

# Moorebank Precinct West Stage 2 Proposal Response to Submissions

## Appendix C: Construction traffic impact assessment



**SIMTA**

SYDNEY INTERMODAL TERMINAL ALLIANCE

Part 4, Division 4.1, State Significant  
Development



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# MOOREBANK PRECINCT WEST - STAGE 2 PROPOSAL

## Construction Traffic Impact Assessment – Addendum

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**Revision** F

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# 1 INTRODUCTION

On the 3 June 2016 Concept Plan Approval (SSD 5066) was granted, under Part 4, Division 4.1 of the Environmental Planning and Assessment Act 1979 (EP&A Act), to develop the Moorebank Precinct West Project (MPW Project) on the western side of Moorebank Avenue, Moorebank, in south-western Sydney (the MPW site).

The MPW Project involves the development of intermodal freight terminal facilities (IMT), linked to Port Botany, the interstate and intrastate freight rail network. The MPW Project includes associated commercial infrastructure (i.e. warehousing), a rail link connecting the MPW site to the Southern Sydney Freight Line (SSFL), and a road entry and exit point from Moorebank Avenue.

Under the MPW Concept Approval, the MPW Project is to be developed in four phases, being:

- Early Works development phase, comprising:
  - The demolition of existing buildings and structures
  - Service utility terminations and diversion/relocation
  - Removal of existing hardstand/roads/pavements and infrastructure associated with existing buildings
  - Rehabilitation of the excavation/earthmoving training area (i.e. ‘dust bowl’)
  - Remediation of contaminated land and hotspots, including areas known to contain asbestos, and the removal of:
    - Underground storage tanks (USTs)
    - Unexploded ordnance (UXO) and explosive ordnance waste (EOW) if found
    - Asbestos contaminated buildings
  - Archaeological salvage of Aboriginal and European sites
  - Establishment of a conservation area along the Georges River
  - Establishment of construction facilities (which may include a construction laydown area, site offices, hygiene units, kitchen facilities, wheel wash and staff parking) and access, including site security
  - Vegetation removal, including the relocation of hollow-bearing trees, as required for remediation and demolition purposes
- Development of the intermodal terminal (IMT) facility and initial warehousing facilities
- ‘Ramp up’ of the IMT capacity and warehousing
- Development of further warehousing.

Approval for the Early Works phase (MPW Concept Approval) was granted as the first stage of the MPW Project within the Concept Approval. Works, approved as part of this stage are anticipated to commence in the third quarter of 2016.

Commonwealth Approval (No. 2011/6086), under the *Environmental Protection Biodiversity Conservation Act 1999* (EPBC Act), was also granted in mid-2016 (soon after the Concept Plan Approval) for the MPW Project. In addition to this, the Planning Proposal (PP\_2012\_LPOOL\_004\_00) which provided a rezoning of part of the MPW site, and surrounds, was gazetted on 24 June 2016 into the Liverpool Local Environmental Plan 2008 (Amendment No. 62).

On 5 December 2014, Moorebank Intermodal Terminal Company (MIC) and SIMTA announced their in-principle agreement to develop the Moorebank IMT Precinct on a whole of precinct basis. This agreement is subject to satisfying several conditions which both parties are currently working towards. SIMTA is therefore seeking approval to build and operate the IMT facility and warehousing under the MPW Project Concept Approval, known as the MPW Stage 2 Proposal (the Proposal).

## 1.1 Report purpose

This report has been prepared to provide a revised assessment of the construction traffic impacts of the Proposal. This revised Construction Traffic Impact Assessment (CTIA) has been prepared to describe the potential construction traffic impacts in light of:

- Revised traffic modelling scenarios – The revised traffic modelling scenarios are representative of a worst-case construction scenario, which provides a more conservative assessment than what was presented in the EIS. The EIS provided an assessment of the construction traffic impacts of the Proposal of the following:
  - Scenario 1 – Works Period A only
  - Scenario 2 – Concurrent undertaking of construction Works Period C, D, E and F, and MPE Stage 1 operations traffic

The revised assessment presents the construction traffic impacts of the construction of the Proposal under the two following worst-case construction scenarios:

- Scenario 1 – Concurrent undertaking of construction Works Period C, D, E and F of the Proposal
- Scenario 2 – Concurrent undertaking of construction Works Period C, D, E and F of the Proposal and construction of the MPE Stage 1 project.

Additional information detailing how these worst-case construction scenarios were determined is provided in section 2.1.2

- Revised configuration of the Anzac Road / Moorebank Avenue intersection – The original CTIA assumed that the upgraded, operational Anzac Road / Moorebank Avenue / MPW Site Access intersection (with greater capacity) would be established and used from the commencement of construction. The revised intersection arrangement included in this CTIA is more representative of the configuration of the intersection that would be present throughout construction of the Proposal. See Table 2-2 and Appendix B for the proposed configuration of site access(es) during the construction of the Proposal
- The Amended Proposal - the Amended Proposal alters the Proposal based on design development, submissions received during exhibition of the EIS and, consultation with key stakeholders. The Amended Proposal is described in more detail in Section 1.2.1, and has been considered as part of this revised CTIA, where relevant.

This report has been prepared to support the MPW Stage 2 response to submissions report. A summary of the works included in the Proposal is provided in Section 1.2 below.

This report has been prepared as part of a State Significant Development (SSD) Application for which approval is sought under Part 4, Division 4.1 of the EP&A Act. This report has been prepared in accordance with the Secretary's Environmental Assessment Requirements (SEARs) (ref: SSD 16-7709 and dated 14 July 2016) and revised environmental mitigation measures (REMMs) identified in the MPW Concept Plan Approval (SSD\_5066). Table 1-1 provides a summary of the SEARs and the REMMs from the MPW Concept Plan Approval, which are relevant to this report and the section where they have been addressed in this report.

The report includes an overview of the proposed construction works, provides an assessment of potential traffic impacts on the road network during construction stages of the project, and identifies mitigation measures to address impacts.

**Table 1-1 SEARs (SSD 16-7709) and REMMs Compliance Table**

SEAR/REMM	Where Addressed	
	Documents	Sections
<b>SEARS</b>		
<b>4. Traffic and Transport</b>		
k) assess construction traffic impacts, which may include a draft Construction Traffic Management Plan including:	Revised Construction Traffic Impact Assessment Report (this report) and the Preliminary Construction Traffic Management Plan (PCTMP) provided at Appendix M of the MPW Stage 2 EIS.	All sections
i. the identification of haulage routes and the details of existing traffic situation on these routes;	Revised Construction Traffic Impact Assessment Report (this report)	Section 5.2 of this report discusses construction haulage routes. The existing level of service of key intersections along these routes is described in Section 6.1.1.
ii. an assessment of construction traffic volumes (including spoil haulage/delivery of materials and equipment to the road corridor and ancillary facilities);	Revised Construction Traffic Impact Assessment Report (this report)	Construction traffic volumes are detailed in section 5.1 and an assessment of this traffic at key access roads/ intersections is provided in section 6.
iii. an assessment of potential impacts to the regional and local road network (including safety and level of service) and potential disruption to existing public transport services, pedestrians and cyclist movements and access to properties and businesses;	Revised Construction Traffic Impact Assessment Report (this report)	An assessment of the impacts of construction traffic on key access roads/ intersections, public and active transport and accessibility for road users, landholders and emergency vehicles is provided in section 6

SEAR/REMM	Where Addressed	
	Documents	Sections
iv. an assessment of cumulative impacts associated with other construction activities (if any);	Revised Construction Traffic Impact Assessment Report (this report)	The impacts of cumulative construction of the Proposal concurrently with the MPE Stage 1 Project has been undertaken, and is detailed in section 6.1.4
v. details of peak hour and daily truck movements, hours of operation, access arrangements at all stages of construction and traffic control measures for all demolition / construction activities;	Revised Construction Traffic Impact Assessment Report (this report)	Construction traffic movements, including total daily and peak hour (AM and PM peak) are included in Section 5 of this report. Construction hours are detailed in Section 4.3 of this report, and construction site access arrangements are included at Section 4.4.
vi. an assessment of construction road safety at key intersections and locations subject to pedestrian / vehicle / bicycle conflicts;	Revised Construction Traffic Impact Assessment Report (this report) and the PCTMP (Appendix M of the EIS)	Section 7 includes mitigation measures to manage any potential construction traffic impacts, including the undertaking of a road safety audit at the Cambridge Avenue intersection. Section 5 of the PCTMP includes traffic management procedures to be adopted during construction of the Proposal, including procedures specific to maintaining the safety and amenity of road users and the public, including pedestrians and cyclists.
vii. details of any required temporary cycling and pedestrian access during construction;	Revised Construction Traffic Impact Assessment Report (this report)	Impacts to public and active transport during construction are described in Section 6.4
viii. details of access arrangements for workers to / from the site, including pedestrian and public transport linkages, emergency vehicles and service vehicle movements; and	Revised Construction Traffic Impact Assessment Report (this report)	Accessibility for road users, landholders and emergency vehicles are detailed in Sections 6.2, 6.4 and 6.5. This description of accessibility is relevant to workers and service vehicles.
ix. details of mitigation measures for the identified impacts (if any).	Revised Construction Traffic Impact Assessment Report (this report)	Mitigation measures associated with construction traffic impacts are provided in section 7 of this report

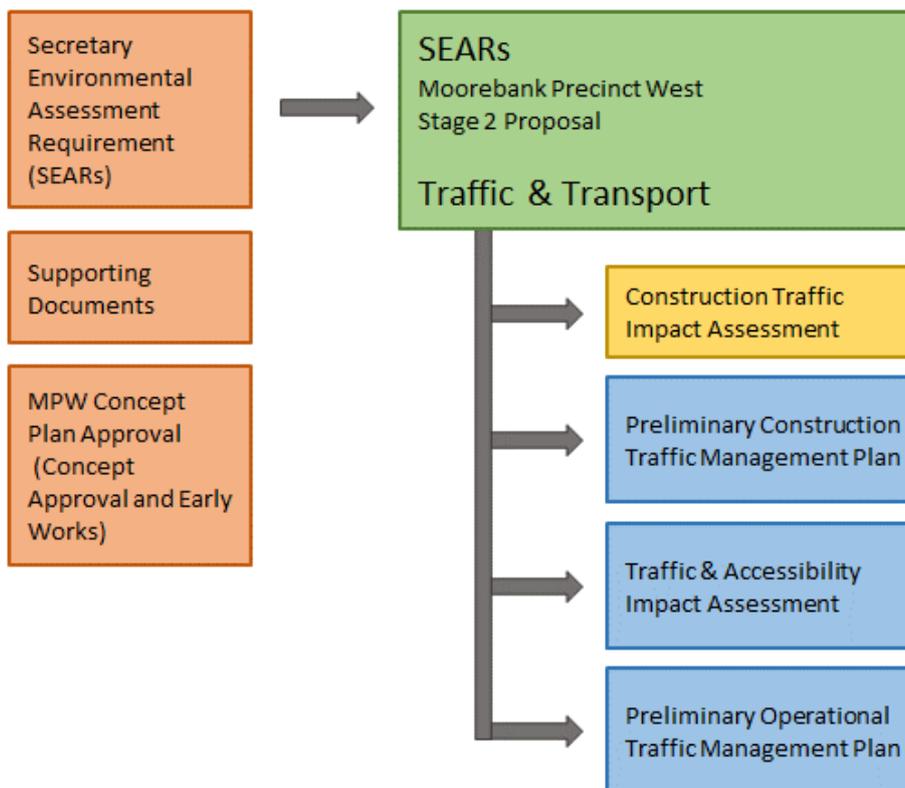
SEAR/REMM	Where Addressed	
	Documents	Sections
<b>REMMs</b>		
<b>Traffic Management Plans</b>		
4I Reducing the volumes of construction vehicles travelling during peak periods, especially if the increase in traffic generated by construction activities impedes on the operation of Moorebank Avenue.	Revised Construction Traffic Impact Assessment Report (this report)	Section 7 of this report notes that mitigation measures that would be considered as part of the CTMP include ' <i>Reducing the volumes of construction vehicles travelling during peak periods</i> '.
4J Maintain access to neighbouring properties. It is particularly important that the ABB site has access throughout the construction stages.	Revised Construction Traffic Impact Assessment Report (this report)	Access and egress, and Impacts to the accessibility of nearby properties is detailed in section 6.2 and Section 6.5 respectively. The mitigation measures to minimise the impacts of construction traffic in Section 7 of this report include measures relating to the maintenance of property access.
4K In addition to the Community Engagement Plan (or equivalent) (Refer to 2A), a communication plan will be developed to provide information to the relevant authorities and bus operators in addition to the local community. The communication plan will need to incorporate a contact list with the chain of command.	Revised Construction Traffic Impact Assessment Report (this report)	The implementation of a community engagement plan is included as a mitigation measures in Section 7 of this report.
4L Implement relevant traffic control measures to inform drivers of the construction activities and locations of heavy vehicle access locations.	PCTMP (at Appendix M of the MPW Stage 2 EIS)	Section 4 of the PCTMP provides a description of traffic management controls, and section 5 includes traffic management procedures to be presented.
4M Obtain Road Occupancy Licences (ROLs) as necessary.	Revised Construction Traffic Impact Assessment Report (this report)	Section 6.3 details potential road carriageway closures, and the need to obtain ROLs.

SEAR/REMM	Where Addressed	
	Documents	Sections
4N Develop an emergency response plan for the modification of Moorebank Avenue. During this phase, emergency vehicles using Moorebank Avenue as a transport route would need to be considered, as well as emergency access to adjoining properties	Construction Traffic Impact Report and Preliminary Construction Traffic Management Plan	<p>The Moorebank Avenue modification as described in the MPW Concept EIS would not be undertaken as part of this application.</p> <p>An emergency response plan would be prepared as part of a future application which includes the Moorebank Avenue modification.</p> <p>Impacts to accessibility for emergency vehicles during construction of the Proposal is discussed in Section 6.5.2 of this report.</p>
4P Modify access locations in response to the development of the Moorebank Avenue modification.	N/A	<p>The Moorebank Avenue modification as described in the MPW Concept EIS would not be undertaken as part of this application.</p> <p>The upgrade to the Moorebank Avenue/ Anzac Road intersection would not preclude the Moorebank Avenue modification in the future.</p>
4Q Provision of alternate suitable pedestrian and cycle and facilities during the construction of Moorebank Avenue modifications retaining well defined and well signed routes and paths.	Construction Traffic Impact Report	<p>The Moorebank Avenue modification as described in the MPW Concept EIS would not be undertaken as part of this application.</p> <p>The upgrade to the Moorebank Avenue/ Anzac Road intersection would not preclude the Moorebank Avenue modification in the future.</p> <p>Impacts to pedestrian and cyclist access during construction, including consideration of the Moorebank Avenue/ Anzac Road intersection is described in Section 6.4 of this report.</p>

### 1.1.1 Secretary environmental assessment requirements (SEARs)

The diagram below illustrates the document structure established for Traffic and Transport related reporting for the Proposal. Four standalone reports have been prepared to inform and support the required responses to the SEARs. They are:

1. Construction Traffic Impact Assessment
2. Preliminary Construction Traffic Management Plan
3. Traffic and Accessibility Impact Assessment
4. Preliminary Operational Traffic Management Plan



This report forms the Construction Traffic Impact Assessment prepared to address the impact by construction activities associated with the construction of the Proposal.

This Construction Traffic Impact Assessment Report should be read in conjunction with the three other standalone traffic reports prepared for the Proposal, including:

- Preliminary Construction Traffic Management Plan
- Traffic and Accessibility Impact Assessment
- Preliminary Operational Traffic Management Plan.

## 1.2 MPW Stage 2 Proposal Overview

### 1.2.1 The Proposal

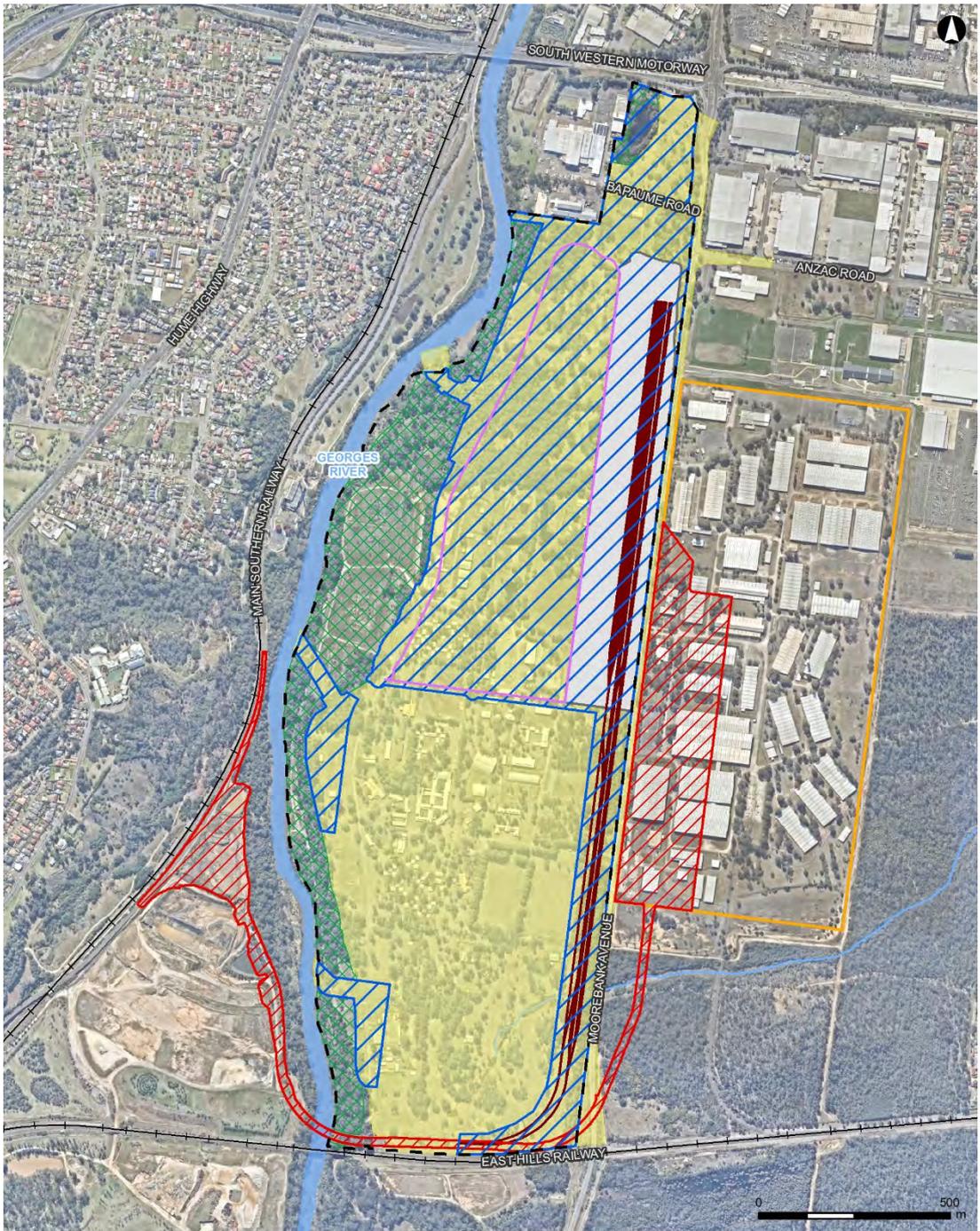
The MPW Stage 2 Proposal (the Proposal) involves the construction and operation of an Intermodal terminal (IMT) facility and associated warehousing, as shown in Figure 1-1.

The IMT facility would have the necessary infrastructure to support a container freight throughput volume of 500,000 twenty-foot equivalent units (TEUs) per annum. Specifically, the IMT facility within the Proposal site would include the following key components:

- Truck processing, holding and loading areas – with entrance and exit from Moorebank Avenue via an upgraded intersection and a round-about to distribute traffic between the warehousing precinct and the IMT
- Rail loading and container storage areas – installation of nine rail sidings, with an adjacent container storage area serviced by manual handling equipment
- Administration facility – office building with associated car parking and light vehicle access from Moorebank Avenue
- The Rail link connection – rail sidings within the IMT facility, which would be linked (to the south) to the Rail link (constructed as part of the MPE Project (SSD 14-6766)).

Also included within the Proposal are the following key components:

- Warehousing area – construction and operation of approximately 215,000 m<sup>2</sup> GFA of warehousing, with warehouses ranging in size from 4,000 m<sup>2</sup> to 71,000 m<sup>2</sup>. Included within the warehousing area would be ancillary offices, truck and light vehicle parking, associated warehouse access roads.
- Freight village – construction and operation of approximately 800 m<sup>2</sup> of retail premises, with access from the internal road.
- Upgraded intersection on Moorebank Avenue and internal road – including works to Moorebank Avenue, Anzac Road to accommodate the proposed site entrance to Moorebank Avenue, and construction of an internal road.
- Ancillary works – including vegetation clearing, earth works, drainage and on-site detention, utilities installation/connection, signage and landscaping.



**LEGEND**

-  MPW site
-  Amended construction area
-  Amended operational area
-  Warehousing footprint
-  MPE Site
-  MPE Stage 1 operational area
-  Conservation area
-  Rail link connection
-  Existing railway
-  Watercourses

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**Figure 1-1 Proposal Overview**

**Moorebank Precinct West (MPW) Stage 2 Proposal - Construction Traffic Impact Assessment**

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## 1.2.2 Amended Proposal

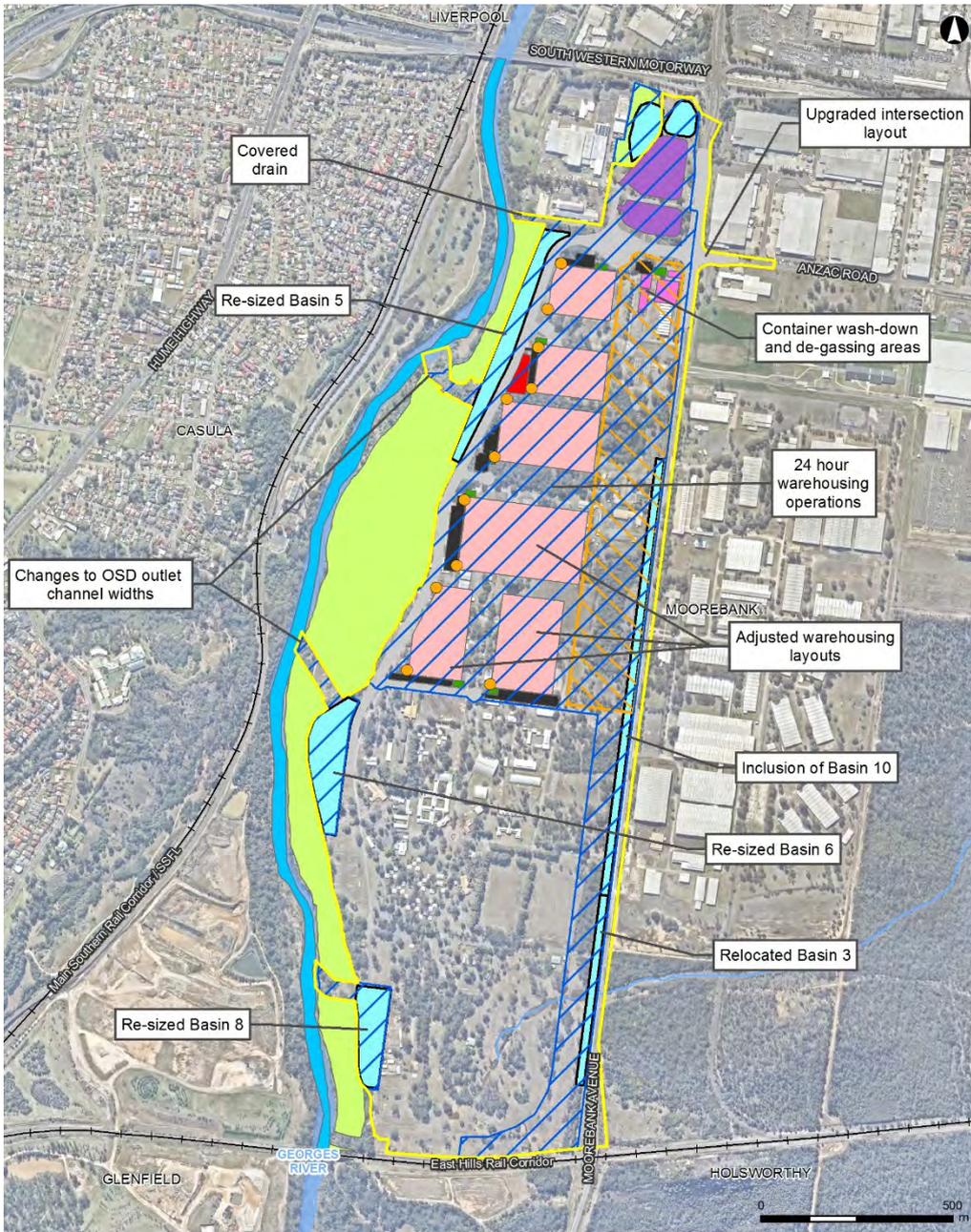
The Proposal involves the construction and operation of an intermodal terminal (IMT) facility to support a container freight throughput volume of 500,000 twenty-foot equivalent units (TEUs) per annum. The Proposal also includes the construction and operation of approximately 215,000 m<sup>2</sup> GFA, freight village (800 m<sup>2</sup>) and associated infrastructure.

The Amended Proposal alters the Proposal based on design development, submissions received during exhibition of the EIS and, consultation with key stakeholders. A summary of the amendments to the Proposal is as follows:

- Alignment of the operational hours for warehouses to the IMT facility and Port freight operations to enable freight movements outside of peak traffic times.
- Alterations to the drainage design, including:
  - Inclusion of the OSD (Basin 10) and relocation of another OSD (Basin 3) along the eastern boundary of the operational area, adjacent to the western verge of Moorebank Avenue
  - Re-sizing of OSD basins along the western boundary of the operational area
  - Reduction to the widths of selected OSD outlet channels
  - Provision of an additional covered drain within the Endeavour Energy easement
- Establishment of a container wash-down facility with de-gassing area within the IMT facility
- Illuminated backlit signage within the warehousing area
- Inclusion of an upgraded layout for the Moorebank Avenue/Anzac Road intersection

The amendments to the Proposal are shown in Figure 1-2.

With the exception of the upgrade to the Moorebank Avenue/ Anzac Road intersection, the Amended Proposal relates to components of the Proposal which are located within the Proposal site and as such, would not impact on the local road network during construction, nor would they alter the construction traffic movements required for construction of the Proposal. Therefore, these amendments to the Proposal have not been assessed any further in this revised CTIA and this revised CTIA considers only the traffic impacts associated with the construction of the Moorebank Avenue/ Anzac Road upgrade.



**LEGEND**

Amended construction area	Ancillary components and services	OSD
Amended operational area	Conservation area	Truck parking
Multipurpose Terminal	Freight Village	Office
Illuminated backlit signage	Georges River	Road
	Carpark	Warehousing

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Figure 1-2 The Amendments to the Proposal

## 1.2.3 Proposal components and key terms

Table 1-2 provides a summary of key terms which are included within this report.

Table 1-2 Key terms

Term	Definition
Moorebank Precinct West (MPW) Concept Approval (MPW Concept Approval and Early Works)	MPW Concept and Stage 1 Approval (SSD 5066) granted on 3 June 2016 for the development of the MPW Intermodal terminal facility at Moorebank and the undertaking of the Early Works. Granted under Part 4, Division 4.1 of the Environmental Planning and Assessment Act 1979. This reference also includes associated Conditions of Approval and Revised Environmental Management Measures, which form part of the documentation for the approval.
MPW EPBC Approval	Commonwealth Approval (No. 2011/6086), granted in mid 2016 under the <i>Environment Protection and Biodiversity Conservation Act 1999</i> , for the impact of the MPW Project on listed threatened species and communities and impacts on the environment by a Commonwealth agency.
MPW EPBC EIS	The Environmental Impact Statement prepared to support the application for approval of the MPW Concept and Early Works (Stage 1) under the <i>Environment Protection and Biodiversity Conservation Act 1999</i> .
MPW Concept EIS	The Environmental Impact Statement prepared to support the application for approval of the MPW Concept and Early Works (Stage 1) under the <i>Environmental Planning and Assessment Act 1979</i> .
MPW Project	The MPW Intermodal Terminal Facility as approved under the MPW Concept Approval (SSD 5066) and the MPW EPBC Approval (2011/6086).
MPW site	The site which is the subject of the MPW Concept Approval, MPW EPBC Proposal and MPW Planning Proposal (comprising Lot 1 DP1197707 and Lots 100, 101 DP1049508 and Lot 2 DP 1197707). The MPW site does not include the rail link as referenced in the MPW Concept Approval or MPE Concept Plan Approval.
Early Works	Works approved under Stage 1 of the MPW Concept Approval (SSD 5066), within the MPW site, including: establishment of construction compounds, building demolition, remediation, heritage impact mitigation works and establishment of the conservation area.
Early Works Approval	Approval for the Early Works (Stage 1) component of the MPW Project under the MPW Concept Approval (SSD 5066) and the MPW EPBC Approval. Largely contained in Schedule 3 of the MPW Concept Approval.
Early Works area	Includes the area of the MPW site subject to the Early works approved under the MPW Concept Approval (SSD 5066).

Term	Definition
MPW Planning Proposal	Planning Proposal (PP_2012_LPOOL_004_00) to rezone the MPW site from 'SP2- Defence to 'IN1- Light Industrial' and 'E3- Management', as part of an amendment to the Liverpool Local Environmental Plan 2008 (as amended) gazetted on 24 June 2016.
MPW Concept RtS	<i>MIC Response to Submissions Report</i> (PB, May 2015)
MPW Concept SRtS	<i>MIC Supplementary Response to Submissions Report</i> (PB, August 2015)
Proposal	MPW Stage 2 Proposal (the subject of the EIS and this RtS), namely Stage 2 of the MPW Concept Approval (SSD 5066) including construction and operation of an IMT facility, warehouses, a Rail link connection and Moorebank Avenue/Anzac Road intersection works.
MPW Stage 2 RtS	This report, which was prepared in response to the submissions received regarding the MPW Stage 2 Proposal.
Amended Proposal	The MPW Stage 2 Proposal has been amended (the Amended Proposal) from that provided within the EIS to respond to submissions provided by the government agencies and the community and also as part of design progression of the Proposal. The Amended Proposal is detailed and assessed in this RtS.
Proposal site	The subject of the EIS, the part of the MPW site which includes all areas to be disturbed by the MPW Stage 2 Proposal (including the operational area and construction area).
IMT facility	The Intermodal terminal facility on the Proposal site, including truck processing, holding and loading areas, rail loading and container storage areas, nine rail sidings, loco shifter and an administration facility and workshop.
internal road	Main internal road through the Proposal site which generally travels along the western perimeter of the site. Provides access between Moorebank Avenue and the IMT facility and warehouses.
Rail link connection	Rail connection located within the Proposal site which connects to the Rail link included in the MPE Stage 1 Proposal (SSD 14-6766).
Proposal operational rail line	The section of the Rail link connection and Rail link between the SSFL and the Rail link connection (included in the MPE Stage 1 Proposal) to be utilised for the operation of the Proposal. and the Rail link connection
construction area	Extent of construction works, namely areas to be disturbed during the construction of the Proposal. This area has been updated in this RtS.
amended construction area	Extent of construction works, namely areas to be disturbed during the construction of the Amended Proposal, as detailed in this RtS.

Term	Definition
operational area	Extent of operational activities for the operation of the Proposal.
amended operational area	Extent of operational activities for the operation of the Amended Proposal, as detailed in this RtS.
Moorebank Precinct	Refers to the whole Moorebank intermodal precinct, i.e. the MPE site and the MPW site.
MPE Project	The Intermodal terminal facility on the MPE site as approved by the MPE Concept Plan Approval (MP 10_0913) and including the MPE Stage 1 Proposal (14-6766).
MPE site	The site which is the subject of the MPE Concept Plan Approval, and includes the site which is the subject of the MPE Stage 1 Approval.
MPE Stage 1 Proposal	MPE Stage 1 Proposal (14-6766) for the development of the Intermodal terminal facility at Moorebank. This reference also includes associated conditions of approval and environmental management measures which form part of the documentation for the approval.
Rail link	Part of the MPE Stage 1 Proposal (14-6766), connecting the MPE site to the SSFL. The Rail link (as discussed above) is to be utilised for the operation of the Proposal.
Revised Environmental Management Measures (REMMs)	The environmental management measures for the MPW Concept Approval as presented within the <i>MPW Supplementary Response to Submissions</i> (SRtS) (PB, 2015a) and approved under the MPW Concept Approval.

## 1.3 Site description

The Proposal site is generally bounded by the Georges River to the west, Moorebank Avenue to the east, the East Hills Railway Line to the south and the M5 Motorway to the north. It is located on Moorebank Avenue, Moorebank and forms Lot 1 in Deposited Plan (DP) 1197707<sup>1</sup>. The Proposal site also contains Lots 100 and 101 DP1049508, which are located north of Bapaume Road and west of Moorebank Avenue. The Proposal site is located wholly within Commonwealth Land.

The Proposal would also require works to upgrade the intersection of the MPW site with Moorebank Avenue and would therefore be undertaken on the following parcels of land:

- Moorebank Avenue, owned by the Commonwealth Government, south of Anzac Road Lot 2, DP 1197707 (formerly part of Lot 3001, DP 1125930)
- Moorebank Avenue, owned by Roads and Maritime Services, north of Anzac Road
- A portion of Bapaume Road, a public road that is the responsibility of Liverpool City Council
- A portion of Anzac Road, owned by Liverpool City Council, to the east of Moorebank Avenue

The key existing features of the site are:

- Relatively flat topography, with the western edge flowing down towards the Georges River, which forms the western boundary to the MPW site
- A number of linked ponds in the south-west corner of the Proposal site, within the existing golf course, that link to Anzac Creek, which is an ephemeral tributary of the Georges River
- An existing stormwater system comprising pits, pipes and open channels
- Direct frontage to Moorebank Avenue, which is a publicly used private road, south of Anzac Road and a publicly owned and used road north of Anzac Road
- The majority of the site has been developed and comprises low-rise buildings (including warehouses, administrative offices, operative buildings and residential buildings), access roads, open areas and landscaped fields for the former School of Military Engineering (SME) and the Royal Australian Engineers (RAE) Golf Course and Club. Defence has since vacated and all buildings on the site are currently unoccupied and would be removed during the Early Works
- Native and exotic vegetation is scattered across the Proposal site
- The riparian area of the Georges River lies to the west of the Proposal site and contains a substantial corridor of native and introduced vegetation. The riparian vegetation corridor provides a wildlife corridor and a buffer for the protection of soil stability, water quality and aquatic habitats. This area has been defined as a conservation area as part of the MPW Concept Plan Approval
- As stated above, the majority of the Proposal site has been developed, however heritage and biodiversity values still remain on the site
- A strip of land (up to approximately 250 metres wide) along the western edge of the MPW site lies below the 1% annual exceedance probability (AEP) flood level

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<sup>1</sup> Previously legally described as “Lot 3001, DP 1125930” in the MPW Concept Plan Approval (SSD 5066), however has since been subdivided.

- The site is privately owned by the Commonwealth and leased by SIMTA.

A number of residential suburbs are located in proximity to the Proposal site, including:

- Wattle Grove, located approximately 1,000 m from the Proposal site and 1,000 m from the Rail link connection to the east. The Rail link, which would be used during operation of the Proposal is 1,260 m to the west of Wattle Grove at its closest point
- Moorebank, located approximately 630 m from the Proposal site and more than 1,400 m from the Rail link connection to the north. The Rail link is 2,500 m to the south of Moorebank at its closest point
- Casula, located approximately 330 m from the Proposal site and 1,200 m from the Rail link connection to the west. The Rail link is approximately 290 m to the east of Casula at the closest point
- Glenfield, located approximately 820 metres from the Proposal site and 1,100 metres from the Rail link connection to the south-west. The Rail link is approximately 750 m to the east of Glenfield at its closest point.

## 1.4 Construction Overview

The following construction activities would be carried out across and surrounding the Proposal site:

- Establishment of construction compounds for the:
  - Pre-construction stockpiling and bulk earthworks (Earthworks Compound) providing car parking, offices, amenities, laydown and storage
  - IMT facility (the IMT Compound) providing car parking, offices, amenities, laydown and storage
  - Rail link connection (the Rail Compound) providing car parking, offices, amenities, laydown and storage
  - Warehouses (Warehouse compounds) providing car parking, offices, amenities, laydown and storage
- Establishment of a temporary batching plant
- Vegetation clearing and remediation works
- Pre-construction stockpiling
- Bulk earthworks to level and raise the site
- Utilities installation
- Construction of the IMT facility and associated infrastructure, including the freight village
- Construction of the Rail link connection from the IMT facility to the Rail link
- Upgrade works at the intersection of Moorebank Avenue and Anzac Road
- Upgrade of the site access off Moorebank Avenue and construction of the internal road network
- Construction of the warehouses and warehouse access roads
- Fit-out of warehousing and the freight village
- Landscaping and finishing works.

- Signage, landscaping, stormwater and drainage works
- Subdivision of the MPW site.

Figure 1-3 provides further detail on the Proposal construction site layout.



<b>LEGEND</b> MPW site Construction site access Rail station Existing railway Watercourses		<b>MPW PROPOSAL FEATURES</b> MPW Stage 2 construction area (proposed) IMT facility area Warehousing area Materials crushing and batch plant (Option 2)		Earthworks compound Pre-construction & bulk earthworks stockpiling Batch plant (option 1) Construction parking area IMT facility compound Rail and IMT compound		<p>ARCADIS AUSTRALIA PACIFIC PTY LTD          AEN 76 104 485 289          Level 5, 141 Walker St   North Sydney NSW 2060          P: +61 (0) 2 8907 9000   F: +61 (0) 2 8907 5001</p> <p>Scale: 1:20,000 @ A4</p>	
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**Figure 1-3 Construction layout**

## 1.5 Report structure

This Construction Traffic Impact Assessment contains the following six chapters providing an assessment of the traffic issues relating to the proposed construction of the Proposal:

- Section 2 describes the methodology adopted for undertaking this CTIA
- Section 3 outlines the existing environment including road network and traffic volumes
- Section 4 outlines construction staging, proposed site access, construction site layout and staff parking for the Proposal
- Section 5 quantifies the expected traffic movements during construction
- Section 6 reports the results of the construction traffic impact assessment
- Section 7 identifies measures to mitigate the identified impacts
- Section 8 provides a conclusion for the Proposal construction traffic impact investigation.

## 2 METHODOLOGY

In order to assess any potential impacts of the Proposal during construction, the following steps were undertaken:

1. Identification of existing road network conditions and performance (Section 3) including:
  - a. Review of existing configuration of the surrounding road network and its function
  - b. Review of existing daily traffic data on key roads on the surrounding road network
2. Determination of construction program and methodology (Section 4)
3. Identification of construction traffic generation (based on construction methodology) and traffic distribution onto the surrounding road network (Section 5)
4. Undertake traffic modelling to identify the likely impacts as a result of construction of the Proposal on the local and regional road network(s) for the peak construction period (Section 6.1.1). A detailed breakdown of the traffic impact assessment methodology is provided in Section 2.1.1 and 2.1.2
5. Undertake an assessment of the likely impacts the construction of the Proposal would have on public transport and accessibility for road users, landholders and emergency vehicles (Sections 6.1 to 6.5)
6. Identifications of mitigation measures to avoid, minimise and/or manage any potential construction impacts on the local and regional road network, based on the results of step four and five identified above (Section 7)

### 2.1.1 Traffic modelling methodology

SIDRA network traffic modelling (version 7.0.7.6759) was undertaken to assess the potential impacts of construction traffic at the following key intersections along Moorebank Avenue(see Figure 4-1):

- M5 Motorway / Moorebank Avenue interchange
- Anzac Road / Moorebank Avenue intersection – Proposed site access
- Chatham Avenue / Moorebank Avenue intersection – Proposed site access

As part of the Amended Proposal, the Anzac Road / Moorebank Avenue intersection would be upgraded. The upgrades to this intersection would be undertaken in stages, during which Proposal construction traffic and other background traffic would continue to travel along Moorebank Avenue.

Separate construction sensitivity testing was undertaken to determine the proportion of construction traffic that could access and egress the Proposal site via the Moorebank Avenue/ Anzac Road and/ or Moorebank Avenue/ Chatham Avenue intersections while still performing at an acceptable Level of Service (LoS) during each stage of construction of the Anzac Road/ Moorebank Avenue intersection upgrade.

As part of the construction sensitivity testing, it was determined that the construction of the Anzac Road/ Moorebank Avenue intersection upgrade would be undertaken in three broad stages. Construction traffic scenarios were tested using SIDRA for each of these stages, with varying proportions of construction traffic accessing and egressing the Proposal site via Moorebank Avenue/ Anzac Road and/ or Moorebank

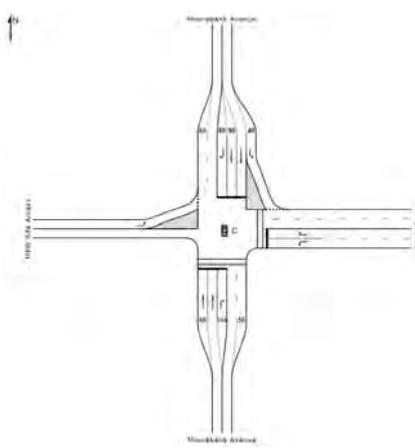
Avenue/ Chatham Avenue. The volume of construction traffic during each construction stage was determined using the anticipated construction program. The Construction Traffic Sensitivity Testing is provided in full in Appendix B of this report.

Based on the sensitivity testing, the worst case scenario construction traffic scenarios that were identified have been used to form the basis of this revised CTIA. It was determined through the sensitivity testing that the concurrent undertaking of Construction Works Periods C, D, E and F during stage 2 of the construction of the Anzac Road/ Moorebank Avenue intersection upgrade would represent the worst case construction scenario. The adopted Proposal construction traffic distribution assumptions, and the layout of the Moorebank Avenue/ Anzac Road and Moorebank Avenue/ Chatham Avenue intersections are detailed in Table 2-1 and Table 2-2 respectively.

**Table 2-1 Adopted Proposal Construction Traffic Distribution Assumptions**

Intersection	Intersection Construction Stage 2	
	LV	HV
Anzac Road / Moorebank Avenue	-	50%
Chatham Avenue / Moorebank Avenue	100% <sup>2</sup>	50%

**Table 2-2 Adopted Assessment Stages, Scenarios and Intersection Layouts**

Intersection	Description of layout
<b>Anzac Road / Moorebank Avenue Intersection</b>	<ul style="list-style-type: none"> <li>One right-turn short-lane, one through lane, one short through lane and one left-turn short slip-lane on the Moorebank Avenue north approach (southbound)</li> <li>One short-length and one full-length through lane and one right-turn short-lane on the Moorebank Avenue south approach (northbound)</li> <li>One right-turn lane and one left-turn lane on the Anzac Road east approach (westbound)</li> </ul> 

<sup>2</sup> Light vehicle distribution remained at 100% through the Chatham Avenue / Moorebank Avenue intersection during intersection construction Stage 2 due to light vehicles being unable to access the Proposal through the Anzac Road / Moorebank Avenue intersection

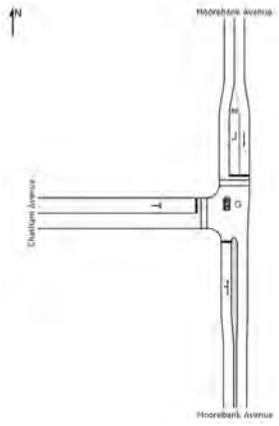
Intersection	Description of layout
	<ul style="list-style-type: none"> <li>One left-turn slip-lane on the MPW site access west approach (eastbound)</li> </ul>
<b>Chatham Avenue / Moorebank Avenue</b>	<ul style="list-style-type: none"> <li>One through lane and one right-turn short-lane on the Moorebank Avenue north approach (southbound)</li> <li>One shared through/left-turn lane on the Moorebank Avenue south approach (northbound)</li> <li>One shared left/right-turn lane on the Chatham Avenue west approach (eastbound)</li> </ul> 

Table 2-3 below presents the standard Level of Service (LoS) criteria used for the intersection assessments as per the Roads and Maritime Guide to Traffic Generating Developments (RTA, 2002), against which the intersection performance for the existing and proposed scenarios was assessed.

Table 2-3 Level of Service (LoS) Criteria for Intersection Capacity Analysis

LoS	Average Delay per Vehicle (sec/veh)	Traffic Signals, Roundabout	Give Way and Stop Signs
A	<14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	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 will cause excessive delays. Roundabouts require other control mode	At capacity, requires other control mode
F	>70	Unsatisfactory with excessive queuing	Unsatisfactory with excessive queuing

Source: RMS Guide to Traffic Generating Developments (RTA, 2002)

## 2.1.2 Construction traffic modelling scenarios

Traffic impacts from construction activities associated with the Proposal have been assessed for the following scenarios:

- *Scenario 1:* The peak construction period of the Proposal only, which has conservatively been assumed as the concurrent undertaking of construction works periods C, D, E and F and considered to be the ‘worst-case’ scenario.
- *Scenario 2:* The cumulative worst-case construction scenario, being the concurrent construction of the Proposal and the MPE Stage 1 Project. The cumulative worst case construction scenarios has conservatively been assumed as the concurrent undertaking of construction works periods identified in Scenario 1 for the Proposal with construction works period 3 of the MPE Stage 1 Project.

Table 2-4 summarises the construction modelling scenarios for the Proposal. The construction traffic modelling scenarios include predicted background traffic growth for 2018.

**Table 2-4 Summary of construction traffic modelling scenarios**

Scenario	MPE Stage 1 Construction	Proposed Construction Traffic Access Points for Proposal	Construction Works Period
1	Not Applicable.	<ul style="list-style-type: none"> <li>• Anzac Road / Moorebank Avenue intersection (via additional western leg)</li> <li>• Chatham Avenue / Moorebank Avenue intersection</li> </ul>	MPW Stage 2 Construction Works Period C,D,E and F
2	MPE Stage 1 construction considered in Scenario 2.	<ul style="list-style-type: none"> <li>• Anzac Road / Moorebank Avenue intersection (via additional western leg)</li> <li>• Chatham Avenue / Moorebank Avenue intersection</li> </ul>	<ul style="list-style-type: none"> <li>• MPW Stage 2 Construction works periods C,D,E and F</li> <li>• MPE Stage 1 Construction Works Period 3</li> </ul>

## 3 EXISTING CONDITIONS

### 3.1 Road network

The MPW site is located on the western side of Moorebank Avenue, west of Anzac Road, Moorebank in south-west Sydney. It is expected that the majority of traffic associated with the construction of the Proposal would travel to and from the MPW site via the M5 motorway and Moorebank Avenue (refer to Section 5.1 of this report for more information regarding construction traffic distribution).

Table 3-1 Existing key roads on the road network adjacent to the MPW site

Road Names	Road Hierarchy	Characteristics
M5 South West Motorway	Motorway	The M5 South West Motorway (M5) is a 22km tolled road with generally three lanes in each direction between Camden Valley Way, Prestons and King Georges Road, Beverly Hills. It is operated by Interlink Roads. It forms part of the M5 transport corridor, the main passenger, commercial and freight route between Sydney Airport, Port Botany and south west Sydney. It is also a key part of the Sydney Orbital Network, a series of interconnected roads that link key areas of the Greater Sydney Metropolitan Region.
Moorebank Avenue	State Road <sup>(1)</sup> / Local Road	Moorebank Avenue is currently a two lane undivided road (one lane on each direction) between Cambridge Avenue and the M5 South West Motorway (adjacent to the MPW site) and four lane undivided road (two lane on each direction) north of the M5 South West Motorway. This road provides a north-south link between Liverpool and Glenfield. It also forms a grade separated interchange with the M5 South West Motorway. Moorebank Avenue between the M5 and Anzac Road is owned and maintained by Roads and Maritime Services. Moorebank Avenue between Anzac Road and Cambridge Avenue is a private road on Commonwealth land.
Anzac Road	Local Road	Anzac Road is an east-west local road that connects Moorebank Avenue and Heathcote Road. It provides access to the Moorebank Business Park and the residential area of Wattle Grove. This is generally a two-lane undivided road.
Bapaume Road	Local Road	Bapaume Road is an east-west local road that connects Moorebank Avenue to Titalka Park and the privately owned industrial complex (ABB site). This is generally a two-lane undivided road.
Cambridge Avenue	Local Road	Cambridge Avenue is a local road which connects Moorebank Avenue from the south to Macquarie Fields through to Campbelltown. It is generally a two lane road (one lane each direction). Cambridge Avenue is owned and maintained by Campbelltown City Council. Cambridge Avenue crosses the Georges River via a low level narrow bridge (subject to flooding).

Note: (1) Moorebank Avenue, to the north of the M5 Motorway, is classified as a State Road.

### 3.2 Traffic volumes

Traffic count surveys undertaken for MPE, MPW and Roads and Maritime's wider Liverpool Moorebank Arterial Road Investigations (LMARI) traffic model in 2015 have been used for this Construction Traffic Impact Assessment where relevant. Table 3-2 below shows existing peak hour traffic volumes on Moorebank Avenue, Anzac Road and Cambridge Avenue. These roads are likely to be impacted by the Proposal.

**Table 3-2 Peak hour traffic volumes on key roads in 2015**

Locations	AM Peak		PM Peak	
	NB/EB <sup>1</sup>	SB/WB <sup>1</sup>	NB/EB <sup>1</sup>	SB/WB <sup>1</sup>
Moorebank Ave, South of Anzac Rd	950	430	450	840
Anzac Rd, East of Moorebank Ave	720	490	510	520
Moorebank Ave, South of Jacquinet Rd	920	360	350	920
Cambridge Ave, East of Canterbury Rd	960	330	340	930

Note: (1) Northbound (NB), Eastbound (EB), Southbound (SB), Westbound (WB) AM peak represents 8-9 AM and PM peak represents 5-6 PM.

In the AM peak, traffic volumes on Moorebank Avenue (south of Anzac Road) were approximately 950 vehicles per hour in the northbound direction. The traffic volumes on Moorebank Avenue were substantially lower in the southbound direction in the AM peak, approximately 430 vehicles per hour. In the PM peak, the highest traffic volume was observed in the southbound direction approximately 840 vehicles. Similarly, in the PM peak, about 450 vehicles per hour were observed in the northbound direction.

The peak flows on Anzac Road (east of Moorebank Avenue) were between 490 and 720 vehicles in one hour.

The peak traffic flows on Cambridge Avenue (east of Canterbury Road) were found to be similar to Moorebank Avenue. In the AM peak, approximately 960 vehicles per hour were observed in the eastbound direction. The westbound direction traffic in the AM peak was approximately 330 vehicles per hour. In the PM peak, the highest traffic volume was observed in the westbound direction, approximately 930 vehicles in one hour.

Detailed traffic volumes on Moorebank Avenue is included in Figure A-1, Figure A-2 and Table A-5 in Appendix A.

## 4 CONSTRUCTION METHODOLOGY

The construction methodology adopted for this CTIA is based on the following construction related information.

### 4.1 Construction staging

#### 4.1.1 Construction works periods

The work periods identified are for construction of the Proposal as a whole and represent a consolidation of the construction activities identified in the construction program presented in the Environmental Impact Statement (EIS). It is anticipated that construction of the Proposal would be conducted over seven construction works periods, as follows:

- Works period A – Pre-construction stockpiling
- Works period B – Site preparation activities
- Works period C – Bulk earthworks, drainage and utilities
- Works period D – Moorebank Avenue intersection works and internal road network
- Works period E – IMT Facility and Rail link connection construction
- Works period F – Warehouse and freight village construction and fit out
- Works period G – Miscellaneous structural construction and finishing works.

### 4.2 Construction program and activities

Subject to planning approval, construction of the Proposal is planned to commence in the third quarter of 2017 with the total period of construction works for the Proposal anticipated to be approximately 36 months. The indicative construction program, based on the Amended Proposal is shown in Table 4-1.

It should be noted that the construction program has been amended to reflect the Amended Proposal, as presented in Section 6 of the MPW Stage 2 Response to Submissions report (MPW Stage 2 RtS). The Amended Proposal would result in bringing Works Period B forward by three months and extending the duration of Works Period D by six months, as indicated in orange in Table 4-1.

A summary of the indicative activities included in each of these works periods, which is relevant to the construction of the IMT facility, the rail link connection and the warehouses, is provided in Table A-1 in Appendix A.

**Table 4-1 Indicative Proposal construction program**

Construction Phase	2018				2019				2020				2021		
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
Works period A – Pre-construction stockpiling															
Works period B - Site Preparation Activities															
Works period C – Bulk earthworks, drainage and utilities															
Works period D - Moorebank Avenue intersection works and internal road network															
Works period E – IMT facility and Rail link connection construction															
Works period F –Construction and fit-out of warehousing and the freight village															
Works period G – Miscellaneous structural construction and finishing works															

### 4.3 Construction hours

Construction works would generally be undertaken during the standard daytime construction working hours, being:

- 7 am to 6 pm Monday to Friday
- 8 am to 1 pm Saturday
- No works on Sunday or Public Holidays.

It is proposed to undertake the importation and placement of fill to the Proposal site, during the Pre-construction stockpiling and Bulk earthworks works periods (referred to as Works Period A and C, respectively), over the following hours identified in Table 4-2.

Table 4-2 Proposed working hours for fill importation

Day	Proposed Hours	Activities
Weekdays	6:00am – 7:00am	<ul style="list-style-type: none"> <li>• Material Delivery.</li> </ul>
	7:00am – 6:00pm	<ul style="list-style-type: none"> <li>• Material Delivery</li> <li>• Direct Placement; and</li> <li>• Stockpiling; and</li> <li>• Crushing.</li> </ul>
	6:00pm – 10:00pm	<ul style="list-style-type: none"> <li>• Material Delivery; and</li> <li>• Direct Placement; or</li> <li>• Stockpiling.</li> </ul>
Saturdays	7:00am – 8:00am	<ul style="list-style-type: none"> <li>• Material Delivery; and</li> <li>• Direct Placement; or</li> <li>• Stockpiling.</li> </ul>
	8:00am – 1:00pm	<ul style="list-style-type: none"> <li>• Material Delivery</li> <li>• Direct Placement; and</li> <li>• Stockpiling; and</li> <li>• Crushing.</li> </ul>
	1:00PM – 6:00PM	<ul style="list-style-type: none"> <li>• Material Delivery; and</li> <li>• Direct Placement; or</li> <li>• Stockpiling.</li> </ul>

Any other construction works undertaken outside of standard construction hours would be undertaken in consultation with relevant authorities. Works outside standard hours that may be undertaken would include:

- Works associated with the upgrade of the Anzac Road / Moorebank Avenue intersection to minimise impacts on through traffic
- Works associated with the tie-in of the Rail connection to the Rail link to minimise disruption to services on the Rail link

- Any works which do not cause noise emissions to of more than 5dB(A) greater than the criteria at any nearby sensitive receptors or comply with the 'Outside Standard Construction Hours'
- The delivery of materials which is required outside of these hours as requested by Police or other authorities for safety reasons
- Emergency work to avoid the loss of lives, property and/or to prevent environmental harm
- Works required to be undertaken during rail corridor possessions
- Any other work as approved through the Construction Noise and Vibration Management Plan or otherwise approved by the Secretary of the DPE in accordance with the existing consent conditions.

## 4.4 Site access

Access to the Proposal site in the initial stages of construction would be via the existing Chatham Avenue / Moorebank Avenue intersection while intersection construction works are occurring at the Anzac Road / Moorebank Avenue intersection. Minor roadworks involving the remarking of pavement markings to extend the storage lane length (from 20m to 30m) for the right-turn lane on the north approach at the Chatham Avenue / Moorebank Avenue intersection would occur to facilitate its use during construction.

Access to the Proposal for construction traffic would gradually transition from the Chatham Avenue / Moorebank Avenue intersection to the Anzac Road / Moorebank Avenue intersection where upon completion of the intersection construction works all construction related traffic would access the Proposal via the upgraded Anzac Road / Moorebank Avenue intersection.

Access for construction vehicles to the construction compounds within the Proposal site would occur via an internal road network allowing construction traffic to enter via either Chatham Avenue / Moorebank Avenue or Anzac Road / Moorebank Avenue intersection. Proposed usage of the construction site access intersections is provided below in Table 4-3, with the location of the site access points and construction compounds presented in Figure 4-1.

**Table 4-3 Site access utilisation throughout construction of the Proposal**

Construction Site Access	2017				2018				2019				2020			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Chatham Avenue / Moorebank Avenue					X	X <sup>1</sup>	X <sup>1</sup>	X <sup>1</sup>								
Anzac Road / Moorebank Avenue						X <sup>1</sup>	X <sup>1</sup>	X <sup>1</sup>	X	X	X	X	X	X	X	X

Note: 1 – Construction Light Vehicles would only utilise Chatham Avenue / Moorebank Avenue intersection and construction heavy vehicles would utilise both Anzac Road / Moorebank Avenue and Chatham Avenue / Moorebank Avenue intersections



Figure 4-1 Access arrangements during Proposal construction

## 5 CONSTRUCTION TRAFFIC GENERATION

### 5.1 Construction traffic movements

Access to and from the Proposal site would be from the northern end of Moorebank Avenue with access to the Proposal either through the Chatham Avenue / Moorebank Avenue or Anzac Road / Moorebank Avenue intersections, depending on the Anzac Road / Moorebank Avenue intersection construction stage as described in Section 2.1.1 and Section 4.1.

Construction traffic volume estimates are based on the proposed construction schedule and the estimated volume of material to be moved during the various works periods. Table A-3 in Appendix A includes detailed estimated number of truck loads and number of workers.

Table 5-1 below summarises the number of construction vehicle movements, both light vehicle (car) and heavy vehicle (truck), to and from the site each weekday for each works period where one vehicle movement incorporates two trips.

The estimated number of daily car movements varies between 30 and 350 car movements per day depending on the works period. The highest car movements are expected to be 350 car movements per day for works period E.

The number of daily truck movements varies between 6 and 740 truck movements per day depending on the works period. The highest number of truck movements are expected to be for construction works period C with 740 truck movements per day.

**Table 5-1 Estimates of Daily Construction Vehicle Movements**

Construction Period	Daily Vehicle Movements (round-trip)	
	Car movements	Truck movements
Works period A – Pre-construction stockpiling	30	370
Works period B – Site preparation activities	50	26
Works period C – Bulk earthworks, drainage and utilities	50	740
Works period D – Moorebank Avenue and internal road construction	50	19
Works period E – IMT facility and Rail link connection construction	350	31
Works period F – Warehouse construction and fit out	120	20
Works period G – Miscellaneous structural construction and finishing works	100	6

Note: car and truck movements represent two-way daily trips

The above traffic generation is considered to represent a conservative estimation of the traffic that would be generated in scenarios where construction works periods may overlap, as one works period would be 'ramping down' while the subsequent works period would be 'ramping up'.

## 5.2 Construction traffic distribution

Approximately 90% of construction related cars would travel from the north via the Moorebank Avenue / M5 Motorway interchange with the remaining 10% expected to use Anzac Road and Cambridge Avenue.

All trucks are expected to travel from the north of the Proposal via Moorebank Avenue with no construction related trucks allowed to travel via Anzac Road or Cambridge Avenue, with the exception of some minor truck movements anticipated to use Cambridge Avenue for the disposal of waste materials at the Glenfield Waste Facility.

Traffic distribution diagrams for both construction related cars and trucks is provided in Figure 5-1 and Figure 5-2, respectively. It should be noted that trip distribution in the following figures is rounded to the nearest whole number i.e truck movements along Cambridge Avenue (for the purpose of accessing the Glenfield Waste Facility only) comprise less than 0.5%; therefore shown as 0%.

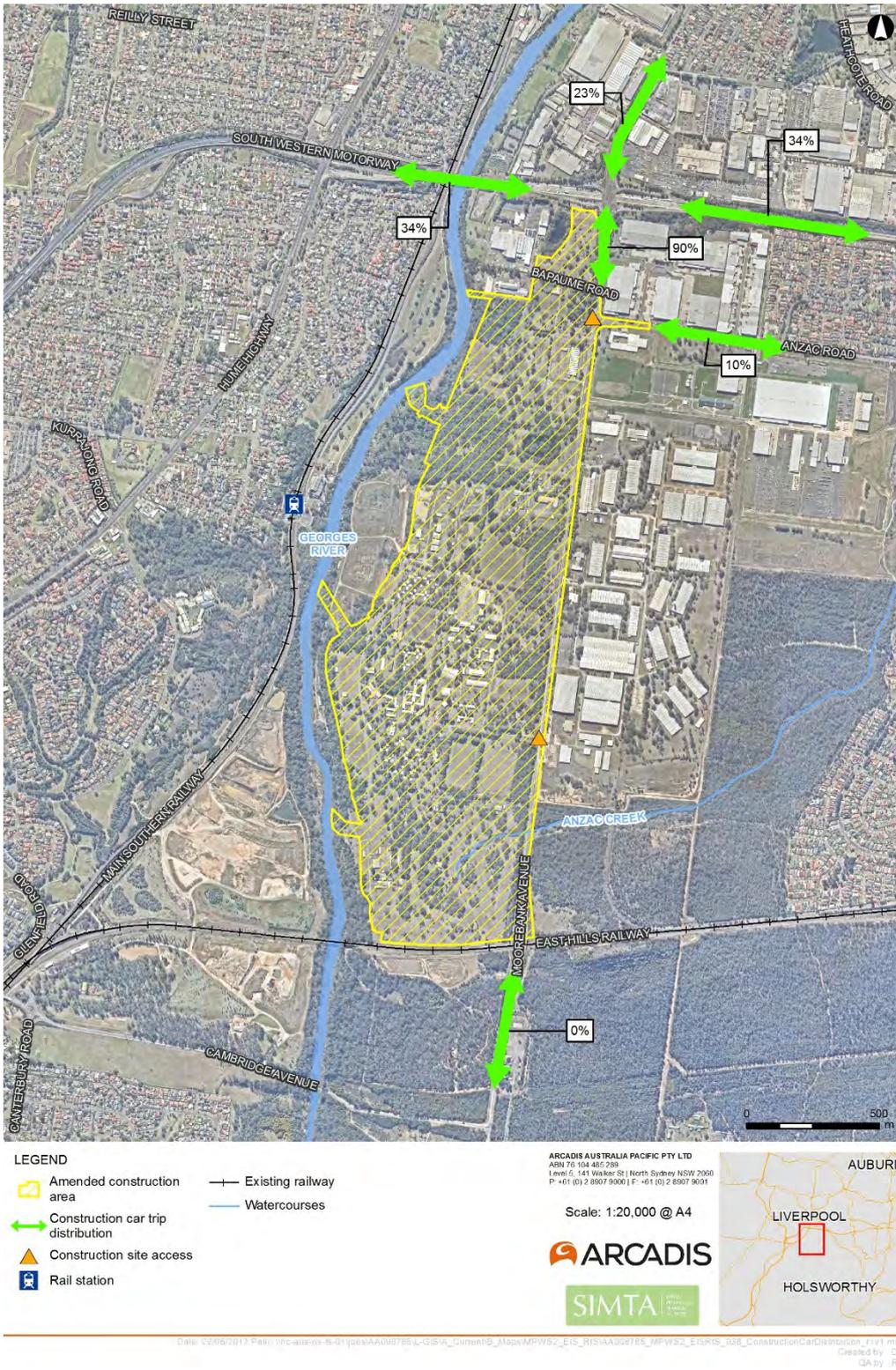


Figure 5-1 Construction Car Trip Distribution

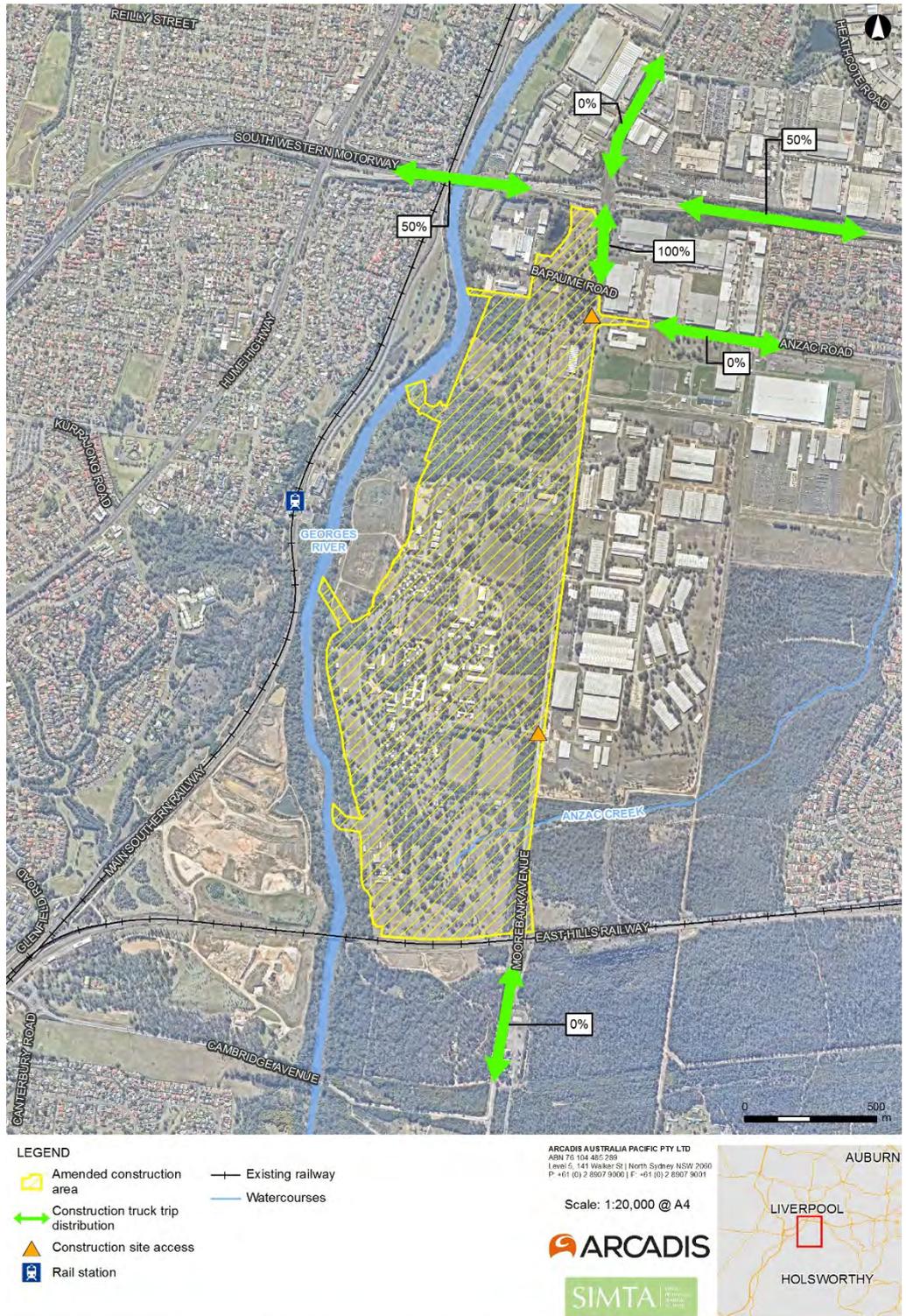


Figure 5-2 Construction Truck Trip Distribution

### 5.3 Peak hour traffic generation

The analysis has assumed that during the peak construction period the construction workers would arrive at the site in the morning between 6-8 am on weekdays and would be on site before the commuter peak of 8-9 am on weekdays. Similarly, the workers would depart the site in the afternoon between 3-6 pm on weekdays. Some lunchtime movements are also anticipated.

The typical construction truck movements each weekday are assumed to be evenly distributed over an approximate 11 hour period, between 7 am and 6 pm on most weekdays, with the exception of fill haulage trucks which are assumed to be evenly distributed over an approximate 15 hour period, between 7 am and 10 pm on most weekdays.

Figure 5-3 and Figure 5-4 below shows the assumed distribution of staff cars and construction truck movements throughout a typical weekday, respectively.

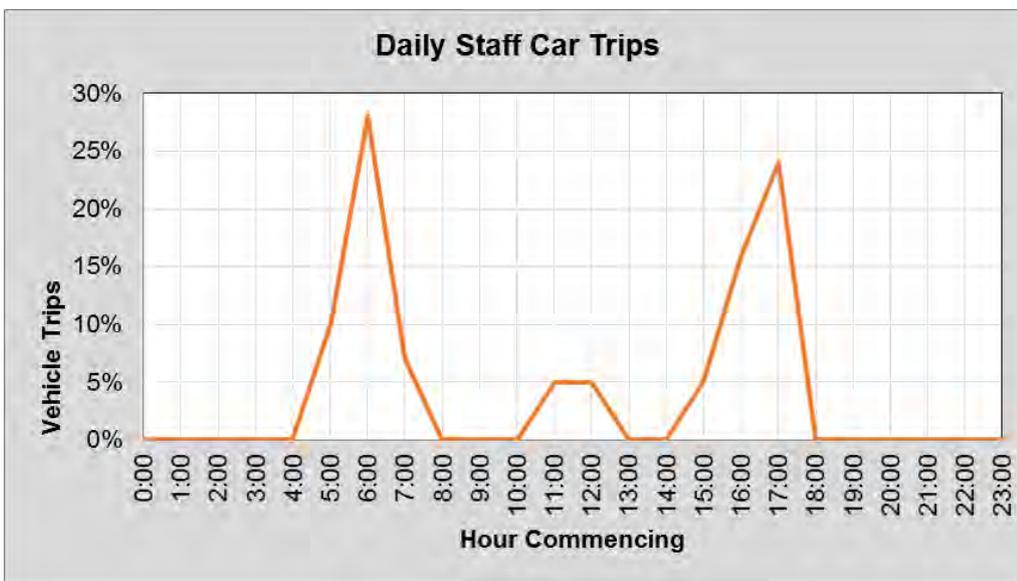


Figure 5-3 Weekday distribution of staff car trips

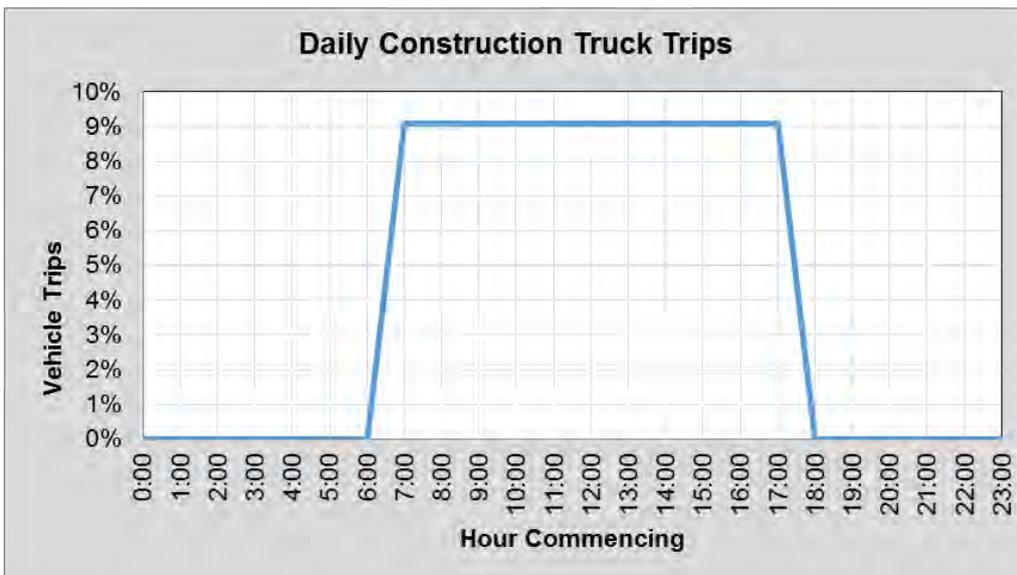


Figure 5-4 Weekday distribution of construction truck trips

Table 5-2 below summarises weekday peak hour, AM (one hour) and PM (one hour), construction traffic movements to and from the site. Detailed traffic movements is included in Table A-4 in Appendix A.

**Table 5-2 Weekday AM and PM peak hour construction traffic movements**

Works Period	AM Peak (8-9am)			PM Peak (5-6pm)		
	Car movements	Truck movements	Total	Car movements	Truck movements	Total
Works period A	0	68	68	14	68	82
Works period B	0	4	4	24	4	28
Works period C	0	98	98	24	98	122
Works period D	0	4	4	24	4	28
Works period E	0	6	6	168	6	174
Works period F	0	4	4	58	4	62
Works period G	0	2	2	48	2	50
Peak construction period (overlap in works periods C, D, E and F)	0	112	112	274	112	386

Note: Car and truck movements represent two-way peak hour trips

It is anticipated that the peak construction period would occur during the overlap in works period C, D, E and F. During the peak construction period, it is expected that approximately 112 vehicles (0 cars and 112 trucks) would be travelling to and from the Proposal site during the AM peak hour (8-9am) and approximately 386 vehicles (274 cars and 112 trucks) would be travelling to/from the Proposal site during PM peak hour (5-6pm).

This estimation represents the predicted peak traffic generation for the above works periods and is considered to represent an overestimation of the traffic that would be generated in scenarios where construction works periods may overlap.

## 6 CONSTRUCTION TRAFFIC IMPACT ASSESSMENT

An analysis of the potential impacts of construction traffic from the Proposal on nearby intersections has been undertaken with consideration given to the factors detailed below:

- The capacity of three intersections that would be largely impacted by the construction activities which includes the M5 Motorway / Moorebank Avenue interchange, Anzac Road / Moorebank Avenue and Chatham Avenue/ Moorebank Avenue intersections (Section 6.1)
- Site access / egress during construction and carriageway restrictions (Section 0)
- Public and active transport (Section 6.4)
- Accessibility for road users, landholders and emergency vehicles (Section 6.5)

### 6.1 Impact at key access roads/intersections

The construction traffic from the Proposal is expected to impact key intersections that would provide access for construction cars and trucks including:

- Anzac Road / Moorebank Avenue intersection
- M5 Motorway / Moorebank Avenue interchange
- Chatham Avenue / Moorebank Avenue intersection.

Figure A-3 to Figure A-6 and Table A-6 and Table A-7 in Appendix A show the estimated AM and PM peak one-hour turning movement volumes with the Proposal construction traffic for Scenario 1 and Scenario 2.

#### 6.1.1 Existing level of service at key intersections

Table 6-1 shows the existing delay and level of service (LoS) results from SIDRA at the Anzac Road / Moorebank Avenue intersection, M5 Motorway / Moorebank Avenue interchange and Chatham Avenue / Moorebank Avenue intersection.

Without the Proposal, the Anzac Road / Moorebank Avenue intersection and M5 Motorway / Moorebank Avenue interchange operate at an acceptable LoS in the AM and PM peak under existing conditions.

The Chatham Avenue / Moorebank Avenue intersection is currently non-operational and as such no existing condition results are reported.

**Table 6-1 Modelled level of service for existing conditions**

Intersection	Peak Period	Average Delay (secs)	LoS
Anzac Road / Moorebank Avenue intersection	AM (8-9am)	18	B
	PM (5-6pm)	17	B
M5 Motorway / Moorebank Avenue	AM (8-9am)	24	B
	PM (5-6pm)	30	C
Chatham Avenue / Moorebank Avenue intersection	AM (8-9am)	N/A	N/A
	PM (5-6pm)	N/A	N/A

Note: Average delay has been rounded  
N/A – Chatham Avenue / Moorebank Avenue is currently not operational.

## 6.1.2 Construction traffic impacts during Works Period A

Works period A would occur prior to the construction phase of the Proposal and therefore prior to the development of the CEMP. The volume of construction traffic vehicles during Works Period A; both heavy (370 round-trip movements per day) and light (30 round-trip movements per day), would be no greater than the total daily vehicle movements than any other construction works periods (refer to Section 5.2 for additional detail regarding construction traffic distribution).

It is therefore expected that construction traffic impacts during the undertaking of Works Period A would be no worse than those anticipated for Scenario 1 and Scenario 2 in Section 6.1.3 and Section 6.1.4 below, i.e. the construction traffic impact along Moorebank Avenue and associated intersections is anticipated to be minor.

## 6.1.3 Forecast level of service – Scenario 1

The predicted average delay and LoS at key intersections near the Proposal during the peak construction period is summarised in Table 6-2. The results of the SIDRA intersection analysis indicate that key intersections near the Proposal would operate at an acceptable LoS during the AM and PM peak periods.

Compared to the existing conditions (i.e. without the Proposal), all intersections would experience an increased average delay during the peak construction of the Proposal and the LoS would remain the same, with the exception of the M5 Motorway/ Moorebank Avenue interchange in the AM peak, where LoS would decrease from a LoS B to a LoS C, however, this intersection would continue to operate acceptably.

Under scenario 1, the construction traffic (staff cars and trucks) from the Proposal would increase traffic volumes at the M5 Motorway / Moorebank Avenue interchange by approximately 3% in the AM peak and 10% in the PM peak. The Proposal construction traffic contribution in peak periods is relatively small compared to the existing traffic volumes on Moorebank Avenue. The construction traffic impact along Moorebank Avenue is anticipated to be minor.

## 6.1.4 Forecast level of service – Scenario 2

The predicted average delay and LoS at key intersections near the Proposal under the cumulative construction scenario is summarised in Table 6-3. The results of the SIDRA intersection analysis indicate that key intersections near the Proposal would operate at an acceptable LoS during the AM and PM peak periods.

Compared to the existing conditions (i.e. without the Proposal), all intersections would experience an increased average delay under the cumulative construction scenario and the LoS would remain the same, with the exception of:

- The Anzac Road/ Moorebank Avenue intersection in the AM peak, where the LoS would reduce from a LoS B to a LoS C. The performance of the intersection would continue to be considered acceptable.
- The M5 Motorway/ Moorebank Avenue interchange in the AM Peak, where the LoS would reduce from a LoS B to a LoS C. The performance of the intersection would continue to be considered acceptable.

Under the cumulative construction scenario, the construction traffic (staff cars and trucks) from the Proposal would increase traffic volumes at the M5 Motorway / Moorebank Avenue interchange by approximately 7% in the AM peak and 14% in the PM peak. The Proposal construction traffic contribution in peak periods is relatively small compared to the existing traffic volumes on Moorebank Avenue. The construction traffic impact along Moorebank Avenue is anticipated to be minor.

Table 6-2 SIDRA modelling results– Scenario 1 (i.e Construction of the Proposal only)

Intersection	Peak Period	Without the Proposal (i.e. existing conditions)		With the Proposal	
		Average Delay (s)	LoS	Average Delay (s)	LoS
Anzac Road / Moorebank Avenue intersection	AM (8-9am)	18	B	28	B
	PM (5-6pm)	17	B	21	B
M5 Motorway / Moorebank Avenue	AM (8-9am)	24	B	36	C
	PM (5-6pm)	30	C	39	C
Chatham Avenue / Moorebank Avenue intersection	AM (8-9am)	N/A	N/A	19	B
	PM (5-6pm)	N/A	N/A	25	B

Table 6-3 SIDRA modelling results – Scenario 2 (i.e. cumulative construction)

Intersection	Peak Period	Without the Proposal (i.e. existing conditions)		Cumulative construction	
		Average Delay (s)	LoS	Average Delay (s)	LoS
Anzac Road / Moorebank Avenue intersection	AM (8-9am)	18	B	41	C
	PM (5-6pm)	17	B	23	B
M5 Motorway / Moorebank Avenue	AM (8-9am)	24	B	36	C
	PM (5-6pm)	30	C	39	C
Chatham Avenue / Moorebank Avenue intersection	AM (8-9am)	N/A	N/A	21	B
	PM (5-6pm)	N/A	N/A	27	B

## 6.2 Access / egress

Access and egress to the construction compounds are proposed off Moorebank Avenue as identified in Section 4.4 and presented in Figure 4-1. The distribution of Proposal construction traffic between the proposed site access points is discussed in Table 2-1 of Section 2.1.1.

The existing local accesses along Moorebank Avenue would be maintained during construction with the exception of the Bapaume Road / Moorebank Avenue intersection during and after the completion of Stage 3 of the Anzac Road / Moorebank Avenue intersection construction works where Bapaume Road / Moorebank Avenue intersection would be reconfigured from an all-movement intersection to a left-out only intersection.

Access to the ABB site (including low-loaders) would be maintained at all times during the construction of the Proposal. During the Moorebank Avenue/ Anzac Road intersection construction stages 1 and 2 (refer to Appendix B for more information), existing access via the Bapaume Road / Moorebank Avenue intersection would be maintained, with access during stage 3 shifted from the existing Bapaume Road / Moorebank Avenue intersection to an additional western leg at the upgraded Anzac Road / Moorebank Avenue intersection.

During the Moorebank Avenue/ Anzac Road intersection construction stage 3, the Bapaume Road/ Moorebank Avenue intersection would become a left-out only priority controlled intersection.

To enable larger vehicles, such as low loaders, to access to the site, a traffic controller would be used to ensure sufficient time to manoeuvre and access the site is provided. Sufficient signage would be installed to ensure unauthorised vehicles do not enter the site.

## 6.3 Potential carriageway closures

Part of Moorebank Avenue would periodically need to be closed for short periods to undertake works near the MPW site boundary and to facilitate construction of the Moorebank Avenue/ Anzac Road intersection upgrade. Should a road closure be required as a result of the construction of the Proposal, the appropriate application and consultation process would be sought in accordance with the CEMP, including the final CTMP, which would be updated by the construction contractor prior to the commencement of construction. This would be subject to a separate permit application e.g. Road Occupancy Licence (ROL). An application for an ROL (with supporting documentation) would be sought with the relevant authorities prior to commencement of any works requiring a road closure by the construction contractor.

## 6.4 Public and active transport

There is currently one bus service in the proximity of the Proposal site, with the service operating north along Moorebank Avenue from Anzac Road (Route 901). There is also one service in each peak hour (i.e. AM and PM peak) that runs south, past the Proposal site. It is anticipated that construction workers would utilise the existing bus route and stops to access the construction site through the designated construction access points.

Given that the majority of construction activities would be contained on the Proposal site rather than Moorebank Avenue, it is considered unlikely that there would be any

significant impacts to public transport services with the exception of construction works to facilitate the Anzac Road / Moorebank Avenue intersection upgrade, where an existing bus stop on the north approach (western side) is likely to be impacted and is proposed to be moved to Anzac Road (southern side) on the east approach to the intersection. Consultation with TfNSW is proposed to discuss and agree on the proposed relocation of the bus stop in either a temporary or permanent basis.

Construction of the Proposal would not preclude the use of Moorebank Avenue by cyclists. During the intersection construction works at the Anzac Road / Moorebank Avenue intersection, temporary signalised pedestrian crossings and cyclist crossing points would be maintained on the east and south approaches whilst the upgraded Anzac Road / Moorebank Avenue intersection is constructed whereby signalised pedestrian crossing and cyclist crossing point would be provided on all approaches of the intersection.

## **6.5 Accessibility for road users, landholders and emergency vehicles**

### **6.5.1 Road access restrictions**

Road access restrictions would be applied to ensure all pre-construction related vehicles are not travelling through nearby residential areas to access the Proposal site. In particular, operational restrictions and signposting would be developed and implemented to ensure no construction related heavy vehicles travel along Anzac Road through the Wattle Grove residential area or utilise Bapaume Road (for both heavy and light vehicles).

Site operation and logistics plans would take this restriction into consideration when planning deliveries and haulage routes, and the restriction on travelling along Anzac Road and Bapaume Road would be reinforced during site induction training for truck operators. This would ensure sensitive local residential roads are protected from amenity impacts associated with heavy vehicle movements and arterial roads are utilised.

In accordance with the Minister's Conditions of Approval for the MPW Concept Plan, a Community Communication Strategy (CCS) would be prepared. The CCS would inform local residents of the proposed construction activities and road access restrictions the construction traffic must adhere to. The program would be initiated prior to commencement of Early Works and continue through the Proposal to ensure that the community are aware of construction activities, with particular regard to construction traffic. The program would establish communication protocols for community feedback on issues relating to construction vehicle driver behaviour and construction related matters.

### **6.5.2 Access for emergency vehicles**

All access points for the Proposal site would be made available for emergency vehicle access when required. This would be considered as part of the site safety and incident management plans.

## 7 MITIGATION MEASURES

A Construction Traffic Management Plan (CTMP) would be prepared, detailing management controls to be implemented to avoid or minimise impacts to traffic, pedestrian and cyclist access, and the amenity of the surrounding environment. The CTMP would be approved by the DP&E prior to commencement of construction and would be implemented during the Proposal. Mitigation measures that would be considered as part of the CTMP include:

- Review of speed restrictions along Moorebank Avenue and additional signposting of speed limitations
- Installation of specific warning signs at entrances to the construction site to warn existing road users of entering and exiting construction traffic
- Establishing pedestrian walking routes and crossing points
- Distribution of day warning notices to advise local road users of scheduled construction activities
- Installation of appropriate traffic control and warning signs for areas identified where potential safety risk issues exist
- The promotion of car-pooling for construction staff and other shared transport initiatives during the pre-construction phase
- Management of the transportation of materials to maximise vehicle loads and therefore minimise vehicle movements.
- Importation of fill to site during construction of the Proposal is to not exceed a total of 22,000 m<sup>3</sup> of material per day. This limit is to be further reduced by an amount equivalent to any fill being imported to the MPE Stage 2 Proposal (SSD 7628) on the same day such that the combined importation of fill to the Proposal site and MPE site does not exceed 22,000 m<sup>3</sup> on any given day.

Mitigation measures identified within the MPW Concept Plan Approval would be implemented during the Proposal. The following mitigation measures would be implemented as part of the traffic management plans to be prepared for the Proposal:

- Reducing the volumes of construction vehicles travelling during peak periods, especially if the increase in traffic generated by construction activities impedes on the operation of Moorebank Avenue
- Maintain access to neighbouring properties. It is particularly important that the ABB site has access throughout the construction stages
- In addition to the Community Engagement Plan (or equivalent)), a communication plan would be developed to provide information to the relevant authorities and bus operators in addition to the local community. The communication plan would need to incorporate a contact list with the chain of command
- Implement relevant traffic control measures to inform drivers of the construction activities and locations of heavy vehicle access locations
- Traffic on Moorebank Avenue would be monitored during peak periods to ensure that queuing at intersections does not impact on other road users
- Road Safety Audit on Cambridge Avenue to be undertaken prior to the commencement of the Proposal works period to identify the traffic safety risks and determine appropriate mitigations.

## 8 CONCLUSIONS

This report has been prepared to revised assessment of the construction traffic impacts of the Proposal in response to continuing review and submissions received from exhibition of the EIS and to provide greater clarity on potential construction traffic impacts. This revised Construction Traffic Impact Assessment (CTIA) has been prepared to describe the potential construction traffic impacts in light of:

- Revised traffic modelling scenarios
- Revised configuration of the Anzac Road / Moorebank Avenue intersection
- The amendments to the Proposal.

This revised CTIA has been prepared by Arcadis Asia Pacific Pty Ltd (Arcadis) to identify potential traffic impacts and recommend mitigation measures to ensure the safe operation of the adjacent road network during construction of the Proposal.

The analysis has determined that the construction traffic associated with the Proposal would have minimal impacts on the performance of the existing M5 Motorway / Moorebank Avenue interchange and Chatham Avenue / Moorebank Avenue intersection in both the AM and PM peak periods with construction of the Proposal under a worst-case scenario (Scenario 1), and under the cumulative construction scenario (Scenario 2).

The analysis also indicated that construction traffic from the Proposal would not adversely impact through traffic along Moorebank Avenue. The Anzac Road/ Moorebank Avenue intersection would operate satisfactorily throughout the construction of the Proposal and is able to accommodate the peak construction traffic.

Construction traffic would largely be confined to Moorebank Avenue (south of M5 Motorway) itself and during normal working hours the existing number of trafficable lanes would be maintained. Some delays are anticipated as a result of the implementation of construction speed limits. Moorebank Avenue is anticipated to experience an increase in vehicle movements due to construction traffic accessing the work areas, however these are expected to be minor and short term in nature.

A Preliminary Construction Traffic Management Plan (PCTMP) has been prepared as part of the submission for the EIS. This preliminary plan would be further developed and finalised prior to the commencement of construction.

# **APPENDIX A - TRAFFIC DATA AND ASSUMPTIONS USED IN CONSTRUCTION TRAFFIC IMPACT ASSESSMENT**

**Table A-1 Works periods and activities**

Works period	Activities
Pre-construction fill placement and stockpiling	<ul style="list-style-type: none"> <li>▪ Establishment of temporary erosion and sediment controls</li> <li>▪ Minor clearing and grubbing of temporary stockpiling area</li> <li>▪ Establishment of a temporary stockpiling pad and associated temporary access roads</li> <li>▪ Installation of temporary construction compound, including amenities and office for bulk earthworks</li> <li>▪ Importation and placement of approximately 400,000 cubic metres (m3) of clean fill</li> </ul>
Site preparation activities	<ul style="list-style-type: none"> <li>▪ Establishment of construction compound fencing and hoardings</li> <li>▪ Installation of temporary sediment and erosion control measures</li> <li>▪ Vegetation clearance</li> <li>▪ Installation of temporary site offices and amenities</li> <li>▪ Construction of hardstands for staff parking and laydown areas</li> <li>▪ Establishment of temporary batch plant sites and installation of batch plant</li> <li>▪ Construction of access roads, site entry and exit points and security (N.B. preference is to use existing access where practicable)</li> <li>▪ Set up of construction monitoring equipment</li> </ul>
Bulk earthworks, drainage and utilities	<ul style="list-style-type: none"> <li>▪ Importation, stockpiling and placement of approximately 1,200,000 m3 of imported clean fill (Bulk Earthworks) and raising of the Proposal site to final level</li> <li>▪ Installation of OSDs</li> <li>▪ Drainage and utilities installation</li> <li>▪ Establishment of a concrete batching plant</li> </ul>
Moorebank Avenue intersection works and internal road network	<ul style="list-style-type: none"> <li>▪ Relocation, adjustment and/or protection of all affected utilities, services and signage, as required</li> <li>▪ Establishment of traffic management devices</li> <li>▪ Installation of erosion and sediment controls</li> <li>▪ Stripping and stockpiling of topsoil by excavators and trucks</li> <li>▪ Drainage works</li> <li>▪ Progressive stabilisation of exposed areas</li> <li>▪ Compaction of widening areas</li> <li>▪ Preparation of new lane surfaces</li> <li>▪ Forming of new kerbs, gutters, medians and other structures</li> <li>▪ Construction of asphalt and concrete pavement</li> <li>▪ Landscaping of exposed earthworks areas</li> <li>▪ New line marking, lighting and sign posting</li> </ul>

Works period	Activities
	<ul style="list-style-type: none"> <li>▪ Removal of construction traffic management and progressive opening of new works to traffic</li> </ul>
<p>IMT facility and Rail link connection construction</p>	<ul style="list-style-type: none"> <li>▪ Importation, placement and compaction of engineering fill</li> <li>▪ Compaction of engineering fill</li> <li>▪ Importation and placement of ballast material</li> <li>▪ Establish formwork and reinforcement for sidings and bridge infrastructure</li> <li>▪ Placement of concrete, curing and sealing</li> <li>▪ Installation of permanent ways and rail systems</li> <li>▪ Installation of permanent access gates, security gatehouse and permanent fencing</li> <li>▪ Installation of the connection between the Rail link and the IMT facility sidings</li> <li>▪ Erection of IMT facility administration building – excavation foundation and floor slab construction, structural wall and roof framework, and roofing</li> <li>▪ Internal fit-out of building with control room, office, workshops, loco-shifter and staff amenities</li> </ul>
<p>Construction and fit-out of warehousing and freight village</p>	<ul style="list-style-type: none"> <li>▪ Establishment of construction compound, temporary fencing/hoardings and temporary sediment and erosion control</li> <li>▪ Installation of temporary site offices and amenities</li> <li>▪ Excavation, foundation and floor slab installation</li> <li>▪ Erection of framework and structural walls</li> <li>▪ Installation of roof</li> <li>▪ Internal fit out</li> <li>▪ Landscaping and surrounds</li> <li>▪ Preparation of warehouse access road subgrade</li> <li>▪ Forming of new kerbs, gutters, medians and other structures</li> <li>▪ Construction of asphalt and concrete pavement</li> <li>▪ New line marking, lighting and sign posting</li> <li>▪ Removal of construction traffic management and progressive opening of the internal road and warehouse access roads to traffic</li> </ul>
<p>Miscellaneous structural construction and finishing works</p>	<ul style="list-style-type: none"> <li>▪ Decommissioning/demobilisation of construction sites</li> <li>▪ Commissioning of operational facilities</li> <li>▪ Landscaping</li> <li>▪ Rehabilitation of affected areas</li> <li>▪ Post-construction condition surveys</li> <li>▪ Removal of construction environmental controls</li> <li>▪ Removal of construction ancillary facility related traffic signage</li> </ul>



**Table A-2 Proposed construction ancillary facilities and activities**

Ancillary facility	Activity and use					Works period(s) used
	Site office	Staff amenities	Car parking	Storage and laydown	Materials testing	
Earthworks Compound	✓	✓	✓	✓	✓	Pre-construction stockpiling Site preparation activities Bulk earthworks, drainage and utilities
IMT facility Compound	✓	✓	✓	✓	✓	Bulk earthworks, drainage and utilities IMT facility and Rail link connection construction
Rail and IMT Compound	✓	✓	✓	✓	✓	Moorebank Avenue intersection works and internal road network IMT facility and Rail link connection construction Construction and fit-out of warehousing
Construction parking area			✓			IMT facility and Rail link connection construction Construction and fit-out of warehousing Miscellaneous structural construction and finishing works
Warehouse Compounds	✓	✓		✓	✓	Construction and fit-out of warehousing Miscellaneous structural construction and finishing works

**Table A-3 Estimated Truck Loads and Number of Staff by Construction Works Period**

Works Period	Construction Works Period	Estimated Number of Truck Loads <sup>1</sup>	Estimated Number of Workers on a Typical Day
A	Pre-Construction Stockpiling	33,300	30
B	Site Preparation Activities	650	50
C	Bulk Earthworks, Drainage and Utilities	100,000	50
D	Moorebank Avenue and Internal Road Construction	3,300 (1,800 (Moorebank Ave) + 1,500 for internal roads)	50
E	IMT Facility and Rail Link Connection	11,000	350
F	Warehouse and freight village Construction and Fit out	6,240 (construction of two warehouses concurrently, 3120 truckloads per warehouse)	120 (construction of two warehouses concurrently, i.e. 50/warehouse plus 10/warehouse overseeing construction)
G	Misc. Structural Construction and Finishing works	500	100

Note 1: Estimated total number of truck loads represent the duration of the entire individual works period.

**Table A-4 Weekday AM and PM Peak hour construction traffic movements**

Works Period	AM Peak Hour Construction Traffic Movements					
	Staff Car Movements		Construction Truck Movements		Total Construction Vehicles (Car + Truck)	
	Inbound	Outbound	Inbound	Outbound	Inbound	Outbound
Works period A	0	0	34	34	34	34
Works period B	0	0	2	2	2	2
Works period C	0	0	49	49	49	49
Works period D	0	0	2	2	2	2
Works period E	0	0	3	3	3	3
Works period F	0	0	2	2	2	2
Works period G	0	0	1	1	1	1
Peak construction period (overlap in works periods C, D, E and F)	0	0	56	56	56	56
Works Period	PM Peak Hour Construction Traffic Movements					
	Staff Car Movements		Construction Truck Movements		Total Construction Vehicles (Car + Truck)	
	Inbound	Outbound	Inbound	Outbound	Inbound	Outbound
Works period A	0	14	34	34	34	48
Works period B	0	24	2	2	2	26
Works period C	0	24	49	49	49	73
Works period D	0	24	2	2	2	26
Works period E	0	168	3	3	3	171
Works period F	0	58	2	2	2	59
Works period G	0	48	1	1	1	49
Peak construction period (overlap in works periods C, D, E and F)	0	274	57	57	57	331

2015 Existing - AM Peak

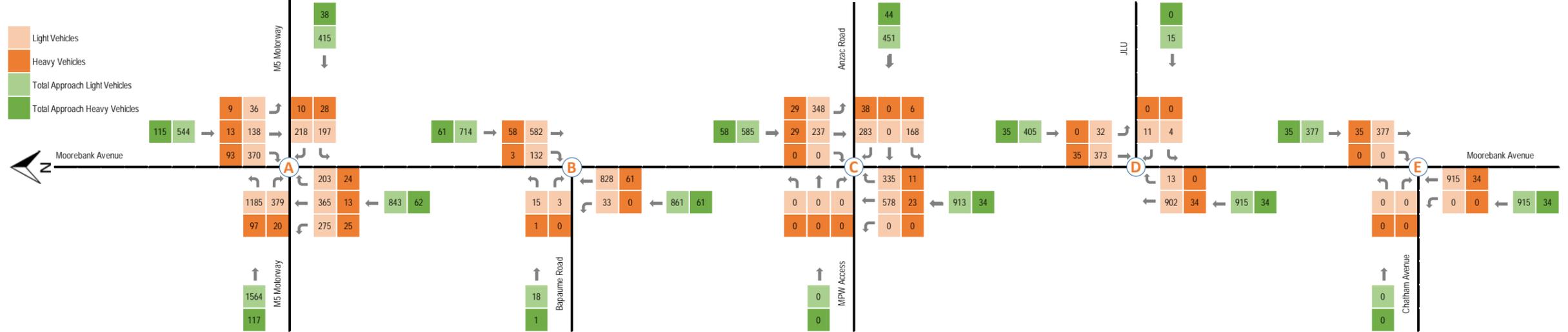


Figure A-1 Existing AM peak 1 hour flows (vehicles) in 2015

2015 Existing - PM Peak

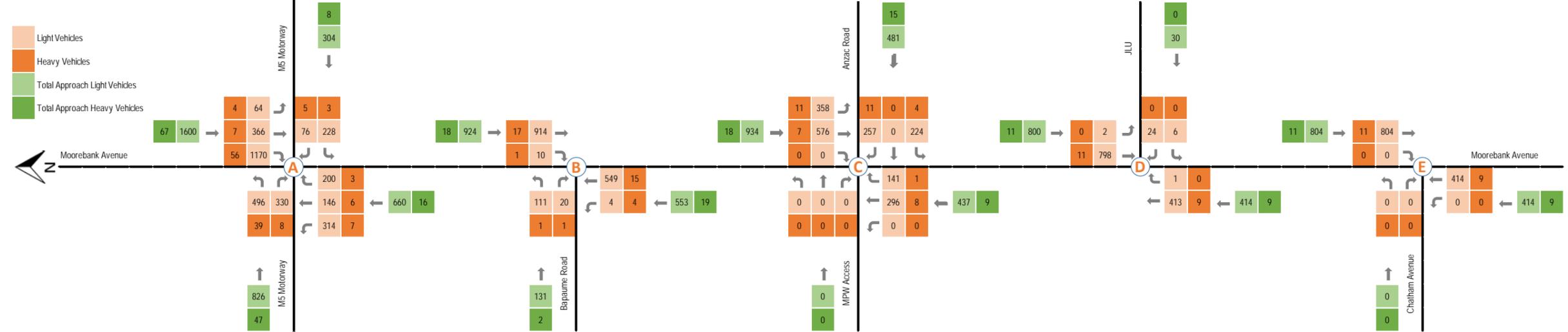


Figure A-2 Existing PM peak 1 hour flows (vehicles) in 2015

**Table A-5 Existing AM and PM peak 1 hour flows (vehicles) in 2015**

Intersection	Approach	Movement	Existing 2015						
			AM Peak 1 Hour			PM Peak 1 Hour			
			Car	Truck	Total	Car	Truck	Total	
M5 Motorway/Moorebank Avenue	North - Moorebank Avenue	Right	370	93	463	1,170	56	1,226	
		Through	138	13	151	366	7	373	
		Left	36	9	45	64	4	68	
	East - M5 Motorway	Right	218	10	228	76	5	81	
		Left	197	28	225	228	3	231	
	South - Moorebank Avenue	Right	203	24	227	200	3	203	
		Through	365	13	378	146	6	152	
		Left	275	25	300	314	7	321	
	West - M5 Motorway	Right	379	20	399	330	8	338	
		Left	1,185	97	1,282	496	39	535	
	Moorebank Avenue/Bapaume Road	North - Moorebank Avenue	Right	132	3	135	10	1	11
			Through	582	58	640	914	17	931
South - Moorebank Avenue		Through	828	61	889	549	15	564	
		Left	33	0	33	4	4	8	
West - Bapaume Road		Right	3	0	3	20	1	21	

Intersection	Approach	Movement	Existing 2015					
			AM Peak 1 Hour			PM Peak 1 Hour		
			Car	Truck	Total	Car	Truck	Total
		Left	0	0	0	0	0	0
Moorebank Avenue/Anzac Road	North - Moorebank Avenue	Through	15	1	16	111	1	112
		Left	0	0	0	0	0	0
	East - Anzac Road	Right	237	29	266	576	7	583
		Left	348	29	377	358	11	369
	South - Moorebank Avenue	Right	283	38	321	257	11	268
		Through	0	0	0	0	0	0

MPW Stage 2 Construction Traffic Impact Assessment - Scenario 1 (Stage 2) - AM Peak

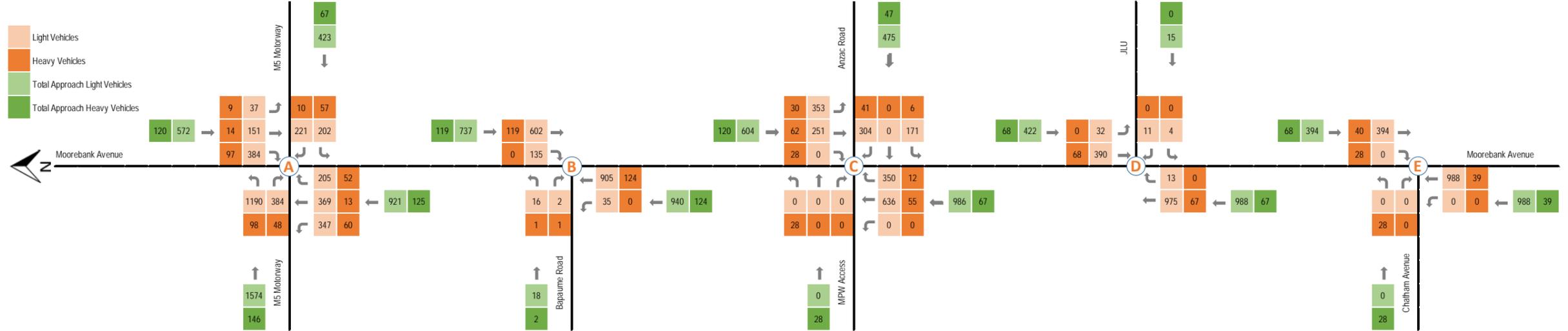


Figure A-3 AM peak one hour traffic volumes with MPW Stage 2 construction traffic – Scenario 1 (Stage 2) in 2018

MPW Stage 2 Construction Traffic Impact Assessment - Scenario 1 (Stage 2) - PM Peak

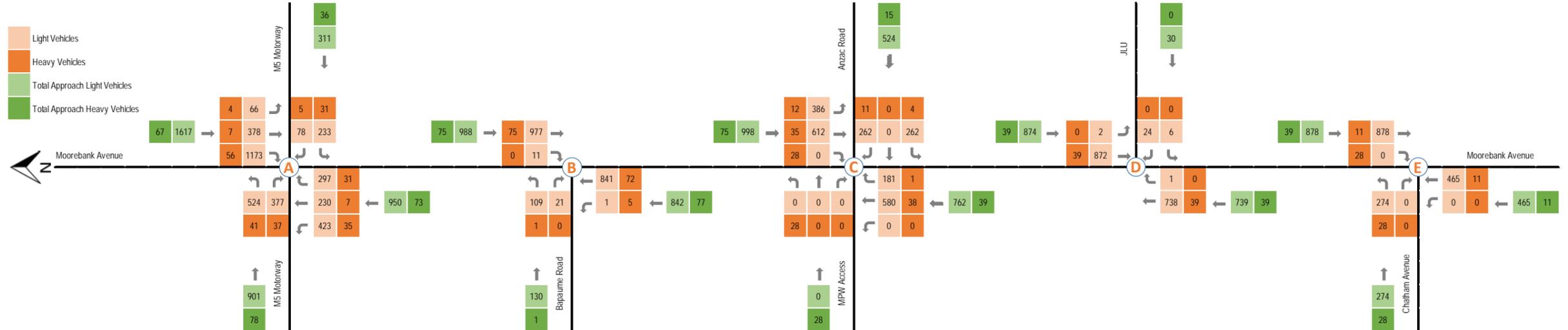


Figure A-4 PM peak one hour traffic volumes with MPW Stage 2 construction traffic – Scenario 1 (Stage 2) in 2018

MPW Stage 2 Construction Traffic Impact Assessment - Scenario 2 (Stage 2) - AM Peak

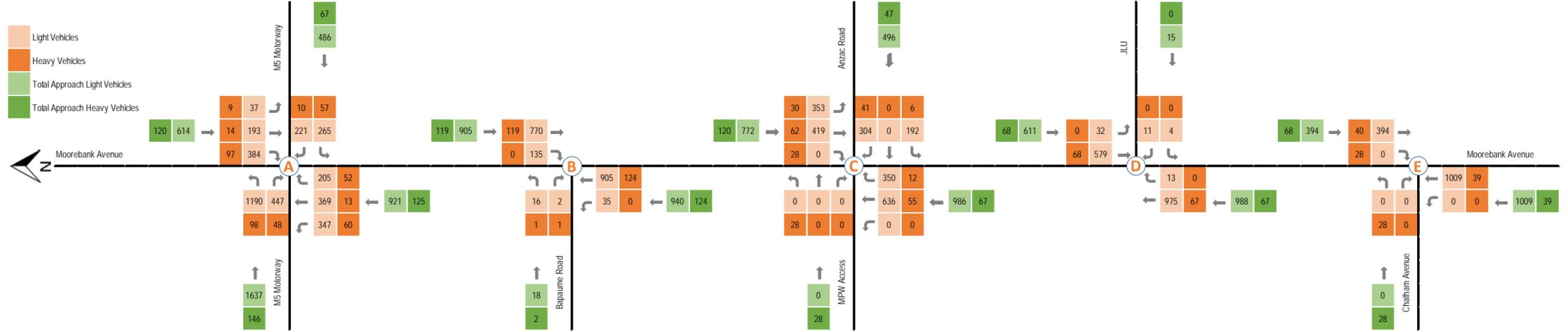


Figure A-5 AM peak one hour traffic volumes with MPW Stage 2 construction traffic – Scenario 2 (Stage 2) in 2018

MPW Stage 2 Construction Traffic Impact Assessment - Scenario 2 (Stage 2) - PM Peak

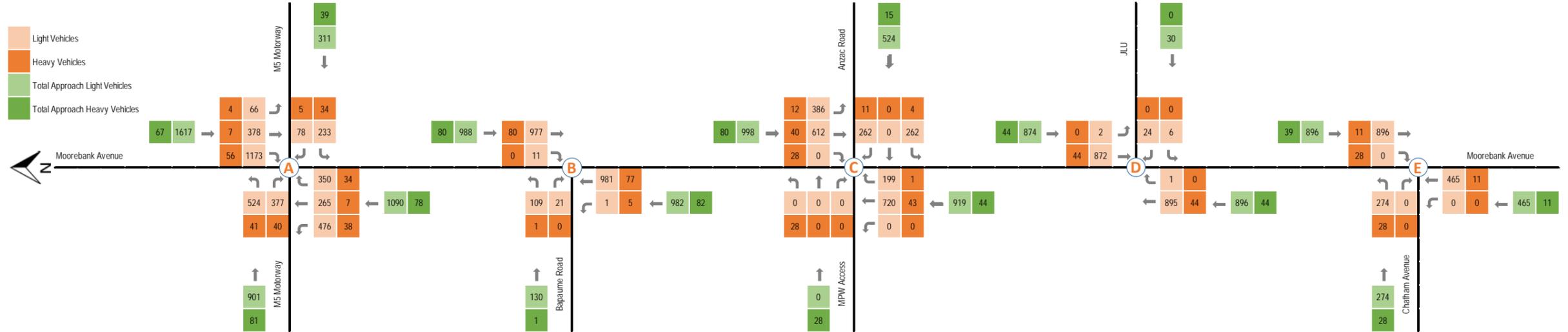


Figure A-6 PM peak one hour traffic volumes with MPW Stage 2 construction traffic – Scenario 2 (Stage 2) in 2018

**Table A-6 Forecast AM and PM peak 1 hour flows with MPW Stage 2 construction traffic – Scenario 1 (Stage 2) in 2018**

Intersection	Approach	Movement	Forecast AM and PM Peak 1 Hour with MPW Stage 2 construction traffic – Scenario 1 (Stage 2)					
			AM Peak 1 Hour			PM Peak 1 Hour		
			Car	Truck	Total	Car	Truck	Total
M5 Motorway/Moorebank Avenue	North - Moorebank Avenue	Right	384	97	481	1,175	56	1,231
		Through	151	14	165	378	7	385
		Left	37	9	46	66	4	70
	East - M5 Motorway	Right	221	10	231	78	5	83
		Left	202	57	259	233	31	264
	South - Moorebank Avenue	Right	205	52	257	297	31	328
		Through	369	13	382	230	7	237
		Left	347	60	407	423	35	458
	West - M5 Motorway	Right	384	48	432	377	37	414
		Left	1,190	98	1,288	524	41	565
Moorebank Avenue/Bapaume Road	North - Moorebank Avenue	Right	135	0	135	11	0	11
		Through	602	119	721	977	75	1,052
	South - Moorebank Avenue	Through	905	124	1,029	841	72	913
		Left	35	0	35	1	5	6

Intersection	Approach	Movement	Forecast AM and PM Peak 1 Hour with MPW Stage 2 construction traffic – Scenario 1 (Stage 2)					
			AM Peak 1 Hour			PM Peak 1 Hour		
			Car	Truck	Total	Car	Truck	Total
	West - Bapaume	Right	2	1	3	21	0	21
		Through	0	0	0	0	0	0
		Left	16	1	17	109	1	110
Moorebank Avenue/Anzac Road	North - Moorebank Avenue	Right	0	28	28	0	28	28
		Through	251	62	313	612	35	647
		Left	353	30	383	386	12	398
	East - Anzac Road	Right	304	41	345	262	11	273
		Through	0	0	0	0	0	0
		Left	171	6	177	262	4	266
	South - Moorebank Avenue	Right	350	12	362	181	1	182
		Through	636	55	691	580	38	618
		Left	0	0	0	0	0	0
	West – MPW Site Access	Right	0	0	0	0	0	0
		Through	0	0	0	0	0	0
		Left	0	28	28	0	28	28

Intersection	Approach	Movement	Forecast AM and PM Peak 1 Hour with MPW Stage 2 construction traffic – Scenario 1 (Stage 2)					
			AM Peak 1 Hour			PM Peak 1 Hour		
			Car	Truck	Total	Car	Truck	Total
Moorebank Avenue/Chatham Avenue	North - Moorebank Avenue	Right	0	28	28	0	28	28
		Through	394	40	434	878	11	889
	South - Moorebank Avenue	Through	988	39	1,027	465	11	476
		Left	0	0	0	0	0	0
	West - Chatham Avenue	Right	0	0	0	0	0	0
		Left	0	28	28	274	28	301

**Table A-7 Forecast AM and PM peak 1 hour flows with MPW Stage 2 construction traffic – Scenario 2 (Stage 2) in 2018**

Intersection	Approach	Movement	Forecast AM and PM Peak 1 Hour with MPW Stage 2 construction traffic – Scenario 2 (Stage 2)					
			AM Peak 1 Hour			PM Peak 1 Hour		
			Car	Truck	Total	Car	Truck	Total
M5 Motorway/Moorebank Avenue	North - Moorebank Avenue	Right	384	97	481	1,175	56	1,231
		Through	193	14	207	378	7	385
		Left	37	9	46	66	4	70
	East - M5 Motorway	Right	221	10	231	78	5	83
		Left	265	57	322	233	34	267
	South - Moorebank Avenue	Right	205	52	257	350	34	383
		Through	369	13	382	265	7	272
		Left	347	60	407	476	38	513
	West - M5 Motorway	Right	447	48	495	377	40	417
		Left	1,190	98	1,288	524	41	565
Moorebank Avenue/Bapaume Road	North - Moorebank Avenue	Right	135	0	135	11	0	11
		Through	770	119	889	977	80	1,057
	South - Moorebank Avenue	Through	905	124	1,029	981	77	1,059
		Left	35	0	35	1	5	6

Intersection	Approach	Movement	Forecast AM and PM Peak 1 Hour with MPW Stage 2 construction traffic – Scenario 2 (Stage 2)					
			AM Peak 1 Hour			PM Peak 1 Hour		
			Car	Truck	Total	Car	Truck	Total
	West - Bapaume	Right	2	1	3	21	0	21
		Through	0	0	0	0	0	0
		Left	16	1	17	109	1	110
Moorebank Avenue/Anzac Road	North - Moorebank Avenue	Right	0	28	28	0	28	28
		Through	419	62	481	612	40	652
		Left	353	30	383	386	12	398
	East - Anzac Road	Right	304	41	345	262	11	273
		Through	0	0	0	0	0	0
		Left	192	6	198	262	4	266
	South - Moorebank Avenue	Right	350	12	362	199	1	200
		Through	636	55	691	720	43	764
		Left	0	0	0	0	0	0
	West – MPW Site Access	Right	0	0	0	0	0	0
		Through	0	0	0	0	0	0
		Left	0	28	28	0	28	28

Intersection	Approach	Movement	Forecast AM and PM Peak 1 Hour with MPW Stage 2 construction traffic – Scenario 2 (Stage 2)					
			AM Peak 1 Hour			PM Peak 1 Hour		
			Car	Truck	Total	Car	Truck	Total
Moorebank Avenue/Chatham Avenue	North - Moorebank Avenue	Right	0	28	28	0	28	28
		Through	394	40	434	896	11	907
	South - Moorebank Avenue	Through	1,009	39	1,048	465	11	476
		Left	0	0	0	0	0	0
	West - Chatham Avenue	Right	0	0	0	0	0	0
		Left	0	28	28	274	28	301

**APPENDIX B - SIDRA SENSITIVITY TESTING FOR  
ANZAC ROAD / MOOREBANK AVENUE  
INTERSECTION AND CHATHAM AVENUE /  
MOOREBANK AVENUE INTERSECTION  
MEMORANDUM (ARCADIS, 2017)**

**Date** 23/06/2017  
**To** Claire Vahtra  
**From** Luke Goldsworthy  
**Copy to** Michael Yong; Wesley Owers  
**Subject** SIDRA Sensitivity Testing for Anzac Road / Moorebank Avenue Intersection and Chatham Avenue / Moorebank Avenue Intersection

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## 1 INTRODUCTION

SIMTA are seeking approval for the construction and operation of the Moorebank Precinct West (MPW) Stage 2 Proposal (the Proposal), which will be the second stage of development under the MPW Concept Approval (SSD 5066).

An Environmental Impact Statement (EIS) was prepared for the Proposal seeking approval under Part 4, Division 4.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The EIS for the Proposal was publicly exhibited between 26 October 2016 and 25 November 2016. During this exhibition period, submissions were invited from all stakeholders including members of the community and government stakeholders. A response to submissions (RtS) report has been prepared which provides a response to the submissions received in relation to the EIS.

In response to the submissions received during exhibition of the Proposal, and as part of a further understanding of construction staging of the Proposal, a sensitivity assessment using SIDRA traffic modelling software (version 7) for the Anzac Road / Moorebank Avenue and Chatham Avenue / Moorebank Avenue intersections (the proposed MPW Stage 2 construction site access points) was undertaken to determine the likely impact on the proposed site access points under various construction traffic distribution profiles and stages of construction at the Anzac Road / Moorebank Avenue intersection.

This technical memorandum describes the methodology and presents the results of additional intersection analysis conducted for the staged construction of the Anzac Road / Moorebank Avenue intersection and the changed lane configuration at the Chatham Avenue / Moorebank Avenue intersection during the construction of the MPW Stage 2 Proposal (SSD 7709) (the Proposal).

The purpose of this technical memorandum is to detail the results of SIDRA sensitivity testing for the MPW Stage 2 construction site access points through various stages of intersection construction.

This technical memorandum:

- Provides background information on the proposed works periods and timings, and associated construction traffic generation (Section 2)
- Describes the methodology used to undertake the sensitivity analysis and illustrates the intersection layouts adopted for the sensitivity testing (Section 3)
- Details the results of the SIDRA analysis (Section 4)
- Provides a summary, conclusion and recommendation of the sensitivity testing (Section 5).

## 2 BACKGROUND

Background information which was used to inform this sensitivity assessment is described below, including an overview of the proposed construction works periods (Section 2.1), and a summary of the traffic generation data which has been used for this assessment (Section 2.2).

### 2.1 Proposed work program

Subject to planning approval, construction of the Proposal is planned to commence in the first quarter of 2018. The total period of construction works for the Proposal is anticipated to be approximately 36 months. The indicative construction programme is shown in Table 2-1.

The construction works have been divided into seven 'works periods' which are interrelated and also may potentially overlap. Subject to confirmation of construction staging, the order of these construction works periods may shift slightly. As detailed in Section 4.3.2 of the MPW Stage 2 Environmental Impact Statement (EIS), and Section 6.4 of the MPW Stage 2 Response to Submissions report (MPW Stage 2 RtS), it is anticipated that construction of the Proposal would be conducted over seven construction works periods, as follows:

- Works period A – Pre-construction stockpiling
- Works period B – Site preparation activities
- Works period C – Bulk earthworks, drainage and utilities
- Works period D– Moorebank Avenue intersection works and internal road network
- Works period E – Intermodal Terminal Facility (IMT) and Rail link connection construction
- Works period F – Warehouse construction and fit out
- Works period G – Miscellaneous structural construction and finishing works.

Table 2-1 Indicative MPW Stage 2 Proposal construction program

Construction Phase	2018				2019				2020				2021			
	Q1	Q2	Q3	Q4												
Works period A – Pre-construction stockpiling																
Works period B - Site Preparation Activities																
Works period C – Bulk earthworks, drainage and utilities																
Works period D - Moorebank Avenue intersection works and internal road network																
Works period E – IMT facility and Rail link connection construction																
Works period F –Construction and fit-out of warehousing and freight village																
Works period G – Miscellaneous structural construction and finishing works																

## 2.2 Traffic Generation

Traffic generation data which has been used for this assessment is based on the traffic generation estimates as presented in the MPW Stage 2 EIS – Construction Traffic Impact Assessment (CTIA) (Arcadis 2016). Additionally, peak construction traffic data for MPE Stage 1 from the SIMTA Intermodal Terminal Facility Stage 1 – Construction Traffic Impact Assessment (Hyder 2015) was used for the cumulative assessment (see Section 3.2 for description of scenarios tested). Table 2-2 presents the traffic generation for each works period for MPW Stage 2 and the peak construction works period for MPE Stage 1.

Table 2-2 Assumed daily construction traffic volumes (two-way)

Works Period	Light Vehicle	Heavy Vehicle	Total	Source of construction traffic data volumes
<b>MPW Stage 2</b>				
Works Period A – Site establishment works	30	370	400	
Works Period B – Site preparation activities	50	26	76	
Works Period C – Bulk earthworks, drainage and utilities	50	740	790	
Works Period D– Moorebank Avenue intersection works and internal road network	50	19	69	MPW Stage 2 EIS – Construction Traffic Impact Assessment (Table 4-1) – Arcadis 2016
Works Period E – IMT Facility and Rail link connection construction	350	31	381	
Works Period F – Warehouse and freight village construction and fit out	120	20	140	
Works period G – Miscellaneous structural construction and finishing works	100	6	106	
<b>MPE Stage 1</b>				
Works Period 3 – Engineering Fill	750	112	862	SIMTA Intermodal Terminal Facility Stage 1 – Construction Traffic Impact Assessment (Table 4-2) – Hyder (2015)

## 3 METHODOLOGY

The methodology adopted for this sensitivity assessment included:

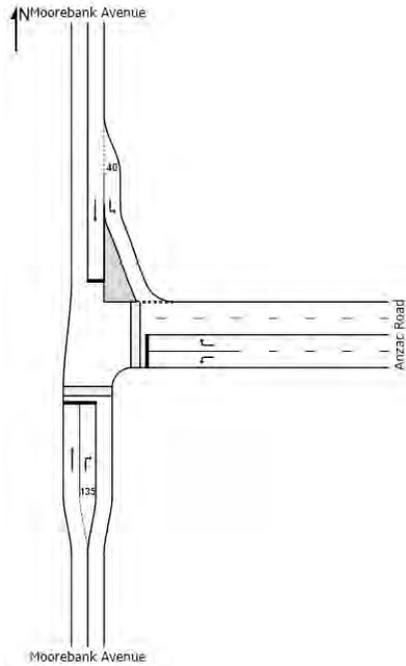
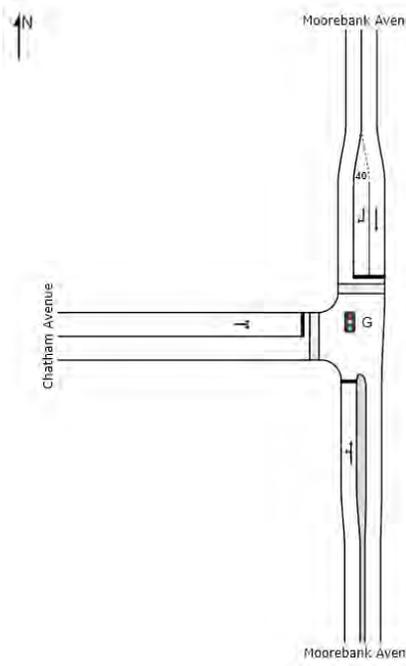
1. Determine staging for the construction of the upgraded Anzac Road / Moorebank Avenue intersection, as presented in the Amended Proposal as part of the MPW Stage 2 RtS, and align with the anticipated timing for the MPW Stage 2 construction works periods, based on the construction program (refer to Section 2.1) to determine worst case construction traffic movements through each construction stage of the Proposal.
2. Identify the likely construction works periods that would be undertaken at the same time as these stages, based on the construction program, and determine worst-case construction traffic movements during each stage of construction.
3. Identify the construction site access points to be used during each stage of construction of the Anzac Road/ Moorebank Avenue intersection upgrade.
4. Undertake sensitivity testing using SIDRA for each construction stage of the Anzac Road/ Moorebank Avenue intersection upgrade, using the identified construction traffic movements during each stage of construction. The modelling scenarios used in the SIDRA modelling are detailed further in Section 3.2 below.

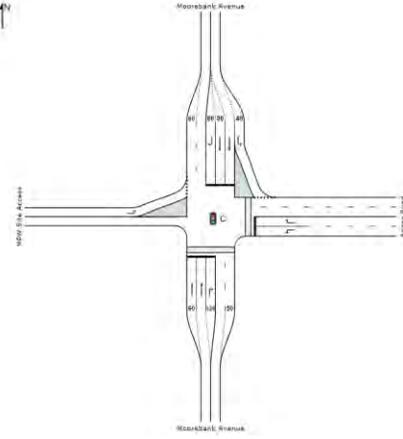
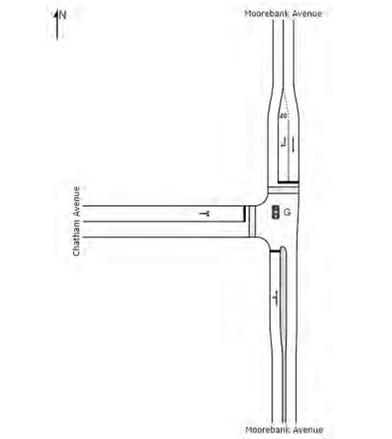
### 3.1 Indicative intersection staging and layouts

A breakdown of each intersection construction stage, including the intersection layout/ configuration and the likely construction works periods that would be undertaken during each stage is presented in Table 3-1.

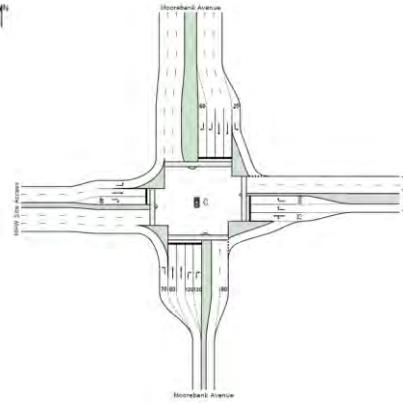
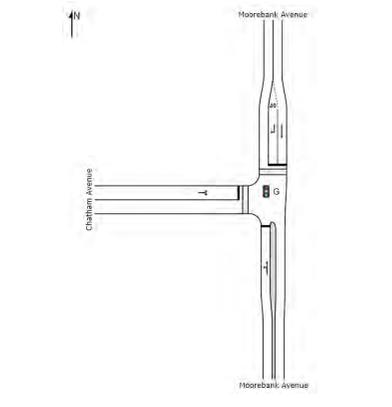
A comparison between the current Moorebank Avenue/ Anzac Road and Moorebank Avenue/ Chatham Avenue intersections with the proposed layouts during the three intersection construction stages is provided in Appendix C.

Table 3-1 Adopted Assessment Stages, Works Periods and Intersection Layouts

Intersection construction stage	Description of intersection Layouts	Adopted Anzac Road / Moorebank Avenue Intersection Layout	Adopted Chatham Avenue / Moorebank Avenue Intersection Layout	MPW Stage 2 Construction works period(s)
1	<ul style="list-style-type: none"> <li>• Proposed Anzac Road / Moorebank Avenue intersection:                             <ul style="list-style-type: none"> <li>– One through lane and one left-turn short slip-lane on the Moorebank Avenue north approach (southbound) (proposed configuration)</li> <li>– One through lane and one right-turn short-lane on the Moorebank Avenue south approach (northbound) (proposed configuration)</li> <li>– One right-turn lane and one left-turn lane on the Anzac Road east approach (westbound) (existing configuration)</li> </ul> </li> <li>• Proposed Chatham Avenue / Moorebank Avenue intersection:                             <ul style="list-style-type: none"> <li>– One through lane and one right-turn short-lane on the Moorebank Avenue north approach (southbound) including a proposed extension to the southbound right-turn lane length (proposed configuration)</li> </ul> </li> </ul>	 <p style="text-align: center;">Proposed Layout</p>	 <p style="text-align: center;">Proposed Layout</p>	A, B, D

Intersection construction stage	Description of intersection Layouts	Adopted Anzac Road / Moorebank Avenue Intersection Layout	Adopted Chatham Avenue / Moorebank Avenue Intersection Layout	MPW Stage 2 Construction works period(s)
	<ul style="list-style-type: none"> <li>- One shared through/left-turn lane on the Moorebank Avenue south approach (northbound) (existing configuration)</li> <li>- One shared left/right-turn lane on the Chatham Avenue west approach (eastbound) (existing configuration)</li> </ul>			
2	<ul style="list-style-type: none"> <li>• Proposed Anzac Road / Moorebank Avenue intersection: <ul style="list-style-type: none"> <li>- One right-turn short-lane, one through lane, one short through lane and one left-turn short slip-lane on the Moorebank Avenue north approach (southbound) (proposed configuration)</li> <li>- One short-length and one full-length through lane and one right-turn short-lane on the Moorebank Avenue south approach (northbound) (proposed configuration)</li> <li>- One right-turn lane and one left-turn lane on the Anzac Road east approach (westbound) (existing configuration)</li> </ul> </li> </ul>	 <p data-bbox="1030 1117 1220 1141">Proposed Layout</p>	 <p data-bbox="1467 1117 1657 1141">Proposed Layout</p>	C, D, E, F

Intersection construction stage	Description of intersection Layouts	Adopted Anzac Road / Moorebank Avenue Intersection Layout	Adopted Chatham Avenue / Moorebank Avenue Intersection Layout	MPW Stage 2 Construction works period(s)
	<ul style="list-style-type: none"> <li>- One left-turn slip-lane on the MPW site access west approach (eastbound) (proposed configuration)</li> <li>• Proposed Chatham Avenue / Moorebank Avenue intersection: <ul style="list-style-type: none"> <li>- One through lane and one right-turn short-lane on the Moorebank Avenue north approach (southbound) including a proposed extension to the southbound right-turn lane length (proposed configuration)</li> <li>- One shared through/left-turn lane on the Moorebank Avenue south approach (northbound) (existing configuration)</li> <li>- One shared left/right-turn lane on the Chatham Avenue west approach (eastbound) (existing configuration)</li> </ul> </li> </ul>			

Intersection construction stage	Description of intersection Layouts	Adopted Anzac Road / Moorebank Avenue Intersection Layout	Adopted Chatham Avenue / Moorebank Avenue Intersection Layout	MPW Stage 2 Construction works period(s)
3	<ul style="list-style-type: none"> <li>• Proposed Anzac Road / Moorebank Avenue intersection: <ul style="list-style-type: none"> <li>– One right-turn short-lane and full length lane, two through lanes and one left-turn short slip-lane on the Moorebank Avenue north approach (southbound) (proposed configuration)</li> <li>– One left-turn short slip-lane, one short-lane and full length through lane and two right-turn short-lanes on the Moorebank Avenue south approach (northbound) (proposed configuration)</li> <li>– One right-turn short-lane and full length lane and one through/left-turn short slip-lane on the Anzac Road east approach (westbound) (proposed configuration)</li> <li>– One full length continuous left-turn slip-lane, one full length through-lane and one right-turn short lane on the MPW site access west approach (eastbound) (proposed configuration)</li> </ul> </li> </ul>	 <p style="text-align: center;">Proposed Layout</p>	 <p style="text-align: center;">Proposed Layout</p>	C, D, E, F

Intersection construction stage	Description of intersection Layouts	Adopted Anzac Road / Moorebank Avenue Intersection Layout	Adopted Chatham Avenue / Moorebank Avenue Intersection Layout	MPW Stage 2 Construction works period(s)
	<ul style="list-style-type: none"> <li>• Proposed Chatham Avenue / Moorebank Avenue intersection:               <ul style="list-style-type: none"> <li>– One through lane and one right-turn short-lane on the Moorebank Avenue north approach (southbound) including a proposed extension to the southbound right-turn lane length (proposed configuration)</li> <li>– One shared through/left-turn lane on the Moorebank Avenue south approach (northbound) (existing configuration)</li> <li>– One shared left/right-turn lane on the Chatham Avenue west approach (eastbound) (existing configuration)</li> </ul> </li> </ul>			

## 3.2 SIDRA Modelling scenarios and sensitivity testing

The sensitivity assessment was undertaken for the layout of the intersections at each construction stage. With the exception of Stage 1, where all construction traffic would access and egress the site via Chatham Avenue, a range of traffic distributions for LV and HV was applied to construction Stages 2 and 3.

A summary of the adopted traffic distributions across the two access intersections, as applied to this sensitivity testing, is shown in Table 3-2.

To undertake the sensitivity testing, SIDRA network modelling (using version 7.0.7.6759) was undertaken, using the previous SIDRA models developed for the MPW Stage 2 and MPE Stage 2 EIS submissions as a basis. For each of the proposed intersection construction stages, the intersection layout was modelled under the following scenarios:

- Scenario 1 – Construction of the Proposal only
- Scenario 2 – Scenario 1 plus construction traffic from MPE Stage 1 for Works Period 3 (as reported in Table 4-1 of the SIMTA Intermodal Terminal Facility – Stage 1 Construction Traffic Impact Assessment (Hyder 2015)). This is considered to be the cumulative worst case construction scenario, consistent with the MPW Stage 2 EIS.

Section 3.1 discusses the proposed intersection construction staging and layouts adopted for this assessment.

## 3.3 Assumptions

The construction sensitivity assessment was undertaken based on the following assumptions:

- The assessment has been undertaken for 2018 AM and PM peak periods, indicative of the likely peak construction period for the Proposal i.e. concurrent undertaking of Works Periods A, B and D for Stage 1 and Works Periods C, D, E and F for Stages 2 and 3
- The Bapaume Road / Moorebank Avenue intersection would be maintained as an all movement intersection during Stages 1 and 2, and changed to a left-out only intersection in Stage 3, however, no construction related traffic was assigned to this intersection
- All trip distributions to the external road network remained unchanged from that reported in the MPW Stage 2 Construction Traffic Impact assessment (Arcadis 2016) and the SIMTA Intermodal Terminal Facility Stage 1 Construction Traffic Impact Assessment (Hyder 2015)
- Adopted acceptable intersection performance criteria is LOS D or better as per Roads and Maritime Services guidelines
- The estimated daily construction traffic volumes detailed in Table 2-2 have been used in the SIDRA analysis

Table 3-2 Adopted Construction Traffic Distribution Assumptions

Intersection	Intersection Construction Stage 1		Intersection Construction Stage 2						Intersection Construction Stage 3						Modelling Scenarios
	Stage 1		Stage 2(i)		Stage 2(ii)		Stage 2(iii)		Stage 3(i)		Stage 3(ii)		Stage 3(iii)		
Vehicle type	LV	HV	LV	HV	LV	HV	LV <sup>1</sup>	HV	LV	HV	LV	HV	LV	HV	
Anzac Road / Moorebank Avenue	-	-	-	50%	-	75%	-	100%	50%	50%	75%	75%	100%	100%	1 and 2
Chatham Avenue / Moorebank Avenue	100%	100%	100% <sup>1</sup>	50%	100% <sup>1</sup>	25%	100% <sup>1</sup>	-	50%	50%	25%	25%	-	-	1 and 2

LV – Light Vehicle  
 HV – Heavy Vehicle

<sup>1</sup> Light vehicle distribution remained at 100% through the Chatham Avenue / Moorebank Avenue intersection during intersection construction Stage 2 due to light vehicles being unable to access the Proposal through the Anzac Road / Moorebank Avenue intersection

## 4 SIDRA MODELLING SUMMARY RESULTS

Based on the methodology and assumptions described in Section 0 of this memorandum, the results of the SIDRA modelling for each scenario are presented in the following sections.

An overview of the modelling results is provided in Section 4.1 and a more detailed breakdown of modelling results for Scenario 1 and Scenario 2 are provided in Sections 4.2 and 4.3, respectively.

### 4.1 Overview of modelling results

A summary of the modelling results for the Anzac Road / Moorebank Avenue and Chatham Avenue/ Moorebank Avenue intersections under Scenario 1 and Scenario 2 is provided below in Table 4-1 and Table 4-2, respectively.

#### 4.1.1 Scenario 1

Under Scenario 1, the Anzac Road/ Moorebank Avenue and Chatham Avenue/ Moorebank intersection would operate satisfactorily during all construction stages, under all modelled traffic distribution assumptions.

#### 4.1.2 Scenario 2

Under Scenario 2, the Anzac Road/ Moorebank Avenue intersection would operate satisfactorily under all modelled traffic distribution scenarios.

It was also observed that the Anzac Road / Moorebank Avenue intersection performance generally improved when less construction traffic was distributed south to Chatham Avenue i.e. from Stage 2(i) to Stage 2(iii) and from Stage 3(i) to Stage 3(iii). This is as a result of lower north and south through movements at the Anzac Road / Moorebank Avenue intersection which results in more green time being provided to the east and west approaches.

The Chatham Avenue/ Moorebank Avenue intersection would operate satisfactorily during all construction stages, under all modelled traffic distribution assumptions.

Table 4-1 SIDRA summary results - Scenario 1

Intersection Construction Stage	Anzac Road/ Moorebank Avenue intersection				Chatham Avenue/ Moorebank Avenue intersection			
	AM Peak		PM Peak		AM Peak		PM Peak	
	Delay (s)	LoS	Delay (s)	LoS	Delay (s)	LoS	Delay (s)	LoS
Stage 1	27	B	29	C	19	B	17	B
Stage 2(i)	28	B	21	B	19	B	25	B
Stage 2(ii)	27	B	20	B	18	B	21	B
Stage 2(iii)	26	B	21	B	18	B	24	B
Stage 3(i)	28	B	20	B	19	B	18	B
Stage 3(ii)	28	B	20	B	18	B	16	B
Stage 3(iii)	26	B	21	B	18	B	15	B

Table 4-2 SIDRA summary results - Scenario 2

Intersection Construction Stage	Anzac Road/ Moorebank Avenue intersection				Chatham Avenue/ Moorebank Avenue intersection			
	AM Peak		PM Peak		AM Peak		PM Peak	
	Delay (s)	LoS	Delay (s)	LoS	Delay (s)	LoS	Delay (s)	LoS
Stage 1	41	C	30	C	21	B	18	B
Stage 2(i)	41	C	23	B	21	B	27	B
Stage 2(ii)	35	C	25	B	21	B	22	B
Stage 2(iii)	32	C	23	B	20	B	25	B
Stage 3(i)	26	B	21	B	21	B	18	B
Stage 3(ii)	25	B	21	B	21	B	16	B
Stage 3(iii)	27	B	22	B	20	B	15	B

## 4.2 Scenario 1 – MPW Stage 2 Construction

The SIDRA modelling results for Scenario 1 are discussed below with detailed SIDRA movement summaries provided in Appendix A of this memorandum.

### 4.2.1 Construction Stage 1

- HV – 100% via Chatham Avenue / Moorebank Avenue
- LV – 100% via Chatham Avenue / Moorebank Avenue

#### 4.2.1.1 Intersection performance

For Construction Stage 1, the Anzac Road / Moorebank Avenue intersection would operate at an acceptable level of service (LoS) B in the AM and LoS C in the PM peak, whilst the Chatham Avenue / Moorebank Avenue intersection would also operate at an acceptable LoS B in the AM and PM peak.

Table 4-3 Summary SIDRA Results for Construction Stage 1 – Scenario 1

Intersection	Peak Period	Average Delay (s)	LoS
Anzac Road / Moorebank Avenue intersection	AM	27	B
	PM	29	C
Chatham Avenue / Moorebank Avenue intersection	AM	19	B
	PM	17	B

#### 4.2.1.2 Impacts on queue lengths

##### Anzac Road / Moorebank Avenue intersection

In the AM and PM peak period, queue lengths for the Anzac Road / Moorebank Avenue intersection are generally contained within the provided lane storage lengths, with the exception of the north approach (southbound) through movement lane, which is expected to queue back beyond the Bapaume Road / Moorebank Avenue intersection by approximately 36m in the AM peak period and 70m in the PM peak period. This would not block back to the M5 Motorway / Moorebank Avenue interchange which is approximately 340m north of the Bapaume Road / Moorebank Avenue intersection.

##### Chatham Avenue / Moorebank Avenue intersection

In the AM and PM peak period, queue lengths for the Chatham Avenue / Moorebank Avenue intersection are not expected to exceed lane storage lengths.

## 4.2.2 Construction Stage 2(i)

- HV – 50% via Anzac Road / Moorebank Avenue and 50% via Chatham Avenue / Moorebank Avenue
- LV – 100% via Chatham Avenue / Moorebank Avenue

### 4.2.2.1 Intersection performance

For Construction Stage 2(i), the Anzac Road / Moorebank Avenue intersection would operate at LoS B in the AM and PM peak, whilst the Chatham Avenue / Moorebank Avenue intersection would also operate at an acceptable LoS B in the AM and PM peak.

Table 4-4 Summary SIDRA Results for Construction Stage 2(i) – Scenario 1

Intersection	Peak Period	Average Delay (s)	LoS
Anzac Road / Moorebank Avenue intersection	AM	28	B
	PM	21	B
Chatham Avenue / Moorebank Avenue intersection	AM	19	B
	PM	25	B

### 4.2.2.2 Impacts on queue lengths

#### Anzac Road / Moorebank Avenue intersection

In the AM and PM peak period, queue lengths for the Anzac Road / Moorebank Avenue intersection are not expected to exceed lane storage lengths with the exception of the southbound approach in the PM peak, which is expected to queue back to, but not beyond, the Bapaume Road / Moorebank Avenue intersection.

This would not impact on the M5 Motorway / Moorebank Avenue interchange.

#### Chatham Avenue / Moorebank Avenue intersection

In the AM and PM peak period, queue lengths for the Chatham Avenue / Moorebank Avenue intersection are not expected to exceed lane storage lengths.

## 4.2.3 Construction Stage 2(ii)

- HV – 75% via Anzac Road / Moorebank Avenue and 25% via Chatham Avenue / Moorebank Avenue
- LV – 100% via Chatham Avenue / Moorebank Avenue

### 4.2.3.1 Intersection performance

For Construction Stage 2(ii), the Anzac Road / Moorebank Avenue intersection would operate at LoS B in the AM and PM peak, whilst the Chatham Avenue / Moorebank Avenue intersection would also operate at an acceptable LoS B in the AM and PM peak.

Table 4-5 Summary SIDRA Results for Construction Stage 2(ii) – Scenario 1

Intersection	Peak Period	Average Delay (s)	LoS
Anzac Road / Moorebank Avenue intersection	AM	27	B
	PM	20	B
Chatham Avenue / Moorebank Avenue intersection	AM	18	B
	PM	21	B

### 4.2.3.2 Impacts on queue lengths

#### Anzac Road / Moorebank Avenue intersection

In the AM and PM peak period, queue lengths for the Anzac Road / Moorebank Avenue intersection are not expected to exceed lane storage lengths.

#### Chatham Avenue / Moorebank Avenue intersection

In the AM and PM peak period, queue lengths for the Chatham Avenue / Moorebank Avenue intersection are not expected to exceed lane storage lengths.

## 4.2.4 Construction Stage 2(iii)

- HV – 100% via Anzac Road / Moorebank Avenue
- LV – 100% via Chatham Avenue / Moorebank Avenue

### 4.2.4.1 Intersection performance

For Construction Stage 2(iii), the Anzac Road / Moorebank Avenue intersection would operate at LoS B in the AM and PM peak, whilst the Chatham Avenue / Moorebank Avenue intersection would operate at an acceptable LoS B in the AM and PM peak.

Table 4-6 Summary SIDRA Results for Construction Stage 2(iii) – Scenario 1

Intersection	Peak Period	Average Delay (s)	LoS
Anzac Road / Moorebank Avenue intersection	AM	26	B
	PM	21	B
Chatham Avenue / Moorebank Avenue intersection	AM	18	B
	PM	24	B

### 4.2.4.2 Impacts on queue lengths

#### Anzac Road / Moorebank Avenue intersection

In the AM and PM peak period, queue lengths for the Anzac Road / Moorebank Avenue intersection are not expected to exceed lane storage lengths.

#### Chatham Avenue / Moorebank Avenue intersection

In the AM and PM peak period, queue lengths for the Chatham Avenue / Moorebank Avenue intersection are not expected to exceed lane storage lengths.

## 4.2.5 Construction Stage 3(i)

- HV – 50% via Anzac Road / Moorebank Avenue and 50% via Chatham Avenue / Moorebank Avenue
- LV – 50% via Anzac Road / Moorebank Avenue and 50% via Chatham Avenue / Moorebank Avenue

### 4.2.5.1 Intersection performance

For Construction Stage 3(i), the Anzac Road / Moorebank Avenue and Chatham Avenue / Moorebank Avenue intersections would operate at an acceptable LoS B in the AM and PM peak.

Table 4-7 Summary SIDRA Results for Construction Stage 3&4(i) – Scenario 1

Intersection	Peak Period	Average Delay (s)	LoS
Anzac Road / Moorebank Avenue intersection	AM	28	B
	PM	20	B
Chatham Avenue / Moorebank Avenue intersection	AM	19	B
	PM	18	B

### 4.2.5.2 Impacts on queue lengths

#### Anzac Road / Moorebank Avenue intersection

In the AM and PM peak period, queue lengths for the Anzac Road / Moorebank Avenue intersection are not expected to exceed lane storage lengths with the exception of the north approach in the PM peak which is expected to queue back to, but not beyond, the Bapaume Road / Moorebank Avenue intersection. This would not impact on the M5 Motorway / Moorebank Avenue interchange.

#### Chatham Avenue / Moorebank Avenue intersection

In the AM and PM peak period, queue lengths for the Chatham Avenue / Moorebank Avenue intersection are not expected to exceed lane storage lengths.

## 4.2.6 Construction Stage 3(ii)

- HV – 75% via Anzac Road / Moorebank Avenue and 25% via Chatham Avenue / Moorebank Avenue
- LV – 75% via Anzac Road / Moorebank Avenue and 25% via Chatham Avenue / Moorebank Avenue

### 4.2.6.1 Intersection performance

For Construction Stage 3(ii), the Anzac Road / Moorebank Avenue intersection would operate at LoS B in the AM and PM peak, whilst the Chatham Avenue / Moorebank Avenue intersection would operate at LoS B in the AM and PM peak.

Table 4-8 Summary SIDRA Results for Construction Stage 3&4(ii) – Scenario 1

Intersection	Peak Period	Average Delay (s)	LoS
Anzac Road / Moorebank Avenue intersection	AM	28	B
	PM	20	B
Chatham Avenue / Moorebank Avenue intersection	AM	18	B
	PM	16	B

### 4.2.6.2 Impacts on queue lengths

#### Anzac Road / Moorebank Avenue intersection

In the AM and PM peak period, queue lengths for the Anzac Road / Moorebank Avenue intersection are not expected to exceed lane storage lengths.

#### Chatham Avenue / Moorebank Avenue intersection

In the AM and PM peak period, queue lengths for the Chatham Avenue / Moorebank Avenue intersection are not expected to exceed lane storage lengths.

## 4.2.7 Construction Stage 3(iii)

- HV – 100% via Anzac Road / Moorebank Avenue
- LV – 100% via Anzac Road / Moorebank Avenue

### 4.2.7.1 Intersection performance

For Construction Stage 3(iii), the Anzac Road / Moorebank Avenue intersection would operate at an acceptable LoS B in the AM and PM peak, whilst the Chatham Avenue / Moorebank Avenue intersection would operate at an acceptable LoS B in the AM and PM peak.

Table 4-9 Summary SIDRA Results for Construction Stage 3&4(iii) – Scenario 1

Intersection	Peak Period	Average Delay (s)	LoS
Anzac Road / Moorebank Avenue intersection	AM	26	B
	PM	21	B
Chatham Avenue / Moorebank Avenue intersection	AM	18	B
	PM	15	B

### 4.2.7.2 Impacts on queue lengths

#### Anzac Road / Moorebank Avenue intersection

In the AM and PM peak period, queue lengths for the Anzac Road / Moorebank Avenue intersection are not expected to exceed lane storage lengths with the exception of the southbound approach in the AM peak, which is expected to queue back beyond Bapaume Road / Moorebank Avenue intersection by approximately 15m.

These queue lengths do not block back to the M5 Motorway / Moorebank Avenue interchange which is approximately 340m north of the Bapaume Road / Moorebank Avenue intersection.

#### Chatham Avenue / Moorebank Avenue intersection

In the AM and PM peak period, queue lengths for the Chatham Avenue / Moorebank Avenue intersection are not expected to exceed lane storage lengths.

## 4.3 Scenario 2 – Cumulative Construction

The SIDRA modelling results for Scenario 2 are discussed below with detailed SIDRA movement summaries provided in Appendix B of this memorandum.

### 4.3.1 Construction Stage 1

- HV – 100% via Chatham Avenue / Moorebank Avenue
- LV – 100% via Chatham Avenue / Moorebank Avenue

#### 4.3.1.1 Intersection performance

For Construction Stage 1, the Anzac Road / Moorebank Avenue intersection would operate at LoS C in the AM and PM peak, whilst the Chatham Avenue / Moorebank Avenue intersection would operate at LoS B in the AM and PM peak.

Table 4-10 Summary SIDRA Results for Construction Stage 1a and 1b – Scenario 2

Intersection	Peak Period	Average Delay (s)	LoS
Anzac Road / Moorebank Avenue intersection	AM	41	C
	PM	30	C
Chatham Avenue / Moorebank Avenue intersection	AM	21	B
	PM	18	B

#### 4.3.1.2 Impacts on queue lengths

##### Anzac Road / Moorebank Avenue intersection

In the AM peak period, queue lengths for the Anzac Road / Moorebank Avenue intersection are expected to exceed lane storage lengths on the Anzac Road east approach (westbound) and extend approximately 52m beyond the Secombe Place / Anzac Road intersection. In the AM and PM peak period, the north approach through lane is expected to queue back beyond Bapaume Road / Moorebank Avenue intersection by approximately 70m. These queue lengths do not block back to the M5 Motorway / Moorebank Avenue interchange which is approximately 340m north of the Bapaume Road / Moorebank Avenue intersection.

##### Chatham Avenue / Moorebank Avenue intersection

In the AM and PM peak period, queue lengths for the Chatham Avenue / Moorebank Avenue intersection are not expected to exceed lane storage lengths.

### 4.3.2 Construction Stage 2(i)

- HV – 50% via Anzac Road / Moorebank Avenue and 50% via Chatham Avenue / Moorebank Avenue
- LV – 100% via Chatham Avenue / Moorebank Avenue

#### 4.3.2.1 Intersection performance

For Construction Stage 2(i) , the Anzac Road / Moorebank Avenue intersection would operate at LoS C in the AM peak and LoS B in the PM peak, whilst the Chatham Avenue / Moorebank Avenue intersection would operate at LoS B in the AM and PM peak.

Table 4-11 Summary SIDRA Results for Construction Stage 2(i) – Scenario 2

Intersection	Peak Period	Average Delay (s)	LoS
Anzac Road / Moorebank Avenue intersection	AM	41	C
	PM	23	B
Chatham Avenue / Moorebank Avenue intersection	AM	21	B
	PM	27	B

#### 4.3.2.2 Impacts on queue lengths

##### Anzac Road / Moorebank Avenue intersection

In the AM peak period, queue lengths for the Anzac Road / Moorebank Avenue intersection are expected to exceed lane storage lengths on the Anzac Road east approach (westbound) and extend approximately 38m beyond the Secombe Place / Anzac Road intersection.

In the AM and PM peak period, the southbound approach through lane is expected to queue back beyond Bapaume Road / Moorebank Avenue intersection by approximately 90m. These queue lengths do not block back to the M5 Motorway / Moorebank Avenue interchange which is approximately 340m north of the Bapaume Road / Moorebank Avenue intersection.

##### Chatham Avenue / Moorebank Avenue intersection

In the AM and PM peak period, queue lengths for the Chatham Avenue / Moorebank Avenue intersection are not expected to exceed lane storage lengths.

### 4.3.3 Construction Stage 2(ii)

- HV – 75% via Anzac Road / Moorebank Avenue and 25% via Chatham Avenue / Moorebank Avenue
- LV – 100% via Chatham Avenue / Moorebank Avenue

#### 4.3.3.1 Intersection performance

For Construction Stage 2(ii), the Anzac Road / Moorebank Avenue intersection would operate at LoS C in the AM peak and LoS B in the PM peak, whilst the Chatham Avenue / Moorebank Avenue intersection would operate at LoS B in the AM and PM peak.

Table 4-12 Summary SIDRA Results for Construction Stage 2(ii) – Scenario 2

Intersection	Peak Period	Average Delay (s)	LoS
Anzac Road / Moorebank Avenue intersection	AM	35	C
	PM	25	B
Chatham Avenue / Moorebank Avenue intersection	AM	21	B
	PM	22	B

#### 4.3.3.2 Impacts on queue lengths

##### Anzac Road / Moorebank Avenue intersection

In the AM and PM peak period, queue lengths for the Anzac Road / Moorebank Avenue intersection are not expected to exceed lane storage lengths with the exception of the north approach in the AM peak which is expected to queue back beyond Bapaume Road / Moorebank Avenue intersection by approximately 75m. These queue lengths do not block back to the M5 Motorway / Moorebank Avenue interchange which is approximately 340m north of the Bapaume Road / Moorebank Avenue intersection.

##### Chatham Avenue / Moorebank Avenue intersection

In the AM and PM peak period, queue lengths for the Chatham Avenue / Moorebank Avenue intersection are not expected to exceed lane storage lengths.

### 4.3.4 Construction Stage 2(iii)

- HV – 100% via Anzac Road / Moorebank Avenue
- LV – 100% via Chatham Avenue / Moorebank Avenue

#### 4.3.4.1 Intersection performance

For Construction Stage 2(iii), the Anzac Road / Moorebank Avenue intersection would operate at LoS C in the AM peak and LoS B in the PM peak, whilst the Chatham Avenue / Moorebank Avenue intersection would operate at LoS B in the AM and PM peak.

Table 4-13 Summary SIDRA Results for Construction Stage 2(iii) – Scenario 2

Intersection	Peak Period	Average Delay (s)	LoS
Anzac Road / Moorebank Avenue intersection	AM	32	C
	PM	23	B
Chatham Avenue / Moorebank Avenue intersection	AM	20	B
	PM	25	B

#### 4.3.4.2 Impacts on queue lengths

##### Anzac Road / Moorebank Avenue intersection

In the AM and PM peak period, queue lengths for the Anzac Road / Moorebank Avenue intersection are not expected to exceed lane storage lengths with the exception of the north approach in the AM peak, which is expected to queue back beyond Bapaume Road / Moorebank Avenue intersection by approximately 40m.

These queue lengths do not block back to the M5 Motorway / Moorebank Avenue interchange which is approximately 340m north of the Bapaume Road / Moorebank Avenue intersection.

##### Chatham Avenue / Moorebank Avenue intersection

In the AM and PM peak period, queue lengths for the Chatham Avenue / Moorebank Avenue intersection are not expected to exceed lane storage lengths.

### 4.3.5 Construction Stage 3(i)

- HV – 50% via Anzac Road / Moorebank Avenue and 50% via Chatham Avenue / Moorebank Avenue
- LV – 50% via Anzac Road / Moorebank Avenue and 50% via Chatham Avenue / Moorebank Avenue

#### 4.3.5.1 Intersection performance

For Construction Stage 3(i), the Anzac Road / Moorebank Avenue intersection would operate at LoS B in the AM peak and PM peak, whilst the Chatham Avenue / Moorebank Avenue intersection would operate at LoS B in the AM and PM peak.

Table 4-14 Summary SIDRA Results for Construction Stage 3&4(i) – Scenario 2

Intersection	Peak Period	Average Delay (s)	LoS
Anzac Road / Moorebank Avenue intersection	AM	26	B
	PM	21	B
Chatham Avenue / Moorebank Avenue intersection	AM	21	B
	PM	18	B

#### 4.3.5.2 Impacts on queue lengths

##### Anzac Road / Moorebank Avenue intersection

In the AM and PM peak period, queue lengths for the Anzac Road / Moorebank Avenue intersection are not expected to exceed lane storage lengths with the exception of the north approach in the AM peak which is expected to queue back beyond Bapaume Road / Moorebank Avenue intersection by approximately 6m. These queue lengths do not block back to the M5 Motorway / Moorebank Avenue interchange which is approximately 340m north of the Bapaume Road / Moorebank Avenue intersection.

##### Chatham Avenue / Moorebank Avenue intersection

In the AM and PM peak period, queue lengths for the Chatham Avenue / Moorebank Avenue intersection are not expected to exceed lane storage lengths.

### 4.3.6 Construction Stage 3(ii)

- HV – 75% via Anzac Road / Moorebank Avenue and 25% via Chatham Avenue / Moorebank Avenue
- LV – 75% via Anzac Road / Moorebank Avenue and 25% via Chatham Avenue / Moorebank Avenue

#### 4.3.6.1 Intersection performance

For Construction Stage 3(ii), the Anzac Road / Moorebank Avenue intersection would operate at LoS B in the AM and PM peak, whilst the Chatham Avenue / Moorebank Avenue intersection would also operate at LoS B in the AM and PM peak.

Table 4-15 Summary SIDRA Results for Construction Stage 3&4(ii) – Scenario 2

Intersection	Peak Period	Average Delay (s)	LoS
Anzac Road / Moorebank Avenue intersection	AM	25	B
	PM	21	B
Chatham Avenue / Moorebank Avenue intersection	AM	21	B
	PM	16	B

#### 4.3.6.2 Impacts on queue lengths

##### Anzac Road / Moorebank Avenue intersection

In the AM and PM peak period, queue lengths for the Anzac Road / Moorebank Avenue intersection are not expected to exceed lane storage lengths.

##### Chatham Avenue / Moorebank Avenue intersection

In the AM and PM peak period, queue lengths for the Chatham Avenue / Moorebank Avenue intersection are not expected to exceed lane storage lengths.

### 4.3.7 Construction Stage 3(iii)

- HV – 100% via Anzac Road / Moorebank Avenue
- LV – 100% via Anzac Road / Moorebank Avenue

#### 4.3.7.1 Intersection performance

For Construction Stage 3(iii), the Anzac Road / Moorebank Avenue intersection would operate at an acceptable LoS B in the AM and PM peak, whilst the Chatham Avenue / Moorebank Avenue intersection would operate at LoS B in the AM and PM peak.

Table 4-16 Summary SIDRA Results for Construction Stage 3&4(iii) – Scenario 2

Intersection	Peak Period	Average Delay (s)	LoS
Anzac Road / Moorebank Avenue intersection	AM	27	B
	PM	22	B
Chatham Avenue / Moorebank Avenue intersection	AM	20	B
	PM	15	B

#### 4.3.7.2 Impacts on queue lengths

##### Anzac Road / Moorebank Avenue intersection

In the AM and PM peak period, queue lengths for the Anzac Road / Moorebank Avenue intersection are not expected to exceed lane storage lengths with the exception of the north approach in the AM peak which is expected to queue back beyond Bapaume Road / Moorebank Avenue intersection by approximately 30m.

These queue lengths do not block back to the M5 Motorway / Moorebank Avenue interchange which is approximately 340m north of the Bapaume Road / Moorebank Avenue intersection.

##### Chatham Avenue / Moorebank Avenue intersection

In the AM and PM peak period, queue lengths for the Chatham Avenue / Moorebank Avenue intersection are not expected to exceed lane storage lengths.

## 5 CONCLUSIONS

A sensitivity assessment using SIDRA traffic modelling software (version 7) for the Anzac Road / Moorebank Avenue and Chatham Avenue / Moorebank Avenue intersections (the proposed MPW Stage 2 construction site access points) was undertaken to determine the likely impact on the proposed site access points under various construction traffic distribution profiles and stages of construction at the Anzac Road / Moorebank Avenue intersection. The sensitivity analysis tested the performance of these intersections through various stages of intersection construction for two development scenarios (i.e. Scenario 1 - MPW Stage 2 construction only and Scenario 2 - Cumulative construction (MPW Stage 2 + MPE Stage 1)).

Based on the SIDRA sensitivity analysis undertaken, it was determined that the proposed intersection layouts would operate satisfactorily for all construction stages and traffic distribution.

Some queue lengths for the Anzac Road / Moorebank Avenue intersection were observed queuing back to the adjacent intersections of Bapaume Road / Moorebank Avenue and Secombe Place / Moorebank Avenue for various stages and scenarios, however, the overall intersection performance is within the acceptable limits of Level of service and these queues do not impact on the operation of the M5 Motorway / Moorebank Avenue interchange.