TRAFFIC IMPACT ASSESSMENT

Hexham Depot Relocation and Wagon Storage
New England Highway (Maitland Road), Hexham
State Significant Infrastructure SSI-6090 Mod 2

Prepared for:

Aurizon Operations Limited
900 Ann Street, Fortitude Valley
QLD 4006 Australia

SLR Ref: 620.30688.00100-R01
Version No: -v1.3
March 2022

PREPARED BY

SLR Consulting Australia Pty Ltd
ABN 29 001 584 612
Tenancy 202 Submarine School, Sub Base Platypus, 120 High Street
North Sydney NSW 2060 Australia

T: +61 2 9427 8100
E: sydney@slrconsulting.com
www.slrconsulting.com

BASIS OF REPORT

This report has been prepared by SLR Consulting Australia Pty Ltd (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Aurizon Operations Limited (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

DOCUMENT CONTROL

Reference	Date	Prepared	Checked	Authorised
620.30688.00100-R01-v1.3	24 March 2022	Charlie Seventekin	Anthony Kay	Jeffrey Baczynski

EXECUTIVE SUMMARY

SLR Consulting Australia Pty Ltd **(SLR)** has been engaged by Aurizon Operations Limited **(Aurizon)** to prepare a Traffic Impact Assessment **(TIA)** for the development of a depot, warehouse and wagon storage (the Modification Proposal) to support the ongoing operations at the existing Long Term Train Support Facility near Hexham, NSW (Hexham LTTSF Project).

This State Significant Infrastructure **(SSI)** modification is associated with construction and operation of a new warehouse for storing rail maintenance equipment, a new depot for train crew including car parking, a separate area for the storage of rail wagons, and ancillary infrastructure.

An overview of the Modification Proposal is as follows:

- Site preparation and earthworks;
- Construction of the following elements:
  - A warehouse for the storage of rail maintenance equipment;
  - A depot for office staff and train crew; and
  - Ancillary staff and visitor car park connected to the private roadway (existing main access road).
- Rail wagon storage area located on the western portion of the Site;
- Ancillary infrastructure (hardstand, water management, landscaping, lighting etc);
- Connection to utilities.

The proposed development has been assessed against the traffic and transport requirements of Transport for New South Wales **(TfNSW)**, City of Newcastle Council **(CNC or Council)** as well as the relevant Australian Standards and Austroads Guidelines.

Based on the analysis and discussion documented herein, the following is concluded:

- The proposed access, car parking and servicing arrangements satisfy the relevant DCP and AS2890 requirements;
- The proposed development will generate additional 59 light vehicle trips in the morning and afternoon peak hours following the completion of the construction activities;
- The operational assessment conducted herein demonstrates that the intersections on Anderson Drive at the New England Highway (Maitland Road) Tarro interchange will operate within acceptable performance levels under the 'With Development' traffic scenario at the 10-year design horizon (2032);
- It is concluded that the construction traffic demand will be less than the operational traffic demand and therefore no further detailed analysis of the above intersections was required; and
- The road safety assessment conducted herein demonstrates that the proposed development is not anticipated to exacerbate the existing safety issues identified in this report.

CONTENTS

CONTENTS

DOCUMENT REFERENCES

TABLES

FIGURES

CONTENTS

APPENDICES

1 Introduction

This Traffic Impact Assessment **(TIA)** has been prepared for the development of a depot, warehouse, and wagon storage (the Modification Proposal) to support the ongoing operations of the Hexham Long Term Train Support Facility (Hexham LTTSF Project), Hexham (the Hexham LTTSF Site). The Modification Proposal is to be undertaken as a modification (under Part 5, Section 5.2 of the Environmental Planning and Assessment Act 1979 **(EP&A Act)** to the Hexham LTTSF Approval (MP07_0171).

This report has been prepared in accordance with the requirements set out within the DPIE letter dated 17 September 2021:

- The Secretary's Environmental Assessment Requirements **(SEARs)** issued for SSI-6090 Mod 1 (previously MP 07_0117 MOD 1); and
- The relevant industry specific SEARs applicable to warehouse development.

This report has been prepared by SLR Consulting Australia Pty Ltd **(SLR)** on behalf of Aurizon (the client). Plans of the proposed development are provided in **Appendix A**.

1.1 Key Terms

Table 1 identifies the key terms which are relevant to this report.

Table 1 Key Terms

Term	Description
The Modification Proposal	The depot, warehouse, wagon storage and associated development for which approval is sought, as SSI-6090 – Mod 2.
Hexham LTTSF Project	The Hexham Long Term Train Stabling Facility (and associated development) approved under MP 07_0117, now SSI 6090 (inc. Mod 1).
The Hexham LTTSF Project Site	Area on which the Hexham LTTSF is located, and the surrounds assessed under the MP 07_0117, now SSI 6090 (inc. Mod 1).
The Site	The area where the Modification Proposal works are to be undertaken. This area signifies the area to be directly impacted/disturbed by the Modification Proposal.

1.2 Assessment Scope

This TIA report has been prepared to inform the DPIE with their assessment of the proposed modification by identifying and addressing the following traffic and transport matters:

- Assessment of site access and external road network operational and construction impacts;
- Analysis of parking provision for the staff and visitors; and
- Compliance of the proposal with the relevant DPIE requirements as well the relevant Australian Standards and Austroads Guidelines.

Response to SEARs is tabulated in **Table 2**.

Table 2 DPIE SEARs

	Comments / Requirements	SLR Response
1.	The Proponent must assess construction transport and traffic (vehicle, pedestrian and cyclists) impacts, including, but not necessarily limited to:	
(a)	A considered approach to route identification and scheduling of transport movements.	See Section 6 and Section 7
(b)	The number, frequency and size of construction related vehicles passenger, commercial and heavy vehicles, including spoil management movements).	See Section 6 and Section 7
(c)	Construction worker parking.	See Section 4.2.5
(d)	The nature of existing traffic (types and number of movements) on construction access routes (including consideration of peak traffic times and sensitive road users and parking arrangements).	See Section 7
(e)	Access constraints and impacts on public transport, pedestrians, and cyclists.	See Section 7
(f)	The need to close, divert or otherwise reconfigure elements of the road and cycle network associated with construction of the modification.	Not proposed.
2.	The Proponent must assess the operational transport impacts of the modification, including forecast travel demand and traffic volumes for the modification and the surrounding road, cycle, and public transport network.	See Section 6 and Section 7

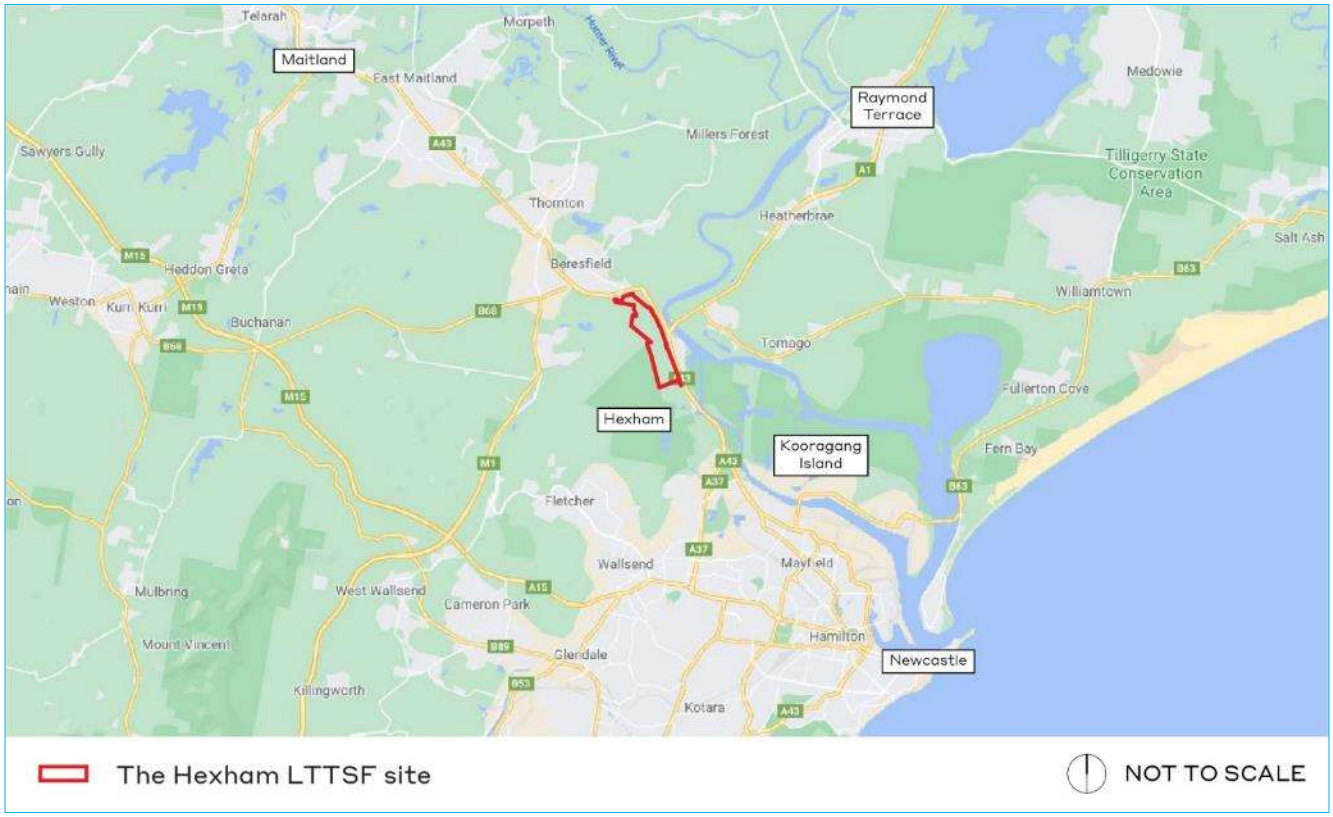
2 Existing Conditions Appraisal

2.1 Subject Site

The LTTSF is located at Maitland Road (New England Highway), Hexham within the Newcastle Local Government Area approximately 16km north-west of Newcastle CBD. The site has a total area of 255ha with the LTTSF developed on a 38ha portion of the site parallel to (and to the west of) the Great Northern Railway (GNR). The LTTSF is located within an industrial setting with only a small number of dwellings within the local vicinity of the site.

The site location in the regional context is illustrated in **Figure 1**.

Figure 1 The Hexham LTTSF in Regional Context



2.1.1 Site Description

The Modification Proposal are fully contained within Lot 104 DP1189565 which is owned by Aurizon. The Hexham LTTSF site covers multiple lots which are not affected by the Modification Proposal. The location of the proposed development in the context of the existing facility is provided within **Figure 2** and **Figure 3**. The property report generated by https://www.planningportal.nsw.gov.au/ is provided in **Appendix B**.

Figure 2 Site Context (Consideration of Previous Approvals)

Figure 3 Proposed Development Area

2.1.2 Modification Proposal Description

The Modification Proposal is to be located within the Hexham LTTSF site at a location previously cleared and disturbed by historical coal handling activities and the construction of the LTTSF.

The Modification Proposal includes the development of a depot, warehouse, wagon storage and ancillary infrastructure to support the ongoing operations of the Hexham LTTSF.

An overview of the Modification Proposal is as follows:

- Site preparation and earthworks;
- Construction of the following elements:
  - A warehouse for the storage of rail maintenance equipment;
  - A depot for office staff and train crew;
  - Ancillary staff and visitor car park connected to the private roadway (existing main access road).
- Rail wagon storage area located on the western portion of the proposed development;
- Ancillary infrastructure (hardstand, water management, landscaping, lighting etc); and
- Connection to utilities.

The depot and warehouse will be operated 24 hours per day, 7 days a week.

2.2 Surrounding Road Network

Details of the key roads surrounding the Hexham LTTSF are provided in **Table 3.**

Table 3 Key Roads

Road Name	Classification	Authority	Existing Form	Posted Speed
Maitland Road (New England Highway)	State Road (Road Number 9)	TfNSW	Two traffic lanes in each direction, median-divided, rural cross-section (highway)	90 km/h
Anderson Drive	Local Road	Council	One traffic lane in each direction, undivided, rural cross-section	50 km/h
Access Road (No Name)			One traffic lane in each direction, undivided, rural cross-section	60 km/h
Woodlands Close			One traffic lane in each direction, undivided, rural cross-section	50 km/h

2.3 Road Network Planning

A review of TfNSW and CNC documents has been undertaken to understand future road upgrades planned in the vicinity of the Hexham LTTSF.

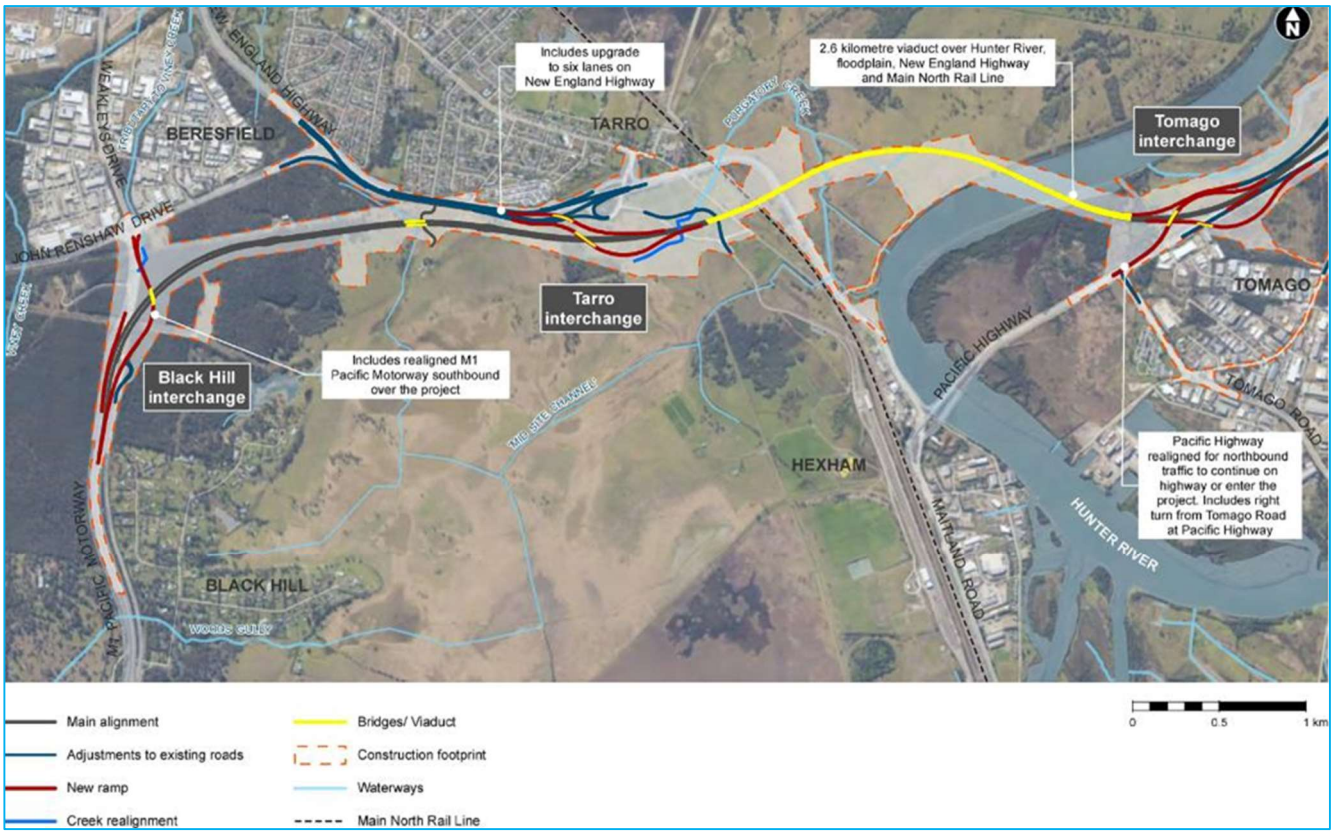
Based on this review, it is understood that major transport specific infrastructure upgrades are proposed in the vicinity of the site. Australian Government's $2.1 billion dollar[1] project *"M1 Pacific Motorway Extension to Raymond Terrace"* will deliver a 15km dual carriageway extension of the M1 Pacific Motorway from Black Hill to Raymond Terrace. The works include a 2.6km bridge over the New England Highway and Hunter River, and upgrades to the surrounding network, including the Hexham Straight Widening. The Hexham Straight Widening includes widening around 6km of the Pacific Highway / Maitland Road between the Newcastle Inner City Bypass at Sandgate and the New England Highway at Hexham Bridge to three lanes in each direction. The project is expected to be opened to traffic by mid-2028. Project details are also shown in **Figure 4** and **Figure 5**.

Whilst not directly changing the form of the Tarro Interchange, the proposed *"M1 Pacific Motorway Extension to Raymond Terrace"* project will impact on how staff will travel to and from the LTTSF site. Based on before / after figures provided on the project website[2], it is anticipated that the left in left out **(LILO)** arrangement at the New England Highway (Maitland Road) / Quarter Sessions Road intersection will be closed. Based on a review of high-resolution aerial imagery (Nearmap), the closure of the LILO intersection will result in Aurizon staff seeking alternative routes to site, the most likely being via the New England Highway (Maitland Road) / Weakleys Drive interchange in Thornton, which is approximately 4km to the northwest of Tarro Interchange.

[1] Source: https://investment.infrastructure.gov.au/projects/ProjectDetails.aspx?Project_id=101250-19NSW-NP
[2] https://caportal.com.au/tfnsw/m1rt/videos-and-images

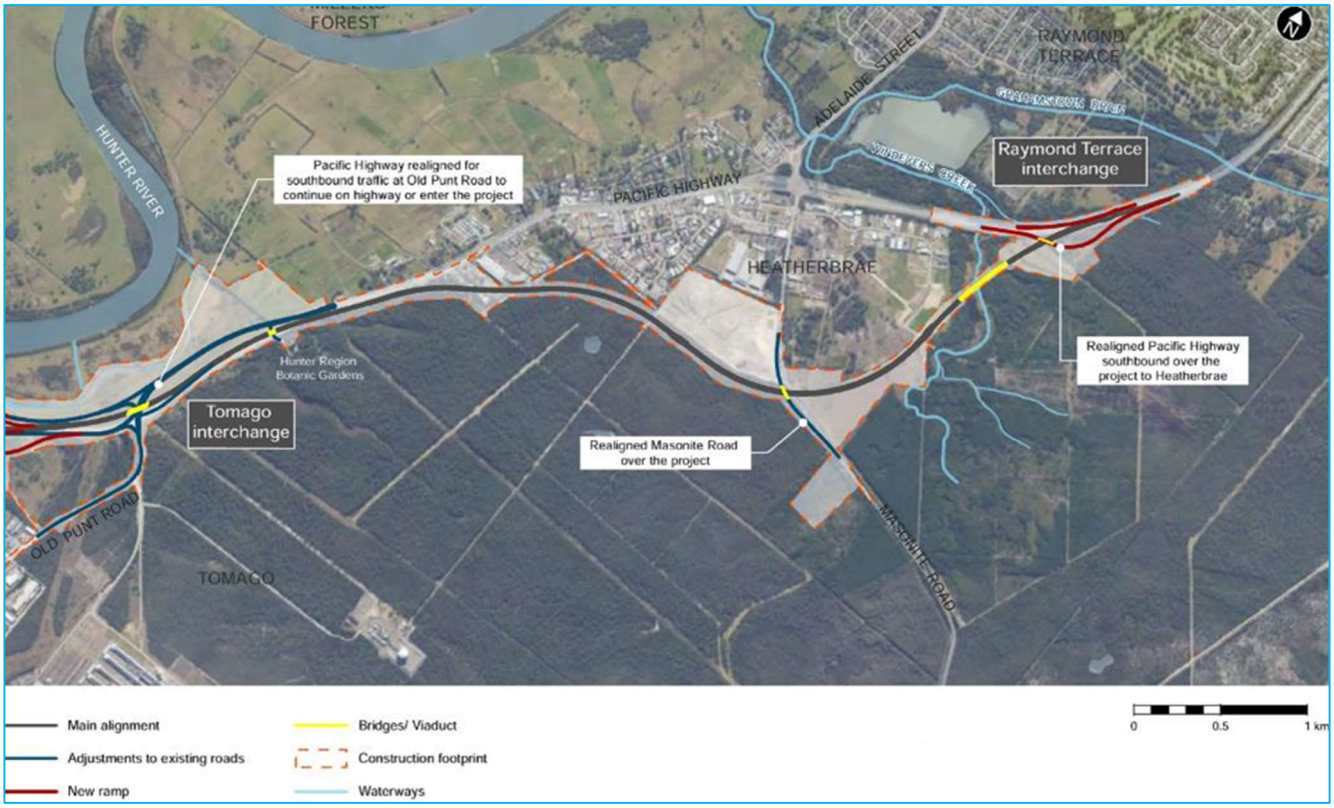
In addition, it is considered that the existing U-turn facility on the New England Highway (Maitland Road), approximately 2km west of the Tarro interchange will also be closed, however there is little detail on this provision on the project website. This could be due to the project still being in early design phase and as a result, not all design details are fully known or exhibited to the public. Based on a review of high-resolution aerial imagery, the potential closure of the U-turn facility in the westbound direction is likely to result in Aurizon staff seeking alternative routes from site, the most likely being the New England Highway (Maitland Road) / Weakleys Drive interchanges in Thornton.

Figure 4 M1 Pacific Motorway Extension to Raymond Terrace – Project Overview (1/2)



Source: M1 Pacific Motorway Extension to Raymond Terrace: Traffic and Transport Working Paper, Transport for NSW, July 2021

Figure 5 M1 Pacific Motorway Extension to Raymond Terrace – Project Overview (2/2)



Source: M1 Pacific Motorway Extension to Raymond Terrace: Traffic and Transport Working Paper, Transport for NSW, July 2021

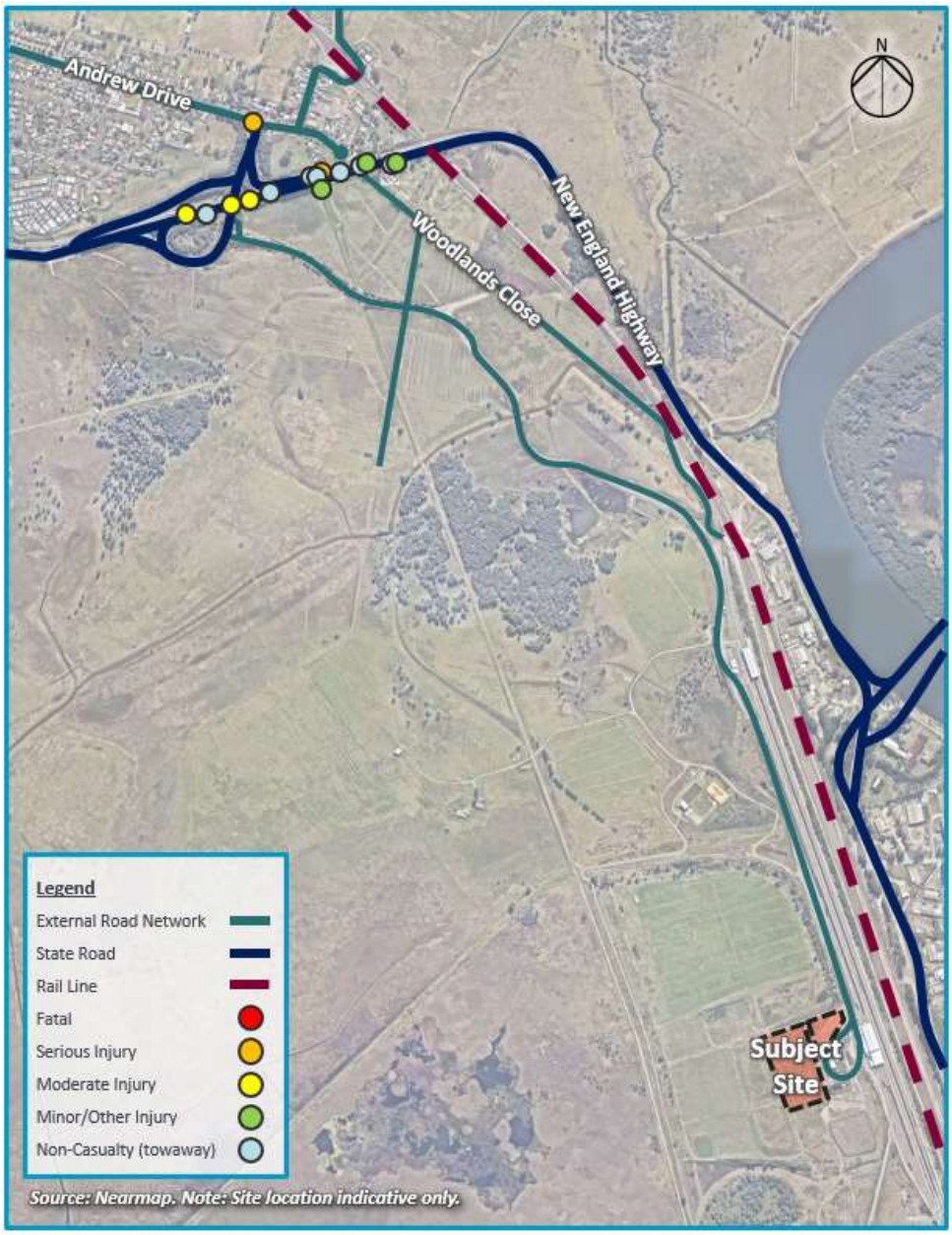
2.4 Crash History

In order to highlight any safety deficiencies in the surrounding road network in proximity to the Hexham LTTSF, crash data has been extracted from Transport for NSW Centre for Road Safety website[3]. Crashes are reported for the latest five-year period between 2016 and 2020.

The locations of the reported crashes are illustrated in **Figure 6**.

[3] https://roadsafety.transport.nsw.gov.au/statistics/interactivecrashstats/lga_stats.html?tablga=4

Figure 6 Crash Locations (Dataset queried on 08/12/2021)



Details of the crashes illustrated in **Figure 6** above are provided in **Table 4**.

Table 4 Crash Data Details

Location	Crash ID	Year	Severity	Rum Code	Description
New England Highway	1227155	2020	Moderate Injury	73	Right off Carriageway into Object / Parked Vehicle
New England Highway	1189252	2018	Non-casualty (towaway)	30	Rear end
New England Highway	1190319	2019	Moderate Injury	30	Rear end
New England Highway	1237283	2020	Moderate Injury	73	Right off Carriageway into Object / Parked Vehicle
New England Highway	1123174	2016	Non-casualty (towaway)	30	Rear end
New England Highway	1117400	2016	Non-casualty (towaway)	40	U turn
New England Highway	1156543	2017	Non-casualty (towaway)	34	Lane change right
New England Highway	1143982	2017	Minor / Other Injury	30	Rear end
New England Highway	1145174	2017	Non-casualty (towaway)	35	Lane change left
New England Highway	1144942	2017	Non-casualty (towaway)	35	Lane change left
New England Highway	1208054	2018	Minor / Other Injury	30	Rear end
New England Highway	1150631	2017	Non-casualty (towaway)	30	Rear end
New England Highway	1127232	2016	Minor / Other Injury	35	Lane change left
New England Highway	1167527	2018	Non-casualty (towaway)	30	Rear end
New England Highway	1235946	2020	Non-casualty (towaway)	71	Left off Carriageway into Object / Parked Vehicle
New England Highway	1170826	2018	Serious Injury	85	Off Carriageway Right on Left Bend into Object / Parked Vehicle
New England Highway	1150344	2017	Non-casualty (towaway)	30	Rear end

As shown in **Figure 6** and **Table 4**, there were no reported crashes that took place in the vicinity of the access road to the proposed development. All reported crashes shown above took place in New England Highway.

There were also no reported fatal crashes and there was only one reported crash that resulted in serious injuries within the five-year crash period. Excluding the reported crashes that resulted in no casualty, there were a total of seven reported crashes within the vicinity of the proposed development site during this period.

This dataset indicates that there is no recurring crash occurrence or theme in the immediate vicinity of the proposed development that would preclude development or warrant mitigation to enable development.

3 Development Overview

3.1 Proposed Development

An overview of the Modification Proposal is as follows:

- Site preparation and earthworks;
- Construction of the following elements:
  - A warehouse for the storage of rail maintenance equipment;
  - A depot for office staff and train crew; and
  - Ancillary staff and visitor car park connected to the private roadway (existing main access road).
- Rail wagon storage area located on the western portion of the Site;
- Ancillary infrastructure (hardstand, water management, landscaping, lighting etc); and
- Connection to utilities.

Plans of the proposed development are provided in **Appendix A**. The proposed land uses, and yields associated with the development are described in **Table 5**.

Table 5 Development Summary

Land Use	Yield / Unit
Crew Depot	Approximately 857.39m^2 GFA
Warehouse (Support Services Building)	Approximately 640.03m^2 GFA
Train Wagon Storage on dirt	Not applicable
Vehicle Wash Bay	1

3.2 Site Access and Car Parking

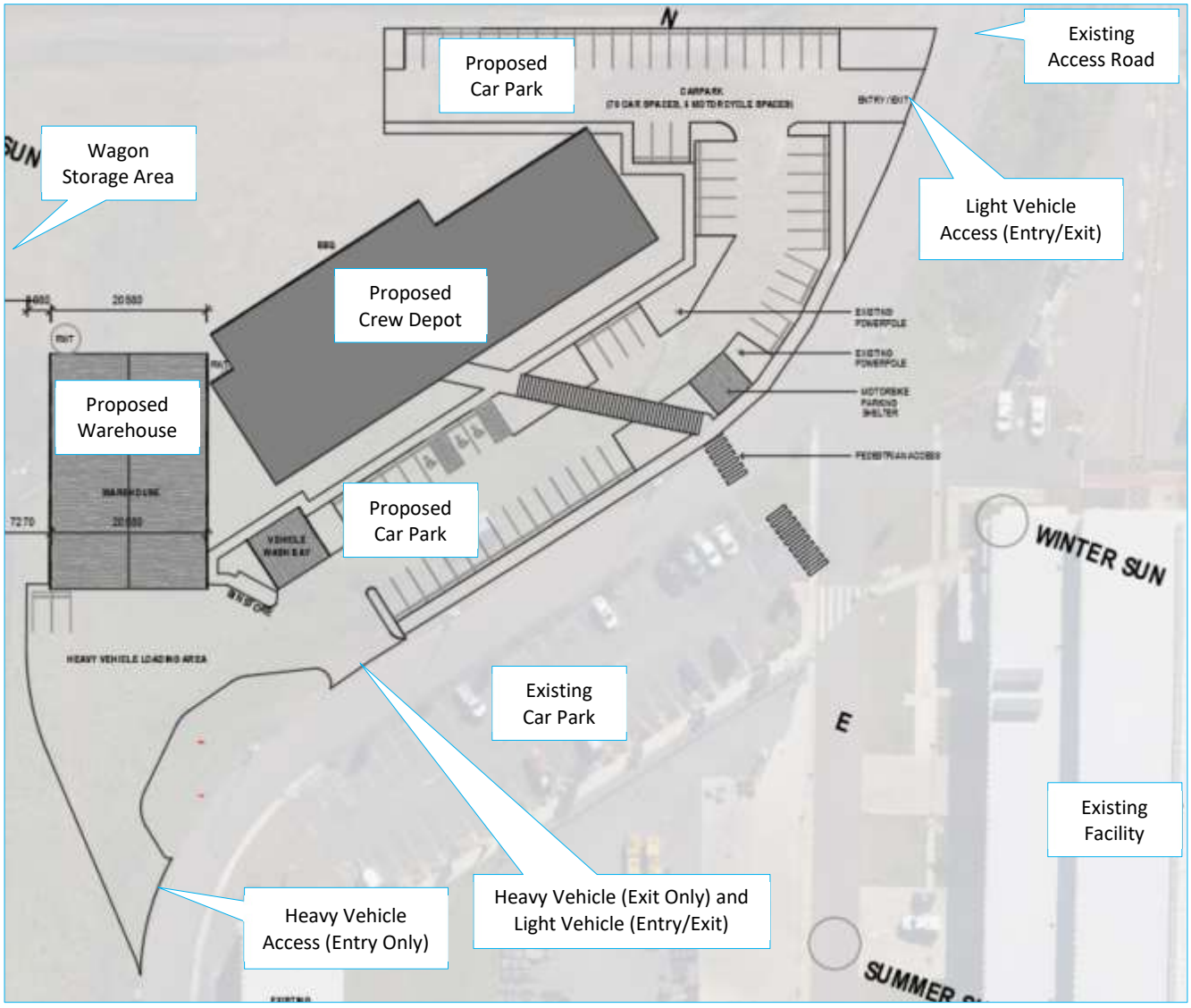
Architectural plans of the proposed development are illustrated in **Figure 7**. It should be noted that no changes are proposed to the vehicular site access at the Tarro Interchange.

Vehicular access for crew depot and warehouse development is proposed via three access driveway crossovers as described below:

- Entry/Exit for light vehicles (up to 5.2m long B99 design vehicle) at the northern end of the proposed facility;
- Entry only for all heavy vehicles (up to 20m long articulated vehicles - **AVs**) at the southern end of the proposed facility; and
- Exit only for heavy vehicles and entry/exit for light vehicles between the northern and southern access driveway crossovers (middle access).

All three site access locations are also illustrated in **Figure 7**.

Figure 7 Proposed Development and Site Access Arrangements



A total of 68 parking spaces are proposed for light vehicles within the site, inclusive of three (3) spaces for Persons with a Disability **(PWD)**. In addition to these parking spaces, there are a proposed heavy vehicle loading / unloading area that can cater for AVs and a shelter with five motorbike parking spaces.

3.3 Servicing

The driveway crossovers for heavy vehicles will be designed to accommodate vehicles up to the size of AVs. As a result, the internal traffic arrangements within the heavy vehicle area are designed for this design vehicle.

Refuse storage area is not shown in the plans however it is anticipated that the refuse should be stored at or near the heavy vehicle loading area so that Council's standard refuse collection vehicle (RCV – 10.4m long) will be able to collect the refuse safely and efficiently.

It is anticipated that all other servicing needs of the proposed development will be catered by medium rigid vehicles (MRV – 8.8m long).

4 Internal Design Considerations

4.1 Overview

A review of the proposed internal traffic arrangements, as shown on the development plan included in **Appendix A**, was undertaken against the following relevant documents:

- Newcastle Development Control Plan **(DCP)** Section 3.13 and 7.03;
- Australian Standards for Parking facilities Part 1: Off-street car parking (AS2890.1);
- Australian Standards for Parking facilities Part 2: Off-Street Commercial Vehicle Facilities (AS2890.2);
- Australian Standards for Parking facilities Part 6: Off-street parking for people with disabilities (AS2890.6);
- Austroads Guidelines (multiple).

4.2 Development Control Plan Requirements

4.2.1 Site Access and Internal Traffic Arrangements

Vehicular access to the wider facility is currently provided by an existing two-way priority intersection with a left-turn slip lane at the Tarro Interchange / Anderson Drive. This access road has a width that ranges from 8m to 11m and rural cross-section. No changes to the access road are proposed nor considered necessary as part of this application.

Section 7.03 *(Traffic, Parking and Access)* of Council's DCP sets the following objectives in relation to access points:

- Maintain the pedestrian amenity of streets;
- Protect the significance of heritage conservation areas; and
- Ensure that vehicular access is appropriately located.

Three separate vehicular accesses are proposed for the crew depot and warehouse developments. All heavy vehicles will enter and exit the site in the forward gear and via the two driveway crossovers to the southeast of the proposed warehouse. As per the swept path assessments provided in **Appendix C**, the driveway crossovers are designed to accommodate the largest anticipated design vehicle, which is an AV. Based on SLR's review of 30% detailed design drawings, an AV can enter and exit the site in a forward direction.

Reflective of the above, the proposed vehicular access arrangements satisfy the relevant design criteria and are therefore considered to be appropriate.

4.2.2 Car Parking and Circulation

The minimum car parking provisions for a warehouse is specified in Section 7.03 of the DCP, specifically Table 1. For ease of reference, the required parking rates are replicated in **Table 6** below:

Table 6 Minimum Car Parking Requirement

Land use	Yield	Car Parking Rate	Requirement
Warehouse (Support Services Building)	640.03m^2 GFA	Council's DCP: 1 space per 200m^2 GFA or 1 space per 2 staff (whichever is greater) RTA Guide: 1 space per 300m^2 GFA	4
Crew Depot	857.39m^2 GFA	Section 6.4 demonstrates that the maximum number of staff (train crew and office staff) onsite at any one time will be 51 staff. Therefore, assuming that each member of staff will travel by car, it is predicted that the minimum number of parking spaces that will be occupied is 51 spaces.	51
			55 spaces

As shown in the development plan (**Appendix A**), the development will provide 68 car parking spaces, which exceeds the minimum car parking requirements detailed in **Table 6**. Therefore, the proposed car parking provision is considered compliant.

Notwithstanding the above, a review of the parking rates provided in the RTA Guide to Traffic Generating Development shows that for office and commercial settings, one (1) parking space should be provided for every 40m^2 GFA. Based on the proposed GFA of 857.39m^2, this would equate to a total of 22 spaces. It is therefore evident that the proposed parking provision meets both the requirements for the site operator, whilst exceeding the applicable parking requirements determined by Council and State.

4.2.3 Motorbike Parking Provision

Based on a review of Council's DCP, it is understood that one motorbike parking space must be provided for every 20 car parking spaces in developments undertaking industrial activities. A total of 68 parking spaces are proposed and therefore four motorbike parking spaces must be provided.

The site plan for the proposed development indicates that five motorbike parking spaces are proposed under a shelter in the car parking area. This provision exceeds the requirements of Council's DCP.

4.2.4 PWD Car Parking Provision

The Building Code of Australia (BCA) stipulates the PWD car parking requirements based on the building classification. The proposed industrial developments are categorised as Class 5 and Class 7b building by the BCA, and as such, requires one (1) PWD space for every 100 car parking spaces or part thereof.

The site plan for the proposed development indicates that three (3) accessible car parking spaces are proposed immediately adjacent to the proposed crew sign-on depot. This provision exceeds the BCA requirements.

4.2.5 Construction Worker Parking

Based on a review of the plans, the reasonably remote nature of the site and the site having a total area of 255ha, construction worker parking is not anticipated to be an issue. As detailed in **Table 17** and **Section 7.4.3** of this report, less than 50 construction vehicles are expected to be on site on any given day during the construction period. Aerial imagery also confirms that there is plenty of space to park within the facility.

4.3 Proposed 30% Detailed Design

4.3.1 Site Access and Internal Traffic Arrangements

SLR undertook a design review of the 30% detailed design drawings prepared by GHD. Based on this review, the following has been determined:

- Northern Access Driveway: 30% detailed design drawings indicate that current design is 7.00m wide. Based on swept path assessments undertaken for a 5.2m long B99 design vehicle, proposed driveway width is considered satisfactory for the two-way operation of light vehicles;
- Middle Access Driveway (Exit only for AVs and two-way for light vehicles): 30% detailed design drawings indicate that current design is 10.00m at its narrowest point. Based on swept path assessments undertaken for a 20m long AV, proposed driveway width is considered satisfactory for both design vehicles; and
- Southern Access Driveway (Entry only for AVs): 30% detailed design drawings indicate that current design is 8.70m wide at its narrowest point. Based on swept path assessments undertaken for a 20m long AV, proposed driveway width is considered satisfactory for the entry manoeuvre of an AV.

Swept path assessments have been prepared using the largest design vehicle for each access driveway mentioned above. These swept paths assessments are provided in **Appendix C**.

4.3.2 Car Parking and Circulation

The design of the proposed car parking and circulation elements has been assessed against the requirements within AS2890.1, AS2890.2 and AS2890.6. This assessment is summarised in **Table 7**.

Table 7 Car Park and Circulation Compliance Review

Element	Proposed Design	AS2890 Compliant
90° parking bays (User Class 1A)	2.5m x 5.4m	Yes (2.4m x 5.4m)
PWD Carparking	2.5m x 5.4m with adjacent 2.5m x 5.4m shared zone	(2.4m x 5.4m with adjacent 2.4m x 5.4m shared zone)
Parking aisle width (User Class 1A)	7.0m or more	Yes (5.8m)
Loading Bay (MRV)	Not shown in 30% detailed design drawings however there is sufficient space in the loading area to cater for 8.8m long MRVs.	Yes (3.5m x 8.8m)
Loading Bay (AV)	Not shown in 30% detailed design drawings however there is sufficient space in the loading area to cater for AVs.	Yes (3.5m x 20.0m)

As identified in **Table 7**, the angled parking bays, PWD parking bays, aisle widths and circulating roadway widths exceed the spatial requirements of AS2890.1, AS2890.2 and AS2890.6, subject to SLR's design recommendation being adopted in the future design iterations.

5 Servicing Considerations

Section 7.03 Table 2 of the DCP outlines the general requirement for delivery and service vehicles for industrial uses. The requirement is reproduced in **Table 8**.

Table 8 Newcastle DCP delivery and service vehicle requirements for industrial use

Land Use	Requirements for Delivery and Service Vehicles
Wholesale, industrial (all spaces adequate for trucks)	<8,000m^2 GFA 1 space per 800m^2
	>8,000m^2 10 + 1 space per 1,000m^2 over 8,000m^2

Based on **Table 8** and the proposed developments' total GFA being less than 1,500m^2, it is understood that the proposed expansion works will require sufficient space to accommodate at least two service vehicles.

Servicing of the site will occur at the designated loading / unloading area, which is designed to accommodate heavy vehicles up to AVs (20m). It is expected that the refuse collection and other servicing activities will be serviced by 10.4m long Refuse Collection Vehicles (RCVs) or 8.8m long Medium Rigid Vehicles (MRVs). 30% detailed design drawings do not show the locations of the parking bays for these heavy vehicles however a review of the CAD plans provided to SLR indicate that there is sufficient space to cater for two service vehicles in this hardstand area, which is located to the south of the proposed car park.

A swept path assessment has been prepared for an AV and is included at **Appendix C**. This swept path assessment demonstrates that AVs will be able to suitably manoeuvre into and out of the proposed loading area, subject to the recommended widening of the exit driveway being adopted in the future design iterations.

6 Assessed Traffic Demands

6.1 Study Intersections

To investigate the potential traffic impacts of the development on the surrounding road network, the following intersections shown in **Figure 8** and **Table 9** were considered for the analysis.

Figure 8 Study Intersections

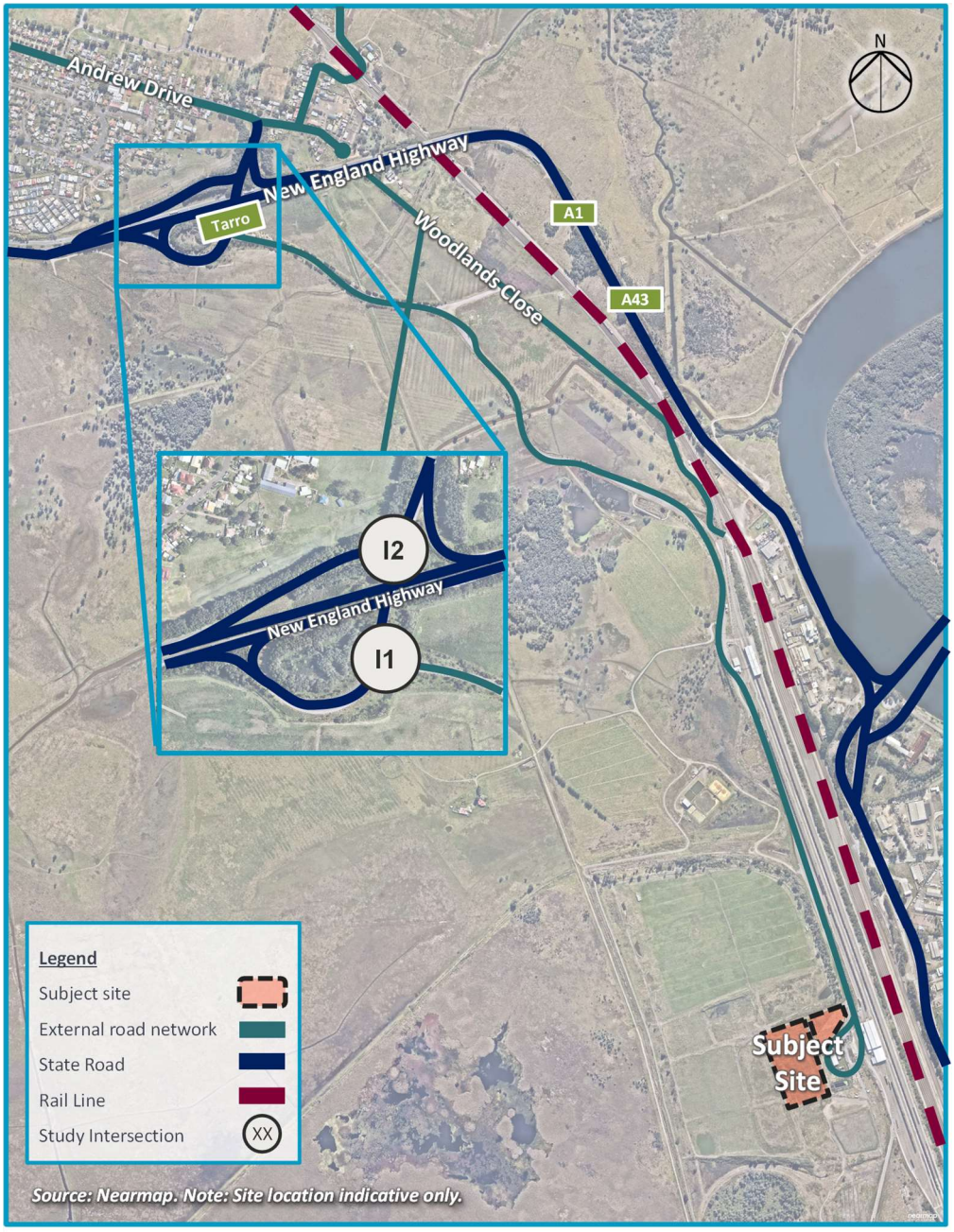


Table 9 Study Intersection

ID	Intersection	Form	Authority
I1	Maitland Road (New England Highway) / Access Road		TfNSW
I2	Maitland Road (New England Highway) Off Ramp / Anderson Drive		TfNSW, Council

6.2 Existing Traffic Demands

In order to ascertain the existing traffic demands, speed environment and vehicle composition for the road network surrounding the site access, automated pneumatic tube counts **(ATC)** survey was undertaken on Thursday 21 October 2021. The study intersections are as follows:

- I1 – New England Highway / Access Road – 3-way priority intersection; and
- I2 – New England Highway off Ramp / Anderson Drive – 3-way priority intersection.

Based on the ATC data it was established that the network peak hours were

- Weekday AM peak hour – 7:15 AM to 8:15 AM; and
- Weekday PM peak hour – 3:00 PM to 4:00 PM.

The traffic volumes used for this assessment are provided at **Appendix D**.

6.3 Background Traffic Demands

When considering forecast year demands, available traffic data from the nearby permanent counters should be extracted from NSW Traffic Volume Viewer. However, there are no permanent counters available on New England Highway that is within the proximity of the subject development. In order to provide a conservative assessment, a 2% p.a. linear growth rate has been adopted by SLR in this report.

6.4 Development Traffic Demands

As detailed in **Section 3.1**, the proposed development will comprise a warehouse to relocate the equipment stored in Mayfield and predominantly a sign-on depot for the existing crew.

Based on the specific nature of the site, it is considered appropriate to adopt a first principles assessment to estimate the traffic generation for the proposed development rather than assuming the industry standard rates provided in RTA (now TfNSW) *Guide to Traffic Generating Developments* (2002). Rates provided in the RTA guidance are based on gross floor areas (GFAs), however as existing personnel will be relocated from Aurizon's Mayfield facility to Hexham, exact staff numbers are known.

The adopted peak hour traffic generation rates and resultant traffic demand estimate for the proposed development are presented in **Table 10**.

Table 10 Development Peak Hour Traffic Demand Estimate

Staff	No	AM Peak Hour Trip Rate	PM Peak Hour Trip Rate
Office Staff (working ordinary hours)	43	1 (inbound trip per staff)	1 (outbound trip per staff)
Additional train crew (working shifts in irregular hours however assume they travel in the peak hours for added conservatism)	8	2 (one inbound and one outbound trip per staff)	2 (one outbound and one inbound trip per staff)

As outlined in **Table 10**, it is assumed that the proposed development would generate the following additional trips:

- Approx. 51 inbound and 8 outbound trips from/ to the wider network in the AM peak hour; and
- Approx. 51 outbound and 8 inbound trips to/ from the wider network in the PM peak hour.

Notwithstanding the above, SLR undertook a review of the trip generation rates provided in RTA Guide for a sense check of the assumptions above. For office and commercial settings, RTA Guide recommends 2 evening peak hour vehicle trips be adopted for every 100m^2 GFA. Based on the proposed GFA of 857.39m^2 of crew depot (office), this would equate to a total of 17 trips. It is evident that SLR's traffic generation assumptions demonstrated above are highly conservative.

6.5 Traffic Distribution

Typical industry practice to identify the traffic distribution of a workplace would be to analyse the Journey to Work data however Aurizon supplied SLR with their personnel's postcodes of residence. Based on the analysis of this information, SLR was able to determine the directional distribution of the anticipated traffic demand accurately.

Whilst analysing the traffic survey data, SLR also identified that there were some illegal right-turn movements at the following two intersections:

- Anderson Drive / Access Road; and
- Anderson Drive / New England Highway Offramp at Tarro Interchange.

While preparing the SIDRA models, consideration was also given to the illegal manoeuvres that are already taking place at the Tarro interchange. It is assumed that with the additional traffic generated by the proposed development, the proportion of illegal manoeuvres will continue.

Based on the analysis of the above information, the external trip distribution rates shown in **Table 11** were adopted.

Table 11 External Trip Distribution

Direction	Route	Weekday AM/PM Peak (All Vehicles)
North	Anderson Drive	9.66%
West	Westbound on New England Highway	33.52%
East / South	Westbound on New England Highway to perform a U-turn after travelling 1,750m in the westbound direction	56.82%
Total		**100.00%**

Reflective of all assumptions documented above, the traffic volumes (desktop models) utilised for the operational assessment are included at **Appendix E**.

7 Traffic Analysis

7.1 Operational Traffic Assessment

The traffic analysis has been undertaken using the volumes developed in a spreadsheet model making the assumptions outlined in Section 6.2 to and Section 6.5. Traffic flow diagrams are provided in **Appendix D**. The resulting data from the traffic surveys are provided in Appendix F.

The performance of the nominated study intersections was assessed using SIDRA Intersection 9.0 (SIDRA), a computer-based modelling software that determines intersection operation based on input parameters, including carriageway geometry and traffic volumes. Amongst other parameters, SIDRA provides an estimate of the intersection's Degree of Saturation (DOS), queues and delays. The maximum DOS thresholds identified by the Austroads Guide to Traffic Management *Part 12: Traffic Impacts of Developments* (AGTM12-19) for each intersection type are reproduced in **Table 12**.

Table 12 Degree of Saturation Thresholds

Intersection Type	DOS Threshold
Signalised intersections	Less than or equal to 0.90
Roundabouts	Less than or equal to 0.85
Priority controlled intersections	Less than or equal to 0.80

TfNSW (formerly RMS) defines intersection performance based on vehicle delay. SIDRA calculates the average delay encountered by all vehicles that travel through the modelled intersection and determines a level of service per intersection, approach, and lane. Based on Guide to Traffic Generating Developments[4] by TfNSW (2002), **Table 13** indicates the criteria that is adopted by SIDRA in assessing the level of service.

[4] TfNSW (formerly RMS) Guide to Traffic Generating Developments, Version 2.2 Dated October 2002
https://www.rms.nsw.gov.au/business-industry/partners-suppliers/documents/guides-manuals/guide-to-generating-traffic-developments.pdf

Table 13 TFNSW SIDRA Level of Service Criteria

Level of Service (LOS)	Average Delay per Vehicle (seconds / vehicle)	Signalised Intersections and Roundabouts	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	Operating 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

Level of Service **(LOS)** values exceeding LOS E indicate that an intersection is nearing its practical capacity and upgrades works or other interventions may be required. At LOS F, road users are likely to experience significant delays and excessive queueing.

It should also be noted that for roundabouts and priority control intersections, the critical movement for LOS assessment should be that with the worst movement delay, however for signalised intersections, LOS should be reported based on the average delay.

7.2 Assessment Scenarios

For the purposes of the traffic assessment conducted herein, it has been assumed that the year of opening of the proposed development will be 2022. On this basis, the performance of the road network has been considered for 10-year design horizon, consistent with typical Council and TfNSW operational assessment requirements.

- **2021 'Background':** To establish the existing operational performance in the absence of the proposed development;
- **2022 'Without Development':** To identify the impact of the background traffic growth at the year of opening;
- **2022 'With Development':** To identify the combined impacts of the background traffic growth and development generated traffic demands at the year of opening;
- **2032 'Without Development':** To identify the marginal impact of the background traffic growth at the 10-year design horizon; and
- **2032 'With Development':** To identify the marginal impact of the background traffic growth and the development generated traffic at the 10-year design horizon.

An operational assessment has been undertaken for New England Highway / Access Road (I1) and New England Highway Off Ramp / Anderson Drive (I2). The operation of these intersections during the weekday AM and PM peak hour periods has been assessed for all the above scenarios.

Whilst it is acknowledged that the proposed *"M1 Pacific Motorway Extension to Raymond Terrace"* project will be completed by 2032, no detailed information is presented in the supporting Traffic and Transport Working Paper (TfNSW, July 2021) that demonstrates any changes to traffic demand through the Tarro interchange, and therefore no allowance has been made for the M1 project within the intersection analysis that follows.

7.3 SIDRA Assessment

7.3.1 I1 – New England Highway / Access Road

The New England Highway / Access Road intersection is a 3-way priority intersection with a left-turn slip lane and channelised right turn (CHR) treatments. The adopted site layout extracted from the SIDRA model and the summary output from the SIDRA assessment are presented in **Figure 9** and **Table 14**, with more detailed SIDRA output provided in **Appendix E**.

Figure 9 New England Highway / Access Road – SIDRA Site Layout as Modelled

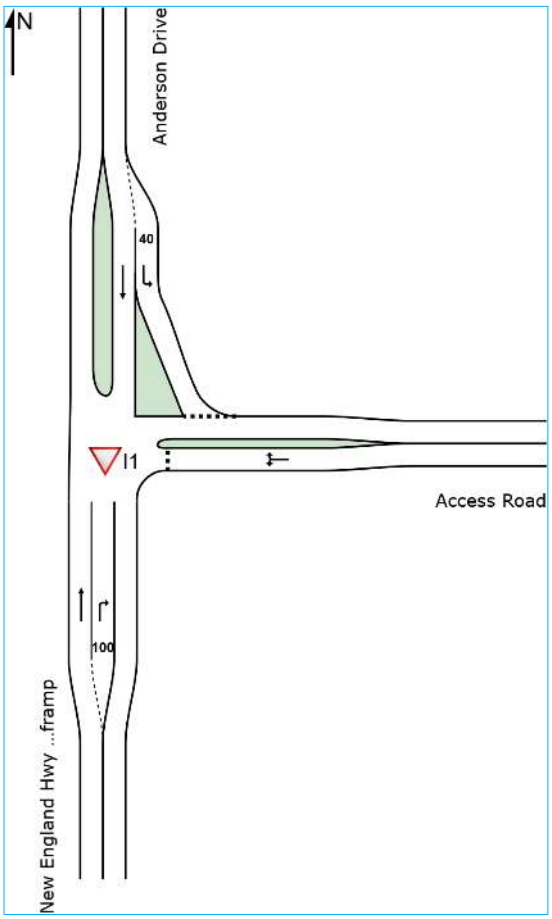


Table 14 New England Highway / Access Road – SIDRA Summary Output

Scenario	Thursday AM Peak			Thursday PM Peak		
	Max DOS (%)	Critical Movement Delay (s)	95th %ile Queue (m)	Max DOS (%)	Critical Movement Delay (s)	95th %ile Queue (m)
2021 Background (Existing Conditions)	0.097	7.5 – LOS A	0.2	0.165	9.1 – LOS A	0.2
2022 Background without Development	0.098	7.6 – LOS A	0.2	0.169	9.2 – LOS A	0.2
2022 Background with Development	0.099	7.9 – LOS A	0.4	0.169	9.5 – LOS A	1.9
2032 Background without Development	0.118	8.1 – LOS A	0.2	0.201	10.3 – LOS A	0.3
2032 Background with Development	0.119	8.5 – LOS A	0.4	0.201	10.8 – LOS A	2.1

The output from the operational assessment, as summarised in **Table 14**, indicate that the New England Highway Ramp / Access Road intersection operates well within the maximum desired operational thresholds for all assessed scenarios, with the traffic demands associated with the proposed development.

The greatest critical movement delay is observed in the 2032 PM Background with Development scenario for the east approach, which is 10.8 seconds per vehicle, or LOS A. The 95th percentile queue associated with this movement is only 2.1m.

7.3.2 I2 – New England Highway Off Ramp / Anderson Drive

The proposed New England Highway Off Ramp / Anderson Drive is a 3-way priority intersection for only egress movement from the New England Highway to Anderson Drive.

The site layout extracted from the SIDRA model and the summary output from the SIDRA assessment are presented in **Figure 10** and **Table 15** , with more detailed SIDRA output provided in **Appendix E**.

Figure 10 New England Highway Off Ramp / Anderson Drive – SIDRA Site Layout as Modelled

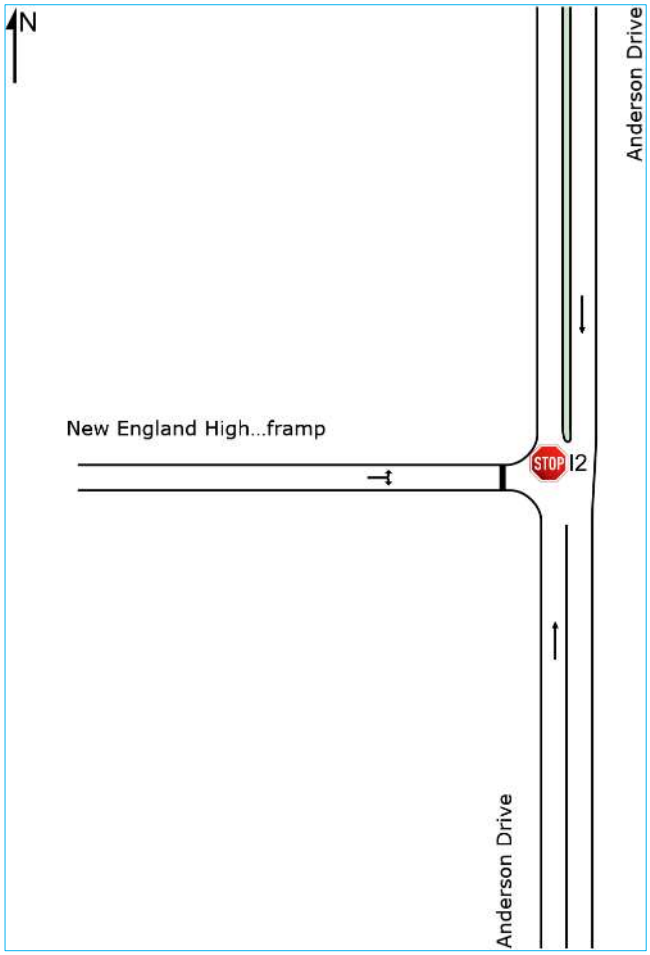


Table 15 New England Highway Off Ramp / Anderson Drive – SIDRA Summary Output

Scenario	Thursday AM Peak			Thursday PM Peak		
	Max DOS (%)	Critical Movement Delay (s)	95th %ile Queue (m)	Max DOS (%)	Critical Movement Delay (s)	95th %ile Queue (m)
2021 Background (Existing Conditions)	0.098	9.6 – LOS A	1.2	0.168	11.3 – LOS A	3.0
2022 Background without Development	0.101	9.6 – LOS A	1.2	0.171	11.4 – LOS A	3.1
2022 Background with Development	0.102	9.8 – LOS A	1.8	0.182	11.6 – LOS A	3.2
2032 Background without Development	0.120	10.2 – LOS A	1.5	0.205	12.7 – LOS A	4.0
2032 Background with Development	0.122	10.4 – LOS A	2.2	0.216	13.0 – LOS A	4.1

The output from the operational assessment, as summarised in **Table 15**, indicate that the New England Highway Offramp / Anderson Drive intersection operates well within the maximum desired operational thresholds for all assessed scenarios, with the traffic demands associated with the proposed development.

The greatest critical movement delay is observed in the 2032 PM Background with Development scenario for the east approach, which is 13.0 seconds per vehicle, or LOS A. The 95th percentile queue associated with this movement is only 4.1m.

7.4 High-Level Construction Traffic Assessment

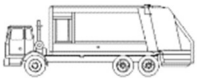
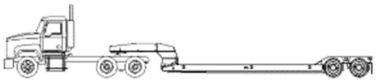
7.4.1 Proposed Civil Works

Aurizon proposes to undertake the construction of a depot, warehouse and wagon storage to support the ongoing operations of the Hexham Long Term Train Support Facility. As illustrated in the 30% detailed design drawings in **Appendix A**, a car park adjacent to the proposed crew sign on depot which can cater for 68 light vehicles and a loading / unloading area adjacent to the warehouse will also be constructed.

7.4.2 High-Level Construction Traffic Generation

It is understood that Aurizon will prepare a comprehensive construction traffic management plan **(CTMP)** once the necessary approvals for the proposal are obtained. It should also be noted a construction methodology will be required to inform the CTMP. None of these are readily available at the time of preparing this TIA. However, based on SLR's experience in the industry, it is anticipated the vehicle fleet illustrated in **Table** 16 will be utilised.

Table 16 Vehicle Fleet

Vehicle	Typical Vehicle Profile	Haulage Material
Private Vehicle		Supervision Workforce Conservatively assumed occupancy of 1 person per vehicle
Work Van		Labour Workforce Conservatively assumed occupancy of 2 persons per vehicle
Concrete Truck		Concrete
12.5m Heavy Rigid Vehicle		Water deliveries
20m Six Axle Articulated Vehicle		40ft container deliveries
20m 32t truck and dog		Aggregate
20m Flat deck		Equipment deliveries
12.5m Hook truck		Waste removal
20m Low Loader		Machinery deliveries

The construction traffic demands of the proposed works are expected to be associated with the workforce and the transportation of construction materials / equipment to the site:

7.4.3 Construction Traffic Volumes

The following assumptions were made to determine the construction traffic demands:

- Workforce will comprise a maximum of 50 persons on-site, being 46 laborers and 4 supervisors;
- Work will be undertaken during day light and standard working hours;
- Rosters will be based on five days on and two days off per week;
- No construction activity will be undertaken on Saturdays and Sundays;
- All construction materials will arrive to site from Newcastle Region and therefore will approach to the site via various routes to be determined in the construction traffic management plan at a later date;
- Entire workforce will be locally sourced (i.e., Newcastle, Maitland) and therefore will approach to the site via various routes to be determined in the construction traffic management plan at a later date;
- Delivery of engineering materials will be undertaken by 20m long Truck & Dog Trailer combinations with a nominal capacity of 32 tonnes;
- Water to suppress dust will be provided on-site by Aurizon and therefore no traffic impacts will occur;
- Machinery such as bulldozers, excavators, graders, compactors, scrapers, water carts, loaders will only be delivered once at the commencement of the project and taken away once at the completion of the project. Based on this, this machinery is not counted towards the peak construction traffic demand;
- Civil works will take a total of 90 business days (18 weeks) to complete; and

Based on the assumptions above, **Table 17** provides a summary of the anticipated construction traffic volumes.

Table 17 Construction Traffic Summary

Element	Assumption	Construction Traffic Generation
Light Vehicles – 5.2m B99 Car (Construction Supervisor)	Every construction supervisor drives alone in the peak hour, coinciding with the existing Aurizon staff for a conservative assessment.	4 inbound trips in the AM peak hour; and 4 outbound trips in the PM peak hour.
Light Vehicles – 5.2m B99 Van (Construction Worker)	Every construction worker drives one other crew member in the peak hour, coinciding with the existing Aurizon staff for a conservative assessment.	23 inbound trips in the AM peak hour; and 23 outbound trips in the PM peak hour.
Heavy Vehicles – up to 20m AV (Construction Materials)	Assume material deliveries occur every 20 minutes in the peak hours	3 inbound and 3 outbound trips in each of the AM and PM peak hours.
Heavy Vehicles – up to 20m AV (Plant)	Assume machinery deliveries occur every 20 minutes in the peak hours	3 inbound and 3 outbound trips in each of the AM and PM peak hours.
TOTAL Construction Traffic		**33 inbound and 6 outbound trips in the AM peak hour 6 inbound and 33 outbound trips in the PM peak hour**

Table 17 concludes that a maximum of 39 construction-related trips are anticipated in both the AM and PM peak hours. Given the operational traffic assessment was undertaken based on an assumption of 59 "new" development-related trips in each of the peak hours, it is anticipated that the study intersections will perform better in the construction scenario than in the operational scenario.

Therefore, based on the lower traffic demand in the construction scenario, no SIDRA assessments were undertaken for the construction traffic.

8 Summary and Conclusions

SLR has been engaged by Aurizon to prepare a TIA for a proposed Long Term Train Support Facility at Hexham, NSW. This State Significant Infrastructure modification is associated with construction and operation of a new warehouse for the storage of rail maintenance equipment, a new depot for train crew and a car parking connected to the existing access road, rail wagon storage area and ancillary infrastructure.

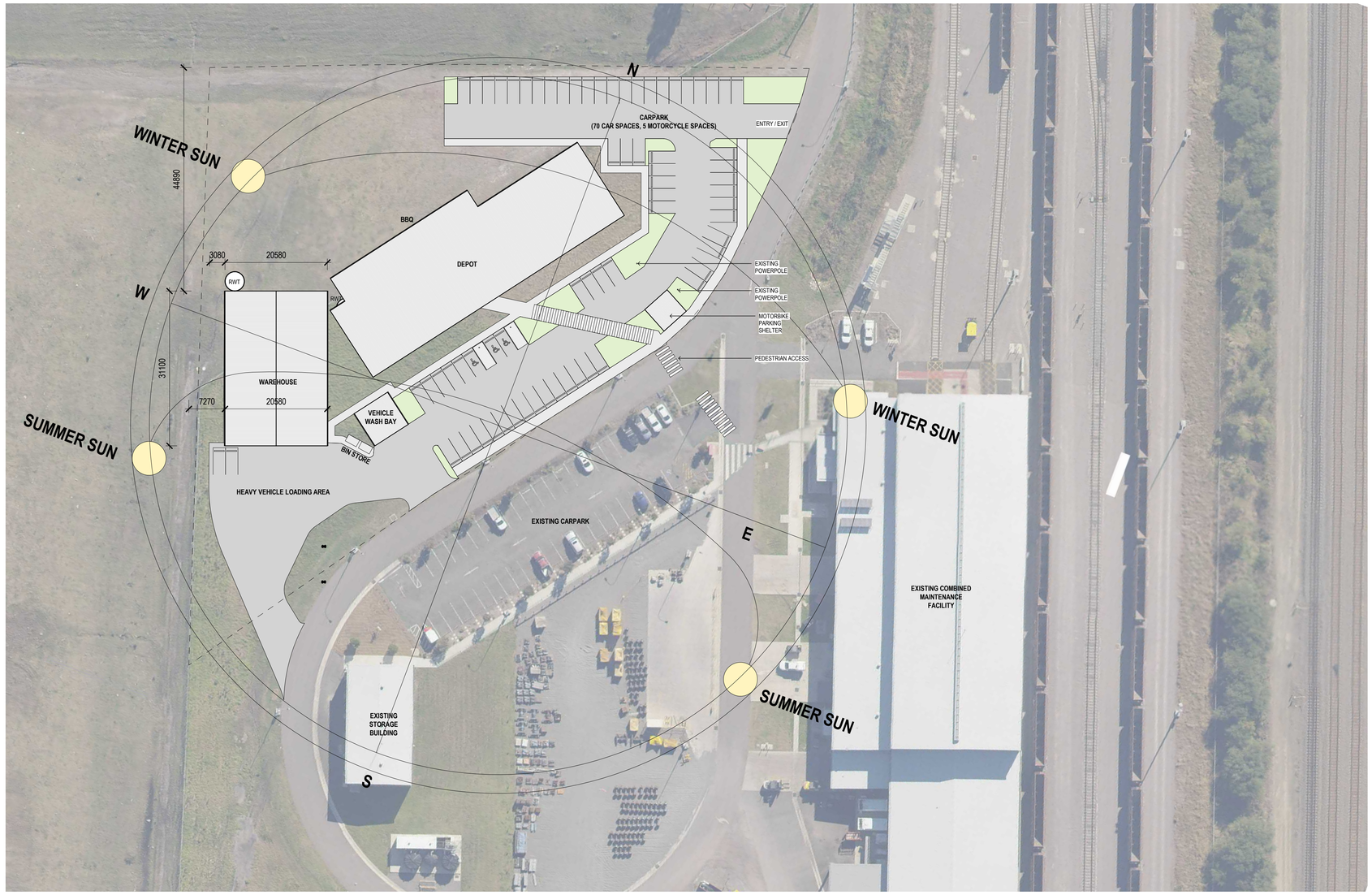
30% detailed design drawings are prepared by GHD and is included at **Appendix A**.

Based on the analysis and discussion documented herein, the following is concluded:

- The proposed development will generate additional 59 light vehicle trips in the morning and afternoon peak hours following the completion of the construction activities;
- The development's car parking and loading / unloading / servicing provisions are in accordance with the Council's DCP requirements;
- The proposed access, car parking and servicing arrangements satisfy the relevant DCP and AS2890 requirements;
- The operational assessment conducted herein demonstrates that the intersections on Anderson Drive at the New England Highway (Maitland Road) at the Tarro interchange will operate within acceptable performance levels under the 'With Development' traffic scenario at the 10-year design horizon (2032);
- It is concluded that the construction traffic demand will be less than the operational traffic demand and therefore no further detailed analysis of the above intersections was required; and
- The historic crash data on the surrounding road network indicates that there is no recurring crash occurrence or theme in the immediate vicinity of the proposed development that would preclude development or warrant mitigation to enable development.

APPENDIX A

Development Plans (30% Detailed Design Drawings)



REVISION					
B	DEPOT REDESIGN - FOR REVIEW	CA	RS	LG	23.02.22
A	30% DESIGN SUBMISSION - PRELIMINARY	CA	RS	LG	03.12.21
REV	DESCRIPTION	DES	CHK	APPD	DATE

0 5 10 15 20 25 m

SCALE 1:500 AT ORIGINAL SIZE

N

GHDWOODHEAD

Nominated Architect – Chris Acevski NSW (6843)

GHDWOODHEAD is a trading name of **GHD Pty Ltd.**

Level 3 GHD Tower,
24 Honeysuckle Drive, Newcastle NSW 2300 Australia
PO Box 5403 Hunter Rgn Mail Cent, NSW 2310
T 61 2 4979 9999 **F** 61 2 9475 0725
E ntlmail@ghd.com **W** www.ghdwoodhead.com

DESIGNED	C. ACVESKI	
CHECKED	R. STEVENS	
DRAWN	J. CARSON	
CHECKED		
APPROVED		
Approver		DATE
RPEQ No.		

AURIZON APPROVALS	
REVIEWED	
DESIGN LEADER	DATE
AUTHORISED	
ENGINEERING MANAGER	DATE

AURIZON

DRAWING TITLE

SITE PLAN

STATUS

30% DESIGN SUBMISSION

PROJECT No. **12560779**

DRAWING NUMBER **AUR-E-A002-7300**

REVISION **B**

REVISION					
B	DEPOT REDESIGN - FOR REVIEW	CA	RS	LG	23.02.22
A	30% DESIGN SUBMISSION - PRELIMINARY	CA	RS	LG	03.12.21
REV	DESCRIPTION	DES	CHK	APPD	DATE

0 1000 2000 3000 4000 5000 mm
SCALE 1:100 AT ORIGINAL SIZE

GHDWOODHEAD
Nominated Architect – Chris Acevski NSW (6843)
GHDWOODHEAD is a trading name of **GHD Pty Ltd.**

Level 3 GHD Tower,
24 Honeysuckle Drive, Newcastle NSW 2300 Australia
PO Box 5403 Hunter Rgn Mail Cent. NSW 2310
T 61 2 4979 9999 **F** 61 2 9475 0725
E ntlmail@ghd.com **W** www.ghdwoodhead.com

DESIGNED	C. ACVESKI
CHECKED	R. STEVENS
DRAWN	J. CARSON
CHECKED	
APPROVED	Approver
RPEQ No.	DATE

AURIZON APPROVALS	
REVIEWED	
DESIGN LEADER	DATE
AUTHORISED	
ENGINEERING MANAGER	DATE

AURIZON

DRAWING TITLE

DEPOT - GENERAL ARRANGEMENT PLAN

STATUS

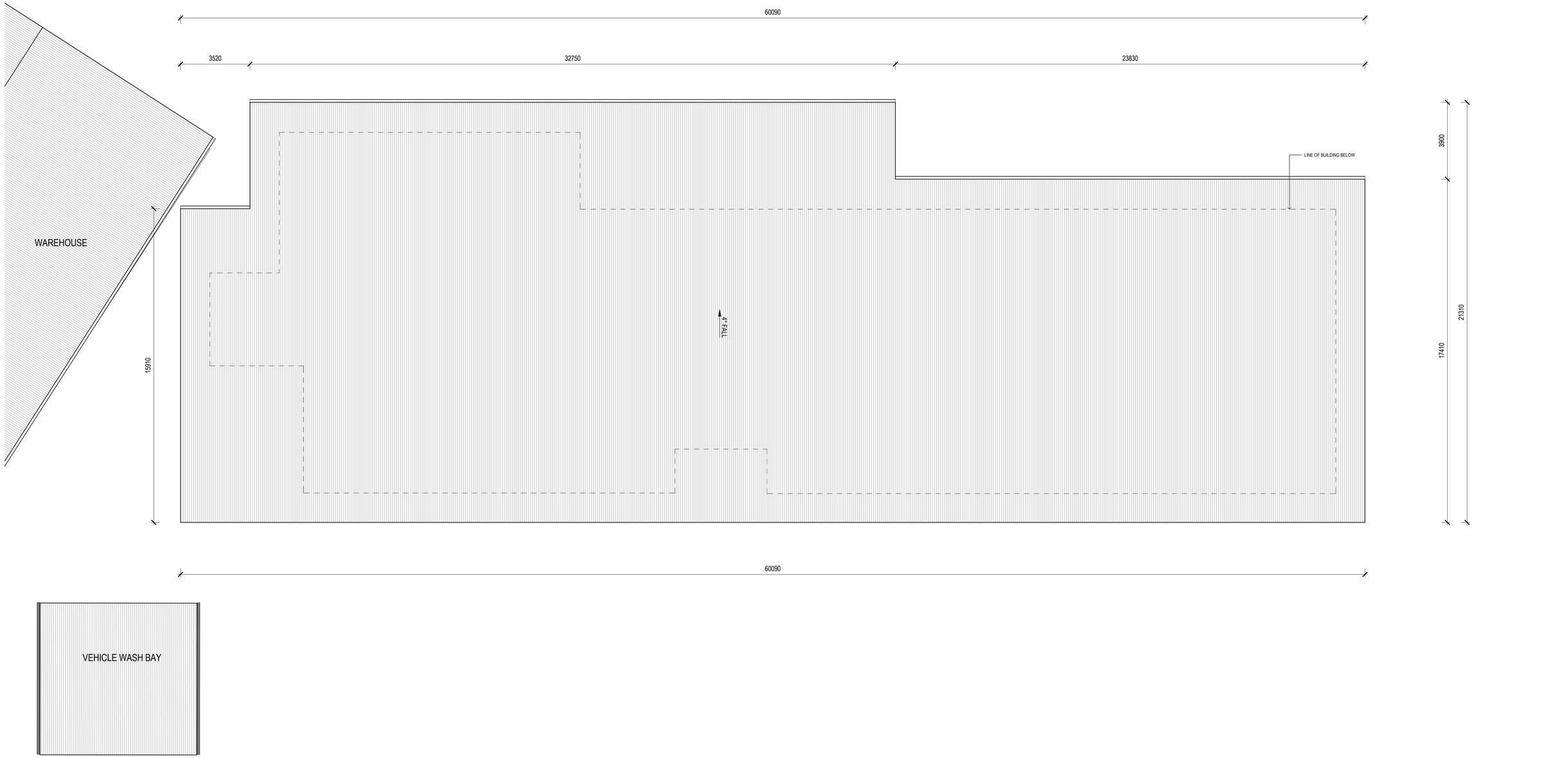
30% DESIGN SUBMISSION

PROJECT No. **12560779**

DRAWING NUMBER **AUR-E-A010-7300**

REVISION **B**

23/02/2022 10:18:41 AM File Name: BIM 360://12560779 - Aurizon Hexham - Operations Depot/12560779_AURIZON_ARC.rvt



REVISION

REV	DESCRIPTION	DES	CHK	APPD	DATE
B	DEPOT REDESIGN - FOR REVIEW	CA	RS	LG	23.02.22
A	30% DESIGN SUBMISSION - PRELIMINARY	CA	RS	LG	03.12.21

0 1000 2000 3000 4000 5000 mm

SCALE 1:100 AT ORIGINAL SIZE

N

GHDWOODHEAD

Nominated Architect – Chris Acevski NSW (6843)

GHDWOODHEAD is a trading name of **GHD Pty Ltd.**

Level 3 GHD Tower,
24 Honeysuckle Drive, Newcastle NSW 2300 Australia
PO Box 5403 Hunter Rgn Mail Cent. NSW 2310
T 61 2 4979 9999 **F** 61 2 9475 0725
E ntlmail@ghd.com **W** www.ghdwoodhead.com

DESIGNED	C. ACVESKI
CHECKED	R. STEVENS
DRAWN	J. CARSON
CHECKED	
APPROVED	Approver
RPEQ No.	DATE

AURIZON APPROVALS

REVIEWED

DESIGN LEADER DATE

AUTHORISED

ENGINEERING MANAGER DATE

AURIZON

DRAWING TITLE

DEPOT - ROOF PLAN

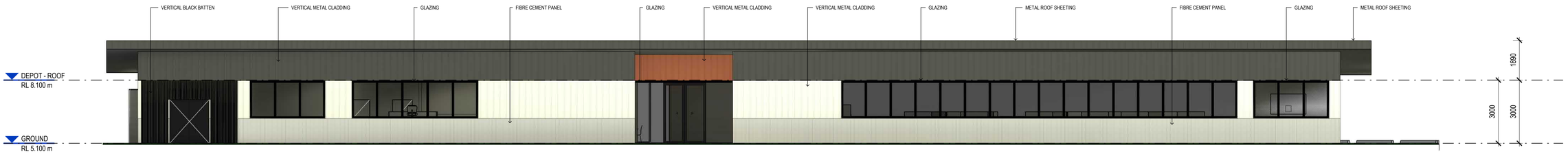
STATUS

30% DESIGN SUBMISSION

PROJECT No. **12560779**

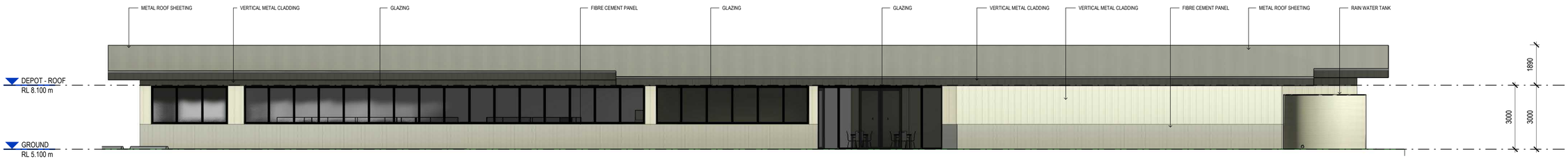
DRAWING NUMBER **AUR-E-A011-7300**

REVISION **B**



DEPOT - SOUTH EAST ELEVATION

SCALE 1 : 100

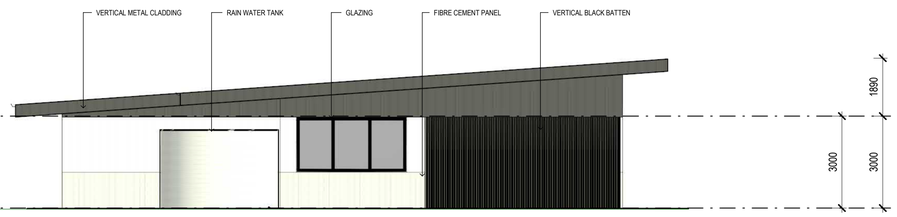


DEPOT - NORTH WEST ELEVATION

SCALE 1 : 100

DEPOT - NORTH EAST ELEVATION

SCALE 1 : 100



DEPOT - SOUTH ELEVATION

SCALE 1 : 100

REVISION

REV	DESCRIPTION	DES	CHK	APPD	DATE
B	DEPOT REDESIGN - FOR REVIEW	CA	RS	LG	23.02.22
A	30% DESIGN SUBMISSION - PRELIMINARY	CA	RS	LG	03.12.21

0 1000 2000 3000 4000 5000 mm

SCALE 1:100 AT ORIGINAL SIZE

GHDWOODHEAD

Nominated Architect – Chris Acevski NSW (6843)

GHDWOODHEAD is a trading name of **GHD Pty Ltd.**

Level 3 GHD Tower,
24 Honeysuckle Drive, Newcastle NSW 2300 Australia
PO Box 5403 Hunter Rgn Mail Cent. NSW 2310
T 61 2 4979 9999 **F** 61 2 9475 0725
E ntlmail@ghd.com **W** www.ghdwoodhead.com

DESIGNED	C. ACVESKI
CHECKED	R. STEVENS
DRAWN	J. CARSON
CHECKED	
APPROVED	Approver
RPEQ No.	DATE

AURIZON APPROVALS

REVIEWED

DESIGN LEADER DATE

AUTHORISED

ENGINEERING MANAGER DATE

AURIZON

DRAWING TITLE

DEPOT - ELEVATIONS

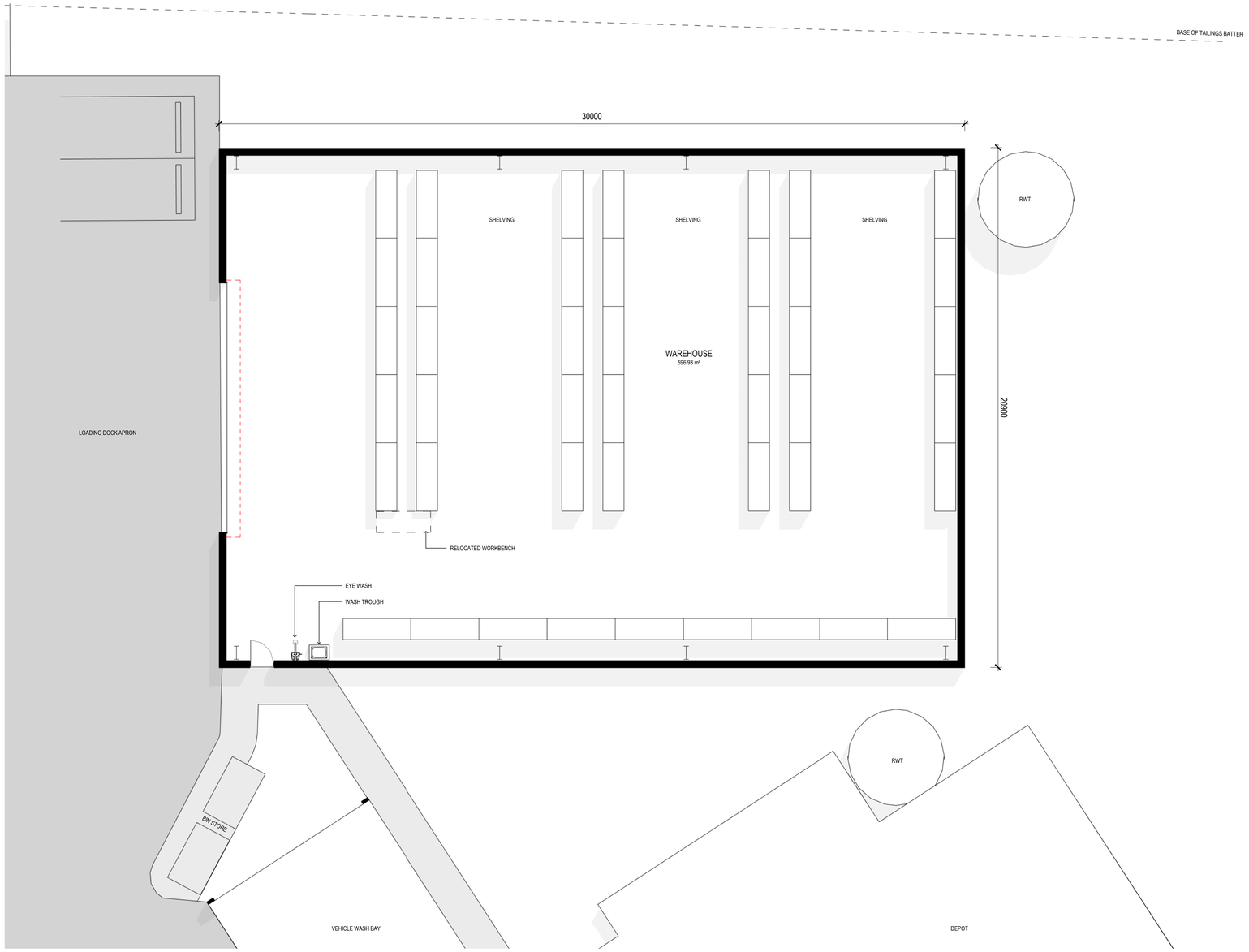
STATUS

30% DESIGN SUBMISSION

PROJECT No. **12560779**

DRAWING NUMBER **AUR-E-A012-7300**

REVISION **B**



REVISION

REV	DESCRIPTION	DES	CHK	APPD	DATE
C	DEPOT REDESIGN - FOR REVIEW	CA	RS	LG	23.02.22
B	30% DESIGN SUBMISSION - PRELIMINARY	CA	RS	LG	03.12.21
A	FOR CLIENT REVIEW	CA	RS	LG	24.11.21

0 1000 2000 3000 4000 5000 mm

SCALE 1:100 AT ORIGINAL SIZE

GHDWOODHEAD

Nominated Architect – Chris Acevski NSW (6843)

GHDWOODHEAD is a trading name of **GHD Pty Ltd.**

Level 3 GHD Tower,
24 Honeysuckle Drive, Newcastle NSW 2300 Australia
PO Box 5403 Hunter Rgn Mail Cent. NSW 2310
T 61 2 4979 9999 **F** 61 2 9475 0725
E ntlmail@ghd.com **W** www.ghdwoodhead.com

DESIGNED	C. ACVESKI
CHECKED	R. STEVENS
DRAWN	J. CARSON
CHECKED	
APPROVED	Approver
RPEQ No.	DATE

AURIZON APPROVALS

REVIEWED

DESIGN LEADER DATE

AUTHORISED

ENGINEERING MANAGER DATE

AURIZON

DRAWING TITLE

WAREHOUSE - GENERAL ARRANGEMENT PLAN

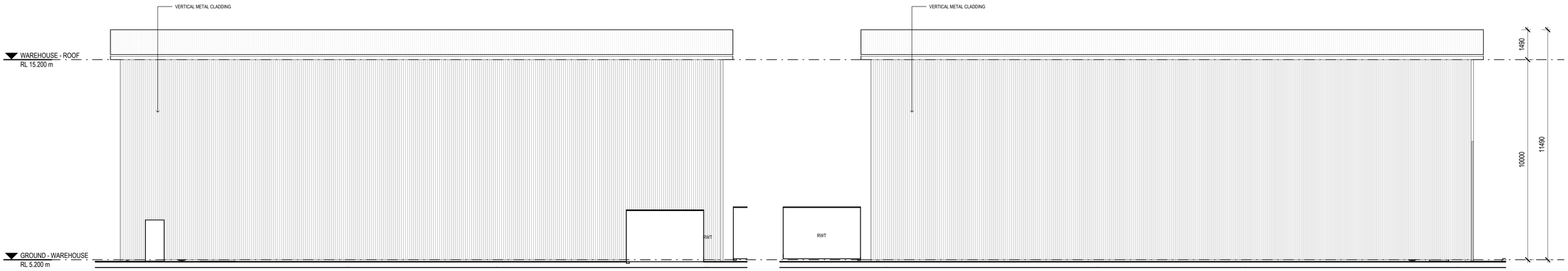
STATUS

30% DESIGN SUBMISSION

PROJECT No. **12560779**

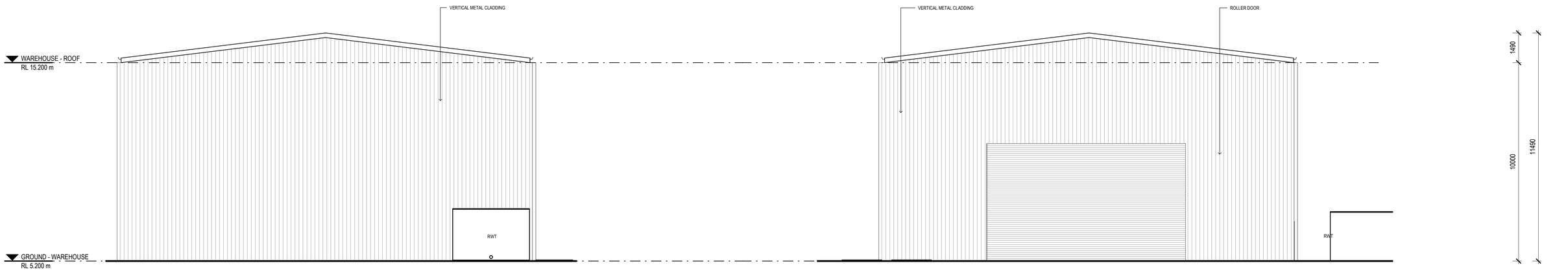
DRAWING NUMBER **AUR-E-A020-7300**

REVISION **C**



WAREHOUSE - EAST ELEVATION
SCALE 1 : 100

WAREHOUSE - WEST ELEVATION
SCALE 1 : 100



WAREHOUSE - NORTH ELEVATION
SCALE 1 : 100

WAREHOUSE - SOUTH ELEVATION
SCALE 1 : 100

REVISION

REV	DESCRIPTION	DES	CHK	APPD	DATE
C	DEPOT REDESIGN - FOR REVIEW	CA	RS	LG	23.02.22
B	30% DESIGN SUBMISSION - PRELIMINARY	CA	RS	LG	03.12.21
A	FOR CLIENT REVIEW	CA	RS	LG	24.11.21

0 1000 2000 3000 4000 5000 mm
SCALE 1:100 AT ORIGINAL SIZE

GHDWOODHEAD
Nominated Architect – Chris Acevski NSW (6843)
GHDWOODHEAD is a trading name of **GHD Pty Ltd.**

Level 3 GHD Tower,
24 Honeysuckle Drive, Newcastle NSW 2300 Australia
PO Box 5403 Hunter Rgn Mail Cent. NSW 2310
T 61 2 4979 9999 **F** 61 2 9475 0725
E ntlmail@ghd.com **W** www.ghdwoodhead.com

DESIGNED	C. ACVESKI
CHECKED	R. STEVENS
DRAWN	J. CARSON
CHECKED	
APPROVED	Approver
RPEQ No.	DATE

AURIZON APPROVALS	
REVIEWED	
DESIGN LEADER	DATE
AUTHORISED	
ENGINEERING MANAGER	DATE

AURIZON

DRAWING TITLE
WAREHOUSE - ELEVATIONS

STATUS
30% DESIGN SUBMISSION

PROJECT No. **12560779**

DRAWING NUMBER **AUR-E-A022-7300**

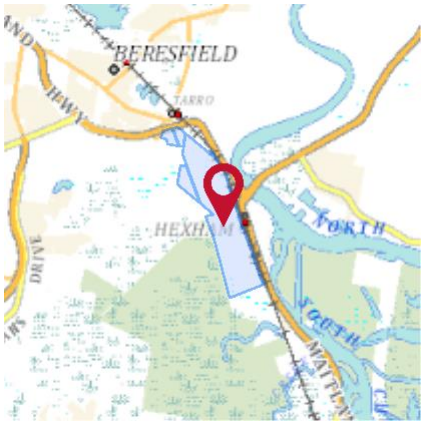
REVISION **C**

APPENDIX B

Property Report

Property Report

179 MAITLAND ROAD HEXHAM 2322



Property Details

Address:	179 MAITLAND ROAD HEXHAM 2322		
Lot/Section /Plan No:	1/-/DP155530	10/-/DP735235	102/-/DP1084709
	104/-/DP1084709	104/-/DP1189565	105/-/DP1189565
	106/-/DP1189565	13/-/DP842856	2/-/DP735456
	5/-/DP227556	6/-/DP227556	
Council:	NEWCASTLE CITY COUNCIL		

Summary of planning controls

Planning controls held within the Planning Database are summarised below. The property may be affected by additional planning controls not outlined in this report. Please contact your council for more information.

Local Environmental Plans	Newcastle Local Environmental Plan 2012 (pub. 30-5-2014)
Land Zoning	C2 - Environmental Conservation: (pub. 5-11-2021)
	IN3 - Heavy Industrial: (pub. 15-6-2012)
Height Of Building	NA
Floor Space Ratio	NA
Minimum Lot Size	1000 m²
	40 ha
Heritage	Minmi To Hexham Railway Significance: State
Land Reservation Acquisition	Classified Road (E2)
Foreshore Building Line	NA
Acid Sulfate Soils	Class 2

Detailed planning information

State Environmental Planning Policies which apply to this property

State Environmental Planning Policies can specify planning controls for certain areas and/or types of development. They can also identify the development assessment system that applies and the type of environmental assessment that is required.

- State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004: Land Application (pub. 25-6-2004)
- State Environmental Planning Policy (Coastal Management) 2018: Land Application (pub. 17-12-2018)
- State Environmental Planning Policy (Coastal Management) 2018: Subject Land (pub. 23-3-2018)
- State Environmental Planning Policy (Concurrences and Consents) 2018: Land Application (pub. 21-12-2018)
- State Environmental Planning Policy (Educational Establishments and Child Care Facilities) 2017: Land Application (pub. 1-9-2017)
- State Environmental Planning Policy (Exempt and Complying Development Codes) 2008: Land Application (pub. 12-12-2008)
- State Environmental Planning Policy (Housing) 2021: Land Application (pub. 26-11-2021)
- State Environmental Planning Policy (Infrastructure) 2007: Land Application (pub. 21-12-2007)
- State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007: Land Application (pub. 16-2-2007)
- State Environmental Planning Policy (Primary Production and Rural Development) 2019: Land Application (pub. 28-2-2019)
- State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017: Excluded (pub. 17-9-2021)
- State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017: Subject Land (pub. 25-8-2017)
- State Environmental Planning Policy No 33—Hazardous and Offensive Development: Land Application (pub. 13-3-1992)
- State Environmental Planning Policy No 50—Canal Estate Development: Land Application (pub. 10-11-1997)
- State Environmental Planning Policy No 55—Remediation of Land: Land Application (pub. 28-8-1998)
- State Environmental Planning Policy No 64—Advertising and Signage: Land Application (pub. 16-3-2001)
- State Environmental Planning Policy No 65—Design Quality of Residential Apartment Development: Land Application (pub. 26-7-2002)

Property Report

179 MAITLAND ROAD HEXHAM 2322

Other matters affecting the property

Information held in the Planning Database about other matters affecting the property appears below. The property may also be affected by additional planning controls not outlined in this report. Please speak to your council for more information

1.5 m Buffer around Classified Roads	Classified Road Adjacent
Biodiversity Value (BV) Map	Clearing native vegetation for a development on an area on the BV Map may require a Biodiversity Development Assessment Report. Consult your local council.
Bushfire Prone Land	Vegetation Buffer
	Vegetation Category
Hunter Valley Flood Mitigation Scheme Development Consent Area	Declared Floodplain (Newcastle City Council DC)
Land near High Pressure Pipelines	This property may be located near High Pressure Pipelines and could be subject to requirements listed under ISEPP Clause 66C. Please contact the relevant consent authority for more information.
Local Aboriginal Land Council	AWABAKAL
	MINDARIBBA
Regional Plan Boundary	Hunter

APPENDIX C

Swept Path Assessments
(Based on 30% Detailed Design Drawings)

CONCEPT ONLY

N

CARPARK
(70 CAR SPACES, 5 MOTORCYCLE SPACES)

ENTRY / EXIT

BBQ

DEPOT

3080

20580

RWT

RWT

WAREHOUSE

7270

20580

VEHICLE WASH BAY

BIN STORE

HEAVY VEHICLE LOADING AREA

EXISTING POWERPOLE

EXISTING POWERPOLE

MOTORBIKE PARKING SHELTER

PEDESTRIAN ACCESS

WINTER SUN

EXISTING CARPARK

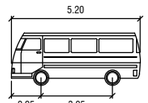
SLR

15 ASTOR TERRACE
SPRING HILL 4000
AUSTRALIA
T: 61 7 3858 4800
www.slrconsulting.com

Project No:	620.30688
Date:	14/03/2022
Drawn by:	Charlie Seventekin
Scale:	AS SHOWN
Sheet Size:	A3
Projection:	-

SWEPT PATH LEGEND

- Vehicle Path
- Vehicle Body
- Body Clearance
- Front Wheels



PASSENGER-VAN

	meters
Width	: 1.94
Track	: 1.84
Lock to Lock Time	: 6.0
Steering Angle	: 33.6

N

0.0 1.5 3 4.5 6
METERS

SCALE 1:150

Aurizon

Hexham Facility Expansion

5.2m B99 Design Vehicle Swept Path Assessment

FIGURE SK-01

CONCEPT ONLY

3080
20580
31100
7270
20580

RWT
RWT

DEPOT
WAREHOUSE
VEHICLE WASH BAY
BIN STORE
HEAVY VEHICLE LOADING AREA
EXISTING CARPARK
EXISTING STORAGE BUILDING
EXISTING COMBINED MAINTENANCE FACILITY

EXISTING POWERPOLE
EXISTING POWERPOLE
MOTORBIKE PARKING SHELTER
PEDESTRIAN ACCESS

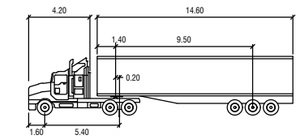
W
R SUN
WINTER SUN
E
SUMMER SUN
S

AV STANDARDS 2018 (4m)

SLR
15 ASTOR TERRACE
SPRING HILL 4000
AUSTRALIA
T: 61 7 3858 4800
www.slrconsulting.com

Project No:	620.30688
Date:	14/03/2022
Drawn by:	Charlie Seventekin
Scale:	AS SHOWN
Sheet Size:	A3
Projection:	-

SWEPT PATH LEGEND
- Vehicle Path
- Vehicle Body
- Body Clearance
- Front Wheels



AV

meters

Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 28.3
Tractor Track	: 2.50	Articulating Angle	: 72.0
Trailer Track	: 2.50		

N

0.0 5.0 10 15 20
METRES

SCALE 1:500

Aurizon

Hexham Facility Expansion

20m AV Design Vehicle Swept Path Assessment

FIGURE SK-02

APPENDIX D

Traffic Flow Diagrams (Desktop Models)

Legend

L Left Turn
T Through
R Right turn
U U-turn

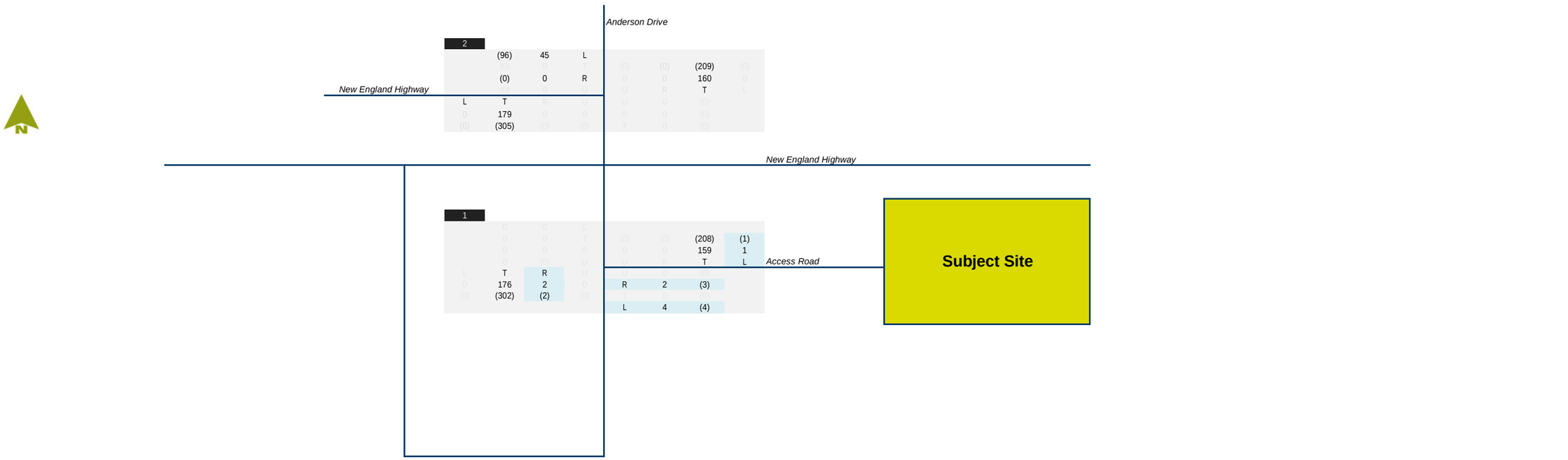
00 Weekday AM Peak Hour Volumes
(00) Weekday PM Peak Hour Volumes

2021 Traffic Survey Results

Aurizon Hexham Depot LVIA - Transport

620.30688.00100

04-02-2022



Legend

L Left Turn
T Through
R Right turn
U U-turn

00 Weekday AM Peak Hour Volumes
(00) Weekday PM Peak Hour Volumes

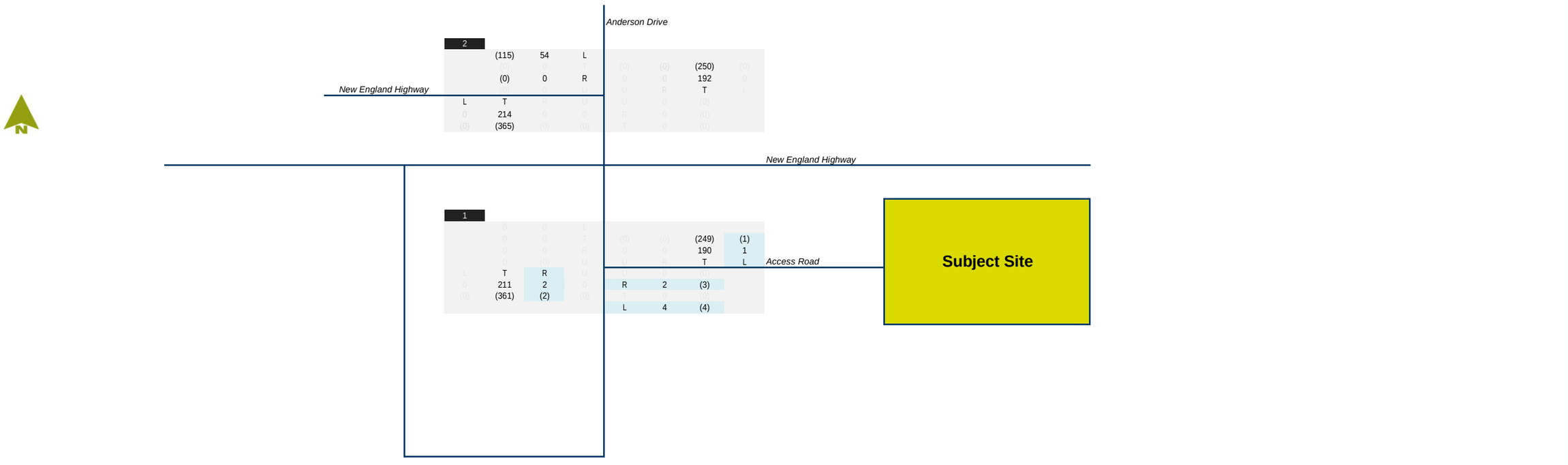
2022 Background Growth

Aurizon Hexham Depot LVIA - Transport

620.30688.00100

04-02-2022

SLR



Legend

L Left Turn
T Through
R Right turn
U U-turn

00 Weekday AM Peak Hour Volumes
(00) Weekday PM Peak Hour Volumes

2032 Background Growth

Aurizon Hexham Depot LVIA - Transport

620.30688.00100

04-02-2022

SLR

Legend

L Left Turn
T Through
R Right turn
U U-turn

00 Weekday AM Peak Hour Volumes
(00) Weekday PM Peak Hour Volumes

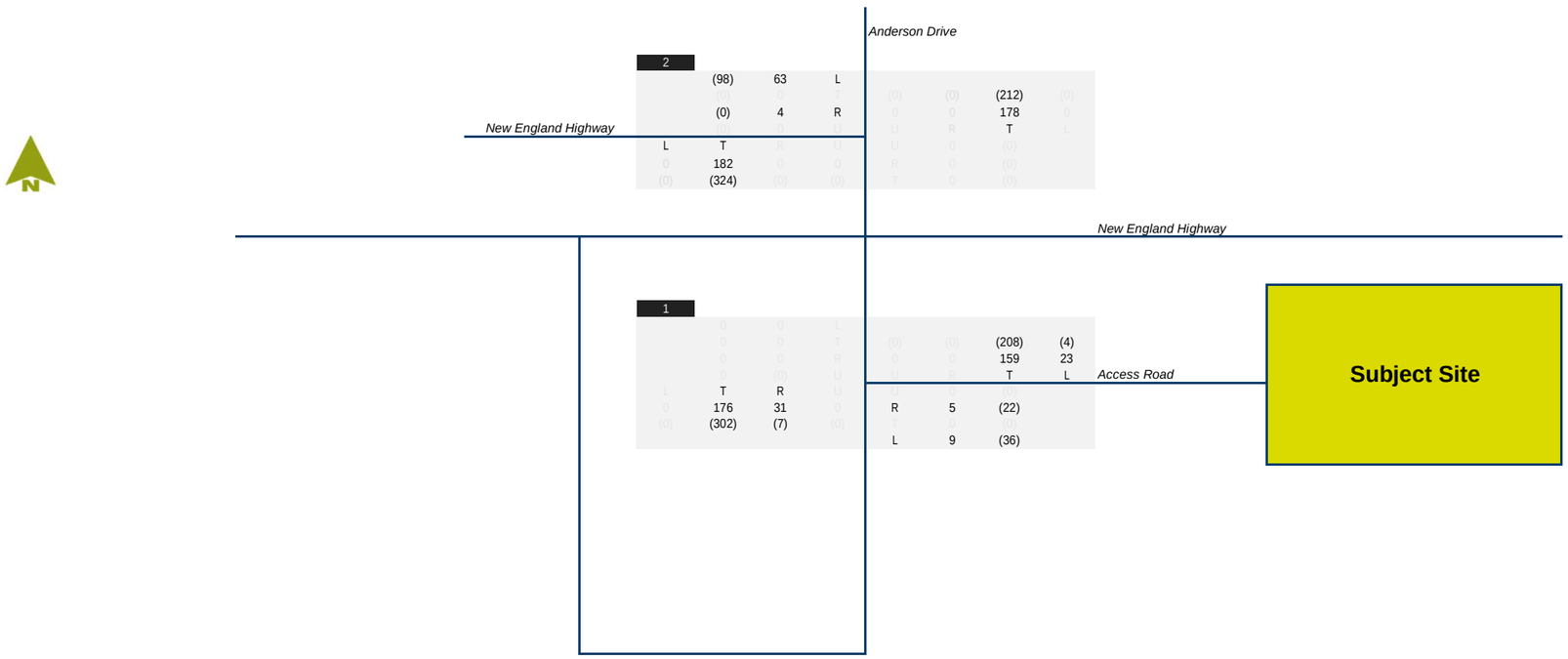
Development Trips

Aurizon Hexham Depot LVIA - Transport

620.30688.00100

04-02-2022

SLR



Legend

L Left Turn
T Through
R Right turn
U U-turn

00 Weekday AM Peak Hour Volumes
(00) Weekday PM Peak Hour Volumes

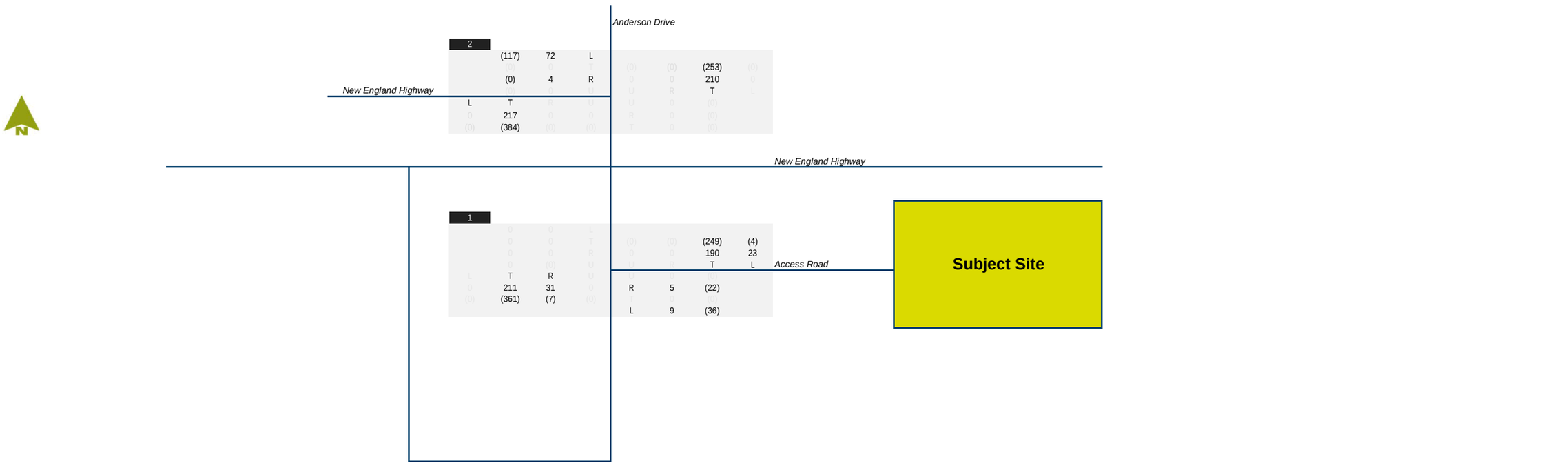
2022 Background with Development

Aurizon Hexham Depot LVIA - Transport

620.30688.00100

04-02-2022

SLR



Legend

L Left Turn
T Through
R Right turn
U U-turn

00 Weekday AM Peak Hour Volumes
(00) Weekday PM Peak Hour Volumes

2032 Background with Development

Aurizon Hexham Depot LVIA - Transport

620.30688.00100

04-02-2022

SLR

APPENDIX E

SIDRA Outputs

USER REPORT FOR SITE

All Movement Classes

Project: 620.30688.00100-SIDRA Analysis-2022 02 02

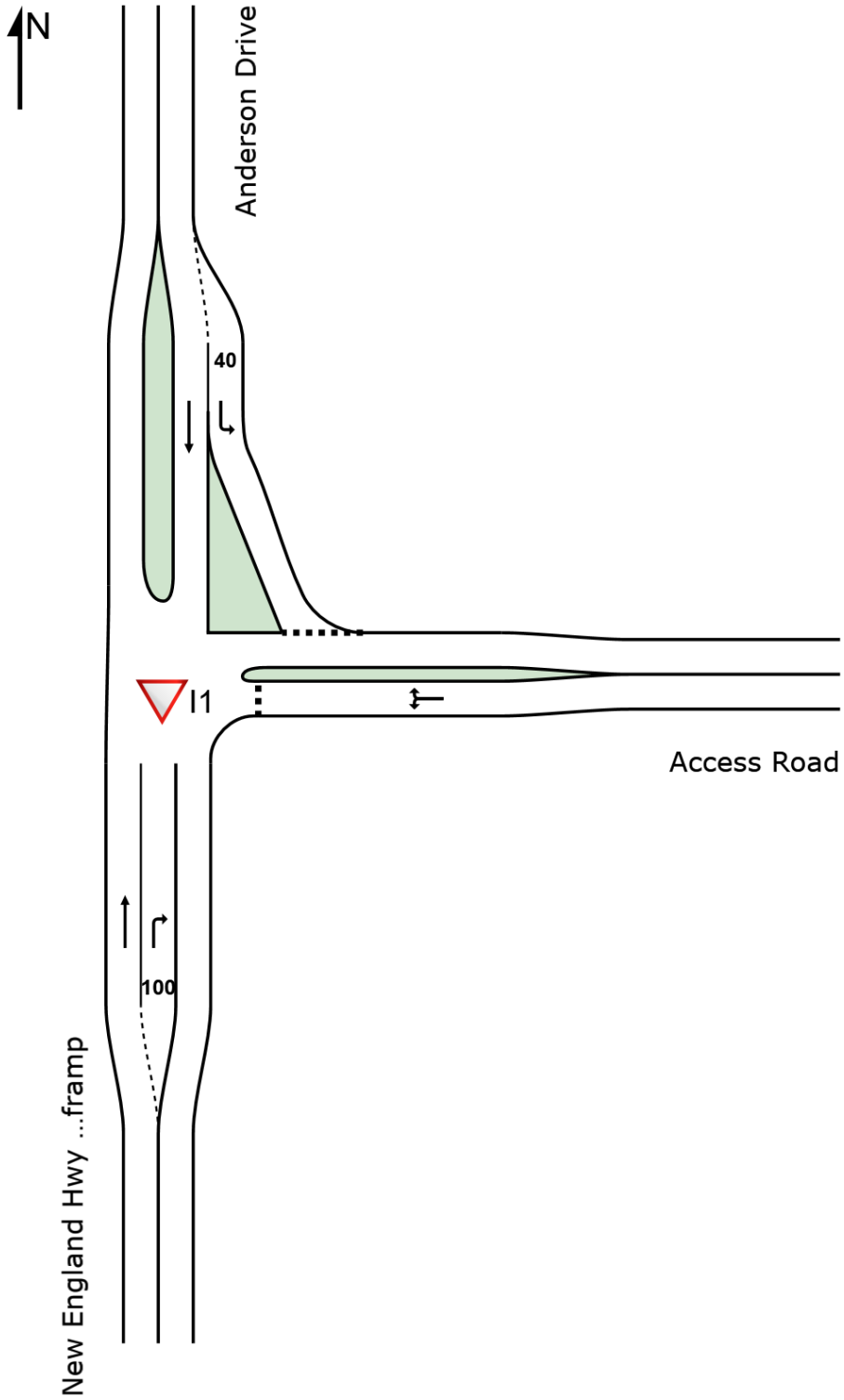
Template: Template 1 - Site Layout

Site: I1 [I1 - Off Ramp & Access Road - EX2021 AM (Site Folder: Existing 2021)]

EX.2021 - AM Peak
620.30688-Aurizon Hexham Depot LVIA
Site Category: Existing Design
Give-Way (Two-Way)

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.


N
Anderson Drive
40
I1
Access Road
100
New England Hwy ...framp

USER REPORT FOR SITE

All Movement Classes

Project: 620.30688.00100-SIDRA Analysis-2022 02 02

Template: Template 2 - Movement Summary

Site: I1 [I1 - Off Ramp & Access Road - EX2021 AM (Site Folder: Existing 2021)]

EX.2021 - AM Peak
620.30688-Aurizon Hexham Depot LVIA
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: New England Hwy Offramp														
2	T1	173	5.2	182	5.2	0.097	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
3	R2	2	5.2	2	5.2	0.001	6.0	LOS A	0.0	0.0	0.23	0.54	0.23	52.3
Approach		175	5.2	184	5.2	0.097	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.8
East: Access Road														
4	L2	4	5.2	4	5.2	0.006	6.1	LOS A	0.0	0.2	0.30	0.54	0.30	52.5
6	R2	2	5.2	2	5.2	0.006	7.5	LOS A	0.0	0.2	0.30	0.54	0.30	48.8
Approach		6	5.2	6	5.2	0.006	6.6	LOS A	0.0	0.2	0.30	0.54	0.30	51.5
North: Anderson Drive														
7	L2	1	5.2	1	5.2	0.001	5.7	LOS A	0.0	0.0	0.02	0.54	0.02	51.4
8	T1	156	5.2	164	5.2	0.087	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		157	5.2	165	5.2	0.087	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
All Vehicles		338	5.2	356	5.2	0.097	0.2	NA	0.0	0.2	0.01	0.01	0.01	59.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: I1 [I1 - Off Ramp & Access Road - EX2021 PM (Site Folder: Existing 2021)]

EX.2021 - AM Peak
620.30688-Aurizon Hexham Depot LVIA
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: New England Hwy Offramp														
2	T1	296	5.2	312	5.2	0.165	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	2	5.2	2	5.2	0.001	6.2	LOS A	0.0	0.0	0.27	0.54	0.27	52.2
Approach		298	5.2	314	5.2	0.165	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.8
East: Access Road														
4	L2	4	5.2	4	5.2	0.008	6.3	LOS A	0.0	0.2	0.38	0.57	0.38	52.0
6	R2	3	5.2	3	5.2	0.008	9.1	LOS A	0.0	0.2	0.38	0.57	0.38	48.1
Approach		7	5.2	7	5.2	0.008	7.5	LOS A	0.0	0.2	0.38	0.57	0.38	50.6
North: Anderson Drive														
7	L2	1	5.2	1	5.2	0.001	5.7	LOS A	0.0	0.0	0.02	0.54	0.02	51.4
8	T1	204	5.2	215	5.2	0.114	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		205	5.2	216	5.2	0.114	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
All Vehicles		510	5.2	537	5.2	0.165	0.2	NA	0.0	0.2	0.01	0.01	0.01	59.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: I1 [I1 - Off Ramp & Access Road - BG2022 AM (Site Folder: Background Growth 2022)]

BG2022 - AM Peak
620.30688-Aurizon Hexham Depot LVIA
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: New England Hwy Offramp														
2	T1	176	5.2	185	5.2	0.098	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
3	R2	2	5.2	2	5.2	0.001	6.0	LOS A	0.0	0.0	0.23	0.54	0.23	52.3
Approach		178	5.2	187	5.2	0.098	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.8
East: Access Road														
4	L2	4	5.2	4	5.2	0.006	6.1	LOS A	0.0	0.2	0.30	0.54	0.30	52.5
6	R2	2	5.2	2	5.2	0.006	7.6	LOS A	0.0	0.2	0.30	0.54	0.30	48.8
Approach		6	5.2	6	5.2	0.006	6.6	LOS A	0.0	0.2	0.30	0.54	0.30	51.5
North: Anderson Drive														
7	L2	1	5.2	1	5.2	0.001	5.7	LOS A	0.0	0.0	0.02	0.54	0.02	51.4
8	T1	159	5.2	167	5.2	0.089	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		160	5.2	168	5.2	0.089	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
All Vehicles		344	5.2	362	5.2	0.098	0.2	NA	0.0	0.2	0.01	0.01	0.01	59.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: I1 [I1 - Off Ramp & Access Road - BG2022 PM (Site Folder: Background Growth 2022)]

BG2022 - AM Peak
620.30688-Aurizon Hexham Depot LVIA
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: New England Hwy Offramp														
2	T1	302	5.2	318	5.2	0.169	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	2	5.2	2	5.2	0.001	6.2	LOS A	0.0	0.0	0.27	0.54	0.27	52.2
Approach		304	5.2	320	5.2	0.169	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.8
East: Access Road														
4	L2	4	5.2	4	5.2	0.008	6.3	LOS A	0.0	0.2	0.38	0.58	0.38	51.9
6	R2	3	5.2	3	5.2	0.008	9.2	LOS A	0.0	0.2	0.38	0.58	0.38	48.1
Approach		7	5.2	7	5.2	0.008	7.5	LOS A	0.0	0.2	0.38	0.58	0.38	50.6
North: Anderson Drive														
7	L2	1	5.2	1	5.2	0.001	5.7	LOS A	0.0	0.0	0.02	0.54	0.02	51.4
8	T1	208	5.2	219	5.2	0.116	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		209	5.2	220	5.2	0.116	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
All Vehicles		520	5.2	547	5.2	0.169	0.2	NA	0.0	0.2	0.01	0.01	0.01	59.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: I1 [I1 - Off Ramp & Access Road - BG2022+DEV AM (Site Folder: Background Growth 2022 + Development)]

BG2022+DEV - AM Peak
620.30688-Aurizon Hexham Depot LVIA
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: New England Hwy Offramp														
2	T1	176	5.2	185	5.2	0.099	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
3	R2	31	5.2	33	5.2	0.022	6.0	LOS A	0.1	0.6	0.24	0.57	0.24	52.3
Approach		207	5.2	218	5.2	0.099	0.9	NA	0.1	0.6	0.04	0.08	0.04	58.1
East: Access Road														
4	L2	9	5.2	9	5.2	0.014	6.1	LOS A	0.1	0.4	0.31	0.56	0.31	52.5
6	R2	5	5.2	5	5.2	0.014	7.9	LOS A	0.1	0.4	0.31	0.56	0.31	48.7
Approach		14	5.2	15	5.2	0.014	6.8	LOS A	0.1	0.4	0.31	0.56	0.31	51.4
North: Anderson Drive														
7	L2	23	5.2	24	5.2	0.016	5.8	LOS A	0.1	0.5	0.10	0.51	0.10	51.0
8	T1	159	5.2	167	5.2	0.089	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		182	5.2	192	5.2	0.089	0.7	LOS A	0.1	0.5	0.01	0.07	0.01	58.6
All Vehicles		403	5.2	424	5.2	0.099	1.0	NA	0.1	0.6	0.03	0.09	0.03	58.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: I1 [I1 - Off Ramp & Access Road - BG2022+DEV PM (Site Folder: Background Growth 2022 + Development)]

BG2022+DEV - AM Peak
620.30688-Aurizon Hexham Depot LVIA
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: New England Hwy Offramp														
2	T1	302	5.2	318	5.2	0.169	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	7	5.2	7	5.2	0.005	6.2	LOS A	0.0	0.1	0.27	0.56	0.27	52.2
Approach		309	5.2	325	5.2	0.169	0.2	NA	0.0	0.1	0.01	0.01	0.01	59.6
East: Access Road														
4	L2	36	5.2	38	5.2	0.067	6.3	LOS A	0.3	1.9	0.39	0.62	0.39	51.9
6	R2	22	5.2	23	5.2	0.067	9.5	LOS A	0.3	1.9	0.39	0.62	0.39	48.0
Approach		58	5.2	61	5.2	0.067	7.6	LOS A	0.3	1.9	0.39	0.62	0.39	50.7
North: Anderson Drive														
7	L2	4	5.2	4	5.2	0.003	5.7	LOS A	0.0	0.1	0.04	0.53	0.04	51.3
8	T1	208	5.2	219	5.2	0.116	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		212	5.2	223	5.2	0.116	0.1	LOS A	0.0	0.1	0.00	0.01	0.00	59.8
All Vehicles		579	5.2	609	5.2	0.169	0.9	NA	0.3	1.9	0.04	0.07	0.04	58.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: I1 [I1 - Off Ramp & Access Road - BG2032 AM (Site Folder: Background Growth 2032)]

BG2032 - AM Peak
620.30688-Aurizon Hexham Depot LVIA
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: New England Hwy Offramp														
2	T1	211	5.2	222	5.2	0.118	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	2	5.2	2	5.2	0.001	6.1	LOS A	0.0	0.0	0.26	0.54	0.26	52.2
Approach		213	5.2	224	5.2	0.118	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.8
East: Access Road														
4	L2	4	5.2	4	5.2	0.006	6.2	LOS A	0.0	0.2	0.33	0.55	0.33	52.4
6	R2	2	5.2	2	5.2	0.006	8.1	LOS A	0.0	0.2	0.33	0.55	0.33	48.6
Approach		6	5.2	6	5.2	0.006	6.8	LOS A	0.0	0.2	0.33	0.55	0.33	51.4
North: Anderson Drive														
7	L2	1	5.2	1	5.2	0.001	5.7	LOS A	0.0	0.0	0.02	0.54	0.02	51.4
8	T1	190	5.2	200	5.2	0.106	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		191	5.2	201	5.2	0.106	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
All Vehicles		410	5.2	432	5.2	0.118	0.2	NA	0.0	0.2	0.01	0.01	0.01	59.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: I1 [I1 - Off Ramp & Access Road - BG2032 PM (Site Folder: Background Growth 2032)]

BG2032 - AM Peak
620.30688-Aurizon Hexham Depot LVIA
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: New England Hwy Offramp														
2	T1	361	5.2	380	5.2	0.201	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	2	5.2	2	5.2	0.002	6.3	LOS A	0.0	0.0	0.30	0.55	0.30	52.1
Approach		363	5.2	382	5.2	0.201	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.8
East: Access Road														
4	L2	4	5.2	4	5.2	0.009	6.4	LOS A	0.0	0.3	0.43	0.60	0.43	51.5
6	R2	3	5.2	3	5.2	0.009	10.3	LOS A	0.0	0.3	0.43	0.60	0.43	47.5
Approach		7	5.2	7	5.2	0.009	8.1	LOS A	0.0	0.3	0.43	0.60	0.43	50.1
North: Anderson Drive														
7	L2	1	5.2	1	5.2	0.001	5.7	LOS A	0.0	0.0	0.02	0.54	0.02	51.4
8	T1	249	5.2	262	5.2	0.139	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		250	5.2	263	5.2	0.139	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
All Vehicles		620	5.2	653	5.2	0.201	0.2	NA	0.0	0.3	0.01	0.01	0.01	59.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: I1 [I1 - Off Ramp & Access Road - BG2032+DEV AM (Site Folder: Background Growth 2032 + Development)]

BG2032+DEV - AM Peak
620.30688-Aurizon Hexham Depot LVIA
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: New England Hwy Offramp														
2	T1	211	5.2	222	5.2	0.119	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	31	5.2	33	5.2	0.022	6.1	LOS A	0.1	0.6	0.26	0.57	0.26	52.2
Approach		242	5.2	255	5.2	0.119	0.8	NA	0.1	0.6	0.03	0.07	0.03	58.4
East: Access Road														
4	L2	9	5.2	9	5.2	0.015	6.2	LOS A	0.1	0.4	0.34	0.57	0.34	52.3
6	R2	5	5.2	5	5.2	0.015	8.5	LOS A	0.1	0.4	0.34	0.57	0.34	48.5
Approach		14	5.2	15	5.2	0.015	7.0	LOS A	0.1	0.4	0.34	0.57	0.34	51.2
North: Anderson Drive														
7	L2	23	5.2	24	5.2	0.016	5.8	LOS A	0.1	0.5	0.10	0.51	0.10	51.0
8	T1	190	5.2	200	5.2	0.106	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		213	5.2	224	5.2	0.106	0.6	LOS A	0.1	0.5	0.01	0.06	0.01	58.8
All Vehicles		469	5.2	494	5.2	0.119	0.9	NA	0.1	0.6	0.03	0.08	0.03	58.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: I1 [I1 - Off Ramp & Access Road - BG2032+DEV PM (Site Folder: Background Growth 2032 + Development)]

BG2032+DEV - AM Peak
620.30688-Aurizon Hexham Depot LVIA
Site Category: Existing Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: New England Hwy Offramp														
2	T1	361	5.2	380	5.2	0.201	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	7	5.2	7	5.2	0.005	6.3	LOS A	0.0	0.1	0.30	0.56	0.30	52.1
Approach		368	5.2	387	5.2	0.201	0.2	NA	0.0	0.1	0.01	0.01	0.01	59.6
East: Access Road														
4	L2	36	5.2	38	5.2	0.075	6.5	LOS A	0.3	2.1	0.44	0.65	0.44	51.5
6	R2	22	5.2	23	5.2	0.075	10.8	LOS A	0.3	2.1	0.44	0.65	0.44	47.5
Approach		58	5.2	61	5.2	0.075	8.1	LOS A	0.3	2.1	0.44	0.65	0.44	50.3
North: Anderson Drive														
7	L2	4	5.2	4	5.2	0.003	5.7	LOS A	0.0	0.1	0.04	0.53	0.04	51.3
8	T1	249	5.2	262	5.2	0.139	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		253	5.2	266	5.2	0.139	0.1	LOS A	0.0	0.1	0.00	0.01	0.00	59.8
All Vehicles		679	5.2	715	5.2	0.201	0.8	NA	0.3	2.1	0.04	0.06	0.04	58.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

USER REPORT FOR SITE

All Movement Classes

Project: 620.30688.00100-SIDRA Analysis-2022 02 02

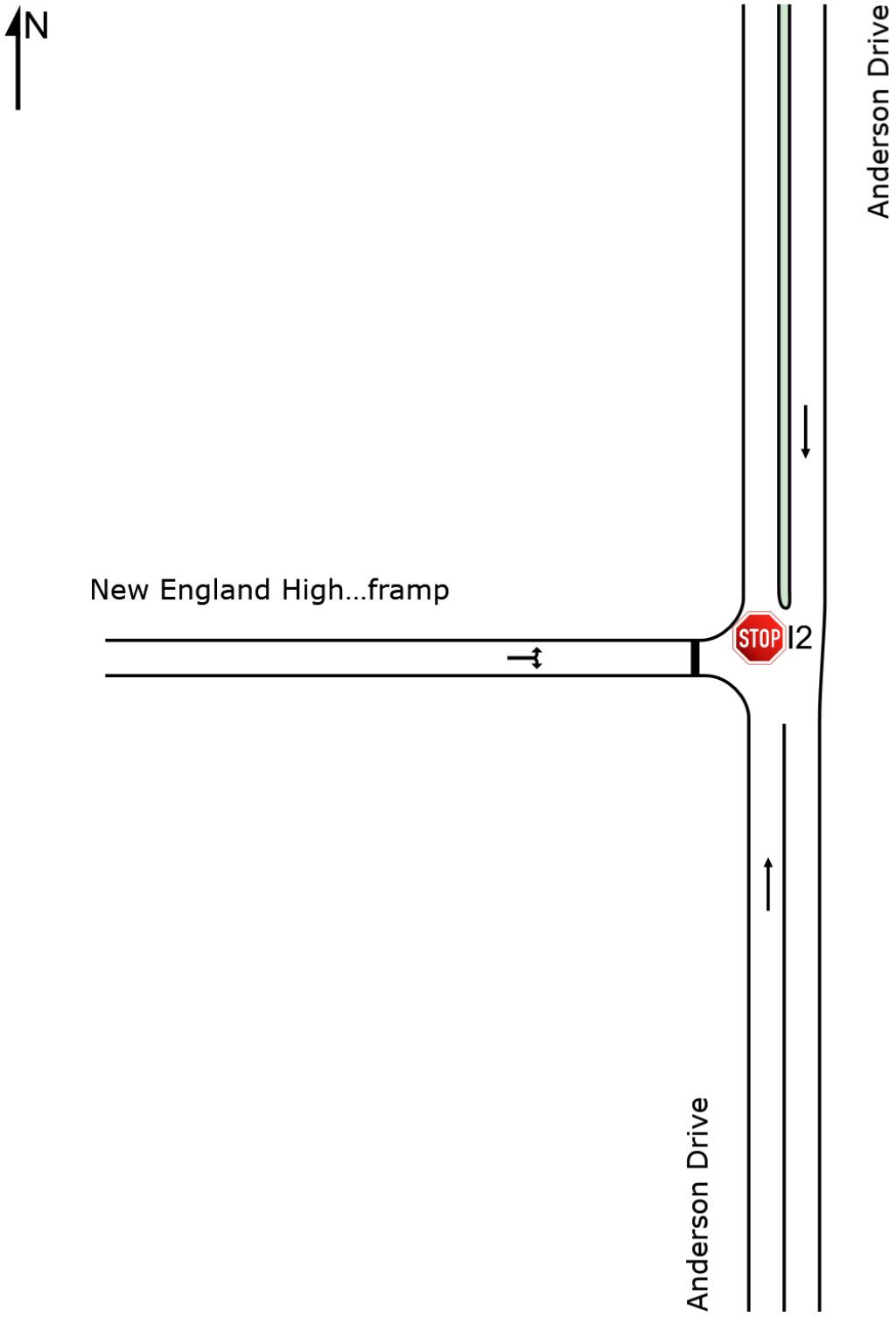
Template: Template 1 - Site Layout

Site: I2 [I2 - Off Ramp & Interchange - EX2021 AM (Site Folder: Existing 2021)]

EX.2021 - AM Peak
620.30688-Aurizon Hexham Depot LVIA
Site Category: Existing Design
Stop (Two-Way)

Site Layout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.


N
Anderson Drive
New England High...framp
STOP
I2
Anderson Drive

USER REPORT FOR SITE

All Movement Classes

Project: 620.30688.00100-SIDRA Analysis-2022 02 02

Template: Template 2 - Movement Summary

Site: I2 [I2 - Off Ramp & Interchange - EX2021 AM (Site Folder: Existing 2021)]

EX.2021 - AM Peak
620.30688-Aurizon Hexham Depot LVIA
Site Category: Existing Design
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Anderson Drive														
2	T1	175	6.3	184	6.3	0.098	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		175	6.3	184	6.3	0.098	0.0	NA	0.0	0.0	0.00	0.00	0.00	60.0
North: Anderson Drive														
8	T1	157	6.3	165	6.3	0.088	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		157	6.3	165	6.3	0.088	0.0	NA	0.0	0.0	0.00	0.00	0.00	60.0
West: New England Highway Offramp														
10	L2	44	6.3	46	6.3	0.042	9.1	LOS A	0.2	1.2	0.30	0.87	0.30	47.7
12	R2	1	6.3	1	6.3	0.042	9.6	LOS A	0.2	1.2	0.30	0.87	0.30	46.7
Approach		45	6.3	47	6.3	0.042	9.1	LOS A	0.2	1.2	0.30	0.87	0.30	47.7
All Vehicles		377	6.3	397	6.3	0.098	1.1	NA	0.2	1.2	0.04	0.10	0.04	56.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: I2 [I2 - Off Ramp & Interchange - EX2021 PM (Site Folder: Existing 2021)]

EX.2021 - AM Peak
620.30688-Aurizon Hexham Depot LVIA
Site Category: Existing Design
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Anderson Drive														
2	T1	299	6.3	315	6.3	0.168	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		299	6.3	315	6.3	0.168	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
North: Anderson Drive														
8	T1	205	6.3	216	6.3	0.115	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		205	6.3	216	6.3	0.115	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
West: New England Highway Offramp														
10	L2	94	6.3	99	6.3	0.102	9.9	LOS A	0.4	3.0	0.42	0.90	0.42	47.2
12	R2	1	6.3	1	6.3	0.102	11.3	LOS A	0.4	3.0	0.42	0.90	0.42	46.2
Approach		95	6.3	100	6.3	0.102	9.9	LOS A	0.4	3.0	0.42	0.90	0.42	47.2
All Vehicles		599	6.3	631	6.3	0.168	1.6	NA	0.4	3.0	0.07	0.14	0.07	55.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: I2 [I2 - Off Ramp & Interchange - BG2022 AM (Site Folder: Background Growth 2022)]

BG2022 - AM Peak
620.30688-Aurizon Hexham Depot LVIA
Site Category: Existing Design
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Anderson Drive														
2	T1	179	6.3	188	6.3	0.101	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		179	6.3	188	6.3	0.101	0.0	NA	0.0	0.0	0.00	0.00	0.00	60.0
North: Anderson Drive														
8	T1	160	6.3	168	6.3	0.090	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		160	6.3	168	6.3	0.090	0.0	NA	0.0	0.0	0.00	0.00	0.00	60.0
West: New England Highway Offramp														
10	L2	45	6.3	47	6.3	0.043	9.1	LOS A	0.2	1.2	0.30	0.87	0.30	47.7
12	R2	1	6.3	1	6.3	0.043	9.6	LOS A	0.2	1.2	0.30	0.87	0.30	46.7
Approach		46	6.3	48	6.3	0.043	9.1	LOS A	0.2	1.2	0.30	0.87	0.30	47.7
All Vehicles		385	6.3	405	6.3	0.101	1.1	NA	0.2	1.2	0.04	0.10	0.04	56.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: I2 [I2 - Off Ramp & Interchange - BG2022 PM (Site Folder: Background Growth 2022)]

BG2022 - AM Peak
620.30688-Aurizon Hexham Depot LVIA
Site Category: Existing Design
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Anderson Drive														
2	T1	305	6.3	321	6.3	0.171	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		305	6.3	321	6.3	0.171	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
North: Anderson Drive														
8	T1	209	6.3	220	6.3	0.117	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		209	6.3	220	6.3	0.117	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
West: New England Highway Offramp														
10	L2	96	6.3	101	6.3	0.105	9.9	LOS A	0.4	3.1	0.42	0.90	0.42	47.1
12	R2	1	6.3	1	6.3	0.105	11.4	LOS A	0.4	3.1	0.42	0.90	0.42	46.1
Approach		97	6.3	102	6.3	0.105	9.9	LOS A	0.4	3.1	0.42	0.90	0.42	47.1
All Vehicles		611	6.3	643	6.3	0.171	1.6	NA	0.4	3.1	0.07	0.14	0.07	55.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: I2 [I2 - Off Ramp & Interchange - BG2022+DEV AM (Site Folder: Background Growth 2022 + Development)]

BG2022+DEV - AM Peak
620.30688-Aurizon Hexham Depot LVIA
Site Category: Existing Design
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Anderson Drive														
2	T1	179	6.3	188	6.3	0.101	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		179	6.3	188	6.3	0.101	0.0	NA	0.0	0.0	0.00	0.00	0.00	60.0
North: Anderson Drive														
8	T1	182	6.3	192	6.3	0.102	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		182	6.3	192	6.3	0.102	0.0	NA	0.0	0.0	0.00	0.00	0.00	60.0
West: New England Highway Offramp														
10	L2	63	6.3	66	6.3	0.063	9.1	LOS A	0.2	1.8	0.31	0.88	0.31	47.6
12	R2	4	6.3	4	6.3	0.063	9.8	LOS A	0.2	1.8	0.31	0.88	0.31	46.6
Approach		67	6.3	71	6.3	0.063	9.2	LOS A	0.2	1.8	0.31	0.88	0.31	47.6
All Vehicles		428	6.3	451	6.3	0.102	1.4	NA	0.2	1.8	0.05	0.14	0.05	55.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: I2 [I2 - Off Ramp & Interchange - BG2022+DEV PM (Site Folder: Background Growth 2022 + Development)]

BG2022+DEV - AM Peak
620.30688-Aurizon Hexham Depot LVIA
Site Category: Existing Design
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Anderson Drive														
2	T1	324	6.3	341	6.3	0.182	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		324	6.3	341	6.3	0.182	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
North: Anderson Drive														
8	T1	212	6.3	223	6.3	0.119	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		212	6.3	223	6.3	0.119	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
West: New England Highway Offramp														
10	L2	98	6.3	103	6.3	0.110	10.1	LOS A	0.4	3.2	0.44	0.90	0.44	47.0
12	R2	1	6.3	1	6.3	0.110	11.6	LOS A	0.4	3.2	0.44	0.90	0.44	46.1
Approach		99	6.3	104	6.3	0.110	10.1	LOS A	0.4	3.2	0.44	0.90	0.44	47.0
All Vehicles		635	6.3	668	6.3	0.182	1.6	NA	0.4	3.2	0.07	0.14	0.07	55.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: I2 [I2 - Off Ramp & Interchange - BG2032 AM (Site Folder: Background Growth 2032)]

BG2032 - AM Peak
620.30688-Aurizon Hexham Depot LVIA
Site Category: Existing Design
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Anderson Drive														
2	T1	214	6.3	225	6.3	0.120	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		214	6.3	225	6.3	0.120	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
North: Anderson Drive														
8	T1	192	6.3	202	6.3	0.108	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		192	6.3	202	6.3	0.108	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
West: New England Highway Offramp														
10	L2	54	6.3	57	6.3	0.053	9.3	LOS A	0.2	1.5	0.34	0.87	0.34	47.6
12	R2	1	6.3	1	6.3	0.053	10.2	LOS A	0.2	1.5	0.34	0.87	0.34	46.6
Approach		55	6.3	58	6.3	0.053	9.3	LOS A	0.2	1.5	0.34	0.87	0.34	47.5
All Vehicles		461	6.3	485	6.3	0.120	1.1	NA	0.2	1.5	0.04	0.10	0.04	56.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: I2 [I2 - Off Ramp & Interchange - BG2032 PM (Site Folder: Background Growth 2032)]

BG2032 - AM Peak
620.30688-Aurizon Hexham Depot LVIA
Site Category: Existing Design
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Anderson Drive														
2	T1	365	6.3	384	6.3	0.205	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		365	6.3	384	6.3	0.205	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
North: Anderson Drive														
8	T1	250	6.3	263	6.3	0.140	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		250	6.3	263	6.3	0.140	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
West: New England Highway Offramp														
10	L2	115	6.3	121	6.3	0.136	10.4	LOS A	0.5	4.0	0.47	0.92	0.47	46.8
12	R2	1	6.3	1	6.3	0.136	12.7	LOS A	0.5	4.0	0.47	0.92	0.47	45.8
Approach		116	6.3	122	6.3	0.136	10.4	LOS A	0.5	4.0	0.47	0.92	0.47	46.8
All Vehicles		731	6.3	769	6.3	0.205	1.7	NA	0.5	4.0	0.08	0.15	0.08	55.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: I2 [I2 - Off Ramp & Interchange - BG2032+DEV AM (Site Folder: Background Growth 2032 + Development)]

BG2032+DEV - AM Peak
620.30688-Aurizon Hexham Depot LVIA
Site Category: Existing Design
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Anderson Drive														
2	T1	217	6.3	228	6.3	0.122	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		217	6.3	228	6.3	0.122	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
North: Anderson Drive														
8	T1	210	6.3	221	6.3	0.118	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		210	6.3	221	6.3	0.118	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
West: New England Highway Offramp														
10	L2	72	6.3	76	6.3	0.075	9.3	LOS A	0.3	2.2	0.35	0.88	0.35	47.5
12	R2	4	6.3	4	6.3	0.075	10.4	LOS A	0.3	2.2	0.35	0.88	0.35	46.5
Approach		76	6.3	80	6.3	0.075	9.4	LOS A	0.3	2.2	0.35	0.88	0.35	47.4
All Vehicles		503	6.3	529	6.3	0.122	1.4	NA	0.3	2.2	0.05	0.13	0.05	55.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: I2 [I2 - Off Ramp & Interchange - BG2032+DEV PM (Site Folder: Background Growth 2032 + Development)]

BG2032+DEV - AM Peak
620.30688-Aurizon Hexham Depot LVIA
Site Category: Existing Design
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Anderson Drive														
2	T1	384	6.3	404	6.3	0.216	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		384	6.3	404	6.3	0.216	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
North: Anderson Drive														
8	T1	253	6.3	266	6.3	0.142	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		253	6.3	266	6.3	0.142	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
West: New England Highway Offramp														
10	L2	117	6.3	123	6.3	0.142	10.6	LOS A	0.6	4.1	0.49	0.93	0.49	46.7
12	R2	1	6.3	1	6.3	0.142	13.0	LOS A	0.6	4.1	0.49	0.93	0.49	45.7
Approach		118	6.3	124	6.3	0.142	10.6	LOS A	0.6	4.1	0.49	0.93	0.49	46.6
All Vehicles		755	6.3	795	6.3	0.216	1.7	NA	0.6	4.1	0.08	0.15	0.08	55.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

APPENDIX F

Traffic Survey Data

TRANS TRAFFIC SURVEY

trafficsurvey.com.au

TURNING MOVEMENT SURVEY

Intersection of Unnamed Rd and Anderson Dr, Tarro

GPS *-32.812802, 151.665578*

Date:	Wed 20-10-21
Weather:	Fine
Suburban:	Tarro
Customer:	SLR

North:	Anderson Dr
East:	Unnamed Rd
South:	Anderson Dr
West:	N/A

Survey Period	AM:	6:00 AM-12:00 PM
	PM:	12:00 PM-6:00 PM
Traffic Peak	AM:	7:15 AM-8:15 AM
	PM:	3:00 PM-4:00 PM

All Vehicles

Time		North Approach Anderson D			East Approach Unnamed Rd			South Approach Anderson D			Hourly Total	
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	Hour	Peak
6:00	6:15	0	38	0	0	0	0	0	0	26	254	
6:15	6:30	0	31	0	0	0	0	0	0	23	249	
6:30	6:45	0	45	0	0	0	0	0	2	29	257	
6:45	7:00	0	27	2	0	0	1	0	2	28	276	
7:00	7:15	0	27	0	0	0	2	0	2	28	297	
7:15	7:30	0	37	1	0	1	0	0	0	23	338	Peak
7:30	7:45	0	48	0	0	0	2	0	1	44	333	
7:45	8:00	0	30	0	0	0	1	0	1	49	321	
8:00	8:15	0	41	0	0	1	1	0	0	57	322	
8:15	8:30	0	24	0	0	0	0	0	1	32	279	
8:30	8:45	0	36	1	0	5	0	0	3	38	285	
8:45	9:00	0	34	2	0	0	3	0	2	41	274	
9:00	9:15	0	31	1	0	0	1	0	0	24	253	
9:15	9:30	0	22	0	0	0	3	0	2	36	266	
9:30	9:45	0	30	0	0	0	2	0	1	39	273	
9:45	10:00	0	19	1	0	2	3	0	1	35	278	
10:00	10:15	0	19	2	0	2	1	0	0	46	278	
10:15	10:30	0	15	1	0	0	1	0	1	52	286	
10:30	10:45	0	26	0	0	1	0	0	2	48	280	
10:45	11:00	0	25	0	0	0	1	0	0	35	258	
11:00	11:15	0	31	0	0	0	2	0	2	43	260	
11:15	11:30	0	22	0	0	0	0	0	2	40		
11:30	11:45	0	16	0	0	3	1	0	0	35		
11:45	12:00	0	22	0	0	0	1	0	3	37		

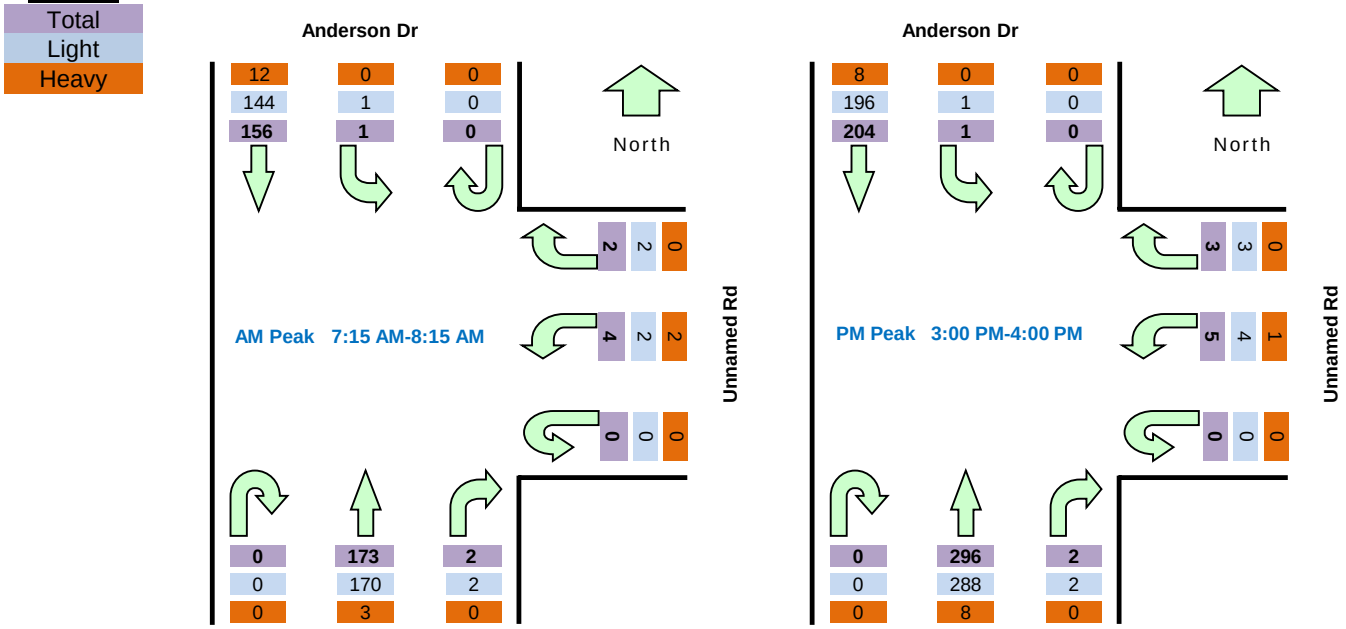
12:00	12:15	0	25	0	0	1	1	1	1	46	294	
12:15	12:30	0	28	2	0	1	1	0	0	36	289	
12:30	12:45	0	31	1	0	1	3	0	3	52	303	
12:45	13:00	0	20	0	0	0	0	0	1	39	308	
13:00	13:15	0	28	0	0	0	0	0	1	41	335	
13:15	13:30	0	29	1	0	1	4	0	1	46	379	
13:30	13:45	0	31	2	0	0	0	0	0	63	407	
13:45	14:00	0	28	0	0	0	1	0	2	56	445	
14:00	14:15	0	47	1	0	1	0	0	1	64	463	
14:15	14:30	0	45	1	0	2	1	0	1	60	476	
14:30	14:45	0	55	0	0	1	1	0	0	77	497	
14:45	15:00	0	34	0	0	1	1	0	0	69	480	
15:00	15:15	0	52	0	0	1	0	0	0	74	511	Peak
15:15	15:30	0	50	1	0	1	1	0	0	78	499	
15:30	15:45	0	46	0	0	1	0	0	0	70	493	
15:45	16:00	0	56	0	0	0	4	0	2	74	496	
16:00	16:15	0	38	0	0	0	1	0	0	76	487	
16:15	16:30	0	48	0	0	0	2	0	1	74	469	
16:30	16:45	0	38	0	0	0	0	0	2	80	458	
16:45	17:00	0	53	0	0	1	1	0	0	72	440	
17:00	17:15	0	41	0	0	0	2	0	0	54	425	
17:15	17:30	0	29	0	0	0	1	0	0	84		
17:30	17:45	0	33	3	0	0	1	0	1	64		
17:45	18:00	0	29	5	0	6	4	0	5	63		

Peak Time		North Approach Anderson D			East Approach Unnamed Rd			South Approach Anderson D			Peak
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	total
7:15	8:15	0	156	1	0	2	4	0	2	173	338
15:00	16:00	0	204	1	0	3	5	0	2	296	511

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total
Light
Heavy



Anderson Dr

Anderson Dr

Light Vehicles

Time		North Approach Anderson D			East Approach Unnamed Rd			South Approach Anderson D		
Period Start	Period End	U	SB	L	U	R	L	U	R	NB
6:00	6:15	0	37	0	0	0	0	0	0	25
6:15	6:30	0	28	0	0	0	0	0	0	22
6:30	6:45	0	45	0	0	0	0	0	1	27
6:45	7:00	0	24	2	0	0	1	0	2	28
7:00	7:15	0	26	0	0	0	2	0	1	27
7:15	7:30	0	33	1	0	1	0	0	0	22
7:30	7:45	0	47	0	0	0	0	0	1	44
7:45	8:00	0	28	0	0	0	1	0	1	49
8:00	8:15	0	36	0	0	1	1	0	0	55
8:15	8:30	0	24	0	0	0	0	0	1	30
8:30	8:45	0	34	1	0	4	0	0	3	36
8:45	9:00	0	33	2	0	0	3	0	2	39
9:00	9:15	0	31	1	0	0	1	0	0	23
9:15	9:30	0	17	0	0	0	3	0	2	34
9:30	9:45	0	27	0	0	0	2	0	1	36
9:45	10:00	0	18	1	0	2	3	0	0	33
10:00	10:15	0	15	2	0	2	0	0	0	45
10:15	10:30	0	12	1	0	0	1	0	1	49
10:30	10:45	0	23	0	0	1	0	0	2	46
10:45	11:00	0	22	0	0	0	1	0	0	34
11:00	11:15	0	27	0	0	0	2	0	1	41
11:15	11:30	0	22	0	0	0	0	0	1	36
11:30	11:45	0	15	0	0	2	0	0	0	33
11:45	12:00	0	19	0	0	0	1	0	2	35

12:00	12:15	0	24	0	0	1	0	1	0	44
12:15	12:30	0	25	2	0	1	1	0	0	31
12:30	12:45	0	27	1	0	1	2	0	3	48
12:45	13:00	0	20	0	0	0	0	0	1	37
13:00	13:15	0	27	0	0	0	0	0	1	39
13:15	13:30	0	28	1	0	1	4	0	1	43
13:30	13:45	0	28	2	0	0	0	0	0	59
13:45	14:00	0	23	0	0	0	1	0	1	53
14:00	14:15	0	46	1	0	1	0	0	1	61
14:15	14:30	0	43	1	0	2	1	0	0	57
14:30	14:45	0	51	0	0	1	0	0	0	75
14:45	15:00	0	34	0	0	1	1	0	0	67
15:00	15:15	0	52	0	0	1	0	0	0	73
15:15	15:30	0	48	1	0	1	1	0	0	75
15:30	15:45	0	44	0	0	1	0	0	0	68
15:45	16:00	0	52	0	0	0	3	0	2	72
16:00	16:15	0	37	0	0	0	1	0	0	74
16:15	16:30	0	47	0	0	0	2	0	1	72
16:30	16:45	0	35	0	0	0	0	0	2	77
16:45	17:00	0	49	0	0	1	1	0	0	69
17:00	17:15	0	39	0	0	0	2	0	0	53
17:15	17:30	0	26	0	0	0	1	0	0	84
17:30	17:45	0	32	3	0	0	1	0	1	63
17:45	18:00	0	28	5	0	6	4	0	5	61

Peak Time		**North Approach Anderson D**			**East Approach Unnamed Ro**			**South Approach Anderson D**			**Peak**
Period Start	**Period End**	U	SB	L	U	R	L	U	R	NB	**total**
7:15	8:15	0	144	1	0	2	2	0	2	170	321
15:00	16:00	0	196	1	0	3	4	0	2	288	494

Heavy Vehicles

Time		North Approach Anderson D			East Approach Unnamed Ro			South Approach Anderson D		
Period Start	Period End	U	SB	L	U	R	L	U	R	NB
6:00	6:15	0	1	0	0	0	0	0	0	1
6:15	6:30	0	3	0	0	0	0	0	0	1
6:30	6:45	0	0	0	0	0	0	0	1	2
6:45	7:00	0	3	0	0	0	0	0	0	0
7:00	7:15	0	1	0	0	0	0	0	1	1
7:15	7:30	0	4	0	0	0	0	0	0	1
7:30	7:45	0	1	0	0	0	2	0	0	0
7:45	8:00	0	2	0	0	0	0	0	0	0
8:00	8:15	0	5	0	0	0	0	0	0	2
8:15	8:30	0	0	0	0	0	0	0	0	2
8:30	8:45	0	2	0	0	1	0	0	0	2
8:45	9:00	0	1	0	0	0	0	0	0	2
9:00	9:15	0	0	0	0	0	0	0	0	1
9:15	9:30	0	5	0	0	0	0	0	0	2
9:30	9:45	0	3	0	0	0	0	0	0	3
9:45	10:00	0	1	0	0	0	0	0	1	2
10:00	10:15	0	4	0	0	0	1	0	0	1
10:15	10:30	0	3	0	0	0	0	0	0	3
10:30	10:45	0	3	0	0	0	0	0	0	2
10:45	11:00	0	3	0	0	0	0	0	0	1
11:00	11:15	0	4	0	0	0	0	0	1	2
11:15	11:30	0	0	0	0	0	0	0	1	4
11:30	11:45	0	1	0	0	1	1	0	0	2
11:45	12:00	0	3	0	0	0	0	0	1	2

12:00	12:15	0	1	0	0	0	1	0	1	2
12:15	12:30	0	3	0	0	0	0	0	0	5
12:30	12:45	0	4	0	0	0	1	0	0	4
12:45	13:00	0	0	0	0	0	0	0	0	2
13:00	13:15	0	1	0	0	0	0	0	0	2
13:15	13:30	0	1	0	0	0	0	0	0	3
13:30	13:45	0	3	0	0	0	0	0	0	4
13:45	14:00	0	5	0	0	0	0	0	1	3
14:00	14:15	0	1	0	0	0	0	0	0	3
14:15	14:30	0	2	0	0	0	0	0	1	3
14:30	14:45	0	4	0	0	0	1	0	0	2
14:45	15:00	0	0	0	0	0	0	0	0	2
15:00	15:15	0	0	0	0	0	0	0	0	1
15:15	15:30	0	2	0	0	0	0	0	0	3
15:30	15:45	0	2	0	0	0	0	0	0	2
15:45	16:00	0	4	0	0	0	1	0	0	2
16:00	16:15	0	1	0	0	0	0	0	0	2
16:15	16:30	0	1	0	0	0	0	0	0	2
16:30	16:45	0	3	0	0	0	0	0	0	3
16:45	17:00	0	4	0	0	0	0	0	0	3
17:00	17:15	0	2	0	0	0	0	0	0	1
17:15	17:30	0	3	0	0	0	0	0	0	0
17:30	17:45	0	1	0	0	0	0	0	0	1
17:45	18:00	0	1	0	0	0	0	0	0	2

Peak Time		North Approach Anderson D			East Approach Unnamed Rd			South Approach Anderson D			Peak
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	total
7:15	8:15	0	12	0	0	0	2	0	0	3	17
15:00	16:00	0	8	0	0	0	1	0	0	8	17

TRANS TRAFFIC SURVEY

trafficsurvey.com.au

TURNING MOVEMENT SURVEY

Intersection of New England Hwy EB Off Ramp and Ande

GPS *-32.811383, 151.665955*

Date:	Wed 20-10-21
Weather:	Fine
Suburban:	Tarro
Customer:	SLR

North:	Anderson Dr
East:	N/A
South:	Anderson Dr
West:	New England Hwy EB Off Ra

Survey Period	AM:	6:00 AM-12:00 PM
	PM:	12:00 PM-6:00 PM
Traffic Peak	AM:	7:15 AM-8:15 AM
	PM:	3:00 PM-4:00 PM

All Vehicles

Time		North Approach Anderson D			South Approach Anderson D			roach New England Hwy EB			Hourly Total	
Period Start	Period End	U	R	SB	U	NB	L	U	R	L	Hour	Peak
6:00	6:15	0	0	37	0	26	0	0	1	12	301	
6:15	6:30	0	0	31	0	23	0	0	0	9	289	
6:30	6:45	0	0	45	0	29	0	0	0	13	303	
6:45	7:00	0	0	29	0	28	0	0	0	18	317	
7:00	7:15	0	0	27	0	28	0	0	0	9	331	
7:15	7:30	0	0	38	0	24	0	0	0	15	376	Peak
7:30	7:45	0	0	48	0	44	0	0	0	9	370	
7:45	8:00	0	0	30	0	49	0	0	0	10	357	
8:00	8:15	0	0	41	0	58	0	0	0	10	360	
8:15	8:30	0	0	24	0	32	0	0	0	15	312	
8:30	8:45	0	0	37	0	43	0	0	0	8	303	
8:45	9:00	0	0	36	0	41	0	0	0	15	296	
9:00	9:15	0	0	32	0	24	0	0	0	5	272	
9:15	9:30	0	0	22	0	36	0	0	0	4	291	
9:30	9:45	0	0	30	0	39	0	0	0	12	311	
9:45	10:00	0	0	20	0	37	0	0	0	11	319	
10:00	10:15	0	0	21	0	48	0	0	0	11	317	
10:15	10:30	0	0	16	0	52	0	0	0	14	320	
10:30	10:45	0	0	26	0	49	0	0	0	14	311	
10:45	11:00	0	0	23	0	35	0	0	2	6	286	
11:00	11:15	0	0	31	0	43	0	0	0	9	291	
11:15	11:30	0	0	21	0	40	0	0	1	11		
11:30	11:45	0	0	16	0	38	0	0	0	10		
11:45	12:00	0	0	22	0	37	0	0	0	12		

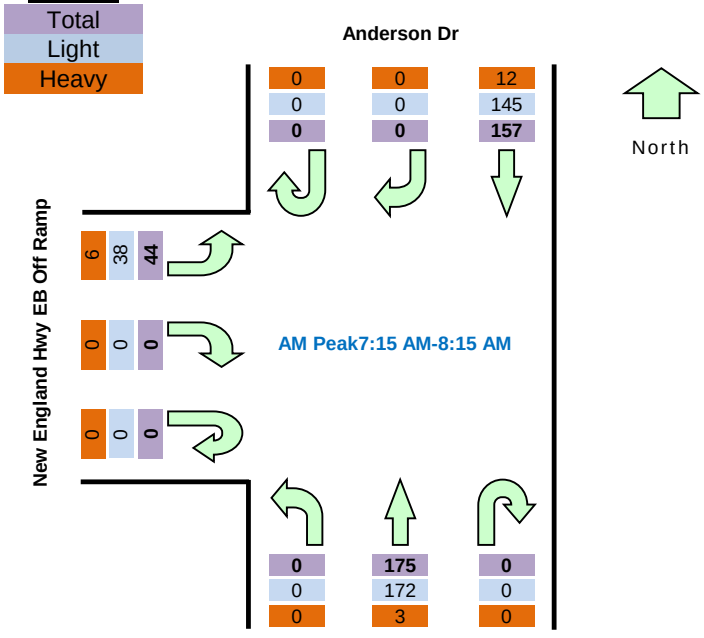
12:00	12:15	0	0	25	0	47	0	0	0	11	326	
12:15	12:30	0	0	30	0	37	0	0	0	9	322	
12:30	12:45	0	0	32	0	53	0	0	0	11	337	
12:45	13:00	0	0	20	0	39	0	0	0	12	348	
13:00	13:15	0	0	28	0	41	0	0	0	10	370	
13:15	13:30	0	0	30	0	47	0	0	0	14	421	
13:30	13:45	0	0	33	0	63	0	0	0	11	453	
13:45	14:00	0	0	28	0	56	0	0	0	9	493	
14:00	14:15	0	0	48	0	65	0	0	0	17	528	
14:15	14:30	0	0	46	0	62	0	0	0	15	552	
14:30	14:45	0	0	55	0	78	0	0	0	14	583	
14:45	15:00	0	0	34	0	70	0	0	0	24	576	
15:00	15:15	0	0	52	0	75	0	0	0	27	598	Peak
15:15	15:30	0	0	51	0	79	0	0	0	24	583	
15:30	15:45	0	0	46	0	71	0	0	0	23	586	
15:45	16:00	0	0	56	0	74	0	0	0	20	585	
16:00	16:15	0	0	37	0	76	0	0	1	25	588	
16:15	16:30	0	0	48	0	74	0	0	0	35	568	
16:30	16:45	0	0	38	0	80	0	0	0	21	553	
16:45	17:00	0	0	53	0	73	0	0	0	27	536	
17:00	17:15	0	0	41	0	54	0	0	0	24	505	
17:15	17:30	0	0	29	0	84	0	0	0	29		
17:30	17:45	0	0	36	0	64	0	0	0	22		
17:45	18:00	0	0	34	0	69	0	0	0	19		

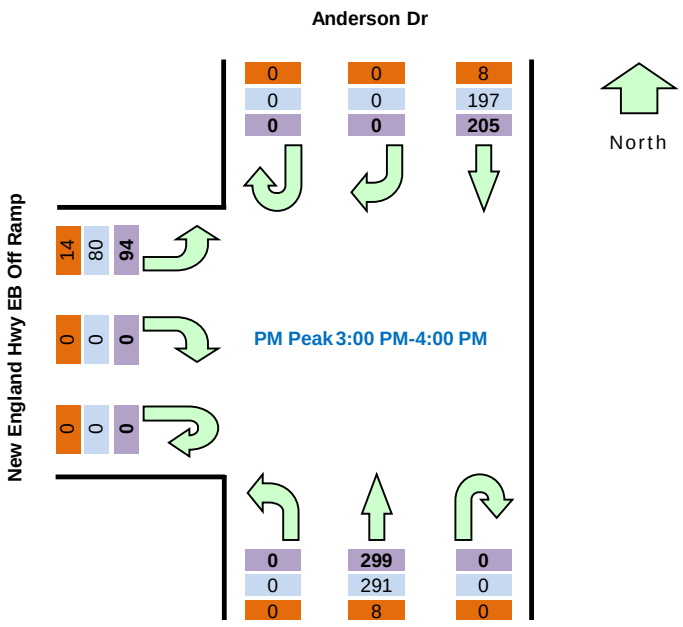
Peak Time		North Approach Anderson D			South Approach Anderson D			roach New England Hwy EB			Peak
Period Start	Period End	U	R	SB	U	NB	L	U	R	L	total
7:15	8:15	0	0	157	0	175	0	0	0	44	376
15:00	16:00	0	0	205	0	299	0	0	0	94	598

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total
Light
Heavy





Light Vehicles

Time		North Approach Anderson D			South Approach Anderson D			oach New England Hwy EB		
Period Start	**Period End**	U	R	SB	U	NB	L	U	R	L
6:00	6:15	0	0	36	0	25	0	0	1	9
6:15	6:30	0	0	28	0	22	0	0	0	8
6:30	6:45	0	0	45	0	27	0	0	0	10
6:45	7:00	0	0	26	0	28	0	0	0	15
7:00	7:15	0	0	26	0	27	0	0	0	7
7:15	7:30	0	0	34	0	23	0	0	0	12
7:30	7:45	0	0	47	0	44	0	0	0	9
7:45	8:00	0	0	28	0	49	0	0	0	10
8:00	8:15	0	0	36	0	56	0	0	0	7
8:15	8:30	0	0	24	0	30	0	0	0	11
8:30	8:45	0	0	35	0	40	0	0	0	5
8:45	9:00	0	0	35	0	39	0	0	0	11
9:00	9:15	0	0	32	0	23	0	0	0	5
9:15	9:30	0	0	17	0	34	0	0	0	4
9:30	9:45	0	0	27	0	36	0	0	0	7
9:45	10:00	0	0	19	0	35	0	0	0	10
10:00	10:15	0	0	17	0	47	0	0	0	10
10:15	10:30	0	0	13	0	49	0	0	0	14
10:30	10:45	0	0	23	0	47	0	0	0	8
10:45	11:00	0	0	21	0	34	0	0	1	6
11:00	11:15	0	0	27	0	41	0	0	0	9
11:15	11:30	0	0	21	0	36	0	0	1	11
11:30	11:45	0	0	15	0	35	0	0	0	8
11:45	12:00	0	0	19	0	35	0	0	0	8

12:00	12:15	0	0	24	0	45	0	0	0	9
12:15	12:30	0	0	27	0	32	0	0	0	9
12:30	12:45	0	0	28	0	49	0	0	0	11
12:45	13:00	0	0	20	0	37	0	0	0	9
13:00	13:15	0	0	27	0	39	0	0	0	8
13:15	13:30	0	0	29	0	44	0	0	0	11
13:30	13:45	0	0	30	0	59	0	0	0	8
13:45	14:00	0	0	23	0	53	0	0	0	8
14:00	14:15	0	0	47	0	62	0	0	0	12
14:15	14:30	0	0	44	0	59	0	0	0	13
14:30	14:45	0	0	51	0	76	0	0	0	12
14:45	15:00	0	0	34	0	68	0	0	0	23
15:00	15:15	0	0	52	0	74	0	0	0	22
15:15	15:30	0	0	49	0	76	0	0	0	19
15:30	15:45	0	0	44	0	69	0	0	0	22
15:45	16:00	0	0	52	0	72	0	0	0	17
16:00	16:15	0	0	36	0	74	0	0	1	22
16:15	16:30	0	0	47	0	72	0	0	0	31
16:30	16:45	0	0	35	0	77	0	0	0	19
16:45	17:00	0	0	49	0	70	0	0	0	27
17:00	17:15	0	0	39	0	53	0	0	0	21
17:15	17:30	0	0	26	0	84	0	0	0	27
17:30	17:45	0	0	35	0	63	0	0	0	21
17:45	18:00	0	0	33	0	67	0	0	0	18

Peak Time		**North Approach Anderson D**			**South Approach Anderson D**			**roach New England Hwy EB**			**Peak**
Period Start	**Period End**	U	R	SB	U	NB	L	U	R	L	**total**
7:15	8:15	0	0	145	0	172	0	0	0	38	355
15:00	16:00	0	0	197	0	291	0	0	0	80	568

Heavy Vehicles

Time		North Approach Anderson D			South Approach Anderson D			roach New England Hwy EB		
Period Start	Period End	U	R	SB	U	NB	L	U	R	L
6:00	6:15	0	0	1	0	1	0	0	0	3
6:15	6:30	0	0	3	0	1	0	0	0	1
6:30	6:45	0	0	0	0	2	0	0	0	3
6:45	7:00	0	0	3	0	0	0	0	0	3
7:00	7:15	0	0	1	0	1	0	0	0	2
7:15	7:30	0	0	4	0	1	0	0	0	3
7:30	7:45	0	0	1	0	0	0	0	0	0
7:45	8:00	0	0	2	0	0	0	0	0	0
8:00	8:15	0	0	5	0	2	0	0	0	3
8:15	8:30	0	0	0	0	2	0	0	0	4
8:30	8:45	0	0	2	0	3	0	0	0	3
8:45	9:00	0	0	1	0	2	0	0	0	4
9:00	9:15	0	0	0	0	1	0	0	0	0
9:15	9:30	0	0	5	0	2	0	0	0	0
9:30	9:45	0	0	3	0	3	0	0	0	5
9:45	10:00	0	0	1	0	2	0	0	0	1
10:00	10:15	0	0	4	0	1	0	0	0	1
10:15	10:30	0	0	3	0	3	0	0	0	0
10:30	10:45	0	0	3	0	2	0	0	0	6
10:45	11:00	0	0	2	0	1	0	0	1	0
11:00	11:15	0	0	4	0	2	0	0	0	0
11:15	11:30	0	0	0	0	4	0	0	0	0
11:30	11:45	0	0	1	0	3	0	0	0	2
11:45	12:00	0	0	3	0	2	0	0	0	4

12:00	12:15	0	0	1	0	2	0	0	0	2	
12:15	12:30	0	0	3	0	5	0	0	0	0	
12:30	12:45	0	0	4	0	4	0	0	0	0	
12:45	13:00	0	0	0	0	2	0	0	0	3	
13:00	13:15	0	0	1	0	2	0	0	0	2	
13:15	13:30	0	0	1	0	3	0	0	0	3	
13:30	13:45	0	0	3	0	4	0	0	0	3	
13:45	14:00	0	0	5	0	3	0	0	0	1	
14:00	14:15	0	0	1	0	3	0	0	0	5	
14:15	14:30	0	0	2	0	3	0	0	0	2	
14:30	14:45	0	0	4	0	2	0	0	0	2	
14:45	15:00	0	0	0	0	2	0	0	0	1	
15:00	15:15	0	0	0	0	1	0	0	0	5	
15:15	15:30	0	0	2	0	3	0	0	0	5	
15:30	15:45	0	0	2	0	2	0	0	0	1	
15:45	16:00	0	0	4	0	2	0	0	0	3	
16:00	16:15	0	0	1	0	2	0	0	0	3	
16:15	16:30	0	0	1	0	2	0	0	0	4	
16:30	16:45	0	0	3	0	3	0	0	0	2	
16:45	17:00	0	0	4	0	3	0	0	0	0	
17:00	17:15	0	0	2	0	1	0	0	0	3	
17:15	17:30	0	0	3	0	0	0	0	0	2	
17:30	17:45	0	0	1	0	1	0	0	0	1	
17:45	18:00	0	0	1	0	2	0	0	0	1	

Peak Time		**North Approach Anderson D**			**South Approach Anderson D**			**roach New England Hwy EB**			**Peak**
Period Start	**Period End**	U	R	SB	U	NB	L	U	R	L	**total**
7:15	8:15	0	0	12	0	3	0	0	0	6	21
15:00	16:00	0	0	8	0	8	0	0	0	14	30

ASIA PACIFIC OFFICES

ADELAIDE
60 Halifax Street
Adelaide SA 5000
Australia
T: +61 431 516 449

BRISBANE
Level 16, 175 Eagle Street
Brisbane QLD 4000
Australia
T: +61 7 3858 4800
F: +61 7 3858 4801

CAIRNS
Level 1 Suite 1.06
Boland's Centre
14 Spence Street
Cairns QLD 4870
Australia
T: +61 7 4722 8090

CANBERRA
GPO 410
Canberra ACT 2600
Australia
T: +61 2 6287 0800
F: +61 2 9427 8200

DARWIN
Unit 5, 21 Parap Road
Parap NT 0820
Australia
T: +61 8 8998 0100
F: +61 8 9370 0101

GOLD COAST
Level 2, 194 Varsity Parade
Varsity Lakes QLD 4227
Australia
M: +61 438 763 516

MACKAY
21 River Street
Mackay QLD 4740
Australia
T: +61 7 3181 3300

MELBOURNE
Level 11, 176 Wellington Parade
East Melbourne VIC 3002
Australia
T: +61 3 9249 9400
F: +61 3 9249 9499

NEWCASTLE CBD
Suite 2B, 125 Bull Street
Newcastle West NSW 2302
Australia
T: +61 2 4940 0442

NEWCASTLE
10 Kings Road
New Lambton NSW 2305
Australia
T: +61 2 4037 3200
F: +61 2 4037 3201

PERTH
Grd Floor, 503 Murray Street
Perth WA 6000
Australia
T: +61 8 9422 5900
F: +61 8 9422 5901

SYDNEY
Tenancy 202 Submarine School
Sub Base Platypus
120 High Street
North Sydney NSW 2060
Australia
T: +61 2 9427 8100
F: +61 2 9427 8200

TOWNSVILLE
12 Cannan Street
South Townsville QLD 4810
Australia
T: +61 7 4722 8000
F: +61 7 4722 8001

WOLLONGONG
Level 1, The Central Building
UoW Innovation Campus
North Wollongong NSW 2500
Australia
T: +61 2 4249 1000

AUCKLAND
Level 4, 12 O'Connell Street
Auckland 1010
New Zealand
T: 0800 757 695

NELSON
6/A Cambridge Street
Richmond, Nelson 7020
New Zealand
T: +64 274 898 628

WELLINGTON
12A Waterloo Quay
Wellington 6011
New Zealand
T: +64 2181 7186

SINGAPORE
39b Craig Road
Singapore 089677
T: +65 6822 2203