WestConnex M4-M5 Link

Mainline Tunnel

Modification report

Appendix B

Traffic and transport report

WESTCONNEX M4-M5 LINK

Mainline Tunnel – Modification report

Appendix B Traffic and transport report

SEPTEMBER 2018

This document cover is to be replaced with a Roads and Maritime Services approved document cover. Refer to Roads and Maritime Services Visual Identity Manual.

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Roads and Maritime Services

WestConnex M4-M5 Link

Mainline Tunnel – Modification report

Appendix B Traffic and transport report

September 2018

Prepared for

Roads and Maritime Services

Prepared by

AECOM Australia

Contents

Glossary of terms and abbreviations

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	
Campbell Road civil and tunnel site	A construction ancillary facility for the M4-M5 Link project at St Peters
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
Construction Traffic Transport and Access Management Sub-Plan	Traffic and Transport Construction Environmental Management Plan sub-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. This modification application proposes to remove this construction ancillary facility from the project
Divided road	A road with a separate carriageway for each direction of travel created by placing a physical separation (eg median) between the opposing traffic directions
DPE	NSW Department of Planning and Environment
E	
EB	Eastbound
EIS	Environmental Impact Statement
Entry ramp	A ramp by which one enters a limited-access highway/tunnel
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
Exit blocking	Queuing traffic from a downstream link or intersection that blocks traffic from being able to travel through and exit an intersection
Exit ramp	A ramp by which one exits a limited-access highway/tunnel
F	
Footpath	The paved area in a footway
Footprint	The extent of the impact that a development (in plan-view) makes on the land
Footway	An area open to the public designated for the movement of pedestrians or has one of its main uses for pedestrians
Freeways	Fast, high volume, access controlled roads that primarily link regional hubs and cities usually with grade separated intersections and without traffic lights
G	
G-loop	A construction traffic only turnaround that allows eastbound trucks on Dobroyd Parade to turn around and head westbound on Dobroyd Parade using a temporary northern leg of the Dobroyd Parade / Waratah Street signalised intersection.

Term	Definition
H	
h	Hour
Haberfield civil site	Construction ancillary facilities for the M4-M5 Link project located at Haberfield. This modification proposes to remove this construction ancillary facility from the project
HV (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
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 modification. A component of the WestConnex program of works
Midblock	A general location on a road between two intersections
Motorway	Fast, high volume controlled access roads. May be tolled or untolled
N	
NB	Northbound
Northcote Street civil and tunnel site	A construction ancillary facility for the M4-M5 Link project located at Haberfield
Northcote Street civil and tunnel site –Route A spoil haulage route	Via a left turn from site onto Wattle Street, then left turn into Ramsay Street/ Road, then left turn into Fairlight Street, then left turn into Great North Road, then right turn into Parramatta Road
Northcote Street civil and tunnel site – Route B spoil haulage route	Via left turn from site onto Wattle Street, then left turn onto a dedicated temporary construction vehicle turning lane (known as the G-loop) at the intersection of Dobroyd Parade and Waratah Street within part of the Reg Coady Reserve. Right turn onto Wattle Street from truck turning facility toward M4 East tunnels or Parramatta Road.
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 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 normal working weekday
Portal	The entry and/or exit to a tunnel

Term	Definition
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
Pyrmont 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 interchange	A new interchange at Lilyfield and Rozelle that would connect the M4-M5 Link mainline tunnels with City West Link, Anzac Bridge, the Iron Cove Link and the proposed future Western Harbour Tunnel and Beaches Link
S	
SB	Southbound
SMC	Sydney Motorway Corporation
SPIR	Submissions and Preferred Infrastructure Report
STM	Strategic Travel Model, operated by Transport for NSW Transport Performance and Analytics
T	
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
Truck and dog construction vehicle	A vehicle with 20 cubic metre capacity and maximum length of 19 metres
V	
Veh	Vehicle
Veh/h	Vehicle per hour
V/C	Volume to capacity ratio, ratio of the traffic volume to the road capacity
W	
Wattle Street civil and tunnel site	A construction ancillary facility for the M4-M5 Link project located at Haberfield
Wattle Street interchange	An interchange to connect Wattle Street (City West Link) with the M4 East and the M4-M5 Link tunnels. Approved and under construction as part of the M4 East project. Additional construction works proposed as part of the M4-M5 Link project
WB	Westbound
WRTM	WestConnex Road Traffic Model
WTP	Water treatment plant

Executive summary

Construction design and planning for the M4-M5 Link between the M4 East Motorway at Haberfield and the New M5 Motorway at St Peters has progressed since the assessment in the M4-M5 Link Environmental Impact Statement (EIS) and the Submissions and Preferred Infrastructure Report (SPIR). A review of the concept design for the approved project has also occurred and, as a result, the proponent has further optimised the construction site arrangements assessed in the EIS and SPIR.

Proposed modifications

The proposed modification relates to Stage 1 of the approved project. The following points provide an overview of the proposed modification:

- The Northcote Street civil site (C3a) would become a civil and tunnel site. This would result in 24 hours, seven days a week tunnelling works being carried out from this location within an existing acoustic shed. The Northcote Street site is being used for tunnelling as part of the M4 East project. A construction access tunnel is to be provided from the Northcote Street site that utilises part of the existing access tunnel for the M4 East project. Proposed spoil haulage routes to and from this site are identified in this traffic and transport assessment. Relevant conditions of the project approval would apply to the use of this site for tunnelling and civil works to ensure potential impacts are managed consistently with the project approval
- The Parramatta Road West and Parramatta Road East civil sites (C1b and C3b) would be used as civil sites in accordance with condition of approval C19 and other conditions of the project approval. The sites would be used for site offices, light and heavy vehicle car parking, shuttle bus services, workshop and storage of equipment, materials and construction machinery. Both sites would operate 24 hours a day, 7 days a week in accordance with the conditions of the project approval. No tunnelling, tunnel spoil handling or tunnel spoil stockpiling and haulage would occur at these sites
- A temporary pedestrian walkway would be constructed above Parramatta Road to connect the Parramatta Road East and Parramatta Road West civil sites. The pedestrian walkway would only be available for use by project staff during the construction phase of the project and would not be available for public use. The pedestrian walkway would be demobilised upon completion of the construction phase of the project
- Removal of the Darley Road civil and tunnel site (C4) from the project. No construction activities or permanent operational infrastructure would be provided at this location. The EIS provided for construction spoil to be removed from the Darley Road site. This spoil would now be removed from other tunnelling sites
- The relocation of the operational water treatment plant from the Darley Road motorway operations complex (as described in the EIS) to the Campbell Road motorway operations complex at the St Peters interchange.

These modifications would result in a small change in construction traffic volumes across the road network relative to that identified in the M4-M5 Link SPIR.

Traffic and transport impacts

The traffic and transport assessment considered potential impacts on the modelled road network associated with changes to the haulage route for the Northcote Street civil and tunnel site. The results of the assessment indicate that there would be minimal impact on the mid-block roadway and intersection level of service through the Haberfield and Ashfield modelled road network compared to the assessment presented in the M4-M5 Link SPIR and the 'without construction' scenarios. No changes in roadway or intersection level of service are forecast through the Five Dock modelled road network as a result of the proposed modification.

A preliminary assessment of parking provision anticipate the total parking provision within the Haberfield and Ashfield construction sites would be able to meet the forecast parking demand.

The construction of a temporary pedestrian walkway above Parramatta Road to connect the Parramatta Road East and Parramatta Road West civil sites, which would only be available for use by project staff during the construction phase of the project, is likely to have a minimal impact on traffic and transport. Impacts on the road network would occur primarily during establishment and decommissioning and therefore over a short duration.

It is likely Parramatta Road would need to be closed overnight for installation of the pedestrian bridge. Approval would be required from the Transport Management Centre (TMC) for a Road Occupancy Licence and diversion routes would be in place during the overnight installation. Impacts on pedestrian, cycle or public transport users are likely to be negligible and able to be adequately managed through the Construction Traffic, Transport and Access Management Sub-Plan that will be prepared for the project.

The relocation of the operational water treatment plant from Darley Road to the Campbell Road motorway operation complex (MOC5) at St Peters interchange is likely to have a negligible change in impact on traffic and transport users compared to the impact assessment in the M4-M5 Link EIS and SPIR, as no change in peak construction traffic volume or length of construction is forecast. The removal of the Darley Road site means that construction vehicles would not need to turn into and out of James Street at the City West Link/James Street intersection. This would improve the performance of this intersection compared to the assessment in the M4-M5 Link SPIR. The removal of site access/egress on Darley Road would also remove potential conflicts with other road users, pedestrians and cyclists.

The proposed use of the Parramatta Road West and Parramatta Road East sites as civil sites for lower impact activities, with no tunnelling works carried out from either site, would mean a reduction in heavy vehicle traffic impacts compared to the M4-M5 Link SPIR. The largest change would be the reduction in daily forecast heavy vehicles to and from the Parramatta Road West site, reducing to 25 heavy vehicles per day compared to 140 heavy vehicles per day as assessed in the M4-M5 Link SPIR. The access points on Parramatta Road, Alt Street and Bland Street (west of Parramatta Road only) would be used by heavy and light vehicles. Safe pedestrian and cyclist access and access to nearby properties would be maintained during construction in accordance with relevant conditions of approval.

It is proposed that the existing bus stop on the western side of Parramatta Road, north of the intersection with Bland Street, would be relocated to avoid conflict between buses and heavy vehicles attempting to access the nearby Parramatta Road West civil site. The bus stop would be moved to a new location around 150 metres to the north on Parramatta Road. The relocation of the bus stop would be subject to on-going consultation with Transport for NSW, Transit Services and other stakeholders and would be detailed in the Construction Traffic, Transport and Access Management Sub-Plan.

Management and mitigation measures

Impacts would continue to be managed through the construction management measures contained in the conditions of approval for the project, specifically those in the Construction Traffic, Transport and Access Management Sub-Plan and the Construction Parking and Access Strategy.

The Route A spoil haulage route from the Northcote Street civil and tunnel site may require pedestrian protection in the signal timing for pedestrian crossings (ie a head start for the green signal for pedestrians before the green signal for left-turning vehicles) on the western leg of the Great North Road/Parramatta Road, Ramsay Road/Fairlight Street and Fairlight Road/Great North Road intersections. This would be decided in conjunction with TMC and documented in the Construction Traffic Transport and Access Management Sub-Plan that will be prepared for the project.

In the Route B spoil haulage route from the Northcote Street civil and tunnel site, the design of the reinstated G-loop would include provision for safe pedestrian movements, as per the Road Safety conditions of the Planning Approval. A Road Safety Audit would be carried out on the Dobroyd Parade/Waratah Street intersection configuration with the G-loop during detailed design (in accordance with condition of approval E56).

During detailed design of the temporary pedestrian walkway connection above Parramatta Road to connect the Parramatta Road East and Parramatta Road West civil sites, a road safety audit would be carried out to ensure that the bridge would not obstruct or reduce motorists' sight distance to any signs / directional signs or important traffic directions / infrastructure (in accordance with condition of approval E56).

The management and mitigation measures identified in Chapter E1 of the M4-M5 Link SPIR and the conditions of approval for the project would appropriately manage other traffic and transport impacts from the proposed modification.

1 Introduction

Approval for the construction and operation of the M4-M5 Link project was granted on 17 April 2018 by the NSW Minister for Planning (application number SSI 7485). **Figure 1-1** provides an overview of the approved project.

Construction design and planning has progressed since the assessment contained in the Environmental Impact Statement (EIS) and the Submissions and Preferred Infrastructure Report (SPIR) and a review of the concept design for the approved project has occurred. As a result, the proponent has further optimised the construction site arrangements assessed in the EIS and SPIR to reduce community impacts and to decrease the overall number of construction sites required for Stage 1 of the project. The main changes include the removal of the Darley Road civil and tunnel site for the project and changes to some of the construction ancillary facilities as summarised in **Table 1-1** and described in **section 1.2** below.

Table 1-1 Change to construction ancillary facilities at Haberfield, Ashfield and Leichhardt

EIS and SPIR	Proposed modification
Wattle Street civil and tunnel site (C1a)	No change
Haberfield civil site (C2a/C2b)[1]	No change
Northcote Street civil site (C3a)	Northcote Street civil and tunnel site Includes tunnelling, spoil handling and spoil haulage from this site
Parramatta Road West civil and tunnel site (C1b)	Parramatta Road West civil site[2] Inclusion of a temporary pedestrian walkway above Parramatta Road to link to the Parramatta Road East civil site.
Parramatta Road East civil site (C3b)	Parramatta Road East civil site[2] Inclusion of a temporary pedestrian walkway above Parramatta Road to link to the Parramatta Road West civil site.
Darley Road civil and tunnel site (C4)	Removal of site

Notes

1: The use and footprint of this site was amended in sections B11.6.8 and C6.1.3 of the SPIR to be as per the arrangement for the Haberfield civil site (C2b).

2: Condition C19 allowed use of the site for parking and other works that do not exceed the 'noise affected' Noise Management Levels as identified in the ICNG.

Not all of the changes proposed can be accommodated within the existing project approval. As such it is necessary to seek a modification to the project approval in accordance with Section 5.25 of the EP&A Act.

1.1 Overview of M4-M5 Link project

The infrastructure approval provides for the construction and operation of the WestConnex M4-M5 Link project.

The EIS describes construction and operation of the M4-M5 Link in two stages:

Stage 1[1], as described in the EIS included:

- Construction of the mainline tunnels between the M4 East Motorway at Haberfield and the New M5 Motorway at St Peters, stub tunnels to the Rozelle interchange (at the Inner West subsurface interchange) and ancillary infrastructure at the Darley Road motorway operations complex (MOC1) and Campbell Road motorway operations complex (MOC5)
- These works are anticipated to commence in 2018 with the mainline tunnel opening to traffic in 2022.

Stage 2[2] as described in the EIS, included:

- Construction of the Rozelle interchange and Iron Cove Link including connection to the stub tunnels at the Inner West subsurface interchange, connection to the surface road network at Lilyfield and Rozelle, and construction of tunnels, ramps and associated infrastructure as part of the Rozelle interchange to provide connections to the proposed future Western Harbour Tunnel and Beaches Link project. Ancillary infrastructure will be provided at Rozelle West motorway operations complex (MOC2), Rozelle East motorway operations complex (MOC3) and Iron Cove Link motorway operations complex (MOC4)
- Stage 2 works are expected to commence in 2019 with these components of the project opening to traffic in 2023.

The M4-M5 Link project is part of the WestConnex program of works that, together with the proposed future Sydney Gateway, would facilitate improved connections between western Sydney, Sydney Airport and Port Botany and south and south-west Sydney, as well as better connectivity between the important economic centres along Sydney's Global Economic Corridor and through local communities.

A more comprehensive overview of the M4-M5 Link project, as well as other aspects of the WestConnex program of works, is provided within the EIS and the Submissions and Preferred Infrastructure Report (SPIR).

[1] M4-M5 Link Stage 1 (the mainline tunnels) is also commonly referred to as Stage 3A of the WestConnex program of works

[2] M4-M5 Link Stage 2 (the Rozelle interchange and Iron Cove Link) is also commonly referred to as Stage 3B of the WestConnex program of works

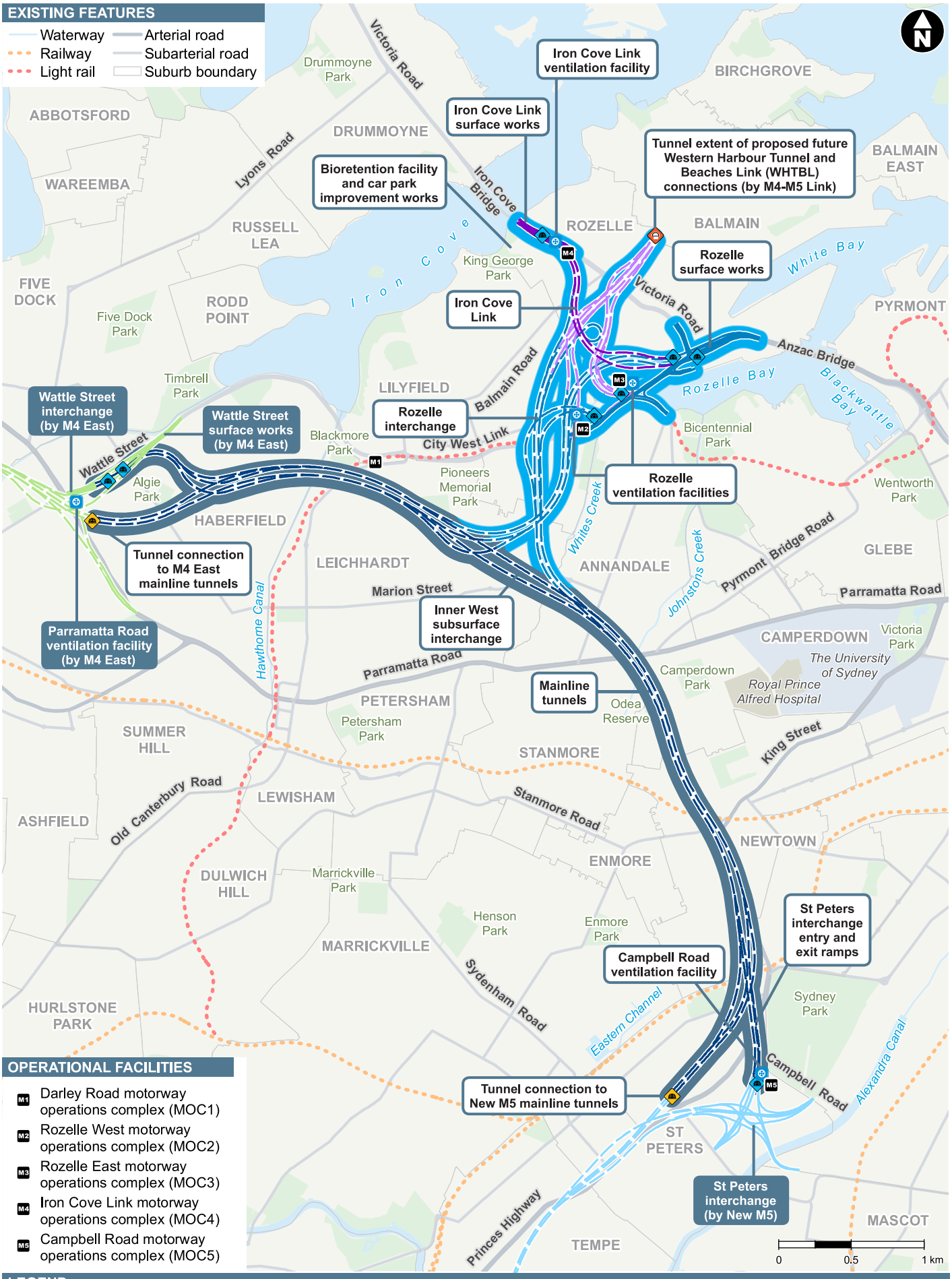


Figure 1-1 EIS Overview of approved project

1.2 Overview of modification

The proposed modification relates to Stage 1 of the approved project. The following points provide an overview of the proposed modification:

- The Northcote Street civil site (C3a) would become a civil and tunnel site. This would result in 24 hours, seven days a week tunnelling works being carried out from this location within an existing acoustic shed. The Northcote Street site is being used for tunnelling as part of the M4 East project. A construction access tunnel is to be provided from the Northcote Street site that utilises part of the existing access tunnel for the M4 East project. Proposed spoil haulage routes to and from this site are identified in this modification report. Relevant conditions of the project approval would apply to the use of this site for tunnelling and civil works to ensure potential impacts are managed consistently with the project approval
- The Parramatta Road West and Parramatta Road East civil sites (C1b and C3b) would be used as civil sites in accordance with condition of approval C19 and other conditions of the project approval. The sites would be used for site offices, light and heavy vehicle car parking, shuttle bus services, workshop and storage of equipment, materials and construction machinery. Both sites would operate 24 hours a day, 7 days a week in accordance with the conditions of the project approval. No tunnelling, tunnel spoil handling or tunnel spoil stockpiling and haulage would occur at these sites
- A temporary pedestrian walkway would be constructed above Parramatta Road to connect the Parramatta Road East and Parramatta Road West civil sites. The pedestrian walkway would only be available for use by project staff during the construction phase of the project and would not be available for public use. The pedestrian walkway would be demobilised upon completion of the construction phase of the project
- Removal of the Darley Road civil and tunnel site (C4) from the project. No construction activities or permanent operational infrastructure would be provided at this location. The EIS provided for construction spoil to be removed from the Darley Road site. This spoil would now be removed from other tunnelling sites
- The relocation of the operational water treatment plant from the Darley Road motorway operations complex (as described in the EIS) to the Campbell Road motorway operations complex at the St Peters interchange.

Key aspects of the proposed modification relevant to the assessment of potential traffic and transport impacts are described in further detail in **Chapter 2**. Chapter 4 (Proposed modification) of the modification report provides a detailed description of the proposed modification.

The proposed modification would require changes to the conditions of the project approval. Proposed changes to the project approval are detailed in Chapter 7 (Conditions of approval) of the modification report.

Site establishment works (in accordance with an approved Site Establishment Management Plan) and/or construction works (in accordance with an approved Construction Environmental Management Plan) are proposed at a number of the project construction sites and will be carried out in accordance with the existing conditions of approval for the project.

1.3 Purpose of this report

The purpose of the traffic and transport assessment is to support the environmental assessment for the project modification by assessing and reporting existing and future traffic and transport conditions under the proposed modifications. Specifically, the assessment includes the following:

- Quantitative assessment of traffic impacts associated with the proposed heavy vehicle and light vehicle modifications on the surrounding road network during the AM and PM peak hours in the forecast peak construction year (2021). The impact of shuttle buses on the road network surrounding the Northcote Street civil and tunnel site was included in this assessment as shuttle buses were included in the light vehicle volumes
- Qualitative assessment of other traffic and transport impacts including access, on-street parking, pedestrians and cyclists, public transport and traffic crashes

- Swept-path analysis of key intersections along the proposed heavy vehicle haulage route from the Northcote Street civil and tunnel site
- Qualitative assessment of the construction of the temporary pedestrian walkway connection above Parramatta Road to connect the Parramatta Road East and Parramatta Road West civil sites
- Qualitative assessment of the potential construction traffic and transport impacts from the proposed relocation of the permanent water treatment plant from Darley Road to the Campbell Road motorway operation complex (MOC5) at the St Peters interchange.

The elements of the proposed modification would result in potential traffic and transport impacts during the construction phase only. No traffic and transport impact assessment during the operational phase is therefore required for the proposed modification.

1.4 Structure of this report

This report has been structured as follows:

- **Chapter 2** presents an overview of the key aspects of the proposed modification as they relate to the assessment of potential traffic and transport impacts
- **Chapter 3** presents the assessment methodology to be used
- **Chapter 4** considers the potential impacts associated with construction activities
- **Chapter 5** documents management measures that are proposed to mitigate impacts
- **Chapter 6** provides a conclusion to the assessment.

2 Key aspects of the proposed modification relevant to this assessment

2.1 Change of use at the Northcote Street civil and tunnel site

The Northcote Street site is located between Wattle Street and Wolseley Street at Haberfield. The site is currently being used as a tunnelling site for the M4 East project and was approved for use as a civil site during construction of the M4-M5 Link project.

The Northcote Street site is proposed to be used as a civil and tunnel site for the project. Once construction works for the M4 East project are completed at this site, the site would be altered to make it suitable for use by the M4-M5 Link project. Existing construction infrastructure that is currently being used for the M4 East project would, where required, be retained and used for the project. This includes hoarding, offices, access gates, noise walls, the acoustic shed structure and part of the construction access tunnel.

2.1.1 Site layout

The proposed indicative site layout is provided in **Figure 2-1**. Key elements that would be consistent with the existing layout for the M4 East project include the vehicle entry and exit locations, the acoustic shed and the entry to the temporary access tunnel. Infrastructure not required for construction of the M4-M5 Link project would be removed from the site. The final layout for this site would be confirmed during detailed design and detailed in the approved Site Establishment Management Plan (SEMP) and/ or approved Construction Environmental Management Plan (CEMP).

2.1.2 Operating hours

Construction activities would operate 24 hours a day, seven days a week at the Northcote Street civil and tunnel site. Activities would predominately include tunnelling, spoil handling and spoil haulage and the delivery of shotcrete and concrete and general construction vehicles. The proposed hours of operation would be consistent with the operating hours used by the M4 East project at this site.

2.1.3 Construction access tunnel

The existing construction access tunnel located at the northern end of the site would be altered to meet the needs of the M4-M5 Link project. For the M4-M5 Link project, the new construction access tunnel would head generally in a south eastern direction beneath Wattle Street, to the north of the Haberfield civil site and beneath a small number of residential properties (less than 10 properties) in Walker Avenue and Alt Street to connect with the M4-M5 Link mainline tunnels. This route has been selected as it would provide the most direct route from the access tunnel to the M4-M5 Link mainline tunnels. Access to the M4 East access tunnel at the alignment of Parramatta Road would be blocked off on completion of the M4 East project. An indicative alignment of the construction access tunnel is shown in **Figure 2-2**.

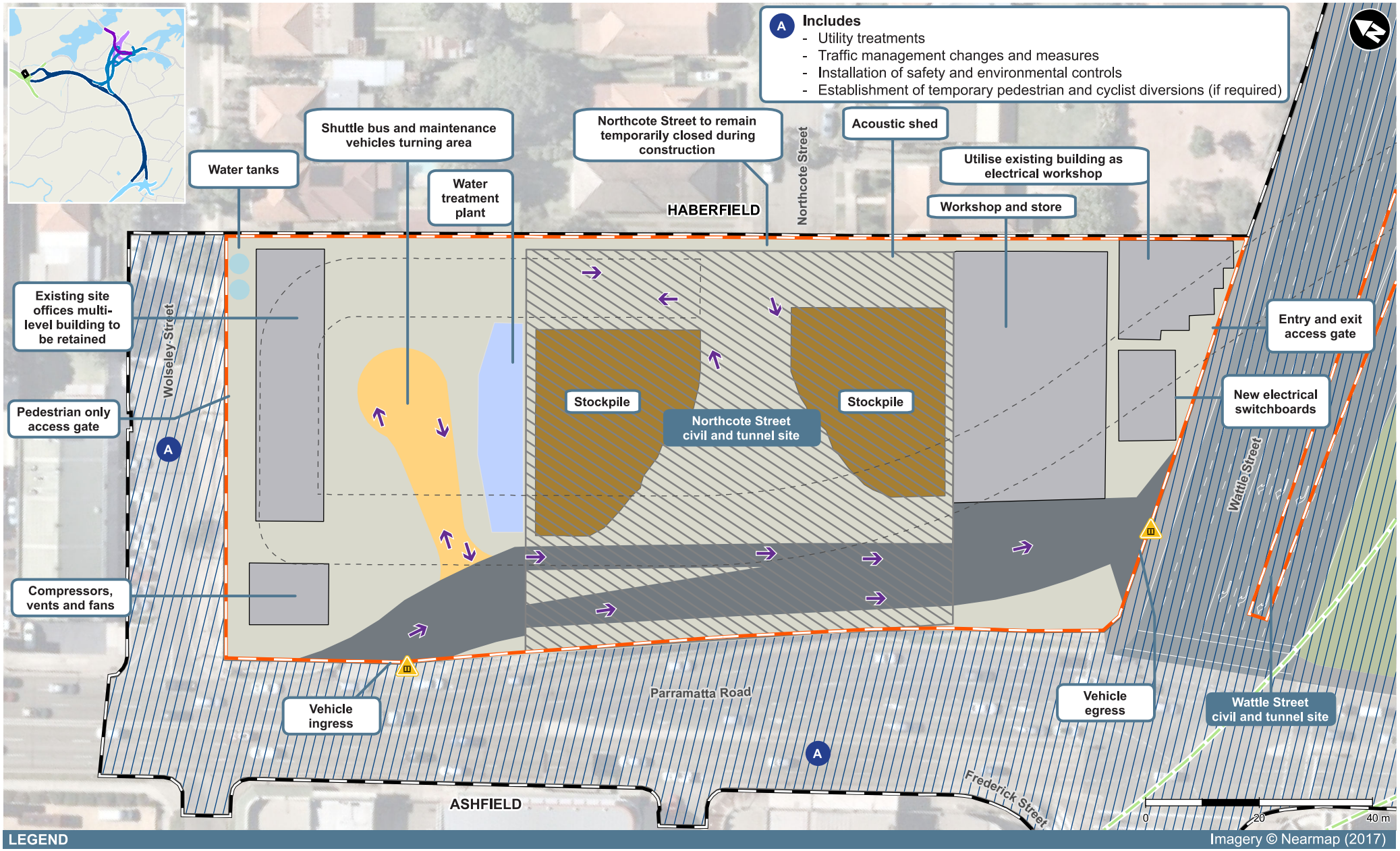


Figure 2-1 Indicative Northcote Street civil and tunnel site layout

Figure 2-2 Indicative alignment of construction access tunnel

2.1.4 Spoil volumes and spoil haulage route

It is anticipated that around 566,300 cubic metres of spoil would be extracted via the Northcote Street civil and tunnel site over the duration of the project.

Two spoil haulage routes are proposed to be used in association with the Northcote Street civil and tunnel site. **Table 2-1** describes each proposed route for spoil haulage. **Figure 2-3** shows the proposed spoil haulage routes.

Table 2-1 Spoil haulage routes for Northcote Street civil and tunnel site

Route	Spoil haulage route
Route A	Entry: via Parramatta Road city bound and left turn into the site
	Exit: via left turn from site onto Wattle Street, then left turn into Ramsay Street/ Road, then left turn into Fairlight Street, then left turn into Great North Road, then right turn into Parramatta Road This heavy vehicle movement may require pedestrian protection in the signal timing (i.e. a head start for the green signal for pedestrians before the green signal for left-turning vehicles) for pedestrian crossings on the western leg of the Great North Road/Parramatta Road, Ramsay Road/Fairlight Street and Fairlight Road/Great North Road intersections. This would be decided in conjunction with Roads and Maritime and Transport for NSW's Transport Management Centre (TMC) and would be documented in the Construction Traffic Transport and Access Management Sub-Plan that will be prepared for the project. All of the roads are state roads managed by Roads and Maritime. The roads all have two traffic lanes, some with provision for car parking in each direction, and aside from the section of Wattle Street where the M4 East entry and exit ramps are located, are not divided carriageways. Photos along the route are shown in **Figure 2-4**, **Figure 2-5** and **Figure 2-6**. The speed limit along the route is 60 kilometres per hour.
Route B	Entry: via Parramatta Road city bound and make left turn into the site
	Exit: via left turn from site onto Wattle Street, then left turn onto a dedicated temporary construction vehicle turning lane (known as the G-loop) at the intersection of Dobroyd Parade and Waratah Street within part of the Reg Coady Reserve. Right turn onto Wattle Street from truck turning facility toward M4 East tunnels or Parramatta Road. The G-loop was used during the construction of the M4 East project. An indicative layout is shown in **Figure 2-7**. Photos of the previous layout provided in **Figure 2-8** and **Figure 2-9** and provide an indication of the arrangement that is proposed to be used for the project. An advance warning sign was previously positioned prior to Martin Street to indicate the presence of the G-loop, as shown in **Figure 2-10**. A similar sign would be used for the project. The length of the G-loop would allow about four truck and dog trailer combinations (each truck and dog trailer is about 20 metres long) to queue in the G-loop, away from the eastbound Dobroyd Parade carriageway. The public roads along this route are state roads and there are traffic signals at the intersections of Wattle Street and Ramsay Street and Dobroyd Parade and Waratah Street. The 'G-loop' would be accessible by construction traffic only.

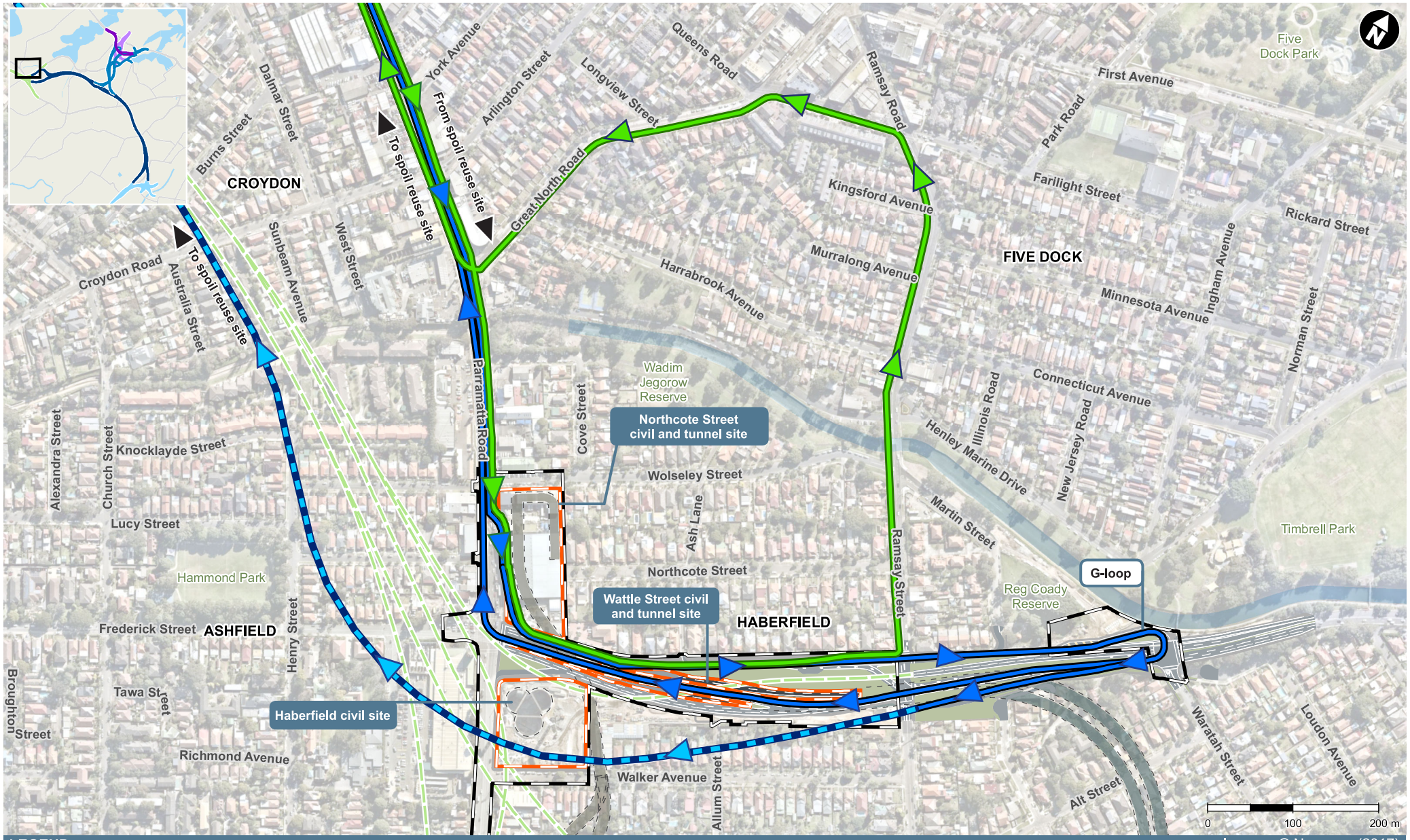


Figure 2-3 Northcote Street civil and tunnel site proposed spoil haulage routes

Figure 2-4 Ramsay Street – looking south towards Wattle Street

Figure 2-5 Ramsay Road – looking south

Figure 2-6 Great North Road – looking south towards Parramatta Road

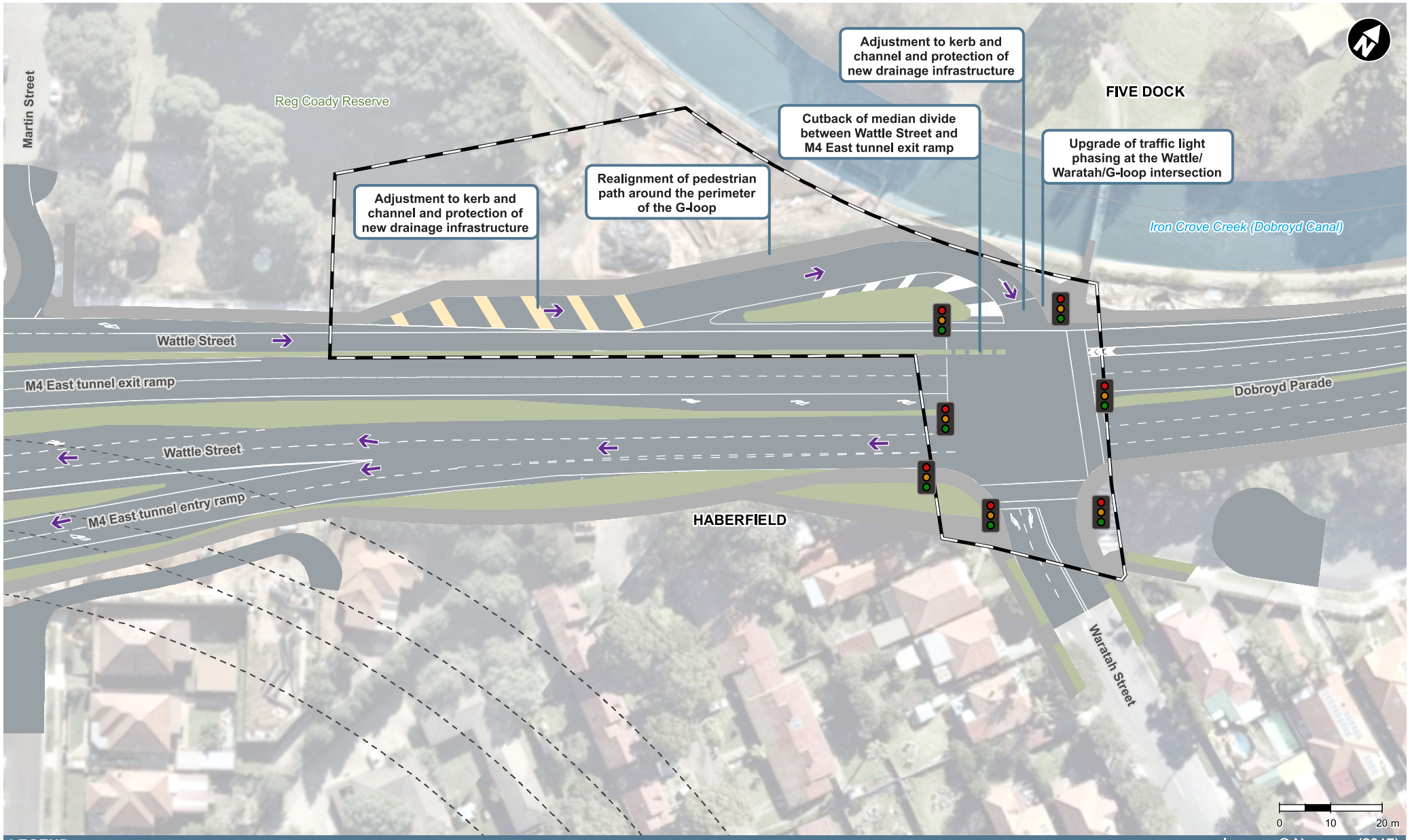


Figure 2-7 Layout of the G-loop north of the Dobroyd Parade eastbound carriageway

Figure 2-8 Approach to G-loop looking east along Dobroyd Parade

Source: Google Maps, Feb 2018. A similar arrangement would be used for the project

Figure 2-9 Exit from G-loop looking west along Dobroyd Parade

Source: Google Maps, Feb 2018. A similar arrangement would be used for the project

Figure 2-10 Advance warning sign prior to Martin Street to indicate the presence of the G-loop

Source: Google Maps, Feb 2018. A similar arrangement would be used for the project

The M4 East is due to open to traffic in early 2019. **Figure 2-11** presents the future layout of the Dobroyd Parade / Waratah Street intersection and eastbound approach to the intersection after the M4 East opens. For the G-loop to be reinstated for use during construction, the following amendments to the road layout would be required:

- The northern kerb of the eastbound carriageway of Dobroyd Parade would be adjusted to allow a left slip lane into the G-loop and the northern leg of the intersection (the G-loop exit) to be reinstated.

  On the eastbound carriageway a left slip deceleration lane into the G-loop, of the same length as was previously there (about 45m including taper), would be provided, while still providing two eastbound general traffic lanes (merging into one lane on approach to the intersection). Advance warning signs and signs and road markings (yellow hatching) would be installed to advise drivers the G-loop is for construction vehicles only. The left slip deceleration lane would therefore not create a less safe situation than would currently exist. A similar situation was in place on the westbound Dobroyd Parade during M4 East construction (see **Figure 2-12**). Safe pedestrian and cyclist access would be maintained around the G-loop during construction in accordance with condition of approval E57.

- The median designed to separate eastbound traffic from Dobroyd Parade from the eastbound traffic from the M4 East Wattle Street exit ramp and prevent the Dobroyd Parade traffic from attempting to make a right turn into Waratah Street would be reduced in length to allow trucks to turn right into Dobroyd Parade (westbound) from the G-loop.

  The median could still extend into the intersection to prevent the right turn from Dobroyd Parade eastbound into Waratah Street, as shown in the swept path analysis in **section 4.7**. Additional signage may be required to reinforce the right turn ban from Dobroyd Parade, but the median reduction would not create a less safe situation than would exist after the M4 East is open.

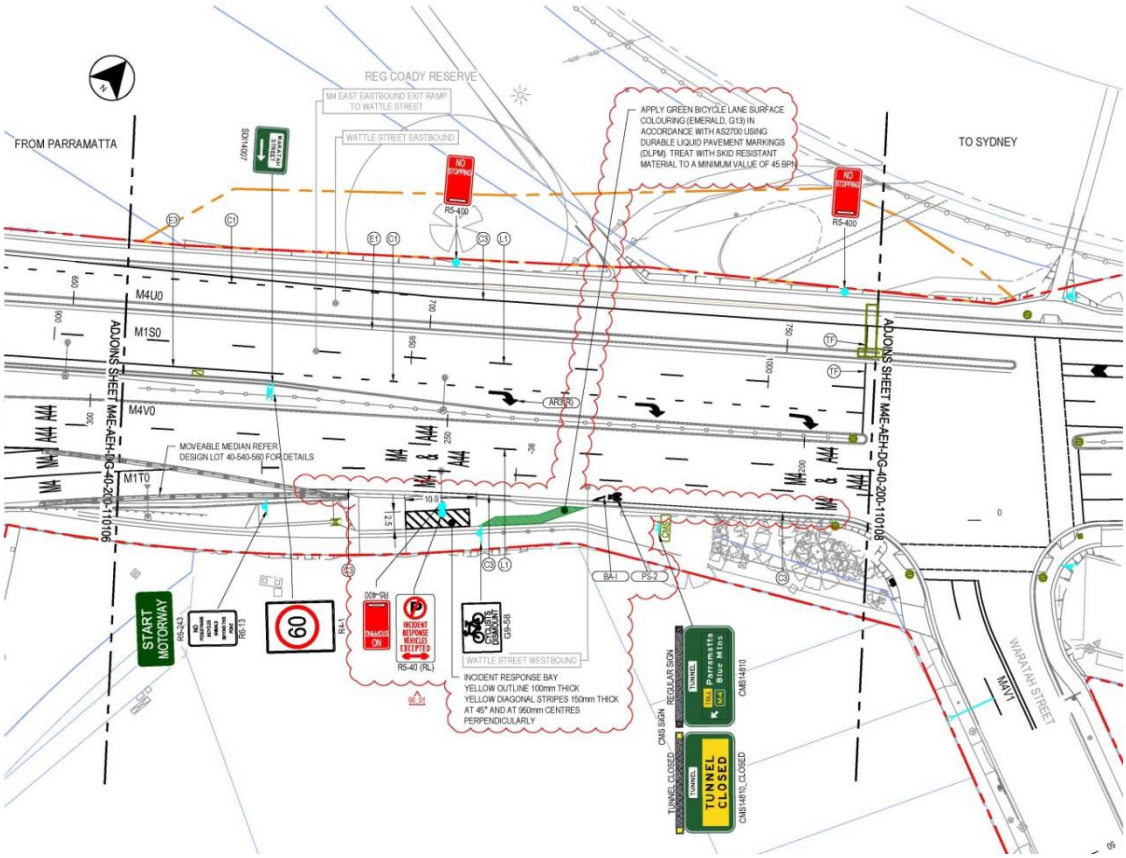


Figure 2-11 Layout of the Dobroyd Parade / Waratah Street intersection after the M4 East opens

Source: WCX Pty Ltd, M4E-AEH-DG-40-660-932-221-E00 and M4E-AEH-DG-40-660-932-222-E00

Figure 2-12 Slip lane to the M4 East construction site marked with yellow hatching

Source: Google Maps, Feb 2018

A swept path analysis was undertaken of trucks turning right from the G-loop to confirm if:

- Trucks would impact on right-turning traffic from Waratah Street
- Trucks could turn into the middle lane of the three exit lanes heading westbound and, in so doing, be able to travel to either the M4 East entry ramp or to Dobroyd Parade (facilitating access to Parramatta Road).

The results of the swept path analysis are presented in **section 4.7** and indicate that the use of the G-loop would not impact on the right turn movement from Waratah Street and so they could both operate at the same time in the same signal phase.

Use of the G-loop for the proposed modification would be restricted to M4-M5 Link construction vehicles. This restriction would be communicated through appropriate signage and line marking. Public motorists would not be able to use the G-loop. However, the completed M4 East project will provide a right turn lane from the M4 East eastbound lanes into Waratah Street at this location and a right turn lane from the Wattle Street eastbound lanes into Ramsay Street.

On completion of construction of the M4-M5 Link project, the G-loop infrastructure would be removed and that part of Reg Coady Reserve would be rehabilitated in accordance with the M4 East Residual Land Management Plan.

Once the G-loop is in operation, Route B would be the preferred spoil haulage route and would be available for use 24 hours a day and 7 days a week in accordance with condition E70 of the project approval.

Route A would also be used as a spoil haulage route. However, in response to feedback received from stakeholders during the consultation process, it is proposed that Route A would generally only be used between 7am and 6pm Monday to Friday and 8am to 6pm on Saturdays except in the following circumstances and in accordance with the relevant conditions of the project approval:

- During the early stages of construction until such time as the works to facilitate operation of the G-loop were completed and the G-loop was functional
- In the event of heavy traffic congestion, an incident or maintenance works on the arterial road and/or motorway network which has the potential to detrimentally impact on the efficient use of the G-loop and result in delays for spoil haulage vehicles.

A spoil haulage protocol would be developed by the contractor in consultation with Roads and Maritime and the Transport for NSW Traffic Management Centre to manage spoil haulage movements on Routes A and B. The protocol would be documented in the Construction Traffic Transport and Access Management Sub-Plan.

2.1.5 Car parking

Limited car parking would be provided at the Northcote Street civil and tunnel site due to space constraints. Car parking for the construction workforce would primarily be provided at the Parramatta Road West and Parramatta Road East civil sites with around a total of 200 spaces being provided at these two sites.

A shuttle bus would be provided to transport the majority of construction workforce to and from designated parking areas, which are anticipated to be predominantly at the Parramatta Road East and Parramatta Road West civil sites and the Northcote Street civil and tunnel site. Where possible, the workforce will be encouraged to walk between the Northcote Street, Parramatta Road and Wattle Street sites.

2.2 Parramatta Road West and East civil sites

The Parramatta Road West and East civil sites are located on the western and eastern sides of Parramatta Road between around Alt Street and Bland Street at Ashfield and Haberfield.

The Parramatta Road West and Parramatta Road East civil sites would be used generally in accordance with condition of approval C19 and other conditions of the project approval. The sites would be used for parking and other works that do not exceed the 'noise affected' Noise Management Levels as identified in the ICNG.

The sites would be used for site offices, light and heavy vehicle car parking, shuttle bus services, workshop and storage of equipment, materials and construction vehicles. Both sites would operate 24 hours a day, 7 days a week in accordance with the conditions of the project approval.

The sites would be used to support civil and tunnelling construction activities at other project construction sites, primarily within the Haberfield and Ashfield area. No tunnelling, tunnel spoil stockpiling and handling or tunnel spoil haulage would occur at these sites.

2.2.1 Site layout

The proposed indicative site layout for Parramatta Road West and Parramatta Road East civil sites is provided in **Figure 2-13** . The layout for the sites would be confirmed during detailed design and in the approved Site Establishment Management Plan (SEMP) and/or approved Construction Environmental Management Plan (CEMP).

Vehicle access points are provided for Parramatta Road West civil site from Parramatta Road, Bland Street (west of Parramatta Road) and Alt Street. The entry along Parramatta Road would only be accessible for westbound traffic with a left turn into the site. Exit onto Parramatta Road would be left turn out to travel westbound. Entry and exit points are proposed on Bland Street, west of Parramatta Road, and Alt Street to allow traffic to access between the sites or onto Parramatta Road as shown in **Figure 2-3**.

The vehicle access point for Parramatta Road East civil site would be from Parramatta Road and Alt Street. Entry would be left turn in, only available for east bound traffic. Exit would be left turn out to travel east bound along Parramatta Road. Crossover would occur between sites on Alt Street. Vehicle access points would not be provided from Bland Street for this site.

It is proposed that the existing bus stop on the western side of Parramatta Road, north of the intersection with Bland Street, would be relocated to avoid conflict between buses and heavy vehicles attempting to access the nearby Parramatta Road West civil site. The bus stop would be moved to a new location around 150 metres to the north on Parramatta Road. The relocation of the bus stop would be subject to on-going consultation with Transport for NSW, Transit Services and other stakeholders and would be detailed in the Construction Traffic, Transport and Access Management Sub-Plan.

2.2.2 Operating hours

The Parramatta Road West and Parramatta Road East civil sites would be used 24 hours a day, seven days a week to support civil and tunnelling construction activities at other project construction sites, primarily within the Haberfield and Ashfield area. No tunnelling, tunnel spoil stockpiling and handling or tunnel spoil haulage would occur at these sites.

Site establishment works would generally occur during standard construction hours of 7.00 am to 6.00 pm Monday to Friday and 8.00 am to 6.00 pm on Saturdays (as permitted by conditions of approvalE68 and E69 of the project approval) or as provided for in other conditions of approval and the project Environment Protection Licence (EPL).

2.2.3 Car parking

A total of around 200 car parking spaces would to be provided at the Parramatta Road West and Parramatta Road East civil sites for the construction workforce. The parking spaces would be used by construction workforce staff working at other project construction sites. A shuttle bus service would be provided to transport the majority of construction workforce to and from construction sites. Where possible the workforce would be encouraged to walk between sites. As required by condition E54 of the project approval, a Construction Parking and Access Strategy would be prepared by the contractor to assist with managing parking demand for the project.

The site would also be used for heavy vehicle parking. The type of heavy vehicles likely to use the sites for parking would include rigid and articulated trucks dropping off or picking up materials or equipment from laydown areas, vehicles or equipment to be serviced at the workshop and short term layover of trucks across working shifts. No tunnel spoil trucks would use these sites.

2.2.4 Parramatta Road West and East civil sites – pedestrian walkway

This modification proposes to link the Parramatta Road West and Parramatta Road East civil sites with a temporary overhead pedestrian walkway above Parramatta Road which would only be used by the construction workforce and would not be available for public use. Access to the walkway would be via stairs at either end located within the work sites. The pedestrian walkway is provided to allow the construction workforce to easily move between the two sites without the need to use the existing at-grade pedestrian crossing on Parramatta Road at the traffic signals.

The structure would provide sufficient clearance for vehicles travelling along Parramatta Road with the base of the walkway being around six metres above Parramatta Road. The Roads and Maritime Special Permits Unit are to be notified for the management of over height vehicle permits. The overall height of the walkway structure would extend to around 10 metres above Parramatta Road. Both the walkway and access towers would be enclosed to provide weather protection for users and enable use 24 hours a day, seven days a week. Lighting would be provided to allow the walkway to be used after daylight hours.

The bridge structure would be fabricated offsite in sections that are of suitable size for transportation to the site. The sections would be welded or bolted together at the Parramatta Road sites. The supporting steel towers would be assembled on site and mounted on concrete foundations to support the pedestrian walkway. The bridge would be a single span and would be lifted into position by a crane. Installation of the span would be carried out at night with full road closure of Parramatta Road and traffic detours provided. A Road Occupancy Licence from the TMC would be required for the installation of the pedestrian walkway, allowing for the temporary closure of Parramatta Road. Once the walkway span is in place the roof and deck would be installed.

The pedestrian walkway is expected to be in place from around late 2018 to end of Q1 in 2023. Once construction works are complete, the pedestrian walkway would be removed following a similar process to that described above, but in reverse.

An indicative location and design of the overhead pedestrian walkway is shown in **Figure 2-14**.

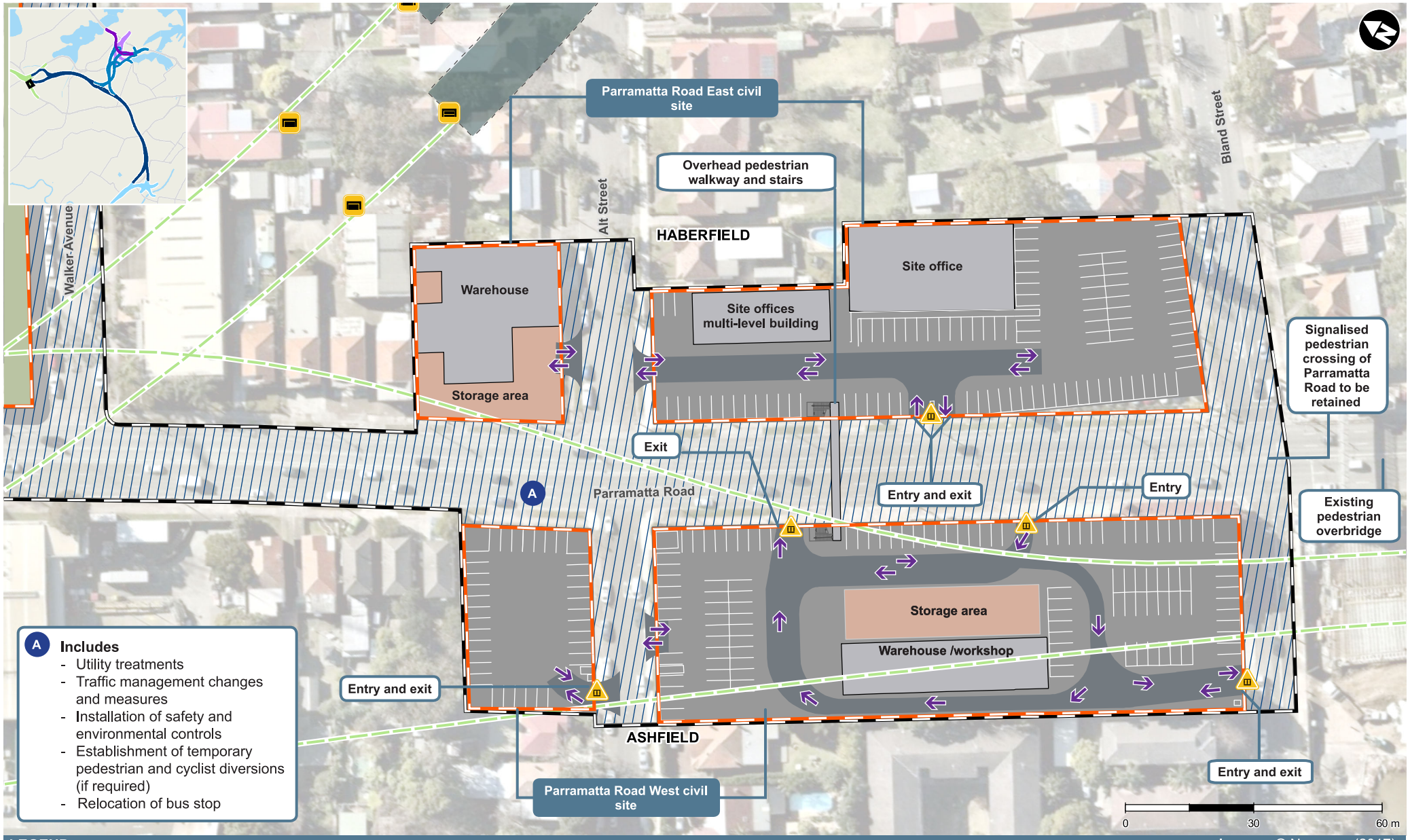
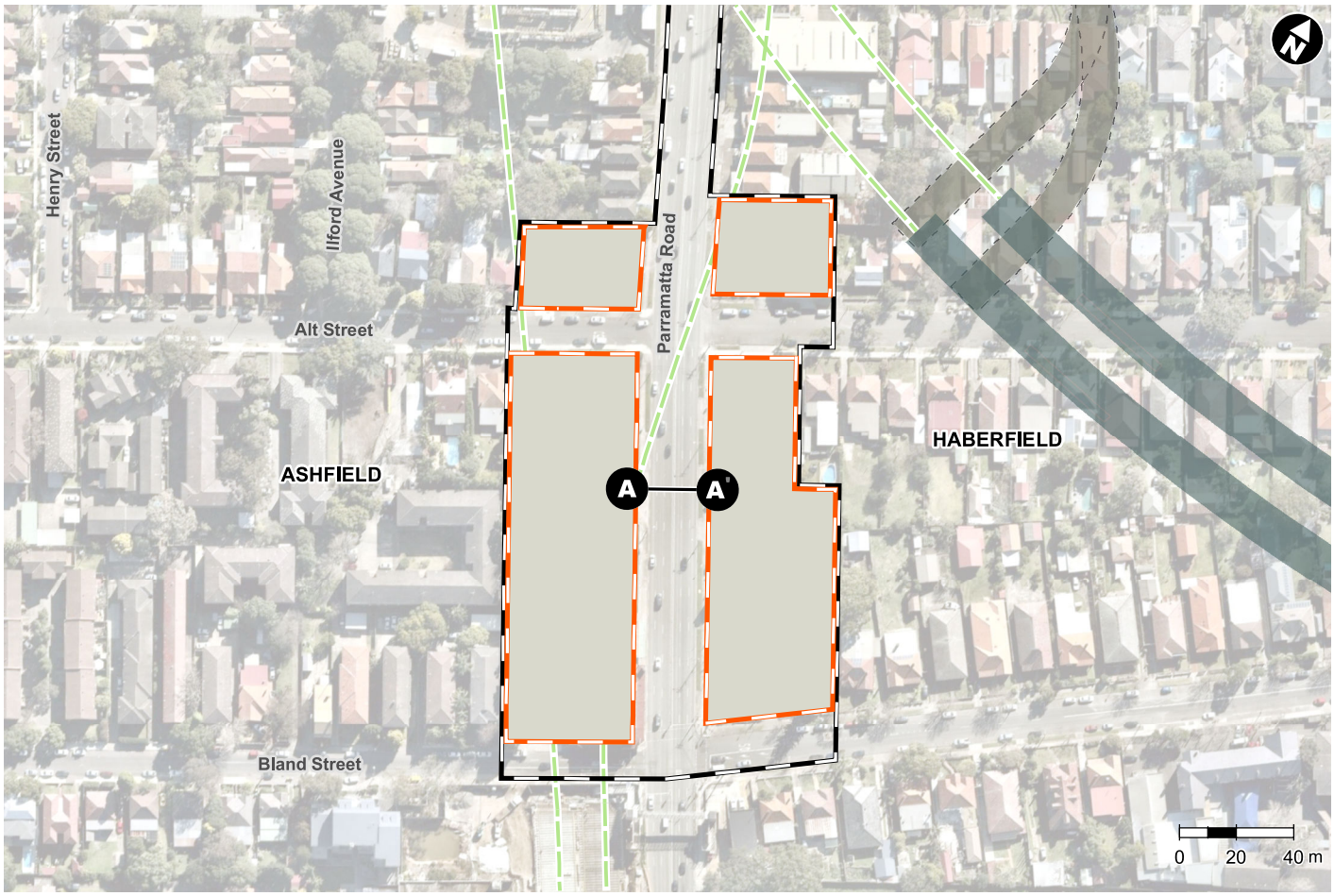


Figure 2-13 Indicative Parramatta Road West and Parramatta Road East sites layouts



Imagery © Nearmap (2017)

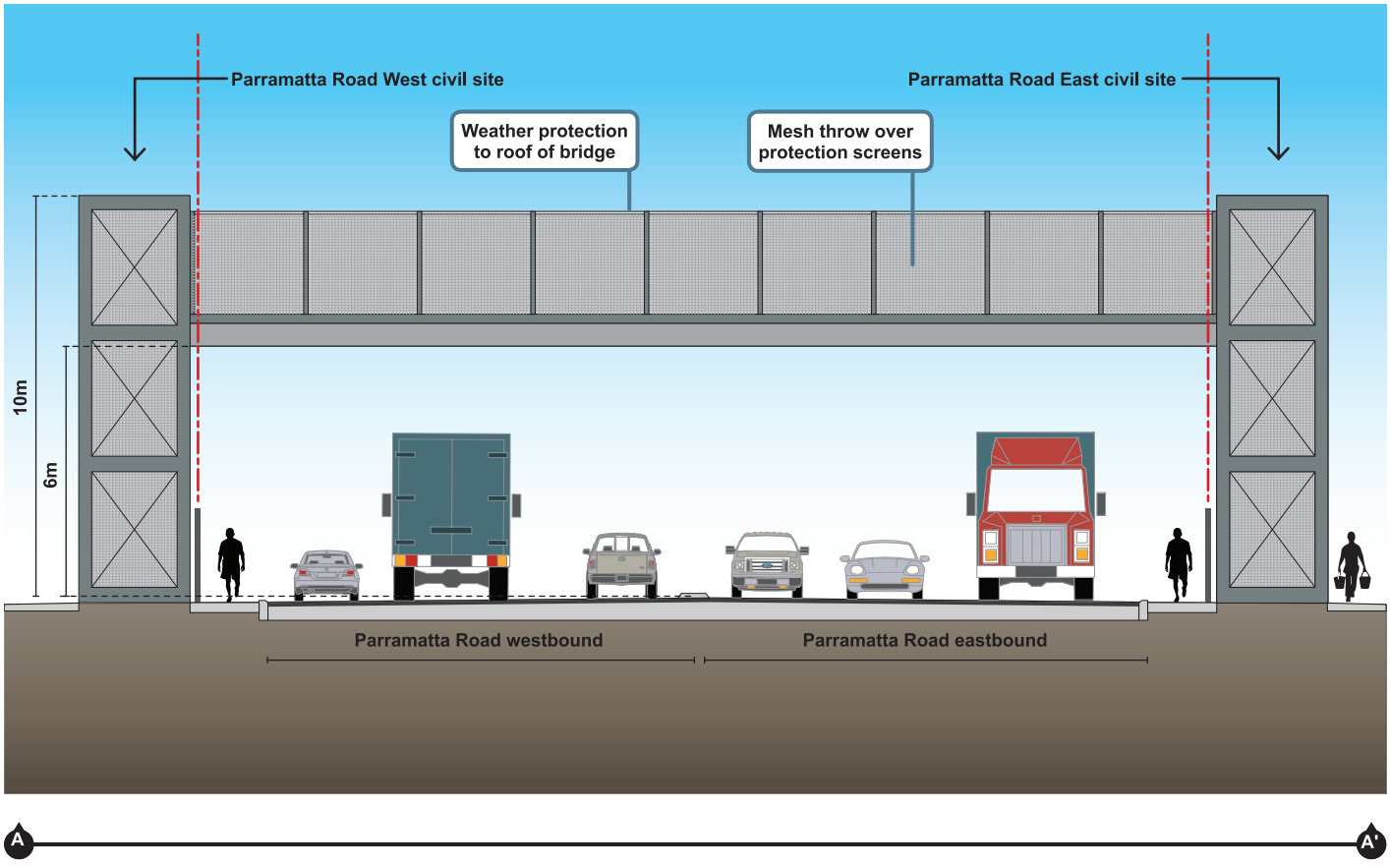


Figure 2-14 Indicative location and design of Parramatta Road West and Parramatta Road East overhead pedestrian walkway

2.3 Removal of Darley Road site from the project

The EIS identified the site as the Darley Road civil and tunnel site (C4) for the construction of the project and as the Darley Road motorway operations complex (MOC1) for the operation of the project.

Ongoing construction design and planning has determined that the Darley Road site is no longer required to support the construction and operation of the project.

2.3.1 Relocation of construction activities

Construction activities would not be carried out at the Darley Road civil and tunnel site. The construction activities proposed for Darley Road civil and tunnel site as described in the EIS would be accommodated at other project construction sites.

The approved project involved the removal and transportation of around 550,300 cubic metres of tunnel spoil from the Darley Road civil and tunnel site as described in section 23.3.2 of the EIS. Given that the length of the mainline tunnel would not change for the proposed modification, this spoil volume would be required to be removed from other tunnelling sites.

The overall intensity (rate) of spoil removal at approved tunnelling sites is not expected to change, however the additional spoil to be removed would require the extension of the tunnelling component of the overall construction program by around six months.

2.3.2 Relocation of operational ancillary infrastructure

The EIS described that an operational water treatment plant and substation would be located at the Darley Road motorway operations complex. The removal of the Darley Road site from the project would result in the relocation of the operational water treatment plant to the Campbell Road motorway operations complex at St Peters interchange. The relocation of the operational water treatment plant is described in **section 2.4** below.

The permanent substation proposed at the Darley Road site in the EIS is no longer required. As described in the EIS, permanent power for Stage 1 of the M4-M5 link project will be supplied via the intake substation at the Campbell Road motorway operations complex at the St Peters interchange. Section 5.10.1 of the EIS and section 4.2.4 of Appendix F (Utilities Management Strategy) of the EIS provides further details on the proposed arrangements to provide electricity to the project.

The removal of the motorway operation complex from Darley Road would result in no permanent infrastructure for the project being located at this location.

2.4 Relocation of operational water treatment plant to St Peters interchange

The proposed relocation of the operational water treatment plant to the Campbell Road motorway operations complex would result in the operational footprint of the motorway operations complex at St Peters being increased. **Figure 2-15** provides an indicative site layout for the Campbell Road motorway operations complex at St Peters interchange, which includes an indicative location for the operational water treatment plant. The motorway operation complex is located on the cut and cover structure above the M4-M5 Link ramps at the St Peters interchange, which is being constructed by the New M5 project and on land to the immediate east. The motorway operations complex as described in the EIS includes ventilation facilities and a substation. Additional land adjacent to, and to the immediate south east of the motorway operations complex would be required to accommodate the operational water treatment plant.

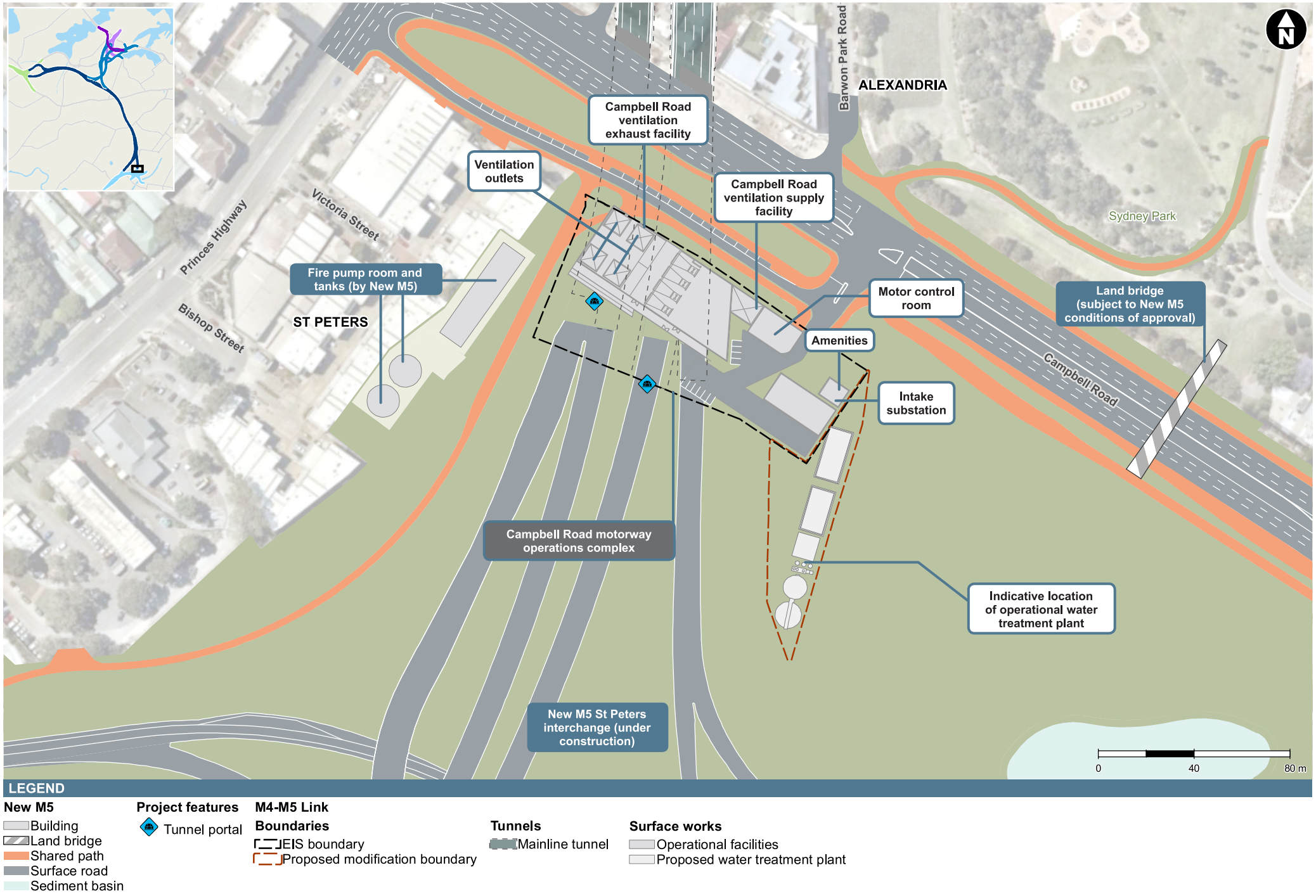


Figure 2-15 Indicative layout of the Campbell Road motorway operations complex

3 Assessment methodology

3.1 Relevant guidelines and policies

The following guidelines were used in carrying out this assessment:

- *Guide to Traffic Management – Part 3 Traffic Studies and Analysis* (Austroads 2013)
- *Traffic Modelling Guidelines* (Roads and Maritime 2013)
- *Guide to Traffic Generating Developments Version 2.2* (NSW Roads and Traffic Authority (RTA) 2002).

3.2 Key assumptions

The most significant change in construction traffic and transport impacts would be due to the proposed change of use at the Northcote Street civil site to also operate as a tunnelling site, and the deletion of the Darley Road civil and tunnel site from the project. These proposed modifications would mean a change in construction traffic generated by the various construction sites in Haberfield and Ashfield of sufficient scale that further assessment is required, as well as changes to the nominated heavy vehicle spoil haulage routes to and from the Northcote Street civil and tunnel site.

The following assumptions were made in the assessment:

- The forecast traffic from the construction sites associated with Stage 2 (Rozelle interchange) of the project was assumed to remain as in the M4-M5 Link: EIS, as varied by the Submissions and Preferred Infrastructure Report (M4-M5 Link SPIR) (January 2018)
- Trucks using the G-loop (Route B from the Northcote Street civil and tunnel site) would primarily enter the M4 East tunnels westbound after making the turnaround. A scenario where trucks use the surface westbound Wattle Street lanes and the Wattle Street / Parramatta Road intersection after making the turnaround has also been assessed
- The assessment of traffic impacts associated with construction of the temporary pedestrian overpass above Parramatta Road to connect the Parramatta Road East and Parramatta Road West civil sites would be a qualitative assessment as impacts on the road network would occur during establishment and decommissioning only and therefore over a short duration
- The assessment of the relocation of the permanent water treatment plant from Darley Road to the Campbell Road motorway operations complex (MOC5) at the St Peters interchange would also be a qualitative assessment as the change in construction traffic is expected to be minimal
- The project modifications relate to the construction phase of works. No assessment of operational traffic and transport impacts is therefore required.

3.3 Methodology

The traffic impacts of the proposed heavy vehicle and light vehicle project modifications were assessed using existing LinSig traffic models previously used to assess construction impacts for the M4 East and M4-M5 Link projects. The assessments were undertaken on the surrounding road network during the AM and PM peak hours in the forecast peak construction year (2021). The impact of shuttle buses from the Parramatta Road sites was included in this assessment as shuttle buses were included in the light vehicle volumes.

The construction impact assessment was undertaken where construction traffic is forecast to pass through the network in significant volumes. The intersections assessed were grouped into two LinSig corridors or clusters, as follows, and indicated on **Figure 3-1**:

- Cluster 1 in Haberfield and Ashfield
- Cluster 2 in Five Dock.

The Cluster 1 model was previously used in the assessment of the construction impacts for the M4-M5 Link, so already had 2021 future year 'without construction' models, which used traffic forecasts from WestConnex Road Traffic Model (WRTM) v2.3.

The Cluster 2 model was previously used in the assessment of the construction impacts for the M4 East, which assessed a 2017 construction year and used traffic forecasts from WRTM v2.1. To create a consistent assessment year model and forecast volumes, AM and PM peak hour models for 2021 were developed using the growth forecast by WRTM v2.3 applied to the Cluster 2 base models to derive the background traffic demand for 2021 'without construction' models.

Construction traffic was then added to the 2021 background traffic, based on the proposed construction methodology, covering vehicle types, volumes and construction traffic routes to and from the various construction ancillary facilities.

As the proposed modifications relate to the Stage 1 construction sites at Haberfield and Ashfield, and the removal of the Darley Road site from the project, there is negligible change in construction impact forecast on the road network east of these sites along City West Link, and so the roads and intersections assessed in Leichhardt North, Lilyfield and Rozelle in the M4-M5 Link SPIR have not been reassessed.

3.3.1 Roadway level of service

Updated analysis of roadway levels of service (LoS) is detailed in **section 4.4.1** and **section 4.5.1** at relevant locations impacted by the changes compared to the M4-M5 Link SPIR. Mid-block traffic level of service demonstrates the forecast impact of construction traffic in 2021 for construction activities. Theoretical mid-block roadway capacities were based on Austroads *Guide to Traffic Management*, shown in **Table 3-1**, with the six levels of service for mid-block locations, ranging from LoS A to F, with LoS A representing optimum operating conditions (free flow) and LoS F the poorest (forced or breakdown in flow).

In highly congested networks, single-point assessment criteria, such as mid-block levels of service, do not present a complete picture of traffic operations. 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.

3.3.2 Intersection level of service

Average delay is commonly used to assess the operational performance of intersections, with level of service used as an index. A summary of the intersection level of service criteria is shown in **Table 3-2**.

The intersection performance results for the road network under the 2021 'without construction' and 'with construction' forecast volumes are summarised for each relevant location in **section 4.4.2** and **section 4.5.2** for the AM and PM peak hours. This allows for comparison with the level of impact reported in Appendix A (Traffic and transport impact assessment) of the M4-M5 Link SPIR.

Intersection modelling was undertaken using passenger car units (PCU) to quantify traffic volumes. This accounts for the amount of road space used by different vehicle types.

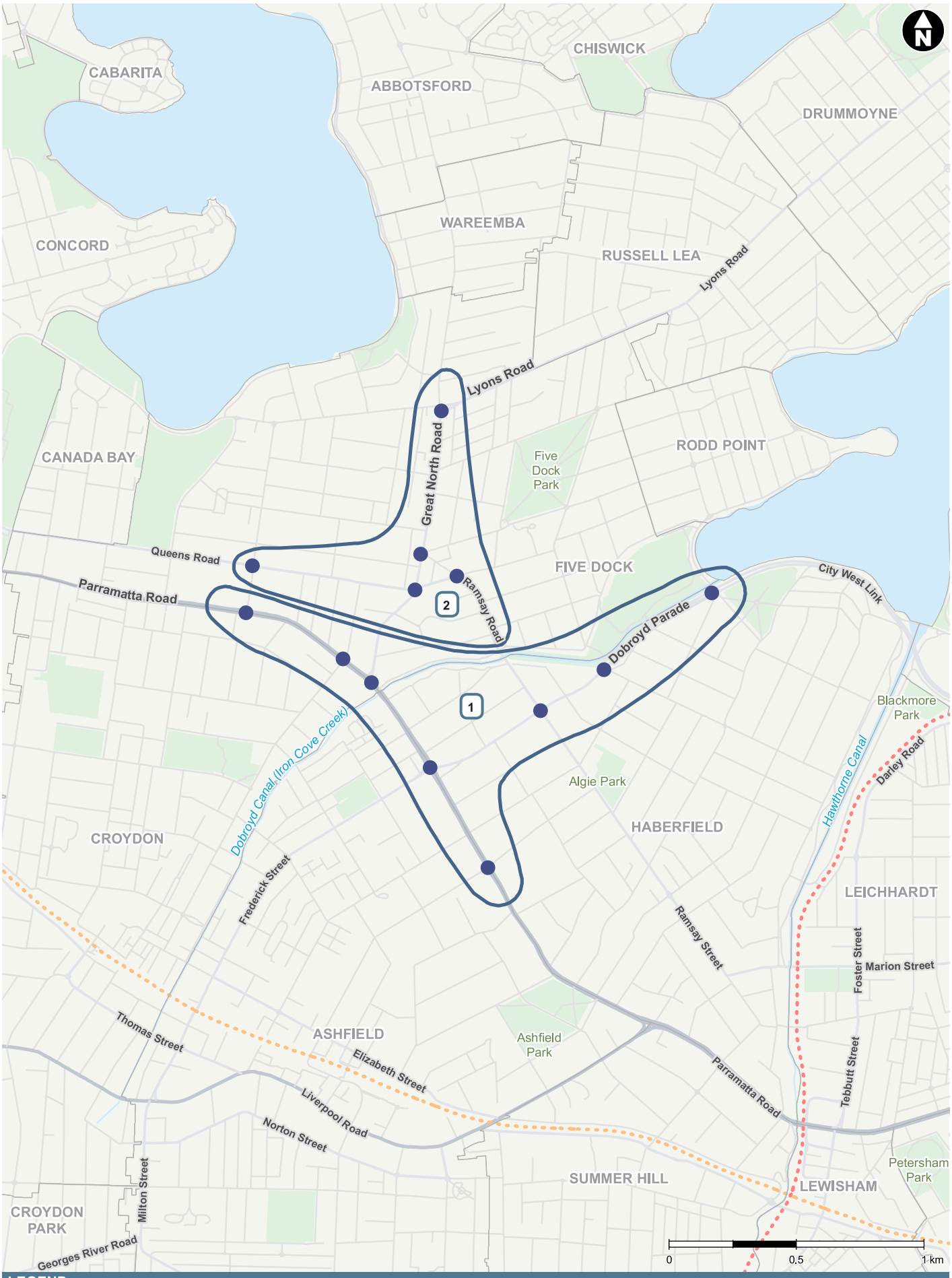


Figure 3-1 LinSig model area coverage

Table 3-1 Mid-block level of service definitions and criteria

LoS	Definition	Multi lane roads[1]	Freeways[2]
		V/C ratio[3]	Density (PCU/km/lane)
A	A condition of free flow in which individual drivers are virtually unaffected by the presence of others in the traffic stream. Freedom to select desired speeds and to manoeuvre within the traffic stream is extremely high.	≤ 0.26	≤ 7.0
B	In the zone of stable flow where drivers still have reasonable freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort is a little less than with level of service A.	0.27 to 0.41	7.1 to 11.0
C	Also in the zone of stable flow, but most drivers are restricted to some extent in their freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience declines noticeably at this level.	0.42 to 0.59	11.1 to 16.0
D	Close to the limit of stable flow and approaching unstable flow. All drivers are severely restricted in their freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience is poor, and small increases in traffic flow would generally cause operational problems.	0.60 to 0.81	16.1 to 22.0
E	Traffic volumes are at or close to capacity, and there is virtually no freedom to select desired speeds or to manoeuvre within the traffic stream. Flow is unstable and minor disturbances within the traffic stream would cause breakdown.	0.82 to 1.00	22.1 to 28.0
F	In the zone of forced flow, where the amount of traffic approaching the point under consideration exceeds that which can pass it. Flow breakdown occurs, and queuing and delays result.	> 1.00	> 28.0

Notes: [1] Where free flow speed is taken as 70 kilometres per hour

[2] Where free flow speed is taken as 90 kilometres per hour

[3] V/C ratio = ratio of the traffic volume to the road capacity

Source: A*ustroads, Guide to Traffic Management – Part 3 Traffic Studies and Analysis*, Second Edition 2013

Table 3-2 Level of service criteria for intersections

LoS	Average delay/vehicles (sec/veh)	Traffic signals/roundabouts	Give way and stop signs
A	≤ 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Good with acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity and accident study required
E	57 to 70	At capacity; at signals incidents would cause excessive delays	At capacity; requires other control mode
F	>70	Roundabouts require other control mode	At capacity; requires other control mode

Source: *Guide to Traffic Generating Developments*, RTA 2002

4 Potential impacts – construction

4.1 Construction traffic generation

Table 4-1 provides details of light and heavy vehicle volumes predicted to arrive and depart from the modelled M4-M5 Link construction sites 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. These forecast construction volumes are based on the information available at the time of preparing this assessment and are subject to detailed construction planning and detailed design.

Compared to the M4-M5 Link SPIR construction vehicle volumes, the following changes in the peak hour volumes at the Stage 1 construction sites are proposed:

- Heavy vehicles
  - Increase at the Northcote Street civil and tunnel site from five heavy vehicles to eight heavy vehicles (one-way) during the AM and PM peak hours
  - Decrease at the Parramatta Road East civil site from three heavy vehicles to one heavy vehicle (one-way) during the AM and PM peak hours
- Light vehicles
  - Decrease at the Northcote Street civil and tunnel site from 50 light vehicles to seven light vehicles (one-way) during the AM peak hour and from 150 light vehicles to seven light vehicles (one-way) in the PM peak hour
  - Increase at the Parramatta Road West civil site from 10 light vehicles to 18 light vehicles (one-way) during the AM peak hour and from 10 light vehicles to 31 light vehicles (one-way) in the PM peak hour
  - Decrease at the Parramatta Road East civil site from 50 light vehicles to 12 light vehicles (one-way) during the AM peak hour and from 150 light vehicles to 20 light vehicles (one-way) in the PM peak hour.

No changes to the indicative construction volumes from the other construction sites are proposed, subject to ongoing detailed construction planning.

The peak hours for the sites are slightly different to the surrounding road network peak hours, ie the busiest periods on the general road network and at the sites 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 at these locations. 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 conservatively assessed in the PM peak hour.

Table 4-1 Modified indicative daily and peak period construction traffic volumes

Location		Daily vehicles (one way)		AM peak hour (7.30–8.30 am)				PM peak hour (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
Stage 1 construction sites											
C1a	Wattle Street civil and tunnel site	133	50	7	7	10	–	7	7	–	50
C3a	Northcote Street civil and tunnel site*	143 (+43)	20 (-130)	8 (+3)	8 (+3)	7 (-43)	4 (+4)	8 (+3)	8 (+3)	4 (+4)	7 (-143)
C1b	Parramatta Road West civil site*	25 (-115)	306 (+296)	7	7	18 (+8)	5 (+5)	7	7	5 (+5)	31(+21)
C2a/C2b	Haberfield civil site[#]	10	20	2	2	10	–	2	2	–	10
C3a/C3b	Parramatta Road East civil site*	25 (-5)	210 (+60)	1 (-2)	1 (-2)	12 (-38)	4 (+4)	1 (-2)	1 (-2)	4 (+4)	20 (-130)
C4	Darley Road civil and tunnel site – removed										
C9	Pyrmont Bridge Road tunnel site	133	70	7	7	20	–	7	7	–	70
C10	Campbell Road civil and tunnel site	133	70	7	7	20	–	7	7	–	70
C11	White Bay civil site	284	100	21	21	50	50	10	21	50	50
Stage 2 construction sites											
C5	Rozelle civil and tunnel site	517	350	23	23	100	–	23	23	–	350
C6	The Crescent civil site	10	20	2	2	0		2	2		5
C7	Victoria Road civil site	42	140	2	2	0	–	2	2	–	0
C8	Iron Cove Link civil site	42	140	2	2	15	–	2	2	–	140

Note: * Light vehicle volumes include forecast project shuttle bus movements

The use and footprint of this site was amended in sections B11.6.8 and C6.1.3 of the SPIR to be as per the arrangement for the Haberfield civil site (C2b)

(+X or -X) = change in volume from the M4-M5 Link EIS

4.2 Construction workforce parking

A preliminary assessment of parking provision, based on approximate peak workforce estimates, anticipate that the total parking provision within the Haberfield and Ashfield construction sites (ie Wattle Street civil and tunnel site (C1a), Northcote Street civil and tunnel site (C3a), Haberfield civil site (C2b) and Parramatta Road West and East civil sites (C1b and C3b)) would be able to meet the forecast parking demand, as shown in **Table 4-2**.

To assist in minimising impacts from the construction workforce using on-street parking, the use of public transport would be encouraged (where feasible). The sites, situated along Parramatta Road, would be serviced by numerous bus routes. However, workers starting or ending shifts very early or very late would be more likely to use private vehicles.

Table 4-2 Parking demand and provision at Haberfield and Ashfield construction ancillary facilities

Location	Approximate day shift peak construction workforce	Estimate of parking demand (0.7 spaces/staff)	Approximate proposed parking numbers	Surplus or Deficit
Haberfield and Ashfield construction ancillary facilities	260	182	200	+18

A Construction Parking and Access Strategy would be developed to identify actions that would be implemented by the contractor to avoid or minimise the use of on-street parking in the vicinity of construction sites by the construction workforce. The car parking strategy would consider forecast parking demand, review of existing parking supply, alternative parking arrangements and communication and engagement. Processes for monitoring, reporting and corrective actions would also be part of the strategy.

4.3 Construction access points and routes

The proposed access points and routes to and from the Stage 1 construction sites considered in this assessment are summarised in **Table 4-3**. These routes were used to inform the assessment of construction traffic impacts and would be confirmed during detailed design and detailed construction planning through the Construction Traffic Transport and Access Management Sub-Plan. Spoil haulage routes are based on the assumption that spoil management sites would be located in western Sydney.

The nominated routes for exiting spoil haulage vehicles from the Northcote Street civil and tunnel site are shown in **Figure 4-1**. As described in **section 2.1**, there are two nominated egress routes for spoil haulage vehicles from the Northcote Street civil and tunnel site. The roads along these nominated routes are classified as state roads. Each spoil haulage vehicle egress route was assessed for use by up to eight heavy vehicles and four light vehicles in the AM peak hour and by eight heavy vehicles and seven light vehicles in the PM peak hour.

The proposed spoil haulage routes for the Northcote Street civil and tunnel site would be more direct and less constrained compared to the spoil haulage route for the Parramatta Road West site described in the EIS and SPIR which included the use of Centenary Drive and the Hume Highway. Inbound vehicles would be able to access the site traveling eastbound on the M4 East Motorway and Parramatta Road, and use of the G-loop would allow outbound spoil haulage vehicles to use the M4 East entry ramps on Wattle Street. Spoil haulage routes would be restricted to state roads that are controlled by Roads and Maritime.

Once the G-loop is in operation, Route B would be the preferred spoil haulage route and would be available for use 24 hours a day and 7 days a week in accordance with condition E70 of the project approval. Route A would also be used as a spoil haulage route. However, in response to feedback received from stakeholders during the consultation process, it is proposed that Route A would generally only be used between 7am and 6pm Monday to Friday and 8am to 6pm on Saturdays except in the circumstances identified in **section 2.1.4**.

A spoil haulage protocol would be developed by the contractor in consultation with Roads and Maritime and the Transport for NSW Traffic Management Centre to manage spoil haulage movements on Routes A and B. The protocol would be documented in the Construction Traffic Transport and Access Management Sub-Plan.

Table 4-3 Proposed routes to and from construction ancillary facilities assessed in this report

Site	Access and egress routes (heavy vehicles)[1,2]	Access and egress points (light vehicles)
Wattle Street civil and tunnel site	Access from Parramatta Road, then Wattle Street via M4-M5 Link entry and exit ramps. Egress follows the same route in reverse. Spoil haulage route is the same. No change from M4-M5 Link SPIR.	Access from Parramatta Road, then Wattle Street northern (eastbound) carriageway (right-in). Egress (right-out) on Wattle Street southern (westbound), then into Parramatta Road. No change from M4-M5 Link SPIR.
Northcote Street civil and tunnel site	Access from Parramatta Road (left-in). Egress onto Wattle Street (left-out). Spoil haulage Route A: Access from Parramatta Road (left-in). Egress onto Wattle Street (left-out), then left into Ramsay Street / Road, left into Fairlight Street, left into Great North Road and right into Parramatta Road. This is a new route that was not assessed in the M4-M5 Link EIS or M4-M5 Link SPIR.	Access from Parramatta Road (left-in). Egress onto Wattle Street (left-out).
	Access from Parramatta Road (left-in). Egress onto Wattle Street (left-out). Spoil haulage Route B: Access from Parramatta Road (left-in). Egress onto Wattle Street (left-out), then along Dobroyd Parade to the G-loop, right turn at Waratah Street into Dobroyd Parade westbound and either into the M4 East westbound or westbound along Wattle Street and then Parramatta Road to head west. This is a new route that was not assessed in the M4-M5 Link EIS or M4-M5 Link SPIR.	Access from Parramatta Road (left-in). Egress onto Wattle Street (left-out).
Parramatta Road West civil site	Access and egress from Parramatta Road (left-in / left-out), Alt Street and Bland Street (west of Parramatta Road). Crossover between sites on Alt Street.	Same as for heavy vehicles.
Parramatta Road East civil site	Access and egress from Parramatta Road (left-in / left-out) and Alt Street. Crossover between sites on Alt Street.	Same as for heavy vehicles.

Note:

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.
2. Access and egress routes for heavy vehicles relate to spoil haulage vehicles only. Some use of other routes by other construction related vehicles (including heavy vehicles) may be undertaken. These movements would occur in accordance with the relevant conditions of approval for the project.

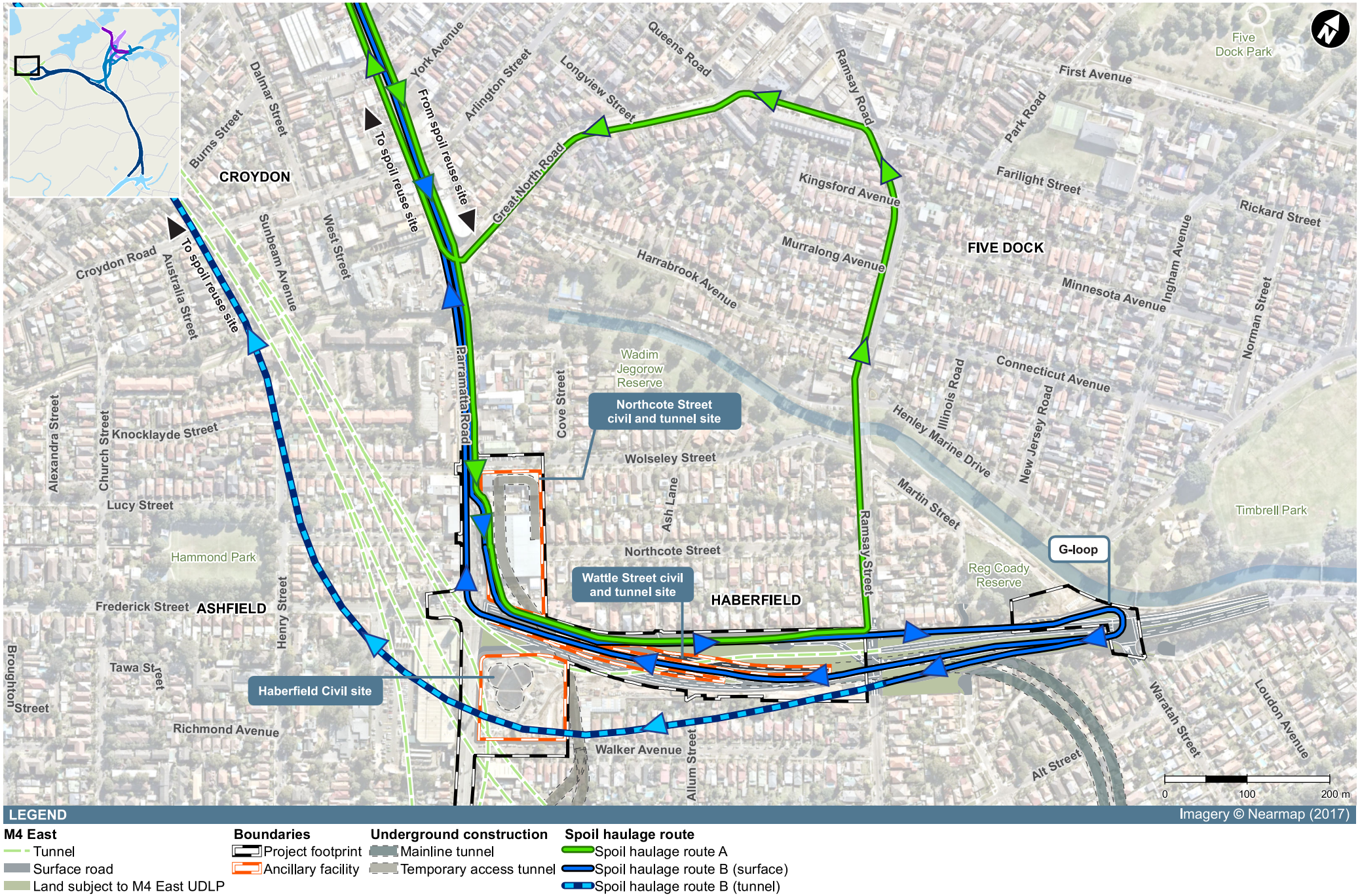


Figure 4-1 Northcote Street civil and tunnel site - proposed spoil haulage routes

4.4 Impact assessment – Haberfield and Ashfield

This section presents changes to the impact assessment of construction activities on proposed access routes in the Haberfield and Ashfield area compared to the M4-M5 Link SPIR assessment. 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.

The Parramatta Road/Great North Road intersection modelling includes the planned Roads and Maritime intersection improvements at this location, which includes an additional right turn lane from Parramatta Road into Great North Road to increase capacity and minimise queuing into the through traffic lanes.

Roads and Maritime is also planning to construct an additional eastbound traffic lane on City West Link between Waratah Street, Haberfield and James Street, Leichhardt, within the existing road footprint. Due to the timing of the announcement, it was not possible to include this proposed upgrade in the traffic modelling. However, this reallocation of road space to allow additional eastbound capacity would be expected to improve the intersection and mid-block performance along Dobroyd Parade/City West Link. Therefore, the analysis undertaken is a worse-case scenario and would be expected to improve with this upgrade.

4.4.1 Impacts on roadway level of service

As described in **section 3.3**, an update of the analysis of the roadway levels of service was carried out to determine the impact of the modification on 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 4-4** and **Table 4-5** for the AM and PM peak hours.

A comparison to the results from Appendix A (Traffic and transport impact assessment) of the M4-M5 Link SPIR are also provided in the tables. While the M4-M5 Link SPIR presented two construction site options (Option A and Option B), a comparison against Option A has been provided, as it is the most comparable in terms of the construction sites assessed as Option A included the use of Northcote Street as a civil site.

The results for Haberfield and Ashfield show limited change in terms of volume over capacity (V/C) from the assessment in Appendix A (Traffic and transport impact assessment) of the M4-M5 Link SPIR and indicate that the relevant mid-blocks would remain within their theoretical capacity. The small change in V/C indicates a small change in forecast volume on these links and therefore a limited impact. The results presented are for the Route A haulage route option. However, the choice of Northcote Street civil and tunnel site egress option – either via Five Dock or via the G-loop – has minimal impact on the mid-block operational performance.

Table 4-4 2021 AM peak hour mid-block operational performance summary[1]

Location and direction		Mid block capacity	Without construction			With construction (M4 M5 Link SPIR Option A)			With construction (Modification)		
			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	1,910	0.58	C
	NB	3,300	1,310	0.40	C	1,340	0.41	C	1,350	0.41	C
Wattle Street, east of Parramatta Road – Haberfield	EB	2,000	740	0.37	B	780	0.39	B	770	0.38	B
	WB	2,000	860	0.43	C	890	0.45	C	880	0.44	C
M4 East ramps at Wattle Street[3]	EB	2,200	1,170	0.53	C	1,310	0.60	D	1,250	0.57	C
	WB	4,500	1,260	0.28	B	1,340	0.30	B	1,310	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 4-5 2021 PM peak hour mid-block operational performance summary[1]

Location and direction		Mid block capacity	Without construction			With construction (M4 M5 Link SPIR Option A)			With construction (Modification)		
			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	2,260	0.68	D	2,120	0.64	D
	NB	3,300	1,310	0.40	C	1,380	0.42	C	1,380	0.42	C
Wattle Street, east of Parramatta Road – Haberfield	EB	2,000	1,110	0.55	C	1,270	0.64	D	1,130	0.57	C
	WB	2,000	730	0.37	B	800	0.40	C	760	0.38	B
M4 East ramps at Wattle Street[3]	EB	2,200	910	0.41	C	1,010	0.46	C	970	0.44	C
	WB	4,500	1,090	0.24	A	1,290	0.29	B	1,240	0.28	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.

4.4.2 Impacts on intersection level of service

Route A: Northcote Street civil and tunnel site egress via Five Dock

The intersection performance results for the road network under the 2021 'without construction' and 'with construction' scenarios are summarised in **Table 4-6** and **Table 4-7** for the AM and PM peak hours. This allows for comparison with the level of impact reported in Appendix A (Traffic and transport impact assessment) of the M4-M5 Link SPIR. As above, Option A from the M4-M5 Link SPIR was used as the basis for comparison.

Compared to the M4-M5 Link SPIR Option A scenario, there is a relatively small change in the volume of construction traffic on parts of the network due to the proposed modification, rising by a maximum of about 60 PCU in the PM peak at the Parramatta Road/Great North Road intersection. This increase in PCUs does not change the LoS at this intersection and there is limited change elsewhere on the network.

The change in intersection performance relative to the M4-M5 Link SPIR assessment is limited with a change in the LoS band seen at two intersections during the PM peak hour:

- Wattle Street/Ramsay Street intersection – improvement from LoS E to LoS D
- Parramatta Road/Croydon Road/Arlington Street intersection – deterioration from LoS E to LoS F. This intersection is at capacity even in the ‘’without construction' scenario – it is close to LoS E – so even a small change in demand has a large impact on intersection delay. The capacity constraint is caused by exit blocking from downstream intersections, so upgrades at this intersection would not alleviate the forecast delay.

This analysis shows that there is a relatively minor difference in volumes on the modelled road network between the 'without construction', 'with construction' (M4-M5 Link SPIR Option A) and 'with construction' modification scenarios. The location forecast to experience the most substantial increase in demand (compared to the 'without construction' scenario) is the Dobroyd Parade/Waratah Street intersection in the PM peak hour (an increase of around 310 PCU or 10 per cent compared to the 'without construction' scenario). However, this is a reduction of 10 PCU when compared to the 'with construction' (M4-M5 Link SPIR Option A) scenario.

There is minimal impact in terms of performance at this intersection with the intersection remaining at LoS B under all modelled scenarios in the PM peak. The increases at other intersections are forecast to be between one and seven per cent (compared to the 'without construction' scenario) – generally well within the typical daily fluctuations of traffic demands.

Table 4-6 2021 AM peak hour intersection operational performance summary[1]

Cluster	Intersection	Without construction		With construction (M4 M5 Link SPIR Option A)		With construction (Modification Northcote Street site egress via Five Dock)	
		Volume (PCU)	LoS	Volume (PCU)	LoS	Volume (PCU)	LoS
1	Parramatta Rd | Harris Rd	2,550	B	2,650	C	2,690	C
	Parramatta Rd | Croydon Rd | Arlington St	3,280	B	3,370	C	3,420	C
	Parramatta Rd | Great North Rd	3,810	C	3,940	C	3,960	C
	Parramatta Rd | Frederick St | Wattle St	4,880	D	4,960	D	4,990	D
	Parramatta Rd | Bland St	2,870	F	2,870	F	2,930	F
	Wattle St | Ramsay St	3,260	C	3,280	C	3,310	C
	Dobroyd Parade | Waratah St	3,470	B	3,710	B	3,720	B
	Dobroyd Parade | Timbrell Dr | Mortley Ave	5,530	F	5,780	F	5,780	F

Notes:

1. Traffic volume rounded to nearest 10.

Table 4-7 2021 PM peak hour intersection operational performance summary[1]

Cluster	Intersection	Without construction		With construction (M4 M5 Link SPIR Option A)		With construction (Modification Northcote Street site egress via Five Dock)	
		Volume (PCU)	LoS	Volume (PCU)	LoS	Volume (PCU)	LoS
1	Parramatta Rd | Harris Rd	3,040	B	3,240	C	3,220	C
	Parramatta Rd | Croydon Rd | Arlington St	3,610	D	3,710	E	3,760	F
	Parramatta Rd | Great North Rd	3,820	F	3,920	F	3,980	F
	Parramatta Rd | Frederick St | Wattle St	4,950	E	5,200	E	5,070	E
	Parramatta Rd | Bland St	2,500	B	2,530	B	2,570	B
	Wattle St | Ramsay St	3,080	D	3,330	E	3,170	D
	Dobroyd Parade | Waratah St	2,960	B	3,280	B	3,270	B
	Dobroyd Parade | Timbrell Dr | Mortley Ave	5,450	F	5,800	F	5,760	F

Notes:

1. Traffic volume rounded to nearest 10.

Route B: Northcote Street civil and tunnel site egress via the G-loop

The assessment of Route B used the same LinSig models as Route A, with the addition of the G-loop into the model network. The reinstatement of the northern leg (the G-loop exit) of the Dobroyd Parade / Waratah Street intersection would impact signal phasing at this intersection. The total cycle time remained the same as the Route A and previously tested scenarios, with a diamond phase introduced to allow the right turn movement from the G-loop and the right turn out of Waratah Street to occur at the same time. This arrangement was based on swept path analysis (see **section 4.7**) that indicated that the two right turn movements could occur simultaneously. An independent road safety audit will be undertaken at this intersection during detailed design to assess safety performance in accordance with condition E56 of the project approval.

Two scenarios have been assessed for Route B:

- Trucks exiting the G-loop and entering the M4 East westbound entry ramp
- Trucks exiting the G-loop and using the surface westbound Wattle Street lanes and the Parramatta Road/Wattle Street intersection.

The results of the assessment for these two scenarios are provided in the following sections.

G-loop to M4 East westbound entry ramp scenario

The intersection performance results for the road network under the 2021 'without construction' and 'with construction' scenarios with the trucks exiting the G-loop and entering the M4 East westbound entry ramp are summarised in **Table 4-8** and **Table 4-9** for the AM and PM peak hours. As above, Option A from the M4-M5 Link SPIR was used as the basis for comparison.

Table 4-8 2021 AM peak hour intersection operational performance summary[1]

Cluster	Intersection	Without construction		With construction (M4 M5 Link SPIR Option A)		With construction (Modification Northcote Street site egress via G loop and M4 East)	
		Volume (PCU)	LoS	Volume (PCU)	LoS	Volume (PCU)	LoS
1	Parramatta Rd | Harris Rd	2,550	B	2,650	C	2,680	C
	Parramatta Rd | Croydon Rd | Arlington St	3,280	B	3,370	C	3,400	C
	Parramatta Rd | Great North Rd	3,810	C	3,940	C	3,940	C
	Parramatta Rd | Frederick St | Wattle St	4,880	D	4,960	D	4,990	D
	Parramatta Rd | Bland St	2,870	F	2,870	F	2,930	F
	Wattle St | Ramsay St	3,260	C	3,280	C	3,310	C
	Dobroyd Parade | Waratah St	3,470	B	3,710	B	3,730	C
	Dobroyd Parade | Timbrell Dr | Mortley Ave	5,530	F	5,780	F	5,780	F

Notes:

1. Traffic volume rounded to nearest 10.

Table 4-9 2021 PM peak hour intersection operational performance summary[1]

Cluster	Intersection	Without construction		With construction (M4 M5 Link SPIR Option A)		With construction (Modification Northcote Street site egress via G loop and M4 East)	
		Volume (PCU)	LoS	Volume (PCU)	LoS	Volume (PCU)	LoS
1	Parramatta Rd | Harris Rd	3,040	B	3,240	C	3,200	C
	Parramatta Rd | Croydon Rd | Arlington St	3,610	D	3,710	E	3,740	F
	Parramatta Rd | Great North Rd	3,820	F	3,920	F	3,960	F
	Parramatta Rd | Frederick St | Wattle St	4,950	E	5,200	E	5,070	E
	Parramatta Rd | Bland St	2,500	B	2,530	B	2,570	B
	Wattle St | Ramsay St	3,080	D	3,330	E	3,170	D
	Dobroyd Parade | Waratah St	2,960	B	3,280	B	3,290	B
	Dobroyd Parade | Timbrell Dr | Mortley Ave	5,450	F	5,800	F	5,760	F

Notes:

1. Traffic volume rounded to nearest 10.

As with Route A, the change in intersection performance relative to the M4-M5 Link SPIR assessment is limited with a change in the LoS band seen at the following intersections:

- Dobroyd Parade/Waratah Street intersection – deterioration from LoS B to LoS C during the AM peak hour. This is mainly due to the additional signal phase for the northern leg (G-loop exit), which reduces the capacity on the other approaches. Compared to the construction scenario of using the Route A haulage route, the maximum queue length on the eastbound lanes from the M4 East exit ramp is forecast to increase from about 115 metres to 180 metres during the AM peak hour. This is some distance from the tunnel portal, located at Ramsay Street, which is about 280 metres from the intersection stop line. The use of the G-loop route (Route B) is therefore not expected to result in queuing back on to the M4 East exit ramps during the AM peak
- Wattle Street/Ramsay Street intersection – improvement from LoS E to LoS D during the PM peak hour, with the forecast reduction in construction vehicles compared to the SPIR
- Parramatta Road/Croydon Road/Arlington Street intersection – deterioration from LoS E to LoS F during the PM peak hour. As noted in the Route A discussion, the capacity constraint at this intersection is caused by exit blocking from downstream intersections, so upgrades at this intersection would not alleviate the forecast delay.

The analysis shows there is a relatively minor difference in volumes on the modelled road network between the 'without construction' and 'with construction' modification scenarios. The Dobroyd Parade/Waratah Street intersection in the PM peak hour is forecast to experience the highest increase in demand (330 PCU, about 11 per cent compared to the 'without construction' scenario). However, this is an increase of only 10 PCU compared to the 'with construction' (M4-M5 Link SPIR) scenario. The increases at other intersections are forecast to be between one and eight per cent when comparing the modification to the 'without construction' scenario (and negligible when comparing the modification to the M4-M5 Link SPIR Option A scenario) – and therefore generally well within the typical daily fluctuations of traffic demands.

G-loop to Wattle Street westbound surface lanes scenario

A scenario where trucks use the surface westbound Wattle Street lanes and the Wattle Street / Parramatta Road intersection after making the G-loop turnaround has also been assessed. The intersection performance results for the road network under the 2021 'without construction' and 'with construction' scenarios with the trucks exiting the G-loop and travelling westbound along Wattle Street and then Parramatta Road to head west are summarised in **Table 4-10** and **Table 4-11** for the AM and PM peak hours. As above, Option A from the M4-M5 Link SPIR was used as the basis for comparison.

The use of this route adds an additional 20 PCU to the intersections west of the Dobroyd Parade/ Waratah Street intersection compared to the scenario where trucks use the G-loop and enter the M4 East. However, this does not impact the forecast level of service of the modelled intersections compared to the route using the M4 East. Therefore, the impacts relative to the M4-M5 Link SPIR assessment are consistent with those described above for M4 East route option.

Table 4-10 2021 AM peak hour intersection operational performance summary[1]

Cluster	Intersection	Without construction		With construction (M4 M5 Link SPIR Option A)		With construction (Modification Northcote Street site egress via G-loop and Parramatta Road)	
		Volume (PCU)	LoS	Volume (PCU)	LoS	Volume (PCU)	LoS
1	Parramatta Rd | Harris Rd	2,550	B	2,650	C	2,700	C
	Parramatta Rd | Croydon Rd | Arlington St	3,280	B	3,370	C	3,420	C
	Parramatta Rd | Great North Rd	3,810	C	3,940	C	3,960	C
	Parramatta Rd | Frederick St | Wattle St	4,880	D	4,960	D	5,010	D
	Parramatta Rd | Bland St	2,870	F	2,870	F	2,930	F
	Wattle St | Ramsay St	3,260	C	3,280	C	3,330	C
	Dobroyd Parade | Waratah St	3,470	B	3,710	B	3,730	C
	Dobroyd Parade | Timbrell Dr | Mortley Ave	5,530	F	5,780	F	5,780	F

Notes:

1. Traffic volume rounded to nearest 10.

Table 4-11 2021 PM peak hour intersection operational performance summary[1]

Cluster	Intersection	Without construction		With construction (M4 M5 Link SPIR Option A)		With construction (Modification Northcote Street site egress via G-loop and Parramatta Road)	
		Volume (PCU)	LoS	Volume (PCU)	LoS	Volume (PCU)	LoS
1	Parramatta Rd | Harris Rd	3,040	B	3,240	C	3,220	C
	Parramatta Rd | Croydon Rd | Arlington St	3,610	D	3,710	E	3,760	F
	Parramatta Rd | Great North Rd	3,820	F	3,920	F	3,980	F
	Parramatta Rd | Frederick St | Wattle St	4,950	E	5,200	E	5,090	E
	Parramatta Rd | Bland St	2,500	B	2,530	B	2,570	B
	Wattle St | Ramsay St	3,080	D	3,330	E	3,190	D
	Dobroyd Parade | Waratah St	2,960	B	3,280	B	3,290	B
	Dobroyd Parade | Timbrell Dr | Mortley Ave	5,450	F	5,800	F	5,760	F

Notes:

1. Traffic volume rounded to nearest 10.

4.4.3 Temporary road network changes, closures and diversions

Works would be required to reinstate the G-loop, which would necessitate amendments to the northern kerb of the eastbound carriageway of Dobroyd Parade to allow the G-loop entry and exit to be reinstated, and to the median between the eastbound Dobroyd Parade and the eastbound M4 East Wattle Street exit ramp to allow trucks to turn right out of the G-loop into Dobroyd Parade (westbound).

These works would be carried out under an ROL and in consultation with TMC. Works would likely be carried out outside of the peak traffic periods, with establishment and decommissioning works carried out in accordance with the conditions of approval for the project, including the Construction Traffic Transport and Access Management Sub-Plan.

There are no other changes proposed to the temporary road network changes, closures and diversions described in the M4-M5 Link SPIR.

4.4.4 Impacts on on-street parking

No changes are proposed to the on-street parking impacts identified in the M4-M5 Link EIS and M4-M5 Link SPIR as part of this modification. Potential impacts on on-street parking would be confirmed during detailed construction planning and detailed design and managed in accordance with the Construction Traffic Transport and Access Management Sub-Plan.

4.4.5 Impacts on pedestrians and cyclists

Key elements of the Northcote Street civil and tunnel site would be consistent with the layout used for the M4 East project, including the vehicle entry and exit locations and the arrangements around the G-loop. The traffic control measures in place to manage impacts on pedestrian and cyclists during construction of the M4 East project would generally be retained or reinstated for the M4-M5 Link Stage 1 construction. These would be further detailed in the Construction Traffic Transport and Access Management Sub-Plan that will be prepared for the project.

Safe pedestrian and cyclist access would be maintained around the G-loop during construction in accordance with condition E57 of the project approval.

4.4.6 Impacts on public transport

With the small changes in peak hour construction volumes compared to the M4-M5 Link SPIR, there is likely to be a small impact on buses commensurate with the impact on general traffic. No changes to bus stops are proposed.

4.4.7 Impacts on traffic crashes

The change in construction traffic volumes is low when compared to existing traffic volumes on key arterial roads connecting to the construction ancillary facility locations and is not expected to substantially impact road safety.

There is still a risk with construction traffic interacting with general traffic, with elevated risk when construction-related vehicles are entering and leaving construction sites. Any foreseen impacts on road safety for all users during construction would be mitigated as much as possible through the provision of tailored construction traffic management plans and other measures detailed in the M4-M5 Link SPIR and in the Construction Traffic Transport and Access Management Sub-Plan that will be prepared for the project.

4.5 Impact assessment – Five Dock

This section presents the impact assessment of the Route A spoil haulage route from Northcote Street civil and tunnel site through the Five Dock road network. As this route was not assessed in the M4-M5 Link EIS or SPIR, comparison is made to the 'without construction' scenario only.

As noted in **section 3.3**, The Cluster 2 model was previously used in the assessment of the construction impacts for the M4 East. The base models were calibrated and validated for the peak periods and took into account any influence of traffic outside the models, eg Queens Road west of Great North Road queueing back and causing exit blocking at the intersections within the models.

Cluster 2 consists of the following intersections:

- Ramsay Road/Fairlight Street
- Great North Road/Queens Road/Fairlight Street
- Great North Road/Ramsay Road/First Avenue
- Queens Road/Harris Street
- Great North Road/Lyons Road.

The impact on the Wattle Street/Ramsay Street and Parramatta Road/Great North Road intersections was assessed in the Cluster 1 model for Route A presented in **section 4.2**.

4.5.1 Impact on roadway level of service

An analysis of the roadway levels of service was carried out to determine the impact of the modification on 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 4-12** and **Table 4-13** for the AM and PM peak hours.

The results in the Five Dock model show limited impact in terms of volume over capacity and indicate that the relevant mid-blocks will remain within their theoretical capacity. This analysis shows that there are no significant adverse changes forecast on the modelled network from construction traffic generated from the proposed modification.

Table 4-12 2021 AM peak hour mid-block operational performance summary[1]

Location and direction		Mid block capacity	Without construction			With construction (Modification)		
			Flow	V/C[2]	LoS	Flow	V/C	LoS
Ramsay Rd, south of Fairlight St	NB	1800	690	0.38	B	710	0.39	B
	SB	1800	770	0.43	C	770	0.43	C
Fairlight St, west of Ramsay Rd	EB	1800	790	0.44	C	790	0.44	C
	WB	1800	700	0.39	B	720	0.40	C
Great North Rd, south of Fairlight St	NB	900	540	0.60	D	540	0.60	D
	SB	900	550	0.61	D	570	0.63	D

Notes:

1. Traffic volume rounded to nearest 10.
2. Volume over capacity ratio.

Table 4-13 2021 PM peak hour mid-block operational performance summary[1]

Location and direction		Mid block capacity	Without construction			With construction (Modification)		
			Flow	V/C[2]	LoS	Flow	V/C	LoS
Ramsay Rd, south of Fairlight St	NB	1800	800	0.44	C	820	0.46	C
	SB	1800	690	0.38	B	690	0.38	B
Fairlight St, west of Ramsay Rd	EB	1800	630	0.35	B	630	0.35	B
	WB	1800	690	0.38	B	710	0.39	B
Great North Rd, south of Fairlight St	NB	900	350	0.39	B	350	0.39	B
	SB	900	510	0.57	C	530	0.59	D

Notes:

1. Traffic volume rounded to nearest 10.
2. Volume over capacity ratio.

4.5.2 Impact on intersection level of service

The intersection performance results for the road network within the Five Dock cluster under the 2021 'without construction' and 'with construction' scenarios are summarised in **Table 4-14** and **Table 4-15** for the AM and PM peak hours.

There is a relatively small change in traffic volume at parts of the network under the 'with construction' (modification) scenario when compared to the 'without construction' scenario, rising by a maximum of about 30 PCU in each peak hour. This increase in PCUs is not forecast to change the level of service at the modelled intersections compared to the 'without construction' scenario. These tables show the proposed modification is not forecast to have a material impact on the performance of the modelled road network.

Table 4-14 2021 AM peak hour intersection operational performance summary[1]

Cluster	Intersection	Without construction		With construction (Modification)	
		Volume (PCU)	LoS	Volume (PCU)	LoS
2	Ramsay Rd | Fairlight St	2,070	D	2,090	D
	Great North Rd | Queens Rd | Fairlight St	2,840	E	2,860	E
	Great North Rd | Ramsay Rd | First Ave	1,880	F	1,880	F
	Queens Rd | Harris St	2,460	C	2,460	C
	Great North Rd | Lyons Rd	3,530	F	3,530	F

Notes:

1. Traffic volume rounded to nearest 10.

Table 4-15 2021 PM peak hour intersection operational performance summary[1]

Cluster	Intersection	Without construction		With construction (Modification)	
		Volume (PCU)	LoS	Volume (PCU)	LoS
2	Ramsay Rd | Fairlight St	1,950	C	1,970	C
	Great North Rd | Queens Rd | Fairlight St	2,410	B	2,440	B
	Great North Rd | Ramsay Rd | First Ave	1,780	F	1,780	F
	Queens Rd | Harris St	2,300	C	2,300	C
	Great North Rd | Lyons Rd	3,650	F	3,650	F

Notes:

1. Traffic volume rounded to nearest 10.

4.5.3 Temporary road network changes, closures and diversions

No temporary road network changes, closures or diversions are identified as being required along this route during construction.

4.5.4 Impacts on on-street parking

The proposed Route A spoil haulage route is not expected to result in impacts on on-street parking.

4.5.5 Impacts on pedestrians and cyclists

Key elements of the Northcote Street civil and tunnel site would be consistent with the existing layout for the M4 East project including the vehicle entry and exit locations. The traffic control measures in place to manage impacts on pedestrian and cyclists around the Northcote Street site during construction of the M4 East project would generally be retained for the M4-M5 Link Stage 1 construction.

The Route A spoil haulage route may require pedestrian protection in the signal timing (i.e. a head start for the green signal for pedestrians before the green signal for left-turning vehicles) for pedestrian crossings on the western leg of the Great North Road/Parramatta Road, Ramsay Road/Fairlight Street and Fairlight Road/Great North Road intersections. This would be decided in conjunction with TMC and would be documented in the Construction Traffic Transport and Access Management Sub-Plan that will be prepared for the project.

4.5.6 Impacts on public transport

The small changes in forecast peak hour construction volumes would result in a minor impact on buses commensurate with the impact on general traffic. No temporary or permanent impact on bus stops is expected to occur.

4.5.7 Impacts on traffic crashes

The change in construction traffic volumes is low when compared to existing traffic volumes on key arterial roads connecting to the construction ancillary facilities and is not expected to substantially impact road safety in the study area.

There is still a risk with construction traffic interacting with general traffic, with elevated risk when construction-related vehicles are entering and leaving construction sites. Any foreseen impacts on road safety for all users during construction would be mitigated as much as possible through the provision of tailored construction traffic management plans and other measures detailed in the M4-M5 Link SPIR and in the Construction Traffic Transport and Access Management Sub-Plan that will be prepared for the project.

4.6 Cumulative scenario

With regard to the cumulative scenario assessment, cumulative traffic volumes included in the M4-M5 Link SPIR (in addition to the construction traffic volumes being generated by the project) were the proposed Western Harbour Tunnel construction site at Rozelle and the Multi-User Facility and Concrete Batching Plant planned at Glebe Island.

Based on forecast traffic distribution, traffic from these facilities is likely to have minimal impact on the Haberfield and Ashfield road network. Some traffic would access the M4 East Wattle Street ramps, which is forecast to have a minor impact on the Dobroyd Parade/Waratah Street and Dobroyd Parade/Timbrell Drive intersections, with no change in level of service.

4.7 Swept path analyses

An assessment of the intersections along the two proposed spoil haulage routes for the Northcote Street civil and tunnel site was carried out to identify intersections that needed further analysis to ensure the proposed turning movements could be made safely by a truck and dog vehicle. Two intersections were identified as requiring further analysis: the Wattle Street/Ramsay Street intersection (Route A) and the G-loop/Dobroyd Parade/Waratah Street intersection (Route B).

4.7.1 Wattle Street/Ramsay Street intersection

Along the proposed access route from the Northcote Street civil and tunnel site through the Five Dock road network (Route A), the left turn from Wattle Street into Ramsay Street was highlighted as a potential tight turn and therefore a swept path for a truck and dog construction vehicle was assessed at this location.

Figure 4-2 illustrates the swept path for a truck and dog trailer combo (20 metres). This shows that, while the truck would use two lanes of Wattle Street as is permitted under the road rules, it would not turn into opposing traffic when making the left turn into Ramsay Street and therefore impacts on the operation of the road network at this intersection would be negligible.

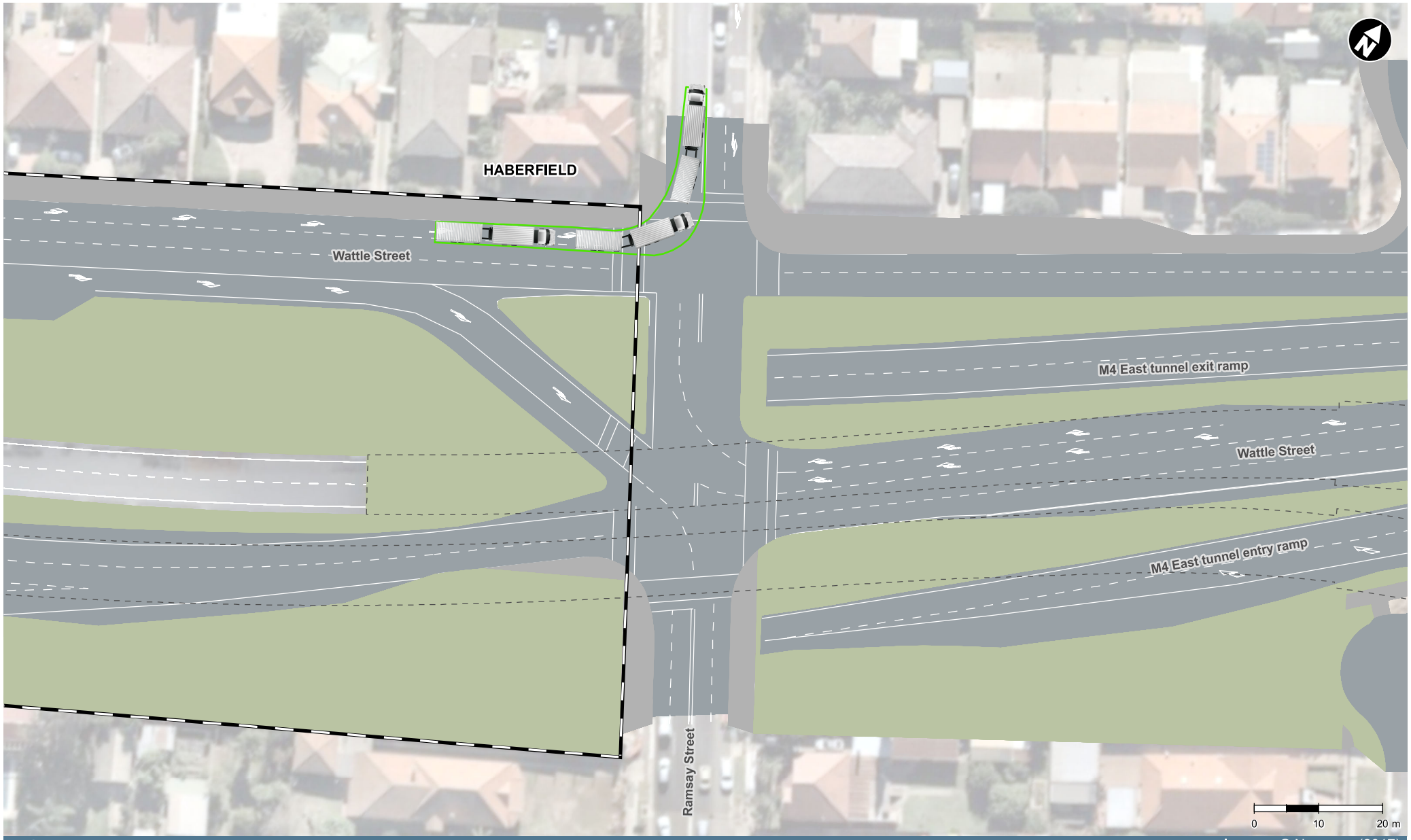


Figure 4-2 Swept path analysis for left turn by truck and dog at Wattle Street/ Ramsay Street intersection

4.7.2 G-loop/Dobroyd Parade/Waratah Street intersection

Figure 4-3 illustrates the swept path of a truck and dog trailer combo (20 metres long) exiting from the G-loop and, to test a worst case, a single unit truck / bus (12.5 metres long) turning right from Waratah Street into the furthest exit lane on Dobroyd Parade eastbound at the same time. Waratah Street is not currently a bus route and the chevron east of the intersection prevents this movement, with the right turning movement directed into the two closer exit lanes. However, the swept path analysis was done using this scenario to illustrate a potential worst case.

In **Figure 4-3**, the green line represents a 500 millimetre clearance to the body of the vehicle. The distance between the vehicles at the closest point is about 1.8 metres, with one metre being the required minimum according to guidance (Austroads GTRD Part 4A). Smaller vehicles turning from Waratah Street into the closer exit lanes would result in a greater distance between the turning vehicles. The swept path indicates the right turn movement out of the G-loop and the right turn movement out of Waratah Street can occur at the same time in the same signal phase under a conservative assessment scenario.

The figure also shows that the truck exiting the G-loop can turn into the second westbound lane of Dobroyd Parade and therefore can travel to either the M4 East entry ramp or to Dobroyd Parade and Parramatta Road. With the M4 East operational, queuing from the Wattle Street/Ramsay Street intersection is not forecast to reach the Dobroyd Parade/Waratah Street intersection as westbound demand on Dobroyd Parade/Wattle Street is split between the surface road network and the M4 East westbound entry ramp.

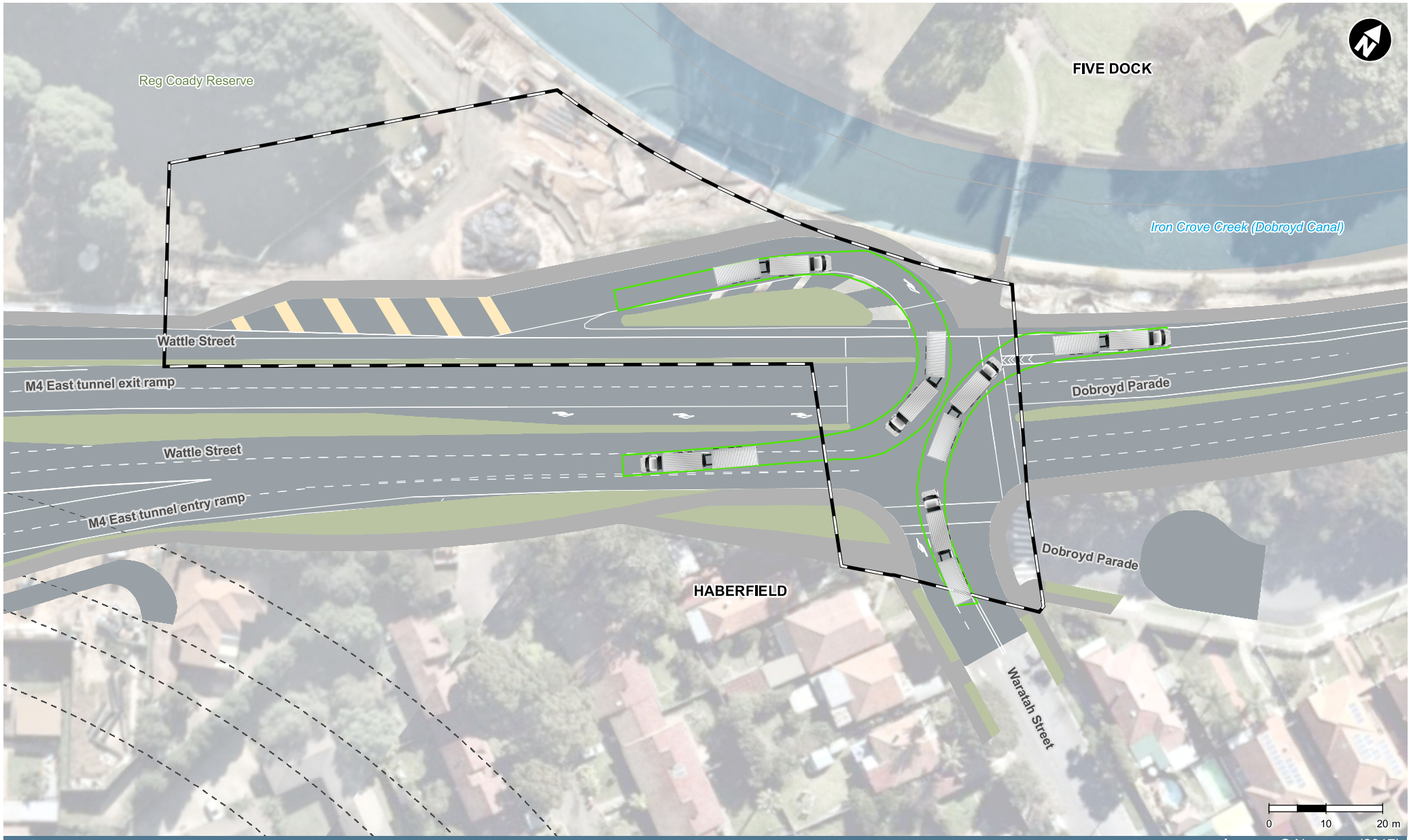


Figure 4-3 Swept path analysis for G-loop traffic at the Dobroyd Parade/ Waratah Street intersection

4.8 Parramatta Road West and Parramatta Road East civil sites

The use of the Parramatta Road West and Parramatta Road East civil sites generally in accordance with condition of approval C19 for the project would mean a reduction in heavy vehicle traffic impacts compared to the M4-M5 Link SPIR.

The largest change would be the reduction in daily forecast heavy vehicles to and from the Parramatta Road West site, reducing to 25 heavy vehicles per day compared to 140 as assessed in the M4-M5 Link SPIR. There would be an increase in the number of light vehicles accessing these sites due to the increase in parking provision at these sites.

The proposed modification would move the entry point from Bland Street, east of Parramatta Road as described in the EIS, to Bland Street, west of Parramatta Road. The access from Bland Street into the Parramatta Road West site would enable trucks needing to access the warehouse / workshop building to move through the site in a forward direction, minimising conflict with other site vehicles and workers, and minimising the need for reversing.

Entry and exit points to the site on Alt Street have remained. Construction vehicles would only use the Bland Street and Alt Street entry and exit points to travel to and from Parramatta Road, or in the case of Alt Street, between the sites on either side of Alt Street. The access points on Parramatta Road, Alt Street and Bland Street (west of Parramatta Road only) would be used by heavy and light vehicles.

It is proposed that the existing bus stop on the western side of Parramatta Road, north of the intersection with Bland Street, would be relocated to avoid conflict between buses and heavy vehicles attempting to access the nearby Parramatta Road West civil site. The bus stop would be moved to a new location around 150 metres to the north on Parramatta Road. The relocation of the bus stop would be subject to on-going consultation with Transport for NSW, Transit Services and other stakeholders and would be detailed in the Construction Traffic, Transport and Access Management Sub-Plan.

Safe pedestrian and cyclist access will be maintained during construction in accordance with condition of approval E57 and will be documented in the Construction Traffic Transport and Access Management Sub-Plan. Access to nearby properties would be maintained during construction in accordance with condition E46 of the project approval.

4.9 Pedestrian walkway to connect Parramatta Road East and Parramatta Road West sites

The provision of a temporary pedestrian walkway connection above Parramatta Road to connect the Parramatta Road East and Parramatta Road West civil sites, which would only be available for use by project staff during the construction phase of the project, is likely to have a minimal impact on traffic and transport. Impacts on the road network would occur primarily during establishment and decommissioning and therefore over a short duration. It is likely Parramatta Road would need to be closed overnight for installation of the pedestrian bridge. Approval would be required from TMC for a Road Occupancy Licence and diversion routes would be in place during the overnight installation. The Roads and Maritime Special Permits Unit would need to be notified for the management of over height vehicle permits.

A road safety audit would be carried out during detailed design to ensure that the bridge would not obstruct or reduce motorists' sight distance to any signs / directional signs or important traffic directions / infrastructure (in accordance with condition of approval E56).

Impacts on pedestrian, cycle or public transport users are likely to be negligible and able to be adequately managed through the Construction Traffic Transport and Access Management Sub-Plan that will be prepared for the project.

4.10 Removal of Darley Road site from the project

Detailed construction planning of the approved project has determined that the Darley Road site is no longer required to support the construction and operation of the project. The removal of the Darley Road site means that construction vehicles would not need to turn into and out of James Street at the City West Link/James Street intersection. This would improve the performance of this intersection compared to the M4-M5 Link SPIR as construction traffic would now be travelling through the intersection (to and from sites to the east and west of this intersection). The removal of turning movements would also reduce delays at this intersection compared to the M4-M5 Link SPIR.

The removal of site access/egress on Darley Road also removes any potential conflicts with other road users, pedestrians and cyclists and persons using the adjacent light rail stop.

The removal of the Darley Road site from the project therefore has a beneficial impact on network performance, road safety and amenity at this location, compared to the M4-M5 Link SPIR.

4.11 Relocation of permanent water treatment plant from Darley Road to Campbell Road motorway operation complex at St Peters interchange

The relocation of the permanent water treatment plant from Darley Road to the Campbell Road motorway operation complex at St Peters interchange is likely to result in a negligible change in impact on traffic and transport users compared to the impact assessment in the M4-M5 Link EIS, as no change in peak construction traffic volumes are forecast, and the length of construction would be consistent with that assessed in the EIS.

5 Management of impacts

The impacts assessed indicate the proposed modification would result in minimal change to the traffic and transport impacts previously assessed in the M4-M5 Link EIS and SPIR. The proposed Route A haulage route for the Northcote Street civil and tunnel site, which was not considered in the M4-M5 Link EIS or SPIR, is also forecast to have minimal impact on the modelled road network around Five Dock when compared to the 'without construction' scenario.

Impacts would therefore continue to be managed through the construction management measures contained in the conditions of approval for the project, specifically those in the Construction Traffic Transport and Access Management Sub-Plan and the Construction Parking and Access Strategy. Safe pedestrian and cyclist access would be maintained during construction in accordance with condition of approval E57 and road safety audits would be carried during detailed design to assess the safety performance of new or modified road and pedestrian and cyclist infrastructure (including around construction ancillary facilities).

These plans and strategies will indicate how:

- The environmental performance outcomes identified in the M4-M5 Link EIS and SPIR as modified by the conditions of approval will be achieved
- The mitigation measures identified in the M4-M5 Link EIS and SPIR as modified by the conditions of approval will be implemented
- The relevant terms of the project approval will be complied with
- Issues requiring management during construction (including cumulative impacts) will be managed.

The plans and strategies will include:

- Ensuring all stakeholders are considered during all stages of the project
- Providing safe routes for pedestrians and cyclists during construction
- Developing construction methodologies so that interaction with existing road users is minimised thereby creating a safer work and road user environment
- Planning and staging works to minimise the need for road occupancy, where possible
- Developing project staging plans in consultation with relevant traffic and transport stakeholders
- Minimising the number of changes to the road users' travel paths and, where changes are required, developing and implementing an effective community communication strategy, coupled with temporary wayfinding signage to warn, inform and guide. This would aim to minimise confusion by providing clear and concise traffic management schemes
- Comprehensively communicate changes in traffic conditions to emergency services, public transport operators, other road user groups and any other affected stakeholders
- Identify measures to manage the movements of construction-related traffic to minimise traffic and access disruptions in the public road network
- Minimising the use of local roads for heavy vehicles
- Minimising the loss of on-road parking for local residents, by describing a construction car parking and access strategy for construction staff at the various work sites and ancillary facilities.

6 Conclusion

The changes in construction methodology and forecast heavy and light construction vehicle volumes introduced by the proposed modification result primarily from:

- Change in use of the Northcote Street civil site at Haberfield to a civil and tunnel site, which would result in 24 hours, seven day a week tunnelling works being carried out from this location and a new spoil haulage route to and from the site along state roads. Two spoil haulage routes for this site have been assessed
- Deletion of the Darley Road civil and tunnel site from the project.

These modifications would result in a small change in construction traffic volumes across the network relative to those identified in the M4-M5 Link SPIR and/or the 'without construction' scenario. The updated traffic modelling analysis undertaken at the relevant locations suggests that there would be minimal impact on the mid-block roadway and intersection level of service compared to the assessment presented in the M4-M5 Link SPIR and the 'without construction' scenarios for the Haberfield and Ashfield modelled road network.

Forecast impacts on modelled roads associated with Route A from the Northcote Street civil and tunnel site would comprise:

- Wattle Street/Ramsay Street intersection – improvement from LoS E to LoS D during the PM peak hour
- Parramatta Road/Croydon Road/Arlington Street intersection – deterioration from LoS E to LoS F during the PM peak hour. This intersection is at capacity even in the ''without construction' scenario – it is close to LoS E – so even a small change in demand has a large impact on intersection delay. The capacity constraint is caused by exit blocking from downstream intersections, so upgrades at this intersection would not alleviate the forecast delay.

Forecast impacts on modelled roads associated with Route B from the Northcote Street civil and tunnel site would comprise:

- Dobroyd Parade/Waratah Street intersection – deterioration from LoS B to LoS C during the AM peak hour. This is mainly due to the additional signal phase for the northern leg (G-loop exit), which reduces the capacity on the other approaches
- Wattle Street/Ramsay Street intersection – improvement from LoS E to LoS D during the PM peak hour
- Parramatta Road/Croydon Road/Arlington Street intersection – deterioration from LoS E to LoS F during the PM peak hour. As noted above, the capacity constraint is caused by exit blocking from downstream intersections, so upgrades at this intersection would not alleviate the forecast delay.

No changes in roadway or intersection level of service compared to the 'without construction' scenario are forecast through the Five Dock modelled road network as a result of the proposed modification.

The proposed spoil haulage routes for the Northcote Street civil and tunnel site would be more direct and less constrained compared to the spoil haulage route for the Parramatta Road West site described in the EIS and SPIR. Inbound spoil haulage vehicles would be able to use the M4 East Motorway and Parramatta Road to access the Northcote Street civil and tunnel site directly from Parramatta Road, and use of the G-loop would allow outbound spoil haulage vehicles to use the M4 East Motorway tunnels. Spoil haulage routes would be restricted to state roads that are controlled by Roads and Maritime.

Impacts from the construction of a temporary pedestrian walkway connection above Parramatta Road to connect the Parramatta Road East and Parramatta Road West civil sites on the road network would occur primarily during establishment and decommissioning and therefore over a short duration. It is likely Parramatta Road would need to be closed overnight for installation of the pedestrian bridge. Approval would be required from TMC for a Road Occupancy Licence and diversion routes would be in place during the overnight installation. Impacts on pedestrian, cycle or public transport users are likely to be negligible and able to be adequately managed through the Construction Traffic Transport and Access Management Sub-Plan that will be prepared for the project.

Compared to the M4-M5 Link SPIR, the removal of the Darley Road site from the project would have a beneficial impact on motorists, pedestrians and cyclists around Darley Road and the City West Link/James Street intersection, as heavy and light construction-related vehicles would not need to turn into and out of City West Link and the site entry and exit points on Darley Road. Construction traffic would continue to travel through the City West Link/James Street intersection, but forecast delays would be reduced as construction vehicle turning movements are removed.

The relocation of the permanent water treatment plant from Darley Road to the Campbell Road motorway operation complex at St Peters interchange is likely to have a negligible change in impact on traffic and transport users compared to the impact assessment in the M4-M5 Link EIS, as no change in peak construction traffic volume is forecast.

The management and mitigation measures identified in Chapter E1 of the M4-M5 Link SPIR and the conditions of approval for the project would appropriately manage impacts from the proposed modifications.

7 References

WestConnex M4-M5 Link: Environmental Impact Statement, Roads and Maritime Services, August 2017

WestConnex M4-M5 Link: Submissions and preferred infrastructure report, Roads and Maritime Services, January 2018

WestConnex M4-M5 Link: Infrastructure approval, Department of Planning & Environment, April 2018