



REPORT

VOLUME 2

Environmental Impact Statement

Prestons Waste Treatment Facility

Submitted to:

NSW Department of Planning, Industry and Environment

Submitted by:

Hi Quality Waste Treatment Services Pty Ltd

Golder Associates Pty Ltd

Level 8, 40 Mount Street, North Sydney, New South Wales 2060, Australia

20142192-052-R-Rev0 - Appendices A to D

August 2021



APPENDIX A

SEARS

Planning Secretary's Environmental Assessment Requirements

Section 4.12(8) of the *Environmental Planning and Assessment Act 1979*
 Schedule 2 of the *Environmental Planning and Assessment Regulation 2000*

Application Number	SSD-9346594
Project Name	Prestons Waste treatment Facility
Development	Construction and operation of a waste treatment facility with the capacity to process up to 270,000 tonnes of contaminated soil, contaminated sludges and liquid waste.
Location	9-13 Whyalla Place Lot 103 DP 866530 within Liverpool City LGA
Applicant	Hi-Quality Waste Treatment Services Pty Ltd
Date of Issue	14/10/2020
General Requirements	<p>The environmental impact statement (EIS) for the development must meet the form and content requirements of clauses 6 and 7 of Schedule 2 of the Environmental Planning and Assessment Regulation 2000 (the Regulation).</p> <p>In addition, the EIS must include:</p> <ul style="list-style-type: none"> · a detailed description of the development, including: <ul style="list-style-type: none"> - an accurate history of the site, including development consents and confirmation of the intention to surrender any existing development consents - the need for the proposed development - justification for the proposed development - likely staging of the development - likely interactions between the development and existing, approved and proposed operations in the vicinity of the site - plans of any proposed building works - contributions required to offset the proposal and - infrastructure upgrades or items required to facilitate the development, including measures to ensure these upgrades are appropriately maintained. · consideration of all relevant environmental planning instruments, including identification and justification of any inconsistencies with these instruments · consideration of issues discussed in the public authority responses to key issues (available the Department's Planning Portal) including detailed responses to the EPA's key issues identified in its letter dated 7 October 2020. · a risk assessment of the potential environmental impacts of the development, identifying the key issues for further assessment · a detailed assessment of the key issues specified below, and any other significant issues identified in this risk assessment, which includes: <ul style="list-style-type: none"> - a description of the existing environment, using sufficient baseline data - an assessment of the potential impacts of all stages of the development, including any cumulative impacts, taking into consideration relevant guidelines, policies, plans and statutes and - a description of the measures that would be implemented to avoid, minimise, mitigate and if necessary, offset the potential impacts of the development, including proposals for adaptive management and/or contingency plans to manage significant risks to the environment. · a consolidated summary of all the proposed environmental management and monitoring measures, highlighting commitments included in the EIS. <p>The EIS must also be accompanied by:</p>

	<ul style="list-style-type: none"> · high quality files of maps and figures of the subject site and proposal · a report from a qualified quantity surveyor providing: <ul style="list-style-type: none"> - a detailed calculation of the capital investment value (CIV) of the proposal (as defined in clause 3 of the Environmental Planning and Assessment Regulation 2000) of the proposal, including details of all assumptions and components from which the CIV calculation is derived. The report shall be prepared on company letterhead and indicate the applicable GST component of the CIV - an estimate of the jobs that will be created by the development during the construction and operational phases of the proposed development and - certification that the information provided is accurate at the date of preparation.
<p>Key issues</p>	<p>The EIS must include an assessment of the potential impacts of the proposal (including cumulative impacts) and develop appropriate measures to avoid, mitigate, manage and/or offset these impacts.</p> <p>The EIS must address the following specific matters:</p> <ul style="list-style-type: none"> · Statutory and strategic context – including: <ul style="list-style-type: none"> - detailed justification for the proposal and the suitability of the site - detailed justification that the proposed land use is permissible with consent - a detailed description of the history of the site, including the relationship between the proposed development and all development consents and approved plans previously and/or currently applicable to the site - demonstration that the proposal is consistent with all relevant planning strategies, environmental planning instruments, adopted precinct plans, draft district plan(s) and adopted management plans and justification for any inconsistencies. This includes, but is not limited to: <ul style="list-style-type: none"> o State Environmental Planning Policy (Infrastructure) 2007 o State Environmental Planning Policy (State and Regional Development) 2011 o State Environmental Planning Policy No. 55 – Remediation of Land o Liverpool Local Environmental Plan 2008 o Greater Sydney Region Plan: A Metropolis of Three Cities o Our Greater Sydney 2056: Central City District Plan o Future Transport Strategy 2056. · Suitability of the Site – including: <ul style="list-style-type: none"> - a detailed justification that the site can accommodate the proposed waste treatment facility. · Community and Stakeholder Engagement – including: <ul style="list-style-type: none"> - a detailed community and stakeholder participation strategy which identifies who in the community has been consulted and a justification for their selection, other stakeholders consulted and the form(s) of the consultation, including a justification for this approach - a report on the results of the implementation of the strategy including issues raised by the community and surrounding owners and occupiers that may be impacted by the proposal - details of how issues raised during community and stakeholder consultation have been addressed and whether they have resulted in changes to the proposal and - details of the proposed approach to future community and stakeholder engagement based on the results of the consultation. · Waste Management – including: <ul style="list-style-type: none"> - a description of each of the waste streams that would be accepted at the site including maximum daily, weekly and annual throughputs and the maximum size for stockpiles

- details of the source of the waste streams to justify the need for the proposed processing capacity
- a description of waste processing operations (including flow diagrams for each waste stream), including a description of the technology to be installed, resource outputs and the quality control measures that would be implemented.
- details of how waste would be stored (including the maximum daily storage capacity of the site) and handled on site, and transported to and from the site including details of how the receipt of non-conforming waste would be dealt with
- detail the developments waste tracking system for incoming and outgoing waste
- details of the waste management strategy for construction and ongoing operational waste generated and
- details of the measures that would be implemented to ensure that the development is consistent with the aims, objectives and guidance in the NSW Waste Avoidance and Resource Recovery Strategy 2014-2021.

- **Air Quality and Odour** – including:

- a quantitative assessment of the potential air quality, dust and odour impacts of the development in accordance with relevant Environment Protection Authority guidelines
- the details of buildings and air handling systems and strong justification for any material handling, processing or stockpiling external to buildings
- a greenhouse gas assessment and
- details of proposed mitigation, management and monitoring measures.

- **Noise and Vibration** – including:

- a quantitative noise and vibration impact assessment undertaken by a suitably qualified person in accordance with the relevant Environment Protection Authority guidelines and including an assessment of nearby sensitive receivers
- cumulative impacts of other developments and
- details and justification of the proposed noise mitigation, management and monitoring measures.

- **Soils and Water** – including:

- an assessment of potential surface and groundwater impacts associated with the development, including potential impacts on watercourses, riparian areas, groundwater, and groundwater-dependent communities nearby
- a detailed site water balance including a description of the water demands and breakdown of water supplies, and any water licensing requirements
- details of stormwater/wastewater management system including the capacity of onsite detention system(s), onsite sewage management and measures to treat, reuse or dispose of water
- description of the measures to minimise water use
- detailed flooding assessment
- description of the proposed erosion and sediment controls during construction
- characterisation of water quality at the point of discharge to surface and/or groundwater against the relevant water quality criteria (including details of the contaminants of concern that may leach from the waste into the wastewater and proposed mitigation measures to manage any impacts to receiving waters and monitoring activities and methodologies) and
- characterisation of the nature and extent of any contamination on the site and surrounding area.

- **Traffic and Transport** – including:

- details of all traffic types and volumes likely to be generated during

construction and operation, including daily and peak traffic movements, and a description of key access / haul routes

- an assessment of the predicted impacts of this traffic on road safety and the capacity of the road network, including consideration of cumulative traffic impacts at key intersections using SIDRA or similar traffic model
- plans demonstrating how all vehicles likely to be generated during construction and operation and awaiting loading, unloading or servicing can be accommodated on the site to avoid queuing in the street network
- details and plans of any, loading dock servicing and provisions, on-site parking provisions, and sufficient pedestrian and cyclist facilities, in accordance with the relevant Australian Standards
- details of the largest vehicle anticipated to access and move within the site, and swept path diagrams depicting vehicles entering, exiting and manoeuvring throughout the site
- details of road upgrades, infrastructure works or new roads or access points required for the development if necessary.

• **Human Health** –an assessment of the potential impacts to employees at the facility and any off-site impacts including:

- details of measures to manage the exposure of employees to contaminants including the use of appropriate personal protective equipment and engineering controls at the facility to reduce exposure
- details of health monitoring of employees and awareness and education measures
- preventative measures for community exposure from the off-site transfer of contaminants
- details of work health and safety system consistent with the requirements of the Work Health and Safety Regulation 2011.

• **Hazards and Risk** – including a preliminary risk screening completed in accordance with *State Environmental Planning Policy No. 33 – Hazardous and Offensive Development* and Applying SEPP 33 (DoP, 2011), with a clear indication of class, quantity and location of all dangerous goods and hazardous materials associated with the development. Should preliminary screening indicate that the project is “potentially hazardous” a Preliminary Hazard Analysis (PHA) must be prepared in accordance with *Hazardous Industry Planning Advisory Paper No. 6 – Guidelines for Hazard Analysis* (DoP, 2011) and *Multi-Level Risk Assessment* (DoP, 2011).

• **Fire and Incident Management** – including:

- identification of the aggregate quantities of combustible waste products to be stockpiled at any one time
- technical information on the environmental protection equipment to be installed on the premises such as air, water and noise controls, spill clean-up equipment and fire (including location of fire hydrants and water flow rates at the hydrant) management and containment measures
- details regarding the fire hydrant system and its minimum water supply capabilities appropriate to the site’s largest stockpile fire load
- details of size and volume of stockpiles and their management and separation to minimise fire spread and facilitate emergency vehicle access
- consideration of consistency with NSW Fire & Rescue Fire Safety Guideline – Fire Safety in Waste Facilities (February 2020) and
- detailed information relating to the proposed structures addressing relevant levels of compliance with Volume One of the National Construction Code (NCC).

• **Cultural Heritage and Aboriginal Cultural Heritage** – including:

- identify and describe the Aboriginal cultural heritage values that exist across the development and document in an Aboriginal Cultural Heritage Assessment Report (ACHAR) which may include the need for a surface

	<ul style="list-style-type: none"> survey and test excavations - consultation with Aboriginal people must be undertaken and documented in ACHAR - a description of the impacts on Aboriginal cultural heritage values. · Biodiversity – including an assessment of the proposal's biodiversity impacts in accordance with the Biodiversity Conservation Act 2016, including the preparation of a Biodiversity Development Assessment Report (BDAR) where required under the Act, except where a waiver for preparation of a BDAR has been granted. · Ecologically sustainable development – including a description of how the development will incorporate the principles of ecologically sustainable development in the design, construction and ongoing operation of the development.
Consultation	<p>During the preparation of the EIS, you must consult with the relevant local, State or Commonwealth Government authorities, service providers, community groups and affected landowners.</p> <p>In particular you must consult with:</p> <ul style="list-style-type: none"> · Liverpool Council · Environment Protection Authority · Environment, Energy and Science Group · Heritage NSW · NSW Fire and Rescue · Sydney Water · Transport for NSW · surrounding local landowners and stakeholders <p>The EIS must describe the consultation process and the issues raised and identify where the design of the development has been amended in response to these issues. Where amendments have not been made to address an issue, a short explanation should be provided.</p>
Further consultation after 2 years	<p>If you do not lodge a Development Application and EIS for the development within two (2) years of the issue date of these SEARs, you must consult further with the Secretary in relation to the preparation of the EIS.</p>
References	<p>The assessment of the key issues listed above must take into account relevant guidelines, policies, and plans as identified. While not exhaustive, Attachment 1 contains a list of some of the guidelines, policies, and plans that may be relevant to the environmental assessment of this proposal.</p>

ATTACHMENT 1

Technical and Policy Guidelines

The following guidelines may assist in the preparation of the environmental impact statement. This list is not exhaustive and not all of these guidelines may be relevant to your proposal.

Many of these documents can be found on the following websites:

<http://www.planning.nsw.gov.au>

<http://www.shop.nsw.gov.au/index.jsp>

<http://www.australia.gov.au/publications>

<http://www.epa.nsw.gov.au/>

<http://www.environment.nsw.gov.au/>

<http://www.dpi.nsw.gov.au/>

Plans and Documents

The EIS must include all relevant plans, architectural drawings, diagrams and relevant documentation required under Schedule 1 of the Environmental Planning and Assessment Regulation 2000. Provide these as part of the EIS rather than as separate documents.

In addition, the EIS must include the following:

1. An existing site survey plan drawn at an appropriate scale illustrating:
 - the location of the land, boundary measurements, area (sqm) and north point
 - the existing levels of the land in relation to buildings and roads
 - location and height of existing structures on the site
 - location and height of adjacent buildings and private open space
 - all levels to be to Australian Height Datum (AHD).

2. Locality/context plan drawn at an appropriate scale should be submitted indicating:
 - significant local features such as heritage items
 - the location and uses of existing buildings, shopping and employment areas
 - traffic and road patterns, pedestrian routes and public transport nodes.

3. Drawings at an appropriate scale illustrating:
 - detailed plans, sections and elevations of the existing building, which clearly show all proposed buildings

- detailed plans of proposed access driveways, internal roads, carparking and external alterations services infrastructure.

4. Schedule of materials, colours and additions. finishes.

Documents to be Submitted

Documents to submit include:

- one (1) hard copy and one (1) electronic copy of all the documents and plans for review prior to exhibition
 - other copies as determined by the Department once the development application is lodged.
-

Policies, Guidelines & Plans

Aspect	Policy / Methodology
Traffic, Transport and Access	
	Roads Act 1993
	State Environmental Planning Policy (Infrastructure) 2007
	Guide to Traffic Generating Development (RTA, 2002 as updated)
	Road Design Guide (RMS, 2015-2017)
	Guide to Traffic Management – Pt 12: Traffic Impacts of Development (Austroads, 2016)
	Guidelines for Planning and Assessment of Road Freight Access in Industrial Areas (Austroads, 2014)
	Bicycle Parking Facilities: Guidelines for Design and Installation (AS 2890.3:2015)
	Integrated Public Transport Service Planning Guidelines: Sydney Metropolitan Area (TfNSW, 2013)
	Future Transport Strategy 2056 (TfNSW, 2018)
	Greater Sydney Services and Infrastructure Plan (TfNSW, 2018)
	NSW Freight & Ports Plan 2018-2023 (TfNSW, 2018)
Soils and Water	
<i>Erosion and Sediment</i>	Managing Urban Stormwater: Soils & Construction (Landcom, 2004)
	Soil and Landscape Issues in Environmental Impact Assessment (DLWC, 2000)
	Wind Erosion – 2nd Edition (DIPNR, 2003)
<i>Groundwater</i>	National Water Quality Management Strategy Guidelines for Groundwater Protection in Australia (ARMCANZ/ANZECC, 2000)
	NSW State Groundwater Policy Framework Document (DLWC, 1997)
	NSW Aquifer Interference Policy (NOW, 2012)
	Water Sharing Plan for the Greater Metropolitan Region Groundwater Sources (NOW, 2011)
	Storing and Handling Liquids: Environmental Protection (DECC, 2007)
<i>Stormwater</i>	Managing Urban Stormwater: Strategic Framework. Draft (EPA, 1996)
	Managing Urban Stormwater: Council Handbook. Draft (EPA, 1997)
	Managing Urban Stormwater: Treatment Techniques (DEC, 2006)
	Managing Urban Stormwater: Source Control. Draft (EPA, 1998)
	Managing Urban Stormwater: Harvesting and Reuse (DEC, 2006)
<i>Wastewater</i>	National Water Quality Management Strategy: Guidelines for Sewerage Systems - Effluent Management (ARMCANZ/ANZECC, 1997)
	National Water Quality Management Strategy: Guidelines for Sewerage Systems - Use of Reclaimed Water (ARMCANZ/ANZECC, 2000)
	National Water Quality Management Strategy – Guidelines for Water Recycling: Managing Health and Environmental Risks (Phase 1) (EPHC, NRMCC & AHMC, 2006)
	National Water Quality Management Strategy – Guidelines for Water Recycling: Managing Health and Environmental Risks (Phase 2) (EPHC, NRMCC & AHMC,

	2009)
<i>Contamination</i>	State Environmental Planning Policy No. 55 – Remediation of Land
Hazards and Risk	
	State Environmental Planning Policy No. 33 – Hazardous and Offensive Development
	Applying SEPP 33 – Hazardous and Offensive Development Application Guidelines (DoP, 2011)
Noise and Vibration	
	Assessing Vibration: A Technical Guide (DEC, 2006)
	Noise Policy for Industry (EPA, 2017)
	Environmental Criteria for Road Traffic Noise (EPA, 1999)
	Noise Guide for Local Government (EPA, 2013)
	Interim Construction Noise Guideline (DECC, 2009)
Air Quality	
<i>Air Quality</i>	Protection of the Environment Operations (Clean Air) Regulation 2002
	Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales (DEC, 2007)
	Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (EPA, 2016)
<i>Odour</i>	Assessment and Management of Odour from Stationary Sources in NSW (DEC 2006)
<i>Greenhouse Gas</i>	AGO Factors and Methods Workbook (AGO, 2018)
	Guidelines for Energy Savings Action Plans (DEUS, 2005)
Waste	
	Waste Avoidance and Resource Recovery Strategy 2014-2021 (EPA)
	The National Waste Policy: Less Waste More Resources 2009
	Waste Classification Guidelines (EPA 2008)
	Environmental guidelines: Composting and Related Organics Processing Facilities (DEC 2004)
	Environmental guidelines: Use and Disposal of Biosolid Products (EPA 1997)
	Composts, soil conditioners and mulches (Standards Australia, AS 4454)
	NSW Energy from Waste Policy Statement (EPA 2015)
	Standards for Managing Construction Waste in NSW (EPA 2018)
Visual	
	Control of Obtrusive Effects of Outdoor Lighting (AS 2482)
Social	
	Social Impact Assessment Guideline (DPE, 2017)

Policies, Guidelines & Plans

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Traffic, Transport and Access	
	Roads Act 1993
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	Guide to Traffic Generating Development (RTA, 2002 as updated)
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	National Water Quality Management Strategy: Guidelines for Sewerage Systems - Use of Reclaimed Water (ARMCANZ/ANZECC, 2000)
	National Water Quality Management Strategy – Guidelines for Water Recycling: Managing Health and Environmental Risks (Phase 1) (EPHC, NRMMC & AHMC, 2006)
	National Water Quality Management Strategy – Guidelines for Water Recycling: Managing Health and Environmental Risks (Phase 2) (EPHC, NRMMC & AHMC, 2009)
<i>Contamination</i>	State Environmental Planning Policy No. 55 – Remediation of Land
Hazards and Risk	
	State Environmental Planning Policy No. 33 – Hazardous and Offensive Development
	Applying SEPP 33 – Hazardous and Offensive Development Application Guidelines (DoP, 2011)
Biodiversity	
	Biodiversity Conservation Act 2016
	Biodiversity Assessment Method (OEH, 2017)
	Guidelines for Controlled Activities on Waterfront Land (NRAR, 2018)
Heritage	
	Heritage Act 1977
	NSW Heritage Manual (HO and DUAP, 1996)
	The Burra Charter (ICOMOS Australia, 2013)
	Statements of Heritage Impact (HO and DUAP, 2002)
	Code of Practice for the Archaeological Investigation of Aboriginal Objects in New South Wales (DECCW, 2010)
	Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (DECCW, 2011)
	Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 (DECCW, 2010)
Noise and Vibration	
	Assessing Vibration: A Technical Guide (DEC, 2006)
	Noise Policy for Industry (EPA, 2017)
	Environmental Criteria for Road Traffic Noise (EPA, 1999)
	Noise Guide for Local Government (EPA, 2013)
	Interim Construction Noise Guideline (DECC, 2009)
Air Quality	
	Protection of the Environment Operations (Clean Air) Regulation 2002
<i>Air Quality</i>	Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales (DEC, 2007)
	Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (EPA, 2016)

<i>Odour</i>	Assessment and Management of Odour from Stationary Sources in NSW (DEC 2006)
<i>Greenhouse Gas</i>	AGO Factors and Methods Workbook (AGO, 2018)
	Guidelines for Energy Savings Action Plans (DEUS, 2005)
Upper Canal and Warragamba Pipeline Corridors	
	Guidelines for Development Adjacent to the Upper Canal and Warragamba Pipelines (WaterNSW, 2018)
Bushfire	
	Planning for Bushfire Protection (RFS, 2006)
Waste	
	Waste Avoidance and Resource Recovery Strategy 2014-2021 (EPA)
	The National Waste Policy: Less Waste More Resources 2009
	Waste Classification Guidelines (EPA 2008)
	Environmental guidelines: Composting and Related Organics Processing Facilities (DEC 2004)
	Environmental guidelines: Use and Disposal of Biosolid Products (EPA 1997)
	Composts, soil conditioners and mulches (Standards Australia, AS 4454)
	NSW Energy from Waste Policy Statement (EPA 2015)
	Standards for Managing Construction Waste in NSW (EPA 2018)
Visual	
	Control of Obtrusive Effects of Outdoor Lighting (AS 2482)
Social	
	Social Impact Assessment Guideline (DPE, 2017)

APPENDIX B

Consultation Materials

APPENDIX B1

**Community Stakeholder
Feedback**

From: [Praneesh Chand - Hi-Quality Group](#)
To: [Daniel Blair - Hi Quality Group](#)
Subject: Fwd: Hi Quality Prestons
Date: Friday, 13 August, 2021 1:51:53 PM
Attachments: [image004.png](#)
[image005.png](#)
[image006.png](#)
[image007.png](#)
[image008.png](#)
[image009.png](#)
[image012.png](#)

Hi Daniel

See below. I have one client replied already.
Just waiting for one more.

Thanks Praneesh

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From: Anthony Alpen <anthony@tankmanagement.com.au>
Sent: Friday, August 13, 2021 1:49 pm
To: Praneesh Chand - Hi-Quality Group
Subject: RE: Hi Quality Prestons





Hi Praneesh,

We're pleased to have read the Hi Quality Group EIS and fully support the development. This will provide a much needed additional outlet for the processing of waste products.

Kind regards,

Anthony Alpen

[Tank Management Australia](#)

 [02 8786 4804](tel:0287864804)
 [0419 616 224](tel:0419616224)
 anthony@tankmanagement.com.au
 www.tankmanagement.com.au



From: [Praneesh Chand - Hi-Quality Group](#)
To: [Daniel Blair - Hi Quality Group](#)
Subject: Fwd: Proposed Prestons Facility
Date: Wednesday, 18 August, 2021 2:25:56 PM
Attachments: [image001.png](#)

Hi Daniel

See another client as requested for prestons.

Thanks Praneesh

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From: Daniel Lopez <daniel.lopez@sydgal.com>
Sent: Wednesday, August 18, 2021 2:22 pm
To: Praneesh Chand - Hi-Quality Group
Subject: Proposed Prestons Facility

Hi Praneesh,

We at Sydney Galvanizing are aware of the current proposed facility in Prestons and would greatly benefit having access to a local waste treatment service provider. Currently we are stock piling waste to maximise transport efficiency, having a local service would free up valuable space on our site.

Regards,

Daniel Lopez
Production Manager



QMS to ISO9001:2008, OHS to AS/NZS4801:2001, EMS to ISO 14001:2001

Phone: 02 9607 2880

Fax: 02 9607 3088

Web: www.sydgal.com

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From: [Michael Oxman](#)
To: [Daniel Blair - Hi Quality Group](#)
Subject: HGQ Prestons Proposed Facility
Date: Tuesday, 17 August, 2021 9:58:07 AM
Attachments: [image001.png](#)

Hi Daniel,

As discussed ETS is aware of, and generally supports the proposed Hi Quality Group facility at Prestons.

Let me know if you need anything else.

Thanks,

Michael Oxman

Operations Manager

Environmental Treatment Solution (ETS)

M: 0417 657 597
F: (02) 8078 0197
E: michaelo@envirotreat.com.au

Image



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APPENDIX B2

Regulatory Stakeholder Feedback

McCrory, Jessica

Subject: FW: SSD-9346592 Prestons Waste Treatment Facility Consultation

From: Danielle Playford <Danielle.Playford@epa.nsw.gov.au>
Sent: Tuesday, June 29, 2021 10:28 AM
To: McMahon, Jacinta <jmcmahon@golder.com.au>
Cc: Emma Barnet <Emma.Barnet@planning.nsw.gov.au>; Alexander Spaller <Alexander.Spaller@epa.nsw.gov.au>;
Christine Mitchell <Christine.Mitchell@epa.nsw.gov.au>
Subject: RE: SSD-9346592 Prestons Waste Treatment Facility Consultation

EXTERNAL EMAIL

EXTERNAL EMAIL - We could not verify the authenticity of this message. Please be cautious when clicking on links or opening attachments.

Hi Jacinta

Thank you for the invitation, however any request for the EPA must to be put through Planning NSW as the appropriate Authority co-ordinating and processing the Proponents proposal. Please note the EPA does not attend progress meetings in respect of Proposals. The EPA's requirements are set out in the SEARS, if there is clarification sort from the Proponent on actioning the SEARS please provide that in writing to Planning NSW who will than request a response from the EPA. The EPA will review and comment on the EIS when requested by Planning NSW.

Regards
Danielle

Danielle Playford
Unit Head
Regulatory Operations
NSW Environment Protection Authority
D 02 9995 6292 | M 0455078551



www.epa.nsw.gov.au @NSW_EPA

The EPA acknowledges the traditional custodians of the land and waters where we work. As part of the world's oldest surviving culture, we pay our respect to Aboriginal elders past, present and emerging.

Report pollution and environmental incidents 131 555 or +61 2 9995 5555

From: McMahon, Jacinta <jmcmahon@golder.com.au>
Sent: Friday, 25 June 2021 7:42 AM
To: Danielle Playford <Danielle.Playford@epa.nsw.gov.au>
Cc: Robinson, Todd <TRobinson@golder.com.au>
Subject: SSD-9346592 Prestons Waste Treatment Facility Consultation

Hi Danielle,

The preparation of the EIS for SSD-9346592 Prestons Waste Treatment Facility is in progress.

We would like to arrange a brief session with EPA to consult on the development of the project.

Can you advise your availability.

Regards, Jacinta

Jacinta McMahon
Principal Design Engineer



GOLDER
MEMBER OF WSP

Golder Associates Pty Ltd
Level 8, 40 Mount Street, North Sydney, New South Wales 2060, Australia (PO Box 1302, Crows Nest NSW 1585)

T: +61 2 9478 3900 | **M:** +61 488 400 780 | golder.com

[LinkedIn](#) | [Instagram](#) | [Facebook](#) | [Twitter](#)

Golder acknowledges that this office sits on what is, and will always be, Cammeraygal Land. We recognise Aboriginal and Torres Strait Islander Peoples as the first scientists and engineers and pay our respects to Elders past, present and emerging.

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PLEASE CONSIDER THE ENVIRONMENT BEFORE PRINTING THIS EMAIL

McCrory, Jessica

Subject: FW: Industrial development stormwater management information request for 9 Whyalla Place, Prestons
Attachments: D5_Stormwater_Drainage_Design.PDF; D4_Subsurface_Drainage_Design.PDF; OnSite_Stormwater_Detention_Technical_Specification.PDF; Onsite_Stormwater_Detention_Policy.PDF

From: Troy Morris <MorrisT@liverpool.nsw.gov.au>
Sent: Wednesday, June 2, 2021 1:53 PM
To: Basnayaka, Amila <ABasnayaka@golder.com.au>
Cc: Charlie Caraballo <CaraballoC@liverpool.nsw.gov.au>
Subject: FW: Industrial development stormwater management information request for 9 Whyalla Place, Prestons

EXTERNAL EMAIL

I apologise for the delay in response Amila.

Please see attached a couple of Council's design specifications relating to stormwater. Let me know if you need anything further. The DCP Part 1 General & Part 7 Industrial (website) may also assist.

Regarding connection points as shown, there appears to be a drainage easement benefitting the site at these locations, however they are private. I will forward your request to Council's Assets Team to see if Council has any information on these.

Regards

Troy Morris
Land Development Engineer



02 8711 7811 | | MorrisT@liverpool.nsw.gov.au

Customer Service: 1300 36 2170 |



www.liverpool.nsw.gov.au



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From: Basnayaka, Amila <ABasnayaka@golder.com.au>
Sent: Tuesday, 25 May 2021 2:05 PM
To: Charlie Caraballo <CaraballoC@liverpool.nsw.gov.au>
Cc: Waliminipeli Siripala <SiripalaW@liverpool.nsw.gov.au>
Subject: Industrial development stormwater management information request for 9 Whyalla Place, Prestons

H Charlie,

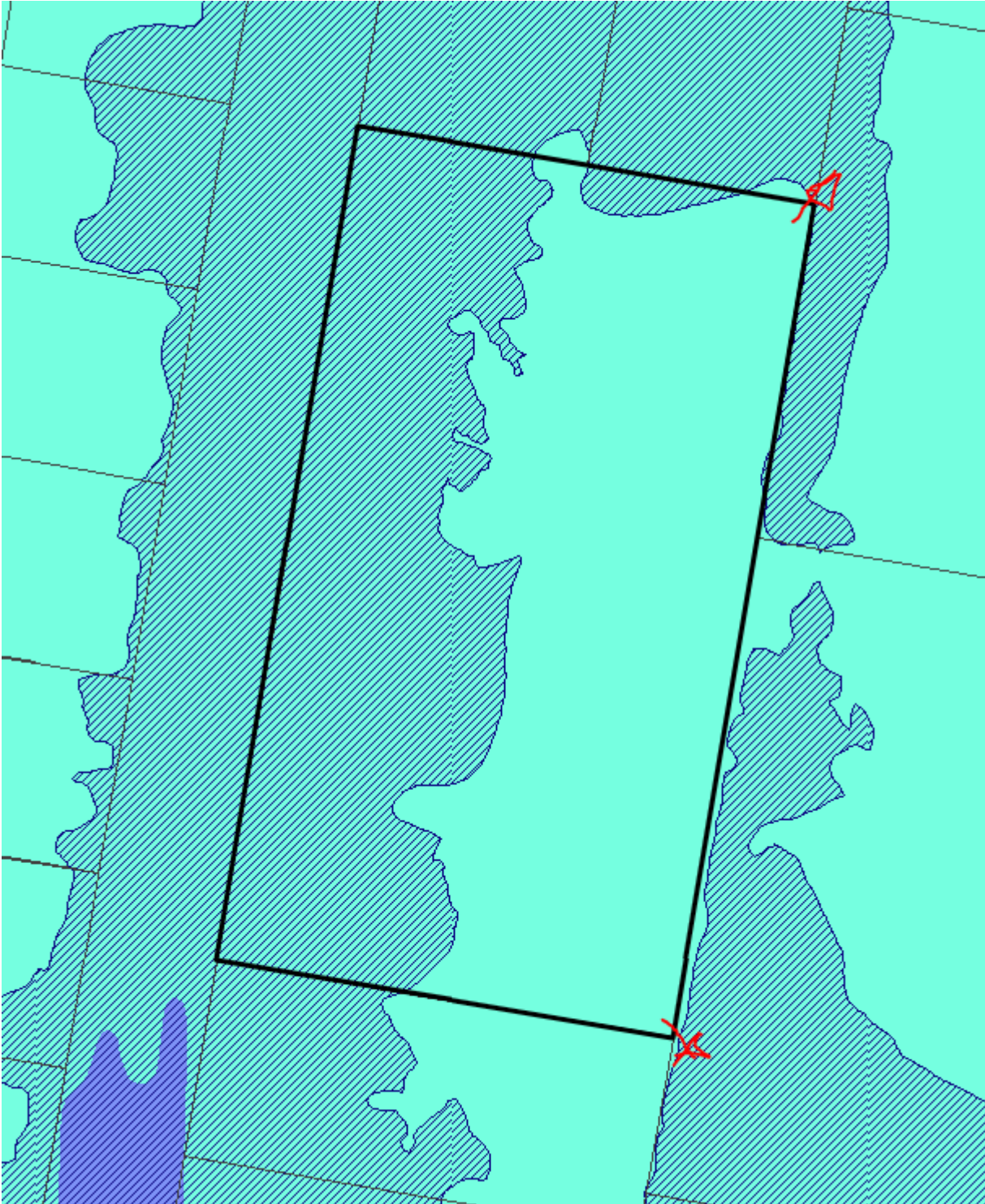
We are engaged by our client Hi Quality Group on their development to undertake an environmental impact assessment (EIS) to develop/upgrade the waste treatment facility at 9 Whyalla Place, Prestons. As a part of the EIS assessment, we are considering options to upgrade the existing internal stormwater drainage system at the facility.

May I kindly request some general information on Council requirements for internal stormwater management for:

1. Minimum underground drainage pipe size? FYI. the current drainage system is 150 mm diameter.
2. The maximum impervious catchment area for a grated lid manhole?
3. Any regulations related to underground rainwater storage tanks?

Alternatively, please direct us to council's stormwater management guidelines for industrial lots.

Also, the survey identified two stormwater connection points from the property to the Council's drainage (see below image). Can we get the details (invert levels and pipe size) of the connecting Council's drainage line please?



Kind regards
Amila

Amila Basnayaka (MPhil, BSc Eng(Hons), GradCertResComm, MIEAust CPEng NER)
Senior Water Resources Engineer



GOLDER
MEMBER OF WSP

Golder Associates Pty Ltd
Level 3, 1 Havelock Street, West Perth, Western Australia 6005, Australia (PO Box
1914, West Perth WA 6872)
T: +61 8 9213 7600 | **D:** +61 8 9213 8273 | golder.com

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Golder acknowledges that this office sits on what is, and will always be, Whadjuk Noongar Land. We recognise Aboriginal and Torres Strait Islander Peoples as the first scientists and engineers and pay our respects to Elders past, present and emerging.

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McCrory, Jessica

From: Boris Santana <SantanaB@liverpool.nsw.gov.au>
Sent: Friday, 13 November, 2020 11:08 AM
To: Robinson, Todd
Cc: Emma Barnet; McMahon, Jacinta
Subject: Re: SSD-9346594 Prestons Waste Treatment Facility

EXTERNAL EMAIL

Hi Todd,

I received the following comments from Council's Flooding Engineers in relation to your query:

The proposed development involves storage and processing of hazardous wastes (contaminated soils, asbestos, heavy metals, liquid wastes etc.), and as per Council's DCP, the proposed land use has been categorised as "Sensitive Uses and Facilities" (Hazardous or offensive industry or storage establishment). Please refer to Council's DCP 2008, Part 1 (Page 39, Page 46-49). As per Council's DCP and flood policy, the flood planning level of a "Sensitive Uses and Facilities" is the Probable Maximum Flood level (i.e. 24.5m Australian Height Datum).

In relation to your query relating to the timing of management plans Council's Environmental Officer advises the following:

The comments provided for the facility go beyond the SEARs and include other requirements which may be imposed by the consent authority. Council presumes that the requirements for a CEMP and OEMP could be imposed as conditions of consent.

Kind regards,

Boris Santana
Principal Planner



02 8711 7683 | 0439 562 915 | SantanaB@liverpool.nsw.gov.au
Customer Service: 1300 36 2170 | 33 Moore Street Liverpool, NSW 2170, Australia



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From: "Robinson, Todd" <TRobinson@golder.com.au>
Date: Thursday, 12 November 2020 at 9:40 am
To: Boris Santana <SantanaB@liverpool.nsw.gov.au>
Cc: Emma Barnet <Emma.Barnet@planning.nsw.gov.au>, "McMahon, Jacinta" <jmcmahon@golder.com.au>
Subject: RE: SSD-9346594 Prestons Waste Treatment Facility

NOTE: This email chain appears to contain email from outside Golder

Hi Boris,

As discussed, could you provide an update with regard to clarifications on Council comments for SSD-9346594 Prestons Waste Treatment Facility with regard to flood considerations and timing request for management plans?

Regards,

Todd Robinson (M.Bus, M.Litt, PgD.URP&Heritage, B.Sc, B.A, CPP)
Principal Environmental Planner



Golder Associates Pty Ltd

Level 5, 450 Hunter Street, Newcastle, New South Wales 2300, Australia (PO Box 676, Newcastle NSW 2300)

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From: Boris Santana <SantanaB@liverpool.nsw.gov.au>
Sent: Wednesday, 28 October 2020 3:10 PM
To: Robinson, Todd <TRobinson@golder.com.au>
Cc: Emma Barnet <Emma.Barnet@planning.nsw.gov.au>; McMahon, Jacinta <jmcmahon@golder.com.au>
Subject: Re: SSD-9346594 Prestons Waste Treatment Facility

EXTERNAL EMAIL

Hi Todd,

Sorry about that. Please try my mobile below.

Are there any particular matters in our correspondence that you would like to discuss? Most of the comments have been provided by Council's technical officers so if you would like to discuss certain comments it would be beneficial to have those officers present at the meeting.

Once I have that I can coordinate a meeting with the relevant officer.

Kind regards,

Boris Santana
Principal Planner



02 8711 7683 | 0439 562 915 | SantanaB@liverpool.nsw.gov.au

Customer Service: 1300 36 2170 | 33 Moore Street Liverpool, NSW 2170, Australia



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From: "Robinson, Todd" <TRobinson@golder.com.au>
Date: Wednesday, 28 October 2020 at 10:26 am
To: Boris Santana <SantanaB@liverpool.nsw.gov.au>
Cc: Emma Barnet <Emma.Barnet@planning.nsw.gov.au>, "McMahon, Jacinta" <jmcmahon@golder.com.au>
Subject: SSD-9346594 Prestons Waste Treatment Facility

Hi Boris,

I'm looking to follow up and clarify on behalf of the Proponent Council comments on the SEARs for the Waste Treatment Facility at 9-13 Whyalla Place, Prestons (Council ref. SSD1-24/2020/SEARs SSD-9346594). I've left a couple of messages on your phone (87117683) but could you let me know the best time to discuss this as we're keen to address in drafting the EIS.

Regards,

Todd Robinson (M.Bus, M.Litt, PgD.URP&Heritage, B.Sc, B.A, CPP)
Principal Environmental Planner



Golder Associates Pty Ltd
Level 5, 450 Hunter Street, Newcastle, New South Wales 2300, Australia (PO Box 676, Newcastle NSW 2300)

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APPENDIX B3

**Stakeholder Consultation
Methods**



REPORT

Community and Stakeholder Participation Strategy

Prestons Waste Treatment Facility

Submitted to:

Hi Quality

Submitted by:

Golder Associates Pty Ltd

Level 8, 40 Mount Street, North Sydney, New South Wales 2060, Australia

+61 2 9478 3900

20142192-013-R-Rev0

August 2021



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Table 2: Consultation Engagement tools and channels3

1.0 COMMUNITY AND STAKEHOLDER PARTICIPATION STRATEGY

1.1 Project Context

Hi Quality Waste Treatment Services Pty Ltd (the Proponent) is seeking to construct and operate a Waste Treatment Facility (the Project) located at 9-13 Whyalla Place, Prestons NSW 2170 (the Site).

The Project proposes to utilise existing buildings and new infrastructure on the Site to provide treatment of solid and liquid waste to a level suitable for reuse, disposal to landfill or dispose to sewer.

The Waste Treatment Facility would process up to 270,000 tonnes of solid waste per annum primarily generated from industrial processes and contaminated sites and include treatment of:

- Contaminated Soils;
- Contaminated sludges; and
- Liquid Wastes.

New ancillary infrastructure would be constructed as part of the Project including:

- weighbridges and weighbridge office;
- warehouse extension;
- new driveway;
- parking; and
- wheel wash and truck wash down bay.

The Proponent would utilise the existing office space within the existing building on the Site.

Consultation activities for the Project commenced prior to submission of the Scoping Report (3 September 2020) to the Department of Planning, Industry and Environment (DPIE) and will continue through the assessment and determination of the Project. It would be anticipated this strategy would be further developed as part of the management plans for construction and operation of the Project to guide future community and stakeholder consultation.

1.2 Objectives of Community and Stakeholder Participation Strategy

Table 1 outlines all stakeholder consultation requirements as identified within SEARs SSD-9346594 issued by the Department of Planning and Industry and Environment (DPIE) on the 14 October 2020.

The Community and Stakeholder Participation Strategy is to provide accessible and fit-for-purpose communication and stakeholder consultation activities that address the Community and Stakeholder Engagement consultation requirements of SSD-9346594. Specifically:

- *a detailed community and stakeholder participation strategy which identifies who in the community has been consulted and a justification for their selection, other stakeholders consulted and the form(s) of the consultation, including a justification for this approach.*

The objective of the Community and Stakeholder Participation Strategy is to:

- identify appropriate stakeholders for the Project and justification for their selection;
- inform identified stakeholders and the broader community about the main features, related issues and potential impacts of the Project that is accurate and timely; and

- provide accessible and sufficient opportunity for stakeholder input to the Project.

Table 1: SEARs SSD-9346594 Community and Stakeholder Engagement

SEARs Key Issue		Address in EIS
Community and Stakeholder Engagement	<ul style="list-style-type: none"> ■ a detailed community and stakeholder participation strategy, which identifies who in the community has been consulted and a justification for their selection, other stakeholders consulted and the form(s) of the consultation, including a justification for this approach ■ a report on the results of the implementation of the strategy including issues raised by the community and surrounding occupiers and landowners that may be impacted by the proposal ■ details of how issues raised during community and stakeholder consultation have been addressed and whether they have resulted in changes to the proposal ■ details of the proposed approach to future community and stakeholder engagement based on the results of the consultation. 	<p>Chapter 5: Stakeholder Consultation</p> <p>Appendix B – Consultation Materials</p>
Consultation	<p>During the preparation of the EIS, you must consult with the relevant local, State or Commonwealth Government authorities, service providers, community groups and potentially affected landowners. In particular you must consult with:</p> <ul style="list-style-type: none"> ■ Liverpool City Council ■ Environment Protection Authority ■ Environment, Energy and Science Group ■ Heritage NSW ■ NSW Fire and Rescue ■ Sydney Water ■ Transport for NSW ■ Surrounding local landowners and stakeholders. <p>The EIS must describe the consultation process and the issues raised and identify where the design of the development has been amended in response to these issues. Where amendments have not been made to address an issue, a short explanation should be provided.</p>	

1.3 Identified Community Stakeholders

As identified in the Scoping Report (20142192-005-R-Rev0) for the Project, the Site is located approximately 500 m to the north of the M7 and approximately 500 m south of the nearest residents across Hoxton Park Road. The Site is 300 m from Maxwells Creek to the east and 420 m from a hotel to the west.

The process of identifying community stakeholders included consideration of individuals and groups geographically located close to the Site, those identified within SEARs SSD-9346594 in addition to potentially sensitive receivers. For example community stakeholders could be considered as having a higher level of interest or concerns about potential impacts as a result of construction and operation of the Project due to their proximity and/or if they are a sensitive receiver such as residences, schools, child care centres, places of worship and/or health care institutions.

Identified community stakeholders for the Project are:

- Neighbours in the Prestons Industrial area that are within an approximate 300 m radius of the Site. This includes those who may potentially be impacted by traffic generated at the Site including on Whyalla Place, Dampier Place, Ash Road, Jedda Road and Weld Street.
- The nearest hotel approximately 420 m to the north west of the Site.
- Nearest residents approximately 500 m to the North of the Site.
- Liverpool Catholic Club located approximately 500 m to the north west of the Site.
- Potters House Church located approximately 350 m to the North of the Site.

1.4 Implementation of the Community and Stakeholder Participation Strategy

All identified community stakeholders and relevant local, State or Commonwealth Government authorities are to be contacted through one or more of the methods identified within Table 2. These channels were chosen as they are considered to provide an appropriate range of methods to communicate the Project information to identified stakeholders. It should be noted that due to COVID-19 restrictions/concerns, we have not included face-to-face consultation as part of the Strategy.

Table 2: Consultation Engagement tools and channels

Tool/Channel	Details
Neighbourhood Mailout	Hi Quality have provided a letter to identified community stakeholders (refer Section 1.3) providing a brief project description, links to the Project website and providing the opportunity to provide feedback on the Project including through email or post.
Stakeholder Phone Calls	Follow up will be made to community stakeholders where feedback is received where necessary to clarify potential issues to address within the Environmental Impact Statement (EIS). Consultation with all relevant local, State or Commonwealth Government authorities and service providers, as identified within the SEARs will also be contacted via phone and/or email to discuss the Project and gain any potential feedback on the Project.
Website	A dedicated website is provided for the Project, which aligns with Hi-Quality branding. The website will host: <ul style="list-style-type: none"> ■ General project information including <ul style="list-style-type: none"> ■ project description,

Tool/Channel	Details
	<ul style="list-style-type: none">■ the planning and assessment process,■ identifying how stakeholders can provide feedback■ Contact details

All issues and feedback received on the Project will be recorded and included within a report within the EIS. This report will include how issues raised by stakeholders about the Project, how these issues have been addressed and details of the proposed approach to future community and stakeholder engagement.

Signature Page

Golder Associates Pty Ltd



Todd Robinson
Principal Environmental Planner



Jacinta McMahon
Principal Engineer

TR/JM/tr:jem

A.B.N. 64 006 107 857

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[https://golderassociates.sharepoint.com/sites/125733/project files/6 deliverables/20142192-013-r community stakeholder participation strategy/20142192-013-r-rev0 community stakeholder participation strategy.docx](https://golderassociates.sharepoint.com/sites/125733/project%20files/6%20deliverables/20142192-013-r%20community%20stakeholder%20participation%20strategy/20142192-013-r-rev0%20community%20stakeholder%20participation%20strategy.docx)



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HI-QUALITY WASTE MANAGEMENT PTY LTD

ABN 25 003 105 379


Cnr Elizabeth Drive & Mamre Road, Kemps Creek NSW 2178

PO BOX 42 Kemps Creek NSW 2178

 (02) 9826 1666

 (02) 9826 1896

 info@hiquality.com.au

 www.hiquality.com.au

Hi Quality Waste Treatment Services Pty Ltd (Hi Quality) is seeking to construct and operate a Waste Treatment Facility located at 9-13 Whyalla Place, Prestons NSW 2170. Hi Quality is a part of the Hi-Quality Group, which was established over 50 years ago and proudly remains an Australian family owned business. Hi-Quality has 14 operational sites located over four Australian States and Territories and services include waste treatment, quarrying, resource recovery and recycling, landfilling and building and landscaping supplies.

The Project proposes to utilise existing buildings and new infrastructure on the site to provide treatment of soil and liquid waste to a level suitable for reuse, disposal to landfill or disposal to sewer. All operations would be conducted inside the building. New ancillary infrastructure would be constructed as part of the project including a warehouse extension and a new driveway.

A dedicated website has been setup for the Project, which includes further project details including a Conceptual Layout of the Project at <http://hiqualityprestons.com/>.

An Environmental Impact Statement (EIS) is currently being prepared for the Waste Treatment Facility to address the form and content requirements of the NSW Department of Planning, Industry and Environment (DPIE) Secretary's Environmental Assessment Requirements (SSSD-9346594) and Hi Quality would like to provide you with the opportunity to provide comments and feedback on the proposal to address within the EIS. Comments can be submitted through the following methods:

- Email us at prestonsproject@hiquality.com.au
- Write to Hi Quality Waste Treatment Services, attention: Proposed Prestons Waste Treatment Facility, PO Box 42 Kemps Creek NSW 2178.

Following submission of the EIS, it will then be placed on public exhibition to provide the opportunity for further comment. For further details on the assessment process and for further access to all assessment documentation on the Project go to the NSW Department of Planning, Industry and Environment Major Projects Website <https://www.planningportal.nsw.gov.au/major-projects/projects>.

**HI-QUALITY GROUP**

Waste treatment facility, Prestons NSW



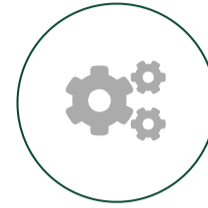
About the project

Hi Quality Waste Treatment Services Pty Ltd is seeking to construct and operate a Waste Treatment...



Have your say

As part of the development of the EIS for this project, Hi Quality would like to...



Planning and assessment process

Hi Quality is currently preparing the Environmental Impact Statement (EIS) to assess the potential impacts of...

About us

Hi-Quality Waste Treatment Services Pty Ltd is part of the Hi Quality Group. Hi Quality Group was established over 50 years ago and proudly remains an Australian family owned business. To read more about Hi Quality, visit the [Hi Quality website](#).

Contact us:

- Email: prestons@hiquality.com.au



HI-QUALITY GROUP

Waste treatment facility, Prestons NSW



About the project

Hi Quality Waste Treatment Services Pty Ltd is seeking to construct and operate a Waste Treatment Facility located at 9-13 Whyalla Place, Prestons NSW 2170.

The Project proposes to utilise existing buildings and new infrastructure on the site to provide treatment soil and liquid waste to a level suitable for reuse, disposal to landfill or disposal to sewer. The Waste Treatment Facility would process up to 270,000 tonnes of soil and liquid waste per annum. All operations would be located inside the building. New ancillary infrastructure would be constructed as part of the project including warehouse extension and a new driveway.

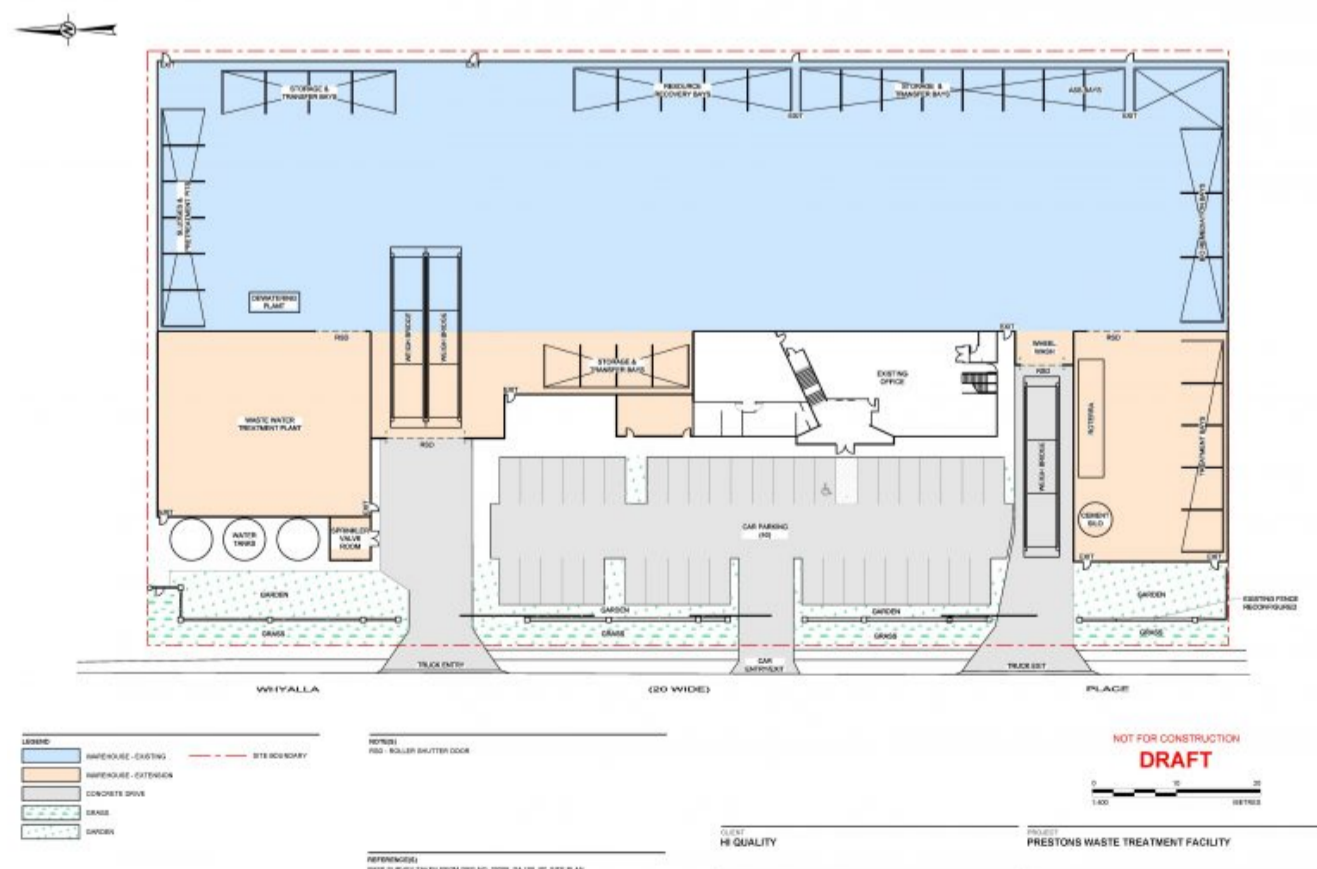
Hi-Quality would also site some administration functions at this location, utilising existing office space.

The existing warehouse building and extension on the site would house the Waste Treatment Facility. All material would be handled within the building. An engineered designed building heating, ventilation and air conditioning (HVAC) system would be installed to capture and treat fugitive dust and/or vapour emissions.

The Project is permissible within the existing zoning for Prestons Industrial area, consistent with all applicable policy and legislation and provides for treatment technologies to reduce potential health and environmental impacts of materials whilst also providing for efficient recovery of resources in a suitable location.

Learn about the [planning and assessment process](#).

Proposed layout of the project: [Concept Layout Prestons Waste Treatment Facility \(click to open\)](#).





HI-QUALITY GROUP

Waste treatment facility, Prestons NSW



Planning and assessment process

Hi Quality is currently preparing the Environmental Impact Statement (EIS) to assess the potential impacts of the Waste Treatment Facility project as a State Significant Development under the *Environmental Planning and Assessment Act 1979*.

The EIS will support a Development Application to be submitted to the NSW Department of Planning, Industry and Environment. The EIS will address the form and content requirements of the Secretary's Environmental Assessment Requirements (SSD-9346594).

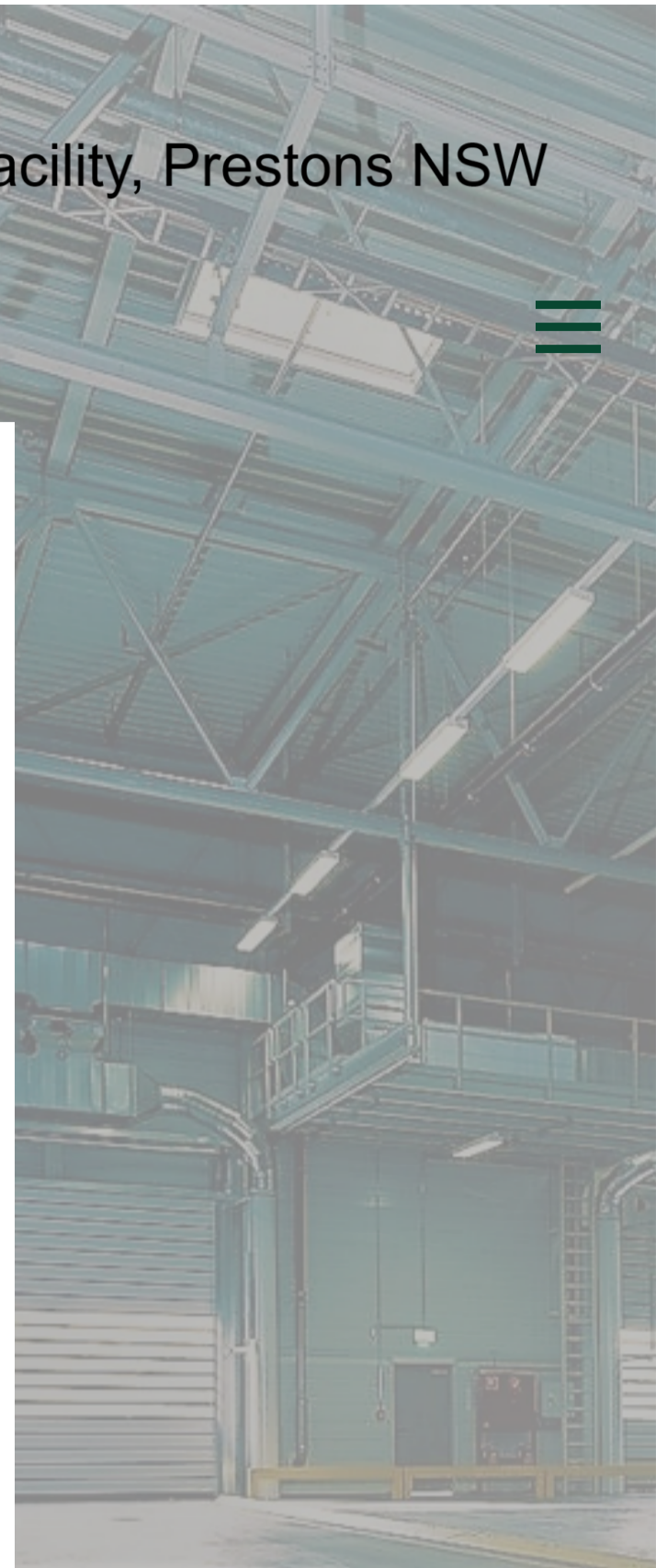
Following submission of the EIS, it will then be placed on public exhibition to provide the opportunity for further comment. For further details on the assessment process and for further access to all assessment documentation on the Project go to the [NSW Department of Planning, Industry and Environment Major Projects website](#).

A range of specific technical assessments will be undertaken to be included within the EIS. These include:

- Air Quality and Odour Assessment
- Noise and Vibration Assessment
- Soils and Water Assessment
- Traffic and Transport Assessment
- Health Impact Assessment
- Fire and Incident Management

The project will also be required to address further issues such as statutory and strategic context, detailed project description, waste management and ecological sustainable development.

Learn how you can [have your say about the project](#).





HI-QUALITY GROUP

Waste treatment facility, Prestons NSW



Have your say

As part of the development of the EIS for this project, Hi Quality would like to invite you to provide initial feedback on the proposal that can be addressed within the EIS. Comments can be submitted through the following methods:

- Email us at prestons@hiquality.com.au
- Write to: Hi Quality Waste Treatment Services, att: Preston Waste Treatment Facility, PO Box 42, Kemp's Creek, NSW 2178.

Following this time, the EIS will be lodged with the NSW Department of Planning, Industry and Environment Major Projects and placed on public exhibition to enable the proposal assessment to be further detailed to the community and stakeholders who may make further representations regarding the project.

For further details on the assessment process and for further access to all assessment documentation on the Project go to the [NSW Department of Planning, Industry and Environment Major Projects website](#).



APPENDIX C

NSW EPA Waste Codes

Table 1 NSW EPA Waste Codes - Proposed to be Treated

20142192-012-M-Rev0

Waste Code	Waste Description	Solids and Sludge Treatment Technology	Liquid Waste Treatment Technology	Potential Sources	Potential Quantities (T/year)	Acceptance Criteria	Treatment Chemicals Used (see also Figure 7 Flow Chart)	Resultant Wastes and Products from Processing (see also Figure 7 Flow Chart)	Storage & Containment	Maximum Facility Storage Volume	Storage and Treatment Time
CATEGORY A - Organics (Non Halogenated)											
J100	Mineral Oils	Bioremediation	Separation	TPH Contaminated soils and solids. Pure oils from various sources including machinery maintenance workshop wastes.	10,000 T/year	Up to 20% w/w oil contamination will be treated. Greater than 20% will be recycled to other licenced facilities.	Bioremediation reagents / Surfactant enhancements	Solid Waste to meet landfill acceptance criteria or beneficial reuse under EOW Application Waste water meeting Trade Waste Criteria Waste oil to be sent to recycling facilities	Packaged waste stored in bunded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks bunded in accordance with Australian Standards Bulk sludge stored in treatment pits	1,000T	4-12 weeks
J160	Coal Derived Hydrocarbon Contaminated Soils (excludes DNAPL)	Enhanced Bioremediation or Chemical Oxidation	Separation	Gasworks or Gasworks impacted materials	10,000T/year	Up to 1% w/w as measured by TPH	Oxidants and / or surfactants	Reuse criteria met or meet solid waste criteria	Soil Treatment Bays or Pits (subject to coal tar impacts)	3,000T	1-2 weeks
J160	Coal Derived Hydrocarbon Contaminated Soils (includes residual free coal tars)	Enhanced Bioremediation and Immobilisation	Separation of NAPL	Gasworks or Gasworks impacted materials	10,000T/year	Evidence of coal tar DNAPL present in soil matrix	Immobilisation reagents	Solid Waste to meet landfill acceptance criteria Waste water to meet Trade Waste Criteria	Stored in treatment bays prior to passed to roterra for treatment	3,000T	1-2 weeks
N120	Soils contaminated with a hazardous substance	Chemical Oxidation Bioremediation Immobilisation	N/A	Soil residues, property development, site remediation, industrial waste, mining waste.	Up to 130,000 T/year	Metals, up to 5% w/w. Organics up to 20% w/w	Metals: Cement / fly ash / Magnesium oxide to immobilise metals. Organics: Activated Carbon or Oxidants, or bioremediation chemicals.	Solid Waste to meet landfill acceptance criteria or beneficial reuse under EOW Application	Packaged waste stored in bunded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk sludge stored in treatment pits	3,000T	2-4 weeks
G100	Ethers	Immobilisation	Adsorption	Chemical manufacturer and by-products	Up to 100 T/year	Organic up to 20%	Activated Carbon	Solid Waste to meet landfill acceptance criteria Waste water to meet Trade Waste Criteria	Packaged waste stored in bunded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks bunded in accordance with Australian Standards Bulk sludge stored in treatment pits	30 T	2-4 days
N190	Filter cake	Immobilisation / Bioremediation / Chemical Oxidation	N/A	Residues from industrial and mining waste water treatment plants	Up to 10,000 T/year	Metals, up to 5% w/w. Organics up to 20% w/w	Metals: Cement / fly ash / Magnesium oxide to immobilise metals. Organics: Activated Carbon or Oxidants, or bioremediation chemicals.	Solid Waste to meet landfill acceptance criteria or beneficial reuse under EOW Application	Bulk solids - stored in bulk solids bunding	1,000 T	1-2 weeks

Waste Code	Waste Description	Solids and Sludge Treatment Technology	Liquid Waste Treatment Technology	Potential Sources	Potential Quantities (T/year)	Acceptance Criteria	Treatment Chemicals Used (see also Figure 7 Flow Chart)	Resultant Wastes and Products from Processing (see also Figure 7 Flow Chart)	Storage & Containment	Maximum Facility Storage Volume	Storage and Treatment Time
G110	Organic solvents, other than halogenated solvents	Chemical Oxidation Bioremediation Immobilisation Storage Only	Chemical Oxidation / Adsorption	Solvent manufacture. By product from paint/pigment manufacture. Alcohol by products.	Up to 1,000 T / year	Up to 5% w/w for treatment. For higher concentrations, transfer to other licenced facilities.	Organic solvents will be recycled at economic concentrations. Waste waters and solids will be treated using oxidants and cement, or bioremediation.	Solid Waste to meet landfill acceptance criteria or beneficial reuse under EOW Application Waste water meeting Trade Waste Criteria	Packaged waste stored in banded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks banded in accordance with Australian Standards Bulk sludge stored in treatment pits	20 T	No storage, treated immediately
D340	Perchlorates	Bioremediation	Adsorption	Fertiliser manufacture, contaminated soils.	Up to 1,000 T / year	Up to 5% w/w for treatment. For higher concentrations, transfer to other licenced facilities.	Cement / fly ash / Magnesium oxide	Solid Waste to meet landfill acceptance criteria Waste water to meet Trade Waste Criteria	Packaged waste stored in banded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks banded in accordance with Australian Standards Bulk sludge stored in treatment pits	20 T	1-2 weeks
G160	Waste from the manufacture, formulation or use of organic solvents	Immobilisation / Chemical Oxidation / Bioremediation	Chemical Oxidation / Adsorption	Solvent manufacture. By product from paint/pigment manufacture. Alcohol by products.	Up to 1,000 T / year	Up to 5% w/w for treatment. For higher concentrations, transfer to other licenced facilities.	Organic solvents will be recycled at economic concentrations. Waste waters and solids will be treated using oxidants and cement, or bioremediation.	Solid Waste to meet landfill acceptance criteria or beneficial reuse under EOW Application Waste water meeting Trade Waste Criteria	Packaged waste stored in banded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks banded in accordance with Australian Standards Bulk sludge stored in treatment pits	20 T	1-2 weeks
N140	Fire debris and fire wash waters	Immobilisation / Chemical Oxidation / Bioremediation	Precipitation / Chemical Oxidation	Demolition waste and fire debris and wash waters	Up to 1,000 T(KL) / year	Highly variable contaminants and concentrations. Case by case analysis. NON PFAS contaminated waste only.	Pre-treatment testing will determine treatment chemicals required, and most appropriate treatment technology	Solid Waste to meet landfill acceptance criteria or beneficial reuse under EOW Application Waste water meeting Trade Waste Criteria	Bulk wastes (from tankers and tippers) will be stored in the main WWTP storage tanks or in the main solids receival area.	500 T (KL)	1-2 weeks
CATEGORY B - HALOGENATED including Brominated											
G150	Halogenated organic solvents - Residues from industrial waste treatment or disposal operations	Chemical Oxidation Bioremediation Immobilisation	Chemical Oxidation / Adsorption	Solvent manufacture wastes eg: paint/pigment & alcohol by products.	Up to 1,000 T / year	Up to 5% w/w for treatment. For higher concentrations, transfer to other licenced facilities.	Oxidants and cement, or bioremediation additives. Organic solvents will be recycled at economic concentrations.	Solid Waste to meet landfill acceptance criteria or beneficial reuse under EOW Application Waste water meeting Trade Waste Criteria	Packaged waste stored in banded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks banded in accordance with Australian Standards Bulk sludge stored in treatment pits	20 T	1-2 weeks
N205	Contaminated Soils Containing chlorinated Compounds	Chemical Oxidation Bioremediation (anearobic)	N/A	Solid Industrial waste treatment residues, Chemical manufacturing. Contaminated soils from redevelopment	Up to 10,000 T/year	Highly variable contaminants and concentrations. Case by case analysis.	Pre-treatment testing will determine treatment chemicals required, and most appropriate treatment technology	Solid Waste to meet landfill acceptance criteria or beneficial reuse under EOW Application	Packaged waste stored in banded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk sludge stored in treatment pits	1,000 T	1-2 weeks
M160	Organo halogen compounds—other than substances referred to in this Table or Table 2	Immobilisation / Chemical Oxidation / Bioremediation	Precipitation / Chemical Oxidation	Manufacturing (various), contaminated site remediation	Up to 1,000 T/year	Highly variable contaminants and concentrations. Case by case analysis.	Oxidants, activated carbon and cement, or bioremediation.	Solid Waste to meet landfill acceptance criteria or beneficial reuse under EOW Application Waste water meeting Trade Waste Criteria	Packaged waste stored in banded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks banded in accordance with Australian Standards Bulk sludge stored in treatment pits	100T	1-2 weeks

Waste Code	Waste Description	Solids and Sludge Treatment Technology	Liquid Waste Treatment Technology	Potential Sources	Potential Quantities (T/year)	Acceptance Criteria	Treatment Chemicals Used (see also Figure 7 Flow Chart)	Resultant Wastes and Products from Processing (see also Figure 7 Flow Chart)	Storage & Containment	Maximum Facility Storage Volume	Storage and Treatment Time
M160	Oxidising agents	Immobilisation / Chemical Oxidation / Bioremediation	Precipitation / Chemical Oxidation	Manufacturing (various), contaminated site remediation	Up to 1,000 T/year	Highly variable contaminants and concentrations. Case by case analysis.	Oxidants, activated carbon and cement, or bioremediation.	Solid Waste to meet landfill acceptance criteria or beneficial reuse under EOW Application Waste water meeting Trade Waste Criteria	Packaged waste stored in banded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks banded in accordance with Australian Standards Bulk sludge stored in treatment pits	100T	1-2 weeks
M100	Waste substances and articles containing or contaminated with polychlorinated biphenyls, polychlorinated naphthalenes, polychlorinated terphenyls and/or polybrominated biphenyls	Immobilisation Chemical Oxidation	Precipitation / Chemical Oxidation	Manufacturing (various), contaminated site remediation	Up to 1,000 T/year	Highly variable contaminants and concentrations. Absence of volatile metals	Oxidants, activated carbon and cement, or bioremediation.	Solid Waste to meet landfill acceptance criteria or beneficial reuse under EOW Application Waste water meeting Trade Waste Criteria	Packaged waste stored in banded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks banded in accordance with Australian Standards Bulk sludge stored in treatment pits	100T	1-2 weeks
CATEGORY C - Metals & Metalloids (excludes solid waste slags derived from metal processing industries)											
D130	Arsenic, arsenic compounds (requires valency assessment)	Immobilisation	Precipitation	Soil residues, property development, timber treatment residues, industrial waste, mining waste	Up to 20,000 T/year	Up to 5% w/w for treatment. For higher concentrations, transfer to other licenced facilities.	Cement / fly ash / Magnesium oxide	Solid Waste to meet landfill acceptance criteria Waste water to meet Trade Waste Criteria	Packaged waste stored in banded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks banded in accordance with Australian Standards Bulk sludge stored in treatment pits	2,000 T	1-2 weeks
D170	Antimony and antimony compounds	Immobilisation	Precipitation	Electrical processing factories, flame retardant	Up to 1,000 T/year	Up to 5% w/w for treatment. For higher concentrations, transfer to other licenced facilities.	Cement / fly ash / Magnesium oxide	Solid Waste to meet landfill acceptance criteria Waste water to meet Trade Waste Criteria	Packaged waste stored in banded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks banded in accordance with Australian Standards Bulk sludge stored in treatment pits	100 T	1-2 weeks
D290	Barium compounds (excluding barium sulphate)	Immobilisation	Precipitation	Soil residues, property development, industrial waste, mining waste	Up to 1,000 T/year	Up to 5% w/w for treatment. For higher concentrations, transfer to other licenced facilities.	Cement / fly ash / Magnesium oxide	Solid Waste to meet landfill acceptance criteria Waste water to meet Trade Waste Criteria	Packaged waste stored in banded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks banded in accordance with Australian Standards Bulk sludge stored in treatment pits	200 T	1-2 weeks
D160	Beryllium and beryllium compounds	Immobilisation	Precipitation	Soil residues, property development, industrial waste, mining waste	Up to 1,000 T/year	Up to 5% w/w for treatment. For higher concentrations, transfer to other licenced facilities.	Cement / fly ash / Magnesium oxide	Solid Waste to meet landfill acceptance criteria Waste water to meet Trade Waste Criteria	Packaged waste stored in banded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks banded in accordance with Australian Standards Bulk sludge stored in treatment pits	200 T	1-2 weeks

Waste Code	Waste Description	Solids and Sludge Treatment Technology	Liquid Waste Treatment Technology	Potential Sources	Potential Quantities (T/year)	Acceptance Criteria	Treatment Chemicals Used (see also Figure 7 Flow Chart)	Resultant Wastes and Products from Processing (see also Figure 7 Flow Chart)	Storage & Containment	Maximum Facility Storage Volume	Storage and Treatment Time
D310	Boron and boron compounds	Immobilisation	Precipitation	Soil residues, property development, timber treatment residues, industrial waste, mining waste	Up to 1,000 T/year	Up to 5% w/w for treatment. For higher concentrations, transfer to other licenced facilities.	Cement / fly ash / Magnesium oxide	Solid Waste to meet landfill acceptance criteria Waste water to meet Trade Waste Criteria	Packaged waste stored in bunded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks bunded in accordance with Australian Standards Bulk sludge stored in treatment pits	100 T	1-2 weeks
D150	Cadmium and cadmium compounds	Immobilisation	Precipitation	Soil residues, property development, industrial waste, mining waste	Up to 5,000 T/year	Up to 5% w/w for treatment. For higher concentrations, transfer to other licenced facilities.	Cement / fly ash / Magnesium oxide	Solid Waste to meet landfill acceptance criteria Waste water to meet Trade Waste Criteria	Packaged waste stored in bunded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks bunded in accordance with Australian Standards Bulk sludge stored in treatment pits	1,000 T	1-2 weeks
D140	Chromium compounds (hexavalent and trivalent)	Immobilisation	Precipitation	Soil residues, property development, timber treatment residues, industrial waste, mining waste	Up to 20,000 T/year	Up to 5% w/w for treatment. For higher concentrations, transfer to other licenced facilities.	Hexavalent chromium will be reduced to trivalent chromium using ferrous sulphate. Cement / fly ash / Magnesium oxide to immobilise trivalent chromium.	Solid Waste to meet landfill acceptance criteria Waste water to meet Trade Waste Criteria	Packaged waste stored in bunded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks bunded in accordance with Australian Standards Bulk sludge stored in treatment pits	2,000 T	1-2 weeks
D190	Copper compounds	Immobilisation	Precipitation	Copper refinery residues. Soil residues, property development, timber treatment residues, industrial waste, mining waste	Up to 20,000 T/year	Up to 5% w/w for treatment. For higher concentrations, transfer to other licenced facilities.	Cement / fly ash / Magnesium oxide	Solid Waste to meet landfill acceptance criteria Waste water to meet Trade Waste Criteria	Packaged waste stored in bunded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks bunded in accordance with Australian Standards Bulk sludge stored in treatment pits	2,000 T	1-2 weeks
N150	Fly ash	Immobilisation	N/A	Power stations	Up to 100,000 T/year	Metals, up to 5% w/w	Metals: Cement / Magnesium oxide to immobilise metals. Fly ash can be selectively used as an immobilisation reagent if metals levels are below landfill guidelines.	Solid Waste to meet landfill acceptance criteria	Bulk wastes (from tankers and tippers) will be stored in the main WWTP storage tanks or in the main solids receival area.	3,500T	1-2 weeks
A100	Waste from surface treatment of metals & plastics	Immobilisation	Precipitation / Neutralisation	Galvanisers, electroplating industry, plastics manufacturing	Up to 1,000 T/year	Metals, up to 5% w/w. Organics up to 10% w/w	Cement / fly ash / Magnesium oxide. Activated Carbon or Oxidants.	Solid Waste to meet landfill acceptance criteria Waste water to meet Trade Waste Criteria	Packaged waste stored in bunded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks bunded in accordance with Australian Standards Bulk sludge stored in treatment pits	100 T	1-2 weeks
D220	Lead; lead compounds	Immobilisation	Precipitation	Lead refinery waste. Soil residues, property development, service station remediation, industrial waste, mining waste	Up to 20,000 T/year	Up to 5% w/w for treatment. For higher concentrations, transfer to other licenced facilities.	Cement / fly ash / Magnesium oxide	Solid Waste to meet landfill acceptance criteria Waste water to meet Trade Waste Criteria	Packaged waste stored in bunded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks bunded in accordance with Australian Standards Bulk sludge stored in treatment pits	2,000 T	1-2 weeks

Waste Code	Waste Description	Solids and Sludge Treatment Technology	Liquid Waste Treatment Technology	Potential Sources	Potential Quantities (T/year)	Acceptance Criteria	Treatment Chemicals Used (see also Figure 7 Flow Chart)	Resultant Wastes and Products from Processing (see also Figure 7 Flow Chart)	Storage & Containment	Maximum Facility Storage Volume	Storage and Treatment Time
D120	Mercury; mercury compounds	Immobilisation	Precipitation	Soil residues, property development, demolition waste from chlor alkali plants, industrial waste, mining waste	Up to 5,000 T/year	Up to 5% w/w for treatment. For higher concentrations, transfer to other licenced facilities.	Cement / fly ash / Magnesium oxide to immobilise ionic mercury. Elemental mercury will be treated using sulphur powder to convert metallic mercury to ionic mercury. Organic mercury will be treated using chemical oxidation prior to immobilisation.	Solid Waste to meet landfill acceptance criteria Waste water to meet Trade Waste Criteria	Packaged waste stored in banded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks banded in accordance with Australian Standards Bulk sludge stored in treatment pits	500 T	1-2 weeks
D100	Metal Carbonyls	Immobilisation	Precipitation / Adsorption	Nickel refineries, steel mill, chemical manufacture	Up to 1,000 T/year	Up to 5% w/w Metals (Nickel, boron, iron) for treatment. For higher concentrations, transfer to other licenced facilities.	Cement / fly ash / Magnesium oxide/Activated carbon	Solid Waste to meet landfill acceptance criteria Waste water to meet Trade Waste Criteria	Wastes in packages will be stored & contained in the package as received in a banded area, according to ADG Code. Bulk wastes (from tankers and tippers) will be stored in the main WWTP storage tanks or in the main solids receival area.	100 T	1-2 weeks
D210	Nickel, nickel compounds	Immobilisation	Precipitation	Nickel refinery waste. Soil residues, property development, industrial waste, mining waste	Up to 5,000 T/year	Up to 5% w/w for treatment. For higher concentrations, transfer to other licenced facilities.	Cement / fly ash / Magnesium oxide	Waste water to meet trade waste criteria. Oil recovered to be sent to oil recycling facilities.	Packaged waste stored in banded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks banded in accordance with Australian Standards Bulk sludge stored in treatment pits	500 T	1-2 weeks
D300	Non-toxic salts	Immobilisation	N/A	Industrial, manufacturing and mining by-products	Up to 1,000 T/year	up to 100%	Activated Carbon / Cement / fly ash / Magnesium oxide to immobilise	Solid Waste to meet landfill acceptance criteria Waste water to meet Trade Waste Criteria	Packaged waste stored in banded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk sludge stored in treatment pits	100 T	1-2 weeks
H110	Organic phosphorous compounds	Immobilisation	Precipitation	Industrial waste, mining waste, fertiliser manufacture.	Up to 1,000 T/year	up to 100 %	Cement / fly ash / Magnesium oxide to immobilise	Solid Waste to meet landfill acceptance criteria Waste water to meet Trade Waste Criteria	Packaged waste stored in banded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks banded in accordance with Australian Standards Bulk sludge stored in treatment pits	100 T	1-2 weeks
M250	Surface active agents (Surfactants)	Immobilisation / Bioremediation / Storage	Chemical Oxidation / Adsorption	Detergent manufacture. NON PFAS fire fighting foam.	Up to 5,000 T / year	Up to 5% w/w for treatment. For higher concentrations, transfer to other licenced facilities.	Bioremediation reagents, Cement / fly ash / Magnesium oxide / activated carbon.	Solid Waste to meet landfill acceptance criteria or beneficial reuse under EOW Application Waste water meeting Trade Waste Criteria	Packaged waste stored in banded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks banded in accordance with Australian Standards Bulk sludge stored in treatment pits	100 T	1-2 weeks
D360	Phosphorus compounds	Immobilisation	Precipitation	Industrial waste, mining waste, fertiliser manufacture.	Up to 500 T/year	up to 100 %	Cement / fly ash / Magnesium oxide to immobilise	Solid Waste to meet landfill acceptance criteria Waste water to meet Trade Waste Criteria	Packaged waste stored in banded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks banded in accordance with Australian Standards Bulk sludge stored in treatment pits	50 T	1-2 weeks

Waste Code	Waste Description	Solids and Sludge Treatment Technology	Liquid Waste Treatment Technology	Potential Sources	Potential Quantities (T/year)	Acceptance Criteria	Treatment Chemicals Used (see also Figure 7 Flow Chart)	Resultant Wastes and Products from Processing (see also Figure 7 Flow Chart)	Storage & Containment	Maximum Facility Storage Volume	Storage and Treatment Time
D240	Selenium and selenium compounds	Immobilisation	Precipitation	Contaminated soils	Up to 1,000 T/year	Up to 5% w/w for treatment. For higher concentrations, transfer to other licenced facilities.	Cement / fly ash / Magnesium oxide to immobilise	Solid Waste to meet landfill acceptance criteria Waste water to meet Trade Waste Criteria	Packaged waste stored in banded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks banded in accordance with Australian Standards Bulk sludge stored in treatment pits	100 T	1-2 weeks
D250	Tellurium and tellurium compounds	Immobilisation	Precipitation	Contaminated soils	Up to 1,000 T/year	Up to 5% w/w for treatment. For higher concentrations, transfer to other licenced facilities.	Cement / fly ash / Magnesium oxide	Solid Waste to meet landfill acceptance criteria Waste water to meet Trade Waste Criteria	Packaged waste stored in banded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks banded in accordance with Australian Standards Bulk sludge stored in treatment pits	100 T	1-2 weeks
D180	Thallium and thallium compounds	Immobilisation	Precipitation	Industrial by-products, Contaminated soils	Up to 1,000 T/year	Up to 5% w/w for treatment. For higher concentrations, transfer to other licenced facilities.	Cement / fly ash / Magnesium oxide	Solid Waste to meet landfill acceptance criteria Waste water to meet Trade Waste Criteria	Packaged waste stored in banded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks banded in accordance with Australian Standards Bulk sludge stored in treatment pits	100 T	1-2 weeks
H170	Waste from the manufacture, formulation or use of wood preserving chemicals	Immobilisation / Chemical Oxidation / Bioremediation	Precipitation / Chemical Oxidation	Soil residues, Timber treatment plants, chemical manufacturing plants	Up to 10,000 T/year	Up to 5% w/w Chromium, Copper, Arsenic, Organics for treatment. For higher concentrations, recycling to other licenced facilities. Non-organic treatment chemicals such as creosote will only be received as packaged waste, not for treatment.	ferrous sulphate/ Cement / fly ash / Magnesium oxide	Solid Waste to meet landfill acceptance criteria or beneficial reuse under EOW Application Waste water meeting Trade Waste Criteria	Packaged waste stored in banded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks banded in accordance with Australian Standards Bulk sludge stored in treatment pits	1,000 T	1-2 weeks
D270	Vanadium compounds	Immobilisation	Precipitation	Vanadium pentoxide Catalysts from fertiliser manufacture or petroleum processing. Contaminated soils.	Up to 5,000 T/year	Up to 5% w/w for treatment. For higher concentrations, transfer to other licenced facilities.	Cement / fly ash / Magnesium oxide	Solid Waste to meet landfill acceptance criteria Waste water to meet Trade Waste Criteria	Packaged waste stored in banded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks banded in accordance with Australian Standards Bulk sludge stored in treatment pits	1,000 T	1-2 weeks
D230	Zinc compounds	Immobilisation	Precipitation	Soil residues, property development, industrial waste, mining waste	Up to 20,000 T/year	Up to 5% w/w Zinc for treatment. For higher concentrations, transfer to other licenced facilities.	Cement / fly ash / Magnesium oxide	Solid Waste to meet landfill acceptance criteria Waste water to meet Trade Waste Criteria	Packaged waste stored in banded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks banded in accordance with Australian Standards Bulk sludge stored in treatment pits	2,000 T	1-2 weeks

CATEGORY D - OTHER (inorganic, specialist waste streams)

Waste Code	Waste Description	Solids and Sludge Treatment Technology	Liquid Waste Treatment Technology	Potential Sources	Potential Quantities (T/year)	Acceptance Criteria	Treatment Chemicals Used (see also Figure 7 Flow Chart)	Resultant Wastes and Products from Processing (see also Figure 7 Flow Chart)	Storage & Containment	Maximum Facility Storage Volume	Storage and Treatment Time
C100	Basic (alkaline) solutions or bases (alkalis) in solid form	Dissolve and treat as liquid	Dissolve / Neutralise	Industrial waste, Mining Waste	Up to 1,000 T/year	up to 100%	Bases will be neutralised with acid (sulphuric or hydrochloric).	Solid Waste to meet landfill acceptance criteria Waste water to meet Trade Waste Criteria	Packaged waste stored in banded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks banded in accordance with Australian Standards Bulk sludge stored in treatment pits	100 T	1-2 weeks
B100	Acidic solutions or acids in solid form	Solids would be dissolved	Dissolve / Neutralise	Industrial waste, Mining Waste	Up to 1,000 T/year	up to 100%	Lime or Magnesium Oxide	Solid Waste to meet landfill acceptance criteria Waste water to meet Trade Waste Criteria	Packaged waste stored in banded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks banded in accordance with Australian Standards Bulk sludge stored in treatment pits	100 T	1-2 weeks
T100	Chemical waste arising from a research and development or teaching activity	Immobilisation	Precipitation / Adsorption / Chemical Oxidation	Laboratory wastes from industry, schools, university, government organisation	Up to 1,000 T/year	Highly variable contaminants and concentrations. Case by case analysis.	Pre-treatment testing will determine treatment chemicals the most appropriate treatment technology .	Solid Waste to meet landfill acceptance criteria Waste water to meet Trade Waste Criteria	Packaged waste - stored in banded area in accordance with the ADG Code and Australian Standards	100 T	1-2 weeks
D350	Chlorates	Immobilisation / Storage	Adsorption	Disinfection by products from water treatment	Up to 1,000 T/year	Up to 5% w/w for treatment. For higher concentrations, transfer to other licenced facilities.	Chlorates will be reduced to chloride salt using bacteria	Solid Waste to meet landfill acceptance criteria Waste water to meet Trade Waste Criteria	Packaged waste stored in banded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks banded in accordance with Australian Standards Bulk sludge stored in treatment pits	100 T	1 week
N160	Encapsulated, chemically-fixed, solidified or polymerised wastes	Immobilisation	N/A	Waste from treatment facilities	Up to 5,000 T/year	Highly variable contaminants and concentrations. Case by case analysis.	Pre-treatment testing will determine most suitable reagents required for immobilisation targets to be met	Solid Waste to meet landfill acceptance criteria	Packaged waste stored in banded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk sludge stored in treatment pits	500 T	1-2 weeks
M220	Isocyanate compounds	Storage / Immobilisation	N/A	Polymer manufacturing	Up to 1,000 T / year	100T	Pre-treatment testing will determine treatment chemicals required, and most appropriate treatment technology	Solid Waste to meet landfill acceptance criteria	Packaged waste stored in banded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk sludge stored in treatment pits	100T	1 week
R120	Waste pharmaceuticals, drugs and medicines	Storage	Storage	Waste mineral oils unfit for their original intended use	Up to 1,000 T/year	Up to 100% oil	N/A	N/A	Packaged waste stored in banded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk sludge stored in treatment pits	100 T	1-2 weeks
J120	Oil and water mixtures or emulsions, or hydrocarbon and water mixtures or emulsions	N/A	Separation / Adsorption	Petroleum refineries, workshops, petrol stations, rolling mills and from edible oil and soap factories	Up to 20,000 T (KL)/year	Up to 30% oil. Higher concentrations will be transfer to licenced facilities.	Coagulants, aluminium sulphate.	Waste water to meet trade waste criteria. Oil recovered to be sent to oil recycling facilities.	Bulk liquid storage in WWTP Tanks banded in accordance with Australian Standards	1000 T (KL)	1-2 weeks

Waste Code	Waste Description	Solids and Sludge Treatment Technology	Liquid Waste Treatment Technology	Potential Sources	Potential Quantities (T/year)	Acceptance Criteria	Treatment Chemicals Used (see also Figure 7 Flow Chart)	Resultant Wastes and Products from Processing (see also Figure 7 Flow Chart)	Storage & Containment	Maximum Facility Storage Volume	Storage and Treatment Time
M230	Triethylamine catalysts for setting foundry sands	Immobilisation	N/A	Foundries	Up to 1,000 T/year	Up to 5% w/w for treatment. For higher concentrations, transfer to other licenced facilities.	Bioremediation reagents, Cement / fly ash / Magnesium oxide / activated carbon.	Solid Waste to meet landfill acceptance criteria or beneficial reuse under EOW Application	Bulk wastes (from tankers and tippers) will be stored in the main WWTP storage tanks or in the main solids receiveal area.	100 T	1-2 weeks
E100	Waste containing peroxides other than hydrogen peroxide	Immobilisation	Precipitation / Adsorption	Industrial waste, Mining Waste	Up to 1,000 T / year	Up to 5% w/w for treatment. For higher concentrations, transfer to other licenced facilities.	Cement / fly ash / Magnesium Oxide / Activated Carbon	Solid Waste to meet landfill acceptance criteria Waste water to meet Trade Waste Criteria	Packaged waste stored in bunded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks bunded in accordance with Australian Standards Bulk sludge stored in treatment pits	1,000 T	1-2 weeks
H100	Waste from the manufacture, formulation or use of biocides or phytopharmaceuticals	Immobilisation / Chemical Oxidation / Bioremediation	Chemical Oxidation / Adsorption	Biocide manufacture. Cooling tower decommissioning.	Up to 1,000 T / year	Up to 5% w/w for treatment. For higher concentrations, transfer to other licenced facilities.	Bioremediation reagents, Cement / fly ash / Magnesium oxide / activated carbon	Solid Waste to meet landfill acceptance criteria or beneficial reuse under EOW Application Waste water meeting Trade Waste Criteria	Packaged waste stored in bunded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks bunded in accordance with Australian Standards Bulk sludge stored in treatment pits	100 T	1-2 weeks
F100	Waste from the manufacture, formulation or use of inks, dyes, pigments, paints, lacquers or varnish	Immobilisation / Chemical Oxidation / Bioremediation	Chemical Oxidation / Adsorption	Solvent manufacture. By product from paint/pigment manufacture. Alcohol by products.	Up to 1,000 T / year	Up to 5% w/w for treatment. For higher concentrations, transfer to other licenced facilities.	Organic solvents will be recycled at economic concentrations. Waste waters and solids will be treated using oxidants and cement, or bioremediation.	Solid Waste to meet landfill acceptance criteria or beneficial reuse under EOW Application Waste water meeting Trade Waste Criteria	Packaged waste stored in bunded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks bunded in accordance with Australian Standards Bulk sludge stored in treatment pits	20 T	No storage, treated immediately
T120	Waste from the manufacture, formulation or use of photographic chemicals or processing materials	Immobilisation / Chemical Oxidation / Bioremediation	Precipitation / Chemical Oxidation	Photograph developers. Product destruction.	Up to 1,000 T/year	Up to 5% w/w organic and metal (predominantly Silver) for treatment. For higher concentrations, transfer to other licenced facilities.	Oxidants, activated carbon and cement, or bioremediation reagents.	Solid Waste to meet landfill acceptance criteria or beneficial reuse under EOW Application Waste water meeting Trade Waste Criteria	Packaged waste stored in bunded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks bunded in accordance with Australian Standards Bulk sludge stored in treatment pits	100 T	1-2 weeks
F110	Waste from the manufacture, formulation or use of resins, latex, plasticisers, glues or other adhesives	Immobilisation / Chemical Oxidation / Bioremediation	Precipitation / Chemical Oxidation / Adsorption	Chemical manufacturers, resin, latex and adhesive manufacturing.	Up to 10,000 T/year	Up to 5% w/w organic and metal contamination. For higher concentrations, transfer to other licenced facilities.	Oxidants, activated carbon and cement, or bioremediation reagents.	Solid Waste to meet landfill acceptance criteria or beneficial reuse under EOW Application Waste water meeting Trade Waste Criteria	Packaged waste stored in bunded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks bunded in accordance with Australian Standards Bulk sludge stored in treatment pits	1,000 T	1-2 weeks
R140	Waste from the manufacture or preparation of pharmaceutical products	Immobilisation / Chemical Oxidation / Bioremediation	Precipitation / Chemical Oxidation	Pharmaceutical manufacturing. Product destruction.	Up to 1,000 T/year	Highly variable contaminants and concentrations. Case by case analysis.	Oxidants, activated carbon and cement, or bioremediation.	Solid Waste to meet landfill acceptance criteria or beneficial reuse under EOW Application Waste water meeting Trade Waste Criteria	Packaged waste stored in bunded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks bunded in accordance with Australian Standards Bulk sludge stored in treatment pits	100 T	1-2 weeks

Waste Code	Waste Description	Solids and Sludge Treatment Technology	Liquid Waste Treatment Technology	Potential Sources	Potential Quantities (T/year)	Acceptance Criteria	Treatment Chemicals Used (see also Figure 7 Flow Chart)	Resultant Wastes and Products from Processing (see also Figure 7 Flow Chart)	Storage & Containment	Maximum Facility Storage Volume	Storage and Treatment Time
A100	Waste resulting from surface treatment of metals and plastics	Immobilisation / Chemical Oxidation / Bioremediation	Precipitation / Chemical Oxidation	Electroplaters, galvanisers, plastic manufacturers	Up to 1,000 T/year	Highly variable contaminants and concentrations. Case by case analysis.	Oxidants, activated carbon and cement, or bioremediation.	Solid Waste to meet landfill acceptance criteria or beneficial reuse under EOW Application Waste water meeting Trade Waste Criteria	Packaged waste stored in banded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks banded in accordance with Australian Standards Bulk sludge stored in treatment pits	100T	1-2 weeks
A110	Waste from heat treatment and tempering operations containing cyanide	Immobilisation / Chemical Oxidation / Bioremediation	Precipitation / Chemical Oxidation	Manufacturing (various), contaminated site remediation	Up to 1,000 T/year	Highly variable contaminants and concentrations. Case by case analysis.	Oxidants, activated carbon and cement, or bioremediation.	Solid Waste to meet landfill acceptance criteria or beneficial reuse under EOW Application Waste water meeting Trade Waste Criteria	Packaged waste stored in banded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks banded in accordance with Australian Standards Bulk sludge stored in treatment pits	100T	1-2 weeks
E100	Waste containing peroxides other than hydrogen peroxide	Immobilisation	Immobilisation	Manufacturing (various), contaminated site remediation	Up to 1,000 T/year	Highly variable contaminants and concentrations. Case by case analysis.	Oxidants, activated carbon and cement, or bioremediation.	Solid Waste to meet landfill acceptance criteria or beneficial reuse under EOW Application Waste water meeting Trade Waste Criteria	Packaged waste stored in banded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks banded in accordance with Australian Standards Bulk sludge stored in treatment pits	100T	1-2 weeks
D110	Inorganic fluorine compounds excluding calcium fluoride	Immobilisation	Immobilisation	Manufacturing (various), contaminated site remediation	Up to 1,000 T/year	Highly variable contaminants and concentrations. Case by case analysis.	Oxidants, activated carbon and cement, or bioremediation.	Solid Waste to meet landfill acceptance criteria or beneficial reuse under EOW Application Waste water meeting Trade Waste Criteria	Packaged waste stored in banded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks banded in accordance with Australian Standards Bulk sludge stored in treatment pits	100T	1-2 weeks
N100	Containers and drums that are contaminated with residues of substances referred to in this list	Immobilisation / Chemical Oxidation / Bioremediation	Precipitation / Chemical Oxidation	Manufacturing (various), contaminated site remediation	Up to 1,000 T/year	Highly variable contaminants and concentrations. Case by case analysis.	Oxidants, activated carbon and cement, or bioremediation.	Solid Waste to meet landfill acceptance criteria or beneficial reuse under EOW Application Waste water meeting Trade Waste Criteria	Packaged waste stored in banded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks banded in accordance with Australian Standards Bulk sludge stored in treatment pits	100T	1-2 weeks
D200	Cobalt compounds	Immobilisation	Precipitation	Manufacturing (various), contaminated site remediation	Up to 1,000 T/year	Up to 5% w/w	Oxidants, activated carbon and cement, or bioremediation.	Solid Waste to meet landfill acceptance criteria or beneficial reuse under EOW Application Waste water meeting Trade Waste Criteria	Packaged waste stored in banded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks banded in accordance with Australian Standards Bulk sludge stored in treatment pits	100T	1-2 weeks
D330	Inorganic sulfides	Immobilisation	Precipitation / Chemical Oxidation	Manufacturing (various), contaminated site remediation	Up to 1,000 T/year	Highly variable contaminants and concentrations. Case by case analysis.	Oxidants, activated carbon and cement, or bioremediation.	Solid Waste to meet landfill acceptance criteria or beneficial reuse under EOW Application Waste water meeting Trade Waste Criteria	Packaged waste stored in banded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks banded in accordance with Australian Standards Bulk sludge stored in treatment pits	100T	1-2 weeks
G110	Organic solvents excluding halogenated solvents	Immobilisation / Chemical Oxidation / Bioremediation	Precipitation / Chemical Oxidation	Manufacturing (various), contaminated site remediation	Up to 1,000 T/year	Highly variable contaminants and concentrations. Case by case analysis.	Oxidants, activated carbon and cement, or bioremediation.	Solid Waste to meet landfill acceptance criteria or beneficial reuse under EOW Application Waste water meeting Trade Waste Criteria	Packaged waste stored in banded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks banded in accordance with Australian Standards Bulk sludge stored in treatment pits	100T	1-2 weeks
N230	Ceramic-based fibres with physico-chemical characteristics similar to those of asbestos	Immobilisation / Chemical Oxidation / Bioremediation	Precipitation / Chemical Oxidation	Manufacturing (various), contaminated site remediation	Up to 1,000 T/year	Highly variable contaminants and concentrations. Case by case analysis.	Oxidants, activated carbon and cement, or bioremediation.	Solid Waste to meet landfill acceptance criteria or beneficial reuse under EOW Application Waste water meeting Trade Waste Criteria	Packaged waste stored in banded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks banded in accordance with Australian Standards Bulk sludge stored in treatment pits	100T	1-2 weeks

Waste Code	Waste Description	Solids and Sludge Treatment Technology	Liquid Waste Treatment Technology	Potential Sources	Potential Quantities (T/year)	Acceptance Criteria	Treatment Chemicals Used (see also Figure 7 Flow Chart)	Resultant Wastes and Products from Processing (see also Figure 7 Flow Chart)	Storage & Containment	Maximum Facility Storage Volume	Storage and Treatment Time
M150	Phenols, phenol compounds including chlorophenols	Immobilisation / Chemical Oxidation / Bioremediation	Precipitation / Chemical Oxidation	Manufacturing (various), contaminated site remediation	Up to 1,000 T/year	Highly variable contaminants and concentrations. Case by case analysis.	Oxidants, activated carbon and cement, or bioremediation.	Solid Waste to meet landfill acceptance criteria or beneficial reuse under EOW Application Waste water meeting Trade Waste Criteria	Packaged waste stored in bunded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks bunded in accordance with Australian Standards Bulk sludge stored in treatment pits	100T	1-2 weeks
M270	Per-and poly fluoroalkyl (PFAS) contaminated materials including waste PFAS-containing products and contaminated containers (Soils & Liquid Streams)	Storage and Transfer Only	Adsorption (Activated carbon, ion exchange)	Airports, defence sites, Manufacturing (various), contaminated site remediation	Up to 10,000 T/year	Compliant with the definition of solid waste storage and transfer requirements	Activated carbon & Ion Exchange Resins	Waste water meeting Trade Waste Criteria	Packaged waste stored in bunded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks bunded in accordance with Australian Standards Bulk sludge stored in treatment pits	2,000T	3 days
	Acid Sulphate Soils	Neutralisation	N/A	Contaminated soils derived from redevelopment / remediation programs	Up to 30,000 T/year	Background reference to Acid Sulphate Soils Map Characterisation Testing including Field pH, pHfox, SPOCAS and chromium suite of analysis at frequencies in accordance with Section 2 of NSW Acid Sulfate Soil Manual (1998)	Selection of reagent and dosage based on neutralising value (NV) requirements	Reuse (subject to relevant statutory approval) Solid waste disposal	Stored in treatment bays or pits and treated immediately	1000T	1-3 days

Acronym Meaning
 WWTP Waste Water Treatment Plant
 ADG Code Australian Dangerous Goods Code Edition 7.5

Table 2: NSW EPA Waste Codes - Proposed for Storage and Transfer Only

20142192-012-M-Rev0

Waste Code	Waste Description	Solids and Sludge Treatment Technology	Waste Water Treatment Technology	Potential Sources	Potential Quantities per annum	Contaminant Concentration	Storage & Containment	Maximum Storage Volume	Storage Time
A130	Cyanides (inorganic)	Storage Only	Storage Only	Transformers	Up to 1,000 T/year	Up to 5% w/w	Packaged waste stored in bunded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks bunded in accordance with Australian Standards Bulk sludge stored in treatment pits	50 T	1-2 weeks
M210	Cyanides (organic)	Storage Only	Storage Only	Transformers	Up to 1,000 T/year	Up to 5% w/w		50 T	1-2 weeks
M100	Material containing polychlorinated biphenyls ((PCB's), polychlorinated naphthalene's (PCN's), polychlorinated terphenyls (PCT's) and/or polybrominated biphenyls (PBB's)	Storage Only	Storage Only	Transformers	Up to 1,000 T/year	Up to 5% w/w		100 T	1-2 weeks
M260	Highly odorous organic chemicals (including mercaptans and acrylates)	Storage Only	Storage Only	Liquid wastes (sulphorous)	Up to 1,000 T/year	Up to 5% w/w		50T	<1 day
M180	Polychlorinated dibenzo-p-dioxin (any congener) Reactive Chemicals	Storage Only	Storage Only	Manufacturing (various), contaminated site remediation	Up to 1,000 T/year	Highly variable contaminants and concentrations. Case by case analysis.	Packaged waste stored in bunded area in accordance with the ADG Code and Australian Standards Bulk solids stored in bulk solids bunding Bulk liquid storage in WWTP Tanks bunded in accordance with Australian Standards Bulk sludge stored in treatment pits	100T	1-2 weeks
N220	Contaminated Soils Containing Asbestos	Storage & Transfer Only	N/A	Contaminated soils derived from redevelopment / remediation programs	Up to 10,000 T/year	Up to 0.001% w/w for friable asbestos (FA/AF)	No treatment proposed. Store and transfer only	1,000 T	1 day

Waste Code	Waste Description	Solids and Sludge Treatment Technology	Waste Water Treatment Technology	Potential Sources	Potential Quantities per annum	Contaminant Concentration	Storage & Containment	Maximum Storage Volume	Storage Time
N220	Pre Packaged Asbestos Waste Prepared for Disposal	Storage & Disposal Only	N/A	Demolition Wastes	Up to 20,000 T/year	Occupational Hygienist Certification Required	No treatment proposed. Store and transfer only	250T	1 day

APPENDIX D

Transport Impact Assessment

people**trans**



9-13 Whyalla Place, Prestons
Prestons Waste Treatment Facility
Transport Impact Assessment

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9-13 Whyalla Place, Prestons
Prestons Waste Treatment Facility
Transport Impact Assessment

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Signature	

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1. Introduction

1.1 Background

Hi Quality Waste Treatment Services Pty Ltd (Hi-Quality) propose to construct and operate a Waste Treatment Facility to be located at 9-13 Whyalla place in Prestons, New South Wales (NSW).

The facility is proposed to utilise technologies for treating solid and liquid waste to a level suitable for reuse, disposal to landfill or disposal to sewer.

The facility would process up to 270,000 tonnes of solid waste per annum, primarily generated from industrial processed and contaminated sites and include treatment of:

- ◆ Contaminated soils
- ◆ Contaminated sludges
- ◆ Liquid waste.

New ancillary infrastructure would be constructed and include:

- ◆ Weighbridges and weighbridge office
- ◆ Warehouse extension
- ◆ New driveway
- ◆ Parking
- ◆ Wheel wash and truck wash down bay.

Hi-Quality would locate some corporate offices at the facility, utilising existing office space.

The Waste Treatment Facility will be assessed as State Significant Development (SSD) by the NSW Department of Planning, Industry and Environment (DPIE) under Part 4 of the *Environmental Planning and Assessment Act 1979*. The assessment will involve the preparation of an Environmental Impact Statement (EIS).

PeopleTrans was engaged by Golder Associates in April 2020 to undertake a Transport Impact Assessment (TIA) of the proposed facility to assist with the EIS.

1.2 Assessment Methodology

To identify the traffic impact of the proposed facility on the nearby traffic and transport network and associated mitigation measures, the following was assessed:

- (1) Active transport requirements (pedestrians and cyclists)
- (2) Public transport in the vicinity of the site
- (3) Existing traffic, transport and parking conditions surrounding the site
- (4) Adequacy of proposed parking supply and layout
- (5) Service vehicle requirements and design of the site layout
- (6) Transport generating characteristics of the site
- (7) Suitability of the proposed access
- (8) Transport impact of the proposed facility on the surrounding road network during construction and operation.

Introduction

1.3 Other Nearby Road Projects

The Hoxton Park Road / Joadja Road intersection upgrade completed by Transport for New South Wales (Transport for NSW) as part of the Urban Roads Pinch Point Program opened in August 2020. The upgrade included an additional right turn lane on Hoxton Park Road in the eastbound direction and a signalised left turn slip lane on Hoxton Park Road in the westbound direction. The upgrade of this intersection is anticipated to improve its performance and safety.

Transport for NSW is also proposing to upgrade Hoxton Park Road between Banks Road and Cowpasture Road as part of the Hoxton Park Road Upgrade project. This project is located west of the site and primarily involves the construction of new bus only lanes, without reducing the capacity of the existing road.

Both proposed upgrades are expected to increase the capacity of the road network at locations likely to be used by traffic accessing the Whyalla Place site.

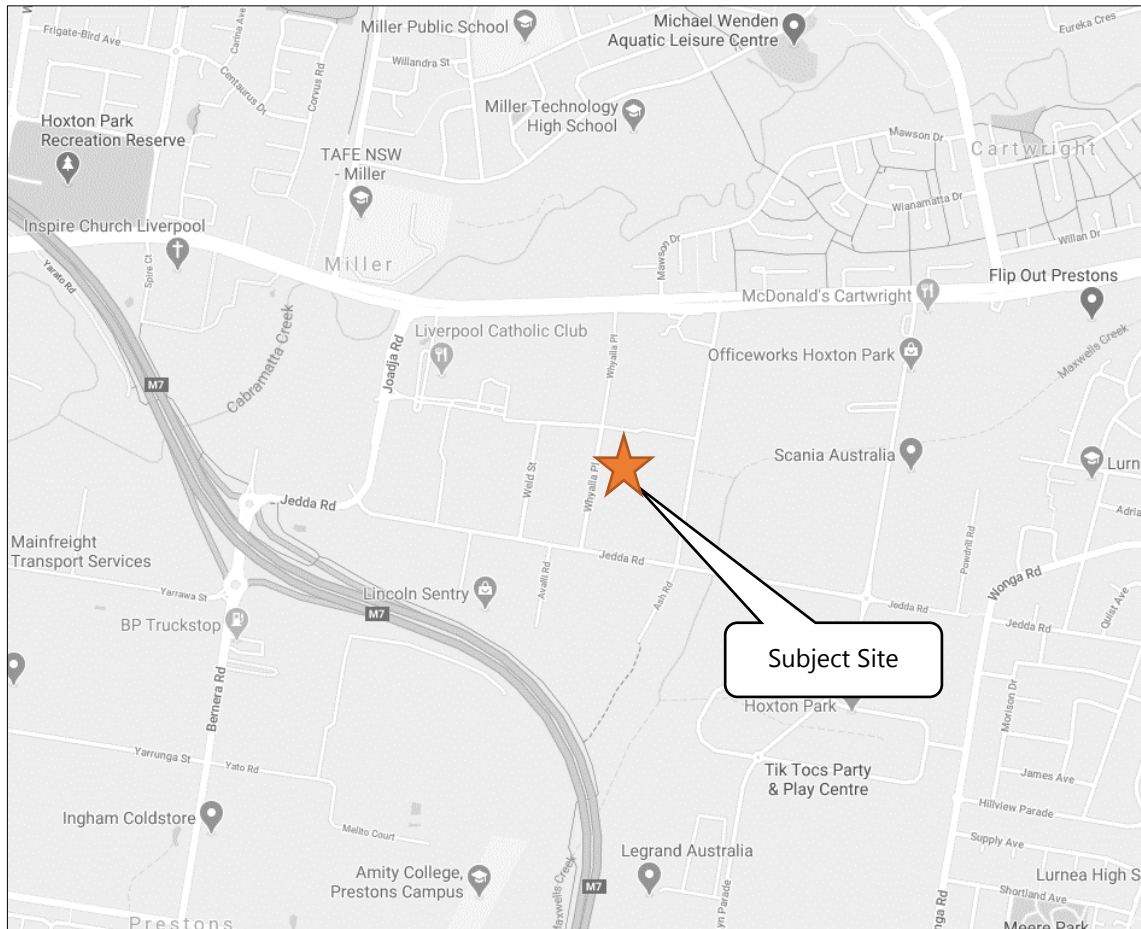
2. Existing Conditions

2.1 Site Location

The subject site is located at 9-13 Whyalla Place in Prestons. The site sits within an IN3 (heavy industry) zone.

The surrounding properties predominantly include a mixture of heavy industrial uses / warehouse uses. The location of the subject site and its neighbourhood is shown in Figure 2.1, with the site zoning shown in Figure 2.2 and existing site access shown in Figure 2.3.

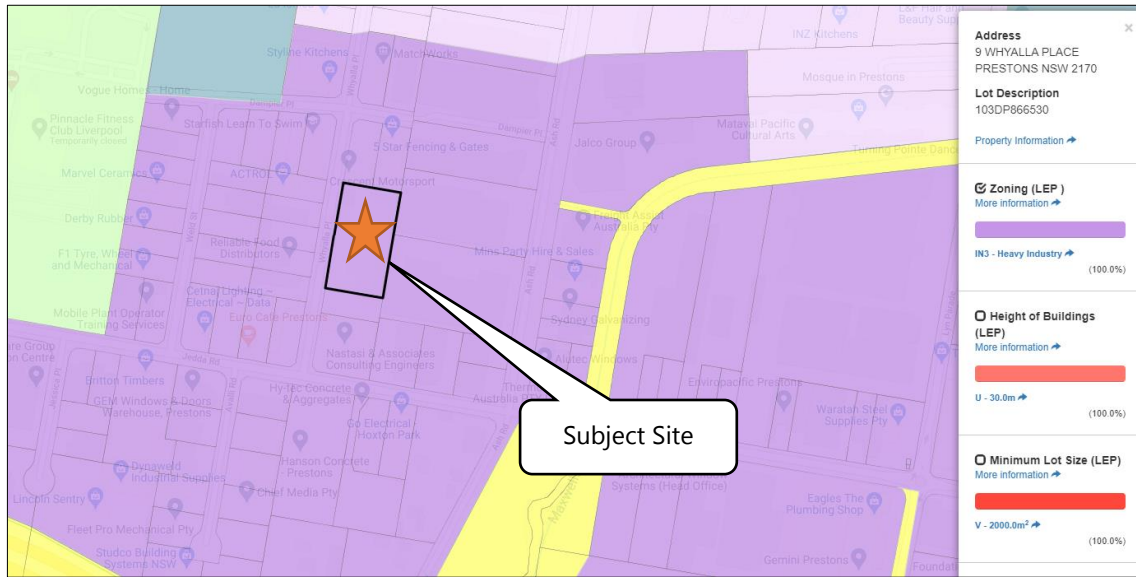
Figure 2.1: Subject Site and Its Neighbourhood



Source: maps.google.com.au

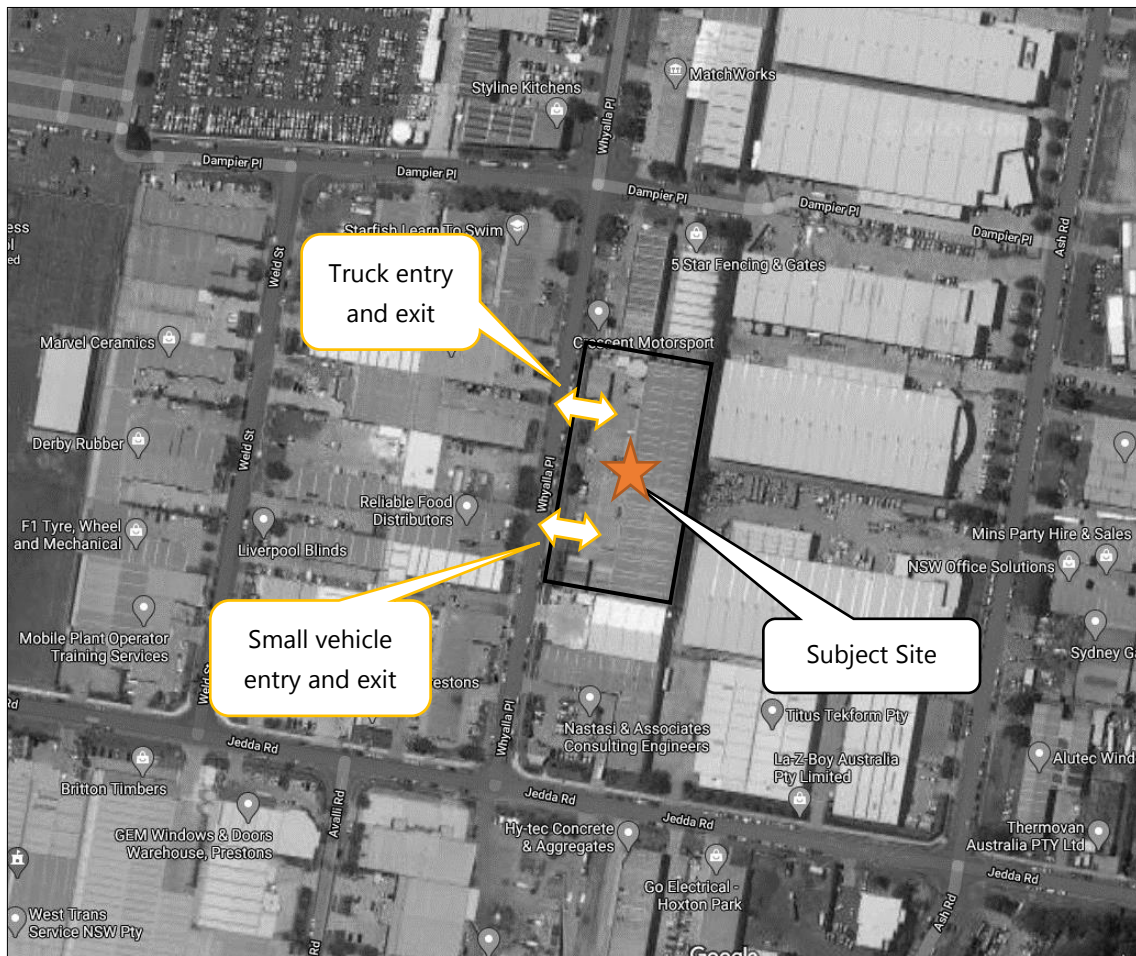
Existing Conditions

Figure 2.2: Subject Site and Zoning



Source: <https://eplanning.liverpool.nsw.gov.au/Pages/lcc.maps/maps.aspx> - accessed 8/9/20

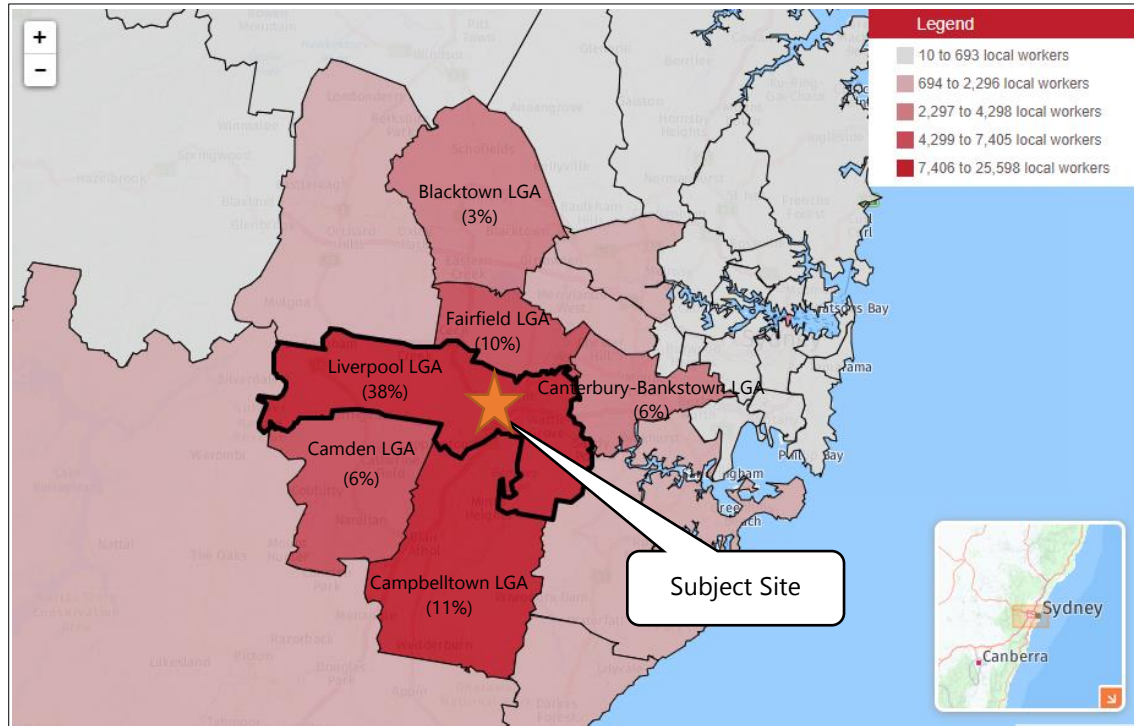
Figure 2.3: Existing Sites Access to / from Whyalla Place



2.2 Local Area Travel Characteristics

The travel characteristics of people who work in Prestons are good indicators for understanding how future employees of the development could travel to and from the site. A key source that provides this information is the Census Community Profile ID as shown in Figure 2.1.

Figure 2.4: Prestons Employees Place of Residence



Source: <https://profile.id.com.au/liverpool/workers?WebID=330> – last accessed 04/09/2020

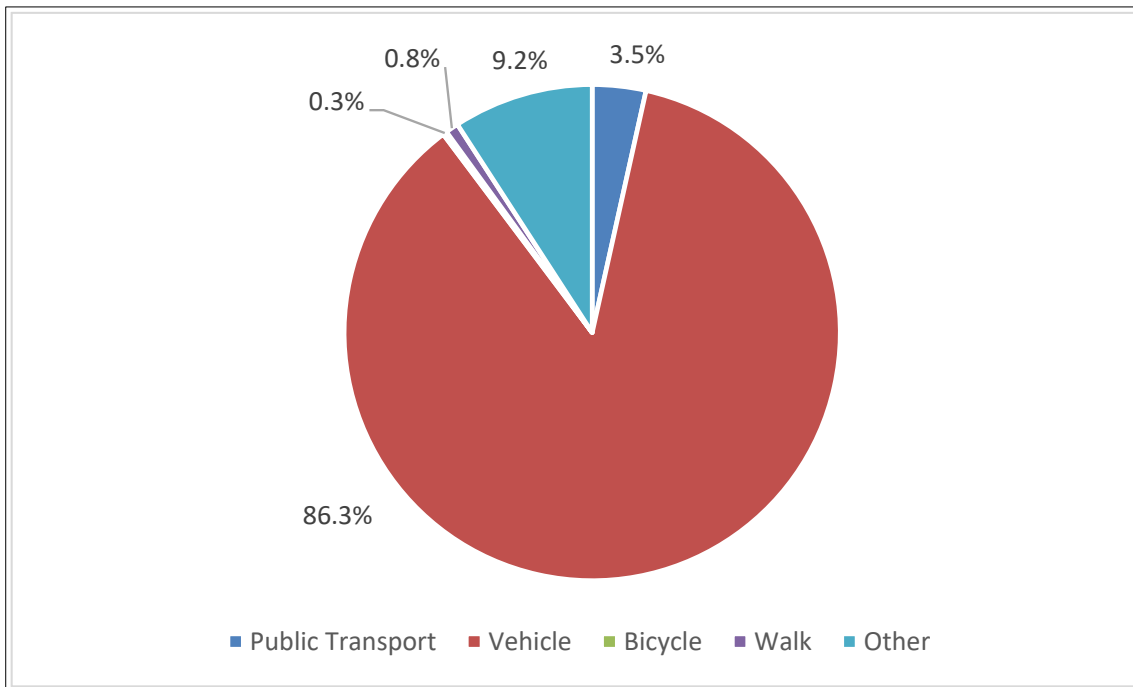
Figure 2.4 indicates that the majority of people that work in Prestons live in the Liverpool, Campbelltown and Fairfield LGA's, accounting for 59% of all employee locations.

Census data for 2016 from the Australian Bureau of Statistics (ABS) was also analysed to gain insight into the mode of transport used by people that work in Prestons. A summary of these transport modes for the Prestons-Edmondson Park area is summarised in Figure 2.5.



Existing Conditions

Figure 2.5: Prestons Employees Mode of Travel



As shown in Figure 2.5, the majority of people that work in Prestons travel by vehicle (car or truck) to get to work, accounting for 86.3% of modes. Approximately 3.5% of Prestons employees use public transport while less than 1 per cent travel to work by cycling or walking.

2.3 Road Network

Details of key roads within close proximity to the site are provided in Table 2.1.

Table 2.1: Summary of key roads

Road Name	Classification	Orientation	Configuration	On-Street Restrictions
M7 Motorway	State Road	North-south	2 lanes in each direction	No stopping
Benera Road	State Road (at M7 interchange) Unclassified Regional Road (south of M7 interchange)	North-south	2 lanes in each direction at M7 interchange 1 lane in each direction between M7 interchange and Kurrajong Road	No stopping
Jedda Road	State Road (between Benera Road and Joadja Road) Local Road (east of Joadja Road)	East-west	2 lanes in each direction (State Road) 1 lane in each direction with provision of kerbside parking on both sides (Local Road)	Unrestricted parking
Joadja Road	State Road	North-south	2 lanes in each direction	No stopping
Hoxton Park Road	State Road	East-west	2 lanes in each direction for general traffic In addition, 1 lane in each direction for Transitway buses (Liverpool-Parramatta Transitway)	No stopping
Kurrajong Road	Unclassified Regional Road (east of Benera Road)	East-west	1 lane in each direction east of Benera Road	No stopping
Beech Road	Unclassified Regional Road (north of M5 Motorway)	North-south	1 lane in each direction north of M5 Motorway	No stopping
Lyn Parade	Local Road	North-south	1 lane in each direction with provision of kerbside parking on both sides	Unrestricted parking north of Enterprise Circuit. No stopping on the western side of Lyn Parade south of Enterprise Circuit. Parking 7pm to 6am Monday to Friday, and all day Saturday to Sunday and Public Holidays, with long or heavy vehicles permitted to stop longer than 1 hour on the eastern side of Lyn Parade south of Enterprise Circuit.
Ash Road	Local Road	North-south	1 lane in each direction with provision of kerbside parking on both sides	Parking 7pm to 6am Monday to Sunday with long or heavy vehicles permitted to stop longer than 1 hour.
Whyalla Place	Local Road	North-south	1 lane in each direction with provision of kerbside parking on both sides	Parking 7pm to 6am Monday to Sunday with long or heavy vehicles permitted to stop longer than 1 hour. Unrestricted parking on the eastern side of Whyalla Place south of the site.

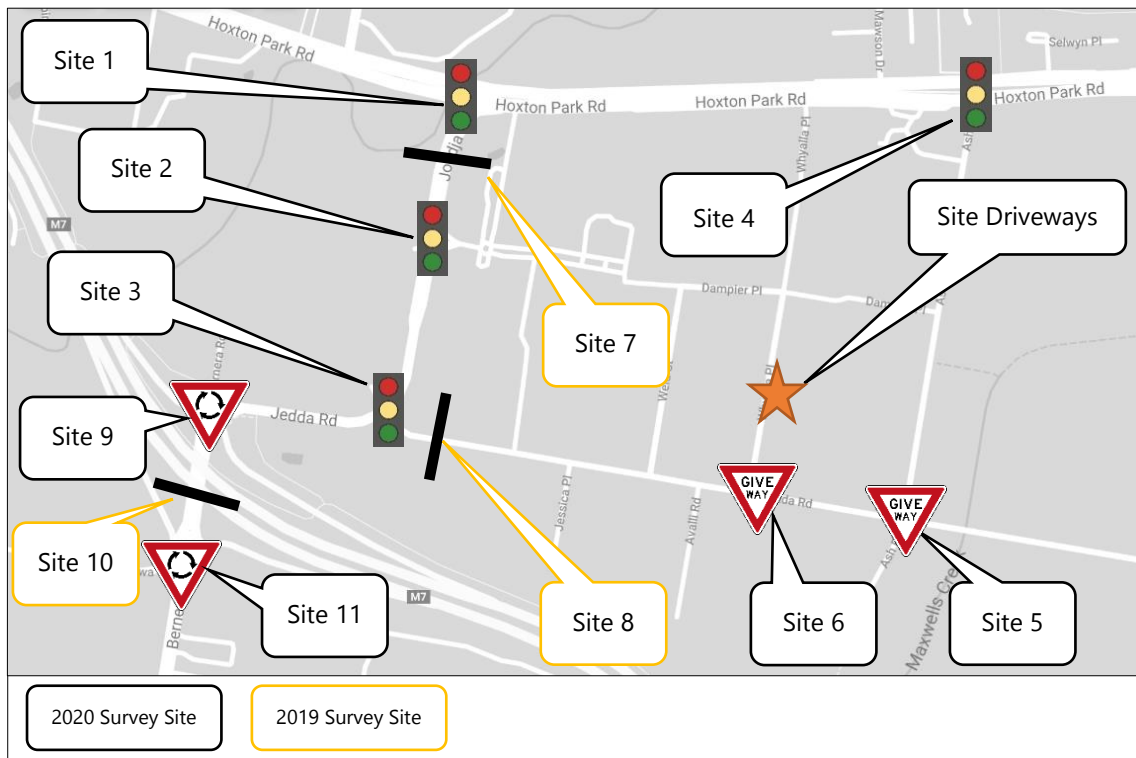
2.4 Traffic Volumes

PeopleTrans commissioned vehicle movement counts in the vicinity of the site on Wednesday 29 April 2020 during the following peak periods:

- ◆ 6:00am to 9:30am
- ◆ 2:00pm to 5:00pm.

To understand whether COVID-19 was impacting the traffic volumes on the survey day, PeopleTrans also sourced traffic counts undertaken in 2019. The locations of the traffic surveys undertaken in 2020 and 2019, for comparison purposes, are shown in Figure 2.6. Full traffic survey data is provided in **Appendix A**.

Figure 2.6: Summary of Traffic Surveys Undertaken / Sourced



The dates of the 2019 and 2020 surveys are shown in Table 2.2.

Table 2.2: 2020 Traffic Survey Locations and Dates

Site	Location	Type of Survey	Survey Dates	Survey Times
1	Hoxton Park Road / Joadja Road	Turning Movement Count	Wed 29/4/20	6:00am-9:30am 2:00pm-5:00pm
2	Joadja Road / Liverpool Catholic Club	Turning Movement Count	Wed 29/4/20	6:00am-9:30am 2:00pm-5:00pm
3	Joadja Road / Jedda Road	Turning Movement Count	Wed 29/4/20	6:00am-9:30am 2:00pm-5:00pm
4	Hoxton Park Road / Ash Road	Turning Movement Count	Wed 29/4/20	6:00am-9:30am 2:00pm-5:00pm
5	Ash Road / Jedda Road	Turning Movement Count	Wed 29/4/20	6:00am-9:30am 2:00pm-5:00pm
6	Whyalla Place / Jedda Road	Turning Movement Count	Wed 29/4/20	6:00am-9:30am 2:00pm-5:00pm
7	Joadja Road south of Hoxton Park Road	7-Day Tube Count	Mon 11/11/19 – Sun 17/11/19	24-hours / 7-days
8	Jedda Road east of Joadja Road	7-Day Tube Count	Mon 11/11/19 – Sun 17/11/19	24-hours / 7-days
9	Roundabout at the intersection of Bernera Road / Jedda Road / M7 Ramps	Turning Movement Count	Wed 25/3/20	6:00am-9:30am 2:30pm-5:00pm
10	Bernera Road between M7 interchange roundabouts	7-Day Tube Count	Mon 25/11/19 – Sun 1/12/19	24-hours / 7-days
11	Roundabout at the intersection of Bernera Road / Yarrowa Street / M7 Ramps	Turning Movement Count	Wed 25/3/20	6:00am-9:30am 2:30pm-5:00pm
Driveway	9-13 Whyalla Place Existing Driveways	Turning Movement Count	Wed 13/5/20	6:00am-9:30am 2:00pm-5:00pm

PeopleTrans compared the tube counts from 2019 with the intersection counts from 2020. The main outcomes were as follows:

- ◆ The AM and PM peak hour times were similar between the two dates.
- ◆ On Joadja Road south of Hoxton Park Road, in the AM peak hour, bi-directional traffic volumes were 67% higher in 2019 compared to 2020. In the PM peak hour, bi-directional traffic volumes were 25% higher in 2019 compared to 2020.
- ◆ On Jedda Road east of Joadja Road, in the AM peak hour, bi-directional traffic volumes were 46% higher in 2019 compared to 2020. In the PM peak hour, bi-directional traffic volumes were 25% higher in 2019 compared to 2020.
- ◆ Although total traffic volumes were lower in the 2020 surveys compared to the 2019 surveys, the number of heavy vehicles in the AM peak hour increased on Joadja Road in the southbound direction (13 more vehicles in 2020 compared to 2019) and Jedda Road in the westbound direction (25 more vehicles in 2020 compared to 2019).

In order to determine the traffic volumes to use for the modelling assessment, PeopleTrans compared the 2019 and 2020 surveys at the two tube count locations and proportionally increased the equivalent intersection counts to approximately match the tube counts.

To provide a conservative assessment, and where movements could not be determined from known values, they were increased by 67% in the AM peak hour and 25% during the PM peak hour from the percentages calculated above.

Traffic volumes at the two M7 interchange roundabouts were based on a similar assessment undertaken by PeopleTrans for a site nearby. Where there was an imbalance in flow, traffic was manually added to the road network to provide a conservative assessment.

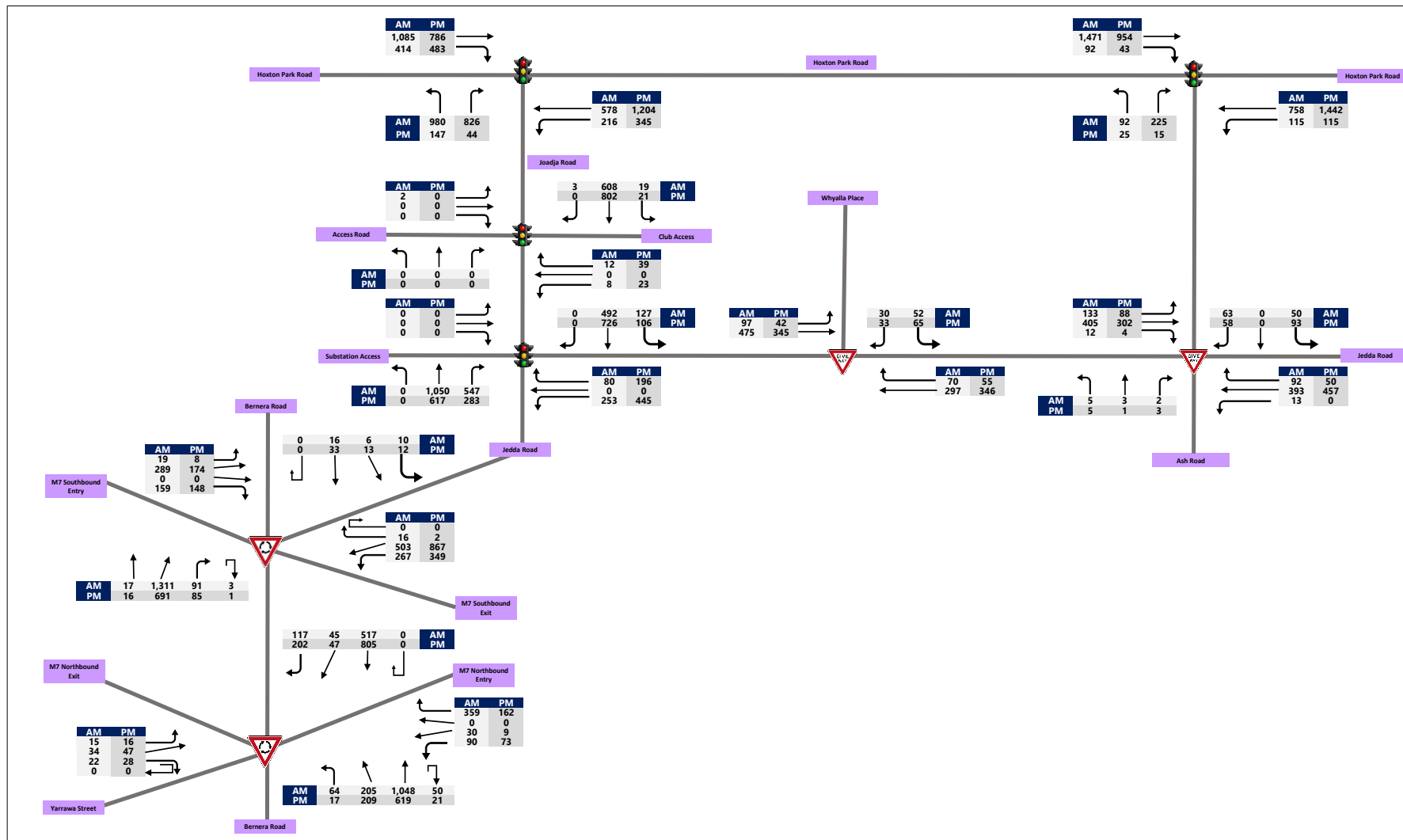
Existing Conditions

The base network 2020 AM and PM peak hour traffic volumes are summarised Figure 2.7 and because they have been increased to reflect 'typical' peak traffic conditions, are considered satisfactory for use as part of future planning for the Whyalla Place site.

Existing Conditions

Figure 2.7: Existing AM Peak Hour (7:30am to 8:30am) / PM Peak Hour (3:15pm to 4:15pm) Traffic Volumes Under 'Typical' Traffic Conditions

People, Passion, Perseverance



Existing Conditions

2.4.1 Existing Driveway

Counts of the existing northern and southern driveways at 9-13 Whyalla Place were collected on 13 May 2020 from 6:00am to 9:30am and 2:00pm to 5:00pm. The number of vehicles travelling to and from the existing site during the road network AM and PM peak hour are summarised in Table 2.3.

Table 2.3: Maximum hourly volume on existing driveways

Peak Hour	Northern		Southern	
	In	Out	In	Out
AM	0 vehicles	0 vehicles	0 vehicles	0 vehicles
PM	0 vehicles	4 light vehicles	1 light vehicle	2 light vehicles

As shown in Table 2.3, there were no vehicles observed travelling to and from the site in the AM peak hour. In the PM peak hour, there was 1 light vehicle entering the site and 6 light vehicles exiting the site. In addition, no heavy vehicles were observed.

2.4.2 Traffic Profile Across the Day

Traffic volumes for Joadja Road, south of Hoxton Park Road, taken from November 2019 tube counts, are shown in Figure 2.8 and Figure 2.9.

Figure 2.8: 2019 Average Weekday Northbound Traffic Volumes on Joadja Road (Site 7)

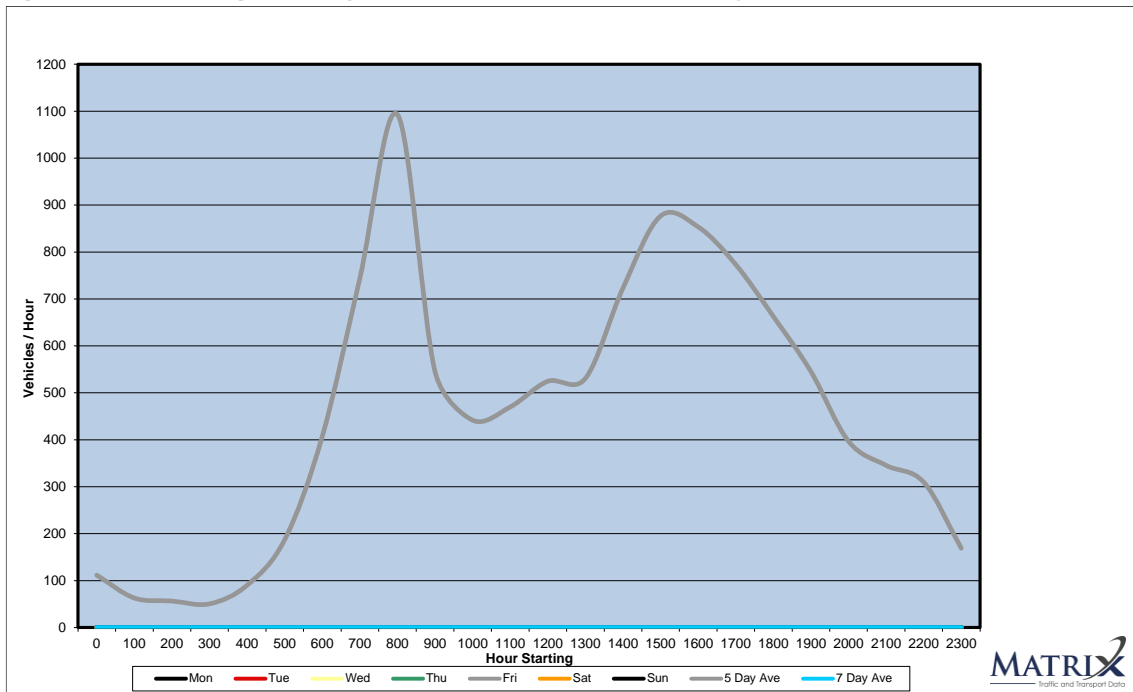
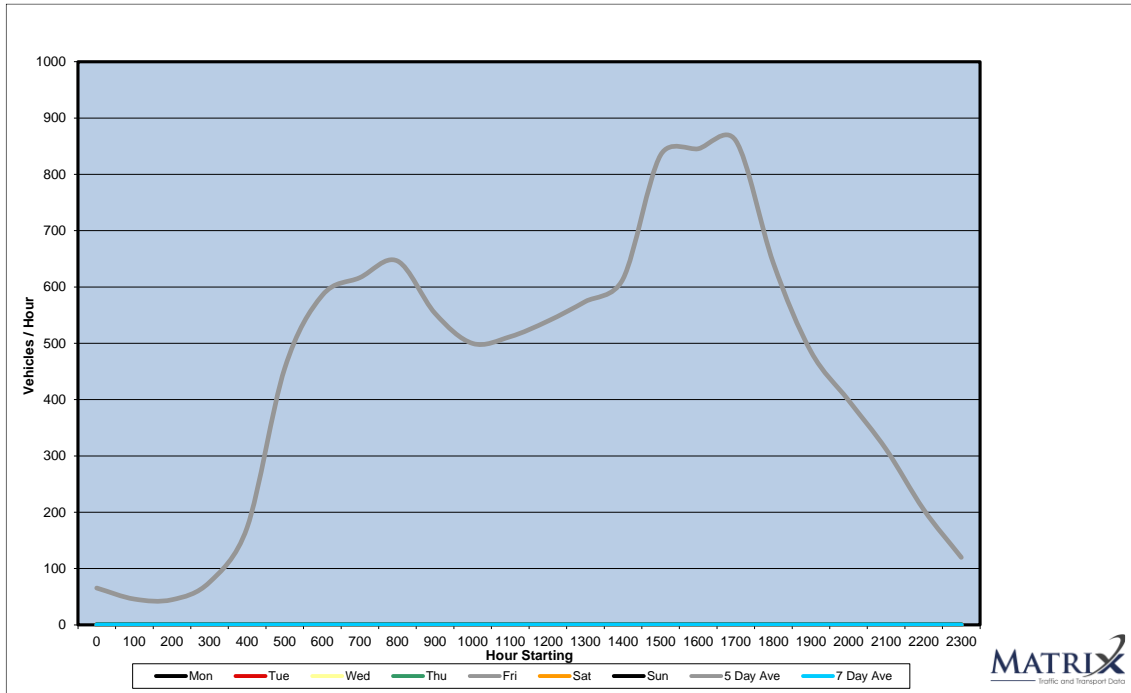


Figure 2.9: 2019 Average Weekday Southbound Traffic Volumes on Joadja Road (Site 7)



The results show that there were distinct spikes in traffic during the AM and PM peak periods in both directions.

During the AM peak period, traffic volumes were higher in the northbound direction, with the survey recording an AM peak hour volume of approximately 1,110 vehicles/hour in the northbound direction compared to approximately 650 vehicles/hour in the southbound direction.

During the PM peak period, traffic volumes were similar in both directions, with the survey recording a PM peak hour volume between 830 and 880 vehicles in each direction.

Traffic volumes for Jeddah Road, east of Joadja Road, taken from November 2019 tube counts are shown in Figure 2.10 and Figure 2.11.

Existing Conditions

Figure 2.10: 2019 Average Weekday Eastbound Traffic Volumes on Jedda Road (Site 8)

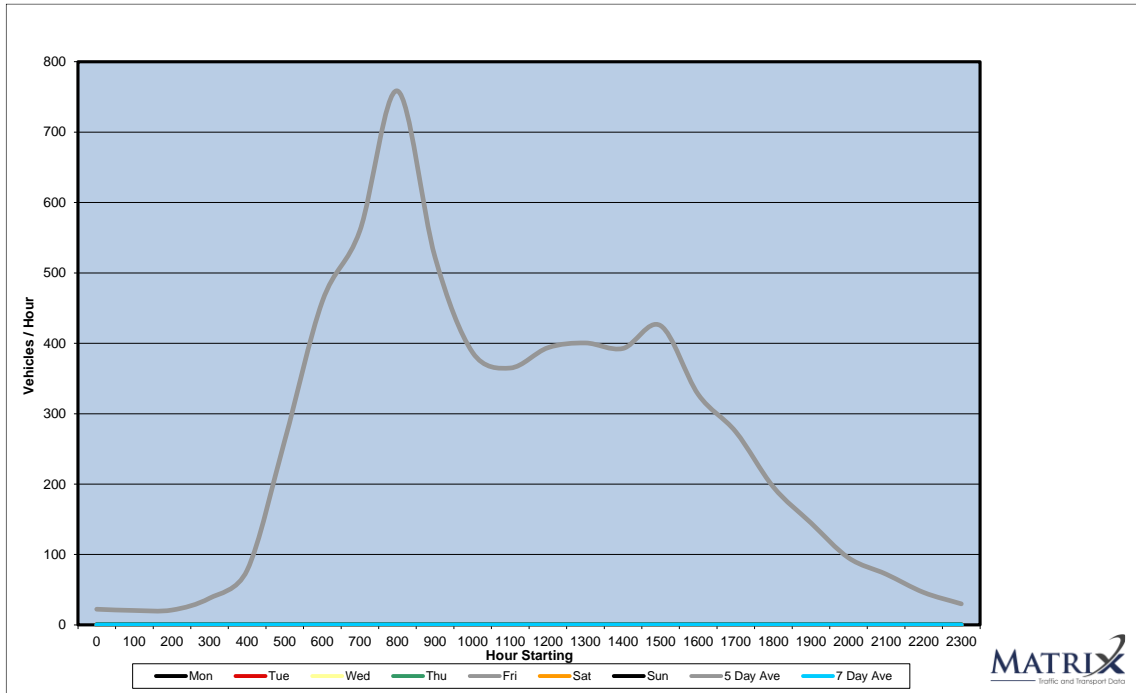
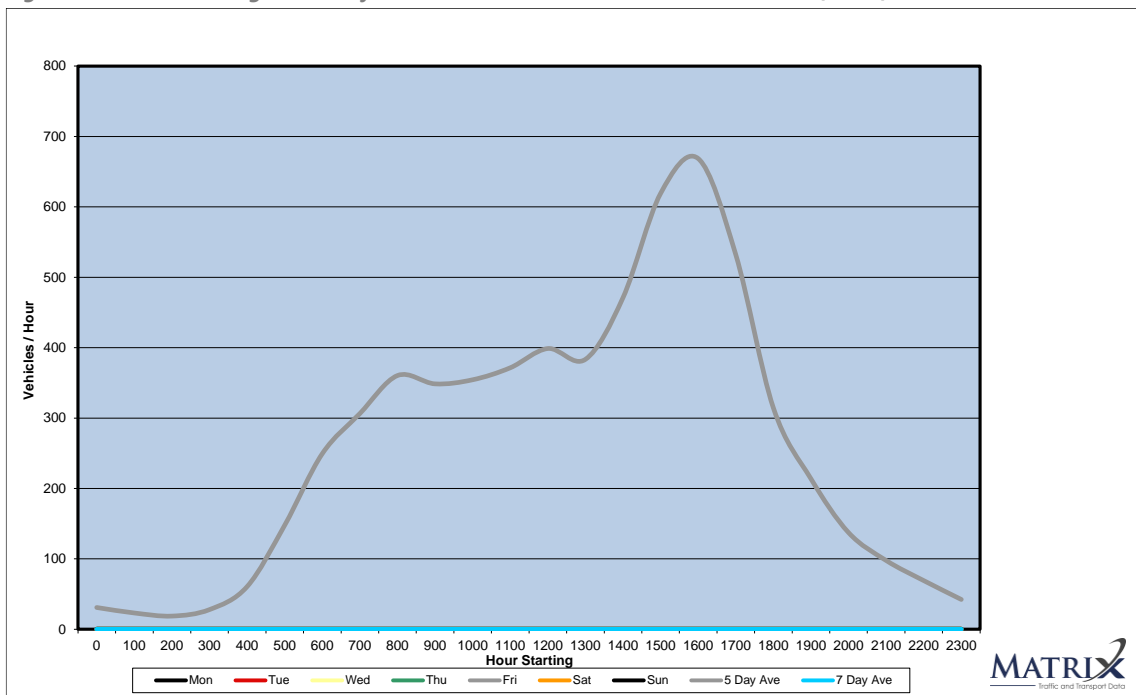


Figure 2.11: 2019 Average Weekday Westbound Traffic Volumes on Jedda Road (Site 8)



The results show that Jedda Road experiences tidal flow condition with an eastbound peak flow during the AM peak period and a westbound peak flow during the PM peak period. Peak direction traffic volumes were between 650 and 760 vehicles/hour respectively.

2.5 Intersection Operation

The operation of the key intersections within the study area identified in Table 2.2 have been assessed using Sidra Intersection, a computer-based modelling package which calculates intersection performance.

The commonly used measure of intersection performance, as defined by Transport for NSW, is vehicle delay. Sidra Intersection determines the average delay that vehicles encounter and provides a measure of the level of service.

Table 2.4 shows the criteria that Sidra Intersection adopts in assessing the level of service.

Table 2.4: Sidra Intersection Level of Service Criteria

Level of Service	Average Delay per vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way & Stop Sign
A	0 to 14.5	Good operation	Good operation
B	14.5 to 28.5	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	28.5 to 42.5	Satisfactory	Satisfactory, but accident study required
D	42.5 to 56.5	Near capacity	Near capacity, accident study required
E	56.5 to 70.5	At capacity, at signals incidents will cause excessive delays	At capacity, requires other control mode
F	Greater than 70.5	Extra capacity required	Extreme delay, major treatment required

2.5.1 Traffic Data / Model Inputs

The following data was used to develop the models:

- ◆ Intersection counts identified in Section 2.4
- ◆ Midblock counts identified in Section 2.4
- ◆ TCS plans of the modelled signalised intersections
- ◆ Google maps
- ◆ Nearthmap
- ◆ Site inspections on 24/03/20 and 29/04/20

As discussed in Section 2.4, the AM and PM peak hour volumes were adjusted to account for changes in typical traffic conditions due to COVID-19. The layout and geometry of intersections were validated against aerial imagery, TCS plans and site inspections on 24/03/20 and 29/04/20. Signal phasing and cycle times were determined by analysing survey video footage of each intersection. Based on the calculated cycle times, the two signalised intersection along Hoxton Park Road were considered likely to be coordinated and this was coded into the Sidra models.

2.5.2 Existing Intersection Performance

Table 2.5 and Table 2.6 present a summary of the existing operation of the intersections with Sidra modelling outputs provided in **Appendix B**.

Table 2.5: Existing Intersection Operating Conditions (AM peak hour)

Intersection	Leg	Degree of Saturation (DOS)	Average Delay (sec)	95 th Percentile Queue (m)	Level of Service (LOS)
Hoxton Park Road / Joadja Road	South	0.686	26.9	114.1	B
	East	0.673	31.6	114.3	C
	West	0.682	17.0	150.1	B
	Overall	0.686	23.6	150.1	B
Joadja Road / Liverpool Catholic Club	South	0.488	4.8	61.7	A
	East	0.058	28.6	2.2	C
	North	0.395	11.4	46.6	A
	West	0.015	27.8	0.6	B
	Overall	0.488	7.4	61.7	A
Jedda Road / Joadja Road	South East	0.434	17.2	37.1	B
	North East	0.909	37.7	92.9	C
	North West	0.017	27.7	0.6	B
	South West	0.821	12.0	107.8	A
	Overall	0.909	18.9	107.8	B
Ash Road / Hoxton Park Road	South	0.523	50.8	37.3	D
	East	0.380	12.8	88.0	A
	West	0.530	7.3	110.6	A
	Overall	0.530	11.1	110.6	A
Ash Road / Jedda Road	South	0.050	43.3	1.5	D
	East	0.362	10.7	15.2	A
	North	0.492	34.7	19.1	C
	West	0.348	11.4	4.0	A
	Overall	0.492	43.3	19.1	D
Jedda Road / Whyalla Place	East	0.273	10.0	10.5	A
	North	0.179	17.2	5.9	B
	West	0.352	5.8	0.0	A
	Overall	0.352	17.2	10.5	B
Whyalla Place / Northern Driveway	South	0.100	4.3	0.1	A
	East	0.002	6.4	0.0	A
	North	0.055	5.5	0.0	A
	Overall	0.100	6.4	0.1	A
Whyalla Place / Southern Driveway	South	0.100	5.8	0.1	A
	East	0.002	6.4	0.0	A
	North	0.055	4.1	0.0	A
	Overall	0.100	6.4	0.1	A
Bernera Road / M7 SB Entry Ramp / Jedda Road / M7 SB Exit Ramp	South	0.491	11.8	31.3	A
	North East	0.409	13.4	18.0	A
	North	0.108	18.9	4.5	B
	North West	0.394	16.6	16.7	B
	Overall	0.491	18.9	31.3	B

Table 2.5 (continued): Existing Intersection Operating Conditions (AM peak hour)

Intersection	Leg	Degree of Saturation (DOS)	Average Delay (sec)	95 th Percentile Queue (m)	Level of Service (LOS)
Bernera Road / M7 NB Exit Ramp / M7 NB Entry Ramp / Yarrawa Street	South	0.592	15.9	34.4	B
	North East	0.386	13.4	14.5	A
	North	0.279	12.2	13.3	A
	South West	0.264	18.6	12.1	B
	Overall	0.592	18.6	34.4	B

Table 2.6: Existing Intersection Operating Conditions (PM peak hour)

Intersection	Leg	Degree of Saturation (DOS)	Average Delay (sec)	95 th Percentile Queue (m)	Level of Service (LOS)
Hoxton Park Road / Joadja Road	South	0.832	35.7	219.5	C
	East	0.824	18.7	208.5	B
	West	0.796	19.3	202.3	B
	Overall	0.832	22.9	219.5	B
Joadja Road / Liverpool Catholic Club	South	0.327	3.9	36.3	A
	East	0.206	28.4	8.3	B
	North	0.466	10.8	62.1	A
	West	0.011	30.1	0.4	C
	Overall	0.466	8.2	62.1	A
Jedda Road / Joadja Road	South East	0.780	22.8	71.5	B
	North East	0.773	24.8	99.6	B
	North West	0.014	27.1	0.6	B
	South West	0.575	10.2	55.9	A
	Overall	0.780	18.7	99.6	B
Ash Road / Hoxton Park Road	South	0.672	51.7	72.7	D
	East	0.665	14.4	212.4	A
	West	0.528	8.1	57.1	A
	Overall	0.672	15.4	212.4	B
Ash Road / Jedda Road	South	0.022	14.6	0.6	B
	East	0.315	8.4	5.7	A
	North	0.302	18.6	9.2	B
	West	0.244	12.1	1.4	A
	Overall	0.315	18.6	9.2	B
Jedda Road / Whyalla Place	East	0.276	8.6	7.0	A
	North	0.141	12.4	4.1	A
	West	0.251	5.9	0.0	A
	Overall	0.276	12.4	7.0	A
Whyalla Place / Northern Driveway	South	0.060	4.3	0.1	A
	East	0.003	6.1	0.1	A
	North	0.055	5.5	0.0	A
	Overall	0.060	6.1	0.1	A

Table 2.6 (continued): Existing Intersection Operating Conditions (PM peak hour)

Intersection	Leg	Degree of Saturation (DOS)	Average Delay (sec)	95 th Percentile Queue (m)	Level of Service (LOS)
Whyalla Place / Southern Driveway	South	0.060	5.8	0.1	A
	East	0.002	6.1	0.1	A
	North	0.056	4.1	0.0	A
	Overall	0.060	6.1	0.1	A
Bernera Road / M7 SB Entry Ramp / Jedda Road / M7 SB Exit Ramp	South	0.270	11.7	12.6	A
	North East	0.576	15.6	29.8	B
	North	0.112	15.0	3.8	B
	North West	0.209	11.4	7.0	A
	Overall	0.576	15.6	29.8	B
Bernera Road / M7 NB Exit Ramp / M7 NB Entry Ramp / Yarrawa Street	South	0.361	14.3	14.4	A
	North East	0.207	13.9	7.3	A
	North	0.393	12.1	20.0	A
	South West	0.187	14.1	7.0	A
	Overall	0.393	14.3	20.0	A

Analysis of the Sidra modelling outputs show the following:

- ◆ All intersections currently operate with a satisfactory level of service (D or better)
- ◆ At the Hoxton Park Road / Joadja Road intersection, queues extend up to 220 metres on all legs during the PM peak hour.
- ◆ At the Hoxton Park Road / Ash Road intersection, queues extend up to 215 metres on the east leg in the PM peak hour.
- ◆ At the Joadja Road / Jedda Road intersection during the AM peak hour the northbound right turn queue extends 108m from the stop line outside of the existing chevron and impeding the northbound through traffic in the adjacent lane as shown in Figure 2.12.

Figure 2.12: Jedda Road / Joadja Road Right Turn Queues – Wednesday 15 April 2020 at 11:56am



2.6 Public Transport Network

There are no train stations located within the immediate vicinity of the site. The nearest train services are accessible from Liverpool Station, Casula Station or Edmondson Park Station which are located around 5km away.

Existing Conditions

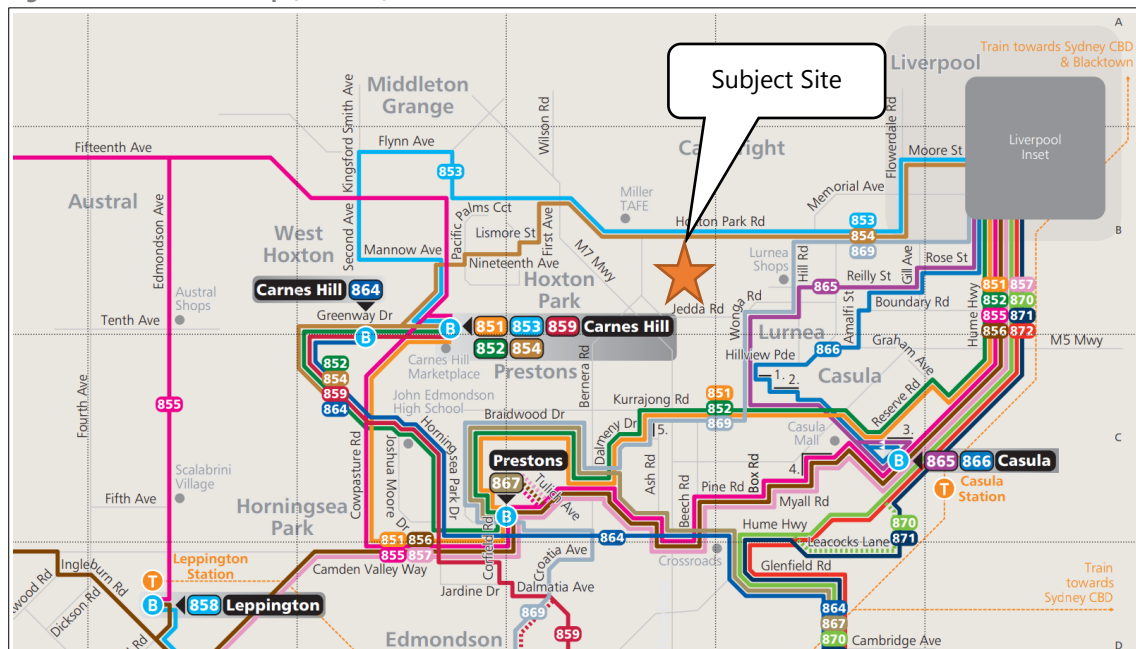
A number of bus routes serve Prestons and are operated by Interline and Transit Systems. These buses are accessible from bus stops located along Hoxton Park Road, Cartwright Avenue, Cabramatta Avenue, Hill Road, Wonga Road and Kurrajong Road. The Liverpool-Parramatta Transitway also operates adjacent to the western side of Banks Road and along the centre of Hoxton Park Road.

A summary of bus services is shown in Table 2.7. Bus route maps are shown in Figure 2.13 (Interline) and Figure 2.14 (Transit Systems).

Table 2.7: Bus services

Route	Description	Weekday Frequency	Weekend Frequency
T80	Liverpool to Parramatta via Transitway	5-10 minutes	15 minutes
802	Liverpool to Parramatta via Green Valley	30 minutes	30 minutes (Saturday) 60 minutes (Sunday)
803	Liverpool to Miller (Loop Service)	30 minutes	Not in operation
851	Carnes Hill Marketplace to Liverpool via Cowpasture Road	30-60 minutes	60 minutes
852	Carnes Hill Marketplace to Liverpool via Greenway Drive and Cowpasture Road	30-60 minutes	60 minutes
853	Carnes Hill to Liverpool via Hoxton Park Road	10-60 minutes	60 minutes
854	Carnes Hill to Liverpool via Greenway Drive and Hoxton Park Road	15-60 minutes	60 minutes
865	Casula to Liverpool via Lurnea Shops	30 minutes	60 minutes (Saturday) 120 minutes (Sunday)
869	Ingleburn to Liverpool via Edmondson Park and Prestons	10-30 minutes	60 minutes

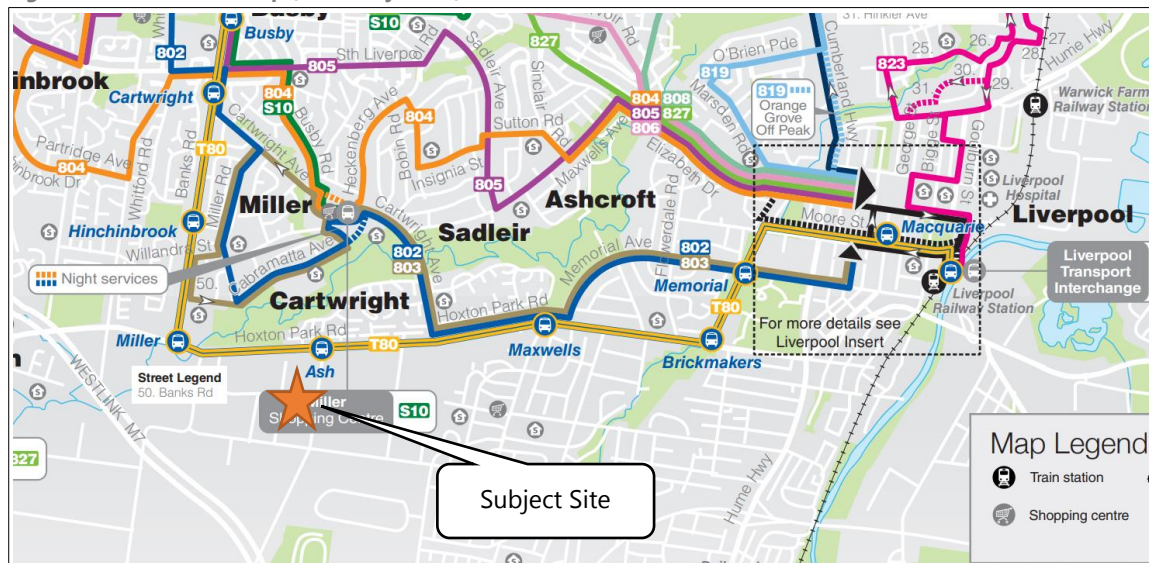
Figure 2.13: Bus route map (Interline)



Source: https://interlinebus.com.au/pdf/maps/Network_Map.pdf - last accessed 03/07/2020

Existing Conditions

Figure 2.14: Bus route map (Transit Systems)



Source:

https://static1.squarespace.com/static/5a668f1080bd5e34d18a7e76/t/5b06206e88251b0847afd7a2/1527128181142/17620_TS_R3_network_map_20171126.pdf - last access 03/07/2020

2.7 Active Transport Network

The active transport network in the vicinity of the site is described in the following sections.

2.7.1 Pedestrian Network

Pedestrian paths are located as follows:

- ◆ M7 Motorway west of Bernera Road – shared path on the western side
- ◆ M7 Motorway east of Bernera Road – shared path on the eastern side
- ◆ Bernera Road near M7 Motorway – shared path on both sides
- ◆ Bernera Road between Yato Road and Kurrajong Road – sealed footpath on the eastern side
- ◆ Jedda Road between Bernera Road and Joadja Road – shared path on the southern side
- ◆ Jedda Road east of Joadja Road – shared path on the northern side
- ◆ Joadja Road – shared path on the eastern side
- ◆ Hoxton Park Road east of Joadja Road – shared path on the northern side and sealed footpath on the southern side
- ◆ Hoxton Park Road west of Joadja Road – shared path on both sides
- ◆ Kurrajong Road between Bernera Road and M7 Motorway – shared path on both sides
- ◆ Kurrajong Road east of M7 Motorway – shared path on the southern side and sealed footpath on the northern side
- ◆ Beech Road between Camden Valley Way and M7 Motorway – sealed footpath on both sides
- ◆ Beech Road north of M7 Motorway – sealed footpath on the western side
- ◆ Lyn Parade south of Jedda Road – sealed footpath on the western side
- ◆ Lyn Parade north of Jedda Road – sealed footpath on both sides
- ◆ Ash Road – sealed footpath on both sides
- ◆ Whyalla Place – sealed footpath on the eastern side (based on aerial imagery, this was constructed between September and October 2019).

Safe crossing points near the site include the following:

Existing Conditions

- ◆ Hoxton Park Road / Joadja Road – signalised pedestrian crossings on the east and south legs
- ◆ Hoxton Park Road / Ash Road – signalised pedestrian crossings on all legs
- ◆ Joadja Road / Liverpool Catholic Club – signalised pedestrian crossings on all legs
- ◆ Joadja Road / Jedda Road – signalised pedestrian crossings on all legs

There will be a safe pedestrian connection between the external footpaths and the site entrance along the perimeter of the car park.

2.7.2 Cycle Network

The site is located within close proximity to a number of local and regional cycle routes. This includes the Westlink M7 shared path which is separated from traffic and is approximately 40km long from Prestons to Baulkham Hills.

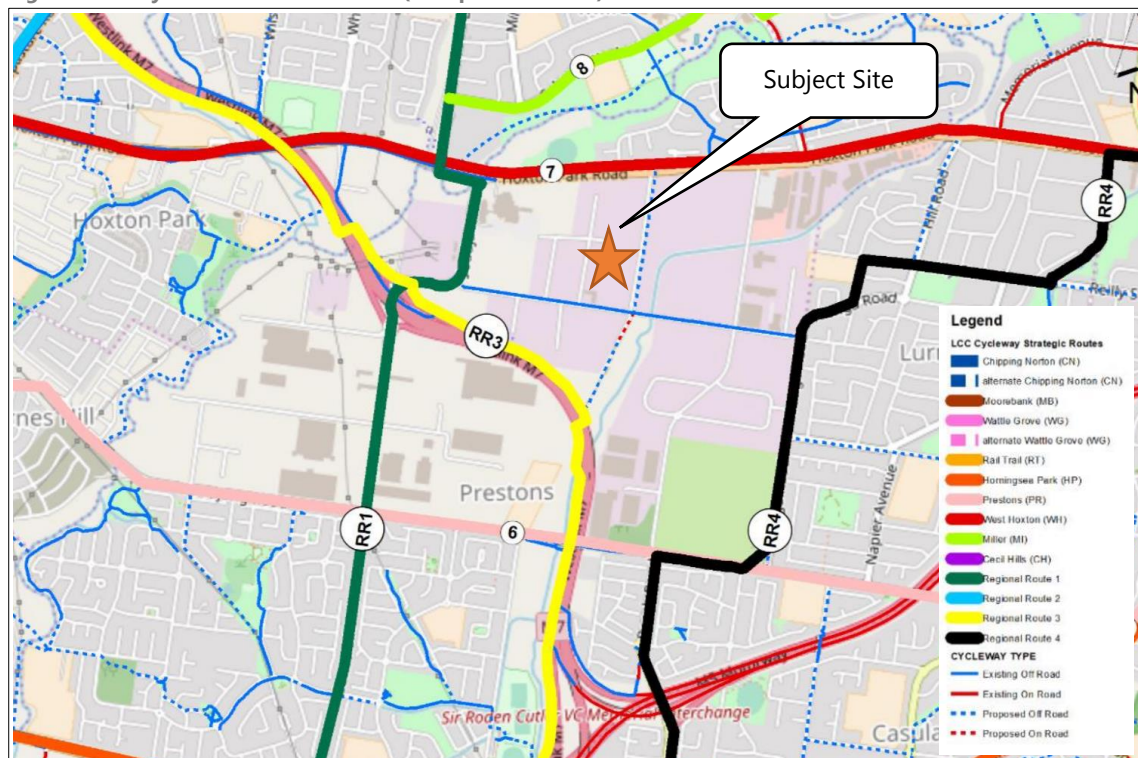
Shared paths along Hoxton Park Road, Jedda Road, Joadja Road, Kurrajong Road and Bernera Road connect to the Westlink M7 shared path and other regional routes running north-south along Cowpasture Road, the Liverpool-Parramatta Transitway and the Georges River. These regional routes provide connectivity to suburbs such as Leppington, Horsley Park, Fairfield and Liverpool.

There are also some on-road cycle routes near the site and include the following:

- ◆ Bernera Road near the M7 Motorway – high difficulty on-road cycle route
- ◆ Jedda Road between Bernera Road and Joadja Road – high difficulty on-road cycle route
- ◆ Joadja Road – high difficulty on-road cycle route
- ◆ Hoxton Park Road east of Whyalla Place – low difficulty on-road cycle route that runs along the service road running parallel to Hoxton Park Road

A summary of the cycle network is shown in Figure 2.15 and Figure 2.16.

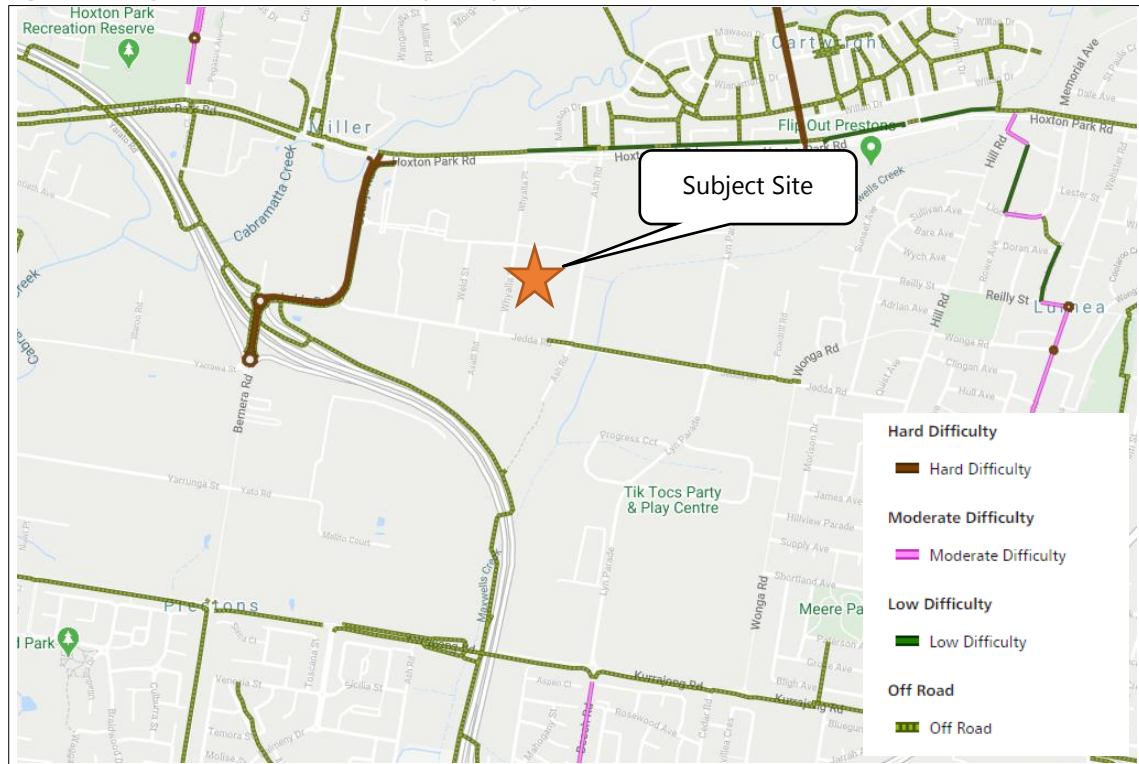
Figure 2.15: Cycle network in Prestons (Liverpool Bike Pan)



Source: <https://www.liverpool.nsw.gov.au/venues/parks-and-playgrounds/cycleways-and-walkways-> last accessed 08/09/2020

Existing Conditions

Figure 2.16: Cycle network in Prestons (Cycleway Finder)



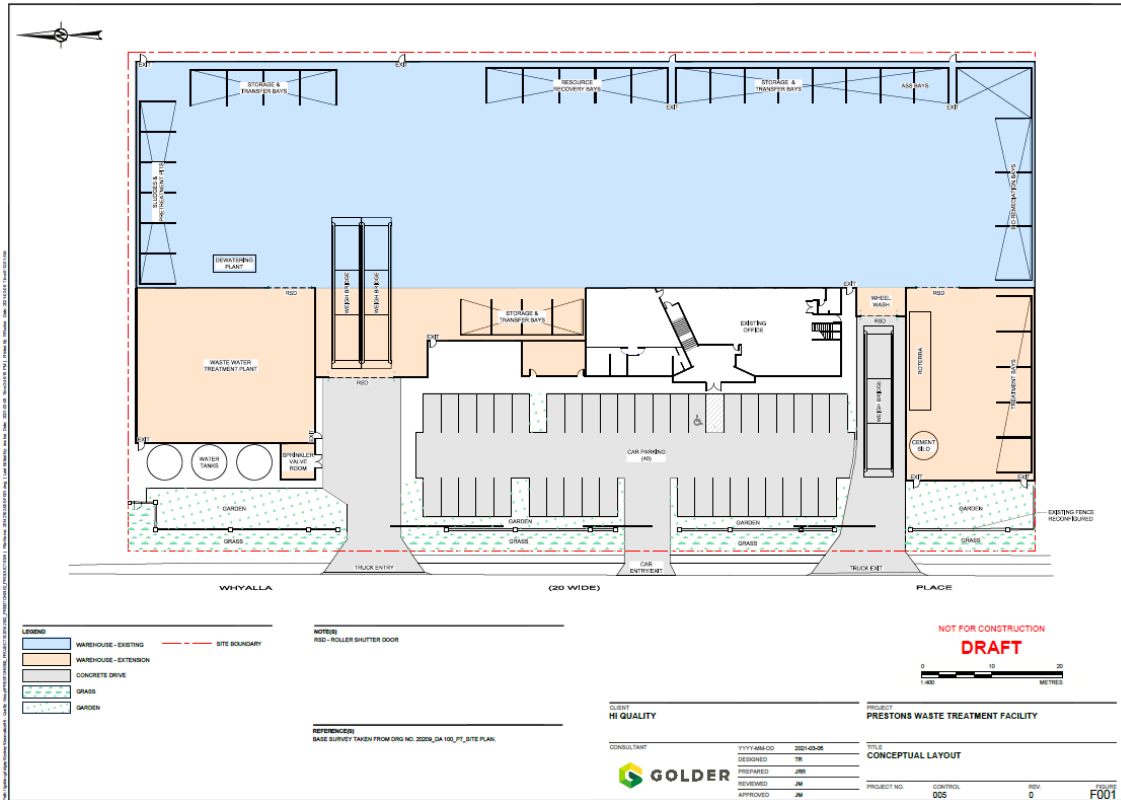
Source: https://www.rms.nsw.gov.au/maps/cycleway_finder- last accessed 10/07/2020

3. Proposed Development

3.1 Site Plan

The proposed layout plan for the site is shown in Figure 3.1.

Figure 3.1: Proposed Site Layout



3.2 Land Uses and People Occupancy

The proposed development includes the construction of an integrated waste treatment facility, with internal areas summarised in Table 3.1.

Table 3.1: Development Schedule

Use	Size
Office	890m ²
Warehouse	5,965m ²

Hi-Quality proposed to locate some corporate offices at the site, utilising existing office space.

New ancillary infrastructure to be constructed include the following:

- ◆ Weighbridges and weighbridge office
- ◆ Warehouse extension
- ◆ New driveway
- ◆ Parking
- ◆ Wheel wash and truck wash down bay.

Proposed Development

The Waste Treatment Facility would process up to 270,000 tonnes of waste per annum. General processing activities would include the following:

- ◆ Bulk Soils Treatment
- ◆ Sediments and Sludges Treatment
- ◆ Liquid Waste Treatment
- ◆ Waste Storage and Transfer.

3.3 Hours of Operation

The facility would receive waste 24 hours a day, while processing and dispatch operations would be undertaken between 7:00am and 6:00pm on Monday to Saturday, and between 8:00am and 6:00pm on Sundays and Public Holidays.

3.4 Work Force

Information provided by Golder Associates indicates that up to 10 full-time employees would be required for processing and dispatch operation of the facility during the day shift, whilst 4 staff would be required outside of these hours for the receipt of materials.

Staff per shift and shift times for Processing Operations are as follows:

- ◆ Day Shift (7am-3pm) 10 staff maximum
- ◆ Afternoon Shift (3pm-11pm) 4 staff maximum
- ◆ Night Shift (11pm-7am) 4 staff maximum
- ◆ Up to a maximum of 30 employees are estimated to utilise the office space
- ◆ Total of up to 48 employees.

3.5 Site Access

The site will be accessed from Whyalla Place.

Separate access points are proposed for trucks and light vehicles. Trucks would enter the site via the northern driveway and exit the site via the southern driveway.

Employees would access the site via a new driveway located between the truck entry and exit driveways.

3.6 Car Parking

One car parking area is proposed for employees only. A total of 40 car parking spaces are proposed, which includes 1 accessible parking space.

3.7 Cycle Facilities

The proposed development will provide 5 bicycle parking spaces including a shower facility and lockers for staff use.

3.8 Weighbridges

Two side by side entry weighbridges are proposed on the northern side of the facility near the entry driveway. A weighbridge office will be located between the two entry weighbridges.

An exit weighbridge is also proposed on the southern side of the facility near the exit driveway. Behind the exit weighbridge is a truck and wheel wash area.

4. Car Parking Appraisal

4.1 Car Parking Requirements

The Liverpool Development Control Plan 2008 (Liverpool DCP) provides detailed planning and design guidelines to support planning controls in the Liverpool Local Environmental Plan 2008. This includes parking requirements for the proposed development, which is located in an industrial zone as discussed in Section 2.1

A review of the car parking requirements for the proposed development is summarised in Table 4.1.

Table 4.1: Minimum Car Parking Requirements

Use	Type	Minimum Parking Rate	Minimum Parking Spaces Required	
Industry	Office parking spaces	1 per 35m ² LFA	26	
	Warehouse parking spaces	1 per 250m ² GFA	24	
	Total			50
	Disabled parking spaces	1 per 100 car spaces	1	
	Delivery parking spaces	Occasional access for an articulated vehicle	-	

The Liverpool DCP states that occasional access for delivery vehicles is required and to refer to Section 4 of the DCP. PeopleTrans was notified by Council staff of a reference error, and that page 97 – Loading Facilities should be referred to in relation to delivery parking.

4.2 Empirical Assessment of Off-Street Car Parking Supply

As discussed in Section 3.6, 40 car parking spaces (including 1 accessible parking space) are proposed. In terms of overall car parking provision, this does not meet the minimum number of 50 parking spaces under the Liverpool DCP.

The full DCP car parking requirement of 26 spaces for the office is proposed on-site.

The requirement for 24 car parking spaces for the standard warehouse is not considered to apply for this Waste Treatment Facility use. In this regard, we have considered the maximum number of staff that would be operating the facility (10 during the day shift) and the shift changeover (4) which indicates a maximum of 14 staff on-site at any one time for this use. A total of 14 car parking spaces are proposed for the Waste Treatment Facility.

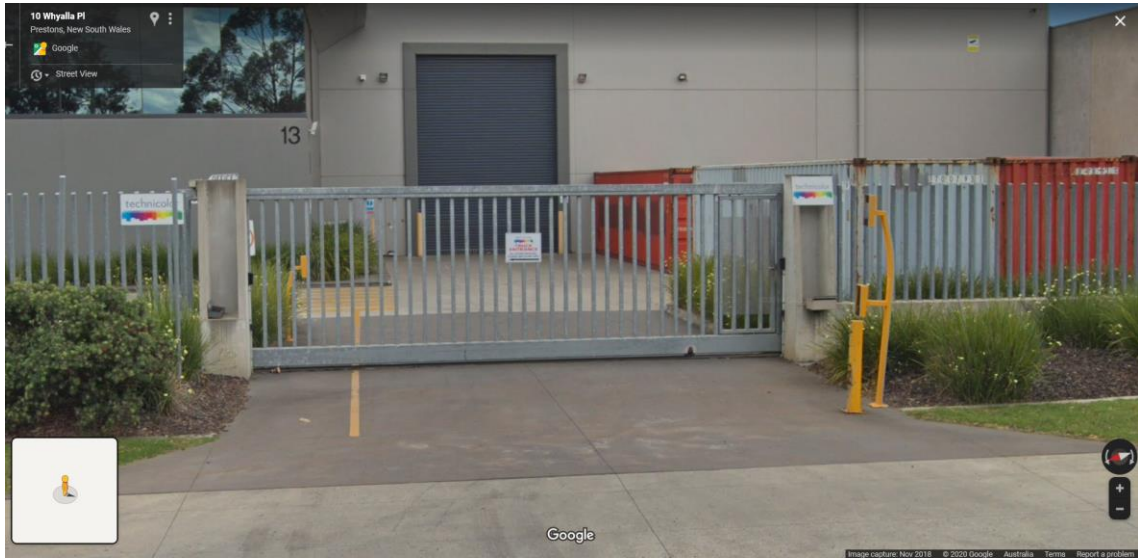
Based on the above, the proposed car parking provision is considered satisfactory.

4.3 Access to the Staff Car Park

Similar to the existing access to the site, a secure gate is proposed at the staff car park driveway and truck driveways.

The secure gates will be open when the site is open and accepting deliveries and closed outside of these times. Similar to the existing access shown in Figure 4.1, an intercom and secure gate access point is proposed.

Figure 4.1: Existing secure gate access to the staff car park



4.4 On-Site Servicing and Loading

No permanent dedicated on-site loading space is proposed. Information provided by Golder Associates indicates that waste generated by the office would be collected by a private operator collecting skips from inside the warehouse.

No visitor parking is proposed on-site with staff parking only allowed on-site. Due to the nature of the development, frequent deliveries to the office are not expected. However, if deliveries occur, there is sufficient space on-site to accommodate a delivery vehicle stopping briefly. Alternatively, there is street parking nearby to the development. Furthermore, in periods where there is no shift change over, there is likely to be spare employee parking spaces that a delivery vehicle could use.

4.5 On-Street Parking Impact

Construction of a new driveway for employees will result in the loss of 1 on-street parking space on the eastern side of Whyalla Place. As the proposed number of parking spaces on-site meets the Council DCP car parking requirements, and there is available alternative on-street parking on Whyalla Place and other streets nearby, overall impacts on parking are considered to be negligible.

5. Sustainable Transport

5.1 Pedestrians

As discussed in Section 2.2, less than 1% of people that work in Prestons travel to their employment on foot. Based on a total of 48 employees working at the facility, this equates to approximately 1 person walking to work. Given the low number of expected pedestrian movements, the existing pedestrian facilities are considered satisfactory to cater for the increase in pedestrian movements.

As discussed in Section 2.7, external pedestrian access to the site includes a footpath on the eastern side of Whyalla Place. A third driveway will be constructed for the development, resulting in an additional conflict point between pedestrians and vehicles. This new driveway will be used by light vehicles only.

The industrial land uses on Whyalla Place will generate low pedestrian volumes and the site will generate low private vehicle trips. As such the impacts on the pedestrian network are anticipated to be minimal.

5.2 Cycling

5.2.1 Bicycle Parking and End of Trip Facility Requirements

A review of bicycle parking requirements outlined in the Liverpool DCP is summarised in Table 5.1.

Table 5.1: Minimum Bicycle Parking Requirements

Use	Type	Minimum Parking Rate	Minimum Parking Spaces Required
Industry	Staff bicycle spaces	1 per 10 staff or 1 per 10 car spaces	5

In addition, end of trip facilities are to be provided at a rate of 1 per 10 employee bicycle spaces.

One shower is required to be provided along with 1 locker per bicycle space.

5.2.2 Adequacy of Bicycle Parking Supply and End of Trip Facilities

As discussed in 3.7, 5 bicycle parking spaces will be provided, meeting the minimum requirements set out in the Liverpool DCP.

A shower and a minimum of 5 lockers will also be provided within the facility, also meeting the requirements in the Liverpool DCP.

5.2.3 Cycle Network Integration

As discussed in Section 2.2, less than 1% of people that work in Prestons cycle to their employment. Based on a total of 48 employees working at the facility, this equates to approximately 1 person cycling to work. Given the low number of expected cycle movements, the existing cycling infrastructure is considered satisfactory to cater for the increase in cycle movements.

As discussed in Section 2.7, a number of cycle routes are located near the site. No changes are proposed to the existing cycling network and therefore no impacts are anticipated on the cycle network due to the development.

5.3 Public Transport

As discussed in Section 2.2, approximately 3.5% of people that work in Prestons catch public transport to work. Based on a total of 48 employees working at the facility, this equates to approximately 2 people catching public transport to work.

As discussed in Section 2.6, the site is currently served by buses. The closest bus stops are located approximately 650 metres (7 to 8-minute walk) from the site on Hoxton Park Road. Given the low increase in number of trips on the bus network, the existing public transport services are considered satisfactory to cater for the increase in public transport trips.

No changes are proposed to the existing public transport network as part of this development. Therefore, impacts on the public transport network are anticipated to be minimal and limited to vehicles generated by the development interacting with buses operating on Hoxton Park Road and Kurrajong Road.

6. Site Layout and Design

Liverpool DCP 2008 outlines the design controls for car parking and safe access provision in industrial developments. It states that the development should be designed with the following objectives:

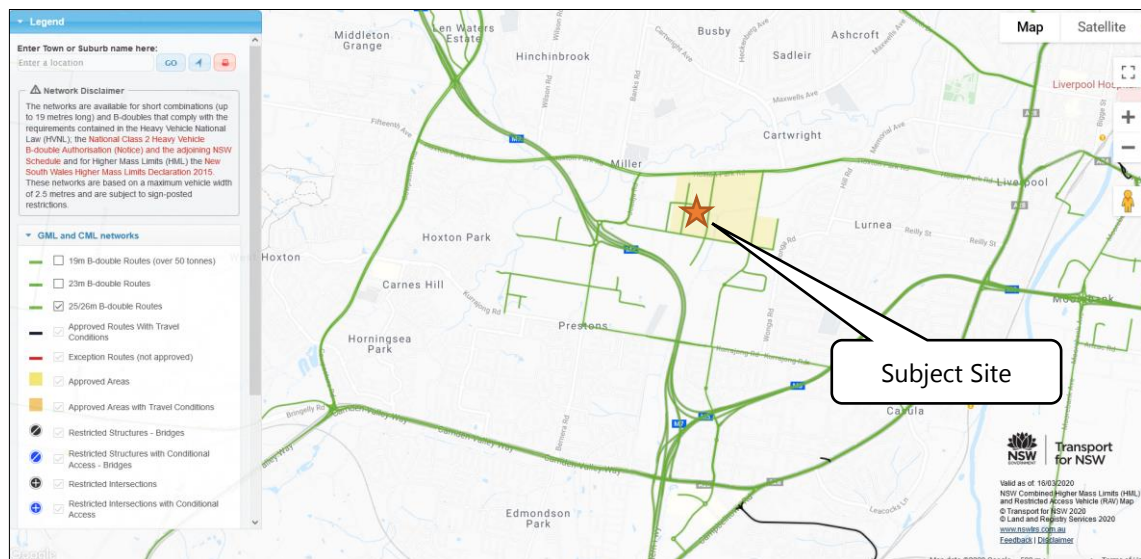
- ◆ To provide adequate on-site car parking to reduce the need for street car parking
- ◆ To ensure safe and easy vehicle circulation within the site
- ◆ To provide safe and easy access to and from the site for pedestrians and motorists
- ◆ To minimise the impact of driveways and parking areas on existing landscaping, landform and streetscape
- ◆ To ensure pavement or driveway materials are sympathetic to the streetscape and surrounding landscape character.

6.1 Site Access

As discussed in Section 3.5, vehicles would access the site via driveways on Whyalla Place.

The B-Double approved roads in the vicinity of the site are shown in Figure 6.1.

Figure 6.1: Approved B-Double Roads in the Vicinity of the Site



As shown in Figure 6.1, Whyalla Place is an approved B-Double Road. Trucks can access the site by travelling on the following B-Double roads:

- ◆ To and from the M7 Motorway via Bernera Road, Jedda Road and Joadja Road
- ◆ To and from the west via Hoxton Park Road, Joadja Road and Jedda Road
- ◆ To and from the east via Hoxton Park Road, Ash Road and Jedda Road
- ◆ To and from the south via Kurrajong Road, Bernera Road and Jedda Road or via Beech Road, Lyn Parade and Jedda Road.

6.2 Vehicle Circulation

Proposed vehicle movements to, from and within the site are shown in Figure 6.2 to Figure 6.4.

Figure 6.2: Truck Circulation - Incoming

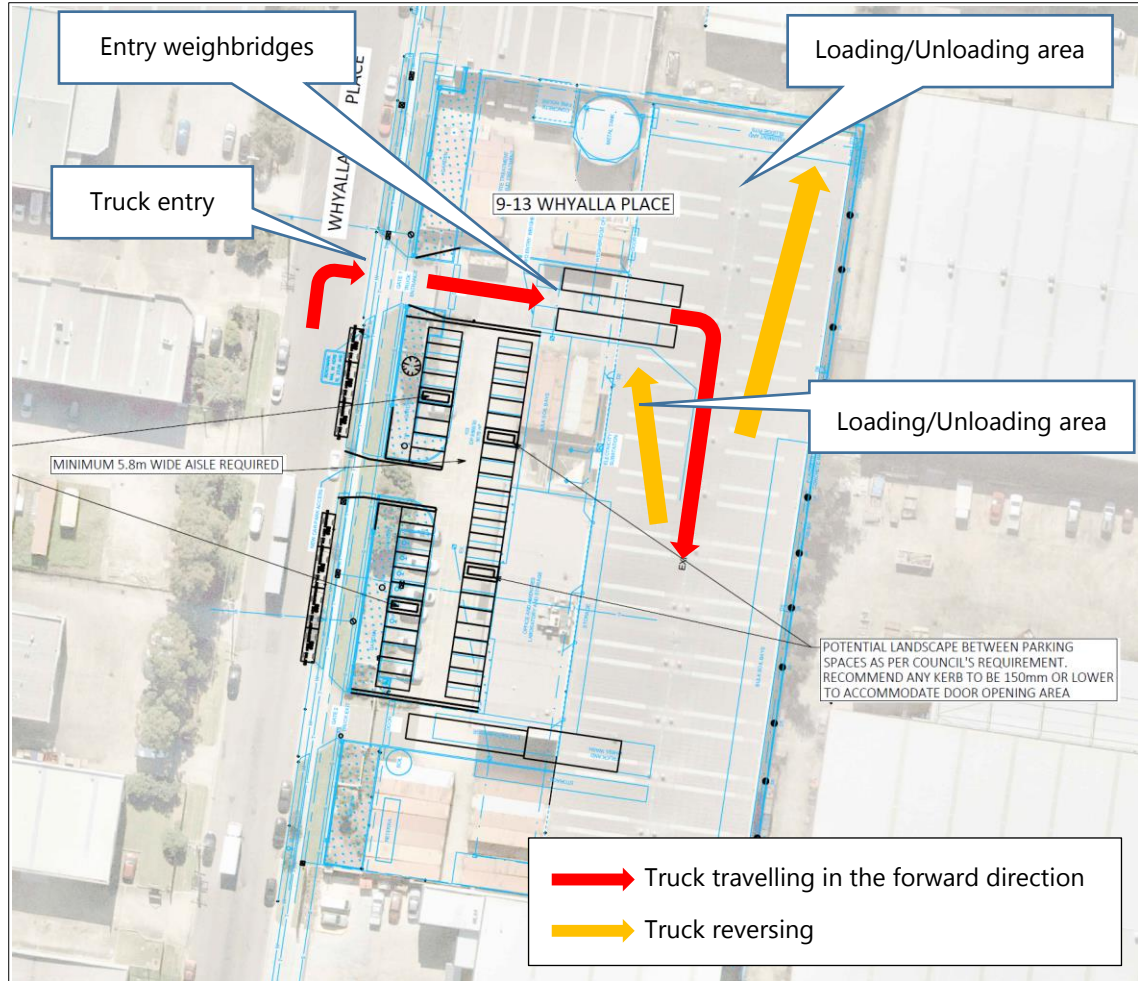


Figure 6.2 indicates that at the northern driveway trucks perform a right turn into the site and proceed to one of two entry weighbridges. These trucks would then reverse into one of four waiting areas to load and unload. Once unloading has been completed the trucks proceed in a clockwise direction towards the exit weighbridge and perform a left turn out at the southern driveway exiting the site as indicated in Figure 6.3.

Site Layout and Design

Figure 6.3: Truck Circulation - Outgoing

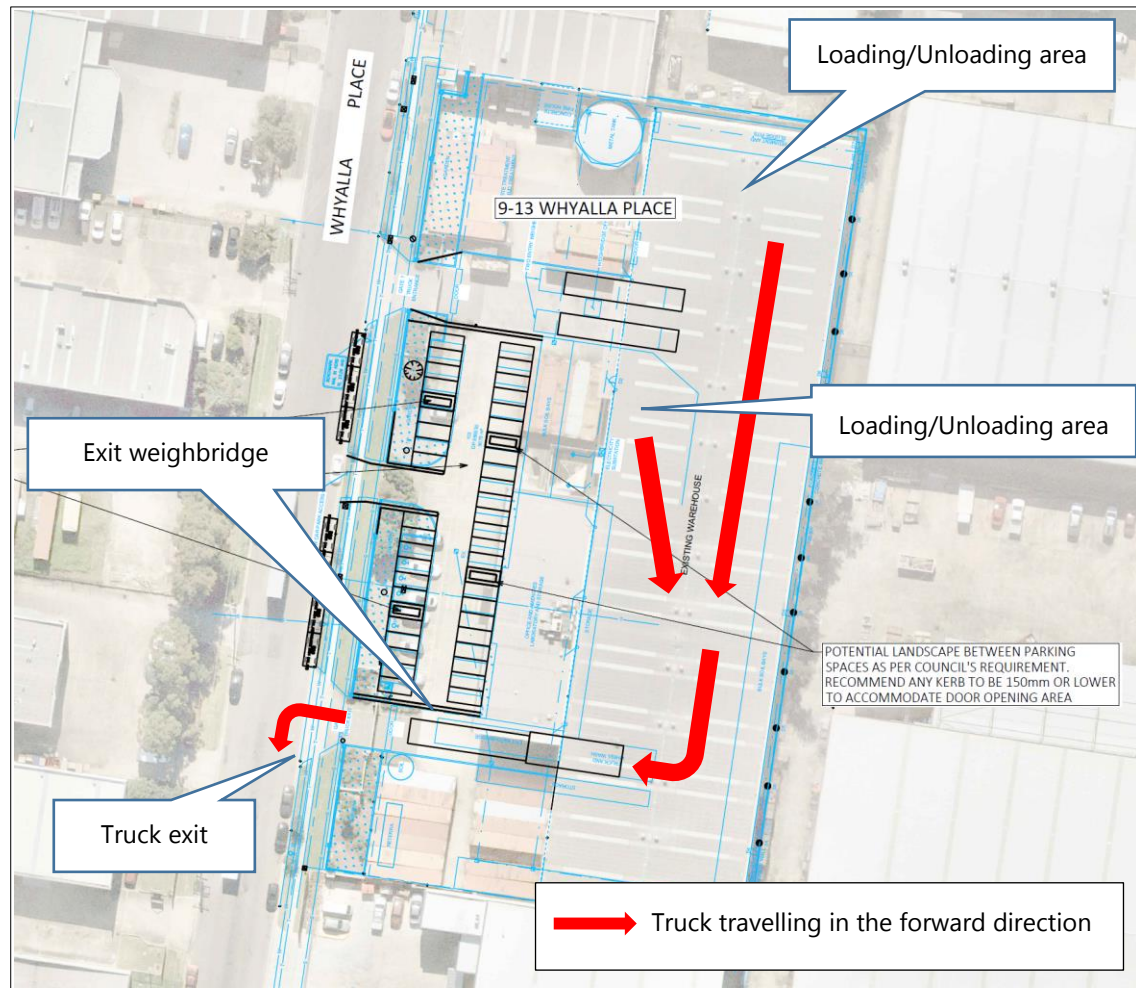


Figure 6.4: Light Vehicle Circulation – Incoming and Outgoing

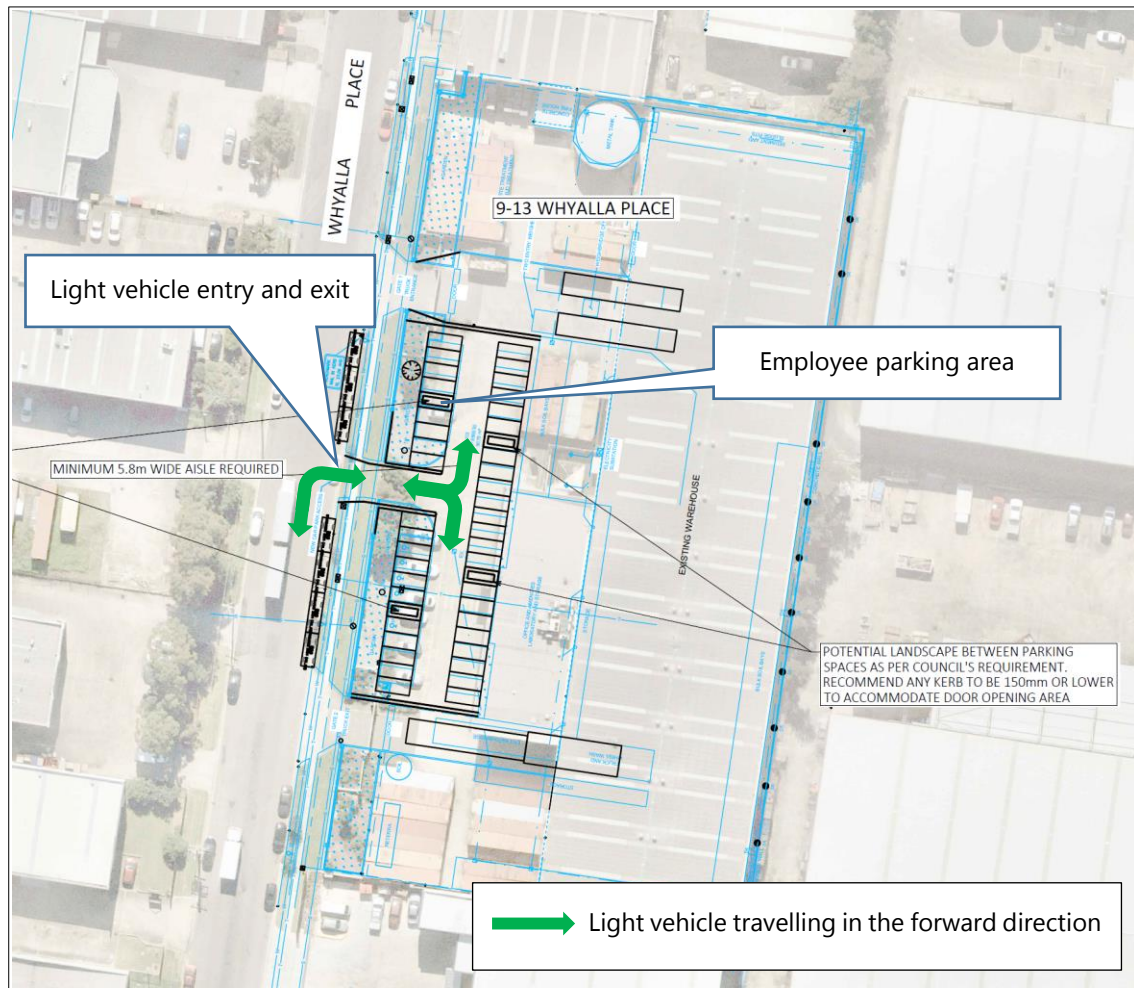


Figure 6.4 indicates that light vehicles will enter the site via the middle two way driveway which provides access to the car parking area.

Swept path assessments for all truck and light vehicle manoeuvres are shown in Appendix C of this report.

6.3 Weighbridge Queuing Assessment

All trucks accessing the site would be required to pass over one of the two entry weighbridges prior to being allowed access to other areas of the development. Similarly, all trucks leaving the site would be required to pass over the exit weighbridge prior to exiting the site.

A survey conducted by PeopleTrans at a comparable site revealed an average weighbridge entry service time of 56 seconds per vehicle. Rounding up to 60 seconds per vehicle, each weighbridge would have an average service rate of 60 vehicles per hour.

As shown in Section 7.1.1, the site is expected to generate 26 truck movements during the busiest hour of the day (13 trips in and 13 trips out). These trucks would pass over the entry and exit weighbridges.

Based on the calculated number of truck movements and queuing theory principles in Austroads Guide to Traffic Management Part 2, which is based on the [M/M/1] system which is a "single channel, single server system with random arrivals, random service times and a first-come-first-served discipline."



Site Layout and Design

People, Passion, Perseverance

the 98th percentile queue length of the entry weighbridges is 1.7086 vehicles (rounded up to 2 vehicles, or one on each entry weighbridge).

Details of the queueing assessment are included in **Appendix C** and is considered adequate for this assessment.

As shown in **Appendix D**, the site will be able to accommodate a queue length of 4 trucks inside the site and hence there aren't expected to be any queueing issues at the site.

7. Operational Traffic Impacts

7.1 Traffic Generation

The amount of traffic generated by the proposed development will largely depend on two factors:

- (1) The quantity of materials processed by the facility.
- (2) The number of employees required to operate the facility.

Traffic generation estimates have been calculated based on information provided by Golder Associates regarding the proposed employee shifts, the amount of material that the facility is expected to process, and the size and type of vehicles proposed to transport these materials.

7.1.1 Traffic Generation – Materials Processing

The size and types of trucks proposed to access the facility is provided in Table 7.1.

The largest truck required to access the site, as indicated by Golder Associates, is a 22m quin-dog noting however that the turning circle of a semi-trailer dictates the design layout of the site.

Table 7.1: Trucks Accessing the Site [1]

Truck Description	Length	Axles
Semi-Trailer	19m	3 Axle Truck + 3 Axle Trailer
Quad-Dog	19.5m	3 Axle Truck + 4 Axle Dog
Quin-Dog	22m	3 Axle Truck + 5 Axle Dog

[1] Further details of the largest truck accessing the site are provided in **Appendix E**.

The amount of material estimated to be processed by the site and corresponding number of vehicles required to transport each amount are indicated in Table 7.2.

Table 7.2: Incoming Materials to be Processed by the Site

Facility	Materials to be Processed per annum (tonnes)	No. of Trucks Required per annum [1]
Bulk Solids Waste	110,000	3,929
Sediments and Sludge Waste	20,000	1,429
Liquid Waste	70,000	7,000
Drill Mud	10,000	286
Storage and Transfer Waste	60,000	3,000
Total	270,000	15,644

[1] Based on the capacity of the vehicle likely to transport the material, details provided in **Appendix F**.

Table 7.3: Outgoing Materials Processed by the Site

Facility	Process / Type	Materials Processed per annum (tonnes)	No. of Trucks Required per annum [1]
Bulk Solids Waste	Physical Screening	20,000	715
Bulk Solids Waste	Bioremediation	10,000	358
Bulk Solids Waste	Chemical Oxidation	10,000	358
Bulk Solids Waste	Acid Sulphate Soil	30,000	1,072
Bulk Solids Waste Sediments and Sludge Waste	Immobilisation	60,000	2,143
Bulk Solids Waste Liquid Waste	Liquid Waste Treatment Plant	70,000	6,679
Drill Mud	Drill Mud Processing Plant	10,000	273
Storage and Transfer Waste	Storage and Transfer Waste	60,000	2,143
Total		270,000	13,741

[1] Based on the capacity of the vehicle likely to transport the material, details provided in **Appendix F**.

Table 7.2 and Table 7.3 indicate that approximately 29,385 trucks are expected to use the facility per annum.

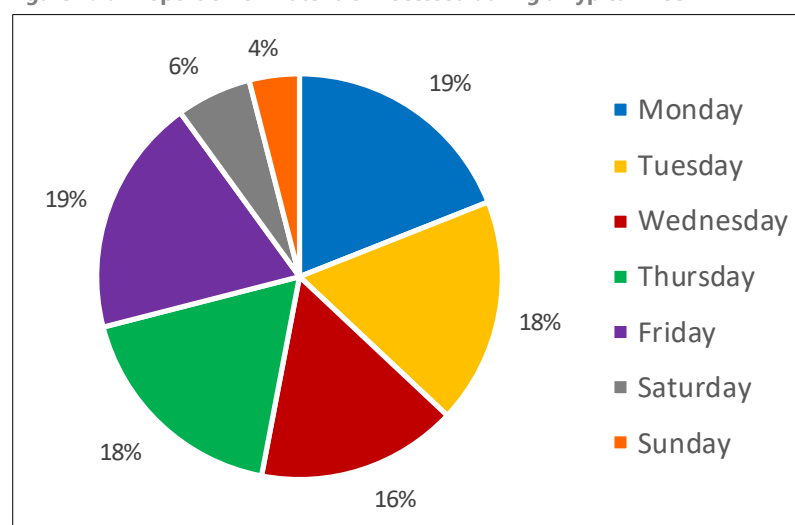
Given that each of these vehicles will enter and exit the site (assuming they will not be used for transporting multiple material types), this equates to an average of 565 trucks per week or 81 trucks per day (assuming even year-round operation, 7 days of the week).

Based on an understanding of the operation of similar facilities, some days of the week are busier than others and traffic doesn't typically spread evenly across the week.

To provide more detail in this respect, PeopleTrans referenced the 2016 Transport Impact Assessment for the proposed Wetherill Park Resource Recovery Park in NSW.

This site, being a waste facility treatment station was considered to have a relatively similar traffic profile. As part of that assessment weighbridge data was analysed over a whole year to understand the proportion of materials being processed on each day of the week, the results of which, are indicated in Figure 7.1.

Figure 7.1: Proportion of Materials Processed during a Typical Week



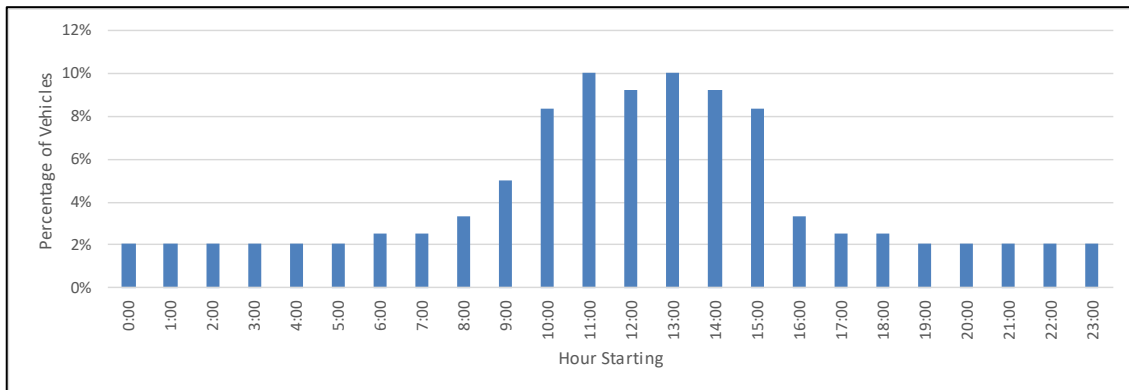
Operational Traffic Impacts

Figure 7.1 indicates that the largest amount of traffic generated by the proposed facility was on a weekday, equating to approximately 19% of the total weekly generated traffic.

Applying this proportion to the Prestons Waste Treatment Facility resulted in 107 trucks generated due to materials processing on the busiest day of the week (occurring on a Monday or Friday).

To calculate the hourly variation of vehicle volumes, PeopleTrans referred to a 2017 Transport Impact Assessment undertaken for the St Marys Resource Recovery Facility in NSW which operates 24hrs per day. Specifically, weighbridge data was analysed to produce a 24-hour profile of site-generated traffic flow proportions, with the results shown in Figure 7.2.

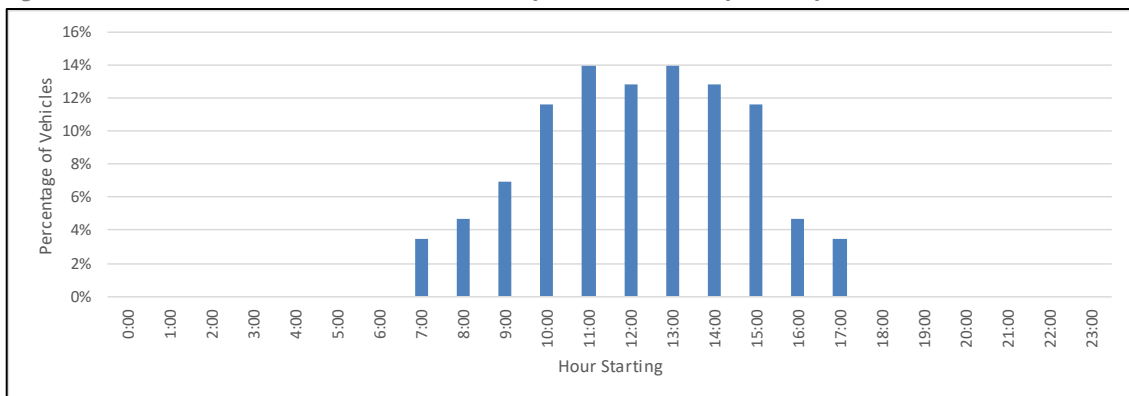
Figure 7.2: Site-Generated Traffic Flow Proportions under 24-hours operation



PeopleTrans adopted these proportions in order to calculate the traffic generated by the proposed Prestons facility throughout the busiest weekday.

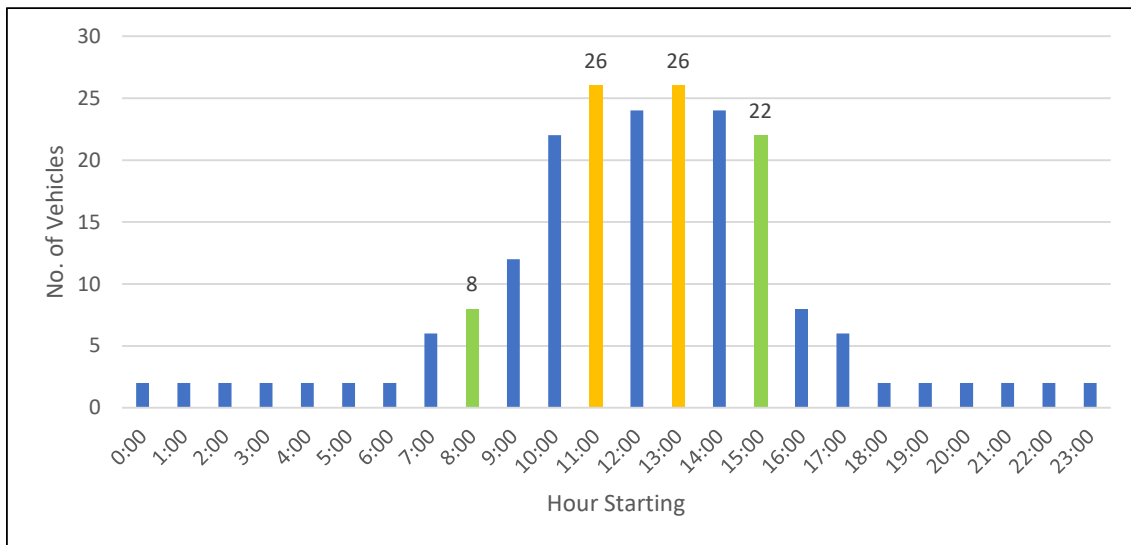
Since the facility dispatch trips (i.e. trips where trucks arrive, collect waste and depart) will only occur during limited operating hours (7:00am to 6:00pm) instead of 24 hours a day, these hourly percentages were reweighted proportionally for the calculation of percentages as shown in Figure 7.3.

Figure 7.3: Potential Site-Generated Traffic Flow Proportions due to Dispatch Trips



All heavy vehicle traffic generated on an hourly basis was then aggregated across the different trip purposes to give a profile of total traffic generation due to the site's materials processing over the day, as shown in Figure 7.4.

Figure 7.4 Hourly Traffic Generation due to Materials



The bars in orange reflect the highest hourly traffic volumes estimated to occur, while those in green represent estimated volumes during the AM and PM road network peak hours. This indicates that the site is expected to generate a maximum of 26 truck movements (13 trips in and 13 trips out) during the busiest hours of the day (11:00am to 12:00pm and 1:00pm to 2:00pm), and 8 truck movements (4 trips in and 4 trips out) per hour in each of the road network peak hours.

A summary of the hourly traffic volumes generated by the processing of materials during the AM and PM road network peak hours are shown in Table 7.4.

Table 7.4: Peak Hour Traffic Generation due to Materials

Time Period	Site Generated Traffic due to Materials (veh/hr)		
	In	Out	Total
Weekday AM peak hour	4	4	8
Weekday PM peak hour	11	11	22

7.1.2 Traffic Generation due to Employees

The arrival and departure of employees throughout the day will also contribute to the traffic generated by the site.

As discussed in Section 4.2, 40 car parking spaces are proposed (26 spaces for office employees and 14 spaces for warehouse employees), which is anticipated to accommodate the maximum number of employees that would be at the facility at any one time.

To undertake a conservative assessment, it was assumed that all office employees would arrive during the AM road network peak hour and depart during the PM road network peak hour, while warehouse employees would arrive and depart during both peak hours.

A summary of the traffic volumes generated by employees is presented in Table 7.5.

Operational Traffic Impacts

Table 7.5: Peak Hour Traffic Generation due to Employees

Time Period	Site Generated Traffic due to Materials (veh/hr)		
	In	Out	Total
Weekday AM peak hour	36	4	40
Weekday PM peak hour	4	36	40

7.2 Traffic Distribution and Assignment

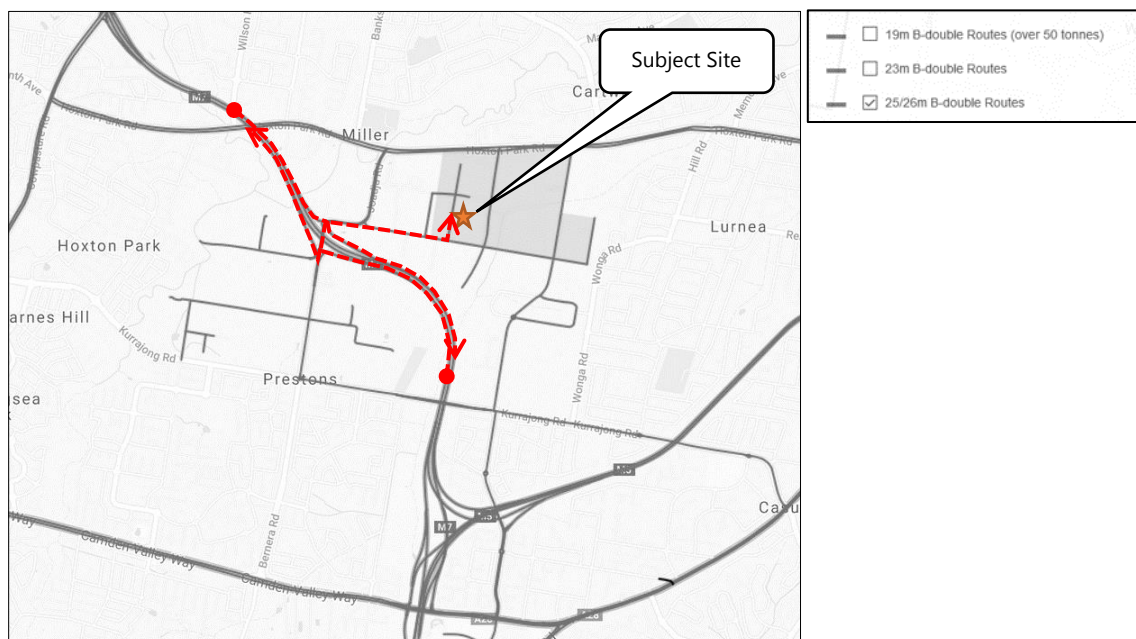
The directional distribution and assignment of traffic generated by the proposed development is influenced by a number of factors including:

- ◆ the configuration of the road network in the vicinity of the site
- ◆ the existing operation of intersections providing access between the local and arterial road network
- ◆ the likely distribution of employee’s residences and waste vehicle origins in relation to the site.

As discussed in Section 6.1, there are 5 x B-double routes that trucks can use to access the site. These routes were all assumed for the future modelling assessment in Section 7.3.

To provide a conservative assessment however, all heavy vehicles were assumed to travel to and from the site via the M7 Motorway as indicated in Figure 7.5.

Figure 7.5: Assumed Truck Haul Routes



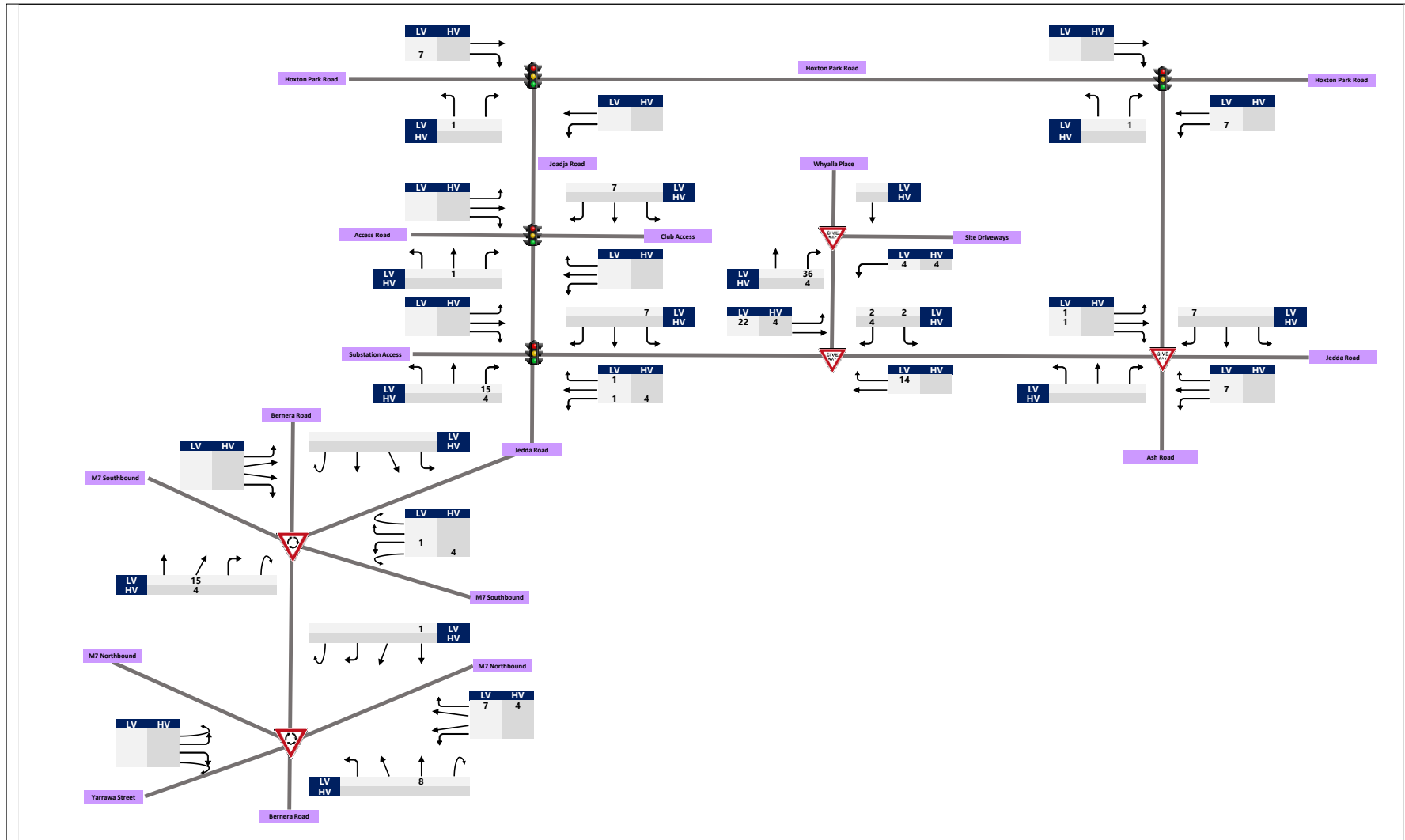
Light vehicles were equally distributed among the 5 routes given that the site is centrally located in the Liverpool LGA, with the majority of people working in Prestons residing in the Liverpool or surrounding LGA’s.

The assessment is also considered conservative as the existing traffic volumes generated at the site were not removed from the future road network traffic volumes.

Development traffic volumes are shown in Figure 7.6 and Figure 7.7, while future traffic volumes for the post development scenario modelled in Sidra are shown in Figure 7.8 and Figure 7.9.

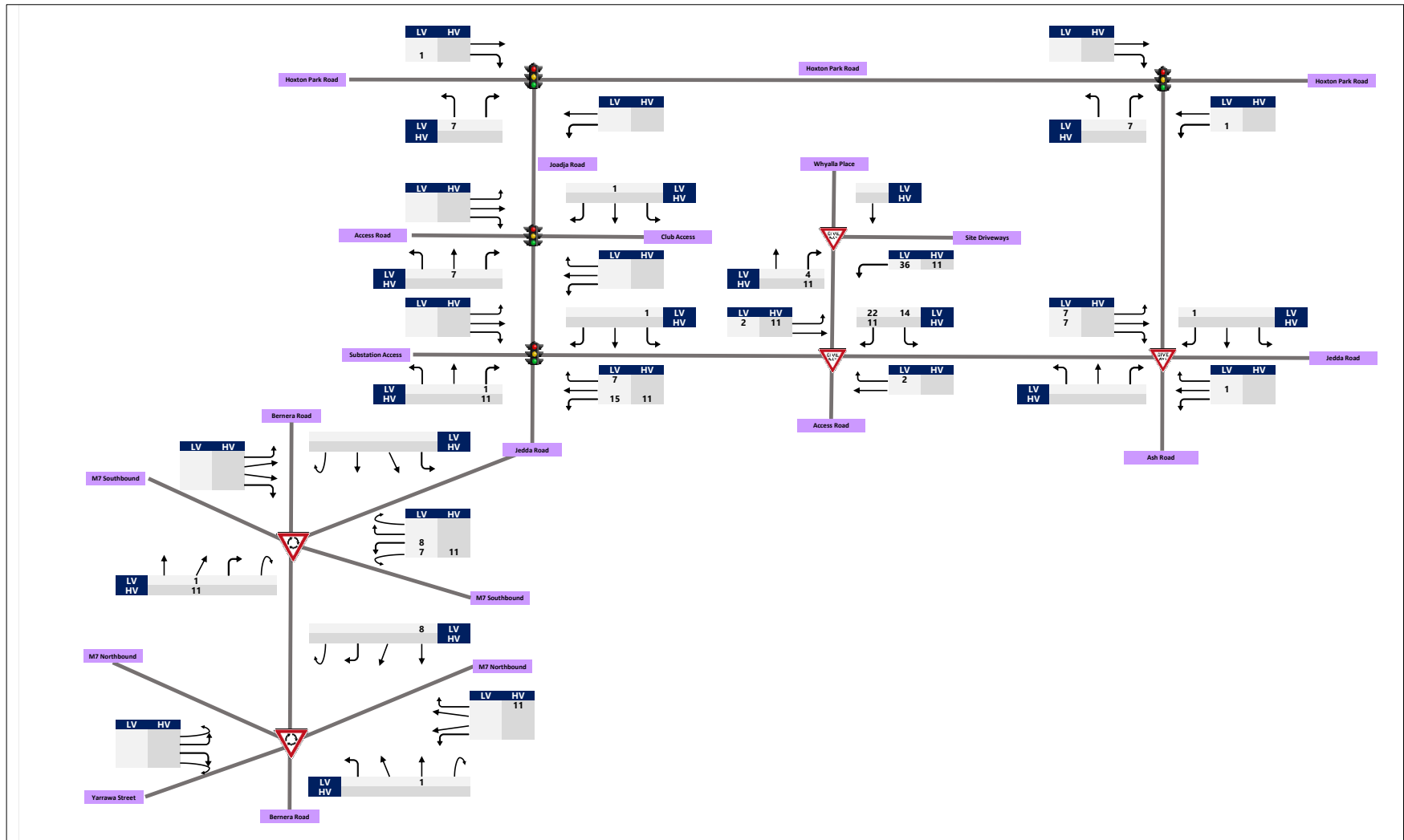
Operational Traffic Impacts

Figure 7.6: AM Peak Hour Site Generated Traffic Volumes



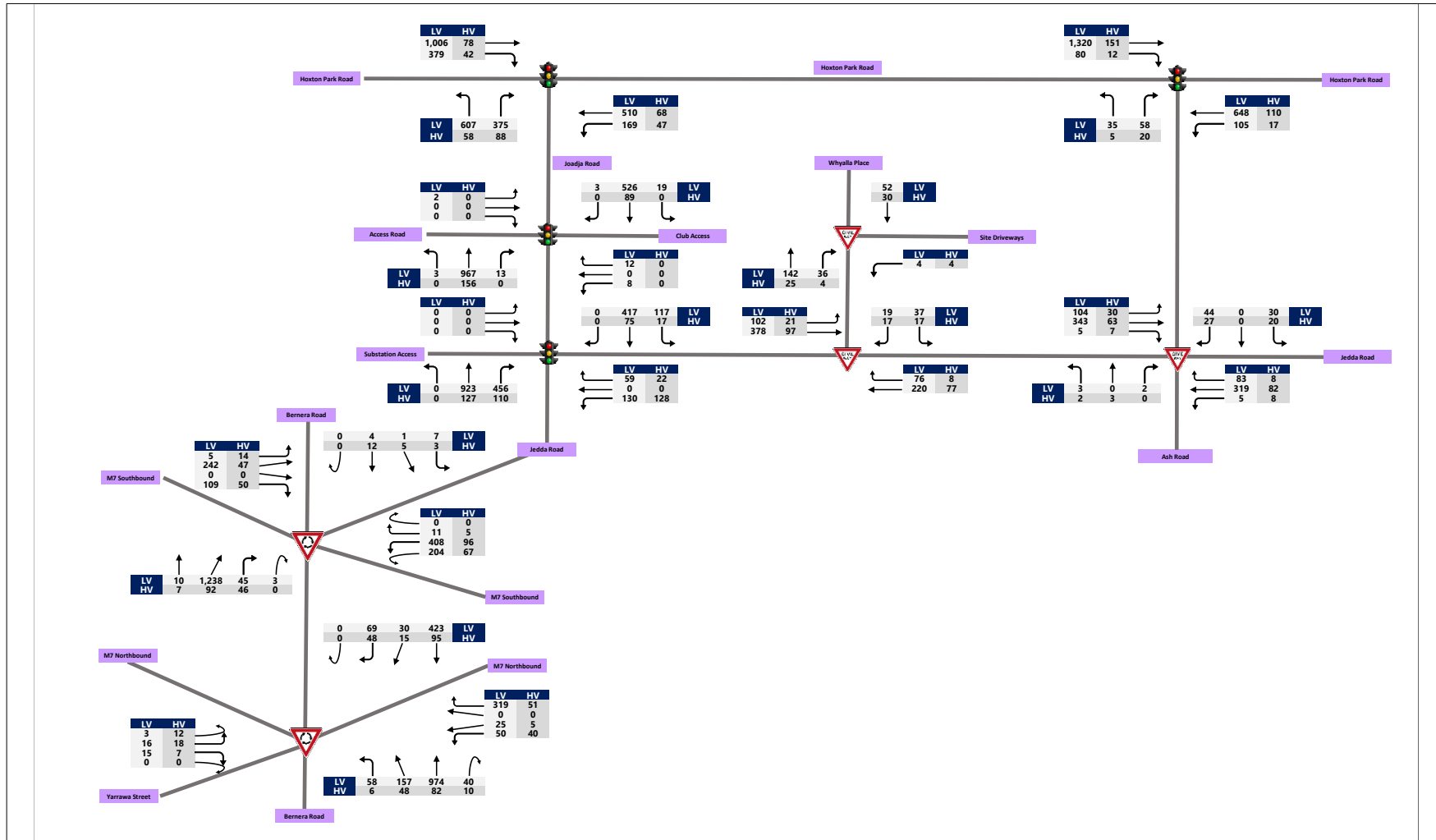
Operational Traffic Impacts

Figure 7.7: PM Peak Hour Site Generated Traffic Volumes



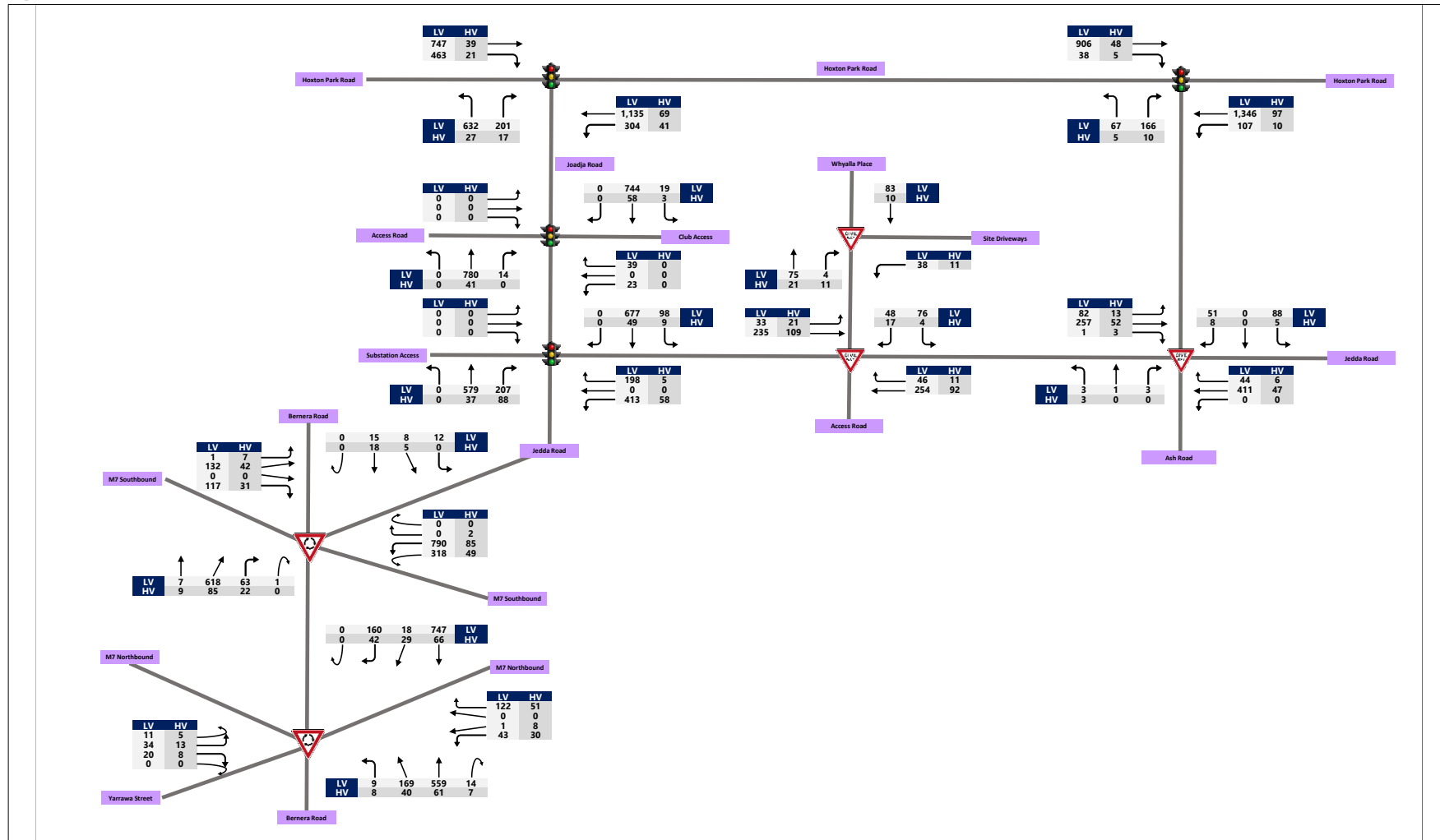
Operational Traffic Impacts

Figure 7.8: Total AM Peak Hour Traffic Volumes – 2021 Post Development



Operational Traffic Impacts

Figure 7.9: Total PM Peak Hour Traffic Volumes – 2021 Post Development



7.3 Intersection Performance – 2021 Post Development

To determine the impact of the proposed development, assuming completion in 2021, the estimated traffic volumes in the vicinity of the site after completion were entered into Sidra Intersection to assess the operation of each intersection with the new site in operation.

The results of this assessment are provided in Table 7.6 and Table 7.7 with full results provided in **Appendix G.**

Table 7.6: 2021 Post Development Intersection Operating Conditions (AM peak hour)

Intersection	Leg	Degree of Saturation (DOS)	Average Delay (sec)	95 th Percentile Queue (m)	Level of Service (LOS)
Hoxton Park Road / Joadja Road	South	0.686	26.8	114.4	B
	East	0.673	31.6	114.3	C
	West	0.693	17.1	153.2	B
	Overall	0.693	23.7	153.2	B
Joadja Road / Liverpool Catholic Club	South	0.488	4.8	61.8	A
	East	0.058	28.6	2.2	C
	North	0.399	11.4	47.2	A
	West	0.015	27.8	0.6	B
	Overall	0.488	7.4	61.8	A
Jedda Road / Joadja Road	South East	0.439	17.2	38.1	B
	North East	0.919	39.3	96.1	C
	North West	0.017	27.7	0.6	B
	South West	0.851	13.0	122.7	A
	Overall	0.919	20.0	122.7	B
Ash Road / Hoxton Park Road	South	0.528	50.9	37.8	D
	East	0.380	12.8	88.0	A
	West	0.530	7.3	110.6	A
	Overall	0.530	11.2	110.6	A
Ash Road / Jedda Road	South	0.051	44.3	1.5	D
	East	0.366	10.7	15.4	A
	North	0.524	34.8	20.7	C
	West	0.349	11.5	4.1	A
	Overall	0.524	44.3	20.7	D
Jedda Road / Whyalla Place	East	0.292	10.4	13.1	A
	North	0.214	18.7	7.2	B
	West	0.369	5.8	0.0	A
	Overall	0.369	18.7	13.1	B
Whyalla Place / HV Entry Driveway	South	0.104	3.8	0.4	A
	North	0.055	0.0	0.0	A
	Overall	0.104	3.8	0.4	A
Whyalla Place / LV Driveway	South	0.125	2.5	1.9	A
	East	0.003	5.8	0.1	A
	North	0.055	0.0	0.0	A
	Overall	0.125	5.8	1.9	A
Whyalla Place / HV Exit Driveway	South	0.122	0.0	0.0	A
	East	0.004	6.8	0.2	A
	North	0.057	0.0	0.0	A
	Overall	0.122	6.8	0.2	A

Table 7.6 (continued): 2021 Post Development Intersection Operating Conditions (AM peak hour)

Intersection	Leg	Degree of Saturation (DOS)	Average Delay (sec)	95 th Percentile Queue (m)	Level of Service (LOS)
Bernera Road / M7 SB Entry Ramp / Jeddah Road / M7 SB Exit Ramp	South	0.498	11.8	32.1	A
	North East	0.412	13.4	18.3	A
	North	0.110	19.1	4.6	B
	North West	0.398	16.8	17.0	B
	Overall	0.498	19.1	32.1	B
Bernera Road / M7 NB Exit Ramp / M7 NB Entry Ramp / Yarrowa Street	South	0.600	16.0	35.5	B
	North East	0.400	13.5	15.4	A
	North	0.279	12.2	13.3	A
	South West	0.269	19.0	12.4	B
	Overall	0.600	19.0	35.5	B

Table 7.7: 2021 Post Development Intersection Operating Conditions (PM peak hour)

Intersection	Leg	Degree of Saturation (DOS)	Average Delay (sec)	95 th Percentile Queue (m)	Level of Service (LOS)
Hoxton Park Road / Joadja Road	South	0.840	36.4	228.1	C
	East	0.824	18.4	207.2	B
	West	0.798	19.4	203.1	B
	Overall	0.840	23.0	228.1	B
Joadja Road / Liverpool Catholic Club	South	0.336	4.0	37.5	A
	East	0.206	28.4	8.3	B
	North	0.466	10.8	62.2	A
	West	0.011	30.1	0.4	C
	Overall	0.466	8.2	62.2	A
Jeddah Road / Joadja Road	South East	0.808	23.2	78.8	B
	North East	0.774	24.8	99.8	B
	North West	0.014	27.2	0.6	B
	South West	0.608	10.6	59.4	A
	Overall	0.808	19.0	99.8	B
Ash Road / Hoxton Park Road	South	0.668	50.9	74.8	D
	East	0.675	15.0	217.8	B
	West	0.528	8.2	57.4	A
	Overall	0.675	15.8	217.8	B
Ash Road / Jeddah Road	South	0.022	14.7	0.6	B
	East	0.317	8.5	5.9	A
	North	0.310	19.0	9.5	B
	West	0.252	12.2	1.4	A
	Overall	0.317	19.0	9.5	B
Jeddah Road / Whyalla Place	East	0.279	8.8	7.4	A
	North	0.247	13.8	7.5	A
	West	0.263	6.0	0.0	A
	Overall	0.279	13.8	7.5	A

Table 7.7 (continued): 2021 Post Development Intersection Operating Conditions (PM peak hour)

Intersection	Leg	Degree of Saturation (DOS)	Average Delay (sec)	95 th Percentile Queue (m)	Level of Service (LOS)
Whyalla Place / HV Entry Driveway	South	0.074	3.7	1.2	A
	North	0.054	0.0	0.0	A
	Overall	0.074	3.7	1.2	A
Whyalla Place / LV Driveway	South	0.071	2.5	0.2	A
	East	0.025	5.8	0.7	A
	North	0.054	0.0	0.0	A
	Overall	0.071	5.8	0.7	A
Whyalla Place / HV Exit Driveway	South	0.071	0.0	0.0	A
	East	0.013	7.0	0.6	A
	North	0.075	0.0	0.0	A
	Overall	0.075	7.0	0.6	A
Bernera Road / M7 SB Entry Ramp / Jeddah Road / M7 SB Exit Ramp	South	0.275	11.7	13.1	A
	North East	0.585	15.7	31.3	B
	North	0.113	15.1	3.9	B
	North West	0.210	11.5	7.0	A
	Overall	0.585	15.7	31.3	B
Bernera Road / M7 NB Exit Ramp / M7 NB Entry Ramp / Yarrowa Street	South	0.365	14.3	14.6	A
	North East	0.229	14.1	8.4	A
	North	0.396	12.1	20.2	A
	South West	0.190	14.2	7.2	A
	Overall	0.396	14.2	20.2	A

Based on Table 7.6 and Table 7.7 for the post development scenario, all intersections would operate at a satisfactory level of service (D or better).

Comparing the post development modelling results to the existing intersection operating conditions in Section 2.5, there are minimal changes to Level of Service between the two scenarios.

As discussed in Section 2.5, AM peak hour northbound right turn queues at the Joadja / Jeddah Road intersection currently extend past the existing chevron (108m), with these vehicles impeding through traffic. The south-west leg of the intersection currently operates at Level of Service A with the overall intersection operating at Level of Service B.

With the development, this queue could extend by up to approximately an additional 15 metres (or an additional 2 vehicles). The south-west leg in 2021 is expected to operate at Level of Service A with overall intersection Level of Service expected to remain at Level of Service B.

Based on the results, the additional traffic generated by the proposed development is not expected to compromise the safety or function of the surrounding road network.

7.3.1 Cumulative Impacts

PeopleTrans investigated other projects in the near vicinity of the site that could have an impact on the overall operation of the immediate road network. Apart from the projects identified in section 1.3 of this report, which as indicated, would have a positive effect on the operation of the road network the only other significant project identified was the future M12 motorway but this project would not have enough influence on the Whyalla site to warrant further assessment given the distance and timing of this project.

8. Construction Impacts

8.1 Construction Activities

Construction methods would be determined at the time of construction in accordance with the project approval conditions. All construction would be carried out in accordance with a Construction Environmental Management Plan (CEMP) (to be completed by others at a later stage), and is expected to comprise the following activities:

- ◆ Construction of Weighbridges and Weighbridge office
- ◆ New driveway
- ◆ Building extension
- ◆ HVAC System
- ◆ Internal fit out – pits, push wall, bunding and water treatment plant.

8.2 Construction Vehicles

Construction vehicles are expected to be of a similar size to the vehicles that would use the facility once operational. The vehicles would include dozers, graders, excavators, rollers, trucks and mobile cranes.

8.3 Construction Vehicle Routes

Construction vehicles would use the same routes to access the site as the site-generated traffic would use once the facility is operational.

8.4 Construction Timing

Construction hours are proposed to be 7:00am to 6:00pm Monday to Friday and 8:00am to 1:00pm on Saturdays with no work on Sundays or public holidays. The construction phase duration is expected to be 4 months.

8.5 Construction Workforce

The construction workforce would vary throughout the construction period.

Typically, the construction workforce would be up to 10 persons.

8.6 Construction Traffic Impacts

Considering the number of construction activities that could be taking place at once on the site, the traffic volume is expected to be lower than the volume of vehicles that would access the site once operational. The site is not expected to be operational during the construction period.

Given this, the impact on the surrounding road network is expected to be less than when the site is operational. Since the facility has been modelled assuming operational capacity and has been shown to not have a substantial impact on the performance of the surrounding road network, the construction traffic would also be expected to have no substantial impact.

8.7 Construction Impacts on Sustainable Transport

Construction activities are not expected to directly impact the public transport and active transport networks. Construction impacts on sustainable transport modes would be limited to construction



Construction Impacts

vehicles interacting with bus services and on-road cycle routes, and potential conflicts between pedestrians travelling on footpaths near the construction site and construction vehicles entering or exiting the site.

Construction impacts would be addressed through the preparation of the Construction Traffic Management Plan at a later stage. It is noted however that given the number of construction vehicles likely to access the site per day, construction impacts on the public transport network, cycle network and pedestrian network are anticipated to be minor.

9. Conclusions

Based on the analysis and discussions presented within this report, the following conclusions are made:

- (1) The proposed supply of 40 car parking spaces (including 1 disabled parking space) is considered to be acceptable for the facility, even though it is less than the Liverpool DCP requirements, given that these spaces can accommodate the maximum number of employees expected at the Waste Treatment Facility at any given time and the full DCP car parking requirement for the office.
- (2) The proposed supply of 5 bicycle parking spaces, a shower facility and 5 lockers meet the minimum requirements set out in the Liverpool DCP and is considered satisfactory.
- (3) One on-street parking space would be lost as a result of an additional driveway for light vehicles as part of the facility. Overall parking impacts would be minor given the number of spaces lost and alternative on-street parking available in Whyalla Place and in the surrounding streets.
- (4) No changes are proposed to the public transport, cycle or pedestrian networks as part of the facility and the additional movements by staff using these transport modes to access the site are not expected to require any additional upgrades to support this movement.
- (5) The proposed layout of the site can accommodate the swept paths of the largest vehicle anticipated at the site.
- (6) With two entry weighbridges, no queueing issues are anticipated at the site, with trucks to be fully contained within the site boundary during the peak hour of the site.
- (7) The site is expected to generate a maximum of 26 truck movements (13 in and 13 out) during the busiest hour and up to 40 light vehicle movements due to employees.
- (8) No permanent dedicated on-site loading space is proposed. Information provided by Golder Associates indicates that waste generated by the office would be collected by a private operator collecting skips from inside the warehouse.
- (9) No visitor parking is proposed on-site and the site will only allow staff parking on-site. Due to the nature of the development, frequent deliveries to the office are not expected. However, if deliveries occur, there is sufficient space on-site to accommodate a delivery vehicle stopping briefly. Alternatively, there is on-street parking nearby to the development. Furthermore, in periods where there is no shift change over, there is likely to be spare employee parking spaces that a delivery vehicle could use.
- (10) There would be minimal impacts to the road network due to the proposed development, with minimal changes to intersection levels of service and queuing currently experienced.
- (11) The northbound right turn queue at the Jedda Road / Joadja Road intersection during the AM peak hour could increase by up to approximately 15 metres (2 vehicles). The south-west leg of the intersection currently operates at Level of Service A with the overall intersection operating at Level of Service B. There is no change anticipated to the south-west leg or overall intersection Level of Service during the critical AM peak hour as a result of this development.
- (12) Traffic during construction is not anticipated to compromise the safety or function of the road network, public transport network, cycle network or pedestrian network but the preparation of a Construction Traffic Management Plan is required at the construction stage of the project.

Conclusions

(13) The Hoxton Park Road / Joadja Road has been upgraded and Transport for NSW plans to upgrade Hoxton Park Road between Banks Road and Cowpasture Road. These projects would likely improve the operational performance of the overall road network contributing positively to this project.

9.1 References

In preparing this report, reference has been made to the following:

- ◆ an inspection of the site and its surrounds on 24/03/20 and 29/04/20
- ◆ Liverpool Council Development Control Plan (DCP)
- ◆ traffic and car parking surveys as referenced in this report
- ◆ Austroads Guide to Road Design Part 3, Part 4a
- ◆ other documents and data as referenced in this report.

Appendix A

Traffic Survey Data

Please use this link to download the traffic survey data

<https://www.dropbox.com/t/19oEOixW2CJXwotK>

The link will be active until 1/4/2022 however the information can be provided at a later stage by contacting PeopleTrans.



Appendix B

Existing Sidra Intersection Modelling Outputs

MOVEMENT SUMMARY

 **Site: TCS3020 [Hoxton Park Road / Joadja Road Ex AM]**  **Network: N101 [Existing AM]**

20S0071 - 9-13 Whyalla Place
Hoxton Park Road / Joadja Road
Existing AM

Site Category: (None)

Signals - Fixed Time Coordinated Cycle Time = 110 seconds (Network User-Given Cycle Time)

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				Vehicles	Distance				
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Joadja Road														
1	L2	699	8.7	699	8.7	0.611	10.8	LOS A	15.2	114.1	0.53	0.74	0.53	41.1
3	R2	487	19.0	487	19.0	0.686	50.0	LOS D	12.4	101.3	0.98	0.85	1.01	13.6
Approach		1186	13.0	1186	13.0	0.686	26.9	LOS B	15.2	114.1	0.71	0.78	0.73	26.2
East: Hoxton Park Road														
4	L2	227	21.8	227	21.8	0.131	7.0	LOS A	0.0	0.0	0.00	0.56	0.00	60.2
5	T1	608	11.8	608	11.8	0.673	40.8	LOS C	14.9	114.3	0.96	0.82	0.96	38.7
Approach		836	14.5	836	14.5	0.673	31.6	LOS C	14.9	114.3	0.70	0.75	0.70	42.2
West: Hoxton Park Road														
11	T1	1141	7.2	1141	7.2	0.449	8.9	LOS A	14.1	105.1	0.51	0.46	0.51	38.5
12	R2	436	10.1	436	10.1	0.682	38.0	LOS C	19.7	150.1	0.90	0.85	0.90	15.7
Approach		1577	8.0	1577	8.0	0.682	17.0	LOS B	19.7	150.1	0.62	0.57	0.62	27.4
All Vehicles		3599	11.1	3599	11.1	0.686	23.6	LOS B	19.7	150.1	0.67	0.68	0.67	32.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow	Average Delay	Level of Service	Average Back of Queue		Prop. Queued	Effective Stop Rate
		ped/h	sec		Pedestrian	Distance		
					ped	m		
P1	South Full Crossing	1	49.2	LOS E	0.0	0.0	0.95	0.95
P21	East Stage 1	1	49.2	LOS E	0.0	0.0	0.95	0.95
P22	East Stage 2	1	49.2	LOS E	0.0	0.0	0.95	0.95
All Pedestrians		3	49.2	LOS E			0.95	0.95

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

 **Site: TCS4222 [Joadja Road / Liverpool Catholic Club Ex AM]**

 **Network: N101 [Existing AM]**

20S0071 - 9-13 Whyalla Place
 Joadja Road / Liverpool Catholic Club
 Existing AM
 Site Category: (None)
 Signals - Fixed Time Isolated Cycle Time = 55 seconds (Site User-Given Cycle Time)

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Back of Queue Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %	Total veh/h	HV %									
South: Joadja Road														
1	L2	3	0.0	3	0.0	0.488	10.3	LOS A	7.9	61.7	0.52	0.47	0.52	29.1
2	T1	1181	13.9	1181	13.9	0.488	4.7	LOS A	7.9	61.7	0.52	0.47	0.52	45.7
3	R2	14	0.0	14	0.0	0.026	11.8	LOS A	0.2	1.2	0.57	0.65	0.57	34.0
Approach		1198	13.7	1198	13.7	0.488	4.8	LOS A	7.9	61.7	0.52	0.47	0.52	45.4
East: Liverpool Catholic Club														
4	L2	1	0.0	1	0.0	0.008	26.4	LOS B	0.0	0.3	0.87	0.59	0.87	9.6
5	T1	1	0.0	1	0.0	0.008	22.9	LOS B	0.0	0.3	0.87	0.59	0.87	15.5
6	R2	13	0.0	13	0.0	0.058	29.2	LOS C	0.3	2.2	0.92	0.67	0.92	8.2
Approach		15	0.0	15	0.0	0.058	28.6	LOS C	0.3	2.2	0.92	0.66	0.92	8.8
North: Joadja Road														
7	L2	3	0.0	3	0.0	0.395	16.8	LOS B	5.9	46.6	0.71	0.61	0.83	23.3
8	T1	640	14.6	640	14.6	0.395	11.1	LOS A	5.9	46.6	0.71	0.61	0.77	33.5
9	R2	20	0.0	20	0.0	0.095	21.2	LOS B	0.4	2.9	0.74	0.70	0.74	26.1
Approach		663	14.1	663	14.1	0.395	11.4	LOS A	5.9	46.6	0.71	0.61	0.77	33.0
West: Liverpool Catholic Club														
10	L2	2	0.0	2	0.0	0.015	29.0	LOS C	0.1	0.6	0.91	0.60	0.91	9.3
11	T1	1	0.0	1	0.0	0.015	24.4	LOS B	0.1	0.6	0.91	0.60	0.91	14.6
12	R2	1	0.0	1	0.0	0.005	28.6	LOS C	0.0	0.2	0.91	0.58	0.91	8.9
Approach		4	0.0	4	0.0	0.015	27.8	LOS B	0.1	0.6	0.91	0.60	0.91	10.6
All Vehicles		1880	13.7	1880	13.7	0.488	7.4	LOS A	7.9	61.7	0.59	0.52	0.61	39.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
 Vehicle movement LOS values are based on average delay per movement.
 Intersection and Approach LOS values are based on average delay for all vehicle movements.
 SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue		Prop. Queued	Effective Stop Rate	
					Pedestrian	Distance m			
P1	South Full Crossing	1	21.8	LOS C	0.0	0.0	0.89	0.89	
P2	East Full Crossing	1	21.8	LOS C	0.0	0.0	0.89	0.89	
P3	North Full Crossing	1	21.8	LOS C	0.0	0.0	0.89	0.89	
P4	West Full Crossing	1	21.8	LOS C	0.0	0.0	0.89	0.89	
All Pedestrians		4	21.8	LOS C			0.89	0.89	

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
 Pedestrian movement LOS values are based on average delay per pedestrian movement.
 Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY



Site: TCS3854 [Joadja Road / Jedda Road Ex AM]



Network: N101 [Existing AM]

20S0071 - 9-13 Whyalla Place

Joadja Road / Jedda Road

Existing AM

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 55 seconds (Site User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Level of Delay	Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV %	Total	HV %				Vehicles	Distance				
		veh/h		veh/h		v/c	sec		veh	m				
SouthEast: Jedda Road														
21	L2	266	49.0	266	49.0	0.317	12.3	LOS A	3.7	37.1	0.55	0.72	0.55	44.9
22	T1	1	0.0	1	0.0	0.434	28.0	LOS B	2.3	20.1	0.97	0.76	0.97	33.4
23	R2	84	27.5	84	27.5	0.434	32.5	LOS C	2.3	20.1	0.97	0.76	0.97	31.5
Approach		352	43.7	352	43.7	0.434	17.2	LOS B	3.7	37.1	0.65	0.73	0.65	40.7
NorthEast: Joadja Road														
24	L2	134	13.4	134	13.4	0.909	42.0	LOS C	11.8	92.9	1.00	1.16	1.64	17.1
25	T1	518	15.2	518	15.2	0.909	36.6	LOS C	11.8	92.9	1.00	1.16	1.65	17.4
Approach		652	14.9	652	14.9	0.909	37.7	LOS C	11.8	92.9	1.00	1.16	1.65	17.3
NorthWest: Liverpool Transmission Substation														
27	L2	1	0.0	1	0.0	0.017	29.2	LOS C	0.1	0.6	0.91	0.61	0.91	12.5
28	T1	1	0.0	1	0.0	0.017	24.7	LOS B	0.1	0.6	0.91	0.61	0.91	12.5
29	R2	1	0.0	1	0.0	0.017	29.2	LOS C	0.1	0.6	0.91	0.61	0.91	12.5
Approach		3	0.0	3	0.0	0.017	27.7	LOS B	0.1	0.6	0.91	0.61	0.91	12.5
SouthWest: Jedda Road														
30	L2	1	0.0	1	0.0	0.444	10.1	LOS A	7.2	55.8	0.50	0.45	0.50	46.4
31	T1	1105	12.1	1105	12.1	0.444	4.5	LOS A	7.2	55.8	0.50	0.45	0.50	46.7
32	R2	576	19.4	576	19.4	0.821	26.2	LOS B	13.2	107.8	0.94	1.04	1.47	23.0
Approach		1682	14.6	1682	14.6	0.821	12.0	LOS A	13.2	107.8	0.65	0.65	0.83	34.4
All Vehicles		2688	18.4	2688	18.4	0.909	18.9	LOS B	13.2	107.8	0.74	0.78	1.01	29.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow	Average Delay	Level of Service	Average Back of Queue		Prop. Queued	Effective Stop Rate
					Pedestrian	Distance		
		ped/h	sec		ped	m		
P5	SouthEast Full Crossing	2	21.8	LOS C	0.0	0.0	0.89	0.89
P6	NorthEast Full Crossing	1	21.8	LOS C	0.0	0.0	0.89	0.89
P7	NorthWest Full Crossing	1	21.8	LOS C	0.0	0.0	0.89	0.89
P8	SouthWest Full Crossing	1	21.8	LOS C	0.0	0.0	0.89	0.89
All Pedestrians		5	21.8	LOS C			0.89	0.89

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

 **Site: TCS3711 [Hoxton Park Road / Ash Road Ex AM]**

 **Network: N101 [Existing AM]**

20S0071 - 9-13 Whyalla Place
Hoxton Park Road / Ash Road
Existing AM

Site Category: (None)

Signals - Fixed Time Coordinated Cycle Time = 110 seconds (Network User-Given Cycle Time)

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				Vehicles	Distance				
		veh/h	% veh/h	%	v/c	sec			veh	m				km/h
South: Ash Road														
1	L2	42	12.5	42	12.5	0.079	34.4	LOS C	1.6	12.3	0.74	0.71	0.74	32.5
3	R2	81	26.0	81	26.0	0.523	59.3	LOS E	4.4	37.3	0.99	0.78	0.99	31.1
Approach		123	21.4	123	21.4	0.523	50.8	LOS D	4.4	37.3	0.91	0.75	0.91	31.4
East: Hoxton Park Road														
4	L2	121	14.8	121	14.8	0.098	10.9	LOS A	1.8	14.2	0.30	0.67	0.30	49.3
5	T1	798	14.5	798	14.5	0.380	13.1	LOS A	11.2	88.0	0.58	0.51	0.58	46.1
Approach		919	14.5	919	14.5	0.380	12.8	LOS A	11.2	88.0	0.54	0.53	0.54	46.5
West: Hoxton Park Road														
11	T1	1548	10.3	1548	10.3	0.530	4.4	LOS A	14.6	110.6	0.39	0.36	0.39	65.6
12	R2	97	13.0	97	13.0	0.369	52.8	LOS D	4.6	35.5	0.90	0.77	0.90	30.5
Approach		1645	10.4	1645	10.4	0.530	7.3	LOS A	14.6	110.6	0.42	0.38	0.42	62.8
All Vehicles		2687	12.3	2687	12.3	0.530	11.1	LOS A	14.6	110.6	0.48	0.45	0.48	56.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow	Average Delay	Level of Service	Average Back of Queue		Prop. Queued	Effective Stop Rate
		ped/h	sec		Pedestrian	Distance		
					ped	m		
P1	South Full Crossing	1	49.2	LOS E	0.0	0.0	0.95	0.95
P21	East Stage 1	1	49.2	LOS E	0.0	0.0	0.95	0.95
P22	East Stage 2	1	49.2	LOS E	0.0	0.0	0.95	0.95
P41	West Stage 1	4	49.2	LOS E	0.0	0.0	0.95	0.95
P42	West Stage 2	4	49.2	LOS E	0.0	0.0	0.95	0.95
All Pedestrians		12	49.2	LOS E			0.95	0.95

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

▽ Site: Site 1 [Ash Road / Jedda Road Ex AM]

Network: N101 [Existing AM]

20S0071 - 9-13 Whyalla Place
 Ash Road / Jedda Road
 Existing AM
 Site Category: (None)
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV % veh/h	Total HV	HV %				Vehicles	Distance m				
South: Ash Road														
1	L2	5	40.0	5	40.0	0.050	8.5	LOS A	0.1	1.5	0.75	0.83	0.75	25.8
2	T1	3	100.0	3	100.0	0.050	43.3	LOS D	0.1	1.5	0.75	0.83	0.75	25.8
3	R2	2	0.0	2	0.0	0.050	16.3	LOS B	0.1	1.5	0.75	0.83	0.75	39.7
Approach		11	50.0	11	50.0	0.050	20.3	LOS B	0.1	1.5	0.75	0.83	0.75	30.3
East: Jedda Road														
4	L2	14	61.5	14	61.5	0.362	10.7	LOS A	1.9	15.2	0.35	0.16	0.45	45.3
5	T1	415	20.8	415	20.8	0.362	1.7	LOS A	1.9	15.2	0.35	0.16	0.45	53.5
6	R2	96	8.8	96	8.8	0.362	10.2	LOS A	1.9	15.2	0.35	0.16	0.45	53.5
Approach		524	19.7	524	19.7	0.362	3.5	NA	1.9	15.2	0.35	0.16	0.45	53.2
North: Ash Road														
7	L2	53	40.0	53	40.0	0.492	13.8	LOS A	2.0	19.1	0.80	1.04	1.18	42.3
8	T1	1	0.0	1	0.0	0.492	19.7	LOS B	2.0	19.1	0.80	1.04	1.18	40.4
9	R2	67	42.2	67	42.2	0.492	34.7	LOS C	2.0	19.1	0.80	1.04	1.18	37.1
Approach		121	40.9	121	40.9	0.492	25.5	LOS B	2.0	19.1	0.80	1.04	1.18	39.9
West: Jedda Road														
10	L2	140	22.6	140	22.6	0.348	6.5	LOS A	0.5	4.0	0.07	0.14	0.09	52.9
11	T1	426	15.6	426	15.6	0.348	0.3	LOS A	0.5	4.0	0.07	0.14	0.09	57.5
12	R2	13	58.3	13	58.3	0.348	11.4	LOS A	0.5	4.0	0.07	0.14	0.09	41.0
Approach		579	18.2	579	18.2	0.348	2.1	NA	0.5	4.0	0.07	0.14	0.09	56.6
All Vehicles		1235	21.3	1235	21.3	0.492	5.1	NA	2.0	19.1	0.27	0.25	0.35	51.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

▽ Site: Site 2 [Whyalla Place / Jedda Road Ex AM] 📍 Network: N101 [Existing AM]

20S0071 - 9-13 Whyalla Place
 Whyalla Place / Jedda Road
 Existing AM
 Site Category: (None)
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				Vehicles	Distance				
		veh/h	% veh/h	%	v/c	sec			veh	m				km/h
East: Jedda Road														
5	T1	313	25.9	313	25.9	0.273	1.7	LOS A	1.2	10.5	0.35	0.15	0.36	48.2
6	R2	74	11.4	74	11.4	0.273	10.0	LOS A	1.2	10.5	0.35	0.15	0.36	48.2
Approach		386	23.2	386	23.2	0.273	3.3	NA	1.2	10.5	0.35	0.15	0.36	48.2
North: Whyalla Place														
7	L2	55	32.7	55	32.7	0.179	9.1	LOS A	0.6	5.9	0.60	0.79	0.60	24.5
9	R2	32	43.3	32	43.3	0.179	17.2	LOS B	0.6	5.9	0.60	0.79	0.60	24.5
Approach		86	36.6	86	36.6	0.179	12.1	LOS A	0.6	5.9	0.60	0.79	0.60	24.5
West: Jedda Road														
10	L2	102	17.5	102	17.5	0.352	5.8	LOS A	0.0	0.0	0.00	0.10	0.00	58.3
11	T1	500	20.4	500	20.4	0.352	0.1	LOS A	0.0	0.0	0.00	0.10	0.00	58.3
Approach		602	19.9	602	19.9	0.352	1.0	NA	0.0	0.0	0.00	0.10	0.00	58.3
All Vehicles		1075	22.4	1075	22.4	0.352	2.7	NA	1.2	10.5	0.17	0.17	0.18	54.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: Site 5 [Whyalla Place Northern Driveway Ex AM]

Network: N101 [Existing AM]

20S0071 - 9-13 Whyalla Place
 Whyalla Place Northern Driveway
 Existing AM
 Site Category: (None)
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				veh	Distance				
		veh/h	% veh/h	veh/h	%	v/c	sec							km/h
South: Whyalla Place														
5	T1	176	15.0	176	15.0	0.100	0.0	LOS A	0.0	0.1	0.00	0.00	0.00	59.9
6	R2	1	0.0	1	0.0	0.100	4.3	LOS A	0.0	0.1	0.00	0.00	0.00	51.2
Approach		177	14.9	177	14.9	0.100	0.0	NA	0.0	0.1	0.00	0.00	0.00	59.9
East: Northern Driveway														
7	L2	1	0.0	1	0.0	0.002	5.8	LOS A	0.0	0.0	0.21	0.55	0.21	38.1
9	R2	1	0.0	1	0.0	0.002	6.4	LOS A	0.0	0.0	0.21	0.55	0.21	46.6
Approach		2	0.0	2	0.0	0.002	6.1	LOS A	0.0	0.0	0.21	0.55	0.21	44.0
North: Whyalla Place														
10	L2	1	0.0	1	0.0	0.055	5.5	LOS A	0.0	0.0	0.00	0.01	0.00	56.6
11	T1	86	36.6	86	36.6	0.055	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.7
Approach		87	36.1	87	36.1	0.055	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.6
All Vehicles		266	21.7	266	21.7	0.100	0.1	NA	0.0	0.1	0.00	0.01	0.00	59.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: Site 6 [Whyalla Place Southern Driveway Ex AM]

Network: N101 [Existing AM]

20S0071 - 9-13 Whyalla Place
 Whyalla Place Southern Driveway
 Existing AM
 Site Category: (None)
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				veh	Distance				
		veh/h	% veh/h	veh/h	%	v/c	sec		veh	m				km/h
South: Whyalla Place														
5	T1	176	15.0	176	15.0	0.100	0.0	LOS A	0.0	0.1	0.00	0.00	0.00	59.6
6	R2	1	0.0	1	0.0	0.100	5.8	LOS A	0.0	0.1	0.00	0.00	0.00	52.9
Approach		177	14.9	177	14.9	0.100	0.0	NA	0.0	0.1	0.00	0.00	0.00	59.5
East: Southern Driveway														
7	L2	1	0.0	1	0.0	0.002	5.8	LOS A	0.0	0.0	0.21	0.55	0.21	38.1
9	R2	1	0.0	1	0.0	0.002	6.4	LOS A	0.0	0.0	0.21	0.55	0.21	38.1
Approach		2	0.0	2	0.0	0.002	6.1	LOS A	0.0	0.0	0.21	0.55	0.21	38.1
North: Whyalla Place														
10	L2	1	0.0	1	0.0	0.055	4.1	LOS A	0.0	0.0	0.00	0.01	0.00	53.3
11	T1	86	36.6	86	36.6	0.055	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	58.8
Approach		87	36.1	87	36.1	0.055	0.1	NA	0.0	0.0	0.00	0.01	0.00	58.6
All Vehicles		266	21.7	266	21.7	0.100	0.1	NA	0.0	0.1	0.00	0.01	0.00	58.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: Site 3 [Bernera Road / Jedda Road / M7 SB Ramps Ex AM]

Network: N101 [Existing AM]

20S0071 - 9-13 Whyalla Place
Bernera Road / Jedda Road / M7 SB Ramps
Existing AM
Site Category: (None)
Roundabout

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				Vehicles	Distance				
		veh/h	% veh/h	%	v/c	sec			veh	m				km/h
South: Bernera Road														
2	T1	18	41.2	18	41.2	0.491	3.6	LOS A	4.1	30.6	0.14	0.56	0.14	42.2
3a	R1	1380	6.7	1380	6.7	0.491	8.2	LOS A	4.1	30.6	0.15	0.56	0.15	36.2
3b	R3	96	50.5	96	50.5	0.491	11.1	LOS A	4.0	31.3	0.16	0.56	0.16	52.4
3u	U	3	0.0	3	0.0	0.491	11.8	LOS A	4.0	31.3	0.16	0.56	0.16	36.0
Approach		1497	9.9	1497	9.9	0.491	8.3	LOS A	4.1	31.3	0.15	0.56	0.15	38.8
NorthEast: Jedda Road														
24	L2	281	23.6	281	23.6	0.409	5.5	LOS A	2.2	18.0	0.43	0.56	0.43	53.9
24a	L1	529	19.1	529	19.1	0.409	5.0	LOS A	2.2	18.0	0.43	0.56	0.43	45.1
26b	R3	17	31.3	17	31.3	0.409	13.0	LOS A	2.1	17.1	0.44	0.55	0.44	40.9
26u	U	1	0.0	1	0.0	0.409	13.4	LOS A	2.1	17.1	0.44	0.55	0.44	45.1
Approach		828	20.8	828	20.8	0.409	5.3	LOS A	2.2	18.0	0.43	0.56	0.43	50.1
North: Bernera Road														
7b	L3	11	30.0	11	30.0	0.108	12.6	LOS A	0.4	4.5	0.79	0.87	0.79	24.4
7a	L1	6	83.3	6	83.3	0.108	16.0	LOS B	0.4	4.5	0.79	0.87	0.79	46.1
8	T1	17	75.0	17	75.0	0.108	15.6	LOS B	0.4	4.5	0.79	0.87	0.79	24.4
9u	U	1	0.0	1	0.0	0.108	18.9	LOS B	0.4	4.5	0.79	0.87	0.79	24.9
Approach		35	60.6	35	60.6	0.108	14.9	LOS B	0.4	4.5	0.79	0.87	0.79	32.1
NorthWest: M7 SB Exit Ramp														
27b	L3	20	73.7	20	73.7	0.394	11.7	LOS A	2.0	16.7	0.74	0.90	0.87	42.0
27	L2	304	16.3	304	16.3	0.394	9.2	LOS A	2.0	16.7	0.74	0.90	0.87	44.1
28	T1	1	0.0	1	0.0	0.394	9.9	LOS A	1.8	16.0	0.75	0.95	0.92	50.2
29a	R1	167	31.4	167	31.4	0.394	16.6	LOS B	1.8	16.0	0.75	0.95	0.92	39.0
Approach		493	23.7	493	23.7	0.394	11.8	LOS A	2.0	16.7	0.75	0.92	0.89	42.1
All Vehicles		2853	16.1	2853	16.1	0.491	8.2	LOS A	4.1	31.3	0.34	0.63	0.37	43.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: Site 4 [Bernera Road / Yarra Street / M7 NB Ramps Ex AM]

Network: N101 [Existing AM]

20S0071 - 9-13 Whyalla Place
Bernera Road / Yarra Street / M7 NB Ramps
Existing AM
Site Category: (None)
Roundabout

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				veh	Distance				
		veh/h	% veh/h	%	v/c	sec			m					
South: Bernera Road														
1b	L3	67	9.4	67	9.4	0.040	3.6	LOS A	0.2	1.3	0.17	0.45	0.17	50.6
1a	L1	216	23.4	216	23.4	0.592	5.4	LOS A	4.4	34.4	0.68	0.61	0.78	54.2
2	T1	1103	7.8	1103	7.8	0.592	6.0	LOS A	4.4	34.4	0.70	0.68	0.82	46.9
3u	U	53	20.0	53	20.0	0.592	15.9	LOS B	4.2	31.9	0.71	0.75	0.85	55.9
Approach		1439	10.7	1439	10.7	0.592	6.1	LOS A	4.4	34.4	0.67	0.66	0.78	49.3
NorthEast: M7 NB Exit Ramp														
24a	L1	95	44.4	95	44.4	0.226	7.5	LOS A	0.9	7.9	0.61	0.73	0.61	55.0
25	T1	32	16.7	32	16.7	0.226	6.7	LOS A	0.9	7.9	0.61	0.73	0.61	52.3
26	R2	1	0.0	1	0.0	0.386	11.7	LOS A	1.9	14.5	0.62	0.85	0.65	52.5
26b	R3	378	13.1	378	13.1	0.386	13.4	LOS A	1.9	14.5	0.62	0.85	0.65	46.0
Approach		505	19.2	505	19.2	0.386	11.8	LOS A	1.9	14.5	0.62	0.82	0.64	48.5
North: Bernera Road														
8	T1	544	18.4	544	18.4	0.279	3.4	LOS A	1.6	12.6	0.25	0.38	0.25	55.3
9a	R1	47	33.3	47	33.3	0.279	8.9	LOS A	1.5	13.3	0.26	0.50	0.26	49.0
9b	R3	123	41.0	123	41.0	0.279	11.5	LOS A	1.5	13.3	0.26	0.50	0.26	53.8
9u	U	1	0.0	1	0.0	0.279	12.2	LOS A	1.5	13.3	0.26	0.50	0.26	39.0
Approach		716	23.2	716	23.2	0.279	5.2	LOS A	1.6	13.3	0.25	0.41	0.25	54.3
SouthWest: Yarra Street														
30	L2	16	80.0	16	80.0	0.264	15.5	LOS B	1.2	12.1	0.85	0.91	0.86	44.5
30a	L1	36	52.9	36	52.9	0.264	12.6	LOS A	1.2	12.1	0.85	0.91	0.86	39.9
32b	R3	23	31.8	23	31.8	0.264	18.6	LOS B	1.2	12.1	0.85	0.91	0.86	46.1
32u	U	1	0.0	1	0.0	0.264	17.7	LOS B	1.2	12.1	0.85	0.91	0.86	49.6
Approach		76	51.4	76	51.4	0.264	15.1	LOS B	1.2	12.1	0.85	0.91	0.86	43.3
All Vehicles		2736	16.7	2736	16.7	0.592	7.2	LOS A	4.4	34.4	0.56	0.63	0.62	50.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 **Site: TCS3020 [Hoxton Park Road / Joadja Road Ex PM]**  **Network: N101 [Existing PM]**

20S0071 - 9-13 Whyalla Place
Hoxton Park Road / Joadja Road
Existing PM

Site Category: (None)

Signals - Fixed Time Coordinated Cycle Time = 120 seconds (Network User-Given Cycle Time)

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV %	Total	HV %				Vehicles	Distance				
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Joadja Road														
1	L2	686	4.1	686	4.1	0.832	24.1	LOS B	30.3	219.5	0.82	0.88	0.87	30.8
3	R2	229	7.8	229	7.8	0.787	70.3	LOS E	7.2	54.0	1.00	0.90	1.23	10.3
Approach		916	5.1	916	5.1	0.832	35.7	LOS C	30.3	219.5	0.86	0.88	0.96	23.5
East: Hoxton Park Road														
4	L2	363	11.9	363	11.9	0.196	6.8	LOS A	0.0	0.0	0.00	0.56	0.00	60.2
5	T1	1267	5.7	1267	5.7	0.824	22.1	LOS B	28.5	208.5	0.81	0.75	0.84	48.7
Approach		1631	7.1	1631	7.1	0.824	18.7	LOS B	28.5	208.5	0.63	0.71	0.65	50.5
West: Hoxton Park Road														
11	T1	827	5.0	827	5.0	0.265	2.7	LOS A	5.5	40.3	0.25	0.22	0.25	56.1
12	R2	508	4.3	508	4.3	0.796	46.3	LOS D	27.9	202.3	0.96	0.90	1.01	13.4
Approach		1336	4.7	1336	4.7	0.796	19.3	LOS B	27.9	202.3	0.52	0.48	0.54	25.3
All Vehicles		3882	5.8	3882	5.8	0.832	22.9	LOS B	30.3	219.5	0.65	0.67	0.69	38.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow	Average Delay	Level of Service	Average Back of Queue	Prop. Queued	Effective Stop Rate	
		ped/h	sec		Pedestrian Distance			
		ped/h	sec		ped	m		
P1	South Full Crossing	1	54.2	LOS E	0.0	0.0	0.95	0.95
P21	East Stage 1	1	54.2	LOS E	0.0	0.0	0.95	0.95
P22	East Stage 2	1	54.2	LOS E	0.0	0.0	0.95	0.95
All Pedestrians		3	54.2	LOS E			0.95	0.95

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

 **Site: TCS4222 [Joadja Road / Liverpool Catholic Club Ex PM]**

 **Network: N101 [Existing PM]**

20S0071 - 9-13 Whyalla Place

Joadja Road / Liverpool Catholic Club

Existing PM

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 60 seconds (Site User-Given Cycle Time)

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %	Total veh/h	HV %				Vehicles veh	Distance m				
South: Joadja Road														
1	L2	1	0.0	1	0.0	0.327	9.3	LOS A	4.8	34.9	0.42	0.37	0.42	29.8
2	T1	857	5.0	857	5.0	0.327	3.8	LOS A	5.0	36.3	0.42	0.37	0.42	48.1
3	R2	15	0.0	15	0.0	0.031	12.8	LOS A	0.2	1.4	0.58	0.66	0.58	33.1
Approach		873	4.9	873	4.9	0.327	3.9	LOS A	5.0	36.3	0.42	0.37	0.42	47.6
East: Liverpool Catholic Club														
4	L2	24	0.0	24	0.0	0.050	21.4	LOS B	0.5	3.8	0.75	0.68	0.75	10.6
5	T1	1	0.0	1	0.0	0.050	17.9	LOS B	0.5	3.8	0.75	0.68	0.75	17.0
6	R2	41	0.0	41	0.0	0.206	32.9	LOS C	1.2	8.3	0.95	0.72	0.95	7.4
Approach		66	0.0	66	0.0	0.206	28.4	LOS B	1.2	8.3	0.88	0.71	0.88	8.5
North: Joadja Road														
7	L2	23	13.6	23	13.6	0.466	16.4	LOS B	8.3	62.1	0.69	0.62	0.80	23.3
8	T1	843	7.2	843	7.2	0.466	10.7	LOS A	8.3	62.1	0.70	0.61	0.75	33.9
9	R2	1	0.0	1	0.0	0.003	16.7	LOS B	0.0	0.1	0.60	0.61	0.60	29.3
Approach		867	7.4	867	7.4	0.466	10.8	LOS A	8.3	62.1	0.70	0.61	0.75	33.4
West: Liverpool Catholic Club														
10	L2	1	0.0	1	0.0	0.011	31.7	LOS C	0.1	0.4	0.92	0.58	0.92	8.9
11	T1	1	0.0	1	0.0	0.011	27.1	LOS B	0.1	0.4	0.92	0.58	0.92	13.9
12	R2	1	0.0	1	0.0	0.005	31.4	LOS C	0.0	0.2	0.92	0.58	0.92	8.3
Approach		3	0.0	3	0.0	0.011	30.1	LOS C	0.1	0.4	0.92	0.58	0.92	10.4
All Vehicles		1809	5.9	1809	5.9	0.466	8.2	LOS A	8.3	62.1	0.57	0.50	0.60	37.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue		Prop. Queued	Effective Stop Rate	
					Pedestrian ped	Distance m			
P1	South Full Crossing	1	24.3	LOS C	0.0	0.0	0.90	0.90	
P2	East Full Crossing	1	24.3	LOS C	0.0	0.0	0.90	0.90	
P3	North Full Crossing	1	24.3	LOS C	0.0	0.0	0.90	0.90	
P4	West Full Crossing	1	24.3	LOS C	0.0	0.0	0.90	0.90	
All Pedestrians		4	24.3	LOS C			0.90	0.90	

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY



Site: TCS3854 [Joadja Road / Jedda Road Ex PM]



Network: N101 [Existing PM]

20S0071 - 9-13 Whyalla Place

Joadja Road / Jedda Road

Existing PM

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 60 seconds (Site User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	Flows HV % veh/h	Arrival Flows Total veh/h	Flows HV % veh/h	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Jedda Road														
21	L2	468	10.6	468	10.6	0.518	16.6	LOS B	9.4	71.5	0.72	0.79	0.72	41.0
22	T1	1	0.0	1	0.0	0.780	32.4	LOS C	6.7	47.9	1.00	0.93	1.28	31.6
23	R2	206	2.6	206	2.6	0.780	36.7	LOS C	6.7	47.9	1.00	0.93	1.28	29.6
Approach		676	8.1	676	8.1	0.780	22.8	LOS B	9.4	71.5	0.81	0.83	0.89	36.7
NorthEast: Joadja Road														
24	L2	112	8.5	112	8.5	0.773	29.6	LOS C	13.4	99.6	0.97	0.93	1.11	22.6
25	T1	764	6.7	764	6.7	0.773	24.1	LOS B	13.4	99.6	0.97	0.93	1.12	23.0
Approach		876	7.0	876	7.0	0.773	24.8	LOS B	13.4	99.6	0.97	0.93	1.12	22.9
NorthWest: Liverpool Transmission Substation														
27	L2	1	0.0	1	0.0	0.014	28.7	LOS C	0.1	0.6	0.87	0.60	0.87	12.7
28	T1	1	0.0	1	0.0	0.014	24.1	LOS B	0.1	0.6	0.87	0.60	0.87	12.7
29	R2	1	0.0	1	0.0	0.014	28.7	LOS C	0.1	0.6	0.87	0.60	0.87	12.7
Approach		3	0.0	3	0.0	0.014	27.1	LOS B	0.1	0.6	0.87	0.60	0.87	12.7
SouthWest: Jedda Road														
30	L2	1	0.0	1	0.0	0.260	10.3	LOS A	4.1	30.5	0.45	0.39	0.45	46.1
31	T1	648	6.0	648	6.0	0.260	4.7	LOS A	4.1	30.5	0.45	0.39	0.45	46.2
32	R2	298	27.2	298	27.2	0.575	22.2	LOS B	6.5	55.9	0.87	0.87	1.06	25.5
Approach		947	12.7	947	12.7	0.575	10.2	LOS A	6.5	55.9	0.58	0.54	0.64	36.7
All Vehicles		2502	9.4	2502	9.4	0.780	18.7	LOS B	13.4	99.6	0.78	0.76	0.88	31.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P5	SouthEast Full Crossing	2	24.3	LOS C	0.0	0.0	0.90	0.90
P6	NorthEast Full Crossing	1	24.3	LOS C	0.0	0.0	0.90	0.90
P7	NorthWest Full Crossing	1	24.3	LOS C	0.0	0.0	0.90	0.90
P8	SouthWest Full Crossing	1	24.3	LOS C	0.0	0.0	0.90	0.90
All Pedestrians		5	24.3	LOS C			0.90	0.90

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

 **Site: TCS3711 [Hoxton Park Road / Ash Road Ex PM]**

 **Network: N101 [Existing PM]**

20S0071 - 9-13 Whyalla Place

Hoxton Park Road / Ash Road

Existing PM

Site Category: (None)

Signals - Fixed Time Coordinated Cycle Time = 120 seconds (Network User-Given Cycle Time)

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				Vehicles	Distance				
		veh/h	% veh/h	%	v/c	sec			veh	m				km/h
South: Ash Road														
1	L2	76	6.9	76	6.9	0.154	40.9	LOS C	3.3	24.8	0.79	0.74	0.79	29.9
3	R2	178	5.9	178	5.9	0.672	56.3	LOS D	9.9	72.7	0.97	0.83	1.01	33.3
Approach		254	6.2	254	6.2	0.672	51.7	LOS D	9.9	72.7	0.92	0.80	0.94	32.5
East: Hoxton Park Road														
4	L2	122	8.6	122	8.6	0.082	8.0	LOS A	1.1	8.4	0.17	0.65	0.17	53.5
5	T1	1519	6.7	1519	6.7	0.665	14.9	LOS B	28.8	212.4	0.68	0.62	0.68	44.0
Approach		1641	6.9	1641	6.9	0.665	14.4	LOS A	28.8	212.4	0.64	0.62	0.64	44.6
West: Hoxton Park Road														
11	T1	1004	5.0	1004	5.0	0.362	5.3	LOS A	7.9	57.1	0.30	0.27	0.30	64.7
12	R2	45	11.6	45	11.6	0.528	69.1	LOS E	2.8	21.2	0.99	0.74	1.01	25.9
Approach		1049	5.3	1049	5.3	0.528	8.1	LOS A	7.9	57.1	0.33	0.29	0.33	62.2
All Vehicles		2944	6.3	2944	6.3	0.672	15.4	LOS B	28.8	212.4	0.55	0.52	0.56	50.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow	Average Delay	Level of Service	Average Back of Queue	Prop. Queued	Effective Stop Rate	
		ped/h	sec		Pedestrian Distance			
					ped			m
P1	South Full Crossing	1	54.2	LOS E	0.0	0.0	0.95	0.95
P21	East Stage 1	2	54.2	LOS E	0.0	0.0	0.95	0.95
P22	East Stage 2	2	54.2	LOS E	0.0	0.0	0.95	0.95
P41	West Stage 1	2	54.2	LOS E	0.0	0.0	0.95	0.95
P42	West Stage 2	2	54.2	LOS E	0.0	0.0	0.95	0.95
All Pedestrians		9	54.2	LOS E			0.95	0.95

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

▽ Site: Site 1 [Ash Road / Jedda Road Ex PM]

Network: N101 [Existing PM]

20S0071 - 9-13 Whyalla Place
 Ash Road / Jedda Road
 Existing PM
 Site Category: (None)
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV %	Total	HV %				Vehicles	Distance				
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Ash Road														
1	L2	6	50.0	6	50.0	0.022	9.3	LOS A	0.1	0.6	0.58	0.76	0.58	35.2
2	T1	1	0.0	1	0.0	0.022	11.4	LOS A	0.1	0.6	0.58	0.76	0.58	35.2
3	R2	3	0.0	3	0.0	0.022	14.6	LOS B	0.1	0.6	0.58	0.76	0.58	46.3
Approach		11	30.0	11	30.0	0.022	11.1	LOS A	0.1	0.6	0.58	0.76	0.58	40.6
East: Jedda Road														
4	L2	1	0.0	1	0.0	0.315	8.3	LOS A	0.7	5.7	0.16	0.07	0.17	56.2
5	T1	481	10.3	481	10.3	0.315	0.5	LOS A	0.7	5.7	0.16	0.07	0.17	57.5
6	R2	53	12.0	53	12.0	0.315	8.4	LOS A	0.7	5.7	0.16	0.07	0.17	57.5
Approach		535	10.4	535	10.4	0.315	1.3	NA	0.7	5.7	0.16	0.07	0.17	57.5
North: Ash Road														
7	L2	98	5.4	98	5.4	0.302	7.6	LOS A	1.2	9.2	0.57	0.78	0.66	50.1
8	T1	1	0.0	1	0.0	0.302	12.7	LOS A	1.2	9.2	0.57	0.78	0.66	48.3
9	R2	61	13.8	61	13.8	0.302	18.6	LOS B	1.2	9.2	0.57	0.78	0.66	46.5
Approach		160	8.6	160	8.6	0.302	11.9	LOS A	1.2	9.2	0.57	0.78	0.66	49.0
West: Jedda Road														
10	L2	93	14.8	93	14.8	0.244	6.2	LOS A	0.2	1.4	0.04	0.13	0.04	53.9
11	T1	318	17.2	318	17.2	0.244	0.2	LOS A	0.2	1.4	0.04	0.13	0.04	57.9
12	R2	4	75.0	4	75.0	0.244	12.1	LOS A	0.2	1.4	0.04	0.13	0.04	38.9
Approach		415	17.3	415	17.3	0.244	1.6	NA	0.2	1.4	0.04	0.13	0.04	57.3
All Vehicles		1120	12.9	1120	12.9	0.315	3.0	NA	1.2	9.2	0.17	0.20	0.19	55.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

▽ Site: Site 2 [Whyalla Place / Jedda Road Ex PM] 📍 Network: N101 [Existing PM]

20S0071 - 9-13 Whyalla Place
 Whyalla Place / Jedda Road
 Existing PM
 Site Category: (None)
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				Vehicles	Distance				
		veh/h	% veh/h	%	v/c	sec			veh	m				km/h
East: Jedda Road														
5	T1	364	26.6	364	26.6	0.276	0.7	LOS A	0.8	7.0	0.22	0.09	0.22	53.0
6	R2	58	20.0	58	20.0	0.276	8.6	LOS A	0.8	7.0	0.22	0.09	0.22	53.0
Approach		422	25.7	422	25.7	0.276	1.8	NA	0.8	7.0	0.22	0.09	0.22	53.0
North: Whyalla Place														
7	L2	69	6.1	69	6.1	0.141	7.3	LOS A	0.5	4.1	0.50	0.70	0.50	28.6
9	R2	34	18.8	34	18.8	0.141	12.4	LOS A	0.5	4.1	0.50	0.70	0.50	28.6
Approach		103	10.2	103	10.2	0.141	9.0	LOS A	0.5	4.1	0.50	0.70	0.50	28.6
West: Jedda Road														
10	L2	43	24.4	43	24.4	0.251	5.9	LOS A	0.0	0.0	0.00	0.06	0.00	58.9
11	T1	362	31.7	362	31.7	0.251	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	58.9
Approach		405	30.9	405	30.9	0.251	0.7	NA	0.0	0.0	0.00	0.06	0.00	58.9
All Vehicles		931	26.2	931	26.2	0.276	2.1	NA	0.8	7.0	0.15	0.15	0.15	54.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: Site 5 [Whyalla Place Northern Driveway Ex PM]

Network: N101 [Existing PM]

20S0071 - 9-13 Whyalla Place
 Whyalla Place Northern Driveway
 Existing PM
 Site Category: (None)
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				Vehicles	Distance				
		veh/h	% veh/h	veh/h	%	v/c	sec		veh	m				km/h
South: Whyalla Place														
5	T1	101	21.9	101	21.9	0.060	0.0	LOS A	0.0	0.1	0.00	0.01	0.00	59.8
6	R2	1	0.0	1	0.0	0.060	4.3	LOS A	0.0	0.1	0.00	0.01	0.00	51.1
Approach		102	21.6	102	21.6	0.060	0.0	NA	0.0	0.1	0.00	0.01	0.00	59.8
East: Northern Driveway														
7	L2	3	0.0	3	0.0	0.003	5.8	LOS A	0.0	0.1	0.19	0.54	0.19	38.3
9	R2	1	0.0	1	0.0	0.003	6.1	LOS A	0.0	0.1	0.19	0.54	0.19	46.7
Approach		4	0.0	4	0.0	0.003	5.9	LOS A	0.0	0.1	0.19	0.54	0.19	41.9
North: Whyalla Place														
10	L2	1	0.0	1	0.0	0.055	5.5	LOS A	0.0	0.0	0.00	0.01	0.00	56.7
11	T1	99	10.6	99	10.6	0.055	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.8
Approach		100	10.5	100	10.5	0.055	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.7
All Vehicles		206	15.8	206	15.8	0.060	0.2	NA	0.0	0.1	0.01	0.02	0.01	59.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

▽ Site: Site 6 [Whyalla Place Southern Driveway Ex PM]

⚡ Network: N101 [Existing PM]

20S0071 - 9-13 Whyalla Place
 Whyalla Place Southern Driveway
 Existing PM
 Site Category: (None)
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				%	v/c				
South: Whyalla Place														
5	T1	101	21.9	101	21.9	0.060	0.0	LOS A	0.0	0.1	0.01	0.01	0.01	59.3
6	R2	1	0.0	1	0.0	0.060	5.8	LOS A	0.0	0.1	0.01	0.01	0.01	52.8
Approach		102	21.6	102	21.6	0.060	0.1	NA	0.0	0.1	0.01	0.01	0.01	59.1
East: Southern Driveway														
7	L2	2	0.0	2	0.0	0.002	5.8	LOS A	0.0	0.1	0.20	0.54	0.20	38.2
9	R2	1	0.0	1	0.0	0.002	6.1	LOS A	0.0	0.1	0.20	0.54	0.20	38.2
Approach		3	0.0	3	0.0	0.002	5.9	LOS A	0.0	0.1	0.20	0.54	0.20	38.2
North: Whyalla Place														
10	L2	1	0.0	1	0.0	0.056	4.1	LOS A	0.0	0.0	0.00	0.01	0.00	53.4
11	T1	101	10.4	101	10.4	0.056	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.3
Approach		102	10.3	102	10.3	0.056	0.0	NA	0.0	0.0	0.00	0.01	0.00	59.0
All Vehicles		207	15.7	207	15.7	0.060	0.1	NA	0.0	0.1	0.01	0.01	0.01	58.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: Site 3 [Bernera Road / Jedda Road / M7 SB Ramps Ex PM]

Network: N101 [Existing PM]

20S0071 - 9-13 Whyalla Place
 Bernera Road / Jedda Road / M7 SB Ramps
 Existing PM
 Site Category: (None)
 Roundabout

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV %	Total	HV %				Vehicles	Distance				
		veh/h	% veh/h	veh/h	%	v/c	sec		veh	m				km/h
South: Bernera Road														
2	T1	17	56.3	17	56.3	0.270	3.6	LOS A	1.6	12.6	0.05	0.58	0.05	41.6
3a	R1	727	10.7	727	10.7	0.270	8.2	LOS A	1.6	12.6	0.05	0.59	0.05	36.9
3b	R3	89	25.9	89	25.9	0.270	10.7	LOS A	1.6	12.5	0.05	0.60	0.05	53.6
3u	U	1	0.0	1	0.0	0.270	11.7	LOS A	1.6	12.5	0.05	0.60	0.05	36.6
Approach		835	13.2	835	13.2	0.270	8.3	LOS A	1.6	12.6	0.05	0.59	0.05	41.1
NorthEast: Jedda Road														
24	L2	367	10.9	367	10.9	0.576	5.7	LOS A	3.9	29.8	0.46	0.58	0.48	54.1
24a	L1	913	9.8	913	9.8	0.576	5.4	LOS A	3.9	29.8	0.47	0.58	0.49	45.0
26b	R3	2	100.0	2	100.0	0.576	15.6	LOS B	3.9	29.4	0.47	0.58	0.50	40.1
26u	U	1	0.0	1	0.0	0.576	14.1	LOS A	3.9	29.4	0.47	0.58	0.50	45.1
Approach		1283	10.3	1283	10.3	0.576	5.5	LOS A	3.9	29.8	0.47	0.58	0.49	49.8
North: Bernera Road														
7b	L3	13	0.0	13	0.0	0.112	6.8	LOS A	0.4	3.8	0.63	0.76	0.63	33.6
7a	L1	14	38.5	14	38.5	0.112	7.8	LOS A	0.4	3.8	0.63	0.76	0.63	52.2
8	T1	35	54.5	35	54.5	0.112	8.9	LOS A	0.4	3.8	0.63	0.76	0.63	33.6
9u	U	1	0.0	1	0.0	0.112	15.0	LOS B	0.4	3.8	0.63	0.76	0.63	29.5
Approach		62	39.0	62	39.0	0.112	8.3	LOS A	0.4	3.8	0.63	0.76	0.63	42.0
NorthWest: M7 SB Exit Ramp														
27b	L3	8	87.5	8	87.5	0.209	8.5	LOS A	0.8	7.0	0.55	0.73	0.55	43.7
27	L2	183	24.1	183	24.1	0.209	6.2	LOS A	0.8	7.0	0.55	0.73	0.55	48.6
28	T1	1	0.0	1	0.0	0.209	5.9	LOS A	0.8	6.5	0.56	0.82	0.56	53.0
29a	R1	156	20.9	156	20.9	0.209	11.4	LOS A	0.8	6.5	0.56	0.82	0.56	43.3
Approach		348	24.2	348	24.2	0.209	8.6	LOS A	0.8	7.0	0.56	0.77	0.56	45.9
All Vehicles		2528	13.9	2528	13.9	0.576	6.9	LOS A	3.9	29.8	0.34	0.61	0.36	46.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: Site 4 [Bernera Road / Yarrowa Street / M7 NB Ramps Ex PM]

Network: N101 [Existing PM]

20S0071 - 9-13 Whyalla Place
Bernera Road / Yarrowa Street / M7 NB Ramps
Existing PM
Site Category: (None)
Roundabout

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				veh	Distance				
		veh/h	% veh/h	%	v/c	sec			m					
South: Bernera Road														
1b	L3	18	47.1	18	47.1	0.013	3.9	LOS A	0.1	0.5	0.17	0.44	0.17	50.4
1a	L1	220	19.1	220	19.1	0.361	4.0	LOS A	1.8	14.4	0.50	0.44	0.50	55.5
2	T1	652	9.9	652	9.9	0.361	4.5	LOS A	1.8	14.4	0.52	0.47	0.52	48.7
3u	U	22	33.3	22	33.3	0.361	14.3	LOS A	1.8	13.5	0.53	0.50	0.53	56.8
Approach		912	13.4	912	13.4	0.361	4.6	LOS A	1.8	14.4	0.51	0.46	0.51	51.4
NorthEast: M7 NB Exit Ramp														
24a	L1	77	41.1	77	41.1	0.171	7.8	LOS A	0.6	6.2	0.65	0.75	0.65	54.4
25	T1	9	88.9	9	88.9	0.171	10.6	LOS A	0.6	6.2	0.65	0.75	0.65	51.8
26	R2	1	0.0	1	0.0	0.207	11.9	LOS A	0.9	7.3	0.63	0.86	0.63	52.5
26b	R3	171	24.7	171	24.7	0.207	13.9	LOS A	0.9	7.3	0.63	0.86	0.63	46.0
Approach		258	31.8	258	31.8	0.207	12.0	LOS A	0.9	7.3	0.64	0.83	0.64	49.2
North: Bernera Road														
8	T1	847	8.2	847	8.2	0.393	3.2	LOS A	2.5	18.8	0.23	0.38	0.23	55.6
9a	R1	49	61.7	49	61.7	0.393	9.2	LOS A	2.5	20.0	0.24	0.50	0.24	48.7
9b	R3	213	20.8	213	20.8	0.393	11.1	LOS A	2.5	20.0	0.24	0.50	0.24	54.7
9u	U	1	0.0	1	0.0	0.393	12.1	LOS A	2.5	20.0	0.24	0.50	0.24	39.0
Approach		1111	13.0	1111	13.0	0.393	5.0	LOS A	2.5	20.0	0.23	0.41	0.23	54.9
SouthWest: Yarrowa Street														
30	L2	17	31.3	17	31.3	0.187	7.6	LOS A	0.8	7.0	0.72	0.82	0.72	48.0
30a	L1	49	27.7	49	27.7	0.187	6.6	LOS A	0.8	7.0	0.72	0.82	0.72	43.6
32b	R3	29	28.6	29	28.6	0.187	14.1	LOS A	0.8	7.0	0.72	0.82	0.72	49.5
32u	U	1	0.0	1	0.0	0.187	13.9	LOS A	0.8	7.0	0.72	0.82	0.72	52.6
Approach		97	28.3	97	28.3	0.187	9.1	LOS A	0.8	7.0	0.72	0.82	0.72	46.7
All Vehicles		2377	15.8	2377	15.8	0.393	5.8	LOS A	2.5	20.0	0.40	0.49	0.40	52.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.



Appendix C

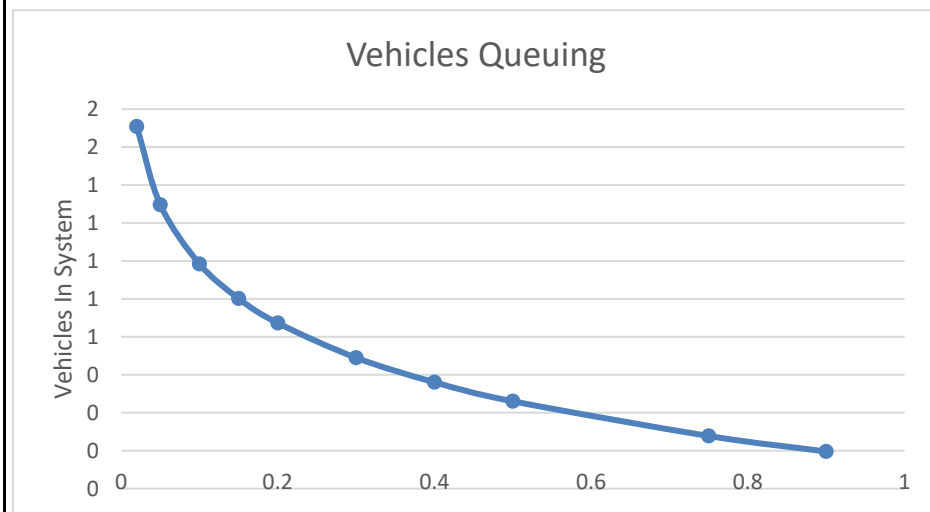
Weighbridge Queuing Analysis

Queuing Theory as documented in Austroads Guide to Traffic Management Part 2 Section 4

Arrival Rate	13	vehicles / hour	r
Service Rate	120	vehicles / hour	s
Utilisation Ratio	0.1083	p	
Pr of Q being empty	0.8917		
Pr of n units in system	4	vehicles in the system	
Pn=	0.0001		8142 27141.12146
Pr of >n units in system	9	vehicles in the system	
P(N>n)	0.0000		

Number of Queued vehicles for the X%ile queue

			Vehicles in the System
10th	0.9		-0.0042
25th	0.75		0.0778
50th	0.5		0.2603
60th	0.4		0.3607
70th	0.3		0.4901
80th	0.2		0.6726
85th	0.15		0.8020
90th	0.1		0.9844
95th	0.05		1.2963
98th	0.02		1.7086

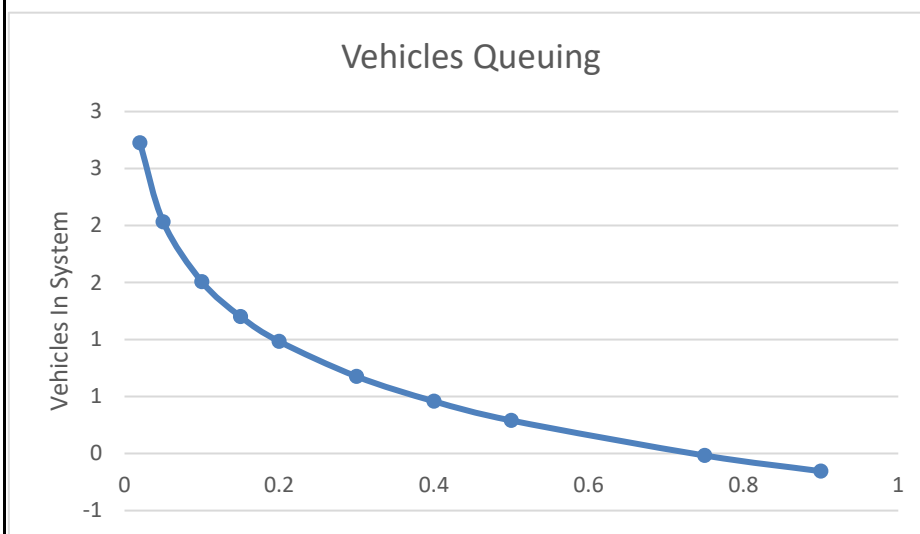


Queuing Theory as documented in Austroads Guide to Traffic Management Part 2 Section 4

Arrival Rate	16	vehicles / hour	r
Service Rate	60	vehicles / hour	s
Utilisation Ratio	0.2667	p	
Pr of Q being empty	0.7333		
Pr of n units in system	5	vehicles in the system	
Pn=	0.0010		
Pr of >n units in system	9	vehicles in the system	
P(N>n)	0.0000		

Number of Queued vehicles for the X%ile queue

			Vehicles in the System
10th	0.9	-0.1549	
25th	0.75	-0.0170	
50th	0.5	0.2898	
60th	0.4	0.4586	
70th	0.3	0.6762	
80th	0.2	0.9830	
85th	0.15	1.2006	
90th	0.1	1.5074	
95th	0.05	2.0318	
98th	0.02	2.7251	

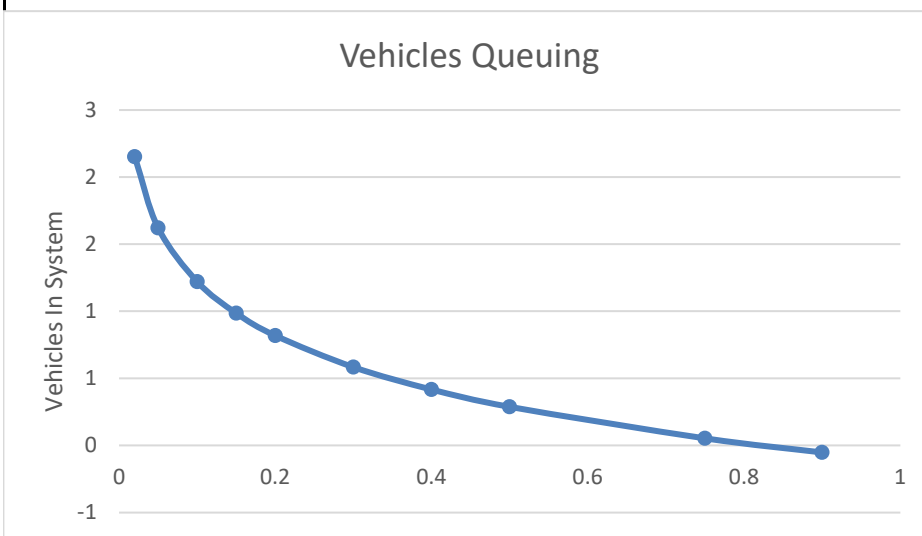


Queuing Theory as documented in Austroads Guide to Traffic Management Part 2 Section 4

Arrival Rate	32	vehicles / hour	r
Service Rate	180	vehicles / hour	s
Utilisation Ratio	0.1778	p	
Pr of Q being empty	0.8222		
Pr of n units in system	5	vehicles in the system	
Pn=	0.0001		
Pr of >n units in system	9	vehicles in the system	
P(N>n)	0.0000		

Number of Queued vehicles for the X%ile queue

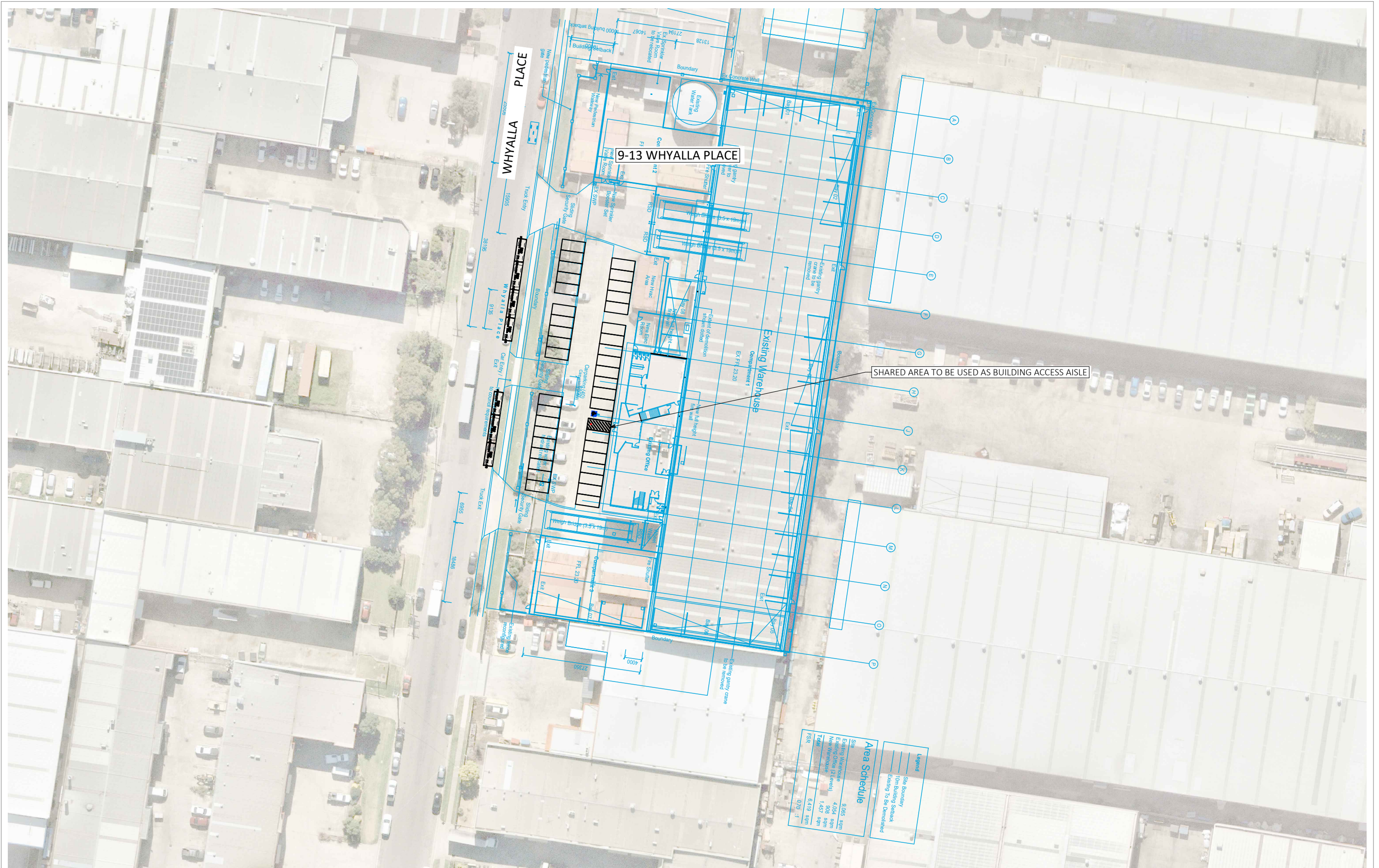
			Vehicles in the System
10th	0.9		-0.0523
25th	0.75		0.0532
50th	0.5		0.2880
60th	0.4		0.4172
70th	0.3		0.5837
80th	0.2		0.8185
85th	0.15		0.9850
90th	0.1		1.2198
95th	0.05		1.6211
98th	0.02		2.1516





Appendix D

Truck Swept Path Analysis

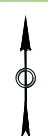


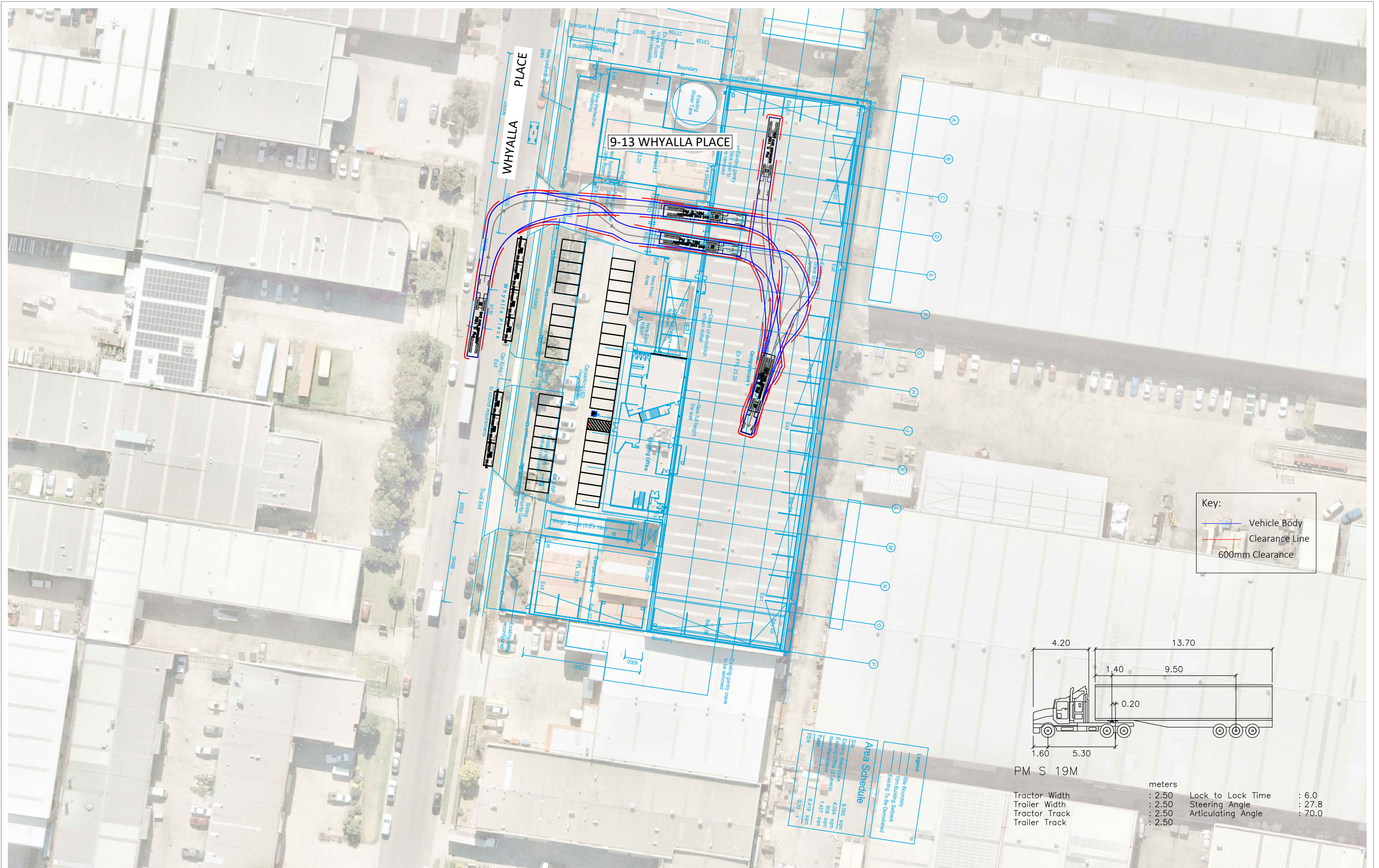
Legend

- Site Boundary
- Form Building Footprint
- Existing To be Demolished

Area Schedule

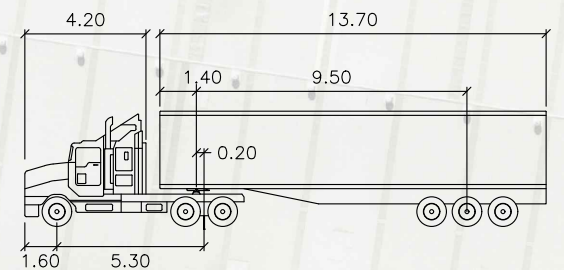
Site	9,085 sqm
Existing Warehouse	4,054 sqm
Existing Office (2, storeys)	908 sqm
New Warehouse	1,457 sqm
Total	6,419 sqm
RSR	0/70 - 1





Key:

- Vehicle Body
- Clearance Line
- 600mm Clearance



PM S 19M

Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 27.8
Tractor Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

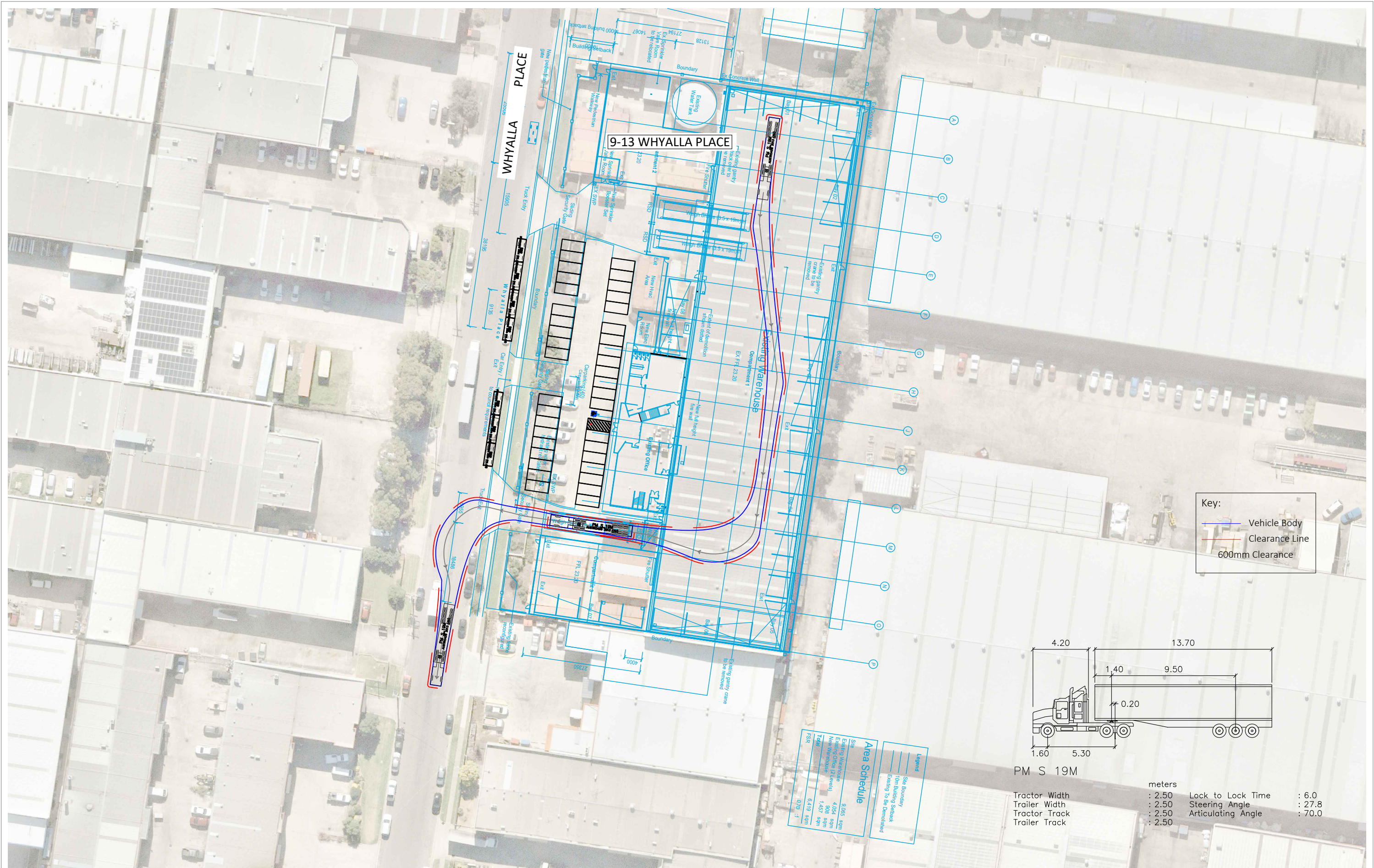
Area Schedule

Site Boundary	9,086 sqm
Existing Warehouse	4,054 sqm
Existing Office (2 Storey)	908 sqm
New Warehouse	1,457 sqm
Total	6,419 sqm
RSR	0/70 - 1



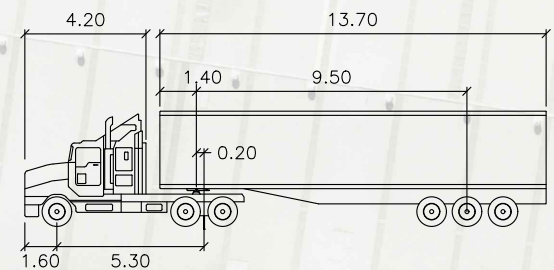
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 SCALE: 1:800 @ A3 DATE: 02.02.2021

9 - 13 WHYALLA PLACE, PRESTONS
ACCESS AND WEIGHBRIDGE
SWEPT PATH ASSESSMENT



Key:

- Vehicle Body
- Clearance Line 600mm Clearance



PM S 19M

Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 27.8
Tractor Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

Area Schedule

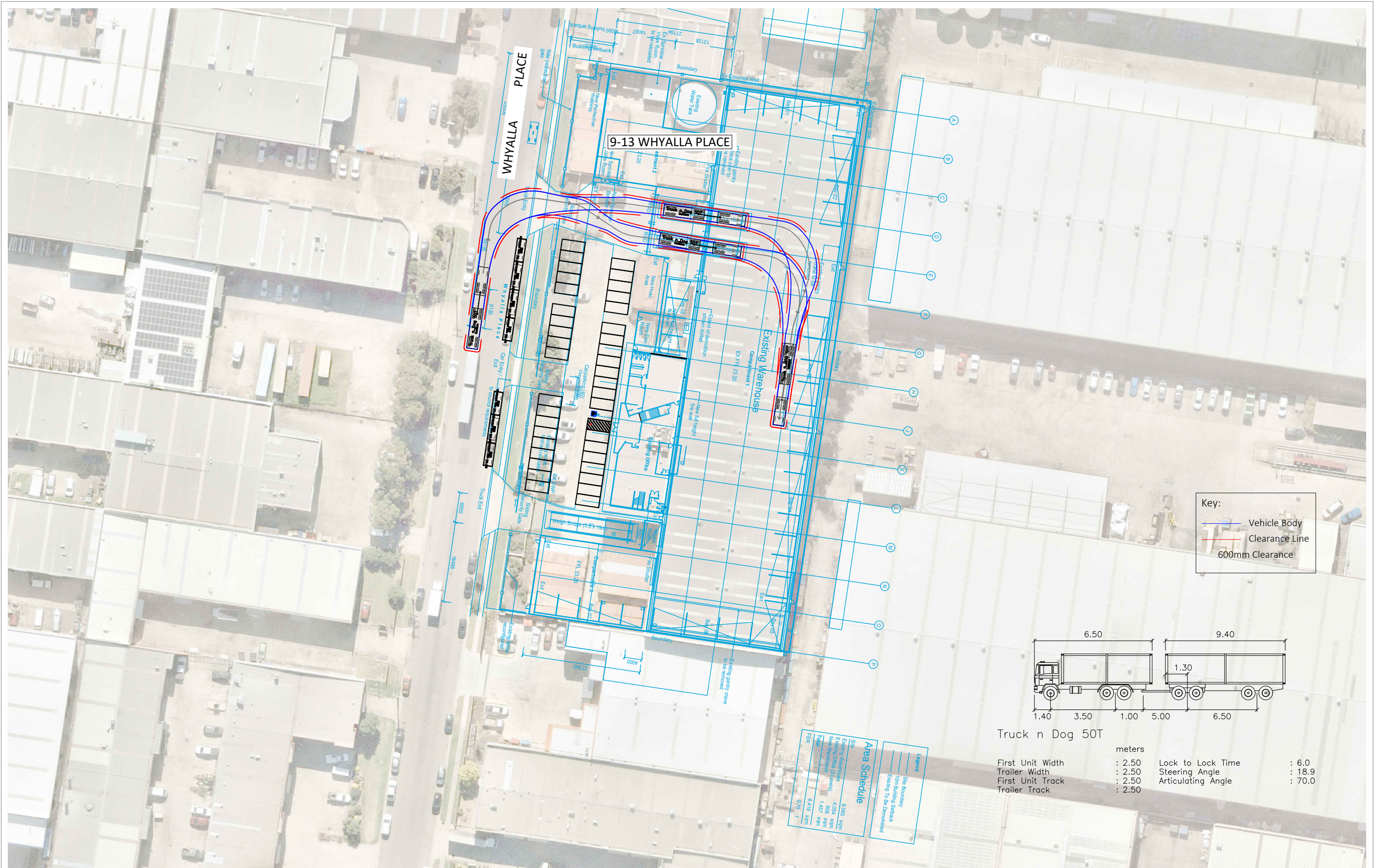
Site	Area	Area
Existing Warehouse	9,085 sqm	
Existing Office (2 stories)	4,054 sqm	
New Warehouse	908 sqm	
Total	14,457 sqm	
RSR	0.419 sqm	
	0.70 - 1	



DRAWN: S.YOU CHECKED: M.HOULDEN DRAWING NO: 20S0071-CS-07-V4 SHEET: 03 OF 08

SCALE: 1:800 @ A3 DATE: 02.02.2021

9 - 13 WHYALLA PLACE, PRESTONS
ACCESS AND WEIGHBRIDGE
SWEEP PATH ASSESSMENT



Area Schedule

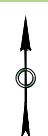
Site	Area	Area (sqm)
Existing Warehouse	4,064 sqm	
Existing Office (2 Storey)	908 sqm	
New Warehouse	1,457 sqm	
Total	6,419 sqm	
RSR	0/70 - 1	

Legend

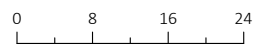
- Site Boundary
- From Building Setback
- Existing To be Demolished

Truck n Dog 50T

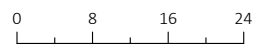
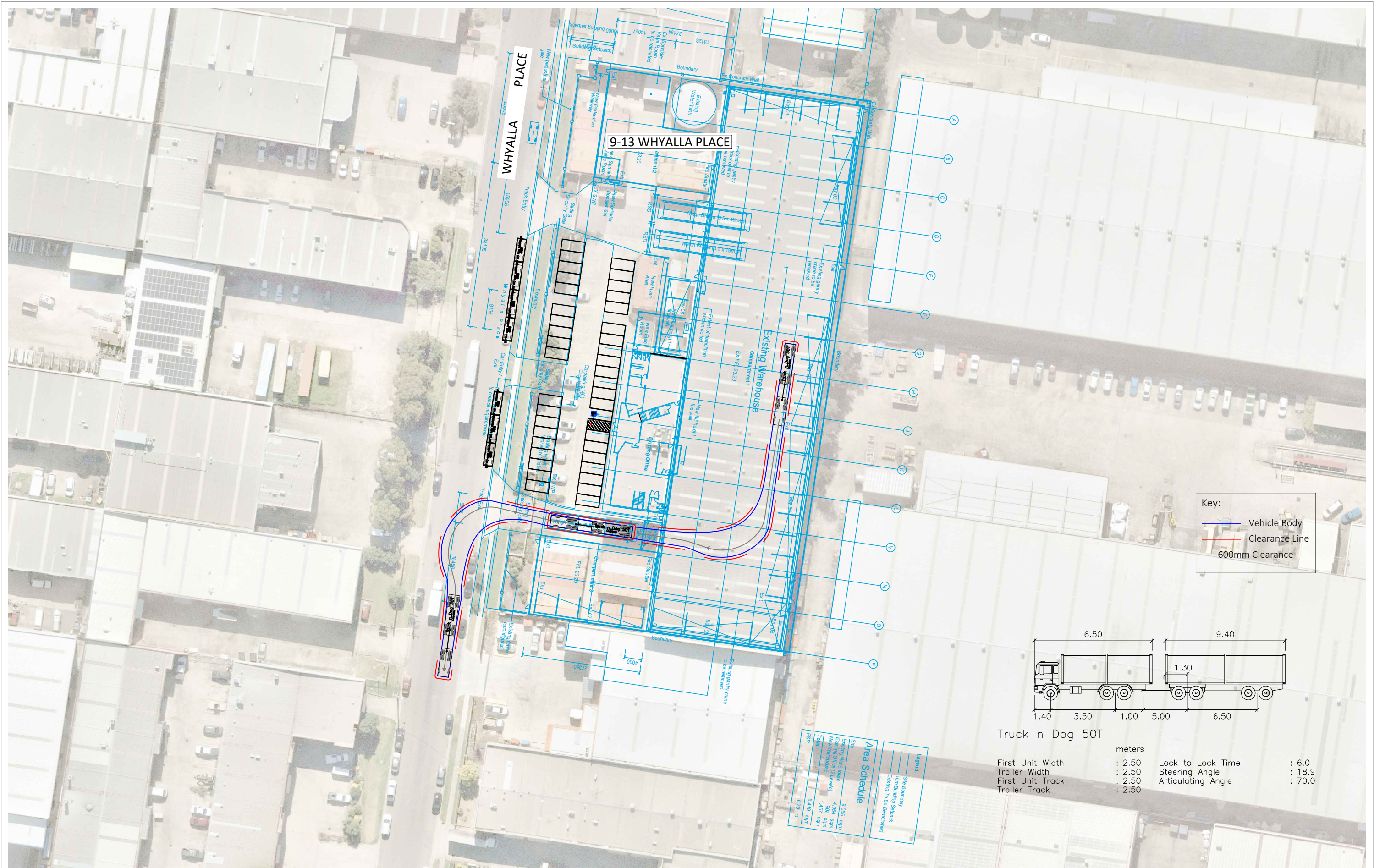
Parameter	Value (meters)
First Unit Width	: 2.50
Trailer Width	: 2.50
First Unit Track	: 2.50
Trailer Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 18.9
Articulating Angle	: 70.0

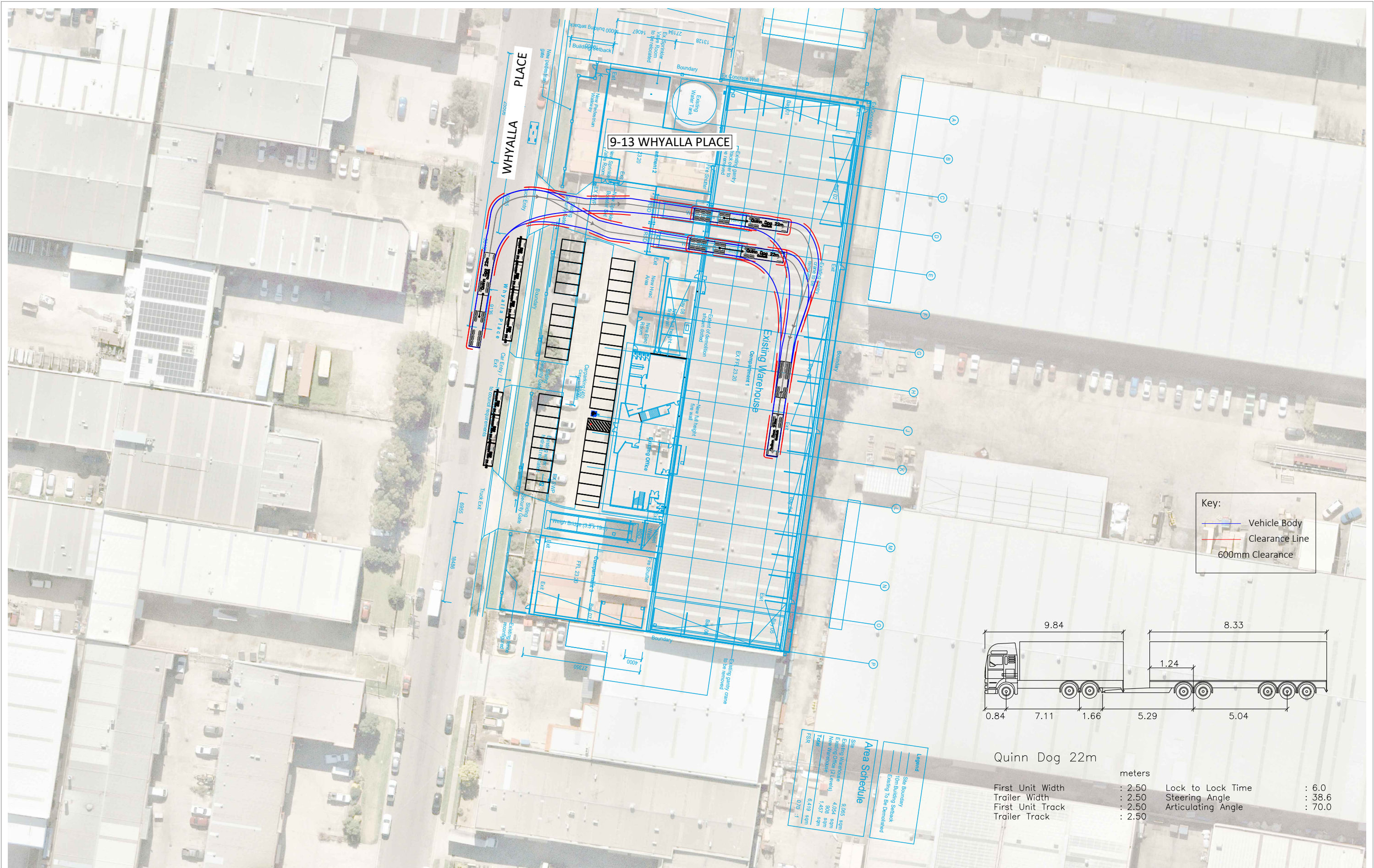


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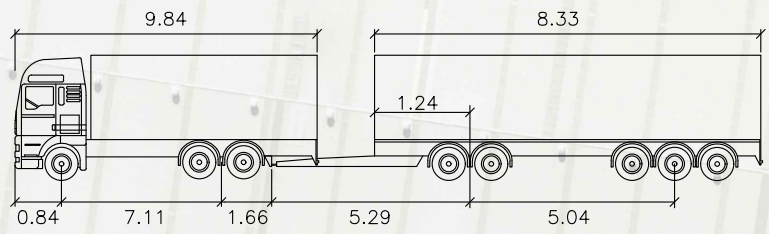
**9 - 13 WHYALLA PLACE, PRESTONS
 ACCESS AND WEIGHBRIDGE
 SWEEP PATH ASSESSMENT**





Key:

- Vehicle Body
- Clearance Line
- 600mm Clearance



Quinn Dog 22m

First Unit Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 38.6
First Unit Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

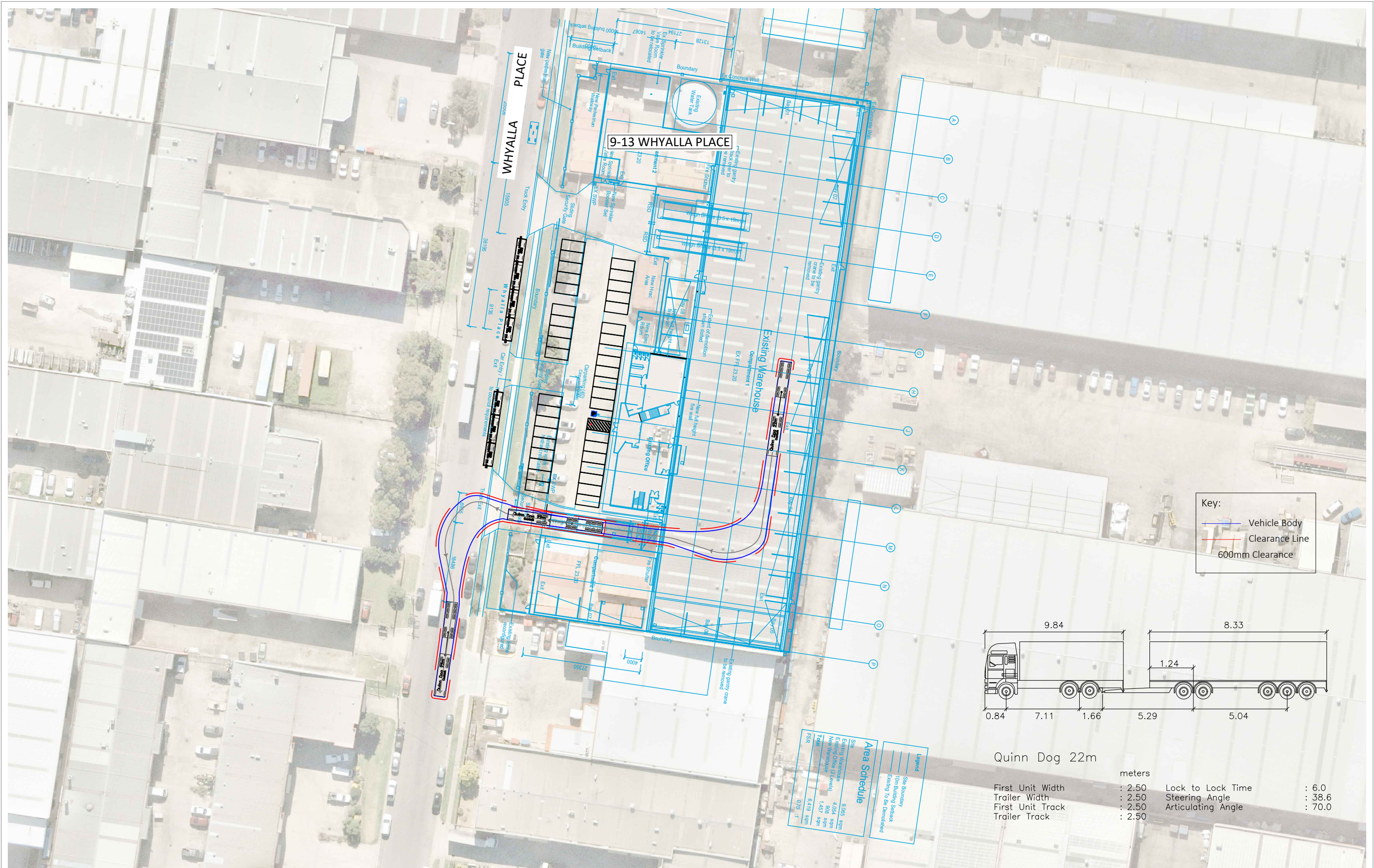
Area Schedule

Site	9,086 sqm
Existing Warehouse	4,054 sqm
Existing Office (2 Storeys)	908 sqm
New Warehouse	1,457 sqm
Total	6,419 sqm
RSR	0/70 - 1

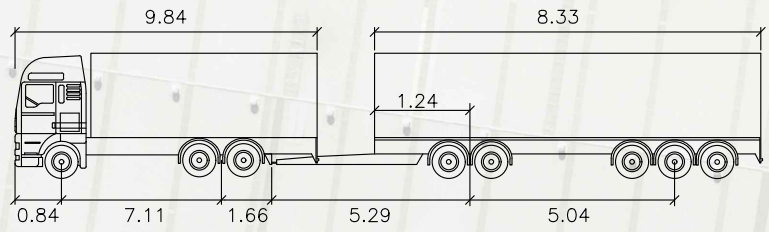


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 DRAWING NO: 20S0071-CS-07-V4
 SHEET: 06 OF 08
 SCALE: 1:800 @ A3
 DATE: 02.02.2021

9 - 13 WHYALLA PLACE, PRESTONS
 ACCESS AND WEIGHBRIDGE
 SWEEP PATH ASSESSMENT



Key:
 — Vehicle Body
 — Clearance Line
 600mm Clearance



Quinn Dog 22m

First Unit Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 38.6
First Unit Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

Area Schedule

Site	9,068 sqm
Existing Warehouse	4,054 sqm
Existing Office (2 Storeys)	908 sqm
New Warehouse	1,457 sqm
Total	6,419 sqm
RSR	0/70 - 1

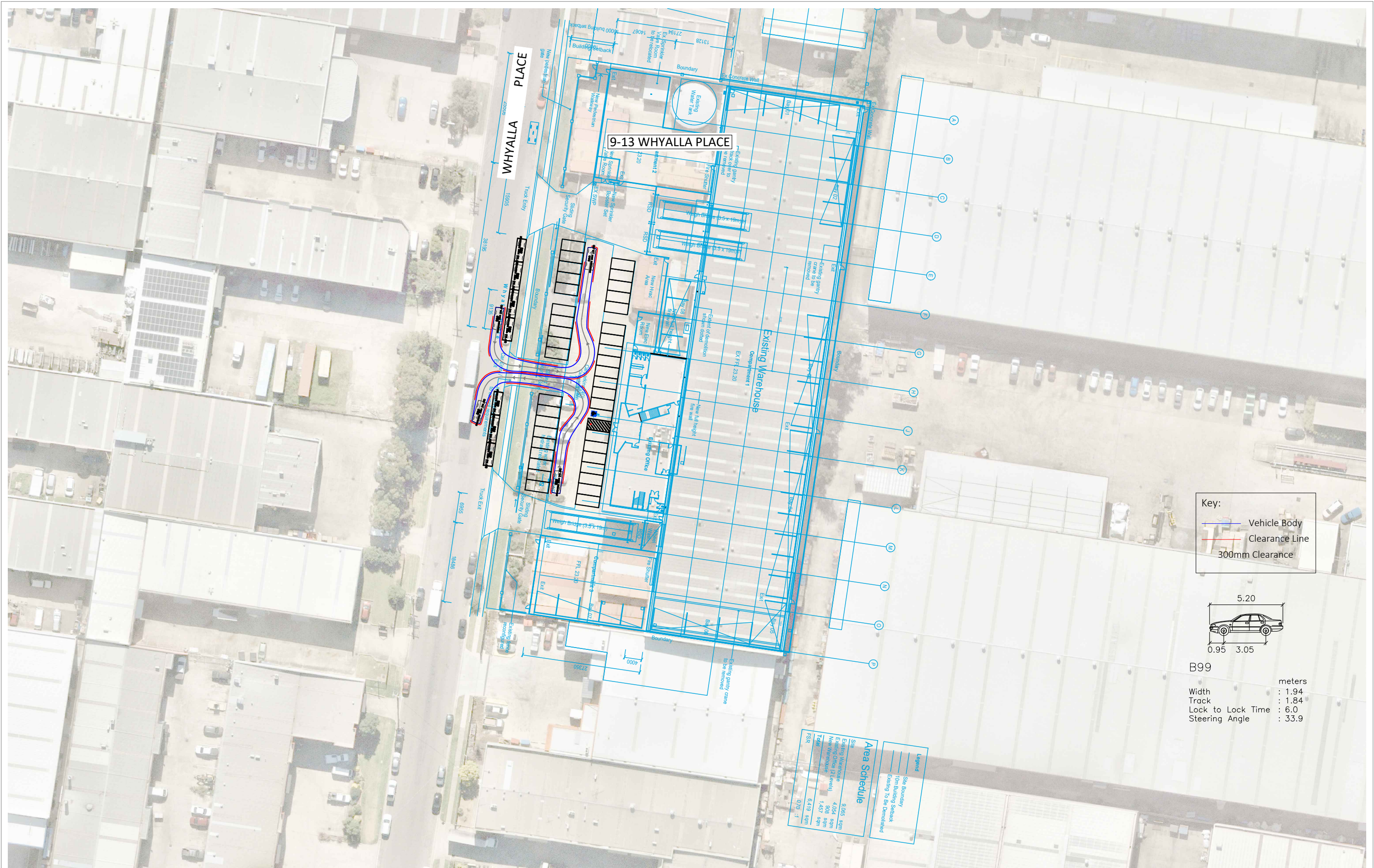
Legend

- Site Boundary
- From Building Setback
- Existing To be Demolished



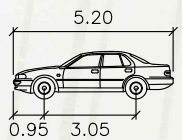
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 SCALE: 1:800 @ A3 DATE: 02.02.2021

9 - 13 WHYALLA PLACE, PRESTONS
 ACCESS AND WEIGHBRIDGE
 SWEEP PATH ASSESSMENT



Key:

- Vehicle Body
- Clearance Line
- 300mm Clearance



B99

	meters
Width	: 1.94
Track	: 1.84
Lock to Lock Time	: 6.0
Steering Angle	: 33.9

Area Schedule

Site	9,068 sqm
Existing Warehouse	4,054 sqm
Existing Office (2 stories)	908 sqm
New Warehouse	1,457 sqm
Total	6,419 sqm
RSR	0/70 - 1

Legend

- Site Boundary
- Item Building Subtrack
- Existing To be Demolished



DRAWN: S.YOU CHECKED: M.HOULDEN DRAWING NO: 20S0071-CS-07-V4 SHEET: 08 OF 08
 SCALE: 1:800 @ A3 DATE: 02.02.2021

9 - 13 WHYALLA PLACE, PRESTONS
 ACCESS AND WEIGHBRIDGE
 SWEEP PATH ASSESSMENT



Appendix E

Largest Truck Accessing the Site Details

Performance-Based Standards (PBS) Vehicle Approval

Heavy Vehicle National Law Section 23

Heavy Vehicle (General) National Regulation Section 17

This is not an authorisation to access the road network.
You must comply with the relevant Notice or if required, obtain an access permit.

3 January 2018

Ref No: PBS – V120804 – VA4286 – Hercules Engineering (Vic) / Road Constructions Australia – v1

This PBS Vehicle Approval modifies any previously issued approval for the vehicles listed herein operating under Application Number V120804.

Applicant details	Kevin Wright Hercules Engineering (Vic) 87 Canterbury Rd Kilsyth Vic 3137	Operator	Road Constructions Australia 43 Yarrowonga St Macksville NSW 2447
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Application Number	V120804	Vehicle	3-axle truck 5-axle dog
Load	Quarry and Bulk	Length (mm)	≤ 22250
Assessor	Rob Di Cristoforo	Height (mm)	≤ 4300

Mass Limits	Level 2
GML (t)	59.5
CML (t)	61.5
HML (t)	63.0
Bridge Assessment	Tier 1

Axle Group Masses	Level 2		
	GML	CML	HML
Steer (t)	6.5	6.5	6.5
Drive (t)	16.5	17.0	17.0
Trailer Front (t)	16.5	17.0	17.0
Trailer Rear (t)	20.0	21.0	22.5

Operating conditions

The NHVR approves the vehicles listed herein for the level(s) shown in the “Mass Limits” table with the following operating conditions:

1. The total combination mass must not exceed the limits in the “Mass Limits” table.
2. The axle group masses must not exceed the limits in the “Axle Group Masses” table.
3. If the “Mass Limits” table specifies Tier 2 or 3, a bridge assessment is required.
4. Payload must be contained within the bins. Maximum payload heights measured from the ground must not exceed: (m)
 - Truck: 2.860
 - Trailer: 2.820
5. 6.5 tonne complying steer axle requirements:
 - an engine that complies with the engine emission standards of Australian Design Rule (ADR) 80/01 (Euro 4) or a later version of ADR 80; and
 - a front underrun protection device (FUPD) that complies with UN ECE Regulation 93 or ADR 84; and
 - a cabin that complies with UN ECE Regulation 29.
6. Concessional Mass Limits (CML) requirements:
 - National Heavy Vehicle Accreditation Scheme (NHVAS) – Mass Management Module.
7. Higher Mass Limits (HML) requirements:
 - for tandem axles groups, road friendly suspensions;
 - for tri-axle groups, National Heavy Vehicles Accreditation Scheme (NHVAS) – Mass Management Module and road friendly suspensions.
8. When the trailer mass exceeds the truck mass, at least 16t on the drive axle group is required. This clause does not apply for an unladen vehicle.
9. A “LONG VEHICLE” sign must be displayed at the rear of the vehicle.
10. The outermost surface of the drawbar must be fitted with yellow reflective material that complies with Class C material requirements of United National Economic Commission for Europe Regulation No. 104 Uniform provisions concerning the approval of retro-reflective markings for vehicles of category M, N and O.

Exemptions

Heavy Vehicle National Law Section 24

Heavy Vehicle (General) National Regulation Section 28

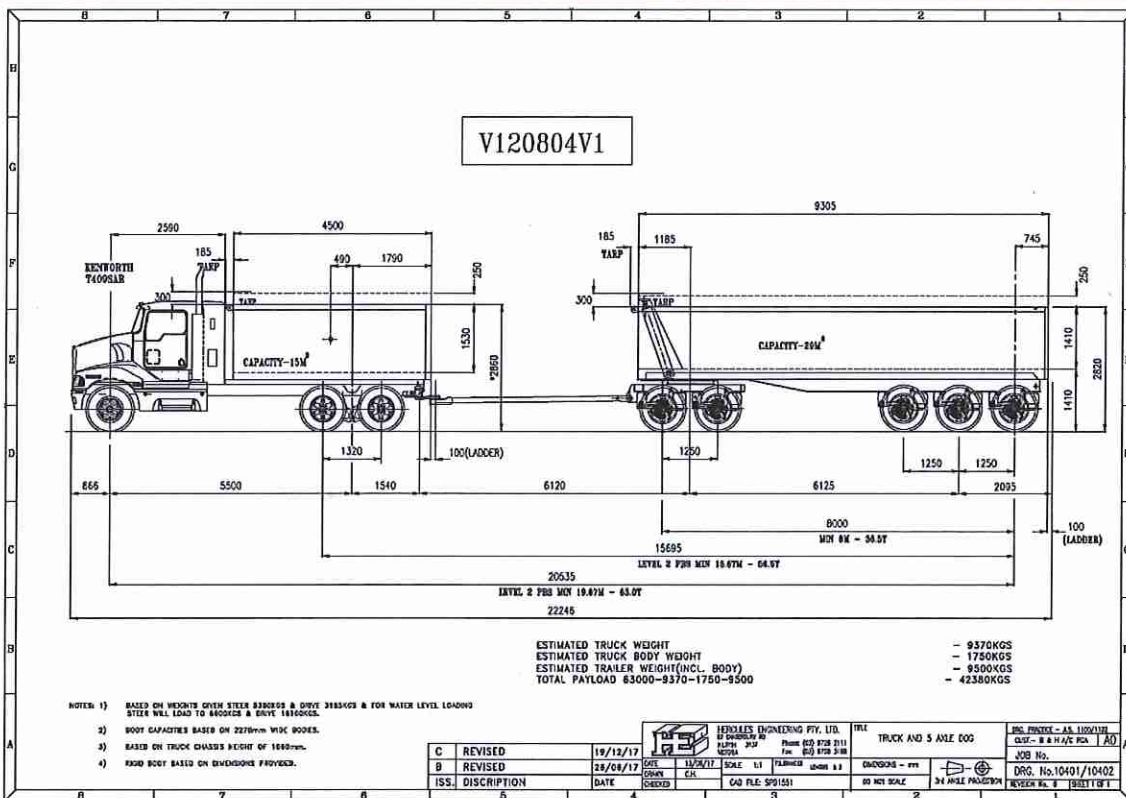
The following table lists exemptions from prescribed vehicle standards that have been granted for the vehicle(s) in this vehicle approval.

Exemptions	
ADR	Rule 43, Clause 6.2.2 (Drawbar length – Trailers)
HV(MDL)NR	Schedule 6, Clause 3 (Length – General) Schedule 6, Clause 6 (Length – Trailer drawbars)
HV(VS)NR	NA

ADR Australian Design Rules

HV(MDL)NR *Heavy Vehicle (Mass, Dimension and Loading) National Regulation*

HV(VS)NR *Heavy Vehicle (Vehicle Standards) National Regulation*



Details of truck(s) or prime mover(s)

Make	Kenworth
Model	T409SAR
VIN(s)	6F5000000HA459891
Engine make/ model/ rating	Cummins / X15-525 550hp / 2508Nm - ADR80/03
Transmission make/ model	Eaton / FO-20E318B-MXP
Differential make/ model/ FD ratio	Meritor / RT46-160GP / FDR – 4.30:1
Suspension make/ model (Steer)	Kenworth / Parabolic
Suspension make/ model (Drive)	Kenworth / Airglide 460 RF2012
Tyres make/ size/ model (Steer)	295/80R22.5 Bridgestone R150 II
Tyres make/ size/ model (Drive)	11R22.5 Bridgestone M766
Brakes (Load Proportioning, ABS, ECB, etc.)	ABS
Tow coupling make/ D rating	Ringfeder 303aus – 320kN / 41.50 tonne
Wheelbase (mm)	5500
Vehicle height (Measured from the ground) (mm)	2860
Number of axles	3
ADR category	NC
GVM (kg)	26,500
GCM (kg)	97,000
Comments/ notes:	

Details of trailer(s) or dolly(s)

Type	Drawbar Trailer
Make	Hercules Engineering
Model	5 Axle Tipper Dog
VIN(s)	6T9T24V86H0AFH187
Suspension make/ model	TMC / LMV-Series RF2035
Tyres make/ size/ model	11R22.5 Hankook TH22
Drawbar length (mm)	6120
Coupling make/ D rating	Ballrace BPW DK90-16 / 60,000 kg
Brakes (Load Proportioning, ABS, ECB, etc.)	ABS / EBS on 2 nd & 5 th Axles
Wheelbase (mm)	6125
Vehicle height (Measured from the ground) (mm)	2820
Number of axles	5
ADR category	TD
ATM (kg)	41,500
Comments/ notes:	

Approved tyre options

Steer – 295/80R22.5 Michelin, Bridgestone, Goodyear, Dunlop

Drive – 11R22.5 Michelin, Bridgestone, Goodyear, Dunlop

Trailer –

- 11R22.5 Michelin, Bridgestone, Goodyear, Dunlop, Continental
- 275/70R22.5 Michelin, Goodyear, Dunlop
- 11R22.5 Hankook TH22

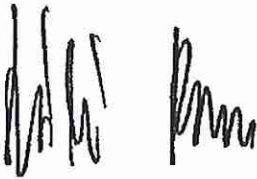
Tyre load ratings must be appropriate for the axle mass.

Tyres listed herein are specific for PBS application number V120804.

A different list of tyres will apply for other combination types and different PBS application numbers.

Declaration

I, Laszlo Bruzsa Chief Engineer, delegate of the National Heavy Vehicle Regulator approve this PBS Vehicle Approval PBS–V120804 –VA4286.



Laszlo (Les) Bruzsa
 Chief Engineer
 National Heavy Vehicle Regulator
 Dated: 03/01/18

Revision table

N	Brief description	Date
1	First issue.	03/01/18

Important information

As per Heavy Vehicle National Law Section 153, the driver must keep in the driver's possession a copy of this Vehicle Approval and be able to produce it for inspection by compliance officers. Penalties apply.

If changes or modifications are required, these are limited to the specifications contained in the relevant PBS Design Approval and the Application for Design Approval Part A and B. Contact the applicant (see the cover page on this document) for information related to the allowed specifications.

A change of components and/or dimensions must be certified by an approved PBS certifier and an updated version of this Vehicle Approval must be obtained. A change of tyres, outside of the list contained on this Vehicle Approval, also requires approval but will not require an inspection by a PBS certifier.

Road access

This is not an authorisation to access the road network. You must comply with the relevant Notice or obtain an access permit.

Please note that if you add vehicles to a PBS Vehicle Approval you will need to update the access permit to reflect the latest Vehicle Approval. If the new vehicles have different masses or dimensions to what is already approved, the NHVR will have to seek Road Manager consent again; which may extend the time required to issue the new permit.

For more information on the PBS Truck and Dog Notice visit [National class 2 PBS level 1 and 2A truck and dog trailer authorisation notice 2016](#).

To apply for an access permit, visit the [NHVR Portal](#). You must supply a route ID when applying for an access permit. Use Route Planner to obtain your route ID, you can do this as part of the permit application process in the [NHVR Portal](#).

For further assistance please visit our website at www.nhvr.gov.au or call 1300 MYNHVR (1300 696 487).

For queries relating to this document please contact the PBS Coordinator at pbs@nhvr.gov.au.

Transfer of Vehicle Approval

When applying for an access permit for a PBS vehicle, a PBS Vehicle Approval must be in the name of the company that operates the vehicle on the road.

If/ when a PBS combination is sold, the PBS Vehicle Approval has to be transferred across to the new owner.

To transfer a PBS Vehicle Approval to a new owner, use a [Vehicle Approval transfer application form](#).



Appendix F

Annual Schedule of Materials Processed by the Facility

INCOMING

Total Incoming Waste 270000

Type	Number	Unit	Notes
Bulk Solids Waste	110,000	t pa	
	28	t truck	Assume 28 t truck (lowest capacity)
	3,929	trucks pa	
Sediments and Sludge Waste	20,000	t pa	
	10	kL tanker	Assume 10 kL tanker (lowest capacity)
	1,429	trucks pa	Assume sludge density 1400 kg/m ³ = 1.4 t/m ³ = 1.4 t/kL
Liquid Waste	70	ML pa	
	10	kL tanker	Assume 10 kL tanker (lowest capacity)
	7,000	trucks pa	
Drill Mud	10,000	t pa	
	35	kL tanker	Assume 35 kL vac truck
	286	trucks pa	
Storage and Transfer Waste	60,000	t pa	
	20	t Pantech	
	3,000	trucks pa	

OUTGOING

Total Outgoing Waste 270000

Process - destination	Number	Unit	Notes
Physical screening - to licensed facility	20,000	t pa	
	28	t truck	Assume 28 t truck (lowest capacity)
	715	trucks pa	
Bioremediation - to landfill or re-use	10,000	t pa	
	28	t truck	Assume 28 t truck (lowest capacity)
	358	trucks pa	
Chemical Oxidation - to landfill or re-use	10,000	t pa	
	28	t truck	Assume 28 t truck (lowest capacity)
	358	trucks pa	
Immobilisation - to landfill	60,000	t pa	
	28	t truck	Assume 28 t truck (lowest capacity)
	2,143	trucks pa	
Acid Sulphate Soil - to landfill	30,000	t pa	
	28	t truck	Assume 28 t truck (lowest capacity)
	1,072	trucks pa	
Liquid Waste Treatment Plant - filter cake to licensed facility	4,000	t pa	
	28	t truck	Assume 28 t truck (lowest capacity)
	143	trucks pa	
Liquid Waste Treatment Plant - to sewer	65	ML pa	
	10	kL tanker	Assume 10 kL tanker (lowest capacity)
	6,500	trucks pa	
Liquid Waste Treatment Plant - waste oil to contractor	1,000	t pa	
	28	t truck	Assume 28 t truck (lowest capacity)
	36	trucks pa	
Drill Mud Processing Plant - to sewer	4,000	t pa	
	35	kL tanker	Assume 35 kL vac truck
	115	trucks pa	
Drill Mud Processing Plant - to landfill or re-use	6,000	t pa	
	38	t truck	Assume 28 t tipper (85 cum)
	158	trucks pa	
Storage and Transfer Waste - to licensed facility	60,000	t pa	
	28	t truck	Assume 28 t truck (lowest capacity)
	2,143	trucks pa	



Appendix G

Future Sidra Intersection Modelling Outputs

MOVEMENT SUMMARY

 **Site: TCS3020 [Hoxton Park Road / Joadja Road Future AM]**

 **Network: N101 [Future AM]**

20S0071 - 9-13 Whyalla Place
Hoxton Park Road / Joadja Road
Future AM

Site Category: (None)

Signals - Fixed Time Coordinated Cycle Time = 110 seconds (Network User-Given Cycle Time)

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				Vehicles	Distance				
		veh/h	% veh/h	veh/h	%	v/c	sec		veh	m				km/h
South: Joadja Road														
1	L2	700	8.7	700	8.7	0.612	10.8	LOS A	15.2	114.4	0.53	0.74	0.53	41.1
3	R2	487	19.0	487	19.0	0.686	50.0	LOS D	12.4	101.3	0.98	0.85	1.01	13.6
Approach		1187	12.9	1187	12.9	0.686	26.8	LOS B	15.2	114.4	0.71	0.78	0.73	26.2
East: Hoxton Park Road														
4	L2	227	21.8	227	21.8	0.131	7.0	LOS A	0.0	0.0	0.00	0.56	0.00	60.2
5	T1	608	11.8	608	11.8	0.673	40.8	LOS C	14.9	114.3	0.96	0.82	0.96	38.7
Approach		836	14.5	836	14.5	0.673	31.6	LOS C	14.9	114.3	0.70	0.75	0.70	42.2
West: Hoxton Park Road														
11	T1	1141	7.2	1141	7.2	0.449	8.9	LOS A	14.1	105.1	0.51	0.46	0.51	38.5
12	R2	443	10.0	443	10.0	0.693	38.2	LOS C	20.2	153.2	0.91	0.85	0.91	15.6
Approach		1584	8.0	1584	8.0	0.693	17.1	LOS B	20.2	153.2	0.62	0.57	0.62	27.3
All Vehicles		3607	11.1	3607	11.1	0.693	23.7	LOS B	20.2	153.2	0.67	0.68	0.67	32.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow	Average Delay	Level of Service	Average Back of Queue		Prop. Queued	Effective Stop Rate
					Pedestrian	Distance		
		ped/h	sec		ped	m		
P1	South Full Crossing	1	49.2	LOS E	0.0	0.0	0.95	0.95
P21	East Stage 1	1	49.2	LOS E	0.0	0.0	0.95	0.95
P22	East Stage 2	1	49.2	LOS E	0.0	0.0	0.95	0.95
All Pedestrians		3	49.2	LOS E			0.95	0.95

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

 **Site: TCS4222 [Joadja Road / Liverpool Catholic Club Future AM]**

 **Network: N101 [Future AM]**

20S0071 - 9-13 Whyalla Place
Joadja Road / Liverpool Catholic Club
Future AM

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 55 seconds (Site User-Given Cycle Time)

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %	Total veh/h	HV %				Vehicles	Distance m				
South: Joadja Road														
1	L2	3	0.0	3	0.0	0.488	10.3	LOS A	7.9	61.8	0.52	0.47	0.52	29.1
2	T1	1182	13.9	1182	13.9	0.488	4.7	LOS A	7.9	61.8	0.52	0.47	0.52	45.7
3	R2	14	0.0	14	0.0	0.026	11.9	LOS A	0.2	1.2	0.57	0.65	0.57	34.0
Approach		1199	13.7	1199	13.7	0.488	4.8	LOS A	7.9	61.8	0.52	0.47	0.52	45.4
East: Liverpool Catholic Club														
4	L2	1	0.0	1	0.0	0.008	26.4	LOS B	0.0	0.3	0.87	0.59	0.87	9.6
5	T1	1	0.0	1	0.0	0.008	22.9	LOS B	0.0	0.3	0.87	0.59	0.87	15.5
6	R2	13	0.0	13	0.0	0.058	29.2	LOS C	0.3	2.2	0.92	0.67	0.92	8.2
Approach		15	0.0	15	0.0	0.058	28.6	LOS C	0.3	2.2	0.92	0.66	0.92	8.8
North: Joadja Road														
7	L2	3	0.0	3	0.0	0.399	16.8	LOS B	6.0	47.2	0.71	0.61	0.83	23.2
8	T1	647	14.5	647	14.5	0.399	11.1	LOS A	6.0	47.2	0.71	0.61	0.77	33.4
9	R2	20	0.0	20	0.0	0.095	21.2	LOS B	0.4	2.9	0.74	0.70	0.74	26.1
Approach		671	14.0	671	14.0	0.399	11.4	LOS A	6.0	47.2	0.71	0.61	0.77	33.0
West: Liverpool Catholic Club														
10	L2	2	0.0	2	0.0	0.015	29.0	LOS C	0.1	0.6	0.91	0.60	0.91	9.3
11	T1	1	0.0	1	0.0	0.015	24.4	LOS B	0.1	0.6	0.91	0.60	0.91	14.6
12	R2	1	0.0	1	0.0	0.005	28.6	LOS C	0.0	0.2	0.91	0.58	0.91	8.9
Approach		4	0.0	4	0.0	0.015	27.8	LOS B	0.1	0.6	0.91	0.60	0.91	10.6
All Vehicles		1888	13.7	1888	13.7	0.488	7.4	LOS A	7.9	61.8	0.59	0.52	0.62	39.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue		Prop. Queued	Effective Stop Rate
					Pedestrian	Distance m		
P1	South Full Crossing	1	21.8	LOS C	0.0	0.0	0.89	0.89
P2	East Full Crossing	1	21.8	LOS C	0.0	0.0	0.89	0.89
P3	North Full Crossing	1	21.8	LOS C	0.0	0.0	0.89	0.89
P4	West Full Crossing	1	21.8	LOS C	0.0	0.0	0.89	0.89
All Pedestrians		4	21.8	LOS C			0.89	0.89

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY



Site: TCS3854 [Joadja Road / Jedda Road Future AM]



Network: N101 [Future AM]

20S0071 - 9-13 Whyalla Place

Joadja Road / Jedda Road

Future AM

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 55 seconds (Site User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Level of Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %	Total veh/h	HV %				Vehicles veh	Distance m				
SouthEast: Jedda Road														
21	L2	272	49.6	272	49.6	0.325	12.4	LOS A	3.8	38.1	0.55	0.73	0.55	44.9
22	T1	1	0.0	1	0.0	0.439	28.0	LOS B	2.4	20.3	0.98	0.76	0.98	33.4
23	R2	85	27.2	85	27.2	0.439	32.5	LOS C	2.4	20.3	0.98	0.76	0.98	31.5
Approach		358	44.1	358	44.1	0.439	17.2	LOS B	3.8	38.1	0.65	0.73	0.65	40.7
NorthEast: Joadja Road														
24	L2	141	12.7	141	12.7	0.919	43.5	LOS D	12.2	96.1	1.00	1.19	1.69	16.6
25	T1	518	15.2	518	15.2	0.919	38.2	LOS C	12.2	96.1	1.00	1.19	1.70	16.9
Approach		659	14.7	659	14.7	0.919	39.3	LOS C	12.2	96.1	1.00	1.19	1.70	16.8
NorthWest: Liverpool Transmission Substation														
27	L2	1	0.0	1	0.0	0.017	29.2	LOS C	0.1	0.6	0.91	0.61	0.91	12.5
28	T1	1	0.0	1	0.0	0.017	24.7	LOS B	0.1	0.6	0.91	0.61	0.91	12.5
29	R2	1	0.0	1	0.0	0.017	29.2	LOS C	0.1	0.6	0.91	0.61	0.91	12.5
Approach		3	0.0	3	0.0	0.017	27.7	LOS B	0.1	0.6	0.91	0.61	0.91	12.5
SouthWest: Jedda Road														
30	L2	1	0.0	1	0.0	0.444	10.1	LOS A	7.2	55.8	0.50	0.45	0.50	46.4
31	T1	1105	12.1	1105	12.1	0.444	4.5	LOS A	7.2	55.8	0.50	0.45	0.50	46.7
32	R2	596	19.4	596	19.4	0.851	28.8	LOS C	15.0	122.7	0.96	1.08	1.57	21.6
Approach		1702	14.7	1702	14.7	0.851	13.0	LOS A	15.0	122.7	0.66	0.67	0.88	33.1
All Vehicles		2722	18.5	2722	18.5	0.919	20.0	LOS B	15.0	122.7	0.74	0.80	1.04	28.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue		Prop. Queued	Effective Stop Rate
					Pedestrian ped	Distance m		
P5	SouthEast Full Crossing	2	21.8	LOS C	0.0	0.0	0.89	0.89
P6	NorthEast Full Crossing	1	21.8	LOS C	0.0	0.0	0.89	0.89
P7	NorthWest Full Crossing	1	21.8	LOS C	0.0	0.0	0.89	0.89
P8	SouthWest Full Crossing	1	21.8	LOS C	0.0	0.0	0.89	0.89
All Pedestrians		5	21.8	LOS C			0.89	0.89

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

 **Site: TCS3711 [Hoxton Park Road / Ash Road Future AM]**

 **Network: N101 [Future AM]**

20S0071 - 9-13 Whyalla Place
Hoxton Park Road / Ash Road
Future AM

Site Category: (None)

Signals - Fixed Time Coordinated Cycle Time = 110 seconds (Network User-Given Cycle Time)

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				Vehicles	Distance				
		veh/h	% veh/h	%	v/c	sec			veh	m				km/h
South: Ash Road														
1	L2	42	12.5	42	12.5	0.079	34.4	LOS C	1.6	12.3	0.74	0.71	0.74	32.5
3	R2	82	25.6	82	25.6	0.528	59.3	LOS E	4.4	37.8	0.99	0.78	0.99	31.1
Approach		124	21.2	124	21.2	0.528	50.9	LOS D	4.4	37.8	0.91	0.76	0.91	31.4
East: Hoxton Park Road														
4	L2	128	13.9	128	13.9	0.103	10.9	LOS A	1.9	15.0	0.30	0.67	0.30	49.3
5	T1	798	14.5	798	14.5	0.380	13.1	LOS A	11.2	88.0	0.58	0.51	0.58	46.1
Approach		926	14.4	926	14.4	0.380	12.8	LOS A	11.2	88.0	0.54	0.53	0.54	46.5
West: Hoxton Park Road														
11	T1	1548	10.3	1548	10.3	0.530	4.4	LOS A	14.6	110.6	0.39	0.36	0.39	65.6
12	R2	97	13.0	97	13.0	0.369	52.8	LOS D	4.6	35.5	0.90	0.77	0.90	30.5
Approach		1645	10.4	1645	10.4	0.530	7.3	LOS A	14.6	110.6	0.42	0.38	0.42	62.8
All Vehicles		2696	12.3	2696	12.3	0.530	11.2	LOS A	14.6	110.6	0.48	0.45	0.48	56.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow	Average Delay	Level of Service	Average Back of Queue	Prop. Queued	Effective Stop Rate	
		ped/h	sec		Pedestrian Distance			
					ped			m
P1	South Full Crossing	1	49.2	LOS E	0.0	0.0	0.95	0.95
P21	East Stage 1	1	49.2	LOS E	0.0	0.0	0.95	0.95
P22	East Stage 2	1	49.2	LOS E	0.0	0.0	0.95	0.95
P41	West Stage 1	4	49.2	LOS E	0.0	0.0	0.95	0.95
P42	West Stage 2	4	49.2	LOS E	0.0	0.0	0.95	0.95
All Pedestrians		12	49.2	LOS E			0.95	0.95

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

▽ Site: Site 1 [Ash Road / Jedda Road Future AM]

⚡ Network: N101 [Future AM]

20S0071 - 9-13 Whyalla Place

Ash Road / Jedda Road

Future AM

Site Category: (None)

Giveway / Yield (Two-Way)

Movement Performance - Vehicles															
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed	
		Total	HV	Total	HV				veh	Distance					veh
South: Ash Road															
1	L2	5	40.0	5	40.0	0.051	8.5	LOS A	0.2	1.5	0.75	0.84	0.75	25.6	
2	T1	3	100.0	3	100.0	0.051	44.3	LOS D	0.2	1.5	0.75	0.84	0.75	25.6	
3	R2	2	0.0	2	0.0	0.051	16.5	LOS B	0.2	1.5	0.75	0.84	0.75	39.5	
Approach		11	50.0	11	50.0	0.051	20.7	LOS B	0.2	1.5	0.75	0.84	0.75	30.0	
East: Jedda Road															
4	L2	14	61.5	14	61.5	0.366	10.7	LOS A	1.9	15.4	0.35	0.16	0.45	45.3	
5	T1	422	20.4	422	20.4	0.366	1.8	LOS A	1.9	15.4	0.35	0.16	0.45	53.6	
6	R2	96	8.8	96	8.8	0.366	10.3	LOS A	1.9	15.4	0.35	0.16	0.45	53.6	
Approach		532	19.4	532	19.4	0.366	3.5	NA	1.9	15.4	0.35	0.16	0.45	53.2	
North: Ash Road															
7	L2	53	40.0	53	40.0	0.524	14.5	LOS B	2.2	20.7	0.81	1.06	1.24	41.9	
8	T1	1	0.0	1	0.0	0.524	20.7	LOS B	2.2	20.7	0.81	1.06	1.24	40.0	
9	R2	75	38.0	75	38.0	0.524	34.8	LOS C	2.2	20.7	0.81	1.06	1.24	36.6	
Approach		128	38.5	128	38.5	0.524	26.4	LOS B	2.2	20.7	0.81	1.06	1.24	39.3	
West: Jedda Road															
10	L2	141	22.4	141	22.4	0.349	6.5	LOS A	0.5	4.1	0.07	0.15	0.09	52.8	
11	T1	427	15.5	427	15.5	0.349	0.3	LOS A	0.5	4.1	0.07	0.15	0.09	57.5	
12	R2	13	58.3	13	58.3	0.349	11.5	LOS A	0.5	4.1	0.07	0.15	0.09	41.0	
Approach		581	18.1	581	18.1	0.349	2.1	NA	0.5	4.1	0.07	0.15	0.09	56.6	
All Vehicles		1252	21.0	1252	21.0	0.524	5.3	NA	2.2	20.7	0.27	0.25	0.37	51.6	

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: Site 2 [Whyalla Place / Jedda Road Future AM] Network: N101 [Future AM]

20S0071 - 9-13 Whyalla Place
 Whyalla Place / Jedda Road
 Future AM
 Site Category: (None)
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles															
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed	
		Total	HV	Total	HV				Vehicles	Distance					veh
		veh/h	% veh/h	%	v/c	sec									km/h
East: Jedda Road															
5	T1	313	25.9	313	25.9	0.292	2.1	LOS A	1.6	13.1	0.40	0.19	0.45	46.3	
6	R2	88	9.5	88	9.5	0.292	10.4	LOS A	1.6	13.1	0.40	0.19	0.45	46.3	
Approach		401	22.3	401	22.3	0.292	3.9	NA	1.6	13.1	0.40	0.19	0.45	46.3	
North: Whyalla Place															
7	L2	57	31.5	57	31.5	0.214	9.1	LOS A	0.8	7.2	0.63	0.81	0.64	23.4	
9	R2	38	47.2	38	47.2	0.214	18.7	LOS B	0.8	7.2	0.63	0.81	0.64	23.4	
Approach		95	37.8	95	37.8	0.214	13.0	LOS A	0.8	7.2	0.63	0.81	0.64	23.4	
West: Jedda Road															
10	L2	129	17.1	129	17.1	0.369	5.8	LOS A	0.0	0.0	0.00	0.12	0.00	58.0	
11	T1	500	20.4	500	20.4	0.369	0.1	LOS A	0.0	0.0	0.00	0.12	0.00	58.0	
Approach		629	19.7	629	19.7	0.369	1.2	NA	0.0	0.0	0.00	0.12	0.00	58.0	
All Vehicles		1125	22.2	1125	22.2	0.369	3.2	NA	1.6	13.1	0.20	0.20	0.21	53.3	

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: Site 5 [Whyalla Place HV Entry Driveway Future AM]

Network: N101 [Future AM]

20S0071 - 9-13 Whyalla Place
 Whyalla Place HV Entry Driveway
 Future AM
 Site Category: (None)
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				veh	Distance				
		veh/h	% veh/h	veh/h	%	v/c	sec							km/h
South: Whyalla Place														
5	T1	176	15.0	176	15.0	0.104	0.0	LOS A	0.1	0.4	0.02	0.03	0.02	59.6
6	R2	4100.0		4100.0		0.104	3.8	LOS A	0.1	0.4	0.02	0.03	0.02	36.7
Approach		180	17.0	180	17.0	0.104	0.2	NA	0.1	0.4	0.02	0.03	0.02	59.1
North: Whyalla Place														
11	T1	86	36.6	86	36.6	0.055	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		86	36.6	86	36.6	0.055	0.0	NA	0.0	0.0	0.00	0.00	0.00	60.0
All Vehicles		266	23.3	266	23.3	0.104	0.1	NA	0.1	0.4	0.01	0.02	0.01	59.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

▽ Site: **Site 5 [Whyalla Place LV Driveway Future AM]**  Network: **N101 [Future AM]**

20S0071 - 9-13 Whyalla Place
 Whyalla Place LV Driveway
 Future AM
 Site Category: (None)
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV %	Total	HV %				Vehicles	Distance				
		veh/h	% veh/h	veh/h	%	v/c	sec		veh	m				km/h
South: Whyalla Place														
5	T1	180	17.0	180	17.0	0.125	0.1	LOS A	0.2	1.9	0.08	0.09	0.08	43.4
6	R2	38	0.0	38	0.0	0.125	2.5	LOS A	0.2	1.9	0.08	0.09	0.08	47.9
Approach		218	14.0	218	14.0	0.125	0.5	NA	0.2	1.9	0.08	0.09	0.08	46.1
East: LV Driveway														
7	L2	4	0.0	4	0.0	0.003	5.8	LOS A	0.0	0.1	0.19	0.53	0.19	38.3
Approach		4	0.0	4	0.0	0.003	5.8	LOS A	0.0	0.1	0.19	0.53	0.19	38.3
North: Whyalla Place														
11	T1	86	36.6	86	36.6	0.055	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		86	36.6	86	36.6	0.055	0.0	NA	0.0	0.0	0.00	0.00	0.00	60.0
All Vehicles		308	20.1	308	20.1	0.125	0.4	NA	0.2	1.9	0.06	0.07	0.06	48.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: Site 6 [Whyalla Place HV Exit Driveway Future AM]

Network: N101 [Future AM]

20S0071 - 9-13 Whyalla Place
 Whyalla Place HV Exit Driveway
 Future AM
 Site Category: (None)
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				Vehicles	Distance				
		veh/h	% veh/h	%	v/c	sec			veh	m				km/h
South: Whyalla Place														
5	T1	218	14.0	218	14.0	0.122	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		218	14.0	218	14.0	0.122	0.0	NA	0.0	0.0	0.00	0.00	0.00	60.0
East: HV Exit Driveway														
7	L2	410	100.0	410	100.0	0.004	6.8	LOS A	0.0	0.2	0.24	0.52	0.24	37.8
Approach		410	100.0	410	100.0	0.004	6.8	LOS A	0.0	0.2	0.24	0.52	0.24	37.8
North: Whyalla Place														
11	T1	91	34.9	91	34.9	0.057	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		91	34.9	91	34.9	0.057	0.0	NA	0.0	0.0	0.00	0.00	0.00	60.0
All Vehicles		313	21.2	313	21.2	0.122	0.1	NA	0.0	0.2	0.00	0.01	0.00	59.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: Site 3 [Bernera Road / Jedda Road / M7 SB Ramps] **Network:** N101 [Future AM]
Future AM]

20S0071 - 9-13 Whyalla Place
 Bernera Road / Jedda Road / M7 SB Ramps
 Future AM
 Site Category: (None)
 Roundabout

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				Vehicles	Distance				
		veh/h	% veh/h	%	v/c	sec			veh	m				km/h
South: Bernera Road														
2	T1	18	41.2	18	41.2	0.498	3.6	LOS A	4.2	31.5	0.14	0.56	0.14	42.2
3a	R1	1400	6.9	1400	6.9	0.498	8.2	LOS A	4.2	31.5	0.15	0.56	0.15	36.2
3b	R3	96	50.5	96	50.5	0.498	11.1	LOS A	4.1	32.1	0.16	0.56	0.16	52.4
3u	U	3	0.0	3	0.0	0.498	11.8	LOS A	4.1	32.1	0.16	0.56	0.16	36.0
Approach		1517	10.1	1517	10.1	0.498	8.3	LOS A	4.2	32.1	0.15	0.56	0.15	38.8
NorthEast: Jedda Road														
24	L2	285	24.7	285	24.7	0.412	5.6	LOS A	2.2	18.3	0.43	0.56	0.43	53.9
24a	L1	531	19.0	531	19.0	0.412	5.0	LOS A	2.2	18.3	0.44	0.56	0.44	45.1
26b	R3	17	31.3	17	31.3	0.412	13.0	LOS A	2.1	17.3	0.44	0.55	0.44	40.9
26u	U	1	0.0	1	0.0	0.412	13.4	LOS A	2.1	17.3	0.44	0.55	0.44	45.1
Approach		834	21.2	834	21.2	0.412	5.4	LOS A	2.2	18.3	0.43	0.56	0.43	50.1
North: Bernera Road														
7b	L3	11	30.0	11	30.0	0.110	12.8	LOS A	0.4	4.6	0.79	0.87	0.79	24.1
7a	L1	6	83.3	6	83.3	0.110	16.3	LOS B	0.4	4.6	0.79	0.87	0.79	45.9
8	T1	17	75.0	17	75.0	0.110	15.9	LOS B	0.4	4.6	0.79	0.87	0.79	24.1
9u	U	1	0.0	1	0.0	0.110	19.1	LOS B	0.4	4.6	0.79	0.87	0.79	24.8
Approach		35	60.6	35	60.6	0.110	15.1	LOS B	0.4	4.6	0.79	0.87	0.79	31.9
NorthWest: M7 SB Exit Ramp														
27b	L3	20	73.7	20	73.7	0.398	11.9	LOS A	2.1	17.0	0.75	0.90	0.88	41.9
27	L2	304	16.3	304	16.3	0.398	9.3	LOS A	2.1	17.0	0.75	0.91	0.88	43.9
28	T1	1	0.0	1	0.0	0.398	10.1	LOS A	1.9	16.2	0.76	0.95	0.93	50.1
29a	R1	167	31.4	167	31.4	0.398	16.8	LOS B	1.9	16.2	0.76	0.95	0.93	38.8
Approach		493	23.7	493	23.7	0.398	12.0	LOS A	2.1	17.0	0.75	0.92	0.90	41.9
All Vehicles		2878	16.2	2878	16.2	0.498	8.2	LOS A	4.2	32.1	0.34	0.63	0.37	43.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: Site 4 [Bernera Road / Yarra Street / M7 NB Ramps Future AM]

Network: N101 [Future AM]

20S0071 - 9-13 Whyalla Place
Bernera Road / Yarra Street / M7 NB Ramps
Future AM
Site Category: (None)
Roundabout

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				veh	Distance				
		veh/h	% veh/h	%	v/c	sec			veh	m				km/h
South: Bernera Road														
1b	L3	67	9.4	67	9.4	0.040	3.6	LOS A	0.2	1.3	0.17	0.45	0.17	50.6
1a	L1	216	23.4	216	23.4	0.600	5.5	LOS A	4.6	35.5	0.70	0.62	0.80	54.2
2	T1	1112	7.8	1112	7.8	0.600	6.1	LOS A	4.6	35.5	0.71	0.69	0.84	46.8
3u	U	53	20.0	53	20.0	0.600	16.0	LOS B	4.4	32.9	0.73	0.77	0.87	55.8
Approach		1447	10.6	1447	10.6	0.600	6.2	LOS A	4.6	35.5	0.68	0.67	0.80	49.2
NorthEast: M7 NB Exit Ramp														
24a	L1	95	44.4	95	44.4	0.228	7.6	LOS A	0.9	8.0	0.62	0.73	0.62	54.9
25	T1	32	16.7	32	16.7	0.228	6.7	LOS A	0.9	8.0	0.62	0.73	0.62	52.2
26	R2	1	0.0	1	0.0	0.400	11.8	LOS A	2.0	15.4	0.63	0.86	0.67	52.5
26b	R3	389	13.8	389	13.8	0.400	13.5	LOS A	2.0	15.4	0.63	0.86	0.67	46.0
Approach		517	19.6	517	19.6	0.400	12.0	LOS A	2.0	15.4	0.63	0.83	0.66	48.5
North: Bernera Road														
8	T1	545	18.3	545	18.3	0.279	3.4	LOS A	1.6	12.7	0.25	0.38	0.25	55.3
9a	R1	47	33.3	47	33.3	0.279	8.9	LOS A	1.5	13.3	0.26	0.50	0.26	49.0
9b	R3	123	41.0	123	41.0	0.279	11.5	LOS A	1.5	13.3	0.26	0.50	0.26	53.8
9u	U	1	0.0	1	0.0	0.279	12.2	LOS A	1.5	13.3	0.26	0.50	0.26	39.0
Approach		717	23.2	717	23.2	0.279	5.2	LOS A	1.6	13.3	0.26	0.41	0.26	54.3
SouthWest: Yarra Street														
30	L2	16	80.0	16	80.0	0.269	16.0	LOS B	1.2	12.4	0.85	0.92	0.88	44.3
30a	L1	36	52.9	36	52.9	0.269	13.1	LOS A	1.2	12.4	0.85	0.92	0.88	39.6
32b	R3	23	31.8	23	31.8	0.269	19.0	LOS B	1.2	12.4	0.85	0.92	0.88	45.9
32u	U	1	0.0	1	0.0	0.269	18.0	LOS B	1.2	12.4	0.85	0.92	0.88	49.4
Approach		76	51.4	76	51.4	0.269	15.6	LOS B	1.2	12.4	0.85	0.92	0.88	43.0
All Vehicles		2757	16.7	2757	16.7	0.600	7.3	LOS A	4.6	35.5	0.57	0.64	0.63	49.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 **Site: TCS3020 [Hoxton Park Road / Joadja Road Future PM]**

 **Network: N101 [Future PM]**

20S0071 - 9-13 Whyalla Place
Hoxton Park Road / Joadja Road
Future PM

Site Category: (None)

Signals - Fixed Time Coordinated Cycle Time = 120 seconds (Network User-Given Cycle Time)

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				Vehicles	Distance				
		veh/h	% veh/h	veh/h	%	v/c	sec		veh	m				km/h
South: Joadja Road														
1	L2	694	4.1	694	4.1	0.840	25.2	LOS B	31.5	228.1	0.83	0.88	0.89	30.1
3	R2	229	7.8	229	7.8	0.787	70.3	LOS E	7.2	54.0	1.00	0.90	1.23	10.3
Approach		923	5.0	923	5.0	0.840	36.4	LOS C	31.5	228.1	0.87	0.89	0.98	23.2
East: Hoxton Park Road														
4	L2	363	11.9	363	11.9	0.196	6.8	LOS A	0.0	0.0	0.00	0.56	0.00	60.2
5	T1	1267	5.7	1267	5.7	0.824	21.7	LOS B	28.4	207.2	0.80	0.74	0.83	48.9
Approach		1631	7.1	1631	7.1	0.824	18.4	LOS B	28.4	207.2	0.63	0.70	0.65	50.7
West: Hoxton Park Road														
11	T1	827	5.0	827	5.0	0.265	2.7	LOS A	5.5	40.3	0.25	0.22	0.25	56.1
12	R2	509	4.3	509	4.3	0.798	46.4	LOS D	28.0	203.1	0.96	0.90	1.01	13.4
Approach		1337	4.7	1337	4.7	0.798	19.4	LOS B	28.0	203.1	0.52	0.48	0.54	25.2
All Vehicles		3891	5.8	3891	5.8	0.840	23.0	LOS B	31.5	228.1	0.65	0.67	0.69	38.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow	Average Delay	Level of Service	Average Back of Queue		Prop. Queued	Effective Stop Rate
		ped/h	sec		Pedestrian	Distance		
					ped	m		
P1	South Full Crossing	1	54.2	LOS E	0.0	0.0	0.95	0.95
P21	East Stage 1	1	54.2	LOS E	0.0	0.0	0.95	0.95
P22	East Stage 2	1	54.2	LOS E	0.0	0.0	0.95	0.95
All Pedestrians		3	54.2	LOS E			0.95	0.95

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

 Site: TCS4222 [Joadja Road / Liverpool Catholic Club Future PM]

 Network: N101 [Future PM]

20S0071 - 9-13 Whyalla Place
Joadja Road / Liverpool Catholic Club
Future PM

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 60 seconds (Site User-Given Cycle Time)

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Queue Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %	Total veh/h	HV %									
South: Joadja Road														
1	L2	1	0.0	1	0.0	0.336	9.3	LOS A	4.8	34.9	0.42	0.37	0.42	29.8
2	T1	864	5.0	864	5.0	0.336	3.8	LOS A	5.1	37.5	0.42	0.37	0.42	48.0
3	R2	15	0.0	15	0.0	0.031	12.8	LOS A	0.2	1.4	0.58	0.66	0.58	33.1
Approach		880	4.9	880	4.9	0.336	4.0	LOS A	5.1	37.5	0.42	0.37	0.42	47.5
East: Liverpool Catholic Club														
4	L2	24	0.0	24	0.0	0.050	21.4	LOS B	0.5	3.8	0.75	0.68	0.75	10.6
5	T1	1	0.0	1	0.0	0.050	17.9	LOS B	0.5	3.8	0.75	0.68	0.75	17.0
6	R2	41	0.0	41	0.0	0.206	32.9	LOS C	1.2	8.3	0.95	0.72	0.95	7.4
Approach		66	0.0	66	0.0	0.206	28.4	LOS B	1.2	8.3	0.88	0.71	0.88	8.5
North: Joadja Road														
7	L2	23	13.6	23	13.6	0.466	16.4	LOS B	8.3	62.2	0.70	0.62	0.80	23.3
8	T1	844	7.2	844	7.2	0.466	10.7	LOS A	8.3	62.2	0.70	0.61	0.75	33.9
9	R2	1	0.0	1	0.0	0.003	16.7	LOS B	0.0	0.1	0.60	0.61	0.60	29.2
Approach		868	7.4	868	7.4	0.466	10.8	LOS A	8.3	62.2	0.70	0.61	0.75	33.4
West: Liverpool Catholic Club														
10	L2	1	0.0	1	0.0	0.011	31.7	LOS C	0.1	0.4	0.92	0.59	0.92	8.9
11	T1	1	0.0	1	0.0	0.011	27.2	LOS B	0.1	0.4	0.92	0.59	0.92	13.9
12	R2	1	0.0	1	0.0	0.005	31.4	LOS C	0.0	0.2	0.92	0.58	0.92	8.3
Approach		3	0.0	3	0.0	0.011	30.1	LOS C	0.1	0.4	0.92	0.58	0.92	10.4
All Vehicles		1818	5.9	1818	5.9	0.466	8.2	LOS A	8.3	62.2	0.57	0.50	0.60	37.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue		Prop. Queued	Effective Stop Rate	
					Pedestrian	Distance m			
P1	South Full Crossing	1	24.3	LOS C	0.0	0.0	0.90	0.90	
P2	East Full Crossing	1	24.3	LOS C	0.0	0.0	0.90	0.90	
P3	North Full Crossing	1	24.3	LOS C	0.0	0.0	0.90	0.90	
P4	West Full Crossing	1	24.3	LOS C	0.0	0.0	0.90	0.90	
All Pedestrians		4	24.3	LOS C			0.90	0.90	

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY



Site: TCS3854 [Joadja Road / Jedda Road Future PM]



Network: N101 [Future PM]

20S0071 - 9-13 Whyalla Place

Joadja Road / Jedda Road

Future PM

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 60 seconds (Site User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Level of Service		95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV %	Total	HV %		Delay	Service	Vehicles	Distance				
		veh/h		veh/h		v/c	sec		veh	m				
SouthEast: Jedda Road														
21	L2	496	12.3	496	12.3	0.554	16.9	LOS B	10.2	78.8	0.74	0.80	0.74	40.8
22	T1	1	0.0	1	0.0	0.808	33.4	LOS C	7.1	50.6	1.00	0.95	1.34	31.2
23	R2	214	2.5	214	2.5	0.808	37.8	LOS C	7.1	50.6	1.00	0.95	1.34	29.2
Approach		711	9.3	711	9.3	0.808	23.2	LOS B	10.2	78.8	0.82	0.85	0.92	36.4
NorthEast: Joadja Road														
24	L2	113	8.4	113	8.4	0.774	29.6	LOS C	13.4	99.8	0.97	0.93	1.11	22.6
25	T1	764	6.7	764	6.7	0.774	24.1	LOS B	13.4	99.8	0.97	0.93	1.12	23.0
Approach		877	7.0	877	7.0	0.774	24.8	LOS B	13.4	99.8	0.97	0.93	1.12	22.9
NorthWest: Liverpool Transmission Substation														
27	L2	1	0.0	1	0.0	0.014	28.7	LOS C	0.1	0.6	0.87	0.60	0.87	12.7
28	T1	1	0.0	1	0.0	0.014	24.1	LOS B	0.1	0.6	0.87	0.60	0.87	12.7
29	R2	1	0.0	1	0.0	0.014	28.7	LOS C	0.1	0.6	0.87	0.60	0.87	12.7
Approach		3	0.0	3	0.0	0.014	27.2	LOS B	0.1	0.6	0.87	0.60	0.87	12.7
SouthWest: Jedda Road														
30	L2	1	0.0	1	0.0	0.260	10.3	LOS A	4.1	30.5	0.45	0.39	0.45	46.1
31	T1	648	6.0	648	6.0	0.260	4.7	LOS A	4.1	30.5	0.45	0.39	0.45	46.2
32	R2	311	29.8	311	29.8	0.608	22.7	LOS B	6.8	59.4	0.88	0.89	1.10	25.2
Approach		960	13.7	960	13.7	0.608	10.6	LOS A	6.8	59.4	0.59	0.55	0.66	36.3
All Vehicles		2551	10.2	2551	10.2	0.808	19.0	LOS B	13.4	99.8	0.78	0.76	0.89	31.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow	Average Level of Service		Average Back of Queue		Prop. Queued	Effective Stop Rate
			Delay	Service	Pedestrian	Distance		
		ped/h	sec		ped	m		
P5	SouthEast Full Crossing	2	24.3	LOS C	0.0	0.0	0.90	0.90
P6	NorthEast Full Crossing	1	24.3	LOS C	0.0	0.0	0.90	0.90
P7	NorthWest Full Crossing	1	24.3	LOS C	0.0	0.0	0.90	0.90
P8	SouthWest Full Crossing	1	24.3	LOS C	0.0	0.0	0.90	0.90
All Pedestrians		5	24.3	LOS C			0.90	0.90

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

 **Site: TCS3711 [Hoxton Park Road / Ash Road Future PM]**

 **Network: N101 [Future PM]**

20S0071 - 9-13 Whyalla Place
Hoxton Park Road / Ash Road
Future PM

Site Category: (None)

Signals - Fixed Time Coordinated Cycle Time = 120 seconds (Network User-Given Cycle Time)

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				Vehicles	Distance				
		veh/h	% veh/h	%	v/c	sec			veh	m				km/h
South: Ash Road														
1	L2	76	6.9	76	6.9	0.150	40.1	LOS C	3.3	24.5	0.79	0.74	0.79	30.2
3	R2	185	5.7	185	5.7	0.668	55.3	LOS D	10.2	74.8	0.96	0.83	1.00	33.5
Approach		261	6.0	261	6.0	0.668	50.9	LOS D	10.2	74.8	0.91	0.80	0.93	32.8
East: Hoxton Park Road														
4	L2	123	8.5	123	8.5	0.083	8.0	LOS A	1.1	8.5	0.17	0.65	0.17	53.5
5	T1	1519	6.7	1519	6.7	0.675	15.6	LOS B	29.5	217.8	0.70	0.64	0.70	43.3
Approach		1642	6.9	1642	6.9	0.675	15.0	LOS B	29.5	217.8	0.66	0.64	0.66	43.9
West: Hoxton Park Road														
11	T1	1004	5.0	1004	5.0	0.367	5.5	LOS A	7.9	57.4	0.30	0.27	0.30	64.6
12	R2	45	11.6	45	11.6	0.528	67.7	LOS E	2.7	20.9	0.98	0.74	0.99	26.3
Approach		1049	5.3	1049	5.3	0.528	8.2	LOS A	7.9	57.4	0.33	0.29	0.33	62.1
All Vehicles		2953	6.2	2953	6.2	0.675	15.8	LOS B	29.5	217.8	0.56	0.53	0.56	50.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow	Average Delay	Level of Service	Average Back of Queue	Prop. Queued	Effective Stop Rate	
		ped/h	sec		Pedestrian Distance			
					ped			m
P1	South Full Crossing	1	54.2	LOS E	0.0	0.0	0.95	0.95
P21	East Stage 1	2	54.2	LOS E	0.0	0.0	0.95	0.95
P22	East Stage 2	2	54.2	LOS E	0.0	0.0	0.95	0.95
P41	West Stage 1	2	54.2	LOS E	0.0	0.0	0.95	0.95
P42	West Stage 2	2	54.2	LOS E	0.0	0.0	0.95	0.95
All Pedestrians		9	54.2	LOS E			0.95	0.95

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

▽ Site: Site 1 [Ash Road / Jedda Road Future PM]

Network: N101 [Future PM]

20S0071 - 9-13 Whyalla Place
 Ash Road / Jedda Road
 Future PM
 Site Category: (None)
 Giveaway / Yield (Two-Way)

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV %	Total	HV %				Vehicles	Distance				
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Ash Road														
1	L2	6	50.0	6	50.0	0.022	9.3	LOS A	0.1	0.6	0.58	0.76	0.58	35.1
2	T1	1	0.0	1	0.0	0.022	11.6	LOS A	0.1	0.6	0.58	0.76	0.58	35.1
3	R2	3	0.0	3	0.0	0.022	14.7	LOS B	0.1	0.6	0.58	0.76	0.58	46.2
Approach		11	30.0	11	30.0	0.022	11.1	LOS A	0.1	0.6	0.58	0.76	0.58	40.5
East: Jedda Road														
4	L2	1	0.0	1	0.0	0.317	8.5	LOS A	0.8	5.9	0.16	0.07	0.17	56.1
5	T1	482	10.3	482	10.3	0.317	0.5	LOS A	0.8	5.9	0.16	0.07	0.17	57.5
6	R2	53	12.0	53	12.0	0.317	8.5	LOS A	0.8	5.9	0.16	0.07	0.17	57.5
Approach		536	10.4	536	10.4	0.317	1.3	NA	0.8	5.9	0.16	0.07	0.17	57.4
North: Ash Road														
7	L2	98	5.4	98	5.4	0.310	7.7	LOS A	1.3	9.5	0.58	0.79	0.68	49.9
8	T1	1	0.0	1	0.0	0.310	13.0	LOS A	1.3	9.5	0.58	0.79	0.68	48.1
9	R2	62	13.6	62	13.6	0.310	19.0	LOS B	1.3	9.5	0.58	0.79	0.68	46.2
Approach		161	8.5	161	8.5	0.310	12.1	LOS A	1.3	9.5	0.58	0.79	0.68	48.8
West: Jedda Road														
10	L2	100	13.7	100	13.7	0.252	6.1	LOS A	0.2	1.4	0.03	0.14	0.04	53.7
11	T1	325	16.8	325	16.8	0.252	0.2	LOS A	0.2	1.4	0.03	0.14	0.04	57.8
12	R2	4	75.0	4	75.0	0.252	12.2	LOS A	0.2	1.4	0.03	0.14	0.04	38.9
Approach		429	16.7	429	16.7	0.252	1.7	NA	0.2	1.4	0.03	0.14	0.04	57.2
All Vehicles		1137	12.7	1137	12.7	0.317	3.1	NA	1.3	9.5	0.18	0.20	0.20	55.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

▽ Site: Site 2 [Whyalla Place / Jedda Road Future PM] 📍 Network: N101 [Future PM]

20S0071 - 9-13 Whyalla Place
 Whyalla Place / Jedda Road
 Future PM
 Site Category: (None)
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				Vehicles	Distance				
		veh/h	% veh/h	%	v/c	sec								km/h
East: Jedda Road														
5	T1	364	26.6	364	26.6	0.279	0.8	LOS A	0.9	7.4	0.23	0.10	0.23	52.6
6	R2	60	19.3	60	19.3	0.279	8.8	LOS A	0.9	7.4	0.23	0.10	0.23	52.6
Approach		424	25.6	424	25.6	0.279	1.9	NA	0.9	7.4	0.23	0.10	0.23	52.6
North: Whyalla Place														
7	L2	84	5.0	84	5.0	0.247	7.5	LOS A	1.0	7.5	0.55	0.75	0.57	26.5
9	R2	68	26.2	68	26.2	0.247	13.8	LOS A	1.0	7.5	0.55	0.75	0.57	26.5
Approach		153	14.5	153	14.5	0.247	10.3	LOS A	1.0	7.5	0.55	0.75	0.57	26.5
West: Jedda Road														
10	L2	57	38.9	57	38.9	0.263	6.0	LOS A	0.0	0.0	0.00	0.08	0.00	58.8
11	T1	362	31.7	362	31.7	0.263	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	58.8
Approach		419	32.7	419	32.7	0.263	0.9	NA	0.0	0.0	0.00	0.08	0.00	58.8
All Vehicles		996	26.8	996	26.8	0.279	2.8	NA	1.0	7.5	0.18	0.19	0.18	53.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

▽ Site: Site 5 [Whyalla Place HV Entry Driveway Future PM]

Network: N101 [Future PM]

20S0071 - 9-13 Whyalla Place
 Whyalla Place HV Entry Driveway
 Future PM
 Site Category: (None)
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				veh	Distance				
		veh/h	% veh/h	%	v/c	sec			veh	m				km/h
South: Whyalla Place														
5	T1	101	21.9	101	21.9	0.074	0.1	LOS A	0.1	1.2	0.07	0.10	0.07	58.4
6	R2	12	100.0	12	100.0	0.074	3.7	LOS A	0.1	1.2	0.07	0.10	0.07	35.9
Approach		113	29.9	113	29.9	0.074	0.8	NA	0.1	1.2	0.07	0.10	0.07	56.2
North: Whyalla Place														
11	T1	99	10.6	99	10.6	0.054	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		99	10.6	99	10.6	0.054	0.0	NA	0.0	0.0	0.00	0.00	0.00	60.0
All Vehicles		212	20.9	212	20.9	0.074	0.3	NA	0.1	1.2	0.04	0.05	0.04	57.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: Site 5 [Whyalla Place LV Driveway Future PM] **Network: N101 [Future PM]**

20S0071 - 9-13 Whyalla Place
 Whyalla Place LV Driveway
 Future PM
 Site Category: (None)
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				Vehicles	Distance				
		veh/h	% veh/h	%	v/c	sec			veh	m				km/h
South: Whyalla Place														
5	T1	113	29.9	113	29.9	0.071	0.0	LOS A	0.0	0.2	0.02	0.02	0.02	55.0
6	R2	4	0.0	4	0.0	0.071	2.5	LOS A	0.0	0.2	0.02	0.02	0.02	49.4
Approach		117	28.8	117	28.8	0.071	0.1	NA	0.0	0.2	0.02	0.02	0.02	53.6
East: LV Driveway														
7	L2	38	0.0	38	0.0	0.025	5.8	LOS A	0.1	0.7	0.19	0.54	0.19	38.3
Approach		38	0.0	38	0.0	0.025	5.8	LOS A	0.1	0.7	0.19	0.54	0.19	38.3
North: Whyalla Place														
11	T1	99	10.6	99	10.6	0.054	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		99	10.6	99	10.6	0.054	0.0	NA	0.0	0.0	0.00	0.00	0.00	60.0
All Vehicles		254	17.4	254	17.4	0.071	0.9	NA	0.1	0.7	0.04	0.09	0.04	46.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

▽ Site: Site 6 [Whyalla Place HV Exit Driveway Future PM]

⚡ Network: N101 [Future PM]

20S0071 - 9-13 Whyalla Place
 Whyalla Place HV Exit Driveway
 Future PM
 Site Category: (None)
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				Vehicles	Distance				
		veh/h	% veh/h	%	v/c	sec			veh	m				km/h
South: Whyalla Place														
5	T1	117	28.8	117	28.8	0.071	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		117	28.8	117	28.8	0.071	0.0	NA	0.0	0.0	0.00	0.00	0.00	60.0
East: HV Exit Driveway														
7	L2	12	100.0	12	100.0	0.013	7.0	LOS A	0.0	0.6	0.29	0.54	0.29	37.4
Approach		12	100.0	12	100.0	0.013	7.0	LOS A	0.0	0.6	0.29	0.54	0.29	37.4
North: Whyalla Place														
11	T1	139	7.6	139	7.6	0.075	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		139	7.6	139	7.6	0.075	0.0	NA	0.0	0.0	0.00	0.00	0.00	60.0
All Vehicles		267	20.9	267	20.9	0.075	0.3	NA	0.0	0.6	0.01	0.02	0.01	56.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: Site 3 [Bernera Road / Jedda Road / M7 SB Ramps] **Network:** N101 [Future PM] **Future PM]**

20S0071 - 9-13 Whyalla Place
 Bernera Road / Jedda Road / M7 SB Ramps
 Future PM
 Site Category: (None)
 Roundabout

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV %	Total	HV %				Vehicles	Distance				
		veh/h	% veh/h	veh/h	%	v/c	sec		veh	m				km/h
South: Bernera Road														
2	T1	17	56.3	17	56.3	0.275	3.6	LOS A	1.7	13.1	0.05	0.58	0.05	41.6
3a	R1	740	12.1	740	12.1	0.275	8.2	LOS A	1.7	13.1	0.05	0.59	0.05	36.9
3b	R3	89	25.9	89	25.9	0.275	10.7	LOS A	1.6	12.9	0.05	0.60	0.05	53.6
3u	U	1	0.0	1	0.0	0.275	11.7	LOS A	1.6	12.9	0.05	0.60	0.05	36.6
Approach		847	14.4	847	14.4	0.275	8.4	LOS A	1.7	13.1	0.05	0.59	0.05	41.1
NorthEast: Jedda Road														
24	L2	386	13.4	386	13.4	0.585	5.9	LOS A	4.1	31.3	0.46	0.58	0.48	54.0
24a	L1	911	9.8	911	9.8	0.585	5.5	LOS A	4.1	31.3	0.47	0.58	0.50	44.9
26b	R3	2	100.0	2	100.0	0.585	15.7	LOS B	4.0	30.5	0.48	0.58	0.51	40.1
26u	U	1	0.0	1	0.0	0.585	14.1	LOS A	4.0	30.5	0.48	0.58	0.51	45.0
Approach		1300	11.0	1300	11.0	0.585	5.6	LOS A	4.1	31.3	0.47	0.58	0.50	49.8
North: Bernera Road														
7b	L3	13	0.0	13	0.0	0.113	6.9	LOS A	0.4	3.9	0.63	0.76	0.63	33.4
7a	L1	14	38.5	14	38.5	0.113	7.9	LOS A	0.4	3.9	0.63	0.76	0.63	52.1
8	T1	35	54.5	35	54.5	0.113	8.9	LOS A	0.4	3.9	0.63	0.76	0.63	33.4
9u	U	1	0.0	1	0.0	0.113	15.1	LOS B	0.4	3.9	0.63	0.76	0.63	29.4
Approach		62	39.0	62	39.0	0.113	8.4	LOS A	0.4	3.9	0.63	0.76	0.63	41.9
NorthWest: M7 SB Exit Ramp														
27b	L3	8	87.5	8	87.5	0.210	8.5	LOS A	0.8	7.0	0.55	0.73	0.55	43.7
27	L2	183	24.1	183	24.1	0.210	6.3	LOS A	0.8	7.0	0.55	0.73	0.55	48.6
28	T1	1	0.0	1	0.0	0.210	5.9	LOS A	0.8	6.6	0.57	0.83	0.57	53.0
29a	R1	156	20.9	156	20.9	0.210	11.5	LOS A	0.8	6.6	0.57	0.83	0.57	43.3
Approach		348	24.2	348	24.2	0.210	8.7	LOS A	0.8	7.0	0.56	0.77	0.56	45.8
All Vehicles		2558	14.6	2558	14.6	0.585	7.0	LOS A	4.1	31.3	0.35	0.62	0.36	46.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: Site 4 [Bernera Road / Yarrowa Street / M7 NB Ramps Future PM]

Network: N101 [Future PM]

20S0071 - 9-13 Whyalla Place
Bernera Road / Yarrowa Street / M7 NB Ramps
Future PM
Site Category: (None)
Roundabout

Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows		Arrival Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV	Total	HV				Vehicles	Distance				
		veh/h	% veh/h	%	v/c	sec			veh	m				km/h
South: Bernera Road														
1b	L3	18	47.1	18	47.1	0.013	3.9	LOS A	0.1	0.5	0.17	0.44	0.17	50.4
1a	L1	220	19.1	220	19.1	0.365	4.0	LOS A	1.9	14.6	0.51	0.44	0.51	55.4
2	T1	653	9.8	653	9.8	0.365	4.5	LOS A	1.9	14.6	0.53	0.48	0.53	48.7
3u	U	22	33.3	22	33.3	0.365	14.3	LOS A	1.8	13.6	0.54	0.51	0.54	56.7
Approach		913	13.4	913	13.4	0.365	4.6	LOS A	1.9	14.6	0.52	0.47	0.52	51.3
NorthEast: M7 NB Exit Ramp														
24a	L1	77	41.1	77	41.1	0.173	7.9	LOS A	0.6	6.2	0.65	0.75	0.65	54.4
25	T1	9	88.9	9	88.9	0.173	10.7	LOS A	0.6	6.2	0.65	0.75	0.65	51.7
26	R2	1	0.0	1	0.0	0.229	11.9	LOS A	1.0	8.4	0.64	0.87	0.64	52.5
26b	R3	182	29.5	182	29.5	0.229	14.1	LOS A	1.0	8.4	0.64	0.87	0.64	45.9
Approach		269	34.8	269	34.8	0.229	12.2	LOS A	1.0	8.4	0.64	0.84	0.64	49.0
North: Bernera Road														
8	T1	856	8.1	856	8.1	0.396	3.2	LOS A	2.5	19.0	0.23	0.38	0.23	55.6
9a	R1	49	61.7	49	61.7	0.396	9.2	LOS A	2.5	20.2	0.24	0.50	0.24	48.7
9b	R3	213	20.8	213	20.8	0.396	11.1	LOS A	2.5	20.2	0.24	0.50	0.24	54.7
9u	U	1	0.0	1	0.0	0.396	12.1	LOS A	2.5	20.2	0.24	0.50	0.24	39.0
Approach		1119	12.9	1119	12.9	0.396	5.0	LOS A	2.5	20.2	0.23	0.41	0.23	54.9
SouthWest: Yarrowa Street														
30	L2	17	31.3	17	31.3	0.190	7.7	LOS A	0.8	7.2	0.72	0.82	0.72	48.0
30a	L1	49	27.7	49	27.7	0.190	6.7	LOS A	0.8	7.2	0.72	0.82	0.72	43.5
32b	R3	29	28.6	29	28.6	0.190	14.2	LOS A	0.8	7.2	0.72	0.82	0.72	49.4
32u	U	1	0.0	1	0.0	0.190	14.0	LOS A	0.8	7.2	0.72	0.82	0.72	52.5
Approach		97	28.3	97	28.3	0.190	9.3	LOS A	0.8	7.2	0.72	0.82	0.72	46.6
All Vehicles		2398	16.2	2398	16.2	0.396	5.8	LOS A	2.5	20.2	0.41	0.49	0.41	52.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

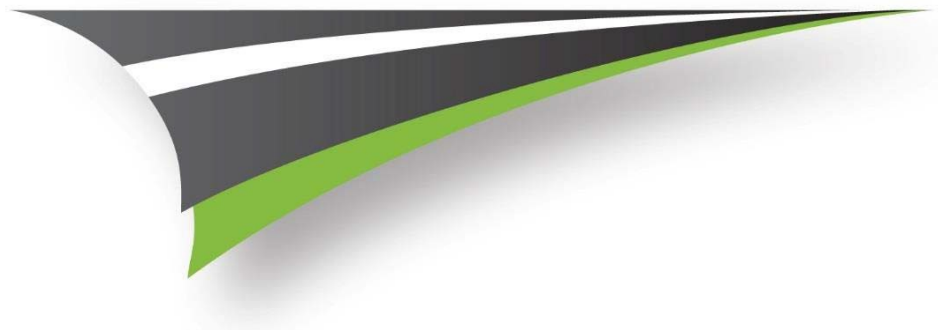
Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).


HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

people**trans**



sydney@peopletrans.com.au
melbourne@peopletrans.com.au

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in f  peopletrans.com.au