

**ratio:**

**Prepared for:**  
Harwood Andrews on behalf of the  
City of Manningham

**Prepared by:**  
Hilary Marshall

**Traffic and Transport Expert Evidence  
North East Link Project**

14 July 2019

**r:**

**traffic: evidence**

**ratio:**consultants

8 Gwynne Street  
Cremorne VIC 3121  
ABN 93 983 380 225

**Prepared for:**

Harwood Andrews on behalf of Manningham  
City Council.  
Our reference 16192REP001F01 North East  
Link Traffic Evidence Statement

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# 1 Statement of Evidence

## Reference

Review of the Environment Effects Statement for the North East Link Project.

## Name and Address

Hilary Anne Marshall - Director  
Ratio Consultants Pty Ltd  
8 Gwynne Street, Cremorne, VIC 3121

## Professional Qualifications

Bachelor of Engineering (Civil) Hons, 1998, RMIT University  
Bachelor of Business Administration (Management), 1998, RMIT University

## Professional Experience

Director – Ratio Consultants	Jan 2018 - present
Senior Associate – Ratio Consultants	Jan 2016 – Dec 2017
Associate – Cardno	Nov 2015 – Jan 2016
Senior Engineer – Cardno	Feb 2011 – Oct 2015
Associate – Urban Crossroads, Irvine, California USA	2004-2006
Senior Engineer – Grogan Richards	2002-2004
Engineer – Grogan Richards	1999 - 2001

## Professional Expertise

- 1.1.1 I have worked in the area of Traffic and Transportation Engineering throughout my career. My area of expertise includes traffic advice and assessment of a wide range of land use and development proposals for planning authorities, government agencies, corporations and developers.
- 1.1.2 My training, qualifications and experience including involvement with a wide variety of developments over a number of years, qualifies me to comment on the traffic and transport implications of this proposal.

## Instructions which define the scope of this report

- 1.1.3 I have been instructed by Harwood Andrews on behalf of the City of Manningham, to undertake a review of the traffic and transport implications of the proposed North East Link road project and prepare an expert evidence statement for submission and presentation at the upcoming panel hearing.
- 1.1.4 My instructions from Harwood Andrew are included in Section 2.2.

## Facts, Matters and Assumptions Relied Upon

- 1.1.5 In the course of preparing this report the facts, matters and assumptions I have relied upon are outlined in Section 2.2.1

## Identity of Persons Undertaking the Work

- 1.1.6 Hilary Marshall of Ratio Consultants.

### **Declaration**

- 1.1.7 I have read the Planning Panels Victoria Expert Witness guidelines (April 2019) and understand my obligations to the Panel.
- 1.1.8 I have no relationship with the client other than a business engagement to comment on this matter.
- 1.1.9 My involvement in this project commenced in April 2019 and I was not involved in the preparation of the Environment Effects Statement for the proposed North East Link project or any associated planning.
- 1.1.10 I have made all the inquiries that I believe are desirable and appropriate and that no matters of significance which I regard as relevant have to my knowledge, been withheld from the Panel.



**Hilary Marshall**  
**Director: Traffic**  
**Ratio Consultants**

# 2 Introduction

## 2.1 Overview

- 2.1.1 I have been instructed by Harwood Andrews Lawyers on behalf of Manningham City Council, to provide my expert opinion with respect to the Environment Effects Statement (EES) regarding the proposed North East Link Project.
- 2.1.2 This report has been prepared in accordance with the recently updated Planning Panels Victoria Expert Witness guidelines.
- 2.1.3 In the course of preparing this assessment, I have reviewed the existing conditions, examined the proposed road design plans and referred to the documents and plans outlined in the following instructions.
- 2.1.4 My opinions with respect to the traffic and transport issues relating to the proposed development are set out in the following report.

## 2.2 Instructions

- 2.2.1 My instructions in this matter were provided by Harwood Andrews dated 25<sup>th</sup> June 2019, as follows:
  - 1. Review the exhibited EES documentation relevant to your area of expertise and Council's municipality, in particular:
    - a. Main Report:
      - i. Volume 1:
        - Chapter 1 Introduction;
        - Chapter 2 Project rationale;
        - Chapter 3 Legislative framework;
        - Chapter 4 EES assessment framework;
        - Chapter 6 Project development;
        - Chapter 8 Project description;
      - ii. Volume 2:
        - Chapter 9 Traffic and transport;
        - Revised figures in Chapter 9 – please note these have been made available following exhibition of the EES to correct errors in the exhibited report;
      - iii. Volume 4:
        - Chapter 27 Environmental management framework;
        - Chapter 28 Conclusion;
    - b. Attachment III Risk Report;
    - c. Map Book;
    - d. Technical Report A Traffic and Transport; and
    - e. EES Transport Model Peer Review (Luis Willumsen of Willumsen Advisory Services) – please note this has been made available following exhibition of the EES.
  - 2. Consider the following and any additional documents we subsequently refer to you:
    - a. final scoping requirements for the EES (June 2018);
    - b. IAC terms of reference (11 April 2019);
    - c. IAC member biographies;

- d. Council's public submission (5 June 2019);
  - e. documents exhibited as part of the Yarra River – Bulleen Precinct Advisory Committee process, including the Draft Land Use Framework Plan and Draft Planning Scheme Amendment C125 – Yarra Valley Country Club (Council has been advised that Amendment C128 – former Bulleen Drive-In will not be pursued);
  - f. IAC preliminary matters and further information request (20 June 2019), particularly section 3 – traffic and transport; and
  - g. Planning Panels Victoria's guide to expert evidence (April 2019).
3. Prepare an expert witness report for circulation that:
- a. provides your opinion on the capacity of the Project to achieve acceptable transport and traffic outcomes as relevant to Council's municipal area;
  - b. provides any recommendations as to feasible modifications to the alignment or design of the Project that would offer improved outcomes relevant to your area of expertise and Council's municipal area;
  - c. provides any recommendations or specific measures (including any changes to the proposed Environmental Performance Requirements) that you consider necessary and appropriate to prevent, mitigate or offset adverse environmental effects having regard to your area of expertise;
  - d. identifies any areas where you consider there to be insufficient information to make an assessment of the environmental effects of the Project, having regard to the current stage of the Project as a 'reference design' with any 'detailed design' to follow the EES process;
  - e. addresses Council's public submission as relevant to your area of expertise;
  - f. considers matters including, but not limited to:
    - i. access opportunities to the North East Link from the City of Manningham;
    - ii. the reference and alternate design for the Manningham Road interchange;
    - iii. local access considerations to land adjacent to the Manningham Road interchange, including existing and future (post-construction) industrial and residential land uses;
    - iv. traffic volume changes of significance within Manningham expected as a result of the North East Link;
    - v. access arrangements from Bulleen Road into Bulleen Park in the context of the proposed southern portal location;
    - vi. the proposed Eastern Freeway widening and whether it is efficiently designed to minimise its footprint;
    - vii. public transport considerations, including:



- Doncaster Park and Ride;
- Bulleen Park and Ride;
- any impacts and implications for bus services on the network; and

viii. pedestrian and bicycle connectivity and constraints, having regard to Banyule and Manningham City Council cycling strategies; and

g. responds appropriately to Planning Panels Victoria's recently updated guide to expert evidence.

4. Review and comment on other parties' transport and traffic expert evidence once exchanged.
5. Attend any expert meeting (conclave) of traffic and transport experts requested by the IAC.
6. Present your expert evidence at the hearing. The IAC's directions will provide further detail on this. The IAC has advised that evidence-in-chief will be requested to be limited to a 15-minute presentation. The presentation is to be drawn from your expert witness report and may respond to other expert reports (as relevant).

2.2.2 Further to the above instructions, a second letter was received from Harwood Andrews, dated 28<sup>th</sup> June 2019, outlining key dates following the directions hearing and reference to updated documents for review.

2.2.3 I also attended a meeting with the NELP on Thursday 11<sup>th</sup> July 2019, to view relevant sections of the microsimulation model and ask questions.

## 2.3 Manningham City Council Submission

2.3.1 Manningham City Council made a public submission in relation to the Environment Effects Statement regarding the proposed North East Link Project. As outlined in the submission, Council are generally in support of the project and recognise that the project would benefit the north east of Melbourne in particular.

2.3.2 Council are however, dissatisfied with the proposed Reference Design put forward. I have reviewed the proposed Reference Design (and Alternate Design) alignment through the City of Manningham and agree that changes to the proposed design would provide better mitigation of potential transport related impacts and/or avoidance of some impacts.

2.3.3 In particular, I have focused on the Manningham Road interchange, the proposed traffic signals on Bulleen Road, and the proposed widening of the Eastern Freeway.

2.3.4 Council have raised concerns with a number of other elements of the North East Link Project. I have addressed the concerns relating to traffic and transport issues in the following report to the best of my abilities given the information provided.

## 2.4 Acronyms

2.4.1 For convenient reference a summary of commonly used acronyms in this report are outlined as follows:

NEL	North East Link
NELP	North East Link Project
EES	Environment Effects Statement
EPR	Environmental Performance Requirement

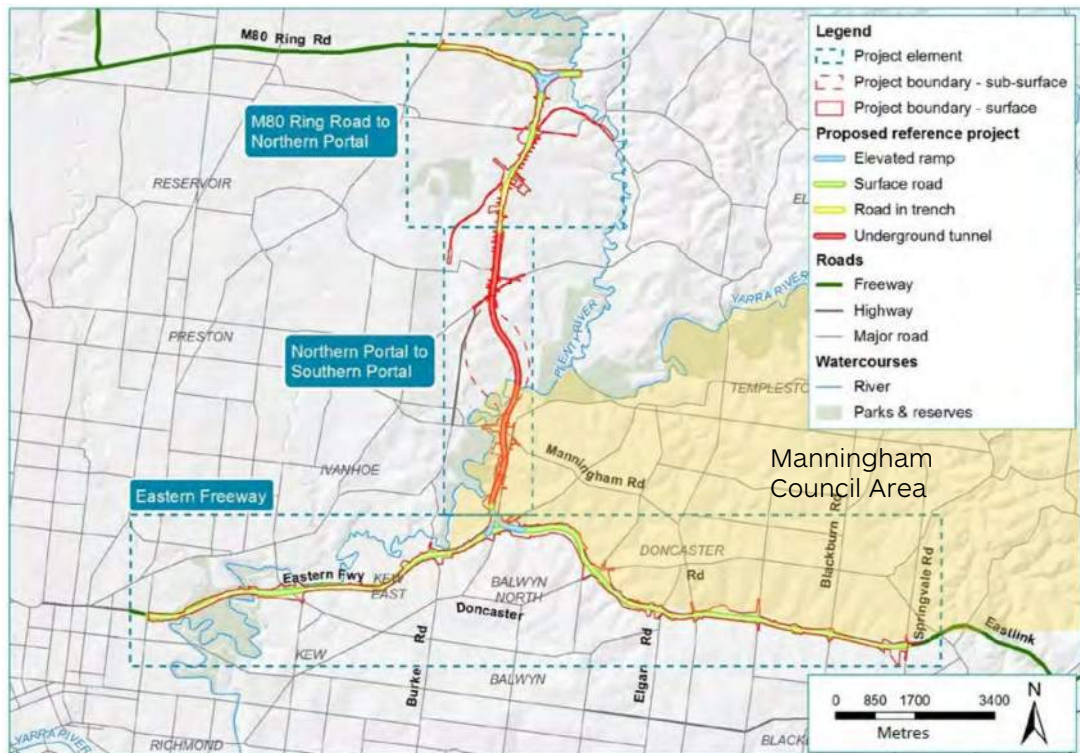
# 3 Overview of NEL relevant to the Manningham Municipal Area

3.1.1 The North East Link Project (NELP) contains three main sections defined as follows:

- M80 (Metropolitan Ring Road) to Northern Portal
- Northern Portal to Southern Portal
- Eastern Freeway

3.1.2 In order to support the proposed North East Link projected traffic volumes of 135,000 vehicles per day, extensive widening is proposed on the Eastern Freeway. The three main segments of the NELP are shown in the following figure.

**Figure 3-1: Proposed North East Link Alignment**



Source: EES Summary Report (pg 2)

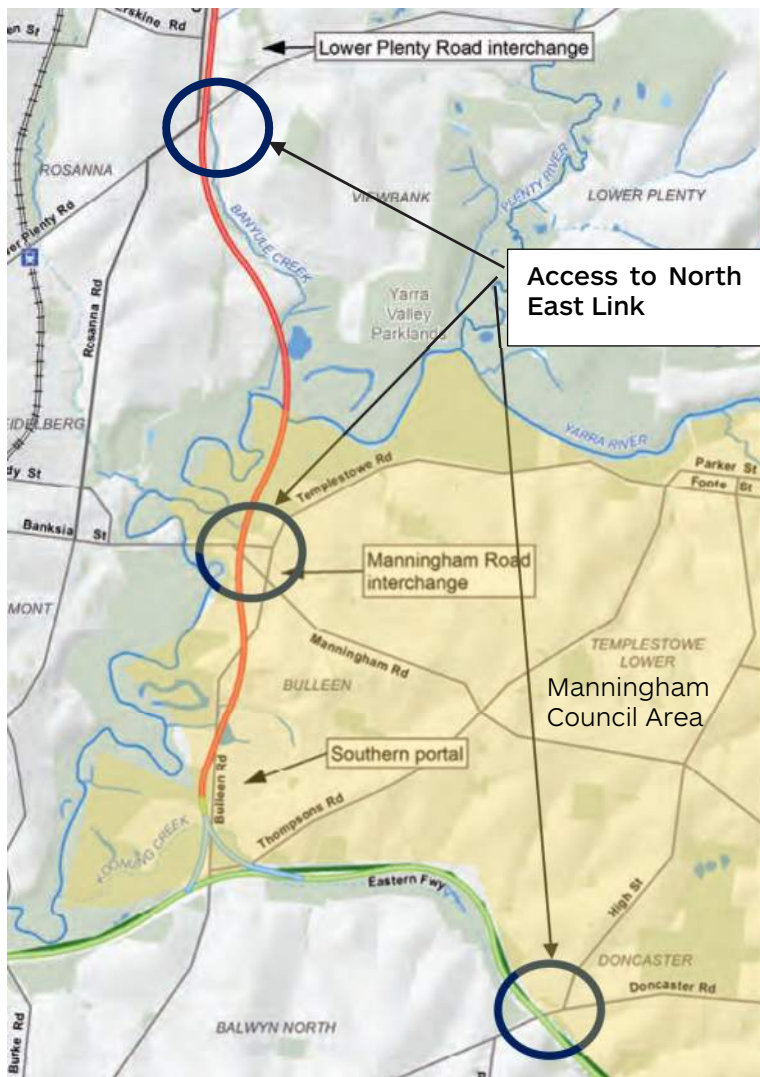
3.1.3 As shown in the preceding figure, the southern portion of the North East Link and the Eastern Freeway works have a direct impact on the City of Manningham.

# 4 Access Opportunities to NEL from Manningham

## 4.1 Access to NEL from City of Manningham

- 4.1.1 The City of Manningham in the vicinity of the proposed NEL is generally bound by the Yarra River to the north and west and the Eastern Freeway to the south.
- 4.1.2 In regard to direct access to the NEL from the City of Manningham, there is one direct option at the proposed interchange with Manningham Road / Bulleen Road.
- 4.1.3 Additional access opportunities will be available via the existing Eastern Freeway interchanges, which allow movement to and from the west, and the proposed NEL interchange at Plenty Road to the north.
- 4.1.4 A simplified version of the NEL route and the access locations available for the City of Manningham are shown in Figure 4-1.

**Figure 4-1: NEL Northern Portal to Southern Portal Section**



Source: EES Chp 8 – Project Description

- 4.1.5 Existing access arrangements to the Eastern Freeway will be maintained at Bulleen Road and Thompsons Road, however there is no access to the NEL from Bulleen Road or Thompsons Road at this location.

- 4.1.6 The only direct access to the NEL for people within the City of Manningham area is via the Manningham Road / Bulleen Road interchange or by first travelling south to use one of the existing interchanges to the Eastern Freeway, then joining onto the southern end of the NEL. The closest Eastern Fwy interchange is at Doncaster Road, approximately 3.0 km east of the start of the NEL.
- 4.1.7 The next opportunity to enter the NEL, north of Manningham Road, will be Plenty Road which is approximately 4km driving distance north of Manningham Road. Access to Plenty Road from the City of Manningham is restricted due to limited crossings of the Yarra River.

## **4.2 Importance of the Manningham Road Interchange**

- 4.2.1 In my opinion the proposed access arrangements will generate a heavy reliance on the Manningham Road interchange for vehicles arriving and departing to the north from the City of Manningham in particular.
- 4.2.2 The Manningham Road interchange will also be the most direct point of access for motorists to and from areas south of the Eastern Freeway, such as Balwyn North and Kew. Access to suburbs west of Bulleen Road, such as Ivanhoe will also find access via Manningham Road to and from the NEL the most convenient.
- 4.2.3 A poorly defined interchange that is difficult for vehicles to access, has the potential to create unnecessary traffic congestion and diverted trips through Manningham as a result of the NEL being too hard to access.
- 4.2.4 On this basis, I believe that convenient, logical and direct access to the NEL from Manningham Road is critical to the project to ensure potential impacts on the adjacent and surrounding road network are minimised.



# 5 Manningham Road Interchange

## 5.1 Overview

- 5.1.1 Conceptual plans of the NEL and its connections with the surrounding road network have been prepared as part of the EES documentation, contained within the Mapbook.
- 5.1.2 At Manningham Road the NEL will be some 10-12.5m underground, with ramps required to connect the underground tunnel with the existing road network.
- 5.1.3 Within the Mapbook there is a single Reference Design for each part of the route, with the exception of the Manningham Road / Bulleen Road Interchange, which includes a second option titled 'Alternate Design'.
- 5.1.4 In my opinion both options have shortcomings and could be redesigned to provide better connection to the adjacent road network. The access limitations of the two options are discussed as follows:

## 5.2 Existing Road Network

- 5.2.1 The existing road network around the future Manningham Road / Bulleen Road interchange is shown in Figure 5-1, with a recent aerial view shown in Figure 5-2.

**Figure 5-1: Existing Road Network at the proposed Manningham Road Interchange**



Source: [online.melway.com.au](http://online.melway.com.au)



**Figure 5-2: Aerial View of Manningham Road / Bulleen Road Intersection**



Source: [maps.au.nearmap.com](https://maps.au.nearmap.com) (7 April 2019)

- 5.2.2 As shown in the preceding figures, Manningham Road is generally aligned north west to south east between the Yarra River and Thompsons Road to the east. West of the Yarra River Manningham Road continues as Banksia Street and then Bell Street, providing an arterial link to the Tullamarine Freeway from the east.
- 5.2.3 Bulleen Road is generally aligned north south between Doncaster Road to the south and Bridge Street, just north of Manningham Road.
- 5.2.4 Bridge Street is a short arterial road connection linking Manningham Road with Templestowe Road / Bulleen Road intersection.
- 5.2.5 Templestowe Road is generally aligned east west between the Bridge Street / Bulleen Road intersection and Thompsons Road to the east. Templestowe Road continues east of Thompsons Road as Foote Street and then Reynolds Road.

- 5.2.6 Traffic signals are currently located at the Manningham Road / Bulleen Road intersection and the Manningham Road / Bridge Street intersection.
- 5.2.7 The intersection of Bridge Street / Templestowe Road / Bulleen Road is unsignalised, with traffic on Bridge Street giving way to through vehicles on Bulleen Road / Templestowe Road.
- 5.2.8 Land use north of Manningham Road / Bridge Street is primarily parkland abutting the Yarra River and the Heide Museum of Modern Art.
- 5.2.9 South of Manningham Road / Bridge Street land uses are primarily light industrial uses containing a variety of businesses.

### **5.3 Design Options Contemplated During EES Process**

- 5.3.1 Chapter 6 of the EES notes that the key challenges of designing the Manningham Road interchange are as follows:
- *“The challenging grade conditions associated with a portal interchange layout*
  - *A number of significant community facilities and sensitive receptors*
  - *A number of commercial and industrial properties.*

*As a result of these competing challenges, three key interchange layout options were considered:*

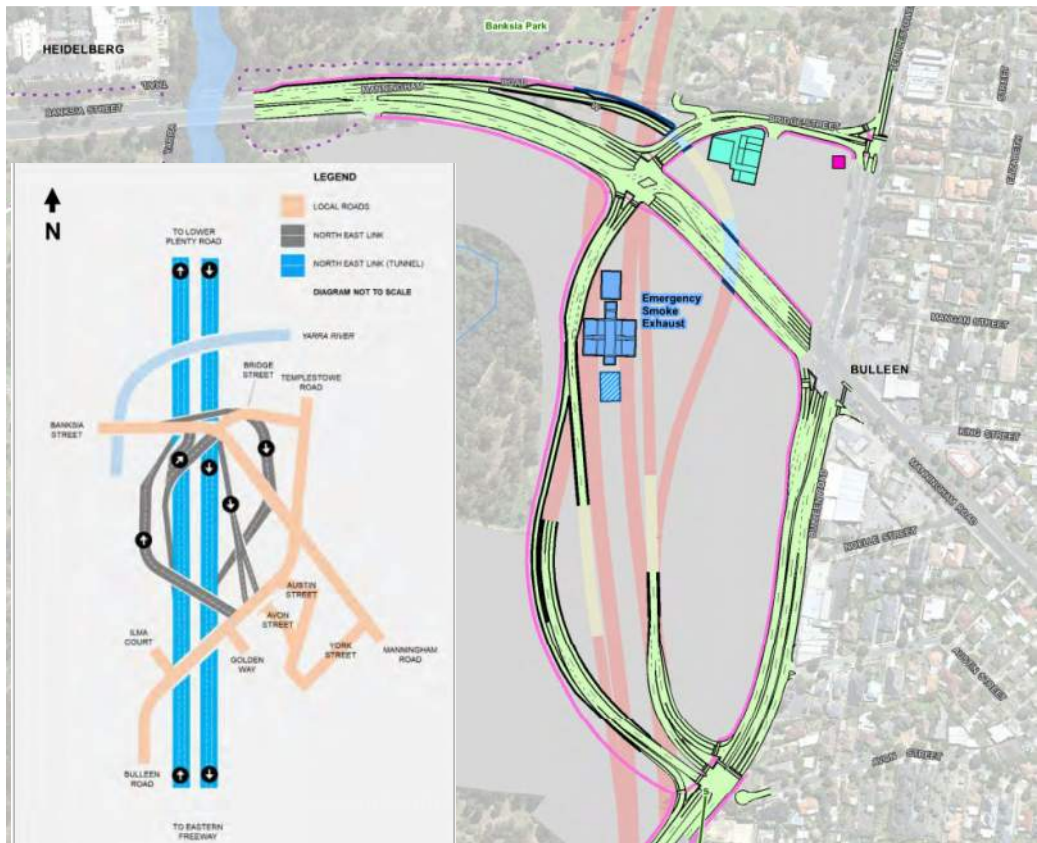
- *Option A – Traditional interchange layout*
  - *Option B – Split diamond interchange with access to Avon Street (reference project)*
  - *Option C – Split diamond interchange without access to Avon Street (reference project, alternative design)”*
- 5.3.2 Option A was not pursued due to its undesirable impact on land north of Bridge Street. Option B which includes access to Avon Street was ultimately not included in the Mapbook.
- 5.3.3 Two versions of Option C were included in the Mapbook as the Reference Design and Alternate Design, which are discussed as follows:

### **5.4 Manningham Road Interchange - Reference Design**

- 5.4.1 The Reference Design (Plan 19 of 42) is shown in Figure 5-3, as well as an insert prepared by Smedtech of a simplified diagram showing access to / from the NEL.



**Figure 5-3: Manningham Rd / NEL Interchange – Reference Design**



Source: Mapbook Plan 19 of 42 and Smedtech Traffic Report Figure 9-48 Pg 335

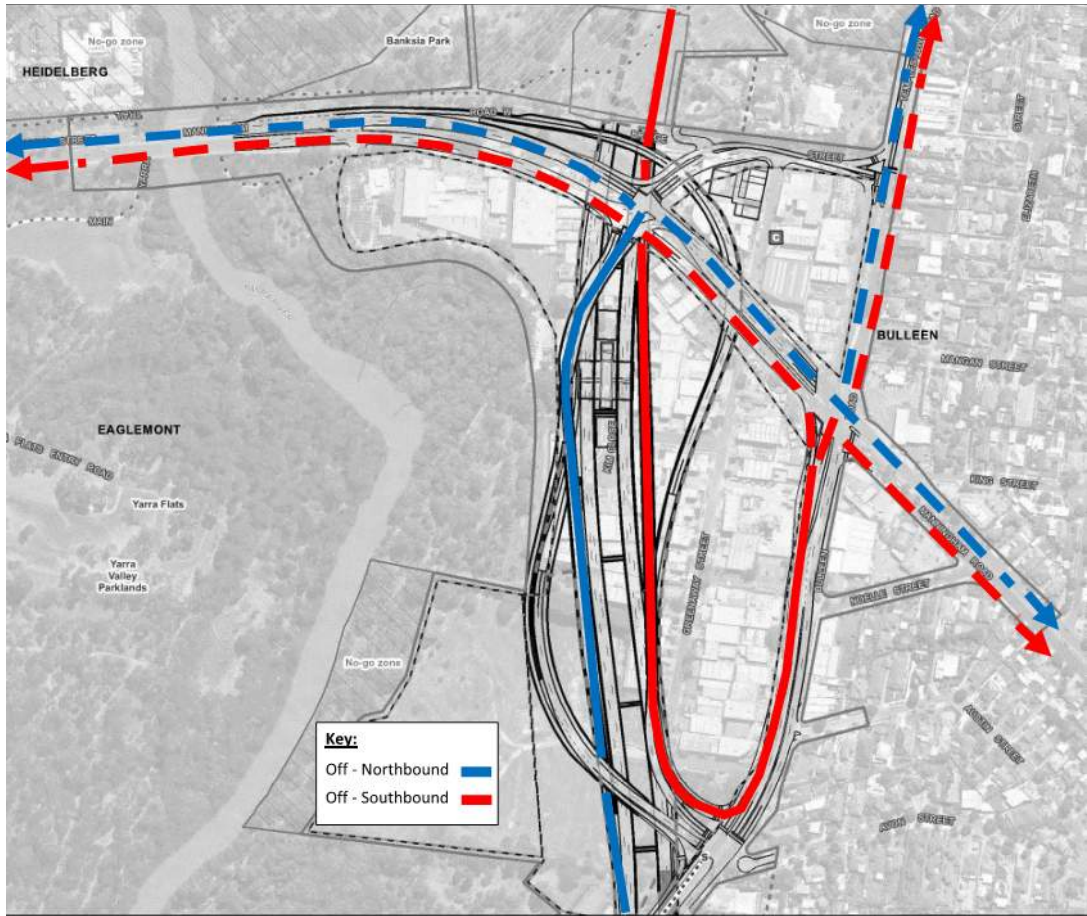
- 5.4.2 As shown on the preceding figure, access to and from the NEL is relatively complex and split between Manningham Road and Bulleen Road.
- 5.4.3 Pedestrian crossings have not been shown across Manningham Road at the new traffic signal.
- 5.4.4 Access to and from the NEL at the Manningham Road interchange is described as follows and demonstrated in the following figures.

**Exit from NEL (Reference Design)**

- 5.4.5 Northbound vehicles will exit the NEL via ramps that connect directly to Manningham Road allowing vehicles to head east or west along Manningham Road at the newly configured traffic signals on Manningham Road.
- 5.4.6 No direct access is proposed from the NEL to or from Bridge Street, even though Bridge Street is being realigned to match into the NEL / Manningham Road traffic signals.
- 5.4.7 Vehicles wishing to access Bridge Street and Templestowe Road after exiting the NEL would need to travel east to the Bulleen Road / Manningham Road intersection first, then proceed north on Templestowe Road.
- 5.4.8 Southbound vehicles on NEL will exit via ramps connected to traffic signals on Bulleen Road, allowing vehicles to travel north or south along Bulleen Road to access the wider road network.



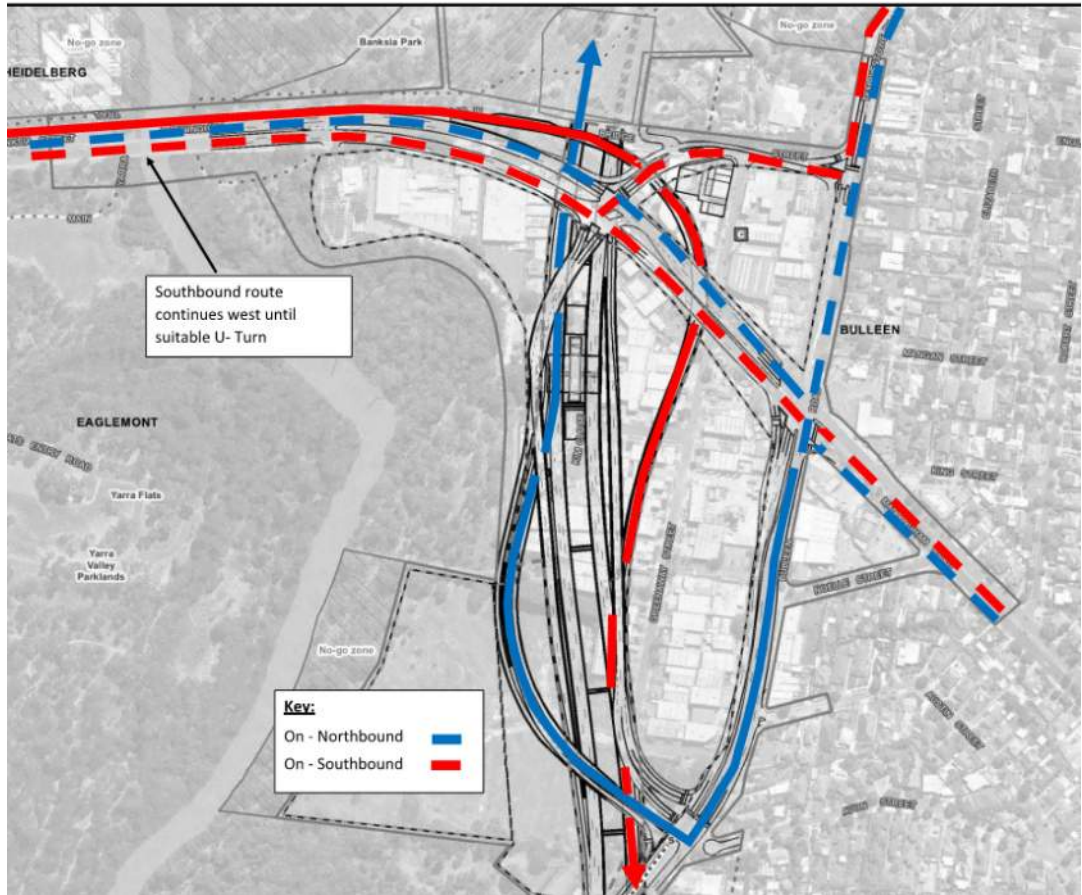
**Figure 5-4: Exiting NEL at Manningham Rd / Bulleen Rd Interchange – Reference Design**



**Entry to NEL (Reference Design)**

- 5.4.9 Vehicles wishing to travel north on NEL would enter at the new traffic signals on Bulleen Road.
- 5.4.10 Vehicles wishing to travel south on NEL would need to be travelling eastbound on Manningham Road, west of the Yarra River, to access the on-ramp. This would require a u-turn for vehicles approaching from Templestowe Road, Manningham Road East or Bulleen Road.

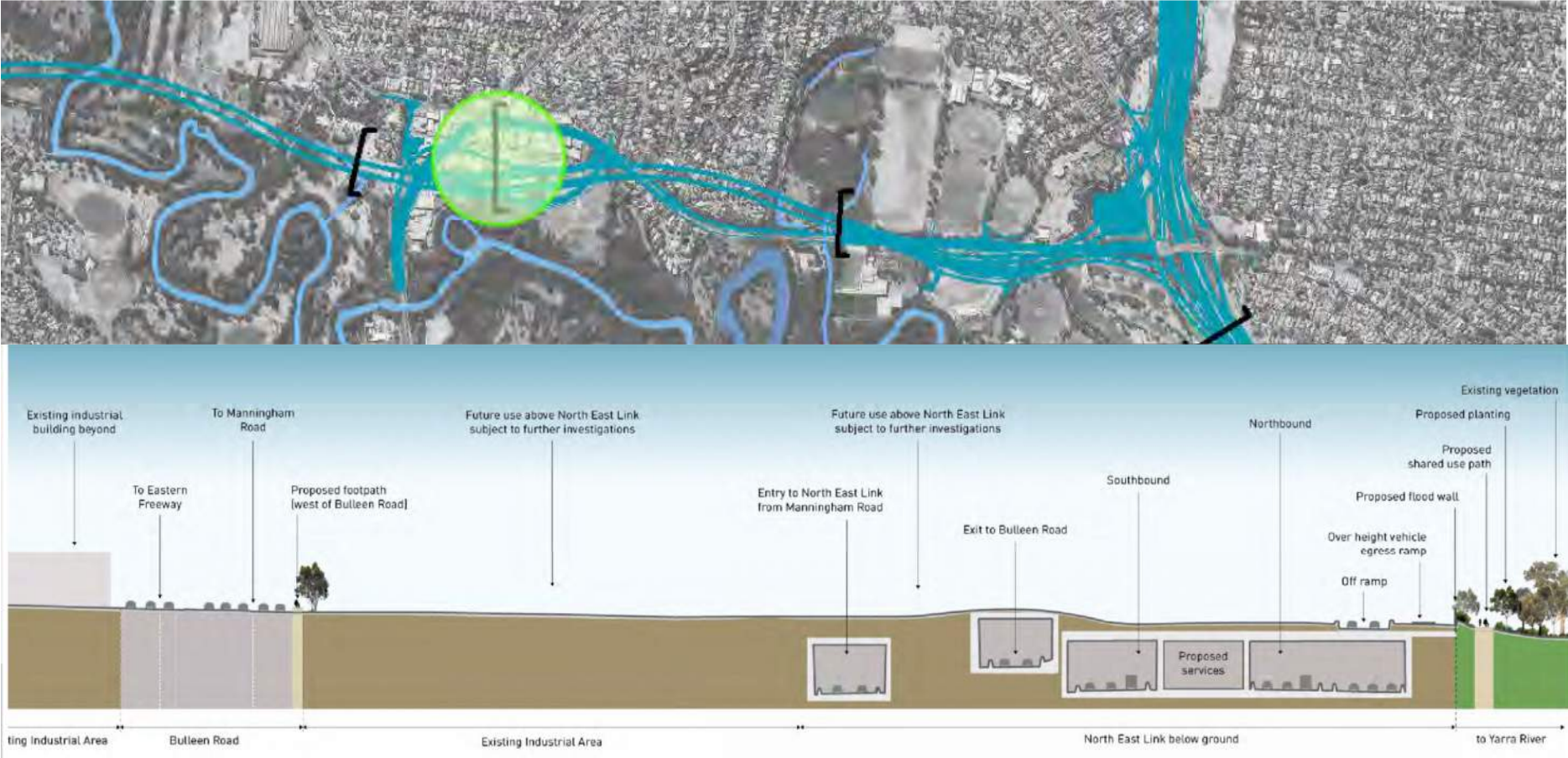
**Figure 5-5: Entering NEL at Manningham Rd / Bulleen Rd Interchange – Reference Design**



**Reference Design Cross Section**

5.4.11 The relevant cross section of the North East Link, south of Manningham Road is reproduced as Figure 5-6.

**Figure 5-6: Reference Design Cross Section and Location (looking south)**



Source: *Mapbook Indicative cross sections (Sheet 7 of 15)*



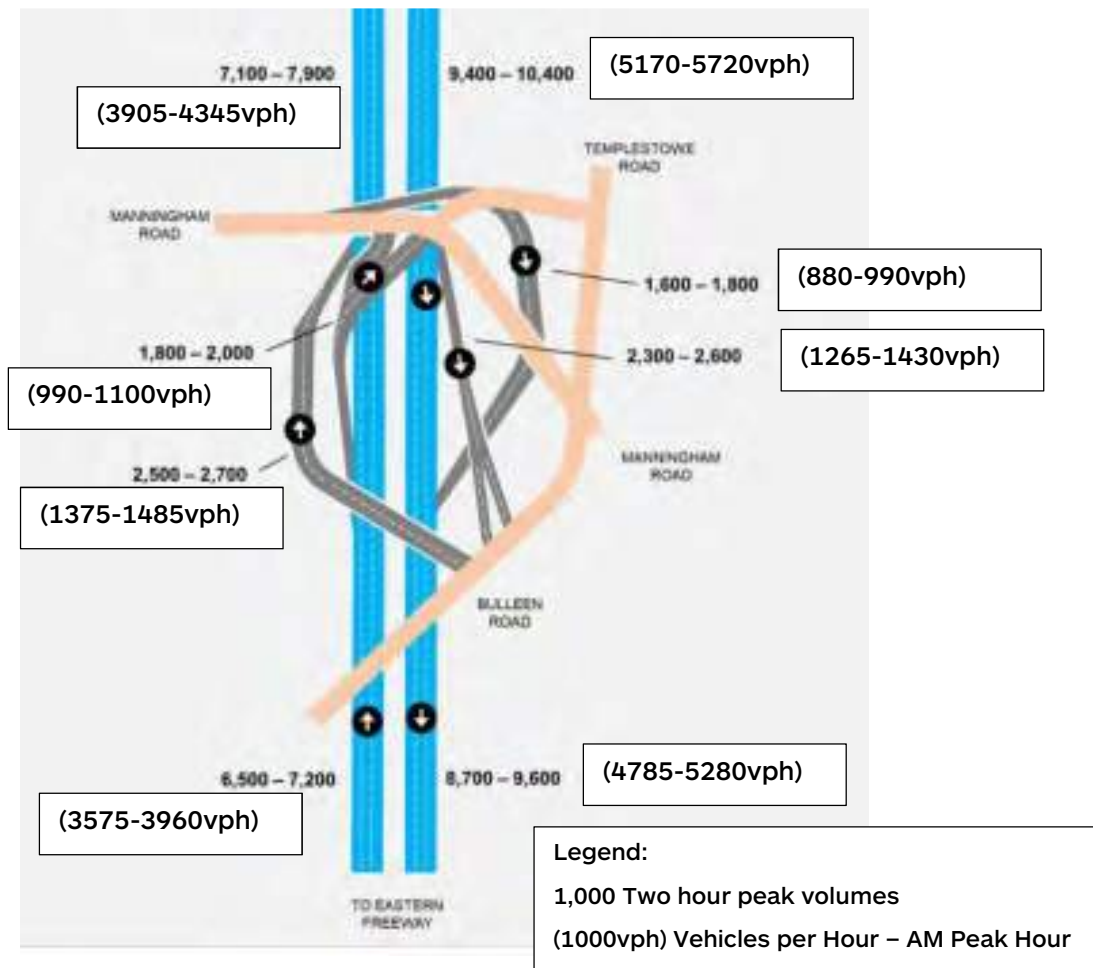
5.4.12 The preceding cross section shows the NEL tunnel in the vicinity of Manningham Road as well as the entry tunnel from Manningham Road and the exit ramp to Bulleen Road. The area between the NEL and Bulleen Road is currently occupied by the Bulleen Industrial Precinct.

## 5.5 Reference Design 2036 Peak Traffic Volumes

### AM Peak

5.5.1 The AM peak 2036 volumes at the interchange are included in the Smedtech Traffic Report and reproduced as Figure 5-7. As the Smedtech volumes represent a 2 hour timeframe, I have converted them to peak hour volumes, as shown on the following figure, assuming a conversion peak of 55%.

**Figure 5-7: Manningham Road / NEL Interchange AM Peak 2036 Traffic Volumes**



Source: Smedtech pg 351

- 5.5.2 As shown in the preceding figure, approximately 880-990 vph are expected to enter NEL to head south from Manningham Road.
- 5.5.3 As discussed earlier, the proposed Reference Design only allows access to this entry from vehicles travelling eastbound on Manningham Road west of the Yarra River.
- 5.5.4 In my opinion it would be reasonable to expect motorists east of the Yarra River may also want to use the Manningham Road interchange to travel south on the NEL, which would provide convenient access to the Eastern Freeway (either east or west). The NEL is expected to provide a faster alternative to using Bulleen Road and avoids a number of new and existing traffic signals along Bulleen Road.
- 5.5.5 The traffic modelling does not provide sufficient detail to determine the likely demand of vehicles wishing to use the Manningham Road interchange to travel south. Therefore

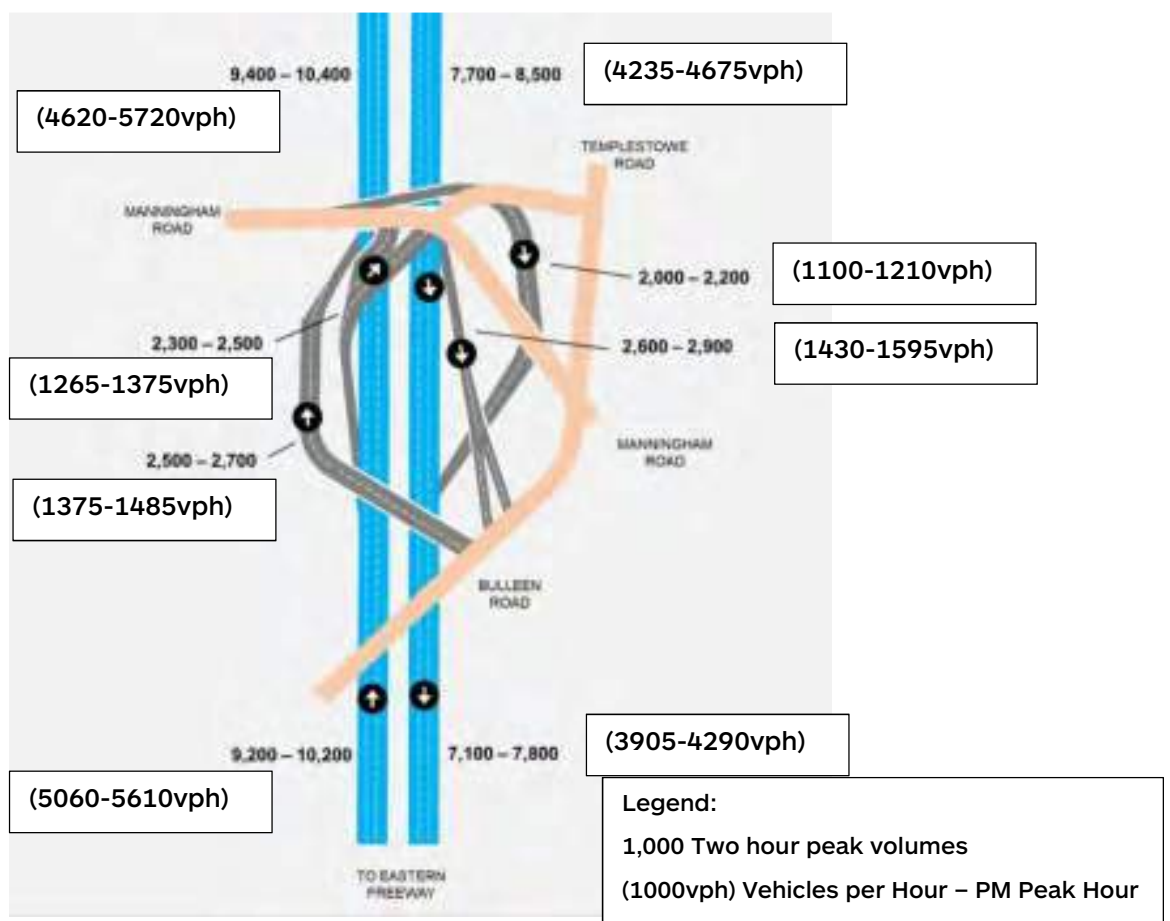
I have considered the following percentages, 25% and 50%, to put the access arrangements into context.

- 5.5.6 If a quarter (25%) of the southbound vehicles originate from the east, then there would be in the order of 200 vehicles undertaking a u-turn movement on Manningham Road in order to access the NEL.
- 5.5.7 If half (50%) of southbound vehicles originate from the east of the NEL, then the number of u-turns would double, resulting in approximately 440-495 u-turn movements on Manningham Road, according to the Smedtech traffic volumes.

**PM Peak**

- 5.5.8 The PM peak 2 hour volumes from the Smedtech report are reproduced in the following figure and converted to peak hour volumes adopting the assumption that the peak hour represents 55% of the 2 hour volume.

**Figure 5-8: Manningham Road / NEL Interchange PM Peak 2036 Traffic Volumes**



Source: Smedtech pg 352

- 5.5.9 The projected southbound traffic volumes entering the NEL from Manningham Road is expected to increase in the PM peak period, with in the order of 1100-1210 vph.
- 5.5.10 As per the AM peak period, I believe it is reasonable to assume that a proportion of these vehicles would originate from east of the Yarra River.
- 5.5.11 If a relatively small proportion (say 25%) originate from the east, there would be in the order of 275-300vph undertaking a u-turn on Manningham Road.
- 5.5.12 If approximately half (50%) of motorists originate from the east in the PM peak, then it is anticipated that in the order of 550-600vph would undertake a u-turn manoeuvre on Manningham Road.

- 5.5.13 Even at the lower levels of u-turn movements, 300vph undertaking a u-turn movement would have a significant impact on the existing operation of Manningham Road, requiring a controlled u-turn facility as a minimum.
- 5.5.14 Traffic volumes for the Alternate Design were not included in the Smedtech traffic report, however given that the same arrangement is proposed for southbound movements onto the NEL, it would be reasonable to assume that a similar level of u-turns on Manningham Road west of the Yarra River would occur.

## **5.6 Access Issues with the Reference Design**

### **Northbound Access**

- 5.6.1 I believe the proposed design is counterintuitive for motorists wishing to travel north on the NEL. For example, westbound vehicles on Manningham Road would need to head south on Bulleen Road to then head north on the NEL. Similarly, vehicles wishing to enter NEL from Templestowe Road would also need to head south on Bulleen Road in order to head north on the NEL.
- 5.6.2 When access is separated in such a fashion and requires drivers to head in the opposite direction to that which they intend to travel, effectively signing and directing vehicles to the appropriate access location becomes more difficult.

### **U-Turns on Manningham Road**

- 5.6.3 As shown in the preceding diagrams, all vehicles wanting to travel south on the NEL from Templestowe Road, Manningham Road westbound or Bulleen Road, would need to undertake a u-turn on Manningham Road, west of the NEL, in order to access the southbound on-ramp.
- 5.6.4 There are currently two opportunities to undertake a u-turn on Manningham Road west of the NEL, one at the entry to the Greenery Garden Centre, which is undesirable due to the limited storage and potential conflict with traffic exiting the Garden Centre as there are no traffic signals at this location.
- 5.6.5 The second option is to continue on, to the traffic signals at Dora Street / Manningham Road. This intersection is approximately 900m west of the NEL alignment, resulting in an additional travel distance of at least 1.8km in order for vehicles to access the southbound lanes of the NEL. Furthermore, there is already a large demand for right turns from Manningham Road into Dora Street at this location with 2 right turn lanes provide. It is considered unlikely that the right turn would have sufficient capacity to cope with the additional u-turn traffic.
- 5.6.6 It is further noted that neither existing u-turn location would be appropriate for large trucks to undertake a u-turn manoeuvre.
- 5.6.7 The Reference Design does not extend to the west where u-turns will need to be undertaken and the traffic studies do not appear to have considered or address this issue, which given the high level of potential u-turn movements, is in my opinion an issue that should be addressed by the EES. Discussions with the NELP confirm that u-turn movements were not considered.

### **Access to Bridge Street**

- 5.6.8 The Reference Design does not facilitate access from the NEL northbound off ramp to Bridge Street, even though this traffic signal will be reconfigured and will have an alignment that would allow the through movement to occur.
- 5.6.9 The current design would require vehicles exiting the northbound NEL ramp to turn right into Manningham Road, then left into Bulleen Road in order to access Bridge Street and Templestowe Road.
- 5.6.10 In my opinion the lack of connection to Bridge Street and Templestowe Road beyond would create unnecessary congestion at the Manningham Road / Bulleen Road intersection that could be avoided.

- 5.6.11 A direct connection to Bridge Street appears to be easily achieved given that Bridge Street is being realigned to match into the proposed NEL egress at new traffic signals on Manningham Road.

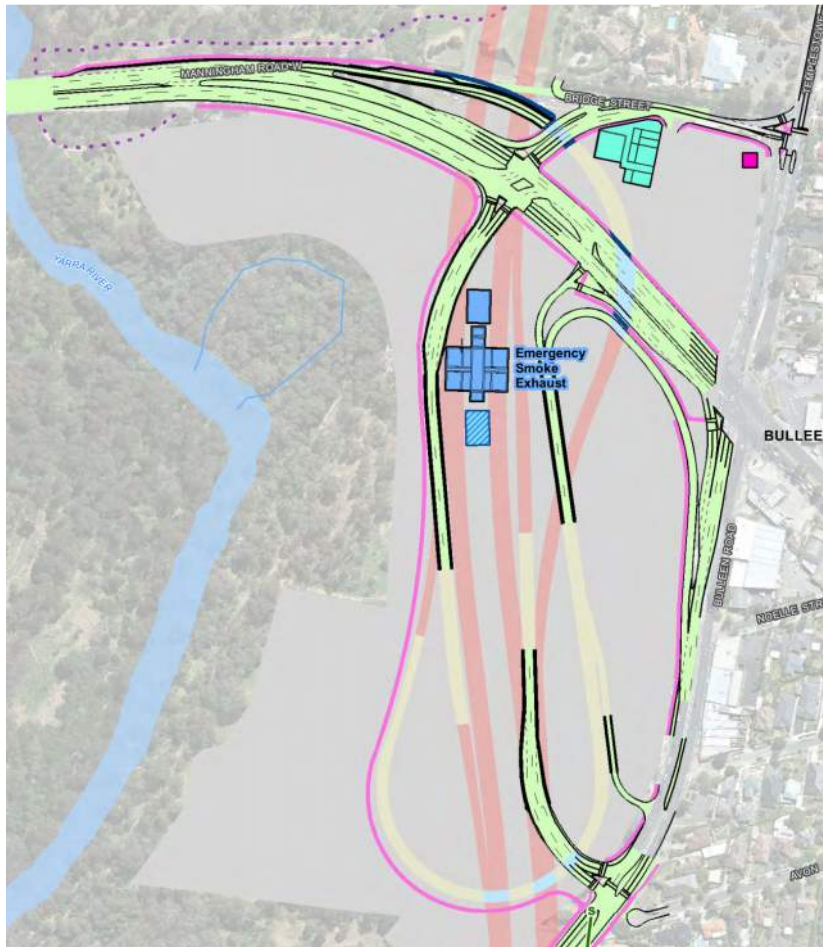
### Reference Design Issues Summary

- 5.6.12 Given the significance of this interchange for both Manningham and other future users of the NEL, the proposed access arrangements at the Manningham Road / Bulleen Road Interchange appear confusing and convoluted.
- 5.6.13 The need for vehicles to undertake a u-turn in order to head south on the NEL is considered highly undesirable. The impact of u-turn movements on Manningham Road would have a significant impact on the operation of Manningham Road and does not appear to be included in the EES analysis.
- 5.6.14 The convoluted nature of the access arrangements is considered likely to cause confusion for motorists. Vehicles that incorrectly access the NEL, will need to proceed to the nearest interchange in order to turn around, which is either Plenty Road Interchange to the north, or Doncaster Road to the south, a one way distance of approximately 4 or 5km respectively.
- 5.6.15 Vehicles finding themselves on NEL heading in the wrong direction have a considerable distance to travel in order to turn around, which emphasises the importance of clear logical access to our freeway network.

## 5.7 Manningham Road Interchange - Alternate Design

- 5.7.1 The Alternate Design is shown in Figure 5-9.

**Figure 5-9: Manningham Rd / NEL Interchange – Alternate Design**



Source: Mapbook Plan 20 of 42

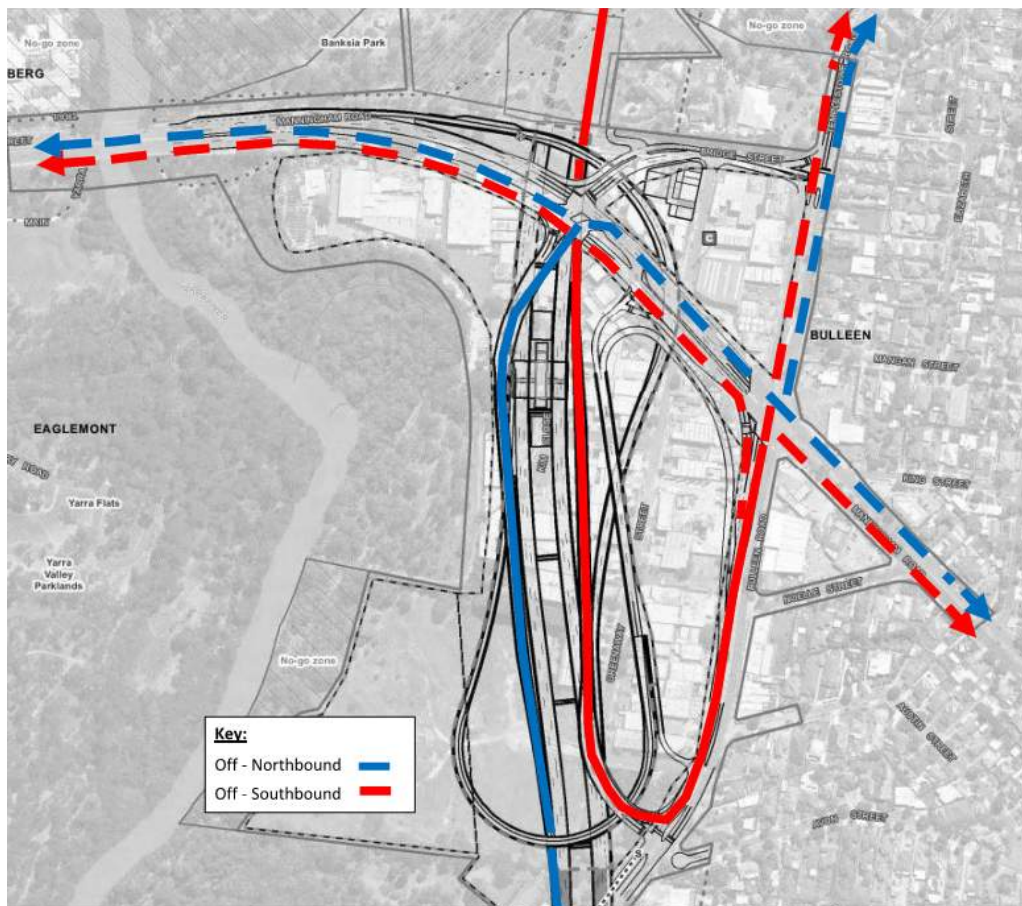


- 5.7.2 The primary difference from the Reference Design to the Alternate Design is the inclusion of on-ramp entries from both Bulleen Road and Manningham Road East, which will eliminate the need for vehicles approaching from the north, east or south to enter at Bulleen Road.
- 5.7.3 The proposed on-ramp is located approximately 50 metres east of the off ramps on Manningham Road, as shown in the preceding figure.
- 5.7.4 The separation between the off ramp and the on ramp on Manningham Road results in a short right turn lane on the western approach to the northbound on ramp, that appears to be unsignalised and as such will rely on gaps in the three westbound traffic lanes on Manningham Road, or courtesy gaps when the traffic comes to a stop at the adjacent traffic signals.
- 5.7.5 As per the Reference Design pedestrian crossings are not shown at the new traffic signal on Manningham Road, limiting the ability of pedestrians and cyclists to travel north south in this location.
- 5.7.6 Access to and from the NEL under the Alternate Design is summarised as follows and diagrammatically shown in the following figures:

**Exit from the NEL**

- 5.7.7 Northbound vehicles will exit the NEL via ramps that connect directly to Manningham Road allowing vehicles to head east or west. As per the Reference Design, no direct access to Bridge Street is proposed at the reconfigured traffic signal on Manningham Road.
- 5.7.8 Southbound vehicles on NEL will exit via ramps connected to traffic signals on Bulleen Road, allowing vehicles to travel north or south along Bulleen Road.

**Figure 5-10: Exiting NEL at Manningham Rd / Bulleen Rd Interchange – Alternate Design**

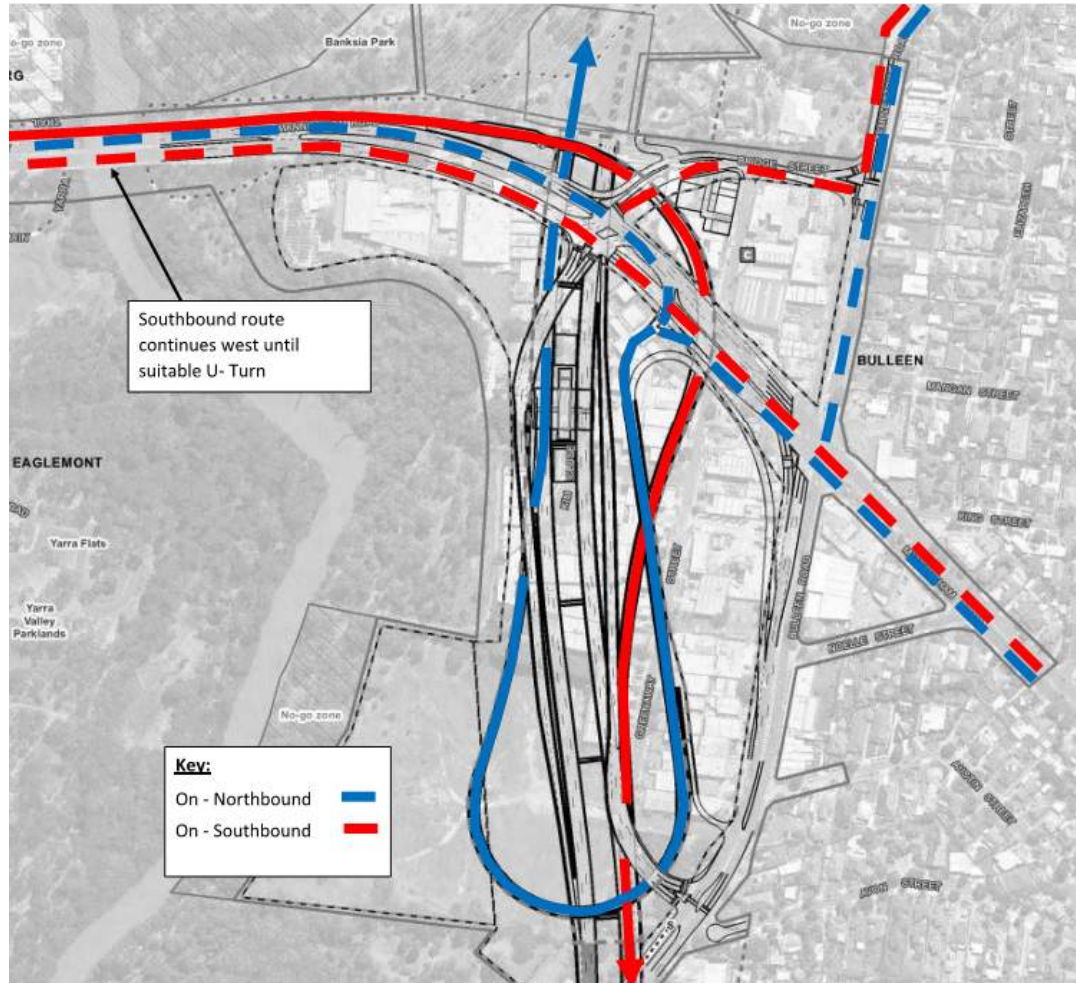




## Entry to NEL

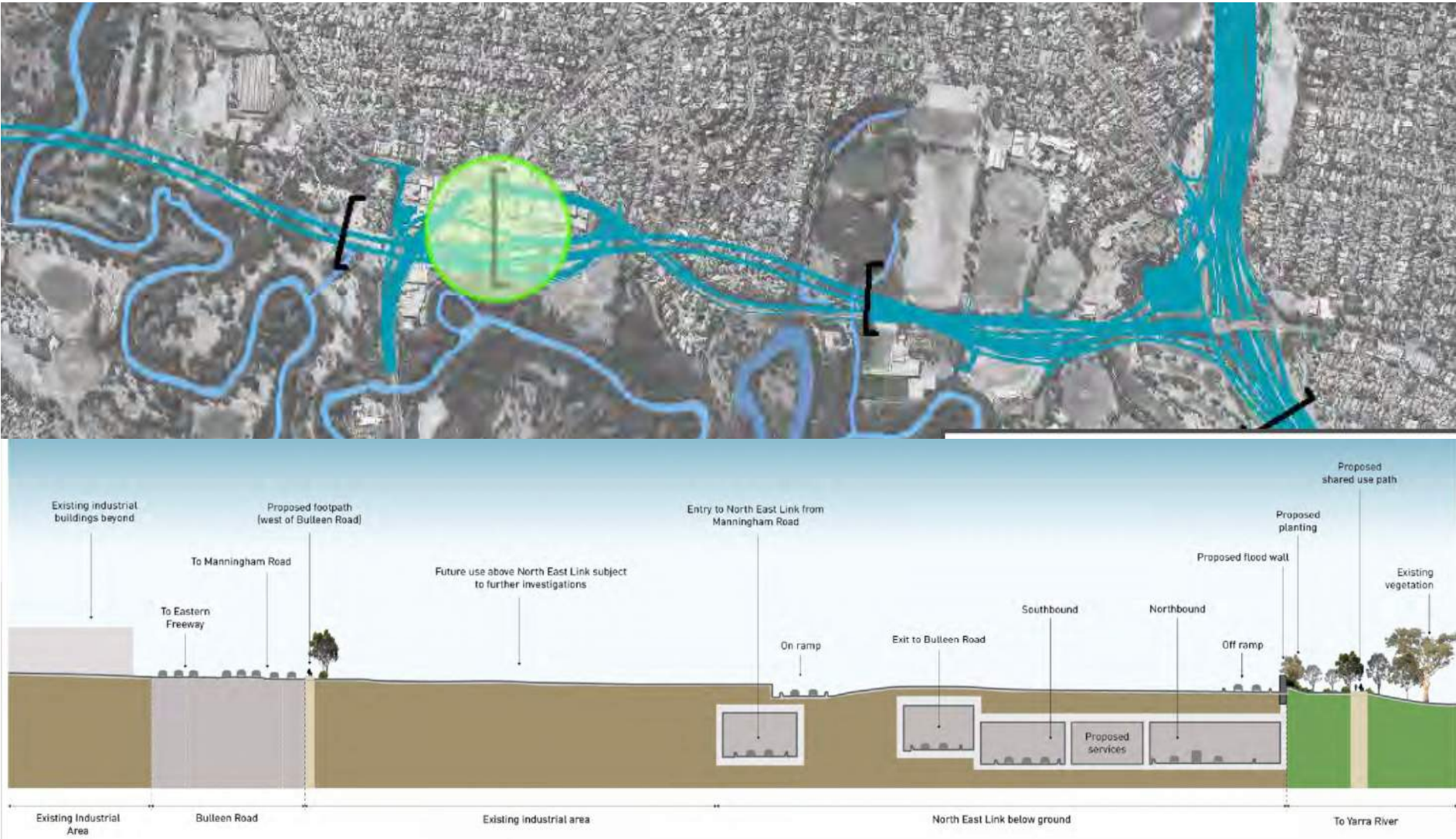
- 5.7.9 The Alternate Design allows vehicles wishing to head north on NEL to enter directly from Manningham Road from either direction. Vehicles approaching from Templestowe Road would need to turn right into Manningham Road and enter the on-ramp, whilst northbound vehicles on Bulleen Road would enter a separate on-ramp that bypasses the Manningham Road / Bulleen Road intersection.
- 5.7.10 Southbound access is the same as the Reference Design, with no alternative suggested to the u-turn on Manningham Road for any vehicle approaching from Templestowe Road, Manningham Road East or Bulleen Road.

**Figure 5-11: Entering NEL at Manningham Rd / Bulleen Rd Interchange – Alternate Design**



- 5.7.11 The proposed cross section for the Alternate Design of the NEL south of Manningham Road is reproduced as Figure 5-12.

Figure 5-12: Alternate Design Cross Section and Location (looking south)



Source: Mapbook Indicative cross sections Sheet 8 of 15



- 5.7.12 The Alternate Design proposes to lower the tunnels by approximately 2.5m deeper than the Reference Design which nominates a minimum of 10m between the Bridge Street ground level and the top of the tunnel.
- 5.7.13 The EES suggests that the lower tunnel would negate the need for significant earthworks on the northern side of Bridge Street.

## **5.8 Sensitivity Analysis of the Reference Design vs Alternate Design**

- 5.8.1 A sensitivity analysis was included in the EES comparing the Alternate Design to the Reference Design at the Manningham Road Interchange. The results are summarised in Table 11.1 of the Smedtech Traffic Report and indicate that the Alternate Design has minimal impact on the surrounding road network compared to the Reference Design. The main difference was a 3% reduction of traffic on Bulleen Road between the Eastern Freeway to Manningham Road. A 2% increase on NEL south of Manningham Rd was also anticipated. The only other differences reported were plus or minus 1%.

## **5.9 Alternate Design Access Issues**

- 5.9.1 The Alternate Design improves access for northbound traffic accessing the NEL, by providing direct access from Manningham Road for vehicles approaching from all directions. However, I have the following concerns with the proposed layout of the Alternate Design:

### **Separated Entry Points on Manningham Road**

- 5.9.2 Although I support the provision of access from Manningham Road to the NEL, the Alternate Design splits the access into three points of entry that require vehicles to merge, prior to entering the 2 lane northbound NEL entry ramp.
- 5.9.3 The complicated access arrangements could easily be consolidated into a single point of entry, that would reduce the amount of roadway required, reduce the number of merge points and reduce the number of pedestrian / bicycle crossings.

### **Short Right Turn Lane on Manningham Road**

- 5.9.4 Traffic volumes on Manningham Road are relatively high and as such an uncontrolled on ramp access (right turn) as proposed is likely to experience lengthy queues and delays particularly in the AM peak.
- 5.9.5 The short right turn lane does not appear to be adequate for the large number of vehicles anticipated to access the NEL from this location. Overqueuing of the right turn lane is highly undesirable and has potential to block the NEL / Bridge Street intersection and cause a safety hazard to eastbound traffic on Manningham Road.

### **U-turns on Manningham Road**

- 5.9.6 The Alternate Design does not appear to address the previous concerns raised about vehicles needing to undertake a u-turn on Manningham Road who are wishing to travel south on the NEL from this location.

## **5.10 Alternative Interchange Design**

- 5.10.1 In my opinion, neither the Reference or the Alternate Design provide a satisfactory access arrangement from the Arterial Road network to what will be one of Melbourne's core circulation routes around the city.
- 5.10.2 If the northbound and southbound entry points to the NEL were combined and incorporated into the proposed traffic signal on Manningham Road, this would resolve all of the issues outlined above as follows:
- The right turn from Manningham Road would not only be controlled by the traffic signals but would also be able to have a much longer turn lane allowing



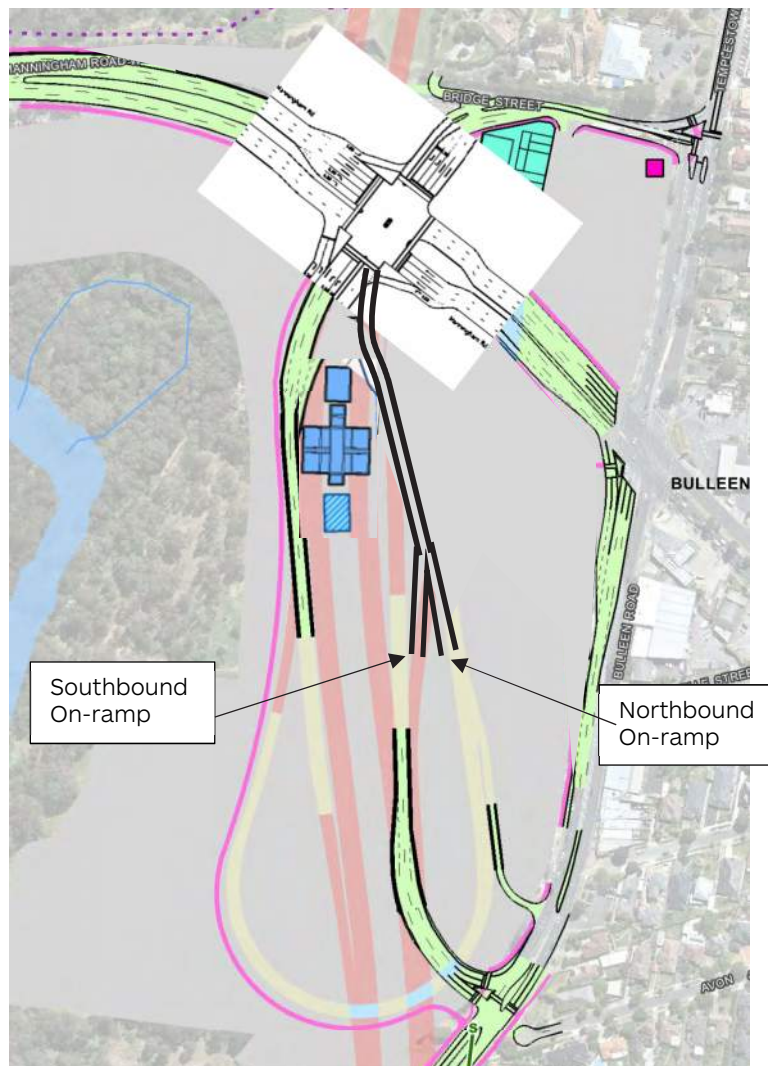
significantly greater storage capacity. There would also be potential for a double right turn lane.

- Vehicles would be able to access the southbound NEL lanes without requiring a u-turn movement on Manningham Road.
- The on ramp and tunnel on the northern side of Manningham Road that is proposed to go under Bridge Street would not be required.
- Direct access to Bridge Street from the NEL would be facilitated, reducing the unnecessary movements on Manningham Road and Bulleen Road to use Templestowe Road.
- Pedestrian and bicycle safety and access would be improved on Manningham Road in the vicinity of the NEL interchange. Pedestrian crossings could be incorporated into the proposed traffic signals at Manningham Road / NEL interchange.

5.10.3 On that basis I have modified the EES Alternate Design and prepared a very basic concept layout that would address my concerns. The proposed concept is indicative only and prepared for the purpose of discussion only. I acknowledge that there are numerous options available, especially given the size of the land acquisition proposed adjacent to the Manningham Road interchange.

5.10.4 An indicative sketch of what the modified intersection would look like is shown in Figure 5-13.

**Figure 5-13: Possible Manningham Road Interchange Concept**



- 5.10.5 As shown in the preceding sketch, the egress for southbound traffic would still need to be retained at Bulleen Road, along with the circular underground loops to provide access for northbound vehicles entering the NEL.
- 5.10.6 The on ramp for southbound vehicles from Manningham Road may need to be extended to the south to accommodate freeway metering and the reduced distance compared to the Reference Designs, however as this entry would be well underground before Bulleen Road, it would seem feasible.
- 5.10.7 The proposed layout would achieve fully directional access, without impacting land north of Bridge Street and without requiring u-turn movements on Manningham Road.
- 5.10.8 It is understood from discussion with NELP that the Manningham Road interchange is expected to operate with a Level of Service D during the AM and PM peak periods with project in 2036. Where Level of Service is defined in the Smedtech report as follows:
- “Level of Service (LoS) - A qualitative measure (from A to F) for ranking operating conditions, based on factors such as traffic density and delays. A Level of Service A represents free flow conditions where individual users are virtually unaffected by the presence of others. A Level of Service F represents flow breakdown with demand exceeding capacity and low comfort and convenience. A road in constant traffic jam is considered Level of Service F.”*
- 5.10.9 The disadvantage of the above arrangement is the potential decrease in Level of Service from what has been modelled in the EES. However, the Level of Service reported is on the basis of an intersection with limited functionality and does not take into account the impact at adjacent intersections.
- 5.10.10 I have not attempted to model the above layout and acknowledge that the incorporation of additional turning movements at the intersection would require additional phases and associated green time, most likely resulting in a decreased Level of Service.
- 5.10.11 In my opinion, the functionality of the intersection should be given priority over a theoretical Level of Service that would most likely decrease over time as traffic volumes and congestion continue to increase.
- 5.10.12 In my opinion, the Reference Design for the Manningham Road interchange needs to provide convenient access rearrangement to motorists wishing to use the NEL, without disadvantaging existing road users and pedestrians in the vicinity of the site.

# 6 Local Access Arrangements Adjacent to Manningham Rd Interchange

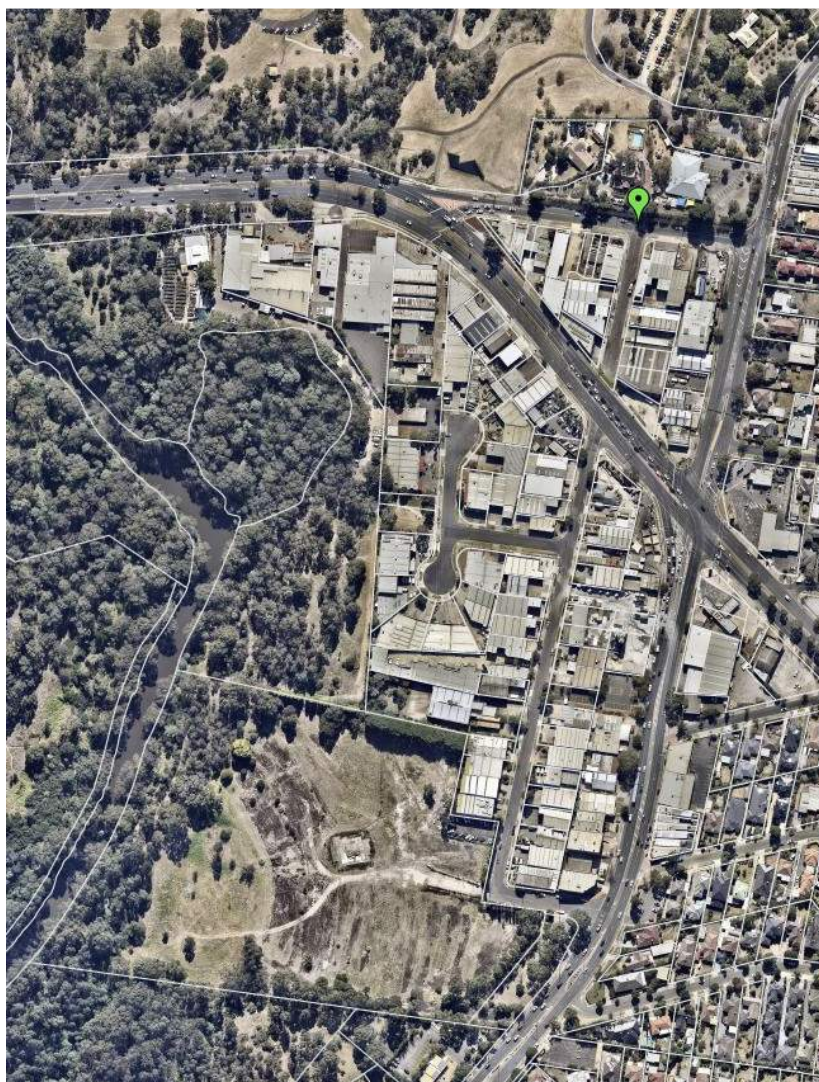
## 6.1 Overview

- 6.1.1 I have been requested to review the existing and future access opportunities for land abutting the proposed Manningham Road interchange. I have taken both the Reference Design and the Alternate Design into account as access to the adjacent land will differ, depending on the ultimate design of the NEL access.

## 6.2 Existing Access Arrangements

- 6.2.1 The area nominated for the Manningham Road / Bulleen Road interchange is currently occupied by the Bulleen Industrial Precinct. Surrounding land use is primarily residential to the east and open space to the north and west which abuts the Yarra River. An aerial view of the interchange area including the existing road network is shown in Figure 6-1.

**Figure 6-1: Aerial View of future Manningham Road / NEL Interchange Location**



Source: [maps.au.nearmap.com](https://maps.au.nearmap.com) (7 April 2019)

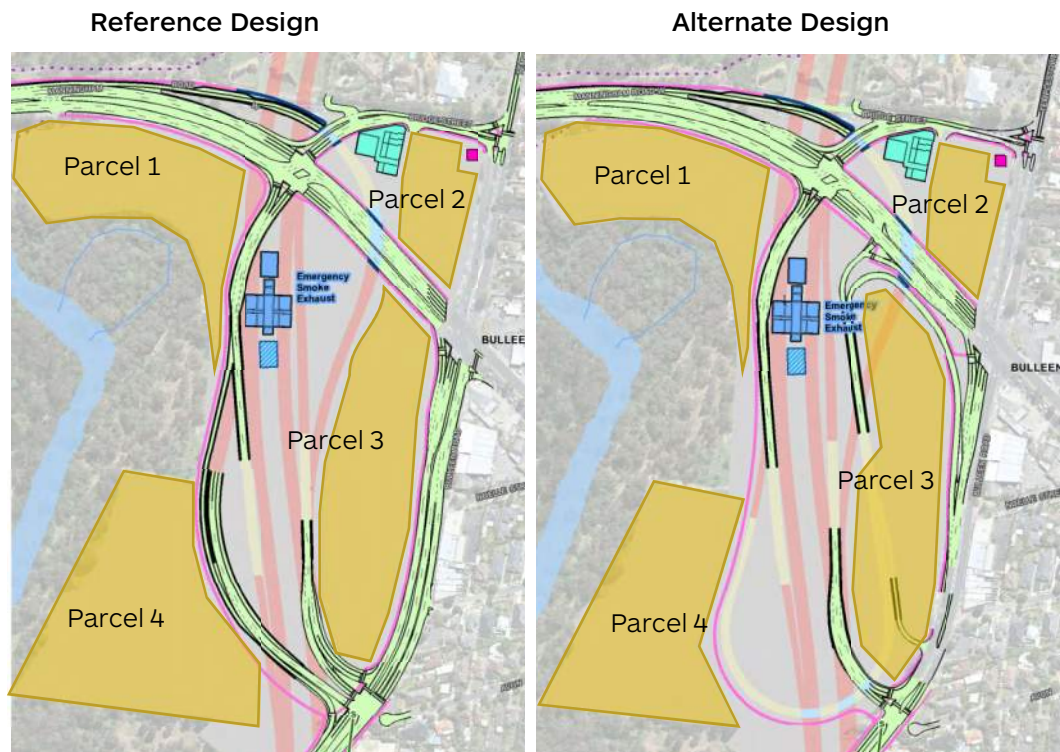


- 6.2.2 Traffic signals are currently provided at the Bulleen Road / Manningham Road intersection and the Bridge Street / Manningham Road intersection.
- 6.2.3 Direct access from the adjacent road is provided to many of the businesses fronting Manningham Road, Bridge Street and Bulleen Road. Greenaway Street currently provides internal access aligned north south in parallel to Bulleen Road.
- 6.2.4 Access along Manningham Road is generally restricted to left in / left out movements only.

### 6.3 Developable Redundant Land

- 6.3.1 The Reference Design does not show access locations to the acquired land surrounding the Manningham Road interchange.
- 6.3.2 The Alternate Design shows some indicative access locations to the future surplus land within the Bulleen Industrial Precinct.
- 6.3.3 In order to visualise the extent of developable land that may be available post NEL construction, I have assumed that the land above the proposed tunnels is not developable along with entry and exit ramps. The 4 land parcels remaining are shown for both the Reference Design and Alternate Design in the following figures:

**Figure 6-2: Surplus Developable Land in the Bulleen Industrial Precinct Post NEL**

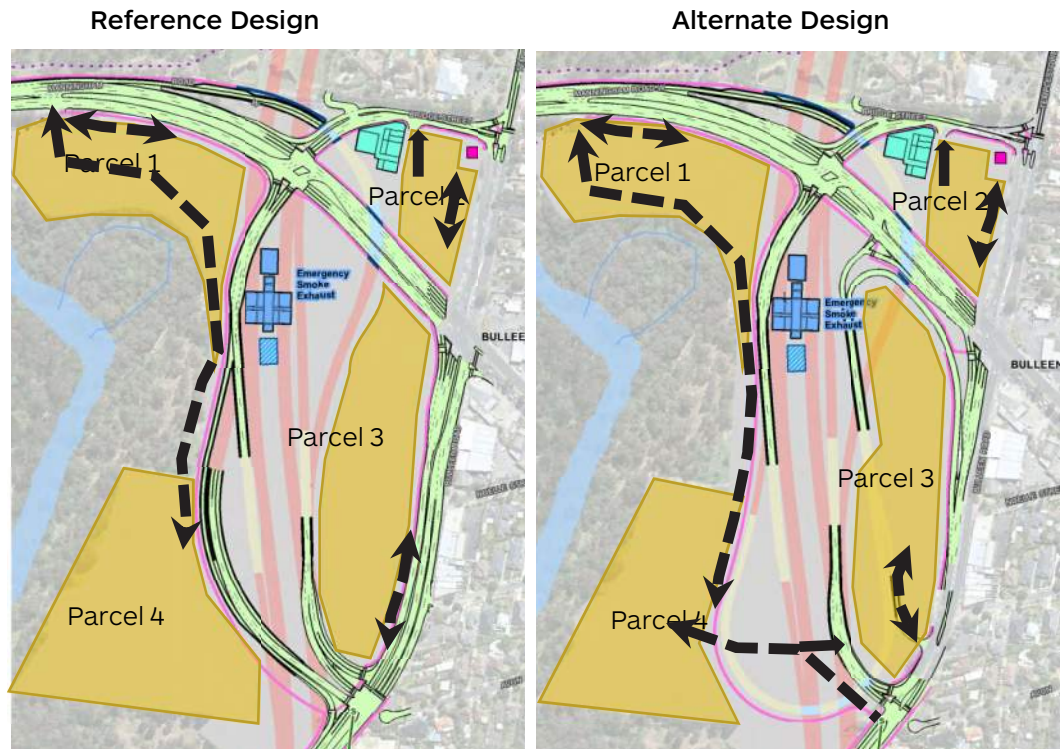


- 6.3.4 It is my expectation that the land shown in yellow above, will be able to be redeveloped post the NEL construction, subject to appropriate vehicular access.
- 6.3.5 As shown in the preceding comparison the useable land at the northern end of the Industrial Precinct will be very similar. The developable area adjacent to Bulleen Road and the portion in the south west corner are larger on the Reference Design compared to the Alternate Design.
- 6.3.6 The areas shown between ramps that are either at grade or open cut are considered unlikely to be developed due to the issue of crossing a freeway on / off ramp.
- 6.3.7 The success of redeveloping the redundant land and the density that can be achieved will be somewhat determined by the limitations of the vehicular access that can be achieved.

## 6.4 Potential Access Opportunities

- 6.4.1 I have undertaken a review of access opportunities and constraints of the four land parcels as shown in the following figure, noting that locations are indicative of access options only and subject to future land use, detailed design and traffic analysis.

**Figure 6-3: Access Opportunities and Constraints to the Surplus Land in the Bulleen Industrial Precinct Post NEL**



- 6.4.2 The preceding access arrangements are summarised as follows:

### Parcel 1

- 6.4.3 Access to redundant land fronting Manningham Road (Parcel 1) will be the same for both the Reference Design and Alternate Design. Access is anticipated to be fairly limited, with access to Manningham Road expected to be restricted to left in / left out movements only.

### Parcel 2

- 6.4.4 Access to Parcel 2, the land fronting Bridge Street, will be the same for both the Reference and Alternate Design. Both design options appear to maintain the existing access at Greenaway Street on Bridge Street.

- 6.4.5 Limited access to Bulleen Road may also be possible, subject to the type and intensity of development.

### Parcel 3

- 6.4.6 Access to the redundant land on the south west corner of the Manningham Road / Bulleen Road intersection is substantially different between the Reference and Alternate Designs.

- 6.4.7 Due to the proposed on-ramp arrangement from both Manningham Road and Bulleen Road shown in the Alternate Design, access is likely to be limited to a location close to the existing southern Greenaway Street on Bulleen Road.



- 6.4.8 By comparison the Reference Design would allow greater flexibility with multiple access opportunities to Bulleen Road. Access is likely to be restricted to left in / left out movements only.

#### **Parcel 4**

- 6.4.9 Parcel 4 will be the most difficult to access. Subject to land availability, both options appear to allow construction of a new road along the western boundary of the NEL ramps. This north south road connecting Parcel 4 with Parcel 1 would allow Parcel 4 to gain access to Manningham Road, noting that such an access is likely to be limited to left in / left out movements only.
- 6.4.10 Under the Reference Design the north south link to Manningham Road is likely to be the only viable access solution. Any other alternative would require further acquisition of land to the south to provide a new connection to Bulleen Road.
- 6.4.11 The Alternate Design has more options to access Parcel 4 as the proposed traffic signal on Bulleen Road is serving southbound movements egressing the NEL at this location. Therefore, the other half of the intersection could be used to provide access to Parcel 4, as indicatively shown on the right hand side of Figure 6-3, with egressing vehicles using the NEL egress.

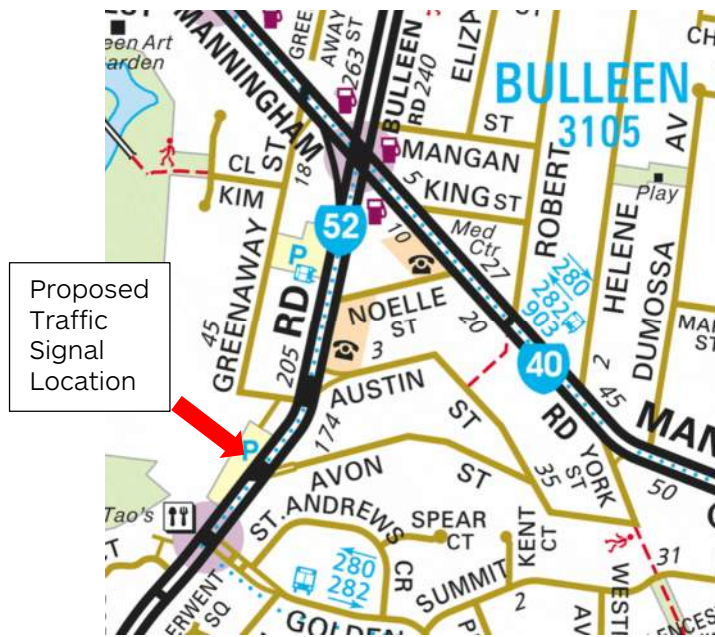
### **6.5 Summary**

- 6.5.1 The introduction of a Freeway interchange on Manningham Road changes the dynamic of the adjacent road network, such that access arrangements that were once deemed appropriate may no longer be suitable, due to the increased traffic activity and change in function to the road network.
- 6.5.2 Consolidation of the interchange as previously suggested in Section 5 and shown in Figure 5-13, would allow greater flexibility of access arrangements in the area. Particularly the consolidation of the northbound on-ramps.
- 6.5.3 The deletion of the southbound on-ramp from the northern side of Manningham Road would also improve access for both vehicles and pedestrians in the area, allowing better access options along Bridge Street. It would also potentially increase the amount of developable land north of Manningham Road as the two triangular pockets of land isolated by the proposed on-ramp would now be accessible.
- 6.5.4 As previously discussed, neither the Reference Design or the Alternate Design for the Manningham interchange are ideal. A redesign of this interchange should include nominated access locations to the land that ultimately won't be required for the NEL.

### **6.6 Avon Street Access**

- 6.6.1 The proposed traffic signal on Bulleen Road, which will provide egress (and/or ingress) for vehicles on NEL will be located opposite Avon Street.
- 6.6.2 Avon Street is a local road aligned east west between Austin Street and Bulleen Road. Avon Street is approximately 300 metres in length.
- 6.6.3 Avon Street, along with Austin Street and York Street form an isolated residential pocket, with left in / left out access from Manningham Road via York Street, and fully directional unsignalised access to Bulleen Road at Avon Street, with left in / left out at Austin Street, as shown in Figure 6-4.

**Figure 6-4: Avon Street and surrounding road network**



Source: [www.melway.com.au](http://www.melway.com.au)

- 6.6.4 Avon Street currently has fully directional access at Bulleen Road, with a median break including a right turn deceleration lane on Bulleen Road.
- 6.6.5 Austin Street provides left in / left out movements at Bulleen Road and although right turn ins are not banned the linemarking and lane configuration on Bulleen Road appears to discourage right turn in movement.
- 6.6.6 Avon Street provides access for approximately 38 dwellings, Austin Street serves approximately 36 dwellings and York Street provides access to a further 10 dwellings. In total there are approximately 84 dwellings using Austin, Avon and/or York Street for access.
- 6.6.7 Both options within the EES Mapbook, for the future NEL interchange at Manningham Road propose a new traffic signal on Bulleen Road opposite Avon Street. Both options include truncating Avon Street and providing a courtbowl at its western end.
- 6.6.8 It is noted that connection to Avon Street was one of the options considered during the project development phase.
- 6.6.9 Truncating Avon Street would directly impact the residents on Avon Street, and indirectly impact residents on Austin Street and York Street. All residents on Avon Street would need to travel east along Avon Street and then exit to the arterial road network via York Street or Austin Street.
- 6.6.10 With 38 existing dwellings, it is estimated that Avon Street generates in the order of 300 vehicle movements per day, which would be solely reliant on York Street and Austin Street for access.
- 6.6.11 The adjacent local road network appears to have sufficient capacity to accommodate the diverted traffic volumes. The issue with truncating Avon Street is primarily related to the constrained access conditions at York Street and Austin Street. As both the intersection of York Street / Manningham Road and Austin Street / Bulleen Road are effectively left in / left out there will be a number of u-turn movements on the adjacent arterial road network associated with the closure of Avon Street.
- 6.6.12 Access from Avon Street could be accommodated at the new traffic signals as a fourth leg, or alternatively as a left in / left out depending on the size and design of the adjacent traffic signal.

- 6.6.13 The GTA peer review (Appendix A of Smedtech Report pg 536) states that: *“there may be an option for Avon to be left in / left out which should be explored before full truncation is adopted.”*
- 6.6.14 The difficulty with providing access from Avon Street to Bulleen Road is that a fourth leg reduces the capacity of the new traffic signal, effectively taking time away from through movements on Bulleen Road.
- 6.6.15 Inclusion of Avon Street with the new traffic signals may promote an undesirable rat run situation between Manningham Road and the new signals on Bulleen Road, which may require local traffic management along Avon Street to mitigate.
- 6.6.16 I support Manningham Council's submission regarding access to Avon Street and Austin Street, suggesting that it be resolved through a consultative process with Manningham Council and input from local residents.

# 7 Traffic Volumes and Road Function:

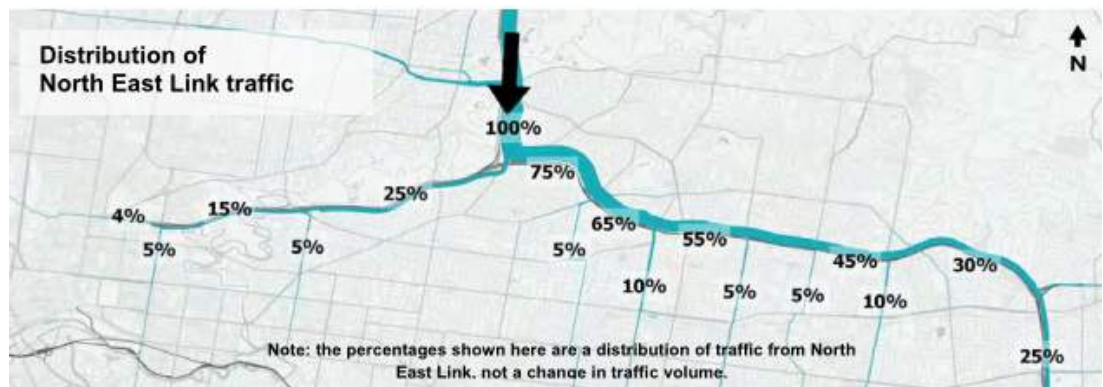
## 7.1 Overview

- 7.1.1 I have reviewed the proposed traffic volumes on the following key roads within the City of Manningham and make the following observations, in relation to:
- Bulleen Road, north of the NEL
  - Templestowe Road
  - Manningham Road
  - Thompsons Road
- 7.1.2 The EES traffic analysis indicates that traffic volumes throughout the Manningham Council area are likely to decrease in the 'With Project' scenario compared to the 'Without Project' scenario.
- 7.1.3 The primary increases to traffic volumes are anticipated on all arterial roads south of the Eastern Freeway, which instead of using roads through Manningham are expected to use the Eastern Freeway instead to access the NEL.
- 7.1.4 The exception to this will be Bulleen Road, north of the Eastern Freeway, which does not provide access to the NEL until the Manningham Road interchange.

## 7.2 Bulleen Road

- 7.2.1 The following distribution is included in the Smedtech Traffic Report, which shows where southbound vehicles using the NEL will exit the Eastern Freeway.

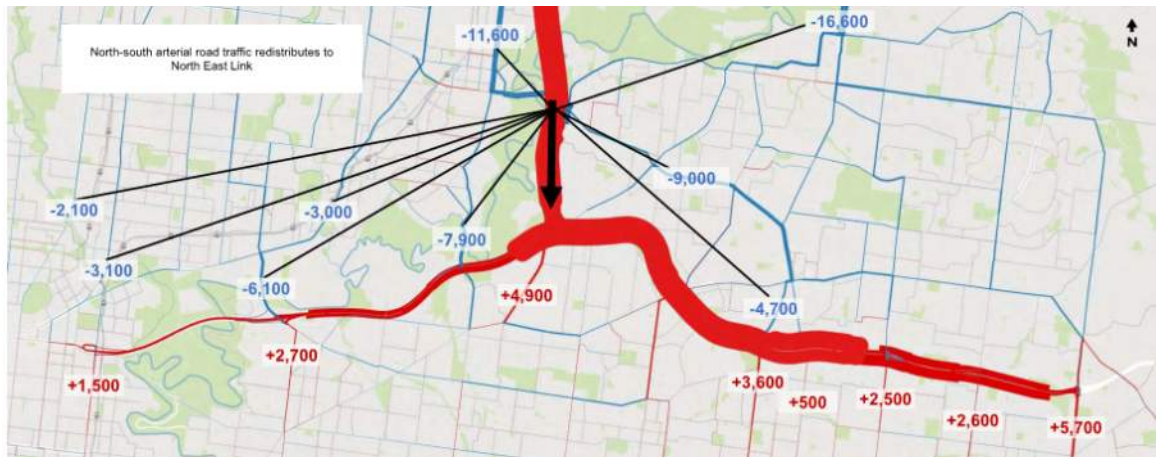
**Figure 7-1: Distribution of southbound North East Link Traffic using the Eastern Freeway 2036 'with project'**



Source: Smedtech Traffic Report Figure 9-27

- 7.2.2 The preceding figure aims to demonstrate the percentage of vehicles using NEL and egressing along the Eastern Freeway. As there is no exit (or entry) at Eastern Freeway / Bulleen Road interchange, southbound vehicles would have exited at the Manningham Road interchange and then proceeded south on Bulleen Road, these movements have been excluded from the preceding diagram.
- 7.2.3 The following figure in the Smedtech report does include the projected increase in traffic volumes on Bulleen Road, south of the Eastern Freeway. However, it does not specifically outline the projected increase on Bulleen Road between the Eastern Freeway and Manningham Road.

**Figure 7-2: Daily Traffic Redistribution near the Eastern Freeway 2036 With Project vs 2036 No Project**



Source: Smedtech Traffic Report Figure 9-28

7.2.4 The change to traffic volumes on Bulleen Road based on the Smedtech Traffic Assessment are summarised in the following table.

**Table 7.1: Bulleen Road Traffic Volumes**

Road and Segment	Direction	Existing 2017		2036 Without Project		2036 With Project		Difference between Existing and With Project	
		Range (vpd)	Range (vpd)	Range (vpd)	Range (vpd)	Range (vpd)	Range (vpd)		
Bulleen Rd, North of Eastern Fwy	NB	21000	27000	23000	30000	23000	30000	2000	3000
	SB	18000	23000	20000	26000	21000	28000	3000	5000
	<b>Two Way</b>	<b>39000</b>	<b>50000</b>	<b>43000</b>	<b>56000</b>	<b>44000</b>	<b>58000</b>	<b>5000</b>	<b>8000</b>
Bulleen Rd, South of Eastern Fwy	NB	7000	8000	7000	9000	9000	12000	2000	4000
	SB	6000	8000	6000	8000	9000	11000	3000	3000
	<b>Two Way</b>	<b>13000</b>	<b>16000</b>	<b>13000</b>	<b>17000</b>	<b>18000</b>	<b>23000</b>	<b>5000</b>	<b>7000</b>

Source: Smedtech Traffic Report

7.2.5 As shown in the preceding table, the traffic volumes are predicated to increase from existing conditions by 5,000 to 8,000 vehicles per day north of the Eastern Freeway (and by a similar amount south of the Eastern Freeway) after the NEL is constructed. This level of increase would result in two-way daily traffic volumes of between 44,000 to 58,000 vehicles per day on Bulleen Road.

7.2.6 Traffic volumes on Bulleen Road are expected to remain considerably higher north of the Eastern Freeway compared to south of the Eastern Freeway, typically 26,000 to 35,000vpd higher.

7.2.7 The cross section of Bulleen Road north of the Eastern Freeway is typically 2 through lanes in each direction, which has a theoretical capacity of 36,000 vpd. While it is acknowledged that many roads in Melbourne exceed their theoretical capacity and continue to perform satisfactorily, I find the assumption that it could carry up to 58,000 vpd in its current state optimistic.

7.2.8 In regard to traffic volumes on Bulleen Road, the Smedtech Traffic Report (pg 323) states the following:

*“The majority of additional northbound traffic along Bulleen Road south of the Eastern Freeway originates from the Boroondara area, particularly the areas of Kew and Balwyn. These areas are predicted to utilise Bulleen Road south of the freeway to take*



advantage of decongestion north of the freeway, and to access North East Link. **Approximately 34% of traffic travelling northbound along Bulleen Rd south of the Eastern Freeway is predicted to access NEL at the Manningham Road interchange.**"

- 7.2.9 Applying the preceding comment to the estimated 'with project' traffic volumes shown in Table 7.1, results in approximately 7820 -10200vpd travelling northbound on Bulleen Road to access the NEL at the Manningham Road interchange. Assuming a similar number use Bulleen Road in a southbound direction, would result in approximately 15,600-20,400 vpd using Bulleen Road north of the Eastern Freeway to access NEL.
- 7.2.10 Smedtech go onto to say that the redistribution of traffic to Bulleen Road is a change to current traffic patterns, with a large proportion of the catchment now coming from the Kew / Balwyn area.
- 7.2.11 Other arterial roads south of the Eastern Freeway are expected to continue serving the same catchment areas, with increased volumes to access the NEL via the Eastern Freeway.
- 7.2.12 Smedtech state that Bulleen Road between Manningham Road and Eastern Freeway will be downgraded from GT2 to GT3. Under the Transport for Victoria guidelines on Movement and Place this means that Bulleen Road would change from GT2, which is defined as providing for significant movement of people by private vehicle to GT3, which is defined as a moderate movement of people by private vehicle. Although it is not clear what this means in reality, it doesn't seem to match the anticipated traffic function of this section of Bulleen Road.
- 7.2.13 Based on the preceding discussion, it is my opinion that the NEL will add considerable traffic to Bulleen Road north of the Eastern Freeway and whilst this may be offset by the redistribution of existing traffic patterns, the overall result is that the NEL will increase traffic volumes on Bulleen Road above what could be expected without the project.
- 7.2.14 Additional traffic volumes on Bulleen Road due to the NEL will necessitate the signalisation of existing uncontrolled access points that are to be maintained.
- 7.2.15 Theoretically the downgrade in function to focus on local access and travel modes other than private vehicles would be supported, however as this section of Bulleen Road will provide direct access to the NEL, with traffic volumes of up to 58,000 vehicles per day, it does not seem appropriate at this point in time.

### 7.3 Templestowe Road

- 7.3.1 A review of the EES traffic modelling suggests that Templestowe Road has the following existing and projected traffic volumes:

**Table 7.2: Daily Traffic Volumes – Templestowe Road near Birranung Park**

Road and Segment	Direction	Existing 2017		2036 Without Project		2036 With Project		Difference between Existing and With Project	
		Range (vpd)		Range (vpd)		Range (vpd)		Range (vpd)	
Templestowe Rd, near Birranung Park	EB	8000	11000	14000	18000	14000	18000	3000	7000
	WB	7000	10000	13000	17000	11000	14000	4000	4000
	<b>Two Way</b>	<b>15000</b>	<b>21000</b>	<b>27000</b>	<b>35000</b>	<b>25000</b>	<b>32000</b>	<b>7000</b>	<b>11000</b>

Source: Smedtech Traffic Report

- 7.3.2 As shown in the preceding table, Templestowe Road is anticipated to carry in the order of 25,000 to 32,000 vehicles per day, which is 7000 to 11000 vehicles per day more than the existing traffic volumes.
- 7.3.3 It is noted that without the project, the traffic volumes are predicted to be even higher with between 27000 to 35000 vehicles per day.



- 7.3.4 Templestowe Road currently has a carriageway providing one through traffic lane in each direction. The theoretical capacity of a 2 lane arterial road is 18,000 vehicles per day. The existing traffic volumes of between 15000 to 21000 vehicles per day indicate that Templestowe Road is currently operating close to capacity.
- 7.3.5 The traffic modelling prepared for the EES, assumes that Templestowe Road is duplicated under both with and without project conditions.
- 7.3.6 The projected traffic volumes clearly indicate that a duplicated carriageway will be required by the 2036 analysis time frame, however this may be a cause and effect scenario, whereby the assumption of duplication adopted, then allows the model to use the increased capacity to distribute more vehicles to Templestowe Road than if it was maintained as a 2 lane road.
- 7.3.7 An assumption that Templestowe Road was not duplicated would force the additional traffic to use alternate routes once the capacity was absorbed.
- 7.3.8 In my opinion, the duplication of Templestowe Road could be linked to one or more of the three following scenarios:
- 1 **Duplication Assumption:** Assuming that Templestowe Rd is duplicated doubles its capacity from existing conditions and allows the model to increase traffic volumes expected to use it.
  - 2 **Growth:** Growth in through volumes generated by future redevelopment on the northern side of Templestowe Road and/or increased through traffic from other sources.
  - 3 **North East Link:** The access arrangements to NEL, creating a new destination that would attract traffic from the north east.
- 7.3.9 The EES does not include an analysis of Templestowe Road without duplication for comparison purposes.
- 7.3.10 As discussed earlier, the primary access to the NEL for vehicles using Templestowe Road will most likely be the Manningham Road interchange, resulting in an increased traffic demand at the western end of Templestowe Road due to the NEL.
- 7.3.11 The relocation of sporting facilities to north of Templestowe Road partly associated with the loss of facilities at Bulleen Park, may also result in a redistribution of traffic to Templestowe Road.
- 7.3.12 The intersection analysis of Templestowe Road / Bridge Street indicates that the future conditions 'without project' would operate with a Level of Service A, decreasing to a Level of Service D 'with project' during both the AM and PM peak hours.
- 7.3.13 It is noted that the Level of Service D applies to the southern leg of the intersection, if Bridge Street was provided with a direct connection to NEL as discussed in Section 5, this would have a significant impact on the analysis undertaken to date.
- 7.3.14 The peak hour analysis clearly indicates that the NEL will have an adverse impact on the Templestowe Road / Bridge Street intersection compared to the 'without project' scenario.
- 7.3.15 On the basis of the above discussion and the information provided in the EES, Manningham Council's request, that Templestowe Road be upgraded as part of the NEL project appears to be reasonable in my opinion.

## 7.4 Thompsons Road

- 7.4.1 Thompsons Road, north east of the Eastern Freeway has a four lane cross section providing two lanes of traffic in each direction.
- 7.4.2 The anticipated existing and future (2036) traffic volumes are summarised in Table 7.3.

**Table 7.3: Daily Traffic Volumes - Thompsons Road, north east of Eastern Freeway**

Road and Segment	Direction	Existing 2017		2036 Without Project		2036 With Project		Difference between Existing and With Project	
		Range (vpd)		Range (vpd)		Range (vpd)		Range (vpd)	
Thompsons Rd, north-east of Eastern Fwy	EB	10000	12000	11000	14000	10000	13000	0	1000
	WB	11000	15000	13000	16000	12000	16000	1000	1000
	<b>Two Way</b>	<b>21000</b>	<b>27000</b>	<b>24000</b>	<b>30000</b>	<b>22000</b>	<b>29000</b>	<b>1000</b>	<b>2000</b>

Source: Smedtech Traffic Report

- 7.4.3 As shown in the preceding table, traffic volumes on Thompsons Road north east of the Eastern Freeway are not expected to change significantly between the with or without project or from existing conditions.
- 7.4.4 The existing and future traffic volumes are within the theoretical capacity of a 4 lane arterial road.

## 7.5 Barak Street

- 7.5.1 Council's submission (Comment 74) states the following:  
*"During construction, access to the Trinity Grammar playing fields will be diverted from Bulleen Road to Barak Street. Council seeks the signalisation of the intersection of Barak Street and Thompsons Road to ensure safe and efficient access during this period."*
- 7.5.2 Barak Street is a local road aligned north south between Thompsons Road to the south and Rocklea Road to the north. Barak Street currently provides access to numerous residential dwellings, the Trinity Grammar School sporting complex, Marcellin College Junior and Senior School campuses, as well as a Kindergarten located off Rocklea Road.
- 7.5.3 Since Council's submission, I have been instructed that NELP will no longer seek to use Barak Street as a diversion route and will provide an alternative access from Bulleen Road.
- 7.5.4 Given the sensitive land uses currently using Barak Street alternative access from Bulleen Road is considered appropriate.

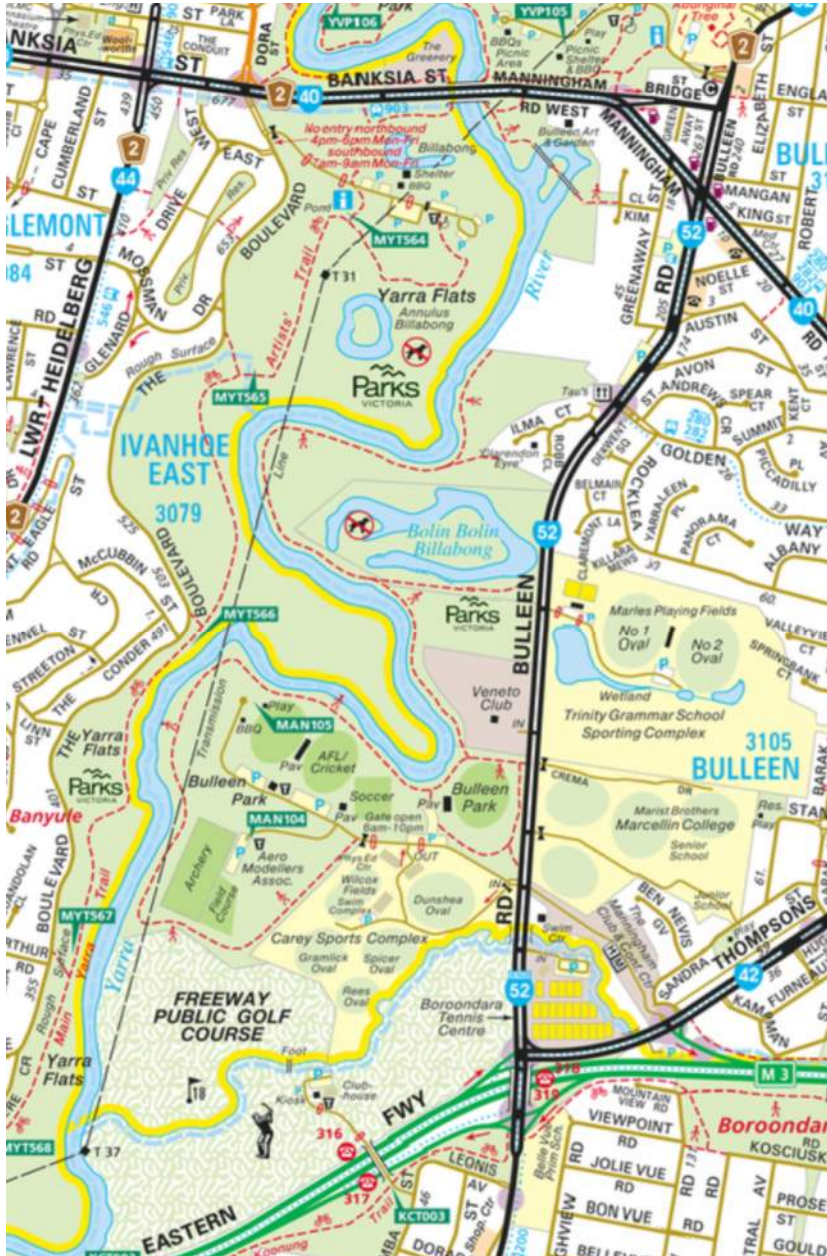


# 8 Access to Bulleen Park from Bulleen Road

## 8.1 Bulleen Park

8.1.1 Bulleen Park is located on the western side of Bulleen Road in Bulleen, generally bound by the Yarra Flats area to the north, Bulleen Road to the east, Eastern Freeway to the south and the Yarra River to the west as shown in Figure 8-1.

**Figure 8-1: Bulleen Park in Bulleen**



Source: [www.melway.com.au](http://www.melway.com.au)

- 8.1.2 Bulleen Park contains sporting facilities accommodating football, soccer, cricket, archery and aeromodelling, playgrounds, car parking, picnic facilities and amenities.
- 8.1.3 Bulleen Park also contains recreational walking and cycling trails.

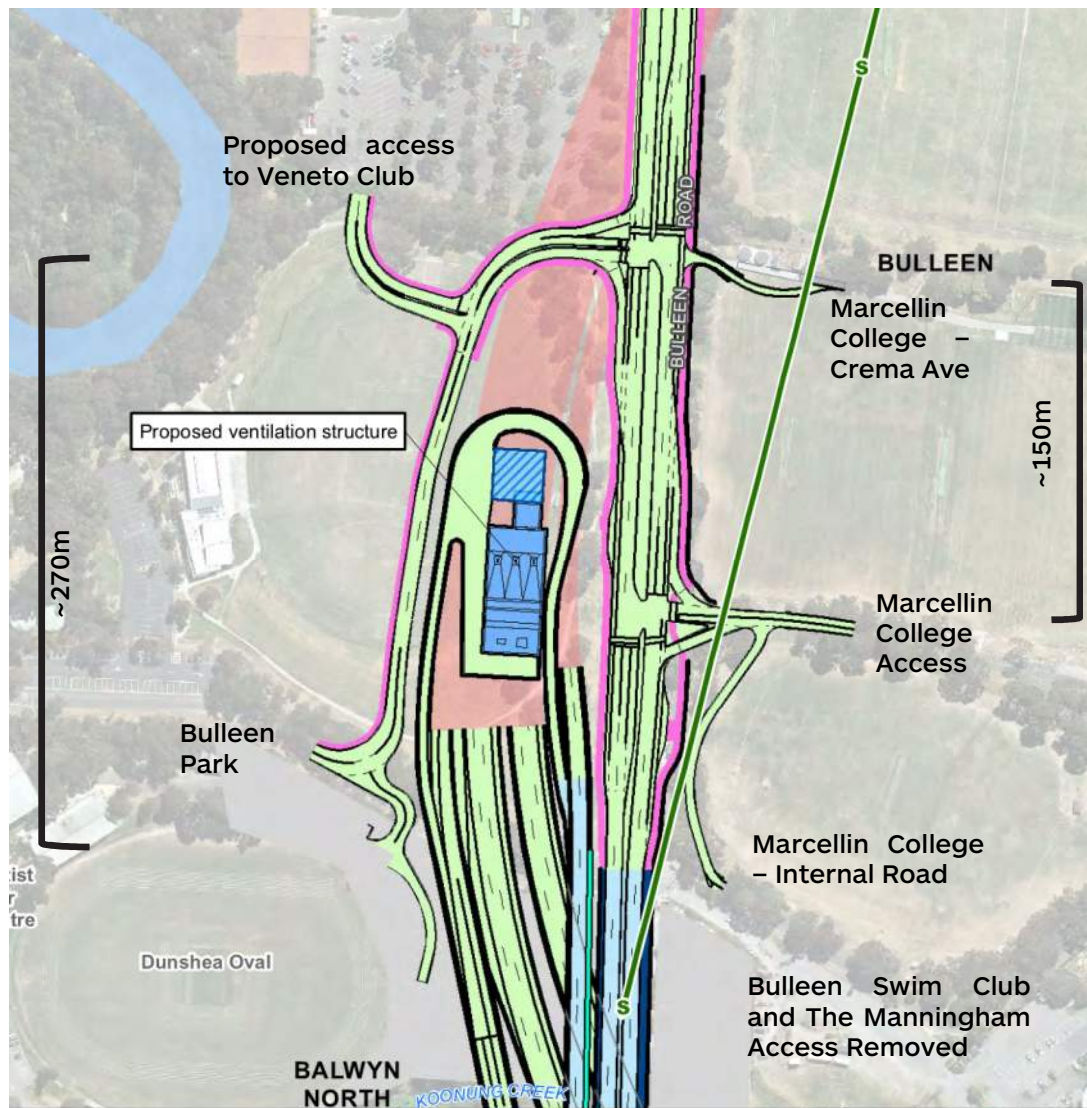
## **8.2 Existing Access Arrangements**

- 8.2.1 Vehicular, pedestrian and cycle access is currently available via Bulleen Road only, with no crossings of the Yarra River available between Manningham Road to the north and the Eastern Freeway to the south.
- 8.2.2 Vehicular access is currently provided at a single unsignalised cross intersection, on Bulleen Road, which also provides access to the Carey Grammar Sports Complex on the western side and The Manningham Club and Bulleen Swim Centre on the eastern side.

## **8.3 Proposed Access Arrangements**

- 8.3.1 The NEL Reference Design proposes a ventilation stack west of Bulleen Road located on top of the existing vehicle access to Bulleen Park. The NEL proposes to transition from above ground to underground immediately south of the proposed ventilation structure.
- 8.3.2 The eastbound and westbound lanes from the Eastern Freeway also merge and diverge at this location, creating a wider cross section on the NEL of 5 lanes in each direction at this location. A cross section of the NEL at this location has not been included in the Mapbook.
- 8.3.3 An access road, that circumnavigates the ventilation structure, is also proposed with access to and from the south on the NEL.
- 8.3.4 As the proposed ventilation structure will delete the existing access to Bulleen Park, the plans propose to construct an access approximately 270m to the north of the existing access, opposite the existing access to Marcellin College (Crema Ave). This access will be signalised as part of the NEL project. The existing Bulleen Park access will be removed. A new signalised T-intersection will also be provided on Bulleen Road that will signalise the existing access to Marcellin College.
- 8.3.5 Access to The Manningham Club and the Bulleen Swim Centre will be removed, with all vehicular access proposed via Thompsons Road. The Bulleen Swim Centre is to be acquired. It is noted that the proposed elevation of Bulleen Road at this location would make retention of the access very difficult.
- 8.3.6 A new road will be constructed from the relocated Bulleen Park Access to the existing internal road network. This road will follow the western side of the ventilation stack and bisect the existing oval.
- 8.3.7 The proposed traffic signal at Crema Avenue will also provide access to the Veneto Club. The Veneto Club currently has direct access from Bulleen Road, which will presumably be removed once the new access is constructed.
- 8.3.8 The proposed access arrangements shown in the Reference Design are reproduced and annotated as Figure 8-2.

**Figure 8-2: NEL Reference Design Showing Access to Bulleen Park**



8.3.9 As shown in the preceding figure, the NEL will occupy approximately half of the existing oval.

## 8.4 Design Considerations

### Signal Locations

- 8.4.1 As shown in the preceding figure, it is proposed to locate two new traffic signals on Bulleen Road. The signals will be approximately 150m apart. In my experience this is far closer than the typical minimum desirable spacing of 400m. The close proximity of the signals may result in drivers, driving through red lights, as they are focused on the further signal rather than the immediate set of lights, known as the see-through effect.
- 8.4.2 Queuing may also be an issue, with queues on Bulleen Road during peak times likely to extend beyond 150m, resulting in vehicles unable to exit the side roads due to queues on Bulleen Road.
- 8.4.3 The close proximity will also necessitate that the two signals operate in unison to ensure priority on Bulleen Road is maintained. This is likely to lead to inefficiencies on the minor legs as the peak traffic activity associated with Marcellin College is unlikely to coincide with peak activity at Bulleen Park or the Veneto Club.



- 8.4.4 The traffic signal design also shows slip lanes both into and out of the minor intersection legs. Slip lanes can increase the efficiency of the intersection but are usually avoided in areas of high pedestrian activity.
- 8.4.5 Given the surrounding land uses of education and recreation, I believe the traffic signals in the Reference Design should be altered to show standard left turn lanes on all approaches where required.
- 8.4.6 A standard left turn lane reduces the speed vehicles enter the minor road and reduces the crossing distance for pedestrians.

#### **Pedestrian Access**

- 8.4.7 Shared paths are proposed on both sides of Bulleen Road, which will improve north south pedestrian and bicycle access along Bulleen Road.
- 8.4.8 However, pedestrian access to Bulleen Park and the Yarra River from Bulleen Road, and land uses south of the proposed entry to Bulleen Park, will be restricted to the new signalised intersection.
- 8.4.9 The proposed intersection is approximately 270 metres further north than the existing access location.
- 8.4.10 The elevation of Bulleen Road and the construction of the NEL will effectively remove any pedestrian access to the east from south of the Eastern Freeway to the proposed traffic signal, a distance of approximately 850 metres.
- 8.4.11 In my opinion, improved permeability for pedestrians and cyclists should be considered during the detailed design process to improve connectivity between the various land uses and Bulleen Park, particularly for residents south of the Eastern Freeway, east of Bulleen Road and west of the Yarra River.

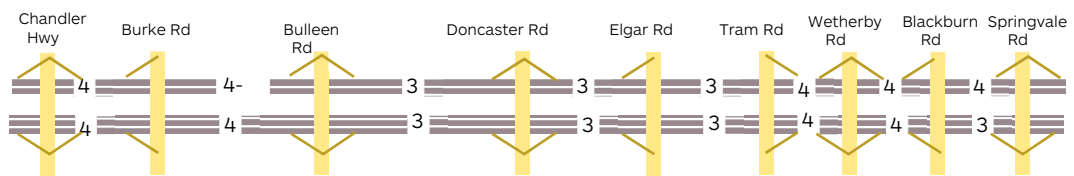


# 9 Eastern Freeway Widening

## 9.1 Existing Conditions

- 9.1.1 The Eastern Freeway currently provides an east west connection between Hoddle Street and Springvale Road. The Eastern Freeway continues as Eastlink east of Springvale Road providing a north south link between the Eastern Freeway and the Mornington Peninsula.
- 9.1.2 The Eastern Freeway forms the southern border of the Manningham municipal area, which extends approximately 10 kilometres from Bulleen Road to the eastern end of the Eastern Freeway.
- 9.1.3 Fully directional interchanges are provided at Bulleen Road and Springvale Road with a further 5 interchanges in-between, providing either a half or full diamond interchange.
- 9.1.4 Between Bulleen Road and Springvale Road the Eastern Freeway currently has between 3 to 4 through lanes, as shown on the following figure.

**Figure 9-1: Existing Through Lanes on Eastern Freeway East of Bulleen Rd**



## 9.2 Proposed Widening

- 9.2.1 Extensive widening of the Eastern Freeway is proposed from Bulleen Road to Springvale Road in conjunction with the NEL project.
- 9.2.2 The proposed widening will increase the number of through lanes from 3-4 lanes to 4-8 lanes between Bulleen Road and Springvale Road. The proposed number of through lanes are shown on the following figure.

**Figure 9-2: Proposed Through Lanes on Eastern Freeway East of Bulleen Road**



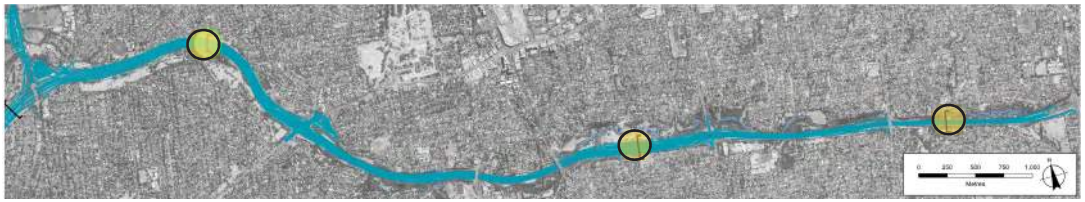
Source: Smedtech Traffic Report (Figure 9-4 – Eastern Freeway upgrades)

- 9.2.3 As shown in the preceding figure, a 3 lane ‘Expressway’ is proposed in each direction. The Expressway will commence east of Bulleen Road and continue to Middleborough Road in the eastbound direction. The proposed Expressway will commence after Tram Road / Station Street in the westbound direction and finish just west of Bulleen Road.

## 9.3 Proposed Cross Sections

- 9.3.1 Indicative cross sections were included in the EES Mapbook of the future Eastern Freeway, including 3 locations east of the NEL, as shown in Figure 9-3.

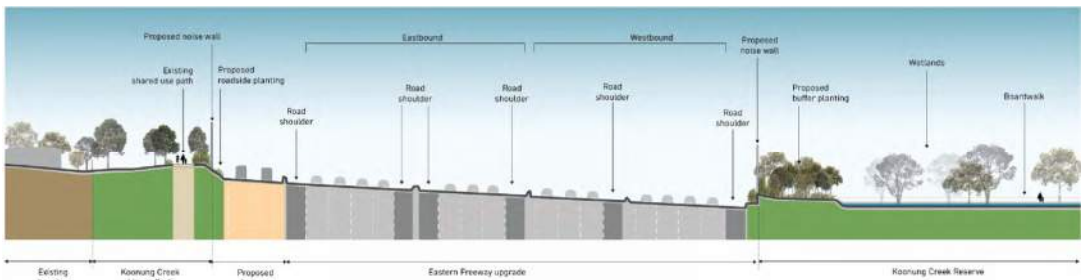
**Figure 9-3: Location of Indicative Eastern Freeway Cross Sections, east of NEL**



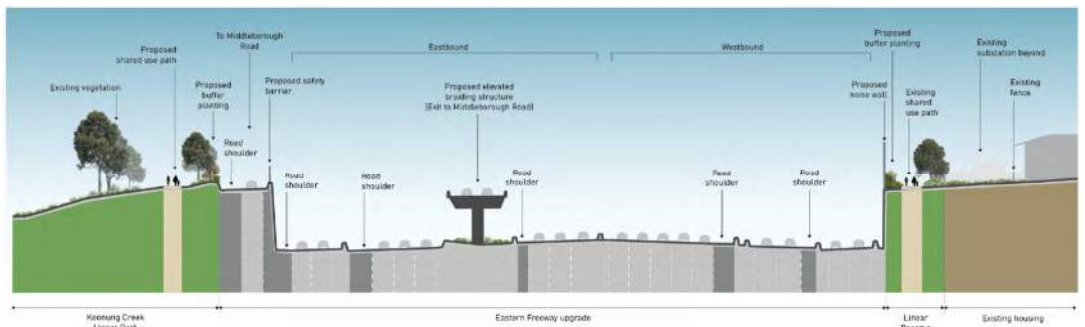
9.3.2 The 3 proposed cross sections of the future Eastern Freeway are shown in the following figures.

**Figure 9-4: Proposed Eastern Freeway Cross Sections**

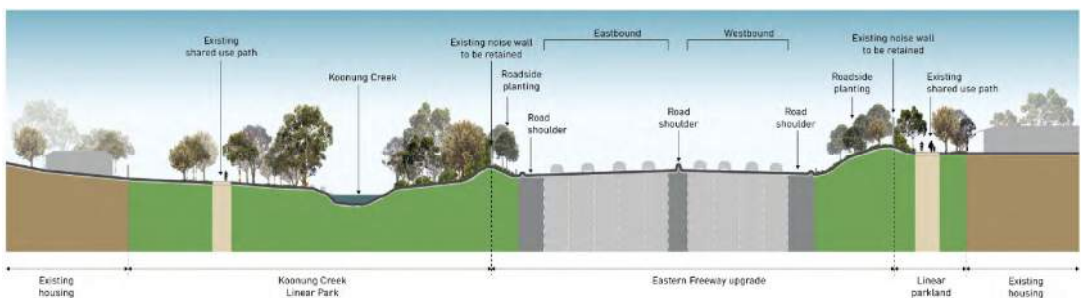
**Eastern Freeway Near Koonung Wetlands looking east**



**Eastern Freeway between Tram Rd and Middleborough Rd looking east**



**Eastern Freeway Between Blackburn Rd and Springvale Rd looking east**



9.3.3 The first cross section includes Expressway lanes in both directions. The second cross section only includes Expressway lanes in the eastbound direction. No Expressway lanes are proposed in the third cross section.

9.3.4 As the Expressway lanes are proposed to be physically separated by barriers from the adjacent through lanes, additional width is required for shoulders abutting the barriers.

9.3.5 Based on typical freeway road width assumptions, the anticipated change in cross section for the three locations identified above are summarised in Table 9.1.

**Table 9.1: Proposed Change to Eastern Freeway Cross Section**

Eastern Freeway Location	Existing Width	Proposed Width
Near Koonung Wetlands	6 lanes ~ 33.5 m	14 lanes + busway ~ 83m
Between Tram Rd and Middleborough Rd	8 lanes ~37.5 m	19 lanes ~ 113.5m
Between Blackburn Rd and Springvale Rd	7 lanes ~ 37m	8 lanes ~ 40m

9.3.6 As shown in the preceding table the Eastern Freeway is anticipated to increase substantially in width from Bulleen Road up to Blackburn Road.

## 9.4 Discussion

9.4.1 The inclusion of a physical barrier as shown in the preceding cross sections, increases the width by approximately 3.0m each side of the barrier. This is consistent with the central median of the existing Eastern Freeway cross sections at the 3 chosen locations.

9.4.2 The issue with the barriers is that instead of having one central barrier, there are now 4 proposed on the first cross section and at least 5 proposed on the second cross section, all requiring a width of approximately 6.5m per barrier. Therefore, the introduction of the separated expressway has a significant effect on the overall width of the proposed Eastern Freeway widening.

9.4.3 A reduced cross section has previously been adopted on the Westgate Freeway, east of Citylink, that separates traffic lanes with physical barriers without the shoulder widths as shown in Figure 9-5. Noting that a reduced speed limit of 80kph typically applies on this section of the Westgate Freeway.

**Figure 9-5: Physically separated traffic lanes with reduced cross section – Westgate Fwy**



9.4.4 It is noted that physical separation as proposed, was not considered necessary at other freeway to freeway interchanges such as the Monash Freeway / Eastlink interchange or the Hume Freeway / Metropolitan Ring Road interchange.

9.4.5 In my opinion, the necessity of such a barrier should be weighed up against the implications it will have on the overall width of the freeway cross section and the associated land acquisition that will be required to achieve such a cross section.



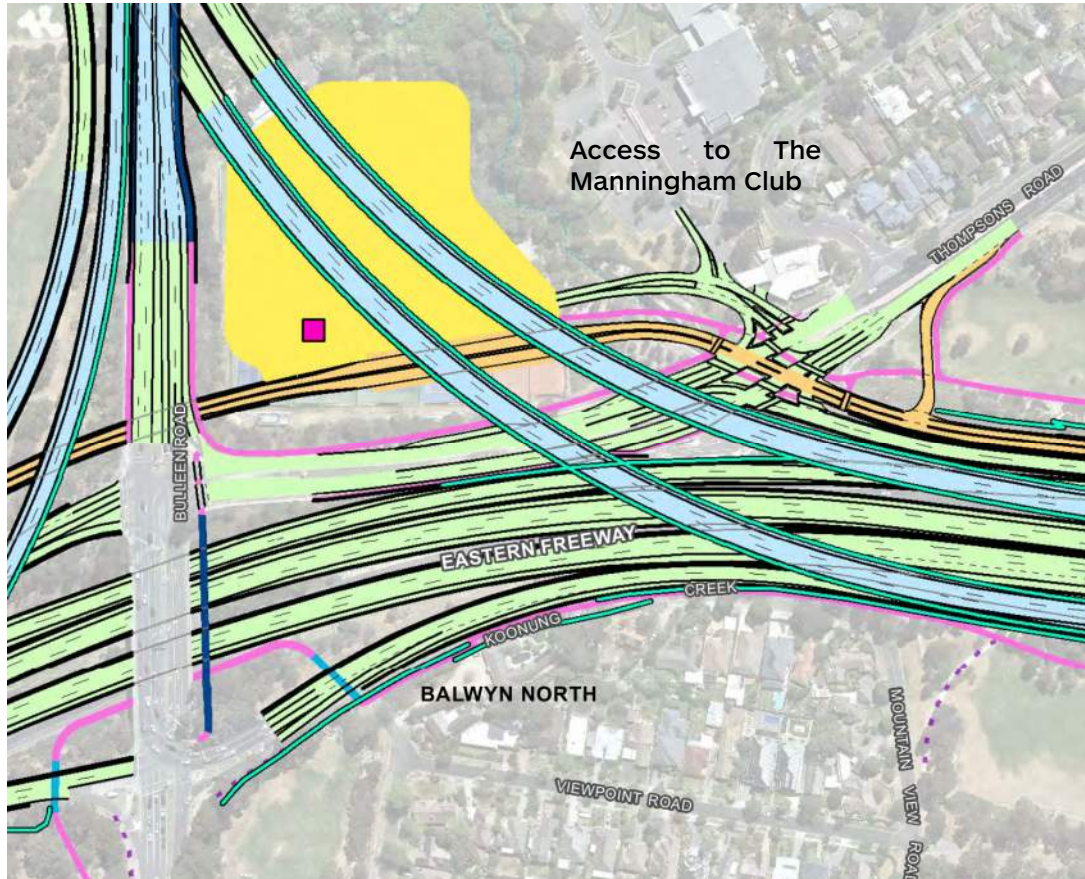
# 10 Public Transport

## 10.1 Bulleen Park and Ride

### Location

10.1.1 In addition to the existing Doncaster Park and Ride facility, a new Park and Ride service is proposed east of Bulleen Road and north of the Eastern Freeway, as shown in Figure 10-1. The Bulleen Park and Ride facility will generally be located on land currently occupied by the Bulleen Tennis Centre.

**Figure 10-1: Proposed Bulleen Road Park and Ride**



### Legend

Proposed road alignment	Existing shared use path	Proposed sewer
Proposed noise wall	Proposed elevated ramp or structure	Proposed communications tower
Proposed shared use path overpass	Bulleen Park and Ride	
Proposed shared use path	Busway	
Proposed shared use path underpass	Proposed surface road	

### Access

10.1.2 The preceding figure indicates that the proposed Bulleen Park and Ride will have bus access from the proposed busway and vehicular access via a new separate road aligned parallel to the busway.

10.1.3 The busway will provide buses with a separate bus only traffic lane in each direction, providing access to the east and west. Buses will have the opportunity to travel north on Thompsons Road or continue east along the busway to its termination at the Doncaster Park and Ride facility.



- 10.1.4 A separate bus only access is proposed for buses approaching the Park and Ride facility from the north, allowing them to access the busway before the Thompsons Road traffic signal, which eliminates the need to facilitate right turns into the busway from Thompsons Road.
- 10.1.5 As previously discussed the existing access to The Manningham Club and Bulleen Swim Club on Bulleen Road will be closed as part of the NEL, with all access to The Manningham Club (Bulleen Swim Club to be relocated), being proposed via the connection shown on the preceding plan, which connects to the proposed Park and Ride vehicle access from Thompsons Road.

### **Concerns with Access Arrangements**

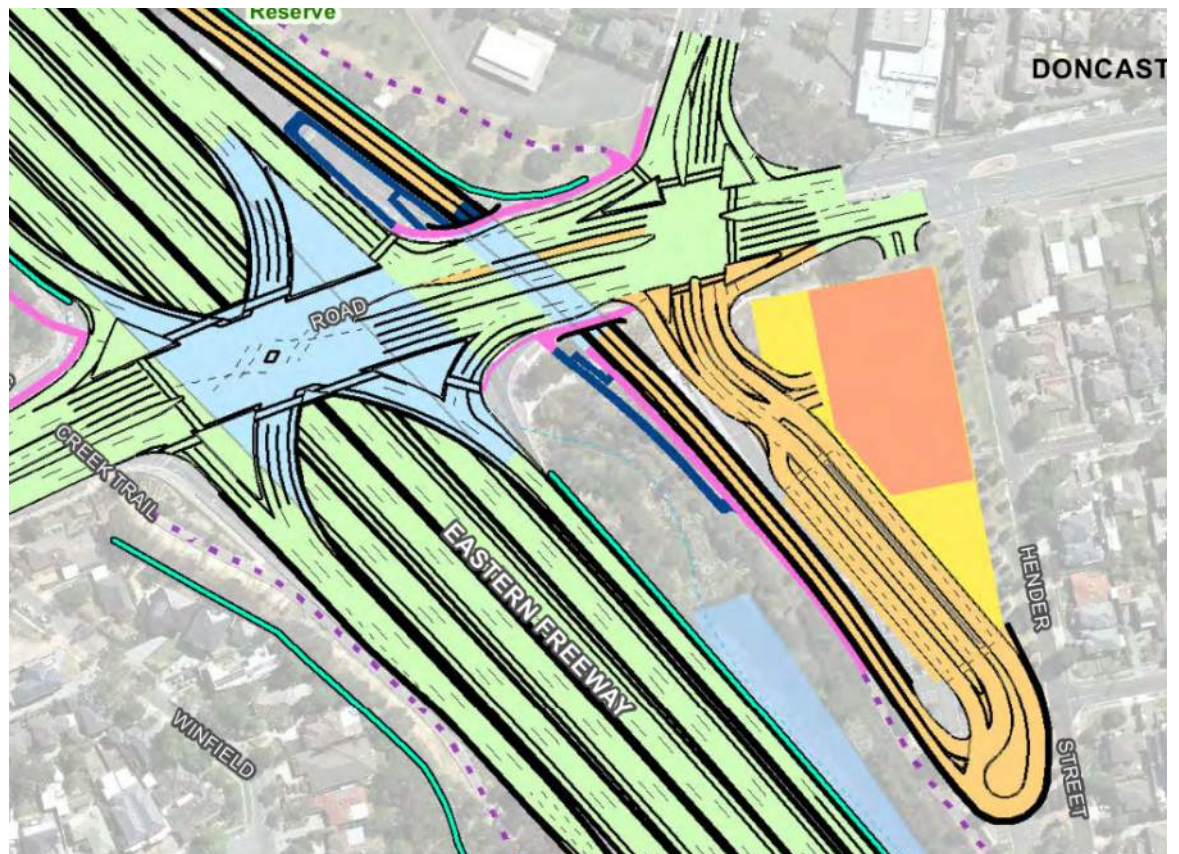
- 10.1.6 The proposed traffic signals on Thompsons Road do not appear to allow buses to access the Park and Ride facility from Thompsons Road west, as there is no right turn out shown on the proposed design. This means that bus services from the south could not use Bulleen Road via Thompsons Road to access the proposed Park and Ride facility, effectively limiting bus connections to the Park and Ride to the north.
- 10.1.7 Vehicular access to the Park and Ride facility appears to be proposed via Thompsons Road only, which allows vehicles to access the proposed facility from both the north and south. However, it does not appear to facilitate right turns out of the Park and Ride. Therefore, any users of the Park and Ride facility, as well as The Manningham Club, wishing to access Bulleen Road would need to depart to the north on Thompsons Road and undertake a u-turn.
- 10.1.8 The impact of u-turns on Thompsons Road or acknowledgment of where this is likely to occur, does not appear to have been considered in the EES documentation.
- 10.1.9 The peak hour analysis indicates that the Park and Ride facility is expected to operate with a Level of Service C in the AM and PM peak hours.
- 10.1.10 It is acknowledged that the inclusion of a right turn from the Park and Ride may result in a lower Level of Service, however as the impact of u-turns has not been considered, the intersection analysis in my opinion, is not clearly identifying the relevant impacts on Thompsons Road.
- 10.1.11 Vehicles departing The Manningham Club and Park and Ride facility who wish to use Bulleen Road to depart will need to undertake an u-turn on Thompsons Road. The introduction of a potentially large number of u-turn movements on Thompsons Road is considered highly undesirable.
- 10.1.12 In my opinion fully directional access should be provided from the Bulleen Park and Ride facility for both vehicles and buses, not only to avoid undesirable u-turn movements but to also facilitate convenient access to residents south of the Eastern Freeway, such as Balwyn North.

## **10.1 Doncaster Park and Ride**

### **Proposed Park and Ride Access**

- 10.1.1 The proposed busway terminates at the Doncaster Park and Ride facility, with the ability for buses to continue along Doncaster Road in either direction or north on High Street.
- 10.1.2 The Reference Design is reproduced as Figure 10-2.

**Figure 10-2: Doncaster Road Park and Ride Bus Station**



**Legend**

- Proposed road alignment
- █ Proposed noise wall
- █ Proposed shared use path overpass
- █ Proposed shared use path
- █ Proposed shared use path underpass
- █ Existing shared use path
- █ Proposed elevated ramp or structure
- █ Bulleen Park and Ride
- █ Busway
- █ Proposed surface road
- █ Proposed sewer
- █ Proposed communications tower

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- 10.1.3 Although the traffic signal on Doncaster Road into the busway is colored orange, indicating that it serves buses only, I was advised by NELP that it will service both buses and commuter vehicles.
- 10.1.4 A new vehicle access is shown on Doncaster Road into the Park and Ride facility as a left in / left out access adjacent to Hender Street, as shown on the preceding figure.

**Concerns with the Access Arrangements**

- 10.1.5 The success of Doncaster Park and Ride will be highly dependent on vehicular access to the facility and availability of parking spaces.
- 10.1.6 A view of the proposed left in / left out access location from Doncaster Road is shown in Figure 10-3.

**Figure 10-3: Doncaster Road / Hender Street looking south towards the Doncaster Park and Ride**



Source: Google Maps Streetview

- 10.1.7 As shown in the preceding figures, the proposed entry to the Park and Ride is extremely close to Hender Street and located within the left turn deceleration lane.
- 10.1.8 The Park and Ride will continue to provide approximately 400 parking spaces, with vehicle movements predominately inbound in the AM peak and outbound in the PM peak.
- 10.1.9 The introduction of a new access in this location is considered undesirable due to the potential for confusion between vehicles entering Hender St and vehicles turning left onto the Eastern Freeway.

### **Recommendation**

- 10.1.10 I believe continuing to use the combined access at the existing traffic signal would provide the best access opportunities for both commuters and buses. Given the constraints of the site and the anticipated traffic volumes on Doncaster Road, I do not support the proposed left in / left out location on Doncaster Road.
- 10.1.11 This recommendation is made on the assumption that a shared access arrangement with Hender Street or closure of Hender Street would be undesirable to existing residents and Manningham Council.

## **10.2 Bus Network Changes**

- 10.2.1 The EES (pg 9-99) states that: “No changes to the on-road bus network are proposed east of the Doncaster Park and Ride.”
- 10.2.2 Residents of the City of Manningham are highly reliant on bus services as an alternative to private vehicles. On that basis, bus lanes, bus facilities and priorities should be maintained and enhanced where possible.
- 10.2.3 The construction of the NEL is expected to result in partial and /or full road closures at various locations as well as additional construction traffic. Although this activity will be temporary in nature, the duration of disruption is expected to be relatively long with completion of the project expected to take up to 7 years.
- 10.2.4 The additional road congestion also presents an opportunity to encourage commuters to use public transport instead of their private vehicle, particularly during the morning and afternoon peak periods.

- 10.2.5 Therefore, in my opinion bus lanes and priorities should not be sacrificed for the benefit of increasing road capacity during construction, as this would be counterproductive to encouraging a mode shift.
- 10.2.6 An Environmental Performance Requirement (EPR) should be included to ensure that the project causes the minimum amount of disruption to existing public transport services, during construction and operation of the NEL.

### **10.3 Extent of Busway Improvements**

- 10.3.1 The Smedtech Traffic Report notes that whilst improvement will be made to the busway along the Eastern Freeway, no changes are proposed at the Hoddle Street / Eastern Freeway interchange or along Hoddle Street, Victoria Parade or within the CBD.
- 10.3.2 The Smedtech Report (pg 132) further notes that the 12km trip from the Doncaster Park and Ride to Hoddle Street takes approximately 12 minutes in peak periods, however the 4.6km trip from Hoddle Street to the King Street terminus takes 22 minutes.
- 10.3.3 In my opinion the ability of the Hoddle Street corridor to accommodate additional bus services should have been assessed as part of the EES process.



# 11 Environmental Performance Requirements (EPRs)

## 11.1 Proposed Environmental Performance Requirements

- 11.1.1 The Environmental Performance Requirements (EPRs) define the environmental outcomes that must be achieved during Design, Construction and Operation of the NEL. The EPRs aim to mitigate the identified potential risks and impacts associated with the NELP.
- 11.1.2 A number of Environmental Performance Requirements (EPRs) are proposed within the EES to guide the design and implementation of the NEL project.
- 11.1.3 The EPR's relevant to this assessment are outlined under Section 17 of the EPRs titled 'Traffic and Transport'. The applicable legislation and policies include:
- Planning and Environment Act 1987; and
  - Road Management Act 2004
- 11.1.4 The suggested EPRs for Traffic and Transport are reproduced as follows:

**Table 11.1: Proposed Environmental Performance Requirements (EPRs) – 17 Traffic and Transport**

EPR Code	Environmental Performance Requirements	Phase
<b>T1</b>	<b>Optimise Design Performance</b> Optimise the design of the works in consultation with appropriate road management authorities, public transport authorities, relevant land managers and local councils as part of the detailed design process to:	Design
<i>T1.1</i>	Minimise adverse impact on travel times for all transport modes, including walking and cycling	
<i>T1.2</i>	Maintain and where practicable, enhance the existing traffic movements at interchanges	
<i>T1.3</i>	Design interchanges and intersections to meet relevant road and transport authority requirements	
<i>T1.4</i>	Maintain and where practicable, enhance pedestrian movements, bicycles connectivity, and shared use paths	
<i>T1.5</i>	Work with relevant public transport authorities to minimise impacts on buses, trams and rail and where practicable, enhance public transport facilities and services that cross or run parallel to the alignment of North East Link	
<i>T1.6</i>	Minimise loss of car parking in consultation with relevant local councils	
<b>T2</b>	<b>Transport Management Plans (TMP)</b> Prior to commencement of relevant works, develop and implement Transport Management Plans(s) (TMP) to minimise disruption to affected local land uses, traffic, car parking, public transport (rai, tram and bus), pedestrian and bicycle movement and existing public facilities during all stages of construction.  The TMP must be informed and supported by an appropriate level of trasnprot modelling and must include:	Construction

T2.1	Requirements for maintaining transport capacity in the peak periods	
T2.2	Requirements for limiting the amount of construction haulage during the peak periods	
T2.3	A monitoring program to assess the effectiveness of the TMPs on all modes of transport	
T2.4	Where monitoring identifies adverse impacts, practicable mitigation measures	
T2.5	Consideration of construction activities for other relevant major projects occurring concurrently with construction activities for North East Link and potentially impacting modes of transport in the same area	
T2.6	Potential routes for construction haulage and construction vehicles travelling to and from the project construction site, recognizing sensitive receptors and avoiding the use of local streets where practicable	
T2.7	Suitable measure developed to consultation with emergency services, to ensure emergency service access is not inhibited as a result of project construction activities	
T2.8	Provision of alternative parking where practicable to replace public and commuter parking lost as a result of project construction activities	
T2.9	Requirements to minimise impacts on local streets, community and commercial facilities by providing parking for construction workers at construction compounds where practicable	
T2.10	Measures to ensure connectivity and safety for all transport network users during construction	
T2.11	Consultation with VicRoads and relevant transportation authorities	
T2.12	A TMP may be split into precincts where appropriate but must consider other precinct TMPs through the Transport Management Liaison Group as per EPR T3. TMPs must be submitted to the relevant authority for approval	
<b>T3</b>	<p><b>Transport Management Liaison Group</b></p> <p>A Transport Management Liaison Group (TMLG) must be established and convene prior to the commencement of any works that may impact on existing roads, paths or public transport infrastructure. The TMLG must include representative from the State, VicRoads, emergency services, the project, relevant transportation authorities and relevant local councils.</p> <p>The TMLG will be a forum for exchange of information and discussion of issues associated with Transport Management plans. This must include review of proposed haulage routes for construction sites south of the northern tunnel portal to minimise reliance on a single haulage route between Bell Street and the M80 Ring Road and facilitate different sites using different haulage routes.</p> <p>The TMLG must be provided with the Transport Management plans, details as to timing of implementation, information about construction traffic monitoring conducted by the project, and other reports as relevant.</p> <p>The TMLG must meet at least monthly until the completion of construction.</p>	Design Construction

<b>T4</b>	<p><b>Road Safety Design</b></p> <p>Undertake independent road safety audits after each stage of detailed design and after construction . The project design and operational activities must meet all relevant road and transport authority requirements with respect to transport network user safety.</p>	<p>Design</p> <p>Construction</p> <p>Operation</p>
<b>T5</b>	<p><b>Traffic Monitoring</b></p> <p>Undertake traffic monitoring on selected roads (arterial and non-arterial) identified in consultation with the relevant transportation authorities and local council pre-construction, at six monthly intervals during construction, and up to two years after construction is complete. As part of the selection process, consideration must be given to roads that carry public transport services. Implement local area traffic management works in consultation with the local relevant councils.</p> <p>Develop and implement traffic performance management to monitor conditions during construction. Real time traffic information must be provided to drivers.</p>	<p>Design</p> <p>Construction</p> <p>Operation</p>

## 11.2 Discussion of Relevant EPRs

### T1 – Optimise Design Performance

- 11.2.1 The first dot point is to minimise travel times. If this is the road design focus, then it may compromise better functionality and design, that could in turn potentially decrease travel time. For example, not including some movements at an interchange will usually improve the intersection’s performance, however the downstream impact of not providing the particular movements are not recorded at the intersection in question. For example the Manningham Road interchange and the Park and Ride access to Thompsons Road are likely to generate significant levels of u-turn movements at adjacent intersections. I would therefore suggest that a performance requirement focusing on functionality and minimisation of downstream impacts may result in a better design outcome for both the NEL and the adjacent road network.

### T2 – Transport Management Plans

- 11.2.2 The proposed Traffic Management related EPRs are generally considered satisfactory. The only additional requirement that I would suggest is to ensure that priority is given to public transport services during the construction stage wherever practicable.

### T3 – Transport Management Liaison Group

- 11.2.3 I have no issue with the formation of a liaison group, however there is no definition of their responsibility and / or authority.
- 11.2.4 Without any ability to recommend or enforce changes to the proposed Traffic Management Plans or other information provided, the proposed committee will have little power to influence the project.

### T4 – Road Safety Design

- 11.2.5 I agree that independent road safety audits should be undertaken at regular intervals throughout the project. I would also recommend that independent road safety audits are undertaken during construction as well, to ensure the requirements of the Traffic Management Plans are being appropriately implemented.

### T5 – Traffic Monitoring

- 11.2.6 The proposed traffic monitoring is supported; however I believe the EPR should be better defined as the expectation of stakeholders may be vastly different when it comes to identifying roads to be monitored and the methods that will be adopted.

- 11.2.7 The EPR also doesn't specify who will be responsible for independently reviewing the monitoring and ensuring the authority is accountable to identified impacts. As the monitoring will affect numerous stakeholders the Transport Management Liaison Group would be the logical choice to review the results of the 6 monthly traffic monitoring.

### **11.3 Proposed and Modified EPRs**

- 11.3.1 Based on the preceding discussion, the following additional and/or modified EPRs are recommended:

#### **T1 – Optimise Design Performance**

- Ensure interchange design does not compromise the operation of the adjacent road network and create adverse downstream impacts.
- Design interchanges and intersections to provide logical and convenient access to the NEL.
- Design to minimise creation of undevelopable land and to show potential access locations to all future parcels of land than can be redeveloped at the completion of the NELP.
- Modify the second dot point to read “Maintain, and where practicable, enhance the existing traffic movements at interchanges *and intersections.*”
- Design Park and Ride facilities to maximise interaction with existing and future bus routes and ensure convenient access for vehicles wishing to use the facility.

#### **T2 – Transport Management Plans**

- Minimise disruption and delays to existing public transport services, during construction and operation of the NEL.

#### **T3 – Transport Management Liaison Group (TMLG)**

- 11.3.2 Recommend adding the following requirements to EPR T3:

- Identify powers and responsibilities of the TMLG.
- Prepare guidelines governing the reporting structure of the liaison group.

#### **T4 – Road Safety Design**

- 11.3.3 Modify the wording to include road safety audits during the construction process to ensure the requirements of the Traffic Management Plans are being appropriately implemented.

#### **T5 – Traffic Monitoring**

- 11.3.4 Recommend that the following is added to EPR T5:

- Identify the roads and locations to be monitored in consultation with the relevant Authorities.
- Consult with the TMLG to identify what constitutes an adverse impact on the monitored road and what steps will be taken to mitigate the identified impact.
- Provide the TMLG with all results of the 6 monthly monitoring and take action to minimise an identified impact as outlined in the agreed guidelines developed in consultation with the TMLG.



# 12 Summary of Opinion

Based on the preceding discussion, my opinions are summarised as follows:

## **NEL / Manningham Road / Bulleen Road Interchange**

- 12.1.1 It is my opinion that the proposed interchange at Manningham Road / Bulleen Road to access the NEL has not yet been appropriately resolved. Both the Reference Design and Alternate Design rely on a large number of motorists from the east having to undertake a u-turn in order to head south on the NEL, which NELP have confirmed has not been considered in the EES documentation. The requirement to undertake a u-turn on Manningham Road could have a significant impact on the operation of Manningham Road. Furthermore, the Reference Design is considered potentially confusing for motorists and requires a convoluted route to access the freeway.
- 12.1.2 The Alternate Design although easier to access from Manningham Road has complicated the access arrangements unnecessarily in my opinion to the detriment of motorists and pedestrians.
- 12.1.3 If the proposed NEL access remains opposite Bridge Street, then I believe access from NEL should be provided directly to and from Bridge Street to reduce unnecessary vehicle movements and better service the 32,000 vehicles per day expected to use Templestowe Road.

## **Reference Design**

- 12.1.4 Prior to commencing detailed design, I believe the Reference Design should be modified to show proposed access to any land acquisition that will ultimately be redeveloped post NEL.
- 12.1.5 The revised Reference Design should also include an updated version of the following intersections to ensure that the detailed design and subsequent construction address the concerns raised:
  - Manningham Road / NEL interchange
  - Bulleen Park Access on Bulleen Road
  - Bulleen Park and Ride access arrangements
  - Doncaster Park and Ride access arrangements

## **Bulleen Park Access**

- 12.1.6 The proposed traffic signals on Bulleen Road to service Bulleen Park and Marcellin College need to be designed in accordance with current best practice to avoid potential safety concerns for pedestrians and motorists.
- 12.1.7 The proximity of the signals also needs to be carefully designed and managed to avoid safety and queuing issues.
- 12.1.8 Pedestrian and bicycle access, to and from Bulleen Park to be better facilitated from the south. The construction of the NEL is an opportunity to improve access for pedestrians and cyclists to Bulleen Park and the Yarra River rather than reduce the current level of connectivity.

## **Eastern Freeway Widening**

- 12.1.9 It is my opinion that the indicative Eastern Freeway cross sections, east of Bulleen Road could be reduced in size to minimise the overall width of the cross section and the associated land acquisition that will be required to achieve it.

### **Bulleen Park and Ride**

- 12.1.10 Fully directional access to the proposed Bulleen Park and Ride facility should be provided to and from Thompsons Road for both vehicles and buses to avoid u-turns on Thompsons Road.

### **Doncaster Park and Ride**

- 12.1.11 The proposed location of the left in / left out access to Doncaster Road is not considered appropriate, given its close proximity to Hender Street and the signalised access to the Park and Ride facility and should be removed.

### **Proposed Environmental Protection Requirements**

- 12.1.12 I am concerned that the proposed Traffic and Transport EPRs contained in the EES documentation will not sufficiently address the various concerns outlined in this report. I have therefore, made a number of recommendations to the wording and contents of EPRs T1, T2, T3, T4 and T5 as outlined in the previous section.