transport management plan(s) must be prepared for each precinct, and also be coordinated across the whole Project to provide an overall transport management plan for the Project.</del></p> <p>The transport management plan(s) must be informed and supported by an appropriate level of transport modelling, as agreed by the TTWG, and must include, but not be limited, to:</p> <ul style="list-style-type: none"> <li>Management of any temporary or permanent full or partial closure of traffic lanes including (but not limited to): <ul style="list-style-type: none"> <li>Childers Street, Tennyson Street and Lloyd Street, Kensington</li> <li>Arden Street, Langford Street and Laurens Street, North Melbourne</li> <li>Royal Parade, Grattan Street, Barry Street <a href="#">and Leicester Street</a>, Parkville</li> <li>Franklin Street, A'Beckett Street and Little La Trobe Street, at CBD North</li> <li>Flinders Street, Flinders Lane and Swanston Street, at CBD South</li> </ul> </li> </ul>	All	Construction

	<ul style="list-style-type: none"> <li>- Linlithgow Avenue, Melbourne</li> <li>- St Kilda Road, Domain Road, Albert Road, <a href="#">Bowen Crescent and Bowen Lane</a>, at Domain</li> <li>- Toorak Road West at Fawkner Park (and the surrounding road network) during construction of the route 8 tram diversion along Toorak Road West between St Kilda Road and Park Street, <a href="#">South Yarra</a></li> <li>- Osborne Street and William Street, South Yarra</li> <li>• A monitoring methodology and a program for monitoring results of the implementation of Transport Management Plans to be reported to the TTWG. If unanticipated adverse effects are further identified, practicable mitigation measures must be developed and implemented.</li> <li>• Monitoring of: <ul style="list-style-type: none"> <li>- Travel behaviour changes caused by construction works, including pre-construction baseline data and periodic reporting on behaviour change. Use this data as an input to the design of transport networks following construction and for review of the transport management plan(s), which should occur at least annually</li> <li>- Traffic, public transport, pedestrian and bicycle movements throughout the construction period</li> </ul> </li> <li>• Transport management plan(s) must be developed recognising other Projects operating concurrently and transient businesses such as bus/walking/cycling tours and airport transfers, where relevant</li> <li>• Provision for <del>a minimum of one lane for traffic in each direction</del> <a href="#">two-way traffic</a> on St Kilda Road through the construction period within the Domain station precinct</li> <li>• Potential routes for construction vehicles travelling to and from all Melbourne Metro construction work sites, recognising sensitive receptors and minimising the use of local streets where practicable (refer to EPR NEW <a href="#">NV23 NV-B*</a>); <a href="#">Approved truck routes in the Arden precinct must not include the use of Miller Street</a></li> <li>• Provision of suitable routes for vehicles to maintain connectivity for road users to JJ Holland Park, South Kensington station, <a href="#">to medical facilities in the Domain Precinct</a> and to the medical and educational facilities adjacent to the Parkville construction work site</li> <li>• Provision of alternative routes for trucks accessing the 50 Lloyd Street Business Estate, Kensington</li> <li>• Provision of construction vehicle staging areas and/or construction methodologies to minimise the potential impacts of truck call-forward options on residents and businesses</li> <li>• Provision of alternate parking where possible to replace public <a href="#">and commuter</a> parking lost from <a href="#">West Footscray Station</a>, Childers Street, Laurens Street, Grattan Street, Domain Road, St Kilda Road and Albert Road during construction and preventing parking at undesigned locations on local roads</li> <li>• <a href="#">Minimisation of the loss of public parking and replace or reinstate parking at the earliest opportunity</a></li> <li>• <a href="#">Provision of suitable alternate parking and associated facilities to replace private parking and facilities lost or inaccessible during construction for any significant time, in consultation with the relevant stakeholders. The private parking is to be replaced or reinstated at the earliest opportunity</a></li> <li>• <a href="#">A parking management plan prepared in consultation with and approved by the relevant road authority to manage parking in and around the construction zones. The plan must:</a> <ul style="list-style-type: none"> <li>- <a href="#">include parking controls to support other relevant EPR requirements</a></li> <li>- <a href="#">maintain Police Only parking bays in Swanston Street and Flinders Lane</a></li> </ul> </li> </ul>		
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	<p><a href="#">to the satisfaction of Victoria Police</a></p> <ul style="list-style-type: none"> <li>– <a href="#">minimise impacts on existing users, particularly those with special needs</a></li> <li>– <a href="#">provide a suitable level of accessibility to loading zones</a></li> </ul> <ul style="list-style-type: none"> <li>• Provision of car parking for construction workers where practicable and in this regard: <ul style="list-style-type: none"> <li>– Use of off-street car parks for construction workers <del>must should</del> be by prior agreement with the relevant management body and</li> </ul> </li> <li>• Measures must be implemented to prevent, to the extent practicable, construction workers parking in on-street spaces, unless it can be demonstrated by car-parking surveys that there is adequate on-street supply</li> <li>• A green travel strategy to encourage construction workers to travel to / from worksites by means other than private vehicle and / or outside peak times. This should include provision for on-site tool storage where practicable <a href="#">and consideration given to the use of shuttle buses to ferry workers to and from off-site car parks</a></li> <li>• Provision of suitable routes for cyclists and pedestrians to maintain connectivity and safety for roads and shared paths to provide continued access, including (but not limited to): Childers Street, JJ Holland Park, South Kensington station, Laurens Street, Grattan Street, Swanston Street, Franklin Street, Flinders Street, St Kilda Road, Albert Road, Domain Road, Toorak Road and Fawkner Park</li> <li>• Develop and implement network enhancement projects (NEPs) in consultation with the TTWG for locations including, but not limited, to: <ul style="list-style-type: none"> <li>– College Crescent, Gatehouse Street, Cemetery Road and other east-west roads in the Parkville Precinct, to accommodate traffic that may use these roads as a result of the Grattan Street closure.</li> <li>– Kings Way, Canterbury Road and other roads and intersections to accommodate additional traffic that may use these roads and to assist traffic flow, including public transport priority treatments for affected bus and tram routes, for the duration of the works</li> </ul> <p>These NEPs should have the objective of balancing impacts across the transport network and must consider the VicRoads Road Users Hierarchy principles set out in SmartRoads</p> </li> <li>• Domain Road should be kept open from the east up to the existing entrance of Edmund Herring Oval, with provision for a local turnaround</li> <li>• In consultation with emergency services, develop suitable measures to ensure emergency service access is not inhibited as a result of Melbourne Metro construction worksites</li> <li>• Special arrangements for delivery or removal of large loads.</li> </ul>		
<p><del>T2</del> <a href="#">T3</a></p>	<p><b>Public Transport (Construction Phase)</b></p> <ul style="list-style-type: none"> <li>• Develop and implement a plan for occupying railway land and tracks at the western portal, eastern portal and western turnback that minimises the disruption to railway services during construction. Plan to be developed to the satisfaction of VicTrack, PTV and MTM.</li> <li>• <a href="#">In consultation with the TTWG</a>, provide suitable routes for pedestrians to maintain connectivity where access is altered, including DDA access where practicable, for users of South Kensington Station, Melbourne Central Station, Flinders Street Station, new tram and bus stops relocated or constructed during the construction period, and around all construction sites generally.</li> <li>• In consultation with <del>the TTWG, PTV, VicRoads or the relevant road management authorities</del>, investigate and implement intersection modifications where practicable, including public transport priority treatments for affected bus and tram routes.</li> </ul>	<p>All</p>	<p>Construction</p>

	<ul style="list-style-type: none"> <li>Develop and implement measures to minimise disruption to the tram and bus networks resulting from the construction of Melbourne Metro in consultation with the relevant road management authorities and to the satisfaction of PTV, including (but not limited to): <ul style="list-style-type: none"> <li>Options to divert the 401, 402, 403, 505 and 546 bus services</li> <li>Tram routes on La Trobe Street and Swanston Street</li> <li>Tram routes on Flinders Street and Swanston Street</li> <li>Tram operations on Toorak Road and the diversion of the No. 8 tram route</li> <li>Periodic closures of Royal Parade tram route</li> <li>Tram routes on St Kilda Road</li> <li>Disruption to other tram routes through Domain tram stop</li> <li>Bus replacement services for disrupted rail passengers.</li> </ul> </li> </ul>		
<p><del>T3</del></p> <p>T4</p>	<p><b>Active Transport (Construction Phase)</b></p> <ul style="list-style-type: none"> <li>Develop and implement transport management measures in consultation with the TTWG and relevant <a href="#">road management</a> authorities for cyclists and pedestrians to maintain connectivity and <a href="#">reasonable</a> performance levels throughout construction for road and shared path users including (but not limited to): JJ Holland Park, South Kensington station, Laurens Street, Grattan Street, Swanston Street adjacent to Gate 4 at University of Melbourne, Franklin Street (including RMIT facilities), Swanston Street, Flinders Street, St Kilda Road, Domain Road, Domain Parklands, Albert Road, Toorak Road, Fawkner Park, Osborne Street, William Street and Chapel Street.</li> <li>Implement active control and wayfinding information at construction work site access points to maintain safety by avoiding potential conflicts between trucks, pedestrians and cyclists.</li> <li><a href="#">In consultation with the City of Melbourne, provide a suitable route for pedestrians to maintain connectivity and connection between Domain Road and the diverted number 8 tram on Toorak Road</a></li> <li><del>In consultation with the City of Melbourne, provide suitable routes for cyclists and pedestrians throughout construction to and maintain connectivity for road and shared path users around JJ Holland Park and South Kensington station.</del></li> <li>In consultation with the City of Stonnington, provide suitable routes for cyclists and pedestrians to maintain connectivity and connection, having regard to the removal of the William Street Bridge and Lovers Walk pedestrian path during the construction phase.</li> <li>Provide for movement along the Tan Track in the Botanical Gardens near the Linlithgow Avenue construction sites, or provide a suitable alternative pedestrian path during construction.</li> <li>Maintain appropriate pedestrian access to public car parks and adjoining properties adjacent to or within construction areas including the car park beneath University Square.</li> </ul>	All	Construction
<p><del>T4</del></p> <p>T5</p>	<p><b>Travel Demand Management Strategy</b></p> <ul style="list-style-type: none"> <li>In advance of construction works, MMRA to develop and implement a Travel Demand Management Strategy and appropriate tools to promote specific transport behaviour changes in response to road, bicycle and pedestrian paths closures/modifications and to reduce traffic congestion around construction sites, particularly in the vicinity of the Parkville and Domain precincts where road closures and restrictions are proposed. The strategy must be consistent with the MMRA Community and Stakeholder Engagement Plan and, where practicable, include a mechanism for collecting and disseminating real-time travel time information to the public. Existing traffic and public transport information channels would be used where ever</li> </ul>	All	Construction

	<p>possible.</p> <ul style="list-style-type: none"> <li>Engage with key stakeholders in the development, implementation and monitoring of the Travel Demand Management Strategy including, but not limited to, councils, road management authorities, PTV and relevant public transport providers, educational facilities, research institutions, businesses, impacted community groups and other affected key stakeholders in each precinct.</li> </ul>		
<p><a href="#">T5</a></p> <p><a href="#">T6</a></p>	<p><b>Road Transport (Operational Phase)</b></p> <ul style="list-style-type: none"> <li>Design all roadworks and shared path works to relevant design standards to maintain safety of movement in consultation with the relevant road management authorities and TTWG, as required. Designs should be underpinned by appropriate transport modelling and have an objective to facilitate public transport and minimise carpark loss to the extent practicable.</li> <li>Develop and implement a plan to reinstate car parking on Childers Street, Kensington and Laurens Street, North Melbourne in consultation with the relevant road management authorities that: <ul style="list-style-type: none"> <li>Minimises the permanent loss of parking where possible</li> <li>Ensures re-instated car parking does not encroach on JJ Holland Park</li> <li>Considers opportunities for replacement of any net loss of parking at nearby locations</li> <li>Reduces the risk of overflow parking in local streets from South Kensington station and activities at JJ Holland Park</li> <li>Replaces loading zones to service the needs of the existing businesses in the precinct where disrupted during construction</li> </ul> </li> <li><a href="#">Develop and implement a plan for the Arden Precinct in consultation with the relevant road management authorities to manage parking generated by the new Arden Station</a></li> <li>Develop and implement a plan for the reinstatement of Grattan Street, Parkville in consultation with the relevant road management authorities that includes: <ul style="list-style-type: none"> <li>Optimal replacement of car parking spaces along Grattan Street to service the needs of the hospitals and the university, including the retention or replacement of specific short-term and DDA compliant parking</li> <li>Optimal design of the road network around Grattan Street associated with the changed demands and network changes on Grattan Street and Royal Parade/Elizabeth Street</li> </ul> </li> <li>Develop and implement a plan for the future use of the Franklin Street road reserve in consultation with the relevant road management authorities that includes: <ul style="list-style-type: none"> <li>Optimising the design of Franklin Street in the Project area</li> <li>Regard to the future function of Franklin Street envisaged in the Queen Victoria Market Precinct Renewal Master Plan</li> <li>Monitoring the change in travel patterns around the area associated with the revised design of Franklin Street</li> </ul> </li> <li>Develop and implement a plan for the design of A'Beckett <a href="#">S</a>treet in consultation with relevant road management authorities that includes: <ul style="list-style-type: none"> <li>Optimising the design of A'Beckett Street and location of station infrastructure</li> <li>Consideration of pedestrian and vehicle movements on Swanston Street between La Trobe and A'Beckett Streets and on Little La Trobe Street</li> </ul> </li> <li>Optimise the design of the reinstated St Kilda Road and apply the road users hierarchy in consultation with the relevant road management authorities to:</li> </ul>	All	Operation

	<ul style="list-style-type: none"> <li>- <del>Align with the conceptual design for St Kilda Road as prepared for the TAC by VicRoads, City of Melbourne and City of Port Phillip</del></li> <li>- Reduce delays and congestion</li> <li>- Maintain safe operations through the precinct</li> <li>- Determine the optimal parking provision in the area and replace any lost parking where possible</li> <li>• Where vehicle and pedestrian access are altered during construction, ensure that vehicle and pedestrian access is reinstated appropriately, in accordance with relevant road design standards, so adjacent land is not compromised.</li> </ul>		
<p><del>T6</del> T7</p>	<p><b>Public Transport (Operational Phase)</b></p> <ul style="list-style-type: none"> <li>• Review, with PTV, the bus services in the areas around Arden, Parkville, CBD North, CBD South and Domain stations including a review of the route 401 bus frequency that will have reduced demand following implementation of Melbourne Metro.</li> <li>• In consultation with PTV, optimise the design of Melbourne Metro stations to ensure integration with existing and planned future uses and so that they will provide connections: <ul style="list-style-type: none"> <li>- Between the new Parkville station and the new tram stop on Royal Parade</li> <li>- For interchange between the new CBD North station and the existing tram and bus services along La Trobe Street and Swanston Street</li> <li>- For interchange between the new CBD South station and the existing tram services along Flinders Street, Swanston Street and Collins Street</li> <li>- Between the new Domain station and the new island platform trams stop in the centre of St Kilda Road and connections to the tram network.</li> </ul> </li> <li>• <a href="#">In consultation with the relevant road management authorities</a>, implement measures to address pedestrian congestion at and around station entrances where they interface with the Precincts, to the extent practicable.</li> <li>• Provide adequate wayfinding to facilitate passenger transfers (Refer to EPR LU4).</li> <li>• Review, with PTV and Yarra Trams, the bus and tram services in the area to optimise the functionality of the CBD North and CBD South stations and to reduce the reliance on the Swanston Street tram corridor.</li> </ul>	All	Operation
<p><del>T7</del> T8</p>	<p><b>Active Transport (Operational phase)</b></p> <ul style="list-style-type: none"> <li>• Develop and implement a permanent pedestrian footpath and on-road bicycle design for Childers Street, Kensington with the relevant road management authority, <a href="#">relevant</a> local council, and the land manager prior to the removal of the shared use path on the southern side of the street.</li> <li>• In cooperation with the relevant road management authority and local council, and where practicable to do so, re-instate on-road bicycle lanes and bicycle parking provisions removed during construction.</li> <li>• <a href="#">In consultation with relevant local councils undertake a study of bicycle parking demands for the new stations</a></li> <li>• Provide appropriate bicycle parking at each station adopting a flexible design that would allow for future expansion of capacity <a href="#">in consultation with relevant local councils and user groups</a>, if required.</li> <li>• Review the reinstatement and provision of safe and effective bicycle lanes and pedestrian access in and around the Melbourne Metro station sites in cooperation with the <a href="#">relevant</a> road management <del>authority</del> <a href="#">authorities</a> and the <a href="#">relevant</a> local council.</li> <li>• Provide wayfinding information to enhance connectivity for pedestrians and public transport users, <a href="#">in consultation with relevant local councils and user</a></li> </ul>	All	Operation



	<p><a href="#">groups</a>, including (but not limited to) the following locations:</p> <ul style="list-style-type: none"> <li>– Between Melbourne Central Station and the new CBD North Station</li> <li>– The underground connection between Flinders Street Station and the new CBD South Station.</li> <li>– At modal interchanges between new Melbourne Metro stations and other transport modes</li> </ul> <ul style="list-style-type: none"> <li>• Consult with the TTWG on active transport, where required.</li> </ul>		
<b>New TB*</b> <a href="#">T9</a>	<p><b>Waste collection</b></p> <p>Develop and implement a plan in consultation with local councils and private waste collection services to manage changes to waste collection and waste storage in the areas <a href="#">affected by construction activity</a>. The plans should include, but not be limited to:</p> <ul style="list-style-type: none"> <li>• <a href="#">Providing for minimal change in waste collection times where the change might affect the capacity of residents to sleep</a></li> <li>• Providing access for existing waste collection services from existing <del>educational facilities, businesses and residential</del> properties considering the extent of the construction areas and road network changes</li> <li>• Providing access to alternative waste collection locations for <a href="#">properties businesses</a> during Project construction and operation where existing waste disposal locations are removed <a href="#">or obstructed</a></li> <li>• Design for re-instatement of appropriate access for existing waste services during Project operation</li> <li>• Consultation with affected businesses, land owners and residents to be undertaken jointly with local councils to encourage alternative waste management options to be adopted.</li> </ul>	All	Design / Construction
<a href="#">T10</a>	<p><a href="#">In consultation and agreement with the owners of the Westin Residential Apartments and the owners corporations in Plan of Subdivision PS428405M, prepare a legacy design for the private car parking, storage units and services below the Westin building (to a similar standard as prior to the commencement of the Project). The legacy design is to be implemented at the earliest opportunity.</a></p>	<a href="#">CBD South</a>	<a href="#">Operation</a>

### Environmental Performance Requirements Glossary

Note: Retain the glossary as per Version 4, with the following additions

Heritage place: [A place \(including buildings, trees, bridges, monuments landscapes, archaeological sites, artefacts and others\) which is subject to statutory heritage controls under Commonwealth or Victorian legislation. This includes places covered by the Heritage Act 1995, the EPBC Act or which are subject to a Heritage Overlay under a VPP Planning Scheme.](#)

HIS: [Heritage Impact Statement to be informed by the HMP and prepared for Development Plans](#)

PPRG: [Parkville Precinct Reference Group](#)

TTWG: [Traffic and Transport Working Group](#)