

Appendix

A

Technical working paper: Traffic and transport

(blank page)

Contents

Appendix A: Traffic and transport impact assessment	i
Contents	i
1 Introduction	1-1
1.1 Background	1-1
1.2 Purpose of this report	1-1
1.3 Summary of design changes	1-1
1.4 Terminology	1-1
2 Project changes	2-1
2.1 White Bay civil site (C11)	2-1
2.1.1 Location and construction activities	2-1
2.1.2 Operation of truck marshalling area	2-1
2.1.3 Site access	2-1
2.2 Relocation of the bioretention facility at Rozelle	2-4
3 Construction traffic management changes from the EIS	3-1
3.1 Construction traffic generation	3-1
3.1.1 Lilyfield and Rozelle (White Bay civil site (C11))	3-1
3.1.2 Haberfield and Ashfield	3-2
3.1.3 Leichhardt North	3-2
3.1.4 Annandale	3-2
3.1.5 Cumulative scenario	3-3
3.2 Access routes	3-5
3.3 Construction traffic distribution	3-9
4 Assessment methodology	4-1
4.1 Roadway level of service	4-1
4.2 Intersection level of service	4-1
5 Assessment of construction impacts	5-1
5.1 Lilyfield and Rozelle	5-1
5.1.1 Roadway level of service	5-1
5.1.2 Intersection level of service	5-4
5.1.3 Temporary road network changes, closures and diversions	5-6
5.1.4 Potential impacts on pedestrians	5-6
5.2 Haberfield and Ashfield	5-6
5.2.1 Roadway level of service	5-6
5.2.2 Intersection level of service	5-9
5.2.3 Temporary road network changes, closures and diversions	5-11
5.3 Leichhardt North	5-12
5.3.1 Roadway level of service	5-12
5.3.2 Intersection level of service	5-15
5.3.3 Temporary road network changes, closures and diversions	5-16

5.4	Annandale	5-16
5.4.1	Roadway level of service	5-17
5.4.2	Intersection level of service	5-17
5.4.3	Temporary road network changes, closures and diversions	5-18
6	Assessment of cumulative impacts	6-1
6.1	Western Harbour Tunnel	6-1
6.2	Site management works at Rozelle Rail Yards	6-1
6.3	Port Authority of NSW proposals	6-1
6.3.1	Roadway level of service	6-2
6.3.2	Intersection level of service	6-4
7	Environmental management measures	7-1
8	Conclusion	8-1

List of Figures

Figure 2-1	Indicative White Bay civil site (C11) layout	2-3
Figure 3-1	Indicative spoil haulage route – White Bay civil site (C11)	3-6
Figure 3-2	Indicative spoil haulage route – Darley Road civil and tunnel site (C4)	3-7
Figure 3-3	Indicative spoil haulage route – Pyrmont Bridge Road tunnel site (C9) for heavy vehicles traveling from the White Bay civil site (C11)	3-8

List of Tables

Table 2-1	White Bay civil site (C11) indicative construction program	2-1
Table 3-1	Indicative daily and peak period construction traffic volumes for White Bay civil site (C11)	3-2
Table 3-2	Indicative daily and peak period construction traffic volumes for cumulative construction scenario	3-4
Table 3-3	Proposed access routes to and from construction ancillary facilities assessed in this report	3-5
Table 3-4	Indicative peak period distribution of heavy vehicle construction vehicles (two-way)	3-9
Table 5-1	Option A – 2021 AM peak mid-block operational performance summary ¹	5-2
Table 5-2	Option A – 2021 PM peak mid-block operational performance summary ¹	5-2
Table 5-3	Option B – 2021 AM peak mid-block operational performance summary ¹	5-3
Table 5-4	Option B – 2021 PM peak mid-block operational performance summary ¹	5-3
Table 5-5	Option A – 2021 AM peak hour intersection operational performance summary ¹	5-5
Table 5-6	Option A – 2021 PM peak hour intersection operational performance summary ¹	5-5
Table 5-7	Option B – 2021 AM peak hour intersection operational performance summary ¹	5-5
Table 5-8	Option B – 2021 PM peak hour intersection operational performance summary ¹	5-5
Table 5-9	Option A – 2021 AM peak mid-block operational performance summary ¹	5-7
Table 5-10	Option A – 2021 PM peak mid-block operational performance summary ¹	5-7
Table 5-11	Option B – 2021 AM peak mid-block operational performance summary ¹	5-8
Table 5-12	Option B – 2021 PM peak mid-block operational performance summary ¹	5-8
Table 5-13	Option A – 2021 AM peak hour intersection operational performance summary ¹	5-10
Table 5-14	Option A – 2021 PM peak hour intersection operational performance summary ¹	5-10

Table 5-15 Option B – 2021 AM peak hour intersection operational performance summary ¹	5-11
Table 5-16 Option B – 2021 PM peak hour intersection operational performance summary ¹	5-11
Table 5-17 Option A – 2021 AM peak mid-block operational performance summary ¹	5-13
Table 5-18 Option A – 2021 PM peak mid-block operational performance summary ¹	5-13
Table 5-19 Option B – 2021 AM peak mid-block operational performance summary ¹	5-14
Table 5-20 Option B – 2021 PM peak mid-block operational performance summary ¹	5-14
Table 5-21 Option A – 2021 AM peak hour intersection operational performance summary ¹	5-15
Table 5-22 Option A – 2021 PM peak hour intersection operational performance summary ¹	5-15
Table 5-23 Option B – 2021 AM peak hour intersection operational performance summary ¹	5-16
Table 5-24 Option B – 2021 PM peak hour intersection operational performance summary ¹	5-16
Table 5-25 2021 AM peak mid-block operational performance summary ¹	5-17
Table 5-26 2021 PM peak mid-block operational performance summary ¹	5-17
Table 6-1 Option A and cumulative – 2021 AM peak mid-block operational performance summary ¹	6-3
Table 6-2 Option A and cumulative – 2021 PM mid-block operational performance summary ¹	6-3
Table 6-3 Option A and cumulative – 2021 AM peak hour intersection operational performance summary ¹	6-4
Table 6-4 Option A and cumulative – 2021 PM peak hour intersection operational performance summary ¹	6-5

1 Introduction

1.1 Background

The traffic and transport impacts during construction and operation of the M4-M5 Link project (the project) have been assessed in Appendix H (Technical working paper: Traffic and transport) of the environmental impact statement (EIS) for the project.

In accordance with section 115Z(6) of the *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act), a preferred infrastructure report (PIR) has been prepared for the project. The PIR for the project describes the design changes that have been identified to minimise environmental impacts, address design and constructability issues and to address issues raised during exhibition of the EIS.

1.2 Purpose of this report

The design changes described in the PIR are proposed to minimise environmental impacts, address design and constructability issues and to address issues raised during public exhibition of the EIS. These changes are summarised in **Chapter 2**. This report provides an assessment of the changed and/or additional noise and vibration impacts associated with the design changes that have been identified in the PIR.

This report is to be read in conjunction with Appendix H (Technical working paper: Traffic and transport) of the EIS which contains detailed descriptions and explanations of the assessment guidelines and methodologies used.

1.3 Summary of design changes

The design changes assessed in this report and as identified in the PIR include:

- An additional construction ancillary facility at Rozelle, to the east of the White Bay Power Station, on land owned by the Port Authority of NSW – the White Bay civil site (C11). The site would be used primarily to support truck marshalling and construction workforce parking
- Relocation of the bioretention facility at Rozelle from within the informal car park adjacent to Manning Street as proposed in the EIS, to around 150 metres north within King George Park adjacent to Victoria Road, at the eastern abutment of Iron Cove Bridge.

These changes are described in detail in the PIR.

1.4 Terminology

The technical terminology used in this report is explained in Annexure A.

2 Project changes

2.1 White Bay civil site (C11)

2.1.1 Location and construction activities

An additional construction ancillary facility is proposed on a portion of the Port Authority of NSW's land located near White Bay at Rozelle. The facility would provide a truck marshalling area for around 40 heavy vehicles transporting tunnel spoil and around 50 parking spaces for the construction workforce. The facility would also provide additional space to store construction plant, machinery and materials at the site. The site is referred to as the White Bay civil site (C11). The location and an indicative site layout are shown in **Figure 2-1**.

This site is part of the larger Glebe Island/White Bay Port Precinct, currently used for dry bulk imports, exports, vessel lay-ups, ad-hoc port and working harbour activities and cruise ships, functioning 24 hours a day, seven days a week. The site is not currently being used, is vacant and comprises poor quality hardstand that would need to be replaced to support the proposed use.

An indicative program for works at the White Bay civil site is provided in . Use of the White Bay civil site would commence in early 2019.

The White Bay civil site would operate 24 hours per day, seven days per week. Peak operations (ie the time of day that the most trucks would be expected to use the site) is anticipated to be between 5 am and 9 am. This peak operations period is reflected in the assumptions around the number of heavy vehicles that would be added to the road network in the AM and PM peak periods (as represented in this assessment). Further detail is provided in **section 3.1.1**.

Table 2-1 White Bay civil site (C11) indicative construction program

Construction activity	Indicative construction timeframe											
	2018			2019			2020			2021		
Site establishment												
Use of the site for truck marshalling and parking												

2.1.2 Operation of truck marshalling area

Spoil transport vehicles would be managed by protocols that would be developed in accordance with the conditions of approval and documented in the Construction Traffic and Access Management Plan (CTAMP) for the project. These protocols would include mechanisms to stage the release of trucks from the truck marshalling facility to the tunnelling sites as required, having regard to the need for trucks at the tunnelling sites, the limited space that is available for trucks to queue on these sites and to avoid queuing of trucks on local roads or circling around construction sites. These mechanisms would be confirmed during detailed design and would likely include:

- Traffic schedulers that would be responsible for directing truck drivers to the construction sites at an appropriate time
- Fitting trucks with real-time tracking capabilities to allow traffic schedulers to monitor and adjust spacing between trucks
- Ensuring that traffic schedulers and truck drivers are given clear instructions on the times that trucks should arrive on site and the time intervals between trucks arriving and departing construction sites.

2.1.3 Site access

Heavy vehicles and light vehicles would access the site via The Crescent, James Craig Road and Sommerville Road. As shown in **Figure 3-1**, separate ingress/egress locations for heavy and light vehicles would be provided to the site having regard to appropriate sight distance is available.

A gatehouse would be established at the heavy vehicle ingress/egress point and appropriate forms of traffic management would be provided to ensure integration with the road network, which is used by other port traffic.

No impacts are expected on local roads, with heavy vehicle access and egress to the site being via The Crescent, James Craig Road and Sommerville Road.

Use of the site, including access and egress arrangements, would be managed with consideration of cruise ship days (at the White Bay Cruise Terminal) and other existing port related traffic requirements given the potential for interaction with port related and cruise ship traffic on Sommerville Road and James Craig Road. Access and egress to the site, using Port Authority of NSW owned roads, may be restricted for defined time periods on cruise ship days in accordance with the licence for the use of the site that is currently under negotiation between the Port Authority of NSW and NSW Roads and Maritime Services (Roads and Maritime).

Should further mitigation measures be required as a result of consultation between the Ports Authority of NSW and Roads and Maritime during licence negotiation, these will be included in the CTAMP as required.

In consultation with the Port Authority of NSW, further investigation would be undertaken to consider alternative routes or arrangements for access and egress to the site during these periods, where appropriate. Any alternative route into or out of the site would be subject to further assessment and approval by the NSW Department of Planning and Environment (DP&E).

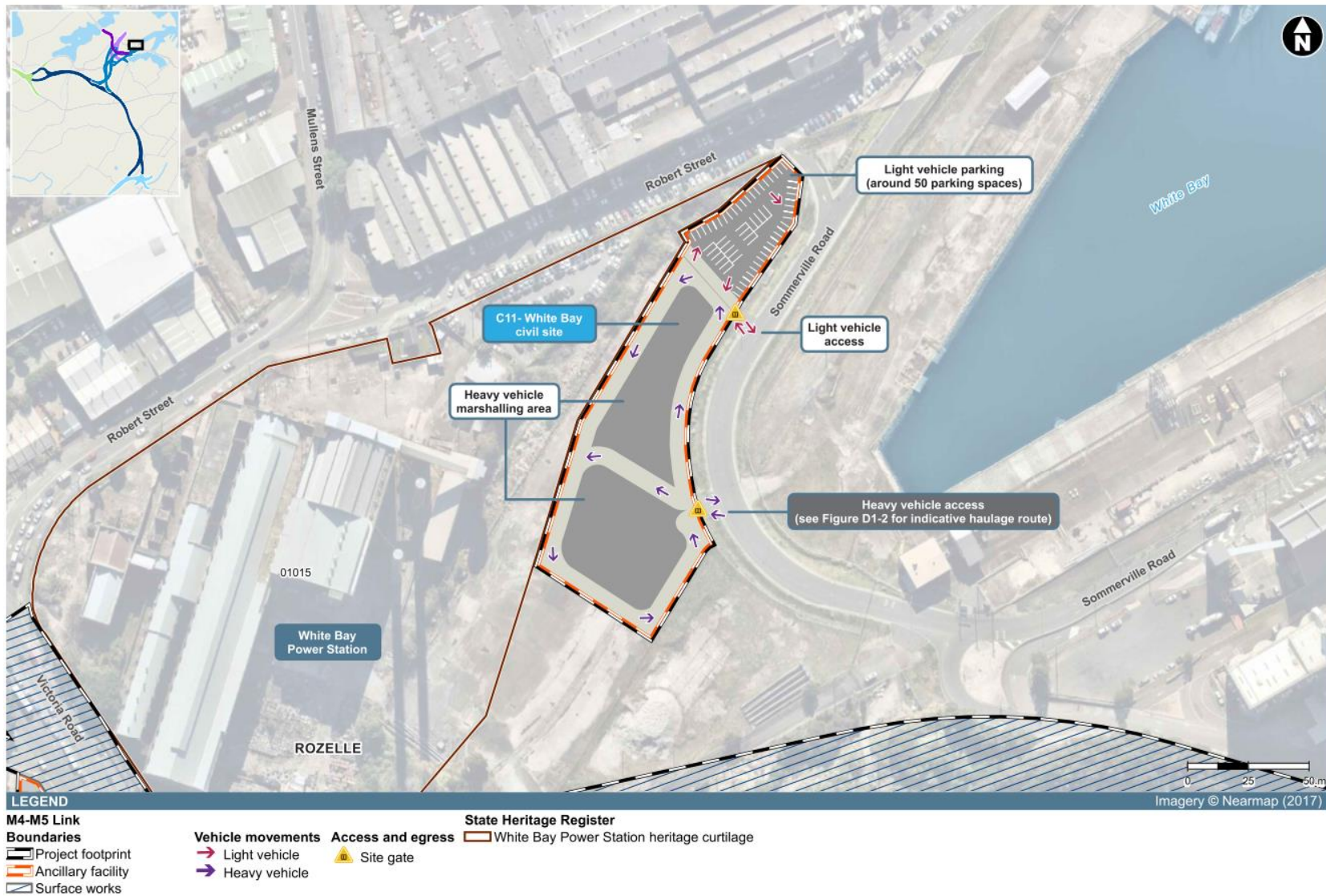


Figure 2-1 Indicative White Bay civil site (C11) layout

2.2 Relocation of the bioretention facility at Rozelle

The PIR proposes to relocate the bioretention facility from the informal car park within King George Park at Rozelle (adjacent to Manning Street) as described in Chapter 5 (Project description) of the EIS. The bioretention facility would be relocated around 150 metres north of the location proposed in the EIS, to an area adjacent to Victoria Road at the eastern abutment of Iron Cove Bridge and within King George Park.

Additional construction traffic impacts on Victoria Road and adjacent local roads such as Toelle Street, Callan Street, Springside Street and Manning Street not contemplated in the EIS would not be anticipated as a result of this change. In addition, the existing informal car park at Manning Street would remain in its current condition and would not be altered by the project. This change has therefore not been further assessed in the PIR.

3 Construction traffic management changes from the EIS

The changes assessed in this report, relative to the EIS, include:

- A new construction ancillary facility – the White Bay civil site (C11) that would be used primarily to support truck marshalling and construction workforce parking. For the purposes of this assessment, it has been assumed that heavy vehicles would be dispatched from the White Bay civil site to the following sites:
 - Parramatta Road West civil and tunnel site (C1b)
 - Darley Road civil and tunnel site (C4)
 - Pyrmont Bridge Road tunnel site (C9)
- The refinement of the heavy vehicle access route for the Darley Road civil and tunnel site (C4), developed in response to submissions received on the EIS, as described in **section 3.2**
- An additional heavy vehicle access route for heavy vehicles accessing the Pyrmont Bridge Road tunnel site (C9) from the White Bay civil site (C11) along Johnston Street.

Using the three sites listed above allows for a representative assessment of potential traffic and transport impacts along key arterial corridors including City West Link, Johnston Street and Parramatta Road associated with the use of the truck marshalling facility at the White Bay civil site.

3.1 Construction traffic generation

3.1.1 Lilyfield and Rozelle (White Bay civil site (C11))

Table 3-1 provides details of light and heavy vehicle volumes predicted to arrive and depart from the White Bay civil site (C11) during the typical network AM peak hour (7.30-8.30 am), PM peak hour (4.15-5.15 pm) and daily period. The peak hours for the site are slightly different to the surrounding road network peak hours, ie the busiest periods on the general road network and at the site do not coincide, but for a conservative assessment they have been assumed to occur in the modelled road network peak hour. With a shift start time of 7.00 am, the majority of light vehicle arrivals would occur before the road network AM peak hour. The end of the shift is more likely to impact on the road network PM peak hour, and although some vehicles would leave before the modelled road network peak hour, they have been assessed in the PM peak hour.

The heavy vehicle movements introduced at the White Bay civil site (C11) are trips previously assumed to go directly to relevant construction sites but which will now be called to the construction site from the proposed truck marshalling area. A conservative assumption of seven heavy vehicles per hour from the White Bay civil site to each of the three representative construction ancillary facilities (Parramatta Road West civil and tunnel site, Darley Road civil and tunnel site and Pyrmont Bridge Road tunnel site) has been applied for the AM and PM peak periods.

It has been assumed that the heavy vehicle arrivals at the White Bay civil site will be highest in the morning (up to 21 heavy vehicles per hour arriving between 5 am and 9 am) with arrivals reducing to a maximum of 10 per hour at other times as more vehicles would travel directly to the relevant site. This is a worst case scenario for traffic generation, particularly during off peak periods, as heavy vehicles may travel directly to site when lesser volumes on the road network allow for a more predictable arrival pattern and adequate spacing between vehicles travelling to the various tunnelling sites

Table 3-1 Indicative daily and peak period construction traffic volumes for White Bay civil site (C11)

Location		Daily vehicles		AM peak hour				PM peak hour			
		(one way)		(7.30–8.30 am)				(4.15–5.15 pm)			
		Heavy vehicles	Light vehicles	Heavy vehicles		Light vehicles		Heavy vehicles		Light vehicles	
				Arrive	Depart	Arrive	Depart	Arrive	Depart	Arrive	Depart
C11	White Bay civil site	284	100	21	21	50	50	10	21 ¹	50	50

Notes:

1. It has been assumed that the heavy vehicle arrivals at the White Bay civil site will be highest in the morning (up to 21 heavy vehicles per hour arriving between 5 am and 9 am) with arrivals reducing to a maximum of 10 per hour at other times as more vehicles would travel directly to the relevant site.

3.1.2 Haberfield and Ashfield

Changes proposed to the traffic generation and distribution at Haberfield and Ashfield are as follows:

- 21 heavy vehicles will travel towards the White Bay civil site (C11) in the AM peak via the M4 East and City West Link and through the Dobroyd Parade/Waratah Street and Dobroyd Parade/Timbrell Drive intersections
- 10 heavy vehicles will travel towards the White Bay civil site (C11) in the PM peak via the M4 East and City West Link and through the Dobroyd Parade/Waratah Street and Dobroyd Parade/Timbrell Drive intersections
- Seven heavy vehicles serving the Parramatta Road West civil and tunnel site (C1b) in the AM and PM peaks would arrive from the White Bay civil site (C11) via Dobroyd Parade, Wattle Street, Parramatta Road and a u-turn via Tebbutt Street/Hathern Street/Brown Street/Cook Street/Old Canterbury Road. The vehicles would depart via Parramatta Road.

The u-turn via Tebbutt Street/Hathern Street/Brown Street/Cook Street/Old Canterbury Road that would be used for the Parramatta Road West civil and tunnel site (C1b) was not contemplated in the EIS. This route is comprised of state roads (ie none of these roads are local roads) and is an approved heavy vehicle route for the M4 East project as documented in the M4 East CTAMP, which can be downloaded from the WestConnex M4 East website¹.

3.1.3 Leichhardt North

The forecast volumes of construction related heavy vehicles at the Darley Road civil and tunnel site (C4) are not expected to change from those forecast in Chapter 7 of Appendix H (Technical working paper: Traffic and transport) of the EIS. Heavy vehicles arriving to the site were previously assumed to turn right to James Street / Darley Road from City West Link eastbound but will now arrive at the site by a left turn from City West Link westbound via the truck marshalling area at the White Bay civil site (C11) or via a u-turn at the roundabout on James Craig Road. There is also expected to be an increase in light vehicles on City West Link in this area due to the additional workforce parking to be provided at the White Bay civil site (C11).

3.1.4 Annandale

The forecast volumes of construction related heavy vehicles at the Pyrmont Bridge Road tunnel site (C9) are not expected to change from those forecast in Chapter 7 of Appendix H (Technical working paper: Traffic and transport) of the EIS. Heavy vehicles arriving to the site were previously assumed to travel along Parramatta Road from the M4 East exit ramp but will now access Parramatta Road by a left turn from Johnston Street via the truck marshalling area at the White Bay civil site (C11). There

¹ <https://www.westconnex.com.au/projects/m4-east>

is also expected to be an increase in light vehicles on Johnston Street in this area due to the additional workforce parking to be provided at the White Bay civil site (C11).

3.1.5 Cumulative scenario

An assessment has been undertaken of a cumulative scenario containing the following elements:

- M4-M5 construction volumes as identified in Chapter 7 of Appendix H (Technical working paper: Traffic and transport) of the EIS and updated in this report (Option A has been used given limited difference between the two scenarios)
- Construction volumes associated with the proposed future Western Harbour Tunnel construction (as noted in **section 3.1.5**)
- Multi-user facility construction volumes of 500 two-way trips per day
 - It has been conservatively assumed that 10 per cent of daily trips would occur during the relevant peak hours
 - 70 per cent of trips assumed between Multi-User Facility and the city centre with the remainder divided equally between north, west and local destinations
- Concrete batching plant with capacity to deliver one million tonnes of concrete per annum
 - Peak hour forecasts were made based on the following assumptions:
 - Six cubic metre capacity heavy vehicles
 - 50 working weeks per year
 - 5.5 working days per week
 - 10 per cent of daily trips would occur during the relevant peak hours
 - 30 per cent of trips each assumed to the west and the north, with 20 per cent each assumed for the east and local destinations.

Table 3-2 provides a summary of light and heavy vehicle volumes predicted to arrive and depart from the various sites in this cumulative scenario during the typical network AM peak hour (7.30 am to 8.30 am), PM peak hour (4.15 pm to 5.15 pm) and daily period.

Table 3-2 Indicative daily and peak period construction traffic volumes for cumulative construction scenario

Location		Daily vehicles		AM peak hour				PM peak hour			
		(one way)		(7.30–8.30 am)				(4.15–5.15 pm)			
		Heavy vehicles	Light vehicles	Heavy vehicles		Light vehicles		Heavy vehicles		Light vehicles	
				Arrive	Depart	Arrive	Depart	Arrive	Depart	Arrive	Depart
C11	White Bay civil site	284	100	21	21	50	50	10	21 ¹	50	50
WHT	Western Harbour Tunnel			10	10			10	10		
MUF	Multi-User Facility	500	-	50	50	-	-	50	50	-	-
CBP	Concrete Batching Plant	250	-	25	25	-	-	25	25	-	-

Notes:

1. It has been assumed that the heavy vehicle arrivals at the White Bay civil site will be highest in the morning (up to 21 heavy vehicles per hour arriving between 5 am and 9 am) with arrivals reducing to a maximum of 10 per hour at other times as more vehicles would travel directly to the relevant site.

3.2 Access routes

The haulage routes from the White Bay civil site (C11) to the arterial road network and the changes to the Darley Road civil and tunnel site (C4) and Pyrmont Bridge Road tunnel site (C9) are shown in **Figure 3-1**, Figure 3-2, **Figure 3-3** and summarised in **Table 3-3**. Haulage routes are based on the assumption that spoil management sites will be located in western Sydney. Depending on final spoil management site locations selected, spoil haulage routes may be subject to change. These will be confirmed in the CTAMP that will be prepared for the project.

These routes have been used to inform the assessment of construction traffic impacts and would be confirmed during detailed design and construction planning through the CTAMP. Heavy vehicle access is proposed from the motorway network (M4 East and New M5 motorways) and major arterial roads (Parramatta Road, Wattle Street, City West Link, The Crescent, Johnston Street and James Craig Road). Most construction ancillary facilities proposed for the project are accessible from these roads.

Table 3-3 Proposed access routes to and from construction ancillary facilities assessed in this report

Site	Access and egress points (heavy vehicles) ¹	Access and egress points (light vehicles)
White Bay civil site (C11)	Access from City West Link/The Crescent then James Craig Road and Sommerville Road. Egress follows same route in reverse.	Same as for heavy vehicles.
Parramatta Road West civil and tunnel site (C1b)	Access from White Bay civil site (C11) to James Craig Road then City West Link, Parramatta Road (southbound), left into Tebbutt Street, left onto Hathern Street, left onto Brown Street, left onto Cook Street, left onto Old Canterbury Road and left onto Parramatta Road (northbound). Egress is northbound along Parramatta Road. The spoil haulage route as presented in the EIS for this site would also continue to be used.	No change from EIS.
Darley Road civil and tunnel site (C4)	Access from City West Link (westbound from James Craig Road / C11) to James Street then Darley Road. Egress is from Darley Road to James Street then City West Link westbound.	Same as for heavy vehicles. Local access to Darley Road also via James Street (north of City West Link) and Norton Street. Egress from Darley Road to James Street and City West Link.
Pyrmont Bridge Road tunnel site (C9)	Access from White Bay civil site (C11) to James Craig Road then The Crescent, Johnston Street and eastbound along Parramatta Road. Egress is via Pyrmont Bridge Road and Parramatta Road (westbound). The spoil haulage route as presented in the EIS for this site would also continue to be used.	No change from the EIS.

Notes:

1. Some use of local roads by heavy vehicles delivering materials and/or equipment may also be required, however this would be minimised as far as practicable.

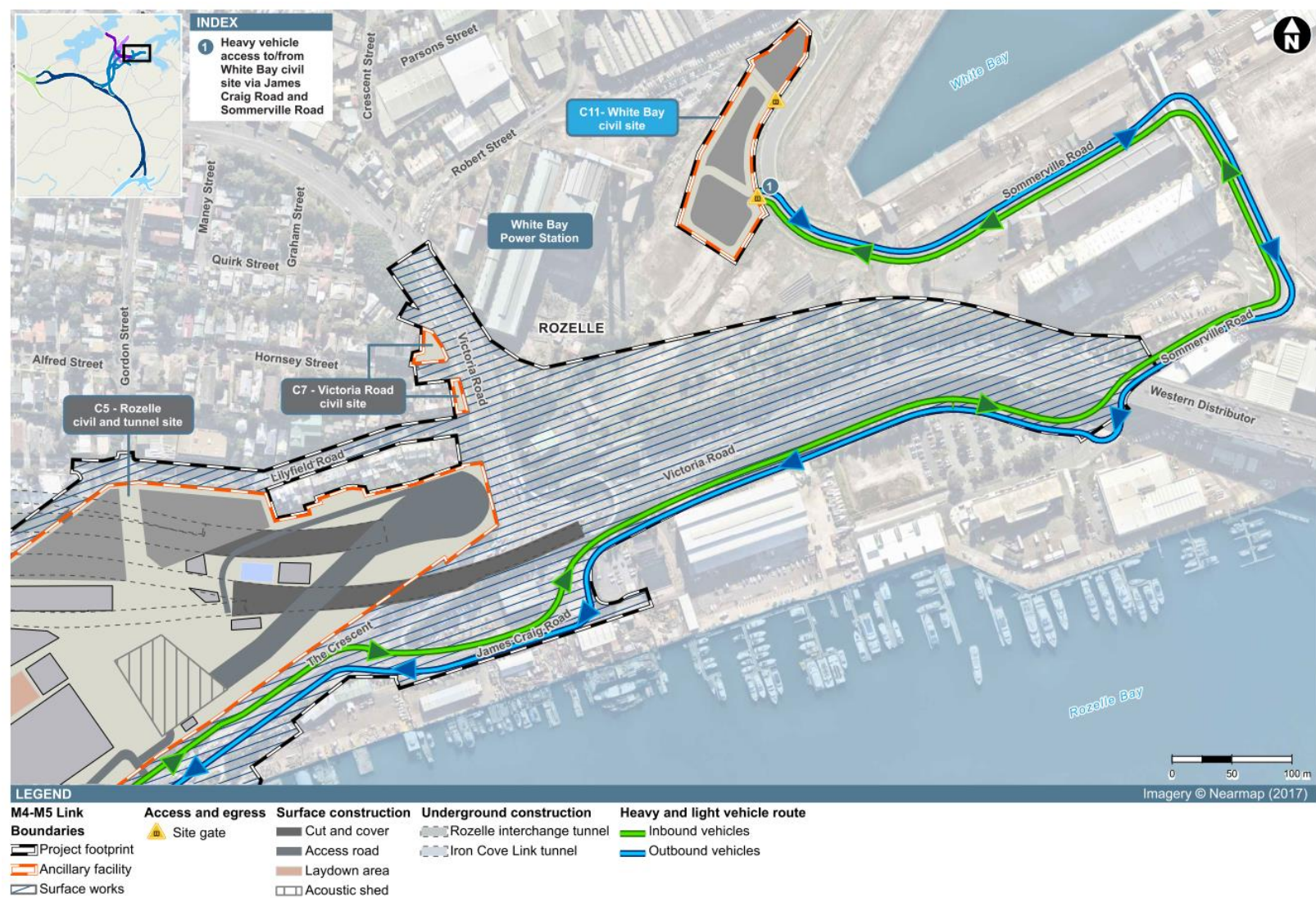


Figure 3-1 Indicative spoil haulage route – White Bay civil site (C11)

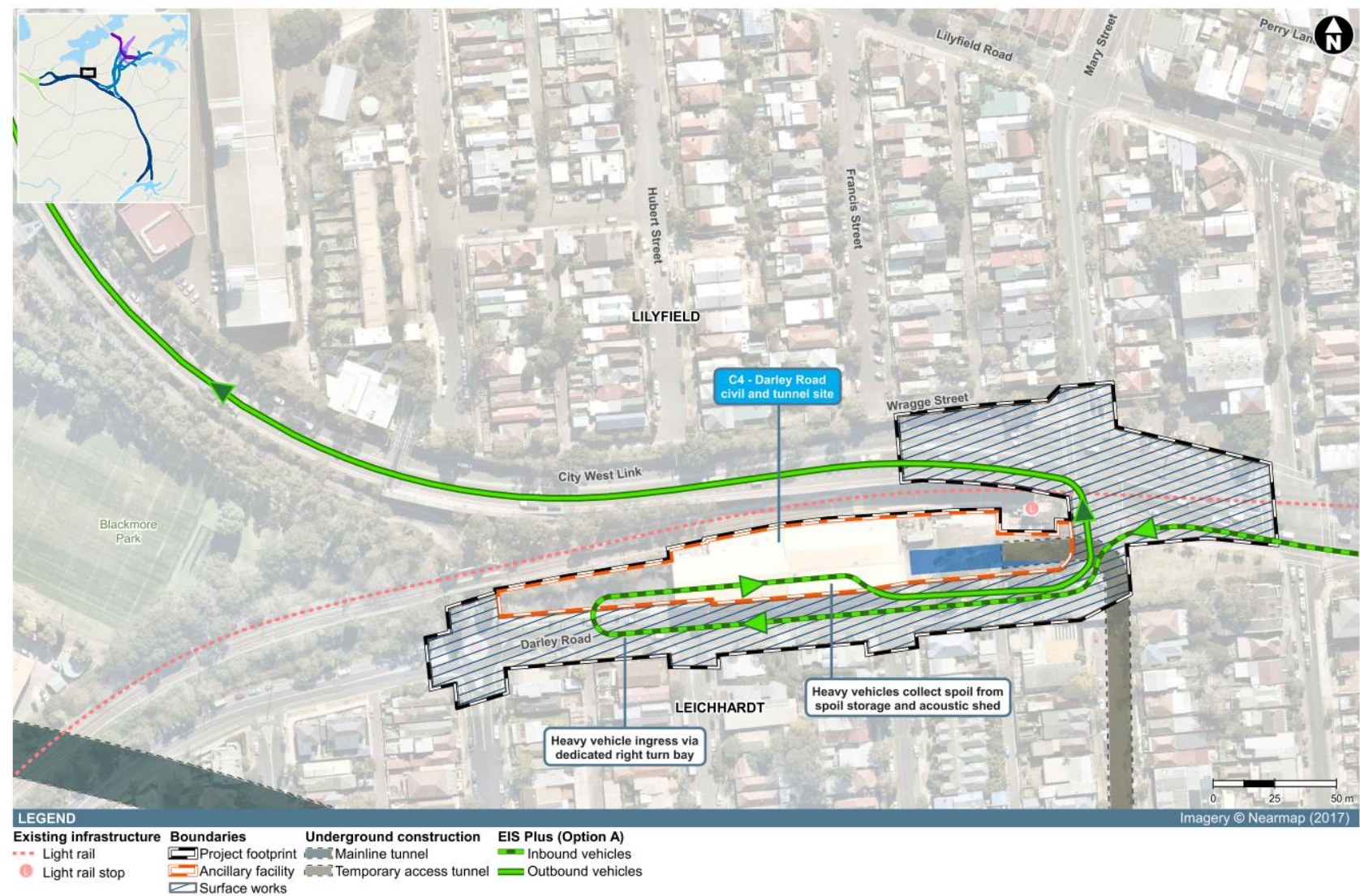


Figure 3-2 Indicative spoil haulage route – Darley Road civil and tunnel site (C4)

D:\10_EIS\02_Maps\IDD\IM4M5-PIR-FIG-ALL.indd | 180118 16:10 [V19E]

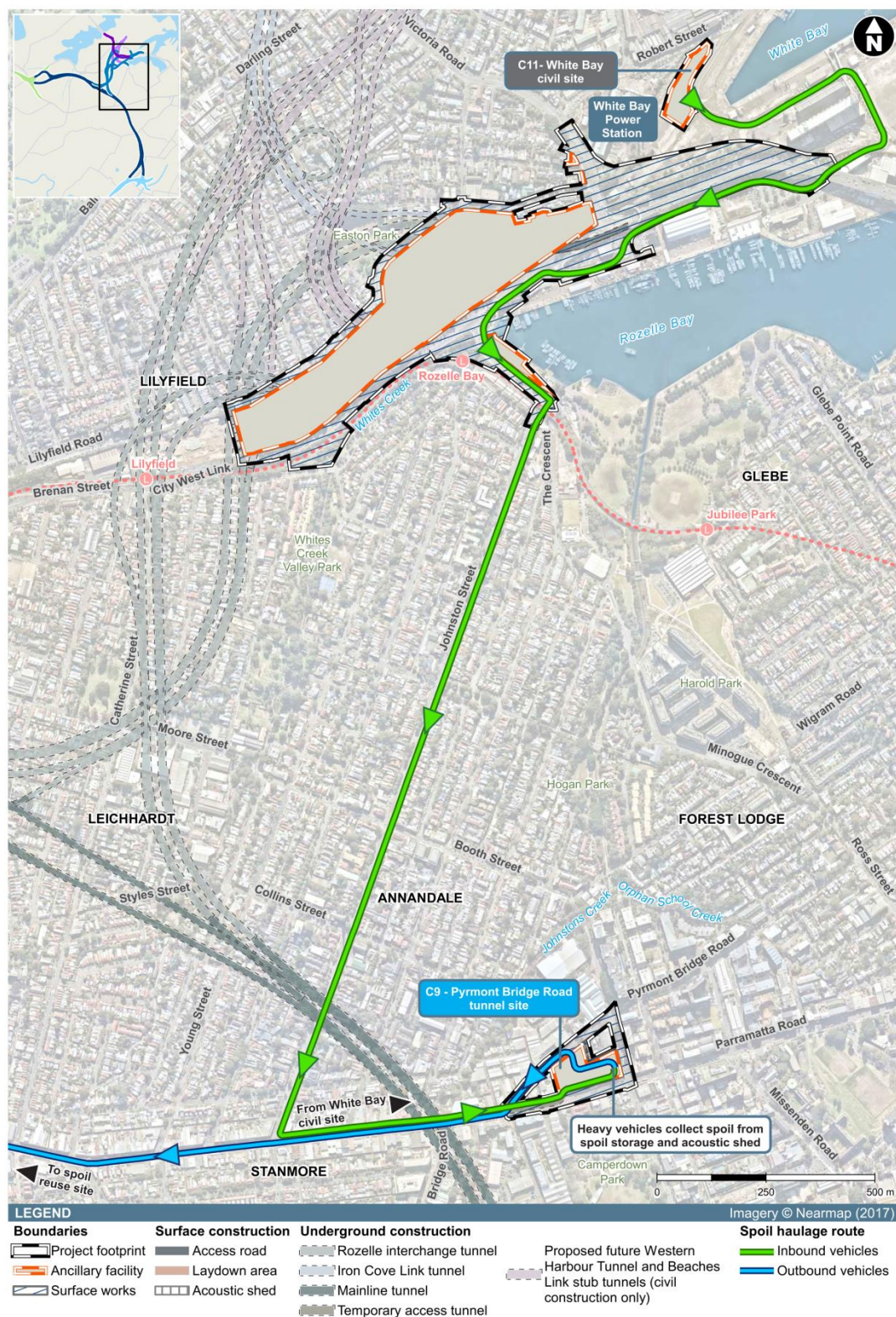


Figure 3-3 Indicative spoil haulage route – Pyrmont Bridge Road tunnel site (C9) for heavy vehicles traveling from the White Bay civil site (C11)

3.3 Construction traffic distribution

The changes from Chapter 7 of Appendix H (Technical working paper: Traffic and transport) of the EIS are limited to the introduction of the White Bay civil site (C11) and associated routings to ancillary construction sites as described in **section 3.2** of this report, and layout changes at the City West Link/James Street intersection. The daily and peak period heavy vehicle estimates have not changed from those presented in the EIS.

Table 3-4 provides estimates of heavy vehicle construction volumes on key roads around the construction ancillary facilities during the AM peak and PM peak hours for the EIS (refer to Chapter 7 of Appendix H (Technical working paper: Traffic and transport) of the EIS) and the scenarios assessed in this report. These estimates are comprised of heavy vehicles travelling to and from the truck marshalling facility at the White Bay civil site (C11) as well as construction ancillary facilities described above.

The roads listed in **Table 3-4** are limited to those reported in the EIS and impacted by the changes associated with the use of the White Bay civil site and the change to the spoil haulage route for the Darley Road civil and tunnel site and the Pyrmont Bride Road tunnel site (C9). **Table 3-4** indicates that there will be:

- No change in heavy vehicle volumes on Parramatta Road compared to the EIS
- Small increases (relative to the EIS) forecast on City West Link, west of The Crescent and west of James Street at Leichhardt
- Up to seven heavy vehicles one-way (southbound) along Johnston Street
- Up to 42 heavy vehicles on James Craig Road.

Table 3-4 Indicative peak period distribution of heavy vehicle construction vehicles (two-way)

Road location	EIS (heavy vehicles/hour)		PIR (heavy vehicles/hour)	
	AM peak	PM peak	AM peak	PM peak
Parramatta Road, north of Wattle Street, Haberfield	24	24	24	24
City West Link, west of James Street, Leichhardt	68	68	82	71
City West Link, west of The Crescent, Lilyfield	32	32	60	49
Johnston Street, north of Parramatta Road, Annandale	¹	¹	²	²
James Craig Road, west of The Crescent, Rozelle	¹	¹	42	31

Notes:

1. Use of Johnson Street and James Craig Road by construction vehicles was not proposed in the EIS
2. Heavy vehicles / hour on Johnston Street are one-way, as trucks would travel in the southbound direction only

4 Assessment methodology

4.1 Roadway level of service

Updated analysis of the existing roadway levels of service (refer to Annexure A for a description of level of service) is detailed in **section 5.1.2**, **5.2.1** and **5.3.1** of this report to determine the impact of construction traffic in 2021 (expected peak period of construction) at relevant locations impacted by the changes from the EIS. The assessment also considers the location of potential spoil reuse sites in western Sydney.

Mid-block traffic level of service demonstrates the impact of construction traffic in 2021 for construction activities. Theoretical mid-block roadway capacities were based on Austroads *Guide to Traffic Management*.

In highly congested networks, single-point assessment criteria, such as mid-block levels of service, do not present a complete picture of traffic operations. In reality, some roads may carry more traffic than the theoretical capacity or, if a link is over capacity, this would result in queuing further back in the network, reducing the capacity of the links. Nonetheless, this assessment provides a high level indication of the effect construction vehicles would have on roadway levels of service, compared to the background traffic.

A more practical impact assessment of capacity is provided in the intersection level of service assessment.

Minor amendments to traffic volumes reported in Chapter 8 and Appendix H (Technical working paper: Traffic and transport) of the EIS have been made for some locations and directions. These have been made to correct small errors which were identified during the preparation of this assessment and are such denoted with a footnote in the relevant tables. These minor amendments to traffic volumes reported in the EIS did not change the level of service (LoS) reported in the mid-block analysis in the EIS for the 'With construction' (EIS) options and would have a negligible impact on the outcomes of the mid-block analysis for construction traffic as reported in Chapter 8 (Traffic and transport) and section 7 of Appendix H (Technical working paper: Traffic and transport) of the EIS.

4.2 Intersection level of service

The construction impact assessment was undertaken where construction traffic is passing through the network in significant volumes. The intersections assessed in Chapter 7 of Appendix H (Technical working paper: Traffic and transport) of the EIS were grouped into six corridors or clusters adjacent to the construction ancillary facilities. Those impacted by the changes identified in this report are listed as follows:

- Cluster 1 in Haberfield and Ashfield – **section 5.2**
- Cluster 2 in Leichhardt North – **section 5.3**
- Cluster 3 in Lilyfield and Rozelle – **section 5.1**

In addition, two intersections on Johnston Street at Annandale have been assessed to determine the impact of construction traveling one-way from the White Bay civil site (C11) to the Pyrmont Bridge Road tunnel site (C9) (see **section 5.4**)

The intersection performance results for the road network under the 2021 'without construction', Option A and Option B forecast volumes are summarised for each relevant location in **section 5.1.2**, **section 5.2.2** and **section 5.3.2** for the AM and PM peak hours. This allows for comparison with the level of impact reported in Chapter 7 of Appendix H (Technical working paper: Traffic and transport) of the EIS.

Additional traffic modelling, over and above that reported in Chapter 7 of Appendix H (Technical working paper: Traffic and transport) of the EIS, was undertaken on Johnston Street given the change in access route for heavy vehicles accessing the Pyrmont Bridge Road tunnel site. This is reported in **section 5.4**.

Intersection modelling was undertaken using passenger car units (PCU) to quantify traffic volumes. As described in Annexure A, this accounts for the amount of road space used by different vehicle types.

As noted in the Appendix H (Technical working paper: Traffic and transport) of the EIS, the intersection levels of service reported for the construction assessment are not directly comparable to those presented in the operational modelling results in Chapter 10 of Appendix H (Technical working paper: Traffic and transport) of the EIS, as the operational modelling results had exit blocking constraints, applied in the microsimulation models to reflect network congestion beyond the modelled network extents, removed.

5 Assessment of construction impacts

5.1 Lilyfield and Rozelle

This section presents changes to the impact assessment of the construction activities on proposed access routes. The construction impact assessment was undertaken where construction traffic is passing through the network in significant volumes. The analysis considers Cluster 3 which covers the section of City West Link adjacent to Rozelle civil and tunnel site (C5) and White Bay civil site (C11).

Cluster 3 consists of the following intersections:

- City West Link/The Crescent
- The Crescent/James Craig Road
- City West Link/Rozelle civil and tunnel site (C5) western access.

There are no additional impacts identified for public transport and cyclists. Potential impacts on pedestrians are described in **section 5.1.4**.

In addition, a mid-block analysis of James Craig Road has been carried out to assess potential impacts from construction traffic accessing the White Bay civil site (C11). As the use of James Craig Road by construction traffic was not contemplated in the EIS, results are presented for the without construction and PIR Option A scenarios. There was no significant difference between PIR Option A and PIR Option B scenarios results so only a single scenario was assessed.

5.1.1 Roadway level of service

As described in **section 4.1**, an update of the analysis of the relevant existing roadway levels of service was undertaken to determine the impact of construction traffic from the White Bay civil site (C11) in 2021. In addition, an assessment of potential impacts from the use of the White Bay civil site (C11) on James Craig Road has been carried out. Theoretical mid-block roadway capacities were based on Austroads *Guide to Traffic Management* and these capacities and assessment results are shown in **Table 5-1**, **Table 5-2**, **Table 5-3** and **Table 5-4** for the AM and PM peaks.

The results generally show a small deterioration in performance at each location under the PIR Option A and PIR Option B scenarios relative to the 'without construction' and 'with construction' scenarios in Chapter 7 of Appendix H (Technical working paper: Traffic and transport) of the EIS. There is a LoS band change relative to the EIS 'with construction' scenario at a single location:

- AM peak westbound at City West Link west of The Crescent where the LoS moves from D to E in both Option A and Option B.

For James Craig Road, when comparing the without construction scenario to the PIR Option A scenario the results show a marginal deterioration in performance along James Craig Road with two LoS band changes, comprising:

- Eastbound performance in the AM peak deteriorates from LoS B to LoS C
- Westbound performance in the PM peak deteriorates from LoS A to LoS B.

The level of service provided on James Craig Road remains satisfactory in all scenarios at a minimum LoS C.

Table 5-1 Option A – 2021 AM peak mid-block operational performance summary¹

Location and direction		Mid-block capacity	2021 AM peak hour (veh/hr)								
			Without construction			EIS Option A			PIR Option A		
			Flow	V/C	LoS	Flow	V/C	LoS	Flow	V/C	LoS
City West Link west of The Crescent – Rozelle	EB	2,300	2,520	1.10	F	2,540 ²	1.10	F	2,580	1.12	F
	WB	2,300	1,800	0.78	D	1,840 ²	0.80	D	1,860	0.81	E
City West Link east of The Crescent – Rozelle	EB	3,400	3,520	1.04	F	3,530	1.04	F	3,570	1.05	F
	WB	3,400	2,560	0.75	D	2,580	0.76	D	2,620	0.77	D
James Craig Road west of The Crescent – Rozelle *	EB	1,000	320*	0.32	B				410*	0.41	C
	WB	1,000	150*	0.15	A				230*	0.23	A

Notes:

1. Traffic volume rounded to nearest 10; Slight amendment to traffic volume reported in EIS.

Table 5-2 Option A – 2021 PM peak mid-block operational performance summary¹

Location and direction		Mid-block capacity	2021 PM peak hour (veh/hr)								
			Without construction			EIS Option A			PIR Option A		
			Flow	V/C	LoS	Flow	V/C	LoS	Flow	V/C	LoS
City West Link west of The Crescent – Rozelle	EB	2,300	2,440	1.06	F	2,630 ²	1.14	F	2,650	1.15	F
	WB	2,300	1,850	0.80	D	1,890 ²	0.82	E	1,900	0.83	E
City West Link east of The Crescent – Rozelle	EB	3,400	3,210	0.94	E	3,420 ²	1.01	F	3,450	1.01	F
	WB	3,400	3,000	0.88	E	3,010	0.89	E	3,050	0.90	E
James Craig Road west of The Crescent – Rozelle *	EB	1,000	80*	0.08	A				170*	0.17	A
	WB	1,000	230*	0.23	A				310*	0.31	B

Notes:

1. Traffic volume rounded to nearest 10; Slight amendment to traffic volume reported in EIS.

Table 5-3 Option B – 2021 AM peak mid-block operational performance summary¹

Location and direction		Mid-block capacity	2021 AM peak hour (veh/hr)								
			Without construction			EIS Option B			PIR Option B		
			Flow	V/C	LoS	Flow	V/C	LoS	Flow	V/C	LoS
City West Link west of The Crescent – Rozelle	EB	2,300	2,520	1.10	F	2,550	1.11	F	2,580	1.12	F
	WB	2,300	1,800	0.78	D	1,840 ²	0.80	D	1,860	0.81	E
City West Link east of The Crescent – Rozelle	EB	3,400	3,520	1.04	F	3,530	1.04	F	3,570	1.05	F
	WB	3,400	2,560	0.75	D	2,570	0.76	D	2,620	0.77	D

Notes:

1. Traffic volume rounded to nearest 10.
2. Slight amendment to traffic volume reported in EIS.

Table 5-4 Option B – 2021 PM peak mid-block operational performance summary¹

Location and direction		Mid-block capacity	2021 PM peak hour (veh/hr)								
			Without construction			EIS Option B			PIR Option B		
			Flow	V/C	LoS	Flow	V/C	LoS	Flow	V/C	LoS
City West Link west of The Crescent – Rozelle	EB	2,300	2,440	1.06	F	2,630 ²	1.14	F	2,630	1.14	F
	WB	2,300	1,850	0.80	D	1,890 ²	0.82	E	1,910	0.83	E
City West Link east of The Crescent – Rozelle	EB	3,400	3,210	0.94	E	3,390 ²	1.00	F	3,430	1.01	F
	WB	3,400	3,000	0.88	E	3,010	0.89	E	3,060	0.91	E

Notes:

1. Traffic volume rounded to nearest 10.
2. Slight amendment to traffic volume reported in EIS.

5.1.2 Intersection level of service

The intersection performance results for the road network under the 2021 'without construction', Option A and Option B forecast volumes are summarised in **Table 5-5**, **Table 5-6**, **Table 5-7** and **Table 5-8** for the AM and PM peaks. This allows for comparison with the level of impact reported in Chapter 7 of Appendix H (Technical working paper: Traffic and transport) of the EIS.

In the updated scenario, there is a relatively small increase in the volume of construction traffic added to the network, from about 80 to 220 PCU in the AM peak, and from 280 PCU to about 370 PCU in the PM peak. This translates to small increases of up to 190 PCU at the existing intersections on The Crescent (relative to the EIS scenarios).

The change in performance relative to the EIS 'with construction' scenarios are limited with changes in LoS band confined to the following locations during the PM peak:

- City West Link/The Crescent changes from LoS C to LoS D in Option B
- The Crescent/James Craig Road performance changes from LoS B to LoS C in both Option A and Option B.

Table 5-5 Option A – 2021 AM peak hour intersection operational performance summary¹

Cluster	Intersection	Without construction		EIS Option A		PIR Option A	
		Volume (PCU)	LoS	Volume (PCU)	LoS	Volume (PCU)	LoS
3	The Crescent James Craig Road	6,730	B	6,760	B	6,940	B
	City West Link The Crescent	6,800	D	6,880	E	7,010	E
	City West Link C5 site access	–	–	4,780	A	4,860	A

Notes:

1. Traffic volume rounded to nearest 10.

Table 5-6 Option A – 2021 PM peak hour intersection operational performance summary¹

Cluster	Intersection	Without construction		EIS Option A		PIR Option A	
		Volume (PCU)	LoS	Volume (PCU)	LoS	Volume (PCU)	LoS
3	The Crescent James Craig Road	6,500	B	6,720	B	6,870	C
	City West Link The Crescent	6,690	C	6,970	C	7,070	C
	City West Link C5 site access	–	–	4,740	A	4,800	A

Notes:

1. Traffic volume rounded to nearest 10.

Table 5-7 Option B – 2021 AM peak hour intersection operational performance summary¹

Cluster	Intersection	Without construction		EIS Option B		PIR Option B	
		Volume (PCU)	LoS	Volume (PCU)	LoS	Volume (PCU)	LoS
3	The Crescent James Craig Road	6,730	B	6,760	B	6,950	B
	City West Link The Crescent	6,800	D	6,880	E	7,020	E
	City West Link C5 site access	–	–	4,770	A	4,870	A

Notes:

1. Traffic volume rounded to nearest 10.

Table 5-8 Option B – 2021 PM peak hour intersection operational performance summary¹

Cluster	Intersection	Without construction		EIS Option B		PIR Option B	
		Volume (PCU)	LoS	Volume (PCU)	LoS	Volume (PCU)	LoS
3	The Crescent James Craig Road	6,500	B	6,700	B	6,860	C
	City West Link The Crescent	6,690	C	6,950	C	7,060	D
	City West Link C5 site access	–	–	4,710	A	4,790	A

Notes:

1. Traffic volume rounded to nearest 10.

5.1.3 Temporary road network changes, closures and diversions

There are no significant changes to the road network relative to the EIS due to the provision of the proposed White Bay civil site (C11).

5.1.4 Potential impacts on pedestrians

A pedestrian crossing of Sommersville Road is present on the western side of the Port Authority of NSW entry gates. This crossing provides a pedestrian connection between the footpath on the northern side of Sommersville Road and the associated connection to the Anzac Bridge pedestrian path, and commercial premises on the southern side of Sommersville Road. This crossing is likely used by pedestrians accessing the adjacent building and is not heavily used.

Given the current use of Sommersville Road for port related activities, including by heavy vehicles, and the presence of traffic signs and line marking to indicate the presence of this crossing, no changes to this crossing are proposed. Truck drivers using the White Bay civil site (C11) will be made aware of the presence of this crossing as part of the protocols to be established for the use of the site.

5.2 Haberfield and Ashfield

This section presents relevant changes to the impact assessment of the construction activities on proposed access routes for Option A and Option B. The construction impact assessment was undertaken where construction traffic is passing through the network in significant volumes.

The impact of changes in the Haberfield and Ashfield area are provided and take account of changes due to provision of the White Bay civil site (C11). There are no additional impacts beyond those identified in Chapter 7 of Appendix H (Technical working paper: Traffic and transport) of the EIS on public transport, pedestrians and/or cyclists.

No changes are proposed to the construction sites or access points for construction ancillary facilities at Haberfield and Ashfield. There will however be some additional traffic passing through Haberfield due to heavy and light vehicles accessing the White Bay civil site (C11) via the M4 East and City West Link.

Cluster 1 covers the Parramatta Road and Wattle Street corridors in Haberfield and consists of the following intersections:

- Parramatta Road/Harris Road
- Parramatta Road/Croydon Road/Arlington Street
- Parramatta Road/Great North Road
- Parramatta Road/Frederick Street/Wattle Street
- Parramatta Road/Bland Street
- Wattle Street/Ramsay Street
- Dobroyd Parade/Waratah Street
- Dobroyd Parade/Timbrell Drive/Mortley Avenue.

5.2.1 Roadway level of service

As described in **section 4.1**, an update of the analysis of the existing roadway levels of service (refer to Annexure A for a description of level of service) was carried out to determine the impact of construction traffic in 2021. Theoretical mid-block roadway capacities were based on Austroads *Guide to Traffic Management* and these capacities and assessment results for Option A and Option B are shown in **Table 5-9**, **Table 5-10**, **Table 5-11** and **Table 5-12** for the AM and PM peaks.

The results for Haberfield and Ashfield show limited change in terms of volume over capacity from the assessment in Chapter 7 of Appendix H (Technical working paper: Traffic and transport) of the EIS and indicate that the relevant mid-blocks will remain within their theoretical capacity.

Table 5-9 Option A – 2021 AM peak mid-block operational performance summary¹

Location and direction		Mid-block capacity	2021 AM peak hour (veh/hr)								
			Without construction			EIS Option A			PIR Option A		
			Flow	V/C ²	LoS	Flow	V/C	LoS	Flow	V/C	LoS
Parramatta Road north of Wattle Street – Haberfield	SB	3,300	1,840	0.56	C	1,890	0.57	C	1,890	0.57	C
	NB	3,300	1,310	0.40	C	1,330	0.40	C	1,340	0.41	C
Wattle Street east of Parramatta Road – Haberfield	EB	2,000	740	0.37	B	760	0.38	B	780	0.39	B
	WB	2,000	860	0.43	C	880	0.44	C	890	0.45	C
M4 East ramps at Wattle Street ³	EB	2,200	1170	0.53	C	1280	0.58	D	1310	0.60	D
	WB	4,500	1260	0.28	B	1330	0.30	B	1340	0.30	B

Notes:

1. Traffic volume rounded to nearest 10.
2. Volume over capacity ratio.
3. Freeway LoS is evaluated in PCU, eastbound (EB) capacity treated as urban road with interrupted flow due to downstream traffic signals.

Table 5-10 Option A – 2021 PM peak mid-block operational performance summary¹

Location and direction		Mid-block capacity	2021 PM peak hour (veh/hr)								
			Without construction			EIS Option A			PIR Option A		
			Flow	V/C ²	LoS	Flow	V/C	LoS	Flow	V/C	LoS
Parramatta Road north of Wattle Street – Haberfield	SB	3,300	2,080	0.63	D	2,240	0.68	D	2,260	0.68	D
	NB	3,300	1,310	0.40	C	1,370	0.41	C	1,380	0.42	C
Wattle Street east of Parramatta Road – Haberfield	EB	2,000	1,110	0.55	C	1,260	0.63	D	1,270	0.64	D
	WB	2,000	730	0.37	B	790	0.39	C	800	0.40	C
M4 East ramps at Wattle Street ³	EB	2,200	910	0.41	C	990	0.45	C	1010	0.46	C
	WB	4,500	1090	0.24	A	1270	0.28	B	1290	0.29	B

Notes:

1. Traffic volume rounded to nearest 10.
2. Volume over capacity ratio.
3. Freeway LoS is evaluated in PCU, eastbound (EB) capacity treated as urban road with interrupted flow due to downstream traffic signals.

Table 5-11 Option B – 2021 AM peak mid-block operational performance summary¹

Location and direction		Mid-block capacity	2021 AM peak hour (veh/hr)								
			Without construction			EIS Option B			PIR Option B		
			Flow	V/C ²	LoS	Flow	V/C	LoS	Flow	V/C	LoS
Parramatta Road north of Wattle Street – Haberfield	SB	3,300	1,840	0.56	C	1,890	0.57	C	1,890	0.57	C
	NB	3,300	1,310	0.40	C	1,330	0.40	C	1,340	0.41	C
Wattle Street east of Parramatta Road – Haberfield	EB	2,000	740	0.37	B	740	0.37	B	740	0.37	B
	WB	2,000	860	0.43	C	870	0.43	C	870	0.43	C
M4 East ramps at Wattle Street ³	EB	2,200	1170	0.53	C	1280	0.58	D	1310	0.60	D
	WB	4,500	1260	0.28	B	1330	0.30	B	1340	0.30	B

Notes:

1. Traffic volume rounded to nearest 10.
2. Volume over capacity ratio.
3. Freeway LoS is evaluated in PCU, eastbound (EB) capacity treated as urban road with interrupted flow due to downstream traffic signals.

Table 5-12 Option B – 2021 PM peak mid-block operational performance summary¹

Location and direction		Mid-block capacity	2021 PM peak hour (veh/hr)								
			Without construction			EIS Option B			PIR Option B		
			Flow	V/C ²	LoS	Flow	V/C	LoS	Flow	V/C	LoS
Parramatta Road north of Wattle Street – Haberfield	SB	3,300	2,080	0.63	D	2,090	0.63	D	2,090	0.63	D
	NB	3,300	1,310	0.40	C	1,410	0.43	C	1,420	0.43	C
Wattle Street east of Parramatta Road – Haberfield	EB	2,000	1,110	0.55	C	1,110	0.56	C	1,110	0.56	C
	WB	2,000	730	0.37	B	740	0.37	B	740	0.37	C
M4 East ramps at Wattle Street ³	EB	2,200	910	0.41	C	990	0.45	C	1010	0.46	C
	WB	4,500	1090	0.24	A	1270	0.28	B	1290	0.29	B

Notes:

1. Traffic volume rounded to nearest 10.
2. Volume over capacity ratio.
3. Freeway LoS is evaluated in PCU, eastbound (EB) capacity treated as urban road with interrupted flow due to downstream traffic signals.

5.2.2 Intersection level of service

The intersection performance results for the road network under the 2021 'without construction', Option A and Option B forecast volumes are summarised in **Table 5-13**, **Table 2-6**, **Table 5-15** and **Table 5-16** for the AM and PM peak hours. This allows for comparison with the level of impact reported in Chapter 7 of Appendix H (Technical working paper: Traffic and transport) of the EIS.

In the PIR Option A and Option B scenarios, there is a relatively small increase in the volume of construction traffic added to the network when compared to the EIS Option A and Option B scenarios, rising by a maximum of about 70 passenger car units (PCU) in the PM peak at the intersections east of the M4 East ramps on Wattle Street, ie at the intersections of Dobroyd Parade/Waratah Street and Dobroyd Parade/Timbrell Drive. This increase in PCUs does not change the LoS at either of these intersections during the AM or PM peaks and there is limited change elsewhere on the network.

The change in intersection performance relative to the EIS assessment is limited with changes in LoS band seen at only two intersections across the four scenarios as follows:

- Deterioration in LoS from LoS B to LoS C at Parramatta Road/Croydon Road/Arlington Street in Option A during the AM peak
- Improvement in LoS from LoS E to LoS D at Parramatta Road/Croydon Road/Arlington Street in Option B during the PM peak
- Improvement in LoS from LoS C to LoS B at Parramatta Road/Harris Road in Option B during the PM peak.

The results at these two intersections show a satisfactory minimum LoS C maintained except where the performance improves relative to the EIS from LoS E to LoS D at Parramatta Road/Croydon Road/Arlington Street under PIR Option B in the PM peak. This improvement results from a slight reduction in forecast traffic as heavy vehicles travelling to the Parramatta Road West civil and tunnel site (C1b) are now assumed to use M4 East/City West Link on route to the truck marshalling facility at the White Bay civil site (C11) rather than using Parramatta Road to travel directly to site.

Table 5-13 Option A – 2021 AM peak hour intersection operational performance summary¹

Cluster	Intersection	Without construction		EIS Option A		PIR Option A	
		Volume (PCU)	LoS	Volume (PCU)	LoS	Volume (PCU)	LoS
1	Parramatta Road Harris Road	2,550	B	2,650	C	2,650	C
	Parramatta Road Croydon Road Arlington Street	3,280	B	3,370	B	3,370	C
	Parramatta Road Great North Road	3,810	C	3,940	C	3,940	C
	Parramatta Road Frederick Street Wattle Street	4,880	D	4,960	D	4,960	D
	Parramatta Road Bland Street	2,870	F	2,870	F	2,870	F
	Wattle Street Ramsay Street	3,260	C	3,280	C	3,280	C
	Dobroyd Parade Waratah Street	3,470	B	3,650	B	3,710	B
	Dobroyd Parade Timbrell Drive Mortley Avenue	5,530	F	5,720	F	5,780	F

Notes:

1. Traffic volume rounded to nearest 10.

Table 5-14 Option A – 2021 PM peak hour intersection operational performance summary¹

Cluster	Intersection	Without construction		EIS Option A		PIR Option A	
		Volume (PCU)	LoS	Volume (PCU)	LoS	Volume (PCU)	LoS
1	Parramatta Road Harris Road	3,040	B	3,240	C	3,240	C
	Parramatta Road Croydon Road Arlington Street	3,610	D	3,710	E	3,710	E
	Parramatta Road Great North Road	3,820	F	3,920	F	3,920	F
	Parramatta Road Frederick Street Wattle Street	4,950	E	5,200	E	5,200	E
	Parramatta Road Bland Street	2,500	B	2,520	B	2,530	B
	Wattle Street Ramsay Street	3,080	D	3,330	E	3,330	E
	Dobroyd Parade Waratah Street	2,960	B	3,240	B	3,280	B
	Dobroyd Parade Timbrell Drive Mortley Avenue	5,450	F	5,770	F	5,800	F

Notes:

1. Traffic volume rounded to nearest 10.

Table 5-15 Option B – 2021 AM peak hour intersection operational performance summary¹

Cluster	Intersection	Without construction		EIS Option B		PIR Option B	
		Volume (PCU)	LoS	Volume (PCU)	LoS	Volume (PCU)	LoS
1	Parramatta Road Harris Road	2,550	B	2,640	B	2,620	B
	Parramatta Road Croydon Road Arlington Street	3,280	B	3,360	B	3,350	B
	Parramatta Road Great North Road	3,810	C	3,900	C	3,880	C
	Parramatta Road Frederick Street Wattle Street	4,880	D	4,970	D	4,970	D
	Parramatta Road Bland Street	2,870	F	2,930	F	2,930	F
	Wattle Street Ramsay Street	3,260	C	3,300	C	3,310	C
	Dobroyd Parade Waratah Street	3,470	B	3,650	B	3,730	B
	Dobroyd Parade Timbrell Drive Mortley Avenue	5,530	F	5,720	F	5,790	F

Notes:

1. Traffic volume rounded to nearest 10.

Table 5-16 Option B – 2021 PM peak hour intersection operational performance summary¹

Cluster	Intersection	Without construction		EIS Option B		PIR Option B	
		Volume (PCU)	LoS	Volume (PCU)	LoS	Volume (PCU)	LoS
1	Parramatta Road Harris Road	3,040	B	3,180	C	3,170	B
	Parramatta Road Croydon Road Arlington Street	3,610	D	3,750	E	3,730	D
	Parramatta Road Great North Road	3,820	F	3,960	F	3,950	F
	Parramatta Road Frederick Street Wattle Street	4,950	E	5,090	E	5,080	E
	Parramatta Road Bland Street	2,500	B	2,640	B	2,630	B
	Wattle Street Ramsay Street	3,080	D	3,120	D	3,120	D
	Dobroyd Parade Waratah Street	2,960	B	3,260	B	3,300	B
	Dobroyd Parade Timbrell Drive Mortley Avenue	5,450	F	5,750	F	5,780	F

Notes:

1. Traffic volume rounded to nearest 10.

5.2.3 Temporary road network changes, closures and diversions

No changes are proposed to the temporary road network changes, closures and diversions identified in the EIS.

5.3 Leichhardt North

This section presents changes to the impact assessment of the construction activities on proposed access routes taking into account the proposed changes at the Darley Street civil and tunnel site (C4) and the White Bay civil site (C11). The analysis is confined to Cluster 2 which is adjacent to the Darley Road civil and tunnel site (C4). There are no additional impacts identified for public transport, pedestrians and cyclists.

The construction impact assessment was undertaken for intersections where construction traffic is passing through the network in significant volumes. This section provides updated results for Cluster 2 which covers the section of City West Link in Leichhardt adjacent to Darley Street and the Darley Road civil and tunnel site (C4).

Cluster 2 consists of the following intersections:

- City West Link/James Street
- City West Link/Norton Street
- Darley Road/Darley Road civil and tunnel site (C4) access.

5.3.1 Roadway level of service

As described in **section 4.1**, an update of the analysis of the existing roadway levels of service was undertaken to determine the impact of construction traffic in 2021. Theoretical mid-block roadway capacities were based on Austroads *Guide to Traffic Management* and these capacities and assessment results are shown in **Table 5-17**, **Table 5-18**, **Table 5-19** and **Table 5-20** for the AM and PM peaks.

The results show a small deterioration in performance at each location relative to the 'with construction' EIS Option A and Option B scenarios in Chapter 7 of Appendix H of the EIS with no LoS band changes noted.

Table 5-17 Option A – 2021 AM peak mid-block operational performance summary¹

Location and direction		Mid-block capacity	2021 AM peak hour (veh/hr)								
			Without construction			EIS Option A			PIR Option A		
			Flow	V/C	LoS	Flow	V/C	LoS	Flow	V/C	LoS
City West Link west of James Street – Rozelle	EB	2,300	2,120	0.92	E	2,200	0.96	E	2,210	0.98	E
	WB	2,300	1,940	0.84	E	1,990	0.86	E	2,010	0.87	E
Darley Road west of James Street – Haberfield	EB	1,000	680	0.68	D	700 ²	0.70	D	700	0.70	D
	WB	1,000	480	0.48	C	500 ²	0.50	C	500	0.50	C

Notes:

1. Traffic volume rounded to nearest 10.
2. Slight amendment to traffic volume reported in EIS.

Table 5-18 Option A – 2021 PM peak mid-block operational performance summary¹

Location and direction		Mid-block capacity	2021 PM peak hour (veh/hr)								
			Without construction			EIS Option A			PIR Option A		
			Flow	V/C	LoS	Flow	V/C	LoS	Flow	V/C	LoS
City West Link west of James Street – Rozelle	EB	2,300	2,230	0.97	E	2,320	1.01	F	2,350	1.02	F
	WB	2,300	2,110	0.92	E	2,240	0.97	E	2,260	0.98	E
Darley Road west of James Street – Haberfield	EB	1,000	540	0.54	C	630 ²	0.63	D	630	0.63	D
	WB	1,000	660	0.66	D	680 ²	0.68	D	680	0.68	D

Notes:

1. Traffic volume rounded to nearest 10.
2. Slight amendment to traffic volume reported in EIS.

Table 5-19 Option B – 2021 AM peak mid-block operational performance summary¹

Location and direction		Mid-block capacity	2021 AM peak hour (veh/hr)								
			Without construction			EIS Option B			PIR Option B		
			Flow	V/C	LoS	Flow	V/C	LoS	Flow	V/C	LoS
City West Link west of James Street – Rozelle	EB	2,300	2,120	0.92	E	2,200 ²	0.96	E	2,200	0.96	E
	WB	2,300	1,940	0.84	E	1,980	0.86	E	2,020	0.88	E
Darley Road west of James Street – Haberfield	EB	1,000	680	0.68	D	700 ²	0.70	D	700	0.70	D
	WB	1,000	480	0.48	C	500 ²	0.50	C	500	0.50	C

Notes:

1. Traffic volume rounded to nearest 10.
2. Slight amendment to traffic volume reported in EIS.

Table 5-20 Option B – 2021 PM peak mid-block operational performance summary¹

Location and direction		Mid-block capacity	2021 PM peak hour (veh/hr)								
			Without construction			EIS Option B			PIR Option B		
			Flow	V/C	LoS	Flow	V/C	LoS	Flow	V/C	LoS
City West Link west of James Street – Rozelle	EB	2,300	2,230	0.97	E	2,310 ²	1.00	F	2,330	1.01	F
	WB	2,300	2,110	0.92	E	2,220 ²	0.96	E	2,250	0.95	E
Darley Road west of James Street – Haberfield	EB	1,000	540	0.54	C	630 ²	0.63	D	630	0.63	D
	WB	1,000	660	0.66	D	680 ²	0.68	D	680	0.68	D

Notes:

1. Traffic volume rounded to nearest 10.
2. Slight amendment to traffic volume reported in EIS.

5.3.2 Intersection level of service

The intersection performance results for the road network under the 2021 'without construction', Option A and Option B forecast volumes are summarised in **Table 5-21**, **Table 5-22**, **Table 5-23** and **Table 5-24** for the AM and PM peak hours respectively. This allows for comparison with the level of impact reported in Chapter 7 of Appendix H (Technical working paper: Traffic and transport) of the EIS.

In the revised scenarios, when comparing the EIS Option A and Option B scenarios to the PIR Option A and Option B scenarios, there is a small increase in the volume of construction traffic added to the network, from about 190 to 260 PCU in the AM peak, and from 350 PCU to about 400 PCU in the PM peak. All of this increase occurs on City West Link, ie there is no additional impact on Darley Road. As can be seen in the relevant tables, this translates to small increases of 40 to 110 PCU at both major intersections (relative to the EIS).

The change in performance under the PIR Option A and Option B scenarios relative to that reported in Chapter 7 of Appendix H (Technical working paper: Traffic and transport) of the EIS is insignificant with no change in LoS predicted in either peak.

Table 5-21 Option A – 2021 AM peak hour intersection operational performance summary¹

Cluster	Intersection	Without construction		EIS Option A		PIR Option A	
		Volume (PCU)	LoS	Volume (PCU)	LoS	Volume (PCU)	LoS
2	City West Link James Street	5,530	F	5,720	F	5,790	F
	City West Link Norton Street	5,290	C	5,450	C	5,540	C
	Darley Road C4 site access	–	–	1,200	A	1,200	A

Notes:

1. Traffic volume rounded to nearest 10.

Table 5-22 Option A – 2021 PM peak hour intersection operational performance summary¹

Cluster	Intersection	Without construction		EIS Option A		PIR Option A	
		Volume (PCU)	LoS	Volume (PCU)	LoS	Volume (PCU)	LoS
2	City West Link James Street	5,640	F	5,990	F	6,030	F
	City West Link Norton Street	5,700	C	5,970	C	6,030	C
	Darley Road C4 site access	–	–	1,210	A	1,210	A

Notes:

1. Traffic volume rounded to nearest 10.

Table 5-23 Option B – 2021 AM peak hour intersection operational performance summary¹

Cluster	Intersection	Without construction		EIS Option B		PIR Option B	
		Volume (PCU)	LoS	Volume (PCU)	LoS	Volume (PCU)	LoS
2	City West Link James Street	5,530	F	5,720	F	5,800	F
	City West Link Norton Street	5,290	C	5,440	C	5,550	C
	Darley Road C4 site access	–	–	1,200	A	1,200	A

Notes:

1. Traffic volume rounded to nearest 10.

Table 5-24 Option B – 2021 PM peak hour intersection operational performance summary¹

Cluster	Intersection	Without construction		EIS Option B		PIR Option B	
		Volume (PCU)	LoS	Volume (PCU)	LoS	Volume (PCU)	LoS
2	City West Link James Street	5,640	F	5,960	F	6,020	F
	City West Link Norton Street	5,700	C	5,940	C	6,020	C
	Darley Road C4 site access	–	–	1,210	A	1,210	A

Notes:

1. Traffic volume rounded to nearest 10.

5.3.3 Temporary road network changes, closures and diversions

The key refinement from the temporary road network changes proposed in the EIS is the removal of the proposal to create a temporary right turn lane for construction traffic from City West Link eastbound to Darley Road (see **section 3.2**).

5.4 Annandale

This section presents the impact assessment of the construction activities on Johnston Street taking into account the proposed haulage route changes between at the White Bay civil site (C11) and Pyrmont Bridge tunnel site (C9). No analysis is provided of Cluster 5 which lies adjacent to the Pyrmont Bridge tunnel site (C9) as no changes are forecast from the EIS assessment in Chapter 7 of Appendix H (Technical working paper: Traffic and transport).

This section provides a construction impact assessment of Johnston Street with particular emphasis on the following intersections:

- The Crescent/Johnston Street/Chapman Road
- Parramatta Road/Johnston Street/Northumberland Avenue.

The above intersections have been modelled individually using LinSig.

Johnston Street runs for approximately 1.8 kilometres and connects The Crescent in Rozelle with Parramatta Road via Annandale. The road is a designated state road and is generally undivided with two though lanes in each direction along its length and a significant amount of angled and parallel parking on either side. There is an AM peak period restriction on right turn movements from Johnston Street to Parramatta Road reflecting the limited capacity available at the intersection during that period.

Traffic volumes are relatively low on Johnston Street (up to 1,600 PCU two-way volume measured at either end of the street) compared with major arterial roads on either end such as Parramatta Road

and City West Link/The Crescent. The proportion of heavy vehicles is also low at no higher than three per cent during peak periods.

The principal generators of pedestrian movements are Annandale Public School, Annandale North Public School and the shopping district adjacent to the Johnston Street/Booth Street intersection. Johnston Street has a speed limit of 60 kilometres an hour, and 40 kilometre an hour speed limits apply within school zones in the AM and PM peaks on school days. There are also signalised pedestrian crossings on Johnston Street adjacent to the two schools.

5.4.1 Roadway level of service

As described in **section 4.1**, an update of the analysis of the existing roadway levels of service was undertaken to determine the impact of construction traffic in 2021. Theoretical mid-block roadway capacities were based on Austroads *Guide to Traffic Management* and these capacities and assessment results are shown in **Table 5-1** and **Table 5-2** for the AM and PM peaks. There is no difference in forecast impact between Option A and Option B so only a single set of results is provided.

The results show a negligible deterioration in performance at each location relative to the 'with construction' scenarios in Chapter 7 of Appendix H of the EIS with no LoS band changes noted.

Table 5-25 2021 AM peak mid-block operational performance summary¹

Location and direction		Mid-block capacity	2021 AM peak hour (veh/hr)					
			Without construction			PIR		
			Flow	V/C	LoS	Flow	V/C	LoS
Johnston Street south west of The Crescent – Rozelle	EB	1,800	1,020	0.57	D	1,030	0.57	D
	WB	1,800	520	0.29	B	550	0.31	B
Johnston Street north east of Parramatta Road – Annandale	NB	1,800	520	0.29	B	520	0.29	B
	SB	1,800	630	0.35	B	650	0.36	B

Notes:

1. Traffic volume rounded to nearest 10.

Table 5-26 2021 PM peak mid-block operational performance summary¹

Location and direction		Mid-block capacity	2021 PM peak hour (veh/hr)					
			Without construction			PIR		
			Flow	V/C	LoS	Flow	V/C	LoS
Johnston Street south west of The Crescent – Rozelle	EB	1,800	640	0.36	B	690	0.38	B
	WB	1,800	740	0.41	C	760	0.42	C
Johnston Street north east of Parramatta Road – Annandale	NB	1,800	570	0.32	B	610	0.34	B
	SB	1,800	430	0.24	A	440	0.24	A

Notes:

1. Traffic volume rounded to nearest 10.

5.4.2 Intersection level of service

The intersection performance results for the road network under the 2021 'without construction', forecast volumes are summarised in **Table 5-3** and **Table 5-4** for the AM and PM peak hours respectively. This allows for comparison with the level of impact reported in Chapter 7 of Appendix H (Technical working paper: Traffic and transport) of the EIS. As noted in **section 5.4.1**, there is no difference in forecast impact between Option A and Option B so only a single set of results is provided.

In the revised scenarios, there is a small volume of construction traffic added to the network, from about 40 to 50 PCU in the AM peak, and about 80 PCU in the PM peak. The change in performance is insignificant in most scenarios with only The Crescent/Johnston Street/Chapman Road showing a change in LoS (from LoS C to LoS D).

Table 5-3 2021 AM peak hour intersection operational performance summary¹

Intersection	Without construction		PIR	
	Volume (PCU)	LoS	Volume (PCU)	LoS
The Crescent Johnston Street Chapman Road	2,650	C	2,700	C
Parramatta Road Johnston Street Northumberland Avenue	5,210	E	5,250	E

Notes:

1. Traffic volume rounded to nearest 10.

Table 5-4 2021 PM peak hour intersection operational performance summary¹

Intersection	Without construction		PIR	
	Volume (PCU)	LoS	Volume (PCU)	LoS
The Crescent Johnston Street Chapman Road	2,520	C	2,600	D
Parramatta Road Johnston Street Northumberland Avenue	4,900	D	4,980	D

Notes:

1. Traffic volume rounded to nearest 10.

5.4.3 Temporary road network changes, closures and diversions

No specific road network changes, closures or diversions are proposed on Johnston Street through Annandale.

The volume of additional traffic is forecast to be no higher than 80 PCU (during the PM peak), with a maximum of seven southbound heavy vehicles per hour. This level of additional traffic would not result in significant impacts to other users particularly given the pedestrian crossing facilities available at Annandale Public School and Annandale North Public School and intermediate intersections such as Booth Street.

6 Assessment of cumulative impacts

This section presents results from the cumulative impact assessment. The analysis is confined to Cluster 3 which covers the section of City West Link adjacent to Rozelle civil and tunnel site (C5) and White Bay civil site (C11) including The Crescent/James Craig Road intersection. There are no additional impacts identified for public transport, pedestrians and cyclists associated with the assessment of cumulative impacts.

6.1 Western Harbour Tunnel

As reported in Chapter 7 of Appendix H (Technical working paper: Traffic and transport) of the EIS, the construction of the proposed future Western Harbour Tunnel may overlap with this project (subject to separate environmental assessment and approval). The Western Harbour Tunnel construction site at the Rozelle Rail Yards would add about 66 PCU to the road network in the AM and PM peak hours, with construction vehicles travelling through several traffic clusters, including Cluster 3. No significant volume of such vehicles is likely to use Johnston Street given the access provided by City West Link and Victoria Road in all directions so no additional impact is forecast.

Analysis indicates that the impact from additional Western Harbour Tunnel construction traffic on Cluster 3 would be limited as the additional traffic would constitute a very small proportion of peak period through traffic on City West Link (up to a maximum of around one to 1.5 per cent). The only change in LoS band would be seen in the PM peak at The Crescent/City West Link intersection where performance would deteriorate from LoS C to LoS D in both Option A and Option B.

6.2 Site management works at Rozelle Rail Yards

As reported in Chapter 7 of Appendix H (Technical working paper: Traffic and transport) of the EIS, the site management works would occur within the Rozelle Rail Yards at Rozelle before the commencement of construction of the M4-M5 Link, including use of the White Bay civil site. Site management works are planned to commence in 2017, with completion planned for 2018 and would be carried out in accordance with a separate planning approval issued in April 2017. There would be no cumulative impacts with the project.

Consecutive impacts on Sommerville Road and James Craig Road associated with truck movements for the site management works currently being undertaken at the Rozelle Rail Yards and truck movements associated with the White Bay civil site would occur.

These two project would occur consecutively and site management works would be completed before the White Bay civil site is used and therefore there would be no cumulative concurrent impact on the road network. Management and mitigation measures identified in the Rozelle Rail Yards site management works review of environmental factors (2016) and Chapter E1 of the Submissions and preferred infrastructure report would manage potential consecutive impacts.

6.3 Port Authority of NSW proposals

The Port Authority submission on the EIS (refer to **Chapter B8** of the submissions report) identified three separate short to medium-term proposals for Glebe Island/White Bay with the potential to result in cumulative impacts during construction of the proposal due to concurrent use of James Craig Road. The relevant proposals are summarised as follows:

- Multi-user facility at Glebe Island - this facility would accommodate importation by sea of sand and other bulk construction materials to supply the increasing demand in the city centre associated with various construction projects. The proposal is progressing under a Part 5 process under the EP&A Act, and subject to planning approval, is expected to commence operations in the first quarter of 2019. The Port advised in their submission on the EIS that peak traffic from the facility will be around 500 trucks per day (1,000 movements)

- Hanson concrete batching plant at Glebe Island - this proposal would relocate the existing Hanson facility at the head of Blackwattle Bay and an EIS is currently being prepared. Limited information is available at this stage other than the intention to provide capacity to deliver one million tonnes of concrete per annum
- Construction logistics site
- The Bays Precinct Urban Transformation Plan anticipates the potential use of Glebe Island for such a site to facilitate major construction projects. A number of NSW Government agencies have approached the Port Authority with proposals to use the precinct for construction support sites, including the location of truck marshalling facilities.

No further information is available at this point of time, including traffic forecasts, regarding these proposals. The Multi-user facility is the most advanced of the three proposals with daily traffic forecasts available, albeit subject to planning. High level traffic volumes can also be calculated for the proposed batching plant based on the proposed delivery capacity of one million tonnes of concrete per annum. The construction logistics site proposal(s) is relatively early in the planning process with greater uncertainty as to approvals, opening dates and size of traffic generation, therefore it has not been included in this assessment.

The cumulative traffic analysis has not included a specific allowance for traffic generated by the White Bay cruise ship terminal as the draft licence between the Port Authority of NSW and Roads and Maritime does not allow access to the site from Sommersville Road and James Craig Road during defined time periods on days when the cruise ship terminal is operating.

6.3.1 Roadway level of service

As described in **section 4.1**, an analysis of the roadway levels of service was undertaken to determine the impact of cumulative construction traffic in 2021 relative to the 'without construction' and PIR Option A scenarios. There was no significant difference between PIR Option A and PIR Option B results so only a single scenario was assessed. Theoretical mid-block roadway capacities were based on Austroads *Guide to Traffic Management* and these capacities and assessment results are shown in **Table 6-1** and **Table 6-2** for the AM and PM peak periods.

A mid-block analysis was also undertaken for James Craig Road given the increase in heavy vehicle traffic assumed under the cumulative scenario. This is also shown in **Table 6-1** and **Table 6-2** for the AM and PM peaks. Existing mid-block volumes for James Craig Road were derived from traffic count data from 2014 as reported in the Rozelle Rail Yards site management works review of environmental factors (2016).

When comparing the PIR Option A scenario to the cumulative scenario, the results generally show a marginal deterioration in performance at each location. There are no LoS band changes at the City West Link and The Crescent locations. LoS band changes are listed as follows for the James Craig Road mid-block:

- Westbound performance in the AM peak deteriorates from LoS A to LoS B
- Eastbound performance in the PM peak deteriorates from LoS A to LoS B
- Westbound performance in the PM peak deteriorates from LoS B to LoS C.

The level of service provided on James Craig Road remains satisfactory in all scenarios at a minimum LoS C.

Table 6-1 Option A and cumulative – 2021 AM peak mid-block operational performance summary¹

Location and direction		Mid-block capacity	2021 AM peak hour (veh/hr)								
			Without construction			PIR Option A			Cumulative		
			Flow	V/C	LoS	Flow	V/C	LoS	Flow	V/C	LoS
City West Link west of The Crescent – Rozelle	EB	2,300	2,520	1.10	F	2,580	1.12	F	2,590	1.13	F
	WB	2,300	1,800	0.78	D	1,860	0.81	E	1,870	0.81	E
City West Link east of The Crescent – Rozelle	EB	3,400	3,520	1.04	F	3,570	1.05	F	3,580	1.05	F
	WB	3,400	2,560	0.75	D	2,620	0.77	D	2,630	0.77	D
James Craig Road west of The Crescent – Rozelle ²	EB	1,000	320 ²	0.32	B	410 ²	0.41	C	550 ²	0.55	C
	WB	1,000	150 ²	0.15	A	230 ²	0.23	A	370 ²	0.37	B

Notes:

1. Traffic volume rounded to nearest 10.

2. Assumed location east of the roundabout. Analysis conservatively undertaken using PCU due to high proportion of heavy vehicles.

Table 6-2 Option A and cumulative – 2021 PM mid-block operational performance summary¹

Location and direction		Mid-block capacity	2021 PM peak hour (veh/hr)								
			Without construction			PIR Option A			Cumulative		
			Flow	V/C	LoS	Flow	V/C	LoS	Flow	V/C	LoS
City West Link west of The Crescent – Rozelle	EB	2,300	2,440	1.06	F	2,650	1.15	F	2,660	1.16	F
	WB	2,300	1,850	0.80	D	1,900	0.83	E	1,920	0.83	E
City West Link east of The Crescent – Rozelle	EB	3,400	3,210	0.94	E	3,450	1.01	F	3,470	1.02	F
	WB	3,400	3,000	0.88	E	3,050	0.90	E	3,070	0.90	E
James Craig Road west of The Crescent – Rozelle ²	EB	1,000	80 ²	0.08	A	170 ²	0.17	A	310 ²	0.31	B
	WB	1,000	230 ²	0.23	A	310 ²	0.31	B	450 ²	0.45	C

Notes:

1. Traffic volume rounded to nearest 10.

2. Assumed location east of the roundabout. Analysis conservatively undertaken using PCU due to high proportion of heavy vehicles.

6.3.2 Intersection level of service

The intersection performance results for the road network under the 2021 'without construction', PIR Option A and cumulative forecast volumes are summarised in **Table 6-3** and Table 6-4 for the AM and PM peak hours respectively. Results are provided for Cluster 3 as described in **section 4.1**. This allows for comparison with the level of impact reported in the EIS.

In the cumulative scenario, there is an increase in the volume of construction traffic added to the network during both peak hours (relative to the PIR Option A) of about 250-300 PCU at the James Craig Road/The Crescent intersection and by a smaller amount of about 70 PCU at The Crescent/City West Link intersection. This reflects the assumption that the majority of Multi-User Facility (MUF) traffic would serve the city centre and thus travel between Anzac Bridge and James Craig Road.

The change in LoS band performance when comparing the cumulative to the PIR Option A scenarios are confined to the following:

- The Crescent/James Craig Road performance deteriorates from LoS B to LoS C in the AM peak
- The Crescent/James Craig Road performance deteriorates from LoS C to LoS E in the PM peak.

The results demonstrate that the combined impact of the Western Harbour Tunnel and Ports projects would result in a deterioration to an unsatisfactory LoS E in the PM peak at the James Craig Road/The Crescent intersection. This deterioration can be attributed primarily to the traffic that would be generated by the Port Authority of NSW proposals described in **section 6.3**.

Queuing on James Craig Road would remain less than 100 metres, though there is potential for an increase in westbound queuing on The Crescent if conservative trip generation assumptions for Port Authority of NSW projects adopted for this assessment during this period occur (as a result of redistribution of signal phase times at this intersection).

Roads and Maritime would consult with the Port Authority of NSW and other stakeholders as appropriate on the use of James Craig Road to ensure coordination of heavy vehicle movements, with a focus on reducing the proportion of vehicle trips (especially inbound from the east) during the PM peak.

Table 6-3 Option A and cumulative – 2021 AM peak hour intersection operational performance summary¹

Cluster	Intersection	Without construction		PIR Option A		Cumulative	
		Volume (PCU)	LoS	Volume (PCU)	LoS	Volume (PCU)	LoS
3	The Crescent James Craig Road	6,730	B	6,940	B	7,210	C
	City West Link The Crescent	6,800	D	7,010	E	7,080	E
	City West Link C5 site access	–	–	4,860	A	4,960	A

Notes:

1. Traffic volume rounded to nearest 10.

Table 6-4 Option A and cumulative – 2021 PM peak hour intersection operational performance summary¹

Cluster	Intersection	Without construction		PIR Option A		Cumulative	
		Volume (PCU)	LoS	Volume (PCU)	LoS	Volume (PCU)	LoS
3	The Crescent James Craig Road	6,500	B	6,870	C	7,150	E
	City West Link The Crescent	6,690	C	7,070	C	7,150	C
	City West Link C5 site access	–	–	4,800	A	4,900	A

Notes:

1. Traffic volume rounded to nearest 10.

7 Environmental management measures

Spoil transport vehicles would be managed by protocols that would be developed in accordance with the conditions of approval and documented in the CTAMP. These would include mechanisms to stage the release of trucks from the truck marshalling facility to the tunnelling sites having regard to the need for trucks at the tunnelling sites, the limited space that is available for trucks on these sites and to avoid queuing of trucks on local streets or trucks circling around construction sites. These may include:

- Traffic schedulers that would be responsible for directing truck drivers to the construction sites at an appropriate time
- Fitting trucks with real-time tracking capabilities to allow traffic schedulers to monitor and adjust spacing between trucks
- Ensuring that traffic schedulers and truck drivers are given clear instructions on the times that trucks should arrive on site and the time intervals between trucks arriving and departing construction sites.

Roads and Maritime will continue to consult with the Port Authority of NSW and other stakeholders as appropriate to ensure coordination between the operation of the White Bay civil site (C11) and other relevant projects in the vicinity.

8 Conclusion

The changes in construction volumes introduced by the White Bay civil site (C11), including a truck marshalling facility and construction workforce parking, would result in a small increase in construction traffic volumes across the network relative to that identified in the EIS. These increases in traffic volumes are as a result of changes to the ways construction traffic would move around the road network between the marshalling facility and the construction ancillary facilities, rather than resulting from an increase in the number of vehicles.

The updated traffic modelling analysis undertaken at the relevant locations suggests that there would be a change in traffic impact at three intersections compared to the assessment presented in the EIS. These changes would comprise:

- Mid-block deterioration in LoS band
 - From LoS D to LoS E westbound at City West Link west of The Crescent in both Option A and Option B AM peaks
- Deterioration in intersection LoS band
 - From LoS B to LoS C at the Parramatta Road/Croydon Road/Arlington Street intersection in Option A during the AM peak
 - From LoS C to LoS D at the City West Link/The Crescent intersection in the Option B PM peak
 - From LoS B to LoS C at The Crescent/James Craig Road intersection in both Option A and Option B PM peaks.

An additional assessment was undertaken of Johnston Street given the revised routing of heavy vehicles to the Pyrmont Bridge Road tunnel site (C9) via the White Bay civil site (C11). No significant impacts are forecast with a minor deterioration in LoS from C to D forecast at The Crescent/Johnston Street/Chapman Road intersection during the PM peak.

The assessment of cumulative impacts identified two relevant scenarios for concurrent works/projects:

- Western Harbour Tunnel only (as reported in Chapter 7 of Appendix H of the EIS)
- Western Harbour Tunnel plus proposed Port Authority of NSW projects, where sufficient details are known to enable an assessment (Multi-user facility and concrete batching plant projects on Glebe Island, which are currently in planning).

No change in intersection LoS band was identified for the Western Harbour Tunnel only scenario except in the PM peak at The Crescent/City West Link intersection, where performance would deteriorate from LoS C to LoS D in both Option A and Option B.

The assessment of cumulative impacts for the proposed future Western Harbour Tunnel plus proposed Port Authority of NSW projects has identified potential for additional volumes using James Craig Road. Limited traffic information is available for the proposed projects so conservative assumptions were developed to facilitate analysis of impacts including traffic generation, trip distribution, haulage routes and project timing.

The assessment identified deterioration in mid-block LoS band on James Craig Road in a number of scenarios but to no worse than LoS C, indicating a continuing high level of performance. Intersection analysis identified deterioration in performance at The Crescent/James Craig Road intersection as follows:

- From LoS B to LoS C in the AM peak
- From LoS C to LoS E in the PM peak.

This indicates that The Crescent/James Craig Road intersection would be expected to reach capacity in the PM peak under the cumulative scenario. This deterioration in LoS from C to E in the PM peak can be attributed primarily to the traffic that would be generated by the Port Authority of NSW proposals. Detailed assessment would be required to confirm potential traffic and road network impacts as part of environmental assessments for these projects.

The conclusions contained in Chapter 7 of Appendix H (Technical working paper: Traffic and transport) of the EIS remain valid for the changes assessed in this report. The management and mitigation measures identified in Chapter E1 of the Submissions and preferred infrastructure report will appropriately manage impacts from the use of the White Bay civil site (C11) and the minor change to the spoil haulage route for the Darley Road civil and tunnel site (C4).

Annexure A - Glossary

Term	Definition
A	
AM peak hour	Unless otherwise stated, this refers to vehicle trips arriving at their destination during the average peak one hour in the AM peak period between 7.00 am–9.00 am on a normal working weekday
C	
Capacity	The nominal maximum number of vehicles which has a reasonable expectation of passing over a given section of a lane or roadway in one direction during a given time period under prevailing roadway conditions
Carriageway	The portion of a roadway used by vehicles including shoulders and ancillary lanes
Construction	Includes all physical work required to construct the project
Construction ancillary facilities	Temporary facilities during construction that include, but are not limited to construction sites (civil and tunnel), sediment basins, temporary water treatment plants, precast yards and material stockpiles, laydown areas, workforce parking, maintenance workshops and offices
CTAMP	Construction Traffic and Access Management Plan
Cumulative impacts	Impacts that, when considered together, have different and/or more substantial impacts than a single impact assessed on its own
D	
Darley Road civil and tunnel site	A construction ancillary facility for the M4-M5 Link project located at Leichhardt
E	
EB	Eastbound
EIS	Environmental Impact Statement
Entry ramp	A ramp by which one enters a limited-access highway/tunnel
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i> (NSW)
Exit ramp	A ramp by which one exits a limited-access highway/tunnel
F	
Freeways	Fast, high volume, access controlled roads that primarily link regional hubs and cities usually with grade separated intersections and without traffic lights
H	
h	Hour
Haberfield civil and tunnel site/Haberfield civil site	Construction ancillary facilities for the M4-M5 Link project located at Haberfield
Heavy vehicles	A heavy vehicle is classified as a Class 3 vehicle (a two axle truck) or larger, in accordance with the Austroads Vehicle Classification System
I	
Impact	Influence or effect exerted by a project or other activity on the natural, built and community environment
L	
Local road	A road or street used primarily for access to abutting properties
LoS	Level of service. A qualitative measure describing operational conditions within a traffic stream or intersection and the perception by motorists and/or passengers

Term	Definition
M	
M4 East Motorway/project	A component of the WestConnex program of works. Extension of the M4 Motorway in tunnels between Homebush and Haberfield via Concord. Includes provision for a future connection to the M4-M5 Link at the Wattle Street interchange
M4-M5 Link	The project which is the subject of this EIS. A component of the WestConnex program of works
Midblock	A general location on a road between two intersections
N	
NB	Northbound
Northcote Street civil site	A construction ancillary facility for the M4-M5 Link project located at Haberfield
NSW	New South Wales
P	
Parramatta Road East civil site	A construction ancillary facility for the M4-M5 Link project at Haberfield
Parramatta Road West civil and tunnel site	A construction ancillary facility for the M4-M5 Link project at Ashfield
PCU	Passenger Car Unit
PM peak hour	Unless otherwise stated, this refers to trips travelling on the network during the average peak one hour in the PM peak period between 3.00 pm–6.00 pm on a weekday hour
Project	A new multi-lane road link between the M4 East Motorway at Haberfield and the New M5 Motorway at St Peters. The project would also include an interchange at Lilyfield and Rozelle (the Rozelle interchange) and a tunnel connection between Anzac Bridge and Victoria Road, east of Iron Cove Bridge (Iron Cove Link). In addition, construction of tunnels, ramps and associated infrastructure to provide connections to the proposed future Western Harbour Tunnel and Beaches Link project would be carried out at the Rozelle interchange
Public transport	Includes train, bus (government and private), ferry (government and private) and light rail (government and private) services
Pymont Bridge Road tunnel site	A construction ancillary facility for the M4-M5 Link project at Annandale
R	
Roads and Maritime	NSW Roads and Maritime Services (formerly NSW Roads and Traffic Authority (RTA))
Roundabout	An intersection where all traffic travels in one direction clockwise around a central island
Rozelle civil and tunnel site	A construction ancillary facility for the M4-M5 Link project located at Lilyfield and Rozelle
S	
SB	Southbound
SMC	Sydney Motorway Corporation

Term	Definition
T	
The Bays Precinct Transformation Plan	Transformation Plan: The Bays Precinct, Sydney (UrbanGrowth NSW 2015)
The Crescent civil site	A construction ancillary facility for the M4-M5 Link project located at Annandale
Traffic efficiency	Measured by savings (and delays) in travel time
Transport infrastructure	Permanent installations including roads, rail, buildings and storage associated with transport
Transport for NSW	NSW Government Department Transport for NSW
V	
Veh	Vehicle
Veh/h	Vehicle per hour
V/C	Volume to Capacity ratio
W	
Wattle Street civil and tunnel site	A construction ancillary facility for the M4-M5 Link project located at Haberfield
WB	Westbound
Western Harbour Tunnel and Beaches Link	The Western Harbour Tunnel component would connect to the M4-M5 Link at the Rozelle interchange, cross underneath Sydney Harbour between the Birchgrove and Waverton areas, and connect with the Warringah Freeway at North Sydney. The Beaches Link component would comprise a tunnel that would connect to the Warringah Freeway, cross underneath Middle Harbour and connect with the Burnt Bridge Creek Deviation at Balgowlah and Wakehurst Parkway at Seaforth. It would also involve the duplication of the Wakehurst Parkway between Seaforth and Frenchs Forest

