APPENDIX G

Traffic Impact Assessment prepared by SLR

brazier motti

Traffic Impact Assessment

North Shore Central Development – 13 Market Street, Burdell

Oreana Project Management Pty Ltd

Level 17, 627 Chapel Street
South Yarra VIC 3141

Prepared by:

SLR Consulting Australia

SLR Project No.: 620.041996.00002

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Making Sustainability Happen

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
01	27 February 2026	Duong Nguyen/Chris Lawlor	Kris Stone	Chris Lawlor

Basis of Report

This report has been prepared by SLR Consulting Australia (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Oreana Project Management Pty Ltd (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 in connection with a development application. 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, with the exception that Council and referral agencies may, however, only for the purposes of assessing this development application.

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

Table of Contents

Tables

Figures

Appendices

1.0 Introduction

1.1 Overview

SLR Consulting Australia Pty Ltd (**SLR**) has been engaged by Oreana Project Management Pty Ltd (**Oreana**) to provide traffic engineering and transport planning advice in relation to a Development Application (**DA**) for North Shore Central, a shopping centre development (**the development**) located at 13 Market Street, Burdell, within the 'Town Centre' of the North Shore master planned community (**North Shore**). Development plans have been prepared by Buchan and are included at **Appendix A**.

1.2 Planning Application

This DA seeks approval for Material Change of Use for Shopping Centre.

1.3 Assessment Scope

This Traffic Impact Assessment (**TIA**) report assesses the consistency of the development with previous North Shore transport assessments, Townsville City Council (**TCC** or **Council**) and the Department of Transport and Main Roads (**DTMR**) planning. The TIA identifies the impacts of the proposed development on the surrounding transport networks and confirms the transport infrastructure required to support the development, including assessment of the traffic and transport aspects of the development against the relevant Council and DTMR requirements.

The report also identifies the development's proposed waste storage and collection strategy to ensure that the development plans make adequate spatial provisions.

1.4 Existing North Shore Approvals

Of relevance to the proposed development, a Preliminary Approval (**PA**) for Precincts 2 and 3 of North Shore (Council references: R360; R361) contemplates substantial commercial (including retail) development. The decision notice for the PA refers to the following documents which are referenced herein:

- An Infrastructure Agreement (**IA**), which includes details of the contemplated master plan development yields, required Council trunk transport infrastructure, as well as details of the required upgrades to State-controlled transport networks;
- Proposal plans for Precinct 2 and 3 (**Precinct Plan**);
- Town Centre Vision document prepared by Urbis, including the 'Vision Elements' figure (**Town Centre Vision**).

Of note, extensive transport planning and transport modelling has previously been undertaken to identify the transport infrastructure required to ultimately enable North Shore, much of which has already been constructed. For reference, a summary of the land uses and master plan development yields contemplated for North Shore by the prior transport modelling (i.e. as per various IA documents) within the 'Commercial Planning Area' is reproduced in **Table 1** overleaf.

Table 1 IA Summary of Land Uses – Commercial Planning Area

Planning region	Land use	Proposed yield
Commercial Planning Area	Offices	5,000sq.m GFA
	Bulky Goods	25,000sq.m GFA
	Department Stores	14,000sq.m GFA
	Supermarkets	9,500sq.m GFA
	Specialty Retail and Mini Majors	16,500sq.m GFA
	Pool	1,000sq.m site
	Tennis Court	4 courts

GFA = Gross Floor Area

2.0 Site Context

2.1 Subject Site

The subject site is located at 13 Market Street, Burdell, within the Emerging Community (**EC**) zone of the current Townsville City Plan (version 2025/01) (**City Plan**). The site is bound by the Stockland North Shore shopping centre (**Stockland North Shore**) to the north, Market Street to the east, and vacant land to the south and west.

Pursuant to the PA (refer to **Section 1.4 herein**), the site is located within the 'Retail Centre' component of the North Shore Town Centre (i.e. as per the Town Centre Vision), which itself is located within the 'Core area' of the approved 'Precinct 2' (i.e. as per the Precinct Plan).

The location of the subject site is shown in the context of the local area on **Figure 1**.

Figure 1 Site Location

Source: Nearmap. Note, site bounds and object locations indicative only.

The subject site is currently cleared and vacant, with vehicular access achieved via two (2) all-movements driveway crossovers, shared with access to Stockland North Shore, to Market Street to the east and Nexus Drive to the west as indicated on **Figure 1**.

2.2 Surrounding Road Network

Details of the key roads surrounding the subject site are provided in **Table 2**.

Table 2 Key Surrounding Roads

Road name	Authority	Road hierarchy	Existing form	Posted speed
Market Street	TCC	Unclassified	Dual carriageway with two (2) traffic lanes in each direction. Urban cross-section with ~1.5m wide footpaths on either side.	60km/h
Main Street	TCC	Unclassified	Single carriageway with one (1) traffic lane in and indented parking in each direction. Urban cross-section with ~2.0m (minimum) wide footpaths on both sides.	40km/h
Nexus Drive/Burdell Drive	TCC	Major Collector	Dual carriageway with two (2) traffic lanes in each direction. Urban cross-section with a ~1.5m wide footpath on the western side and a ~2m wide footpath on the eastern side. Nexus Drive currently terminates immediately west of Market Street to the southeast of the site and south of Main Street to the northwest of the site.	Unposted (50km/h default speed limit applies)

2.3 Public Transport

The subject site has reasonable access to public transport, with two (2) bus routes located within walking distance. Details of bus services located proximate to the site are summarised in **Table 3**.

Table 3 Surrounding Bus Services

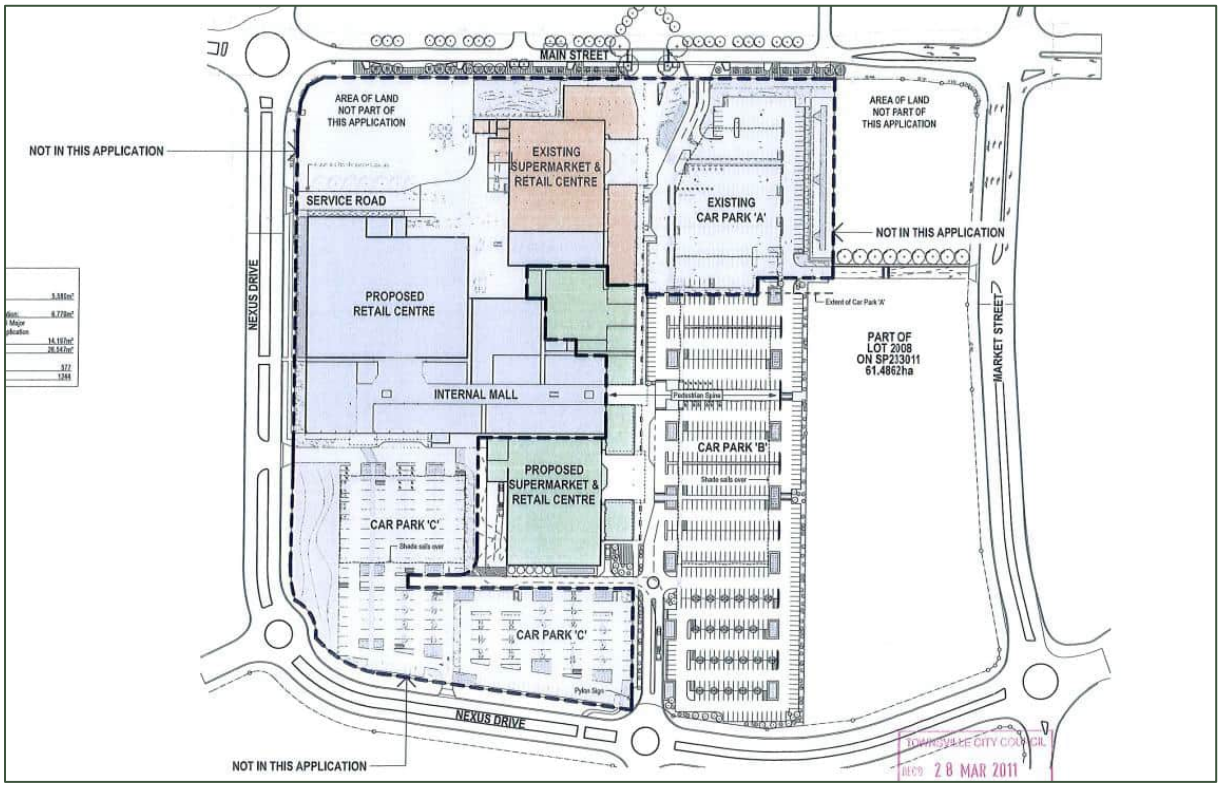
Route Number	Route description	Nearest stop	Walking distance
232	Stockland Aitkenvale – Burdell	Main Street	300m
233	Stockland Aitkenvale – Bushland Beach		

2.4 Road Network Planning

In order to determine the location and nature of any planned upgrades of the surrounding Council road network, SLR carried out a review of TCC's *Local Government Infrastructure Plan* (**LGIP**). The review indicated that there were no trunk transport network upgrades planned within the immediate vicinity of the subject site.

It is noted that the Town Centre Vision indicates a new road connection between the existing roundabouts at Main Street/Okino Place to the northwest and Market Street/Burdell Street to the southeast (i.e. an extension of Nexus Drive), however, it is understood that there are no specific requirements as per the IA or conditions for the PA. It is noted that indicative layouts of the Nexus Drive extension have been indicatively shown on plans approved as part of a DA for the extension of Stockland North Shore over the subject site (Council ref: MI10/0069) as shown on **Figure 2** overleaf.

Figure 2 MI10/0069 – Indicative Nexus Drive Layout



Whilst the above plans appear to show a four-lane cross section for Nexus Drive, the traffic engineering requirements for the required cross-section have been investigated herein.

3.0 Proposed Development

3.1 Development Overview

Based on the development plans prepared by Buchan, which are included at **Appendix A**, it is proposed to develop the site for the purposes of a shopping centre; North Shore Central. The tenancy types and yields proposed as part of the development are summarised in **Table 4**.

Table 4 North Shore Central Development Summary

Tenancy type	Yield
Discount Department	6,724sq.m GFA
Fresh Food	385sq.m GFA
Kiosk	191sq.m GFA
Liquor	153sq.m GFA
Mini Major	2,666sq.m GFA
Specialty	2,338sq.m GFA
Specialty – Food & Beverage	1,290sq.m GFA
Supermarket	4,207sq.m GFA
Total	**17,954sq.m GFA**
Car parking	728 spaces
Motorcycle parking	10 spaces
Bicycle parking	24 spaces

3.2 Proposed Traffic Arrangements

Vehicular access to the development will be achieved via seven (7) driveway crossovers to fronting roads, which are described as follows (i.e. in a clockwise direction from the northwest corner of the site):

- A modified all-movements driveway crossover to Market Street will facilitate access for all vehicle types to car parking and servicing areas within the subject development and also Stockland North Shore. The existing shared driveway crossover to Market Street will be relocated to the south, with the existing driveway crossover closed and the kerb and channel and central median on Market Street to be reinstated;
- A new left in/left out only driveway crossover to Market Street will facilitate access to the main car parking area;
- A new left out only driveway crossover to a new section of Nexus Drive (refer to Section 3.2 herein) will facilitate egress from the main car parking area;
- A new four-way roundabout to the new section of Nexus Drive to the south will facilitate access to the main car parking area, passenger setdown facilities along the shopping centre frontage, and entry to the supermarket (Coles) ‘click and collect’ facility. Provision has been made for a future southern leg to the roundabout to facilitate access to land to the south;
- A new exit only driveway crossover will be provided to the new section of Nexus Drive to the south, facilitating egress from the supermarket (Coles) ‘click and collect’ facility;

- A new all-movements driveway crossover to the new section of Nexus Drive to the south, to be provided for service vehicles only, will facilitate access to the supermarket, discount department and specialty retail loading areas;
- A new all-movements driveway crossover to the new section of Nexus Drive to the west will facilitate access for all vehicle types to car parking and servicing areas within the subject development and also Stockland North Shore.

With respect to the number of driveway crossovers proposed, it is noted that:

- A number of these driveways (i.e. 4x) provide shared access for multiple sites/developments;
- Further access rationalisation is not feasible due to separation (e.g. service vehicles and general traffic) and operational requirements;
- As demonstrated herein, all accesses satisfy relevant design (including safety and separation requirements) and operational performance criteria.

A total of 728 car parking spaces will be provided across the site, inclusive of 16 spaces for Persons with a Disability (**PWD**). In addition, 10 motorcycle parking spaces and a total of 24 bicycle parking spaces (i.e. 12 secure spaces for employees and 12 visitor spaces) are also proposed in proximity to major pedestrian entrances.

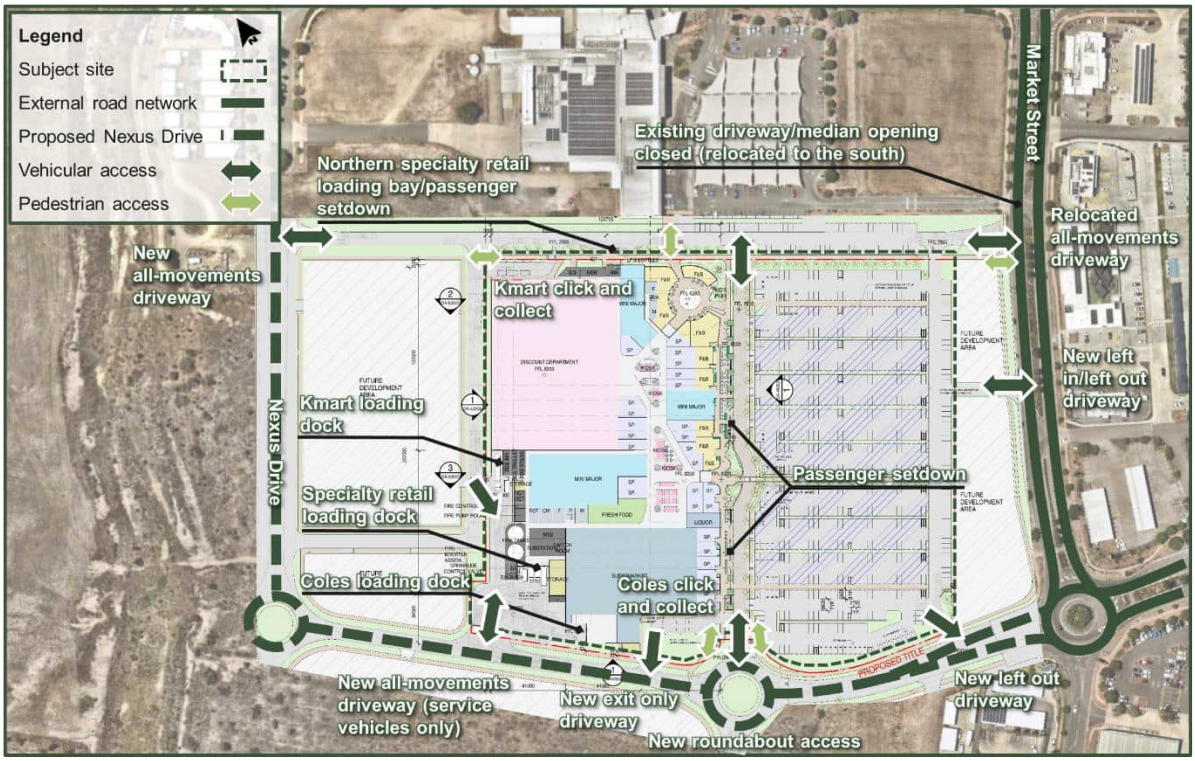
Two (2) indented passenger setdown bays, suitable to accommodate up to a total of five (5) vehicles, are proposed along the eastern face of the retail building. 'Click and collect' facilities are provided for the supermarket and discount department tenancies to the northwest and southwest of the retail building respectively.

The developments proposed servicing arrangements are summarised as follows:

- An indented loading bay will be provided on the northern frontage of the shopping centre building to facilitate refuse collection of bulk bins for specialty retail tenancies (i.e. by rear-lift Refuse Collection Vehicles [**RCVs**]) and also short-term parking for passenger setdown and collection of orders by food delivery services (i.e. from the food and beverage tenancies);
- A dedicated loading area for the discount department tenancy (Kmart) is provided on the western frontage of the retail building, providing a loading bay for deliveries by vehicles up to Articulated Vehicle (**AV**) size. A compactor and bulk bins will be provided for refuse storage, which will require access by Roll On, Roll Off (**RORO**) and front-lift type RCVs;
- A loading area for the specialty retail tenancies is proposed to the southwest of the retail building, with three (3) loading bays provided to suit a range of vehicles up to Heavy Rigid Vehicle (**HRV**) size. A compactor and bulk bins will be provided for refuse storage, which will require access for RORO and front-lift type RCVs;
- A loading area for the supermarket (Coles) tenancy is also proposed to the southwest of the retail building, with one (1) loading bay provided for AVs and one (1) loading bay for vehicles up to **HRV** size. A compactor and bulk bins will be provided for refuse storage, which will require access for RORO and front-lift type RCVs.

Reflective of the above, the proposed traffic arrangements are illustrated on **Figure 3** overleaf.

Figure 3 Proposed Traffic Arrangements



Source: Nearmap, Buchan. Note, site bounds and object locations indicative only.

3.3 Nexus Drive

Based on traffic modelling undertaken for the ultimate Town Centre development scenario (refer to **Section 7** and **Section 8** herein), it has been established that:

- Only two (2) traffic lanes (i.e. single lane in each direction) are required for Nexus Drive to the west of the Nexus Drive/site access roundabout (i.e. proposed with a single circulating lane);
- Nexus Drive will transition from two (2) lanes at the above roundabout to four (4) lanes (i.e. dual lanes in each direction) towards the existing Market Street/Nexus Drive/Burdell Street roundabout to the east (i.e. constructed with dual circulating lanes);
- A single lane roundabout on Nexus Drive to the west of the site access roundabout, with single approach and departure lanes for all legs, would be sufficient to accommodate ultimate development traffic demands.

Other relevant design considerations for the design of Nexus Drive are summarised as follows:

- Provisions have been made for a central median with a raised island to restrict movements at any proposed (or future access) to the east of the site access roundabout. To the west of the access roundabout, based on the traffic modelling documented herein, traffic volumes would be <3,000vpd, and hence no provisions for access restrictions or turning lanes are considered to be warranted, particularly in consideration of the low-speed environment facilitated by the proposed roundabouts along Nexus Drive (i.e. <40km/h);
- There are no on-road cycle facilities on any existing roads surrounding the site, and hence it is considered that cyclists would be best accommodated by a 2.5m shared path on the northern side of Nexus Drive;

- The project civil engineer, Premise, has advised that a 6.0m verge is required for the purposes of bioretention/stormwater management and also street trees.

Reflective of the above, the proposed Nexus Drive cross section is summarised in **Table 5**.

Table 5 Nexus Drive Cross Section (typical)

Element	Width
Verge width (property boundary to back of kerb) (x2)	6.0m[1]
Kerb and channel (x2)	0.6m
Nominal traffic lane width (lip to centreline) x 2	3.7m[2]
Total road reserve width (typical section only)	**20.6m**

[1]2.5m shared path proposed on the northern side, 1.5m footpath on the southern side.

[2]3.5m wide traffic lanes proposed for 4-lane section

4.0 Parking and Servicing Provisions

4.1 Car Parking

The City Plan *Transport impact, access and parking* code (**TIAP code**) acceptable outcome car parking provision, as set out by *Schedule 6.10 (Parking rates planning scheme policy)* of the City Plan, is summarised in **Whilst back of house areas are not currently indicated on the plans, it has been assumed that 10% of the total shopping centre GFA would not be available for the public and hence is considered as 'storage' GFA for the below calculation.**

Table 6. Whilst back of house areas are not currently indicated on the plans, it has been assumed that 10% of the total shopping centre GFA would not be available for the public and hence is considered as 'storage' GFA for the below calculation.

Table 6 TIAP Code Acceptable Outcome Car Parking Provision (minimum)

Land Use	Component	Yield	Car parking rate	Car parking provision
Shopping Centre	Total retail area available to the public (90%)	16,159sq.m GFA	1 space per 25sq.m GFA	646.4 spaces
	Storage area (10%)	1,795sq.m GFA	1 space per 100sq.m GFA	18.0 spaces
Total		**17,954sq.m GFA**	**-**	**664.4 → 665 spaces**

The development's proposed car parking provision of 728 spaces across the site readily satisfies the acceptable outcome provision of 665 spaces as detailed in **Whilst back of house areas are not currently indicated on the plans, it has been assumed that 10% of the total shopping centre GFA would not be available for the public and hence is considered as 'storage' GFA for the below calculation.**

Table 6. Accordingly, the proposed car parking provision satisfies the relevant TIAP Code acceptable outcome (AO17) relevant to car parking provision.

Whilst there is no specific TIAP assessment benchmark relating motorcycle parking, the development will provide 10 motorcycle parking spaces in close proximity to major pedestrian entrances.

4.2 PWD Car Parking

The National Construction Code (**NCC**) stipulates the PWD car parking requirements for a building based on its class. All buildings proposed as part of the development are categorised by the NCC as Class 6 buildings, and as such, require one (1) PWD space for every 50 car parking spaces or part thereof. For the 728 parking spaces proposed, 15 PWD parking spaces (728/50 = 14.6 → 15) are therefore required.

The development plans indicate that 16 PWD parking spaces are proposed across the site, which satisfies the above NCC requirements. This PWD parking provision also satisfies performance outcome PO18 of the TIAP code.

4.3 Bicycle Parking

Performance outcome PO15 of the TIAP Code refers indicates that bicycle facilities are required for major development in accordance with the Queensland Development Code (**QDC**) *Mandatory Part 4.1 — Sustainable Buildings* (**MP4.1**). MP4.1 defines a major retail

development as having greater than 2,000sq.m floor space (i.e. the proposed development achieves).

The MP4.1 requires one (1) medium security bicycle parking space per 500 occupants within the shopping centre. Based on *Table D2D18* of the NCC, the subject development is expected to provide for up to 5,985 occupants, and hence a minimum of 12 (i.e. 5,985/500=11.97) secure bicycle parking spaces are required. Whilst there is no specific visitor bicycle parking requirement in MP4.1, to encourage sustainable transport use, it is recommended the same quantum (i.e. 12 spaces) be provided for visitor parking.

It is therefore recommended that a total provision of 24 bicycle parking spaces (12 secure spaces for employees and 12 spaces for visitors near pedestrian entrances) are provided.

Schedule 4 Table A of MP4.1, required the following end of trip facility provision to support 12 secure employee bicycle parking spaces:

- 2 change rooms (1 male, 1 female);
- 2 showers (1 male, 1 female);
- Toilets and hand basins.

Based on the above bicycle parking and end of trip facility provisions, the development achieves the relevant TIAP code performance outcomes (i.e. PO4 and PO15).

4.4 Passenger Setdown facilities

The development makes the following provisions for passenger setdown (i.e. by taxi, rideshare, buses and private vehicles) in close proximity to main building pedestrian entrances:

- Two (2) indented passenger setdown bays, suitable to accommodate up to a total of five (5) vehicles, are proposed along the eastern face of the retail building.
- An indented bay suitable to accommodate up to three (3) vehicles, and to be shared with occasional RCV and food delivery service use, will be provided on the northern frontage of the retail building.

The proposed passenger setdown facilities are considered to sufficient to satisfy the level of demand anticipated to be generated by the development, and hence the development readily satisfies performance outcome PO19 of the TIAP code.

4.5 Service Vehicle Provision

With respect to service vehicle provision, acceptable outcome AO26 of the TIAP Code refers the standards outlined in the City Plan *SC6.4 Development manual planning scheme policy* (**Development Manual PSP**). *SC6.4.5.4 Car Parking* states, in relation to 'servicing', that:

"The development must make adequate onsite provision for access, loading, unloading, and manoeuvring of service vehicles sufficient to cater for the demand generated by the development and the service vehicles utilised."

In that regard, the development proposes the following:

- The servicing areas proposed for both the supermarket (Coles) and discount department (Kmart) tenancies have been designed in accordance with standard tenant specifications, including the number and size of loading bays provided, and hence will readily accommodate all anticipated design vehicles for loading and waste collection;
- The specialty retail loading areas, consisting of an indented (parallel) loading bay to the north and a southern servicing area with multiple HRV bays, are considered

sufficient to accommodate all anticipated design vehicles for loading and waste collection.

Accordingly, it is considered that the proposed servicing provisions are sufficient to satisfy the level of demand anticipated to be generated by the development, and hence the development readily satisfies acceptable outcome AO26 of the TIAP code.

5.0 Design Considerations

5.1 Overview

A review of the development's proposed traffic arrangements has been undertaken against the following relevant documents:

- TIAP Code;
- Development Manual PSP;
- Australian Standard for Parking facilities *Part 1: Off-street car parking* (**AS2890.1**);
- Australian Standard for Parking facilities *Part 2: Off-street commercial vehicle facilities* (**AS2890.2**);
- Australian Standard for Parking facilities *Part 6: Off-street parking for people with disabilities* (**AS2890.6**).

5.2 Site Access

The following is noted in relation to the design of the proposed site access arrangements:

- All driveway crossovers are located in accordance with AS2890.1 and have been designed to accommodate independent manoeuvring for the largest anticipated design vehicles (refer to swept path assessments included at **Appendix B**) and also in accordance with the relevant Institute of Public Works Engineering Australasia (**IPWEA**) standard drawings for driveway crossovers (i.e. RS-051);
- All proposed driveway crossovers are provided on relatively flat and straight frontage road alignments, and hence readily satisfy the relevant sight distance requirements of AS2890.1/AS2890.2 in consideration of the anticipated design speeds;
- The roundabout access to Nexus Drive has been designed conceptually in accordance with Austroads *Guide to Road Design Part 4B: Roundabouts* (**AGRD4B**);
- Allowance has been made for pedestrian sight splays to be provided in accordance with AS2890.1/AS2890.2. Access grading will be designed by the project civil engineer, premise in accordance with AS2890.1/AS2890.2 requirements;
- For 728 car parking spaces, *Table 3.3* of AS2890.1 recommends a total queuing provision of 10-11 vehicle lengths (i.e. total across all accesses), which is significantly exceeded by that shown on the development plan. Furthermore, all proposed site accesses (i.e. allowing entry movements) provide a minimum of at least four (4) vehicle lengths between the property boundary/external road and internal intersections or car parking spaces;
- All servicing areas are separated a minimum of 20m, or the length of an AV, from the property boundary;
- For site accesses with restricted movements (e.g. exit only and left out only), appropriate signage and/or linemarking should be provided at the driveway crossover near the property boundary to reinforce vehicle movements;
- The SIDRA analysis summarised in **Section 8** herein demonstrates that all proposed site accesses would operate within acceptable performance and safety thresholds under 'ultimate' traffic conditions.

Accordingly, the proposed design of site access arrangements is considered to satisfy the relevant TIAP Code performance outcomes (PO1, PO5 and PO7).

5.3 Car Parking and Circulation

The design of the car parking and circulation arrangements proposed for the development has been assessed against the requirements of AS2890.1 as referred to by the Development Manual PSP. A summary of the assessment is presented in **Table 7**.

Table 7 Car Parking Area Layout Design Compliance Assessment

Element	Proposed design	AS2890.1 Compliant
90° car parking spaces (user class 3A)	2.7m x 5.4m	✓
Parking aisle width (user class 3A)	6.6m+	✓
Motorcycle parking space dimensions	1.2m x 2.5m	✓
Design envelope for car parking spaces	As per *Figure 5.2* of AS2890.1	✓
Height Clearance	2.2m+	✓

As demonstrated in **Table 7**, the design of all assessed car park elements complies with the relevant requirements of AS2890.1 and therefore also satisfies the relevant Development Manual PSP requirements.

The development will provide 16 PWD car parking spaces across the site. The dimensions of the proposed PWD spaces satisfy the requirements of AS2890.6 (2.4m x 5.4m parking space plus 2.4m x 5.4m shared space with 2.5m headroom).

Pedestrian pathways and crossings are provided throughout the car parking area, prioritising pedestrian movements to key building access locations. It is recommended that give-way and directional line marking and supporting signage is provided at the detailed design stage to clearly delineate traffic circulation and priority within car parking areas.

Accordingly, the proposed design of car parking and circulation areas satisfies the relevant TIAP Code assessment benchmarks (i.e. AO18 and PO20, AO21).

5.4 Servicing Areas

The proposed design of servicing arrangements was reviewed against the requirements of AS2890.2, as referred to by the Development Manual PSP. Swept path assessments have been prepared for all anticipated loading and refuse collection design vehicles and are included at **Appendix B**. The swept path assessments show that all design vehicles are able enter and exit the site in a forward direction and manoeuvre within the site while maintaining the minimum clearance required by AS2890.2 (300mm on both sides of the vehicle for low-speed manoeuvres).

All loading bays will provide the minimum dimensions and height clearance required by *Table 4.1* (Service bay dimensions) of AS2890.2 for the respective design vehicles (i.e. 4.5m+ provided). Where RORO RCVs are proposed, a minimum of 5m height clearance will be provided. Where front-lift RCVs are proposed, a minimum of 6.5m height clearance will be provided. It is understood that grading of accesses and service bays will be designed by the project civil engineer, Premise, in accordance with AS2890.2.

Based on the above, the proposed development complies with the relevant AS2890.2 and Development Manual PSP and hence satisfies the TIAP Code acceptable outcomes with respect to the design of service areas (AO26 and AO27).

6.0 Waste Storage and Collection Strategy

6.1 Overview

A review of the development's anticipated operational waste storage and collection requirements has been undertaken in consideration of *SC6.4.22 Waste management* within the Development Manual PSP. It is considered that the requirement for provision of a formal Waste Management Plan (**WMP**) can be conditioned to be provided at the compliance stage.

This review has been undertaken to ensure that the development plans make adequate spatial provisions for the storage and collection of waste (i.e. sufficient for the purposes of the DA. The proposed waste management strategy will then be refined in the WMP in consultation with confirmed tenants and refuse collection contractors.

6.2 Waste Management Areas

From a waste management perspective, the development has been considered across the three (3) following areas:

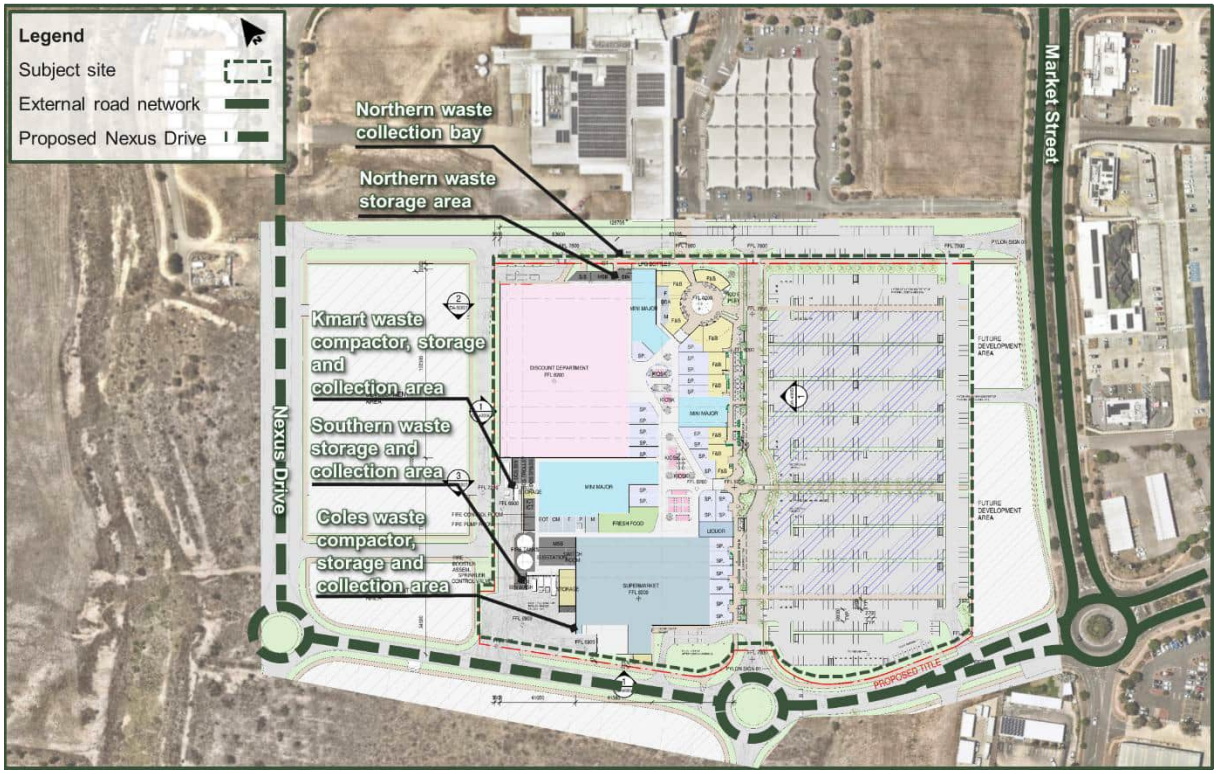
1. Discount Department (Kmart);
2. Specialty retail tenancies;
3. Supermarket (Coles).

The tenancy types and floor areas within each of the above areas are summarised in **Table 8.** The proposed locations of bin storage and refuse collection areas throughout the development are mapped on **Figure 4** overleaf.

Table 8 Waste Management Areas

Area ID	Tenancy type	Yield (GFA)
1	Discount department store (Kmart)	**6,724sq.m**
2	Specialty retail	2,338sq.m
	Kiosk	191sq.m
	Mini major	2,666sq.m
	Food and drink	1,290sq.m
	Liquor	153sq.m
	Fresh food	385sq.m
	Subtotal	**7,023sq.m**
3	Supermarket (Coles)	**4,207sq.m**
Total		**17,954sq.m**

Figure 4 Waste Storage and Collection Locations



Source: Nearmap, Buchan. Note, site bounds and object locations indicative only.

6.3 Waste Generation

Given that there are no specific rates identified within *SC6.4.22 Waste management*, waste quantities have been estimated based on guidance provided within the Council of the City of Gold Coast's *City plan policy – Solid waste management* (**CCGC SWM**).

The proposed supermarket and department store tenancies (i.e. to be operated by Coles and Kmart respectively) will operate in accordance with their own standard waste management practices (i.e. based on significant operation experience) and waste generation has not been estimated for these areas.

Reflective of the above, the waste generation rate adopted for each tenancy type is summarised in **Table 9**.

Table 9 Daily Waste Generation Rates

Tenancy	CCGC SWM rate adopted	Daily generation rates	
		General waste	Recycling
Supermarket (Coles)	As per Coles standard specifications		
Department Store	As per Kmart standard specifications		
Specialty Retail	Shop <100m^2 floor area	50L/100sq.m	25L/100sq.m
Kiosk	Shop <100m^2 floor area	50L/100sq.m	25L/100sq.m
Mini Major	Shop >100m^2 floor area	50L/100sq.m	50L/100sq.m
Food and Drink	Restaurant	660L/100sq.m	200L/100sq.m
Liquor	Retail (non-food)	50L/100sq.m	50L/100sq.m
Fresh Food	Fruit and vegetable shop	240L/100sq.m	120L/100sq.m

6.4 Weekly Waste Generation Estimates.

Based on the above rates, the weekly quantity of estimated to be generated by each area is summarised in **Table 10**.

Table 10 Weekly Waste Generation

Area	Tenancy	Yield (GFA)	Weekly operating days	General waste	Recycling
1	Discount department (Kmart)	**6,724sq.m**	As per Kmart standard specifications		
2	Specialty retail	2,338sq.m	7	8,138L	4,092L
	Kiosk	191sq.m	7	669L	334L
	Mini major	2,666sq.m	7	9,331L	9,331L
	Food and drink	1,290sq.m	7	59,580L	18,060L
	Liquor	153sq.m	7	536L	536L
	Fresh food	385sq.m	7	6,468L	3,234L
	Subtotal	**7,023sq.m**	**-**	**84,784L**	**35,586L**
3	Supermarket (Coles)	**4,207sq.m**	As per Coles standard specifications		

6.5 Waste Collection Frequencies and Storage Requirements

The number of bins required to service the development has been estimated based upon the following:

- For the discount department tenancy (‘Area 1’), in accordance with Kmart standard specifications;
- For the supermarket tenancy (‘Area 3’), in accordance with Coles standard specifications;
- Estimates of weekly refuse and recycling generation as per **Section 6.4** and assumed collection frequencies and bin types based on the tenant operational requirements;
- With respect to ‘Area 2’ (i.e. specialty retail tenancies), as indicated on **Figure 4**, northern and southern waste storage and collection areas are proposed. It is noted that the collection of waste from the northern storage area would be restricted to rear-lift RCVs, and hence a maximum bin size of 1,100L is proposed such that bins can be transferred to the adjacent loading bay. A waste compactor (nominally 19m^3) and large bulk bins (nominally 3,000L) will be provided for the southern storage area, however, only bulk bins have been relied on for the below calculations, noting that the use of the compactor would substantially reduce the below storage requirements and collection frequencies.

Reflective of the above, the anticipated collection frequencies, bin types and quantum required to service the development are presented in **Table 11** overleaf.

Table 11 Waste Collection Frequencies and Storage Requirements

Area	Waste stream	Weekly generation	Collection frequency	Storage required	Proposed bin types and quantum
1	As per Kmart standard specifications				
2	General waste	84,784L	Four times weekly	21,196L	3 x 1,100L bulk bins
					6 x 3m^3 bulk bins
	Recycling	35,586L	Four times weekly	8,897L	3 x 1,100L bulk bins
					2 x 3m^3 bulk bins
3	As per Coles standard specifications				

With respect to the collection frequencies indicated for 'Area 2', if the waste compactor (i.e. nominal 3:1 compaction ratio) proposed for the southern storage area were considered in the above calculations, the weekly waste storage and collection requirements would reduce substantially (i.e. likely 2-3 collections per week would be required). These assumptions will be refined in the WMP to be provided at the compliance stage.

6.6 Waste Storage Areas

Based on the bin types and quantities summarised above, the spatial requirements for each waste storage area are presented in **Table 12**. Typical best practise is to provide a refuse storage area which has a GFA that is 1.5 times larger than the minimum bin footprint requirement for ease of access to bins and also for manoeuvring bins in and out of the storage area as required for collection and cleaning.

Table 12 Waste Storage Area Spatial Requirements

Area		Proposed bin types	Bin dimensions (L x W)[1]	Bin area	Total spatial requirement (bin area x 1.5)	Storage area provided
1		As per Kmart standard specifications				
2	Northern area	6 x 1,100L	1.28m x 1.08m	8.30sq.m	12.45sq.m	44.0sq.m
	Southern area	8 x 3,000L	2.08m x 1.51m	25.13sq.m	37.70sq.m	47.4sq.m
3		As per Coles standard specifications				

[1] Dimensions as per SC6.4.22 Waste Management

As indicated in **Table 12**, the proposed storage areas (including areas labelled as bin wash areas) are sufficient to accommodate the indicative bin storage requirements. Once again, if the waste compactor proposed for the southern storage area were considered, the above storage area requirements would reduce further (i.e. the above presents the worst-case bin storage provision without reliance on compaction).

6.7 Waste Collection

A summary of the bin types proposed in each storage area and the various types of RCVs required is provided in **Table 13**.

Table 13 Waste Collection Requirements Summary

Area		Bin Types	Vehicle Type
1		3m^3 and 4.5m^3 bulk bins	Front-lift RCV
		Compactor	RORO RCV
2	Northern area	1,100L bulk bins	Rear-lift RCV
	Southern area	3,000L bulk bins	Front-lift RCV
		Compactor	RORO RCV
3		3m^3 and 4.5m^3 bulk bins	Front-lift RCV
		Compactor	RORO RCV

Bins will be collected from the loading bays located immediately adjacent to each of the proposed refuse storage areas by private refuse collection contractors. Bins may need to be moved out of the refuse storage area by centre management/tenancy personnel to a suitable location prior to collection. A swept path assessment of all RCV types required has been prepared by SLR and is included at **Appendix B**.

6.8 Operational and Design Requirements

6.8.1 Responsibilities

Tenants will be responsible for:

- Sorting and storage of waste streams into suitable bins within each tenancy;
- Transferring of waste from individual tenancy storage areas to the communal refuse storage areas.

Centre management will be responsible for:

- Documenting and distributing details of the proposed waste management strategy, procedures and requirements etc. to all tenants;
- Provision of appropriate signage adjacent to waste/recycling disposal locations in common areas in order to minimise contamination of waste streams;
- Transfer and sorting of waste from bins located in common areas to the communal refuse storage areas;
- Management, maintenance, cleaning and monitoring of all waste-related equipment provided throughout the site;
- Management of all waste storage area including cleaning, vermin control, etc.;
- Transfer of bins between the waste storage areas and collection points on the evening prior to collection and following collection (if required);
- Cleaning of bins as required following collection.

Coles and Kmart will be responsible for all of the above waste management aspects specific to their respective tenancy lease areas.

Waste collection contractors will be responsible for collection of general waste and recycling streams from the designated loading bays around the site.

6.8.2 Design Requirements

Waste storage areas should be provided in accordance with *SC6.4.22.3 Waste management standards* and should consider the following:

- Appropriate storage for bulk bins, including spare bins if required;
- Appropriate screening, ventilation, vermin-control measures, lighting and security; and
- Provision for cleaning of bins including water supply/tap/hose, graded and slip resistant floor and appropriate drainage.

Where possible:

- Waste transfer paths should be segregated, and bins should not be transferred through public areas during peak operational periods;
- Waste should be collected outside of peak operational periods.

7.0 Assessment Traffic Volumes

7.1 Overview

With reference to the IA for North Shore and the summary of land uses and development yields contemplated by the IA as per **Table 1** herein, the following of relevance is noted:

- A total of 40,000sq.m GFA of retail or 'shopping centre' land uses (i.e. sum of 'Department Stores', 'Supermarkets' and 'Specialty Retail and Mini Majors') are contemplated by the IA for the 'commercial planning area';
- It is understood the existing Stockland North Shore development consists of approximately 5,815sq.m of shopping centre GFA;
- Based on the proposed development yield (i.e. 17,954sq.m GFA) and the Stockland North Shore yield, the cumulative total of retail GFA (i.e. 23,769sq.m GFA) is well within that contemplated for the IA (i.e. the development is well within that previously contemplated by the traffic modelling which informed the IA).
- Given the consistency of the proposed development with the IA (i.e. and major road network planning), no consideration of Council's trunk road network, nor the state-controlled road network, is warranted (i.e. the development does not trigger any additional trunk road network or state-controlled road upgrades due to its consistency with the IA).

Notwithstanding, to establish the required form of the various site accesses and also the required form of the extension of Nexus Drive, traffic analysis has been undertaken for the 'Ultimate' development (i.e. full build out) of the adjacent land parcels forming part of the North Shore Town Centre. Given the limited development and road connectivity currently provided proximate to the subject site (i.e. to the west, northwest and south of the site), consideration of 'Ultimate' development traffic demands is considered a superior approach to traditional assessment approach (i.e. based predominantly on surveys of existing traffic demands).

7.2 Development Traffic Demands

Peak hour traffic demand has been estimated for the proposed shopping centre development based upon the data summarised *Traffic Generation Data 2006 – 2021* (**QLD Open Data**), whereby 85th percentile traffic generation rates for 'shopping centres' between 15,000sq.m – 20,000sq.m in size have been calculated. It is noted that limited data is provided for the weekday AM peak hour period and hence a traffic generation rate of half the observed PM peak hour has been adopted.

Based on the above, the adopted peak hour traffic generation rates and resultant traffic demand estimate for the development is presented in **Table 14**.

Table 14 Development Trip Demand Forecast

Land Use	Yield	Trip Rates	Peak Hour Trips	
			AM	PM
Shopping Centre	17,954sq.m GFA	**AM:** 4.3vph per 100sq.m GFA **PM:** 8.6vph per 100sq.m GFA	772vph	1,544vph

The adopted inbound/outbound distribution of trips is consistent with the All trips have been conservatively assumed to be new trips (i.e. no drop-in trips have been applied) and the trips have been distributed across the proposed accesses as summarised in **Table 15** overleaf.

Table 15 Access Trip Distribution

Access	Distribution
Market Street/Site access 1	10%
Market Street/Site access 2	25%
Nexus Drive/Site access 1	5%
Nexus Drive/Site access 2 (service vehicles only)	1%
Nexus Drive/Site access 3 (click and collect exit only)	4%
Nexus Drive/Site access 4	40%
Nexus Drive/Site access 5 (left out only)	15%

7.3 Ultimate Development Traffic Volumes

7.3.1 Desktop Traffic Model

A desktop traffic model was prepared to establish the future traffic demands likely to be generated by the subject site and the ultimate development of essentially all other land parcels west of Market Street and south of Main Street, to be accessed by the proposed extension of Nexus Drive. An indicative masterplan development layout has been disaggregated into various internal 'zones' based on access provisions to the external and internal network. The model zones and extent of land considered by the desktop traffic model are illustrated on **Figure 5.**

Figure 5 Desktop Traffic Model and Zoning Structure

Source: Nearmap

7.3.2 Existing Traffic Demands

To establish existing traffic volumes on the surrounding road network, particularly to contemplate existing land uses, SLR commissioned Austraffic to undertake 12-hour traffic surveys on Thursday 18 September 2025 at the following intersections:

- Main Street/Market Street;
- Market Street/Nexus Drive;
- Main Street/Stockland North Shore site access;
- Market Street/Stockland North Shore site access;
- Waterway Drive/Yalbira Drive.

The traffic surveys identified the following network peak hour periods:

- **AM peak hour:** 7:45-8:45AM;
- **PM peak hour:** 4:00-5:00PM.

7.3.3 Adopted Ultimate Development Traffic Demands

An indicative yield and land uses for the ultimate development was derived in consultation with Oreana and Buchan and is summarised in **Table 16** (note, this includes the subject development). Peak hour traffic demands, also summarised in **Table 16**, have been estimated for the ultimate development based on the following data sources:

- **Medium density residential:** peak hour rates for 'Medium density residential' (regional) from the NSW GTIA have been adopted;
- **Retirement (lifestyle community):** peak hour rates for 'housing for seniors' from the NSW GTIA have been adopted;
- **Shopping centre:** QLD Open Data (refer to **Section 7.2** herein);
- **Showroom:** peak hour rates for 'bulky goods stores' from the NSW GTIA have been adopted.

Table 16 Ultimate Development Trip Demand Forecast

Land Use	Yield	Trip Rates	Peak Hour Trips	
			AM	PM
Medium density residential	120 dwellings	**AM:** 0.41vph per dwelling **PM:** 0.60vph per dwelling	49vph	72vph
Retirement (lifestyle community)	400 dwellings	**AM & PM:** 0.23vph per dwelling	92vph	92vph
Shopping centre	22,500sq.m GFA[1]	**AM:** 4.3vph per 100sq.m GFA **PM:** 8.6vph per 100sq.m GFA	968vph	1,935vph
Showroom (bulky goods)	15,000sq.m GFA	**AM:** 1.51vph per 100sq.m GFA **PM:** 2.72vph per 100sq.m GFA	227vph	408vph
TOTAL			**1,336vph**	**2,507vph**

[1]includes the subject development.

7.3.4 Trip Distribution

7.3.4.1 Directional Split

The inbound/outbound trip directional splits as documented in **Table 17** have been adopted for each of the assessed land uses.

Table 17 Land Use Directional Splits

Land Use	AM Peak		PM Peak	
	In	Out	In	Out
Medium density residential	30%	70%	70%	30%
Retirement (lifestyle community)	30%	70%	70%	30%
Shopping centre[1]	65%	35%	50%	50%
Showroom (bulky goods)	60%	40%	40%	60%

[1]based on Stockland North Shore traffic survey results

7.3.4.2 External Traffic Distribution

The distribution of trips to the external road network has been assigned according to the distributions presented in **Table 18**. These proportions have been based on a review of an economics assessment prepared by Location IQ in 2025, to understand market catchments, as well as thorough a review of surrounding destinations and their expected attractiveness (e.g. Townsville CBD).

Table 18 External Traffic Distribution

Direction	Via	Proportion of Trips
North	North Shore Boulevard	60%
East	Burdell Drive/Lade Musgrave Circuit	5%
South	Bruce Highway	15%
West	Yalbira Drive	5%

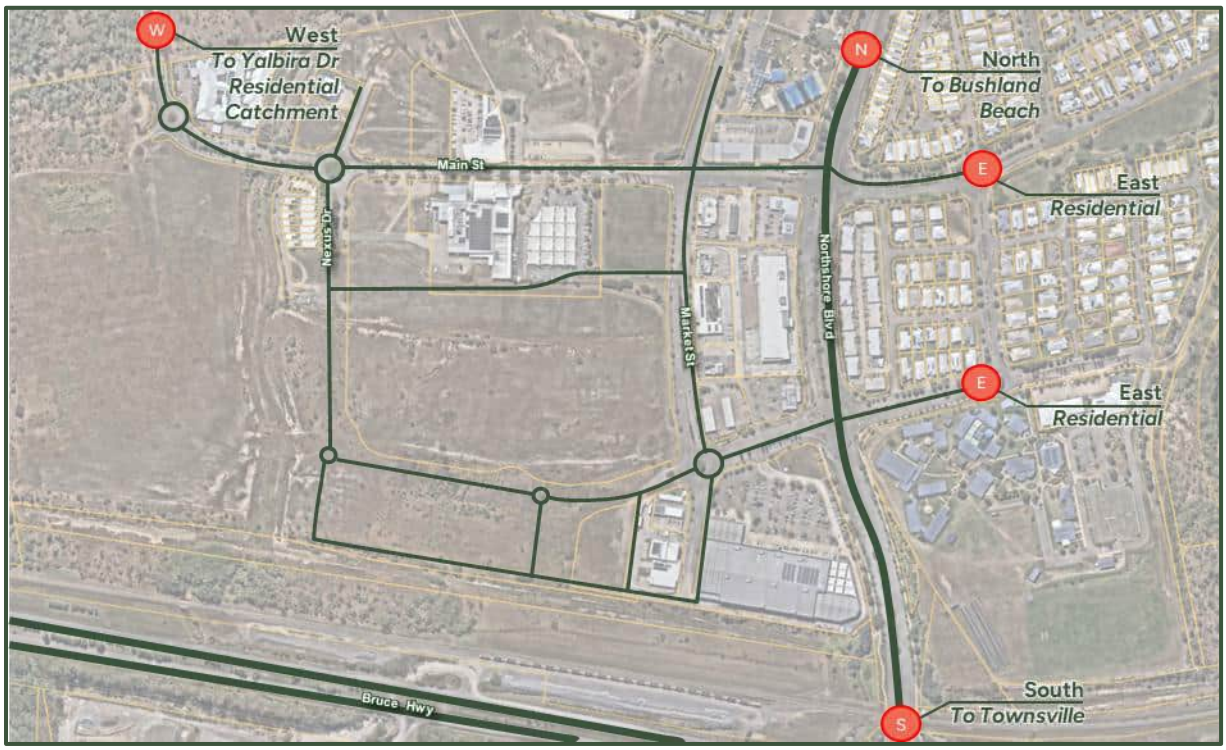
7.3.4.3 Route Assignment

The route assignment for each development zone has been manually assigned to the modelled network based on several factors which will influence vehicle trips to, from and throughout the proposed development. These factors include:

- Distance to destination;
- Road hierarchy;
- Turning restrictions;
- Intersections used on route.

The various ‘external’ destinations are illustrated on **Figure 6** overleaf. It is noted that, given the consistency of the proposed with the IA, no consideration has been given to the routing of trips external to North Shore.

Figure 6 External Destination Zones



Source: Nearmap

7.3.5 Nexus Drive Through Traffic Volumes

Consideration has been given to the ultimate through traffic volumes using the new Nexus Drive connection. It is noted that a new connection across Saunders Creek will ultimately be provided via Yalbira Drive (refer to location 'W' on **Figure 6**), providing an alternate route between Northshore Boulevard and the residential properties to the northwest of the town centre.

To estimate these through traffic volumes, a traffic survey at the Waterway Drive/Yalbira Drive intersection was commissioned and investigated to determine the traffic flows travelling between the residential area to the northwest of the town centre and the southern extent of Northshore Boulevard.

The survey volumes indicate that approximately 400 vehicles per hour (**vph**) (two-way) are expected to travel between these two locations via the existing Waterway Drive/Northshore Boulevard route. It has been assumed that 90% of these vehicles would redistribute across the connection via Yalbira Drive once constructed, resulting in 360vph utilising the new connection. A percentage split has been applied to the total redistributed traffic volumes (i.e. 360vph) to utilise either Nexus Drive or Main Street, as summarised in **Table 19**.

Table 19 Redistributed Traffic Assignment

Via	% Assignment	Redistributed Traffic
Nexus Drive	80%	288 vehicles
Main Street	20%	72 vehicles
TOTAL		**360 vehicles**

The redistributed peak hour traffic volumes were assigned to the desktop model based on the inbound/outbound directional splits summarised in **Table 20** overleaf.

Table 20 Redistributed Traffic Directional Splits

Road Connection	AM Peak		PM Peak	
	In	Out	In	Out
To/from Yalbira Drive	30%	70%	70%	30%

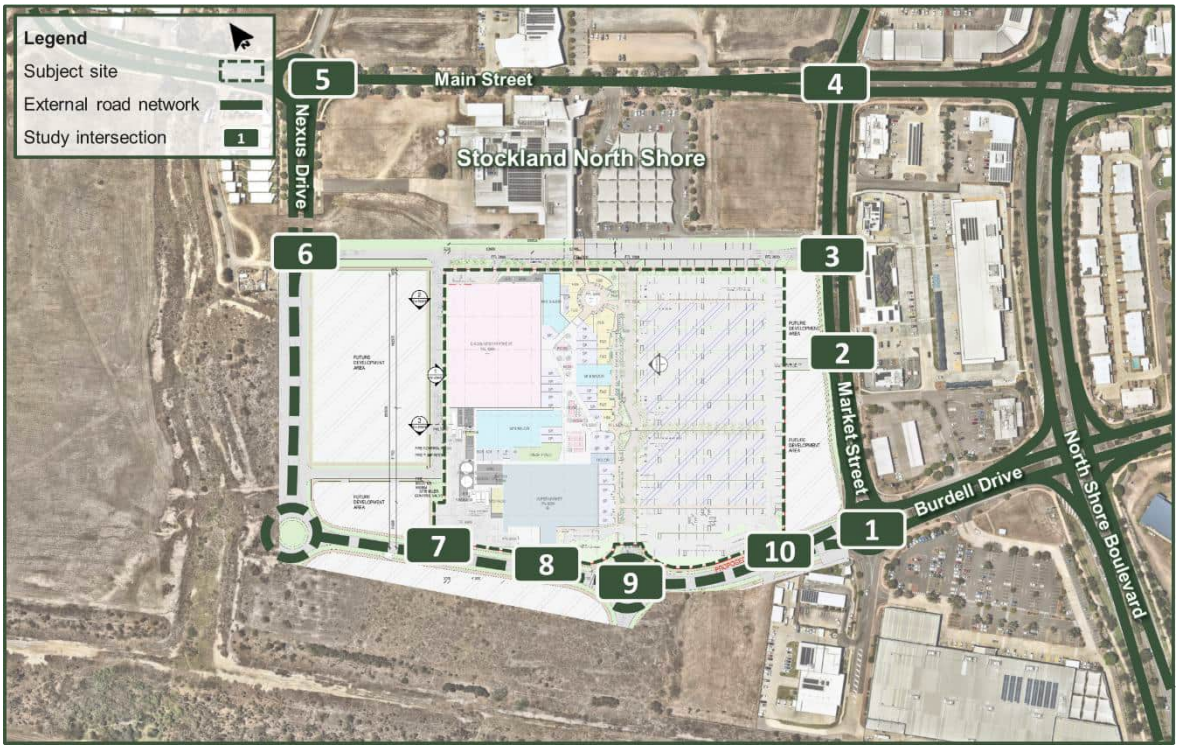
The traffic demand volumes generated across the surrounding road network, as calculated by the desktop model, are summarised in **Appendix C**. These traffic volumes represent that expected following the full buildout of the town centre and have been used in the intersection analysis documented in **Section 8** herein.

8.0 Operational Assessment

8.1 Study Locations

A detailed analysis of the potential impacts of the proposed development on the operation of the external road network has been undertaken at the ten (10) locations identified on **Figure 7**.

Figure 7 Study Intersections



ID	Intersection/Site access	Form	Authority
1	Market Street/Burdell Drive/Nexus Drive		TCC
2	Market Street/Site access 1		TCC
3	Market Street/Site access 2		TCC
4	Market Street/Main Street		TCC
5	Main Street/Nexus Drive		TCC
6	Nexus Drive/Site access 1		TCC
7	Nexus Drive/Site access 2 (service vehicles only)		TCC
8	Nexus Drive/Site access 3 (click-and-collect exit only)		TCC
9	Nexus Drive/Site access 4		TCC
10	Nexus Drive/Site access 5 (left out only)		TCC

Source: Nearmap, Buchan. Note, site bounds and object locations indicative only.

As per the commentary provided in **Section 7.1** herein, the operation of the study intersections has been assessed for the 'Ultimate' development (i.e. full build out) scenario during the weekday AM and PM peak hour periods.

8.2 Performance Criteria

8.2.1 Intersection Performance Thresholds

Study intersections have been assessed in SIDRA Intersection 9.1 (**SIDRA**), an industry-recognised analysis tool used to estimate the capacity and performance of intersections based on input parameters, including geometry and traffic volumes. SIDRA provides an estimate of an intersection's Degree of Saturation (**DOS**), queues and delays. The maximum DOS thresholds identified by Austroads *Guide to Traffic Management Part 12: Integrated Transport Assessments for Developments* (**AGTM12-20**) for each intersection type are reproduced in **Table 21**.

Table 21 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

DOS values exceeding those presented in **Table 21** indicate that as the intersection is nearing its practical capacity and upgrade works may be required. Above these threshold values, users of the intersection are likely to experience rapidly increasing delays and queuing.

8.2.2 Critical Delay

The RMS (now TfNSW) *Guide to Traffic Generating Developments* (2002) recommends that the average delay statistic for the critical movement provides a better indication of intersection performance and safety for roundabouts and priority-controlled intersections than DOS. A summary of the delay thresholds recommended by the TfNSW is provided in **Table 22**.

Table 22 Critical Delay Thresholds

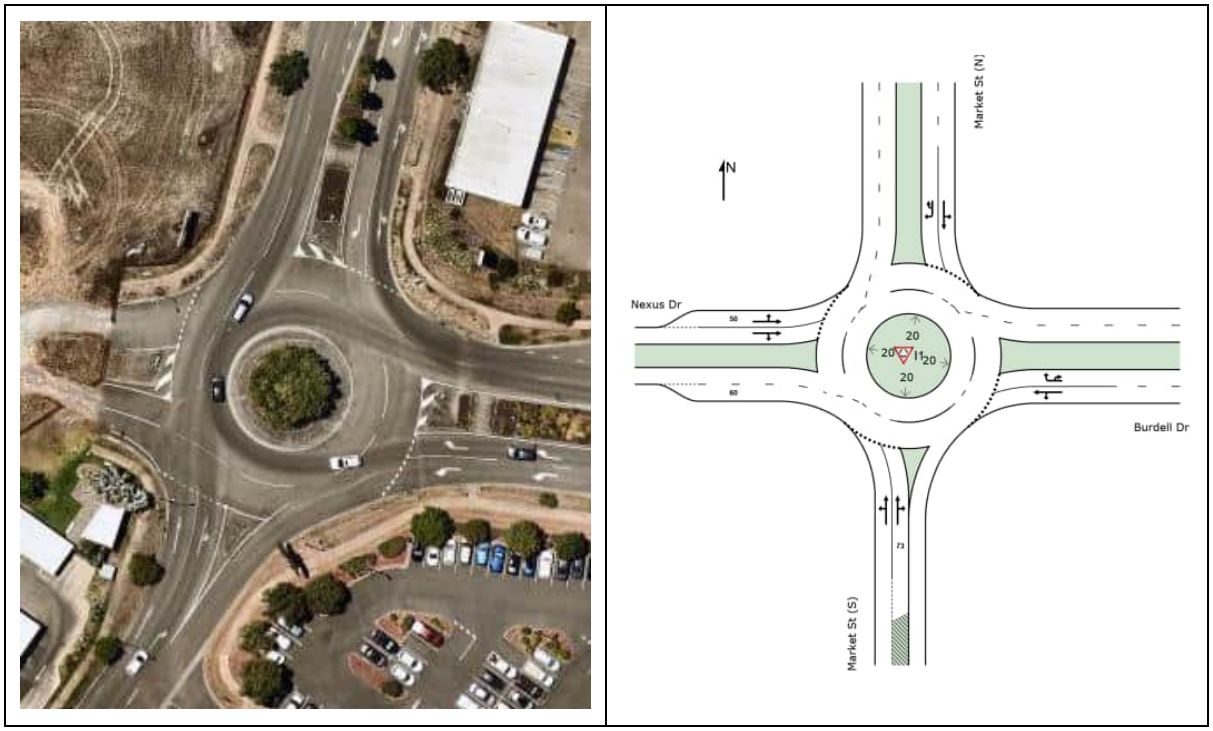
LOS	Description	Critical Delay (sec/vehicle)
A	Good operation	< 14 sec
B	Acceptable delays and spare capacity	15 - 28 sec
C	Satisfactory	29 - 42 sec
D	Near capacity	43 - 56 sec
E	At capacity, requires other control mode	57 - 70 sec

8.3 Intersection Assessment

8.3.1 Market Street/Nexus Drive/Burdell Drive

The Market Street/Nexus Drive/Burdell Drive intersection is currently a three-way roundabout. To facilitate the extension of Nexus Drive to the west, a new fourth western leg of the roundabout will be provided. The existing intersection layout and assessed SIDRA layout of the proposed intersection are shown on **Figure 8**. The results of the SIDRA assessment are presented in **Table 23** and detailed SIDRA outputs are included at **Appendix D**.

Figure 8 Assessed layout: Market Street/ Nexus Drive/Burdell Drive intersection



Source: Nearmap.

Table 23 SIDRA Outputs: Nexus Drive/Market Street/Burdell Drive intersection

Scenario	AM Peak Hour			PM Peak Hour		
	DOS	Critical Delay	95th %ile Queue	DOS	Critical Delay	95th %ile Queue
Ultimate	0.40	14 sec	16m	0.68	23 sec	75m

The SIDRA analysis summarised in **Table 23** identifies that the proposed four-way roundabout layout will perform within typically adopted performance thresholds (i.e. DOS of 0.85 for a roundabout) for the ultimate scenario.

8.3.2 Market Street/Site access 1

Market Street/Site access 1 is proposed as a left in/left out only driveway crossover. The assessed SIDRA layout of the site access is shown on **Figure 9**. The results of the SIDRA assessment are presented in **Table 24** and detailed SIDRA outputs are included at **Appendix D**.

Figure 9 Assessed layout: Market Street/Site access 1

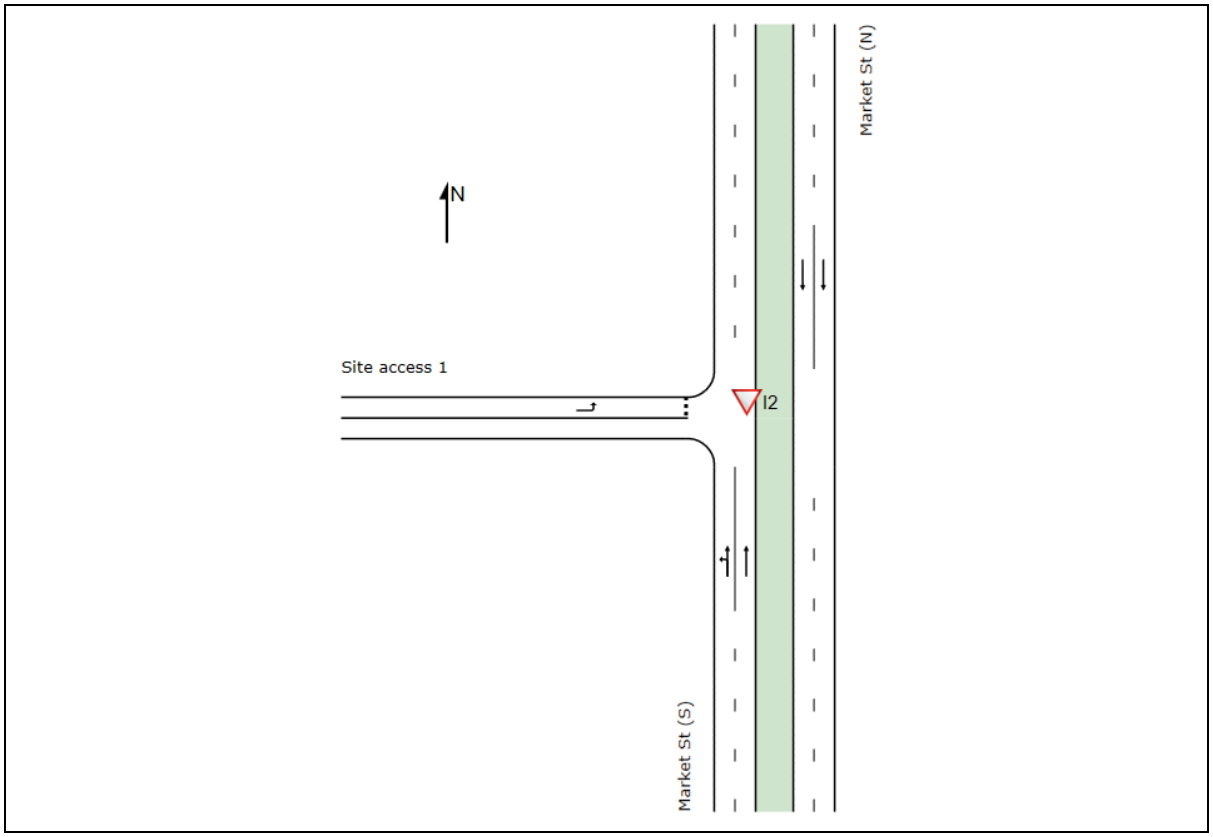


Table 24 SIDRA Outputs: Market Street/Site access 1

Scenario	AM Peak Hour			PM Peak Hour		
	DOS	Critical Delay	95th %ile Queue	DOS	Critical Delay	95th %ile Queue
Ultimate	0.06	6 sec	1m	0.10	6 sec	2m

The SIDRA analysis summarised in **Table 24** identifies that the proposed site access form will perform within typically adopted performance thresholds (i.e. DOS of 0.80 and critical delay of <57 seconds for a priority-controlled intersection) for the ultimate scenario.

8.3.3 Market Street/Site access 2

Market Street/Site access 2 is currently an all-movements driveway crossover, which is proposed to be relocated south as outlined in **Section 3.2** herein. The existing layout and assessed SIDRA layout of the proposed intersection are shown on **Figure 10**. The results of the SIDRA assessment are presented in **Table 25** and detailed SIDRA outputs are included at **Appendix D**.

Figure 10 Existing and Assessed layout: Market Street/Site access 2

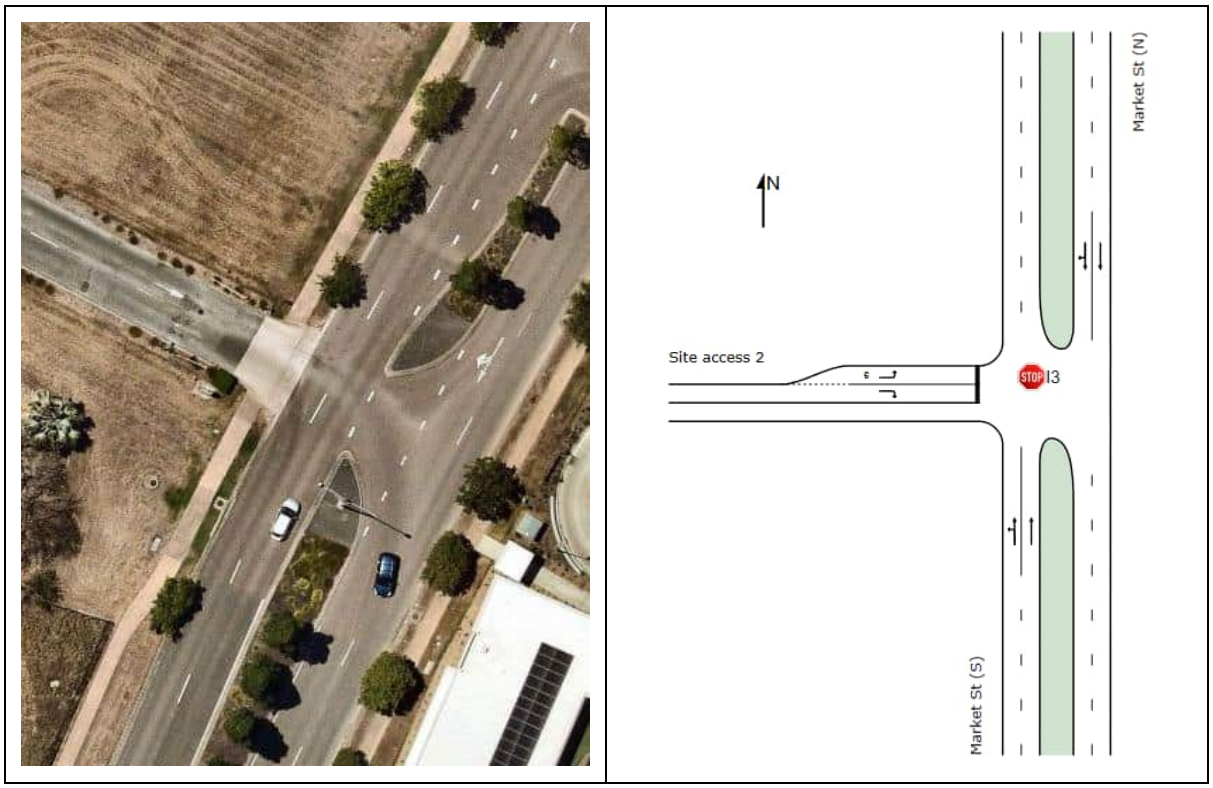


Table 25 SIDRA Outputs: Market Street/Site access 2 intersection

Scenario	AM Peak Hour			PM Peak Hour		
	DOS	Critical Delay	95th %ile Queue	DOS	Critical Delay	95th %ile Queue
Ultimate	0.23	16 sec	7m	0.67	39 sec	25m

The SIDRA analysis summarised in **Table 25** identifies that the proposed site access form will perform within typically adopted performance thresholds (i.e. DOS of 0.80 and critical delay of <57 seconds for a priority-controlled intersection) for the ultimate scenario.

8.3.4 Market Street/Main Street intersection

The Market Street/Main Street intersection is a four-way signalised intersection. The existing layout and assessed SIDRA layout of the intersection are shown on **Figure 11**. The results of the SIDRA assessment are presented in **Table 26** and detailed SIDRA outputs are included at **Appendix D**.

Figure 11 Assessed layout: Market Street/Main Street intersection

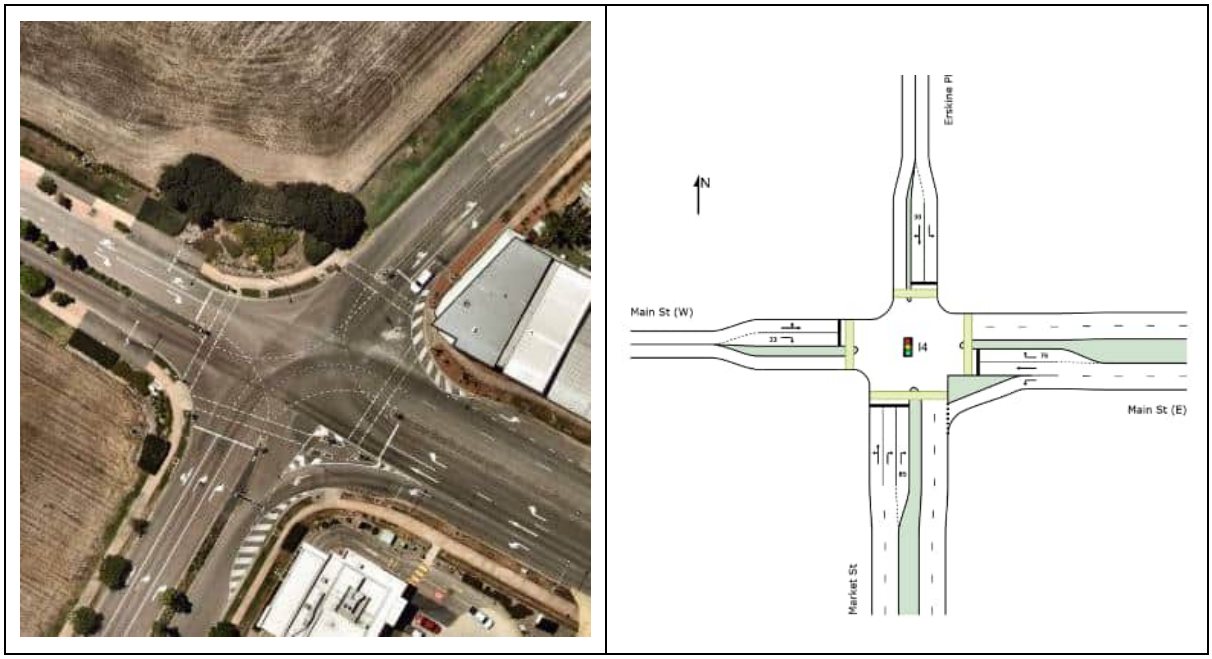


Table 26 SIDRA Outputs: Market Street/Main Street intersection

Scenario	AM Peak Hour			PM Peak Hour		
	DOS	Average Delay	95th %ile Queue	DOS	Average Delay	95th %ile Queue
Ultimate	0.28	27 sec	31m	0.47	29 sec	50m

The SIDRA analysis summarised in **Table 26** identifies that the existing intersection form will perform within typically adopted performance thresholds (i.e. DOS of 0.90 for a signalised intersection) for the ultimate scenario.

8.3.5 Main Street/Nexus Drive intersection

The Main Street/Nexus Drive intersection is a four-way roundabout. The existing layout and assessed SIDRA layout of the intersection are shown on **Figure 12**. The results of the SIDRA assessment are presented in **Table 27** and detailed SIDRA outputs are included at **Appendix D**.

Figure 12 Assessed layout: Main Street/Nexus Drive intersection

Table 27 SIDRA Outputs: Main Street/Nexus Drive intersection

Scenario	AM Peak Hour			PM Peak Hour		
	DOS	Critical Delay	95th %ile Queue	DOS	Critical Delay	95th %ile Queue
Ultimate	0.15	12 sec	6m	0.32	12 sec	15m

The SIDRA analysis summarised in **Table 27** identifies that the existing intersection form will perform within typically adopted performance thresholds (i.e. DOS of 0.85 for a roundabout) for the ultimate scenario.

8.3.6 Nexus Drive/Site access 1

Nexus Drive/Site access 1 is proposed as an all-movements driveway crossover. The assessed SIDRA layout of the site access is shown on **Figure 13**. The results of the SIDRA assessment are presented in **Table 28** and detailed SIDRA outputs are included at **Appendix D**.

Figure 13 Assessed Layout: Nexus Drive/Site access 1

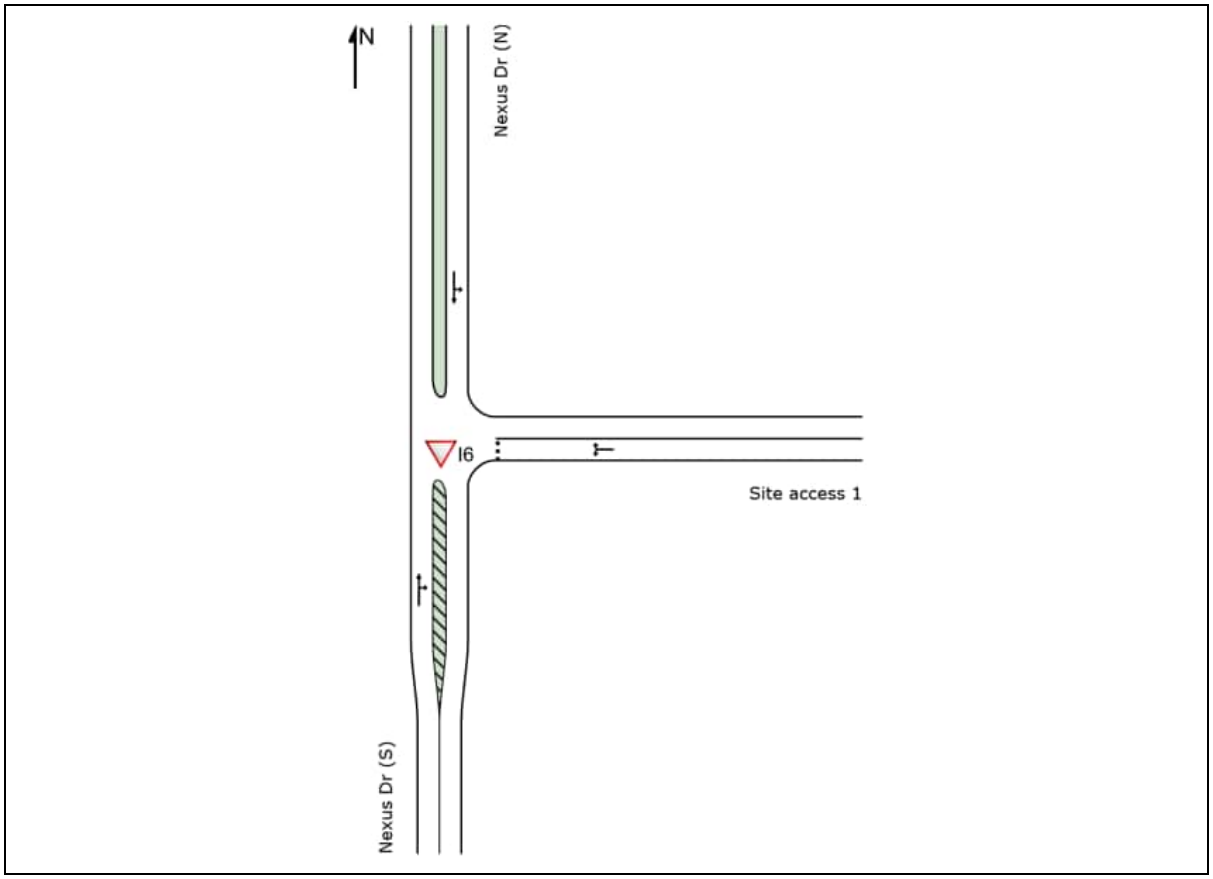


Table 28 SIDRA Outputs: Nexus Drive/Site access 1

Scenario	AM Peak Hour			PM Peak Hour		
	DOS	Critical Delay	95th %ile Queue	DOS	Critical Delay	95th %ile Queue
Ultimate	0.14	7 sec	1m	0.13	7 sec	1m

The SIDRA analysis summarised in **Table 28** identifies that the proposed site access form will perform within typically adopted performance thresholds (i.e. DOS of 0.80 and critical delay of <57 seconds for a priority-controlled intersection) for the ultimate scenario.

8.3.7 Nexus Drive/Site access 2

Nexus Drive/Site access 2 is proposed as an all-movements driveway crossover for service vehicles only. The assessed SIDRA layout of the site access is shown on **Figure 14**. The results of the SIDRA assessment are presented in **Table 27** and detailed SIDRA outputs are included at **Appendix D**.

Figure 14 Assessed Layout: Nexus Drive/Site access 2

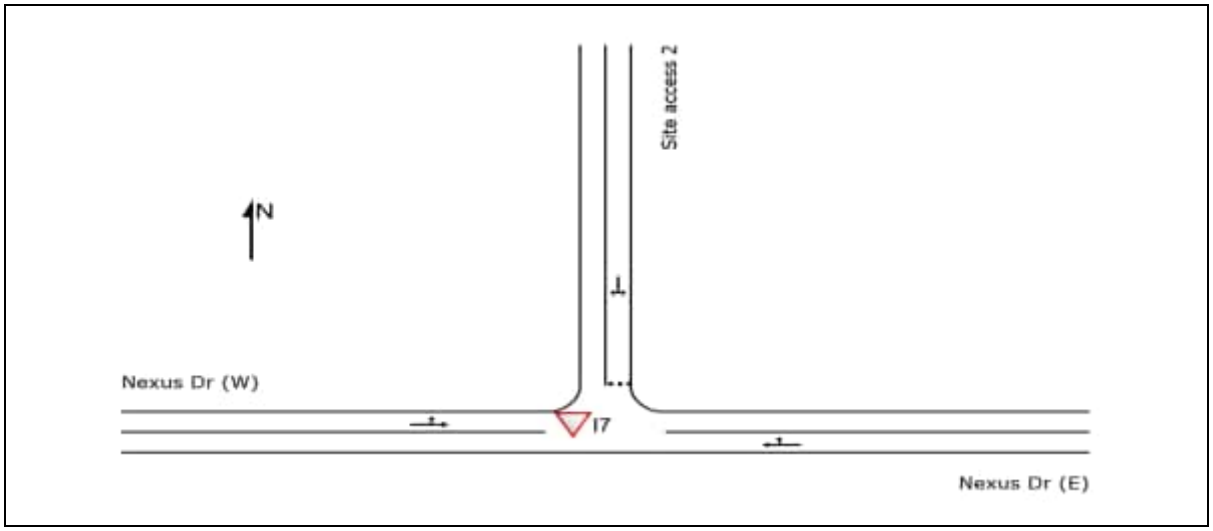


Table 29 SIDRA Outputs: Nexus Drive/Site access 2

Scenario	AM Peak Hour			PM Peak Hour		
	DOS	Critical Delay	95th %ile Queue	DOS	Critical Delay	95th %ile Queue
Ultimate	0.18	10 sec	1m	0.20	9 sec	1m

The SIDRA analysis summarised in **Table 29** identifies that the proposed site access will perform within typically adopted performance thresholds (i.e. DOS of 0.80 and critical delay of <57 seconds for a priority-controlled intersection) for the ultimate scenario.

8.3.8 Nexus Drive/Site access 3

Nexus Drive/Site access 3 is proposed as an exit only driveway crossover for 'click and collect' users. The assessed SIDRA layout of the site access is shown on **Figure 15**. The results of the SIDRA assessment are presented in **Table 30** and detailed SIDRA outputs are included at **Appendix D**.

Figure 15 Assessed Layout: Nexus Drive/Site access 3

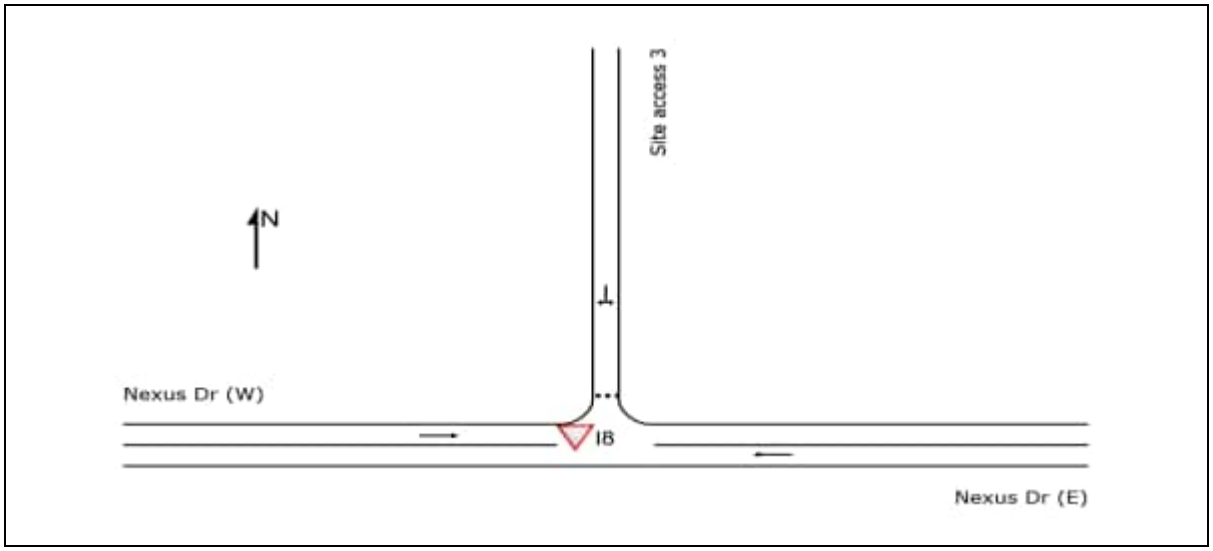


Table 30 SIDRA Outputs: Nexus Drive/Site access 3

Scenario	AM Peak Hour			PM Peak Hour		
	DOS	Critical Delay	95th %ile Queue	DOS	Critical Delay	95th %ile Queue
Ultimate	0.18	8 sec	1m	0.20	9 sec	1m

The SIDRA analysis summarised in **Table 30** identifies that the proposed site access will perform within typically adopted performance thresholds (i.e. DOS of 0.80 and critical delay of <57 seconds for a priority-controlled intersection) for the ultimate scenario.

8.3.9 Nexus Drive/Site access 4 intersection

The Nexus Drive/Site access 4 intersection is proposed as a four-way roundabout, with provision for future access to land located south of Nexus Drive. The assessed SIDRA layout of the site access is shown on **Figure 16**. The results of the SIDRA assessment are presented in **Table 31**. Detailed SIDRA outputs are included at **Appendix D**.

Figure 16 Nexus Drive/Site access 4 intersection

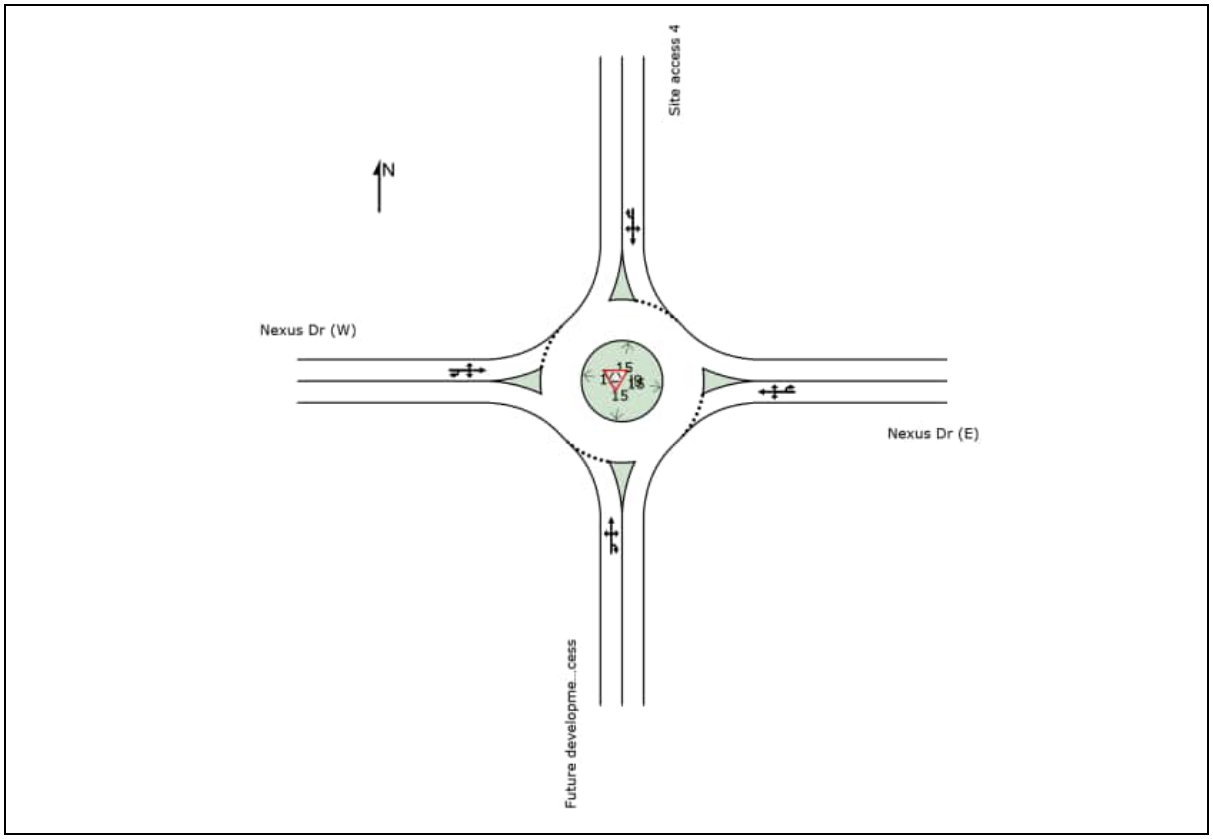


Table 31 SIDRA Outputs: Nexus Drive/Site access 4

Scenario	AM Peak Hour			PM Peak Hour		
	DOS	Critical Delay	95th %ile Queue	DOS	Critical Delay	95th %ile Queue
Ultimate	0.34	12 sec	17m	0.55	16 sec	40m

The SIDRA analysis summarised in **Table 31** identifies that the proposed roundabout layout will perform within typically adopted performance thresholds (i.e. DOS of 0.85 for a roundabout) for the ultimate scenario.

8.3.10 Nexus Drive/Site access 5

Nexus Drive/site access 5 is proposed as a left out only driveway crossover. The assessed SIDRA layout of the site access is shown on **Figure 17**. The results of the SIDRA assessment are presented in **Table 32** and detailed SIDRA outputs are included at **Appendix D**.

Figure 17 Nexus Drive/Site access 5

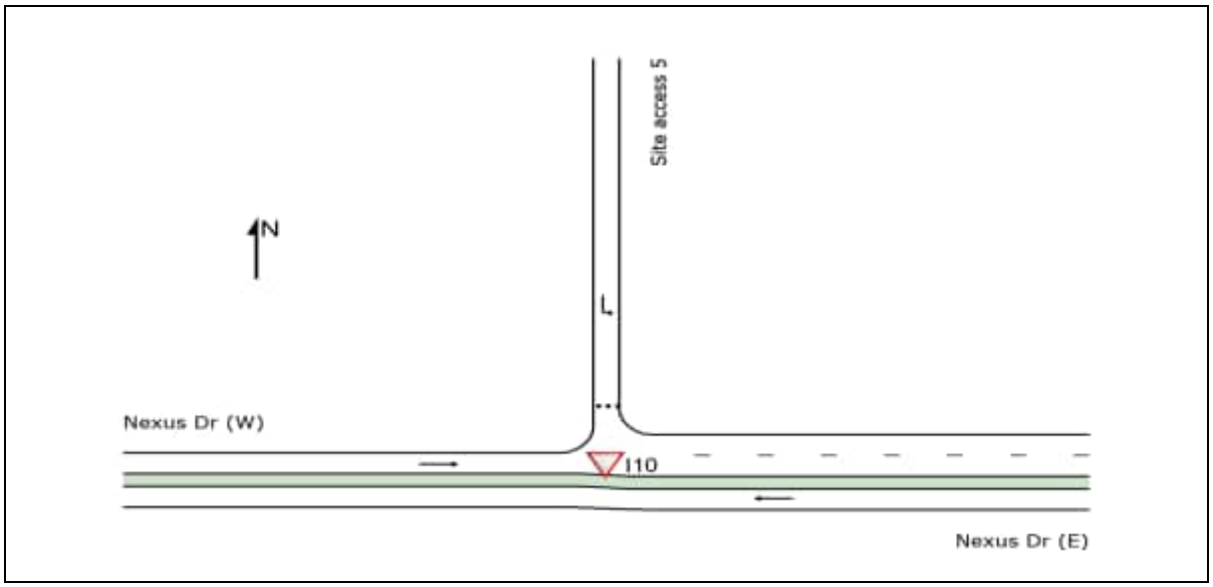


Table 32 SIDRA Outputs: Nexus Drive/Site access 5

Scenario	AM Peak Hour			PM Peak Hour		
	DOS	Critical Delay	95th %ile Queue	DOS	Critical Delay	95th %ile Queue
Ultimate	0.28	6 sec	2m	0.45	6 sec	8m

The SIDRA analysis summarised in **Table 32** identifies that the proposed site access will perform within typically adopted performance thresholds (i.e. DOS of 0.80 and critical delay of <57 seconds for a priority-controlled intersection) for the ultimate scenario.

8.3.11 Intersection Assessment Summary

The intersection analysis documented above demonstrates that:

- All assessed intersections and site accesses perform within acceptable performance and safety thresholds at the ultimate development scenario:
- The proposed form of Nexus Drive, with a two (2) lane cross section west of the proposed site access roundabout (i.e. single circulating lane) and a cross section transitioning from two (2) to four lanes to the east (i.e. towards the existing Market Street/Burdell Drive/Nexus Drive dual lane roundabout) would operate at an acceptable level of service at the ultimate development scenario.

9.0 Code Assessment

9.1 TCC TIAP Code

The traffic and transport of the proposed development have been assessed against the requirements of the TIAP Code. Responses to this code have been prepared and are included at **Appendix E**. The development is considered to comply with all relevant assessment benchmarks.

9.2 QLD SDAP Codes

The traffic and transport aspects of the development have been assessed against the requirements of the relevant Queensland State Development Assessment Provisions (**SDAP**) v3.5 *State Code 6: Protection of state transport networks* (**State Code 6**). Responses to State Code 6 have been prepared and are included at **Appendix F**. The development is considered to comply with all relevant assessment benchmarks.

10.0 Summary and Conclusions

SLR has been engaged by Orena to provide traffic engineering and transport planning advice in relation to a DA for shopping centre development at 13 Market Street, Burdell. Development plans have been prepared by Buchan and are included at **Appendix A**.

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

- The developments proposed parking (car and bicycle) and servicing provisions align with the relevant TIAP Code assessment benchmarks;
- The design of access, car parking and servicing arrangements satisfies the relevant TIAP Code and AS2890 criteria;
- The developments proposed waste storage and collection arrangements are consistent with that required by the Development Manual PSP;
- The proposed development is consistent with previous approvals and the IA (i.e. and major road network planning) and hence no consideration of Council's trunk road network, nor the state-controlled road network, is warranted;
- The intersection analysis documented herein demonstrates that all assessed intersections and site accesses perform within acceptable performance and safety thresholds at the ultimate development scenario, and also that the proposed form of Nexus Drive would operate at an acceptable level of service at the ultimate development scenario;
- The traffic and transport aspects of the proposed development have been assessed against the requirements of the TIAP Code and SDAP State Code 6 and are considered to satisfy all of the relevant assessment benchmarks.

11.0 RPEQ Certification

This traffic assessment and report has been prepared under the direction of a Registered Professional Engineer of Queensland (**RPEQ**) who is experienced in traffic engineering and transport planning. The report is endorsed by that RPEQ accordingly.

Yours sincerely

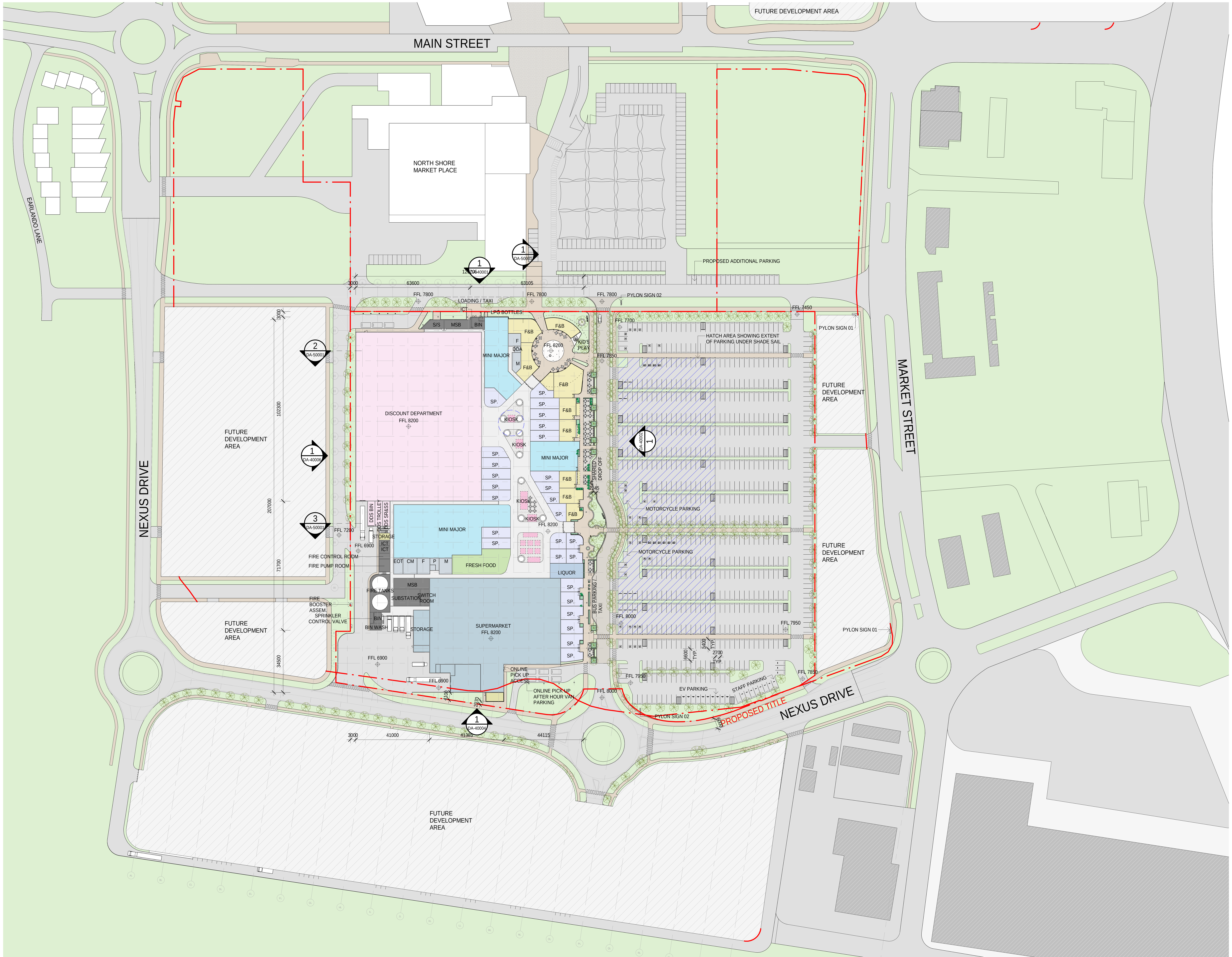
CHRIS LAWLOR
Principal – Transport Advisory
RPEQ No. 24052

Appendix A Development Plans

GFA: 22196m²
SITE COVERAGE: 56498m²

AREA SCHEDULE - GLA	
AREA TYPE	GLA
DISCOUNT DEPARTMENT	6724 m²
FRESH FOOD	385 m²
KIOSK	191 m²
LIQUOR	153 m²
MINI MAJOR	2666 m²
SPECIALTY	2338 m²
SPECIALTY - F&B	1290 m²
SUPERMARKET	4207 m²
TOTAL	17954 m²

PARKING NUMBER	
Description	Count
ACCESSIBLE PARKING	16
ELECTRIC	10
MOTORCYCLE PARKING	10
PARKING WITH PRAMS	12
SENIOR PARKING	10
SHORT TERM PARKING	12
STAFF PARKING	11
STANDARD PARKING	657
TOTAL	738



Rev.	Date	Description	Iss.	Appr.
A	06/02/2026	TOWN PLANNING APPLICATION	LY	

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Project
NORTH SHORE CENTRAL

Project Number
250030

Status

Date Plotted 18/02/26 12:43:27 PM
Scale 1 : 1000 @A1

0 10 20 40 60M

Drawing Title
SITE PLAN

Drawing Number
NTS-BUC-DR-A-DA-20001

Revision
A

BUCHAN

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Autodesk Docs://250030-R25-North-Shore-Townsville/NTS-BUC-AZ-M6-A-R25-MALL.rvt

GFA: 22196m²
SITE COVERAGE: 56498m²

AREA SCHEDULE - GLA	
AREA TYPE	GLA
DISCOUNT DEPARTMENT	6724 m²
FRESH FOOD	385 m²
KIOSK	191 m²
LIQUOR	153 m²
MINI MAJOR	2666 m²
SPECIALTY	2338 m²
SPECIALTY - F&B	1290 m²
SUPERMARKET	4207 m²
TOTAL	17954 m²

PARKING NUMBER	
Description	Count
ACCESSIBLE PARKING	16
ELECTRIC	10
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PARKING WITH PRAMS	12
SENIOR PARKING	10
SHORT TERM PARKING	12
STAFF PARKING	11
STANDARD PARKING	657
TOTAL	738

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Status

Date Plotted 18/02/26 12:43:17 PM
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Drawing Title
GROUND FLOOR PLAN

Drawing Number
NTS-BUC-DR-A-DA-20002

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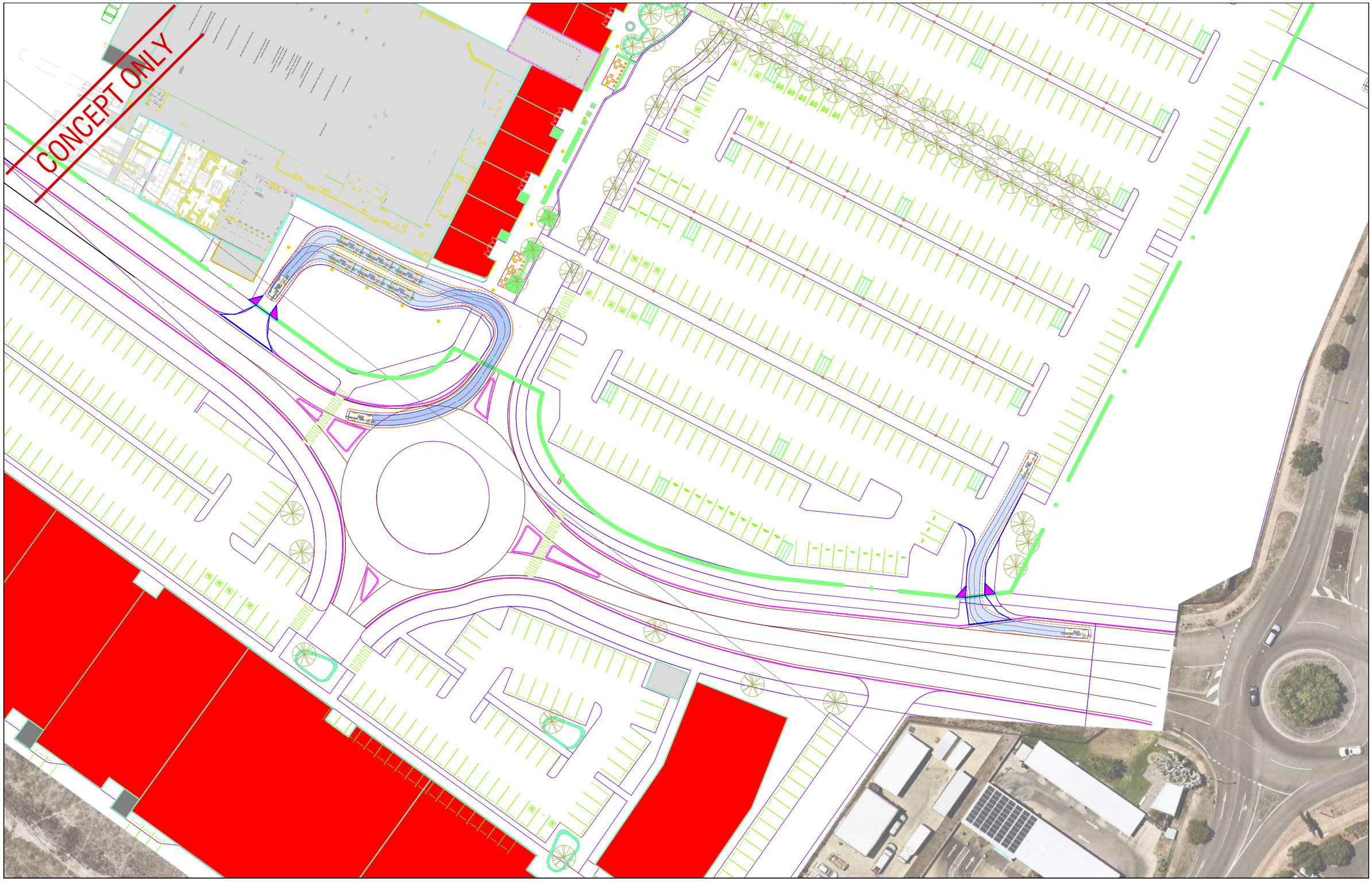
File
Document Set ID: 10252005 //250030-R25-North-Shore-Townsville/NTS-BUC-AZ-MI-A-R25-MALL.rvt
Version: 1, Version Date: 08/05/2026

Appendix B Swept Path Assessments



LEVEL 16, 175 EAGLE ST
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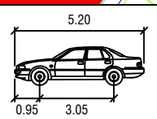
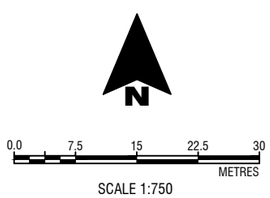
SWEPT PATH LEGEND

- Vehicle Path
- Vehicle Body
- 500mm Body Clearance



B99

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



SCALE 1:750

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Swept Path Assessment
B99 Sheet 1 of 4

FIGURE SK01

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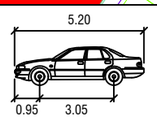
SWEPT PATH LEGEND

- Vehicle Path
- Vehicle Body
- 500mm Body Clearance



B99

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

N

0.0 7.5 15 22.5 30
METRES

SCALE 1:750

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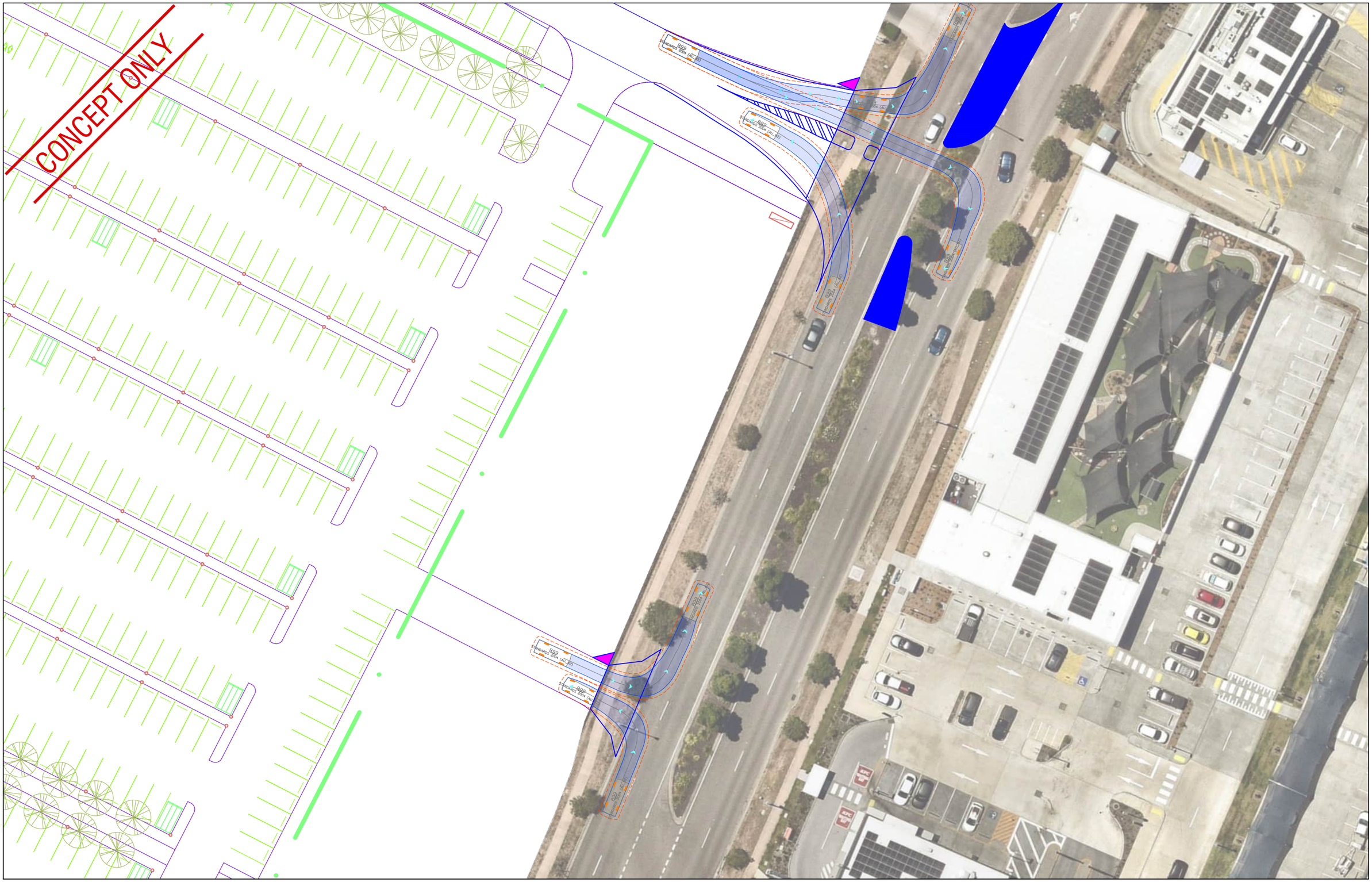
Swept Path Assessment
B99 Sheet 2 of 4

FIGURE SK02

CONCEPT ONLY



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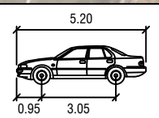
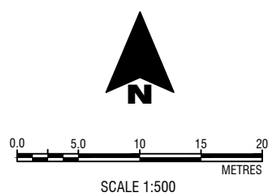
SWEPT PATH LEGEND

- Vehicle Path
- Vehicle Body
- 500mm Body Clearance



B99

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



SCALE 1:500

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Swept Path Assessment
B99 Sheet 3 of 4

FIGURE SK03

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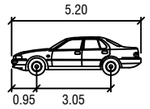
SWEPT PATH LEGEND

- Vehicle Path
- Vehicle Body
- 500mm Body Clearance



B99

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

N

0.0 5.0 10 15 20
METRES

SCALE 1:500

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Swept Path Assessment
B99 Sheet 4 of 4

FIGURE SK04

CONCEPT ONLY

Raised island

HRV
STANDARDS 2018 (AU)

AV
STANDARDS 2018 (AU)

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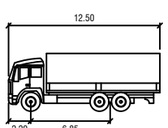
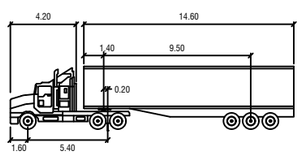
SWEPT PATH LEGEND
- Vehicle Path
- Vehicle Body
- 500mm Body Clearance



HRV

	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 36.7



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 2.5 5 7.5 10
METRES

SCALE 1:250

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North Shore Shopping Centre

Swept Path Assessment
AV Sheet 1 of 4

FIGURE SK05

CONCEPT ONLY

Raised island

HRV
STANDARDS 2018 (AU)

AV
STANDARDS 2018 (AU)

SLR

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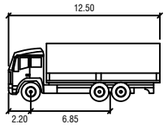
Certified by:	-
Sheet Size:	A3
Projection:	-

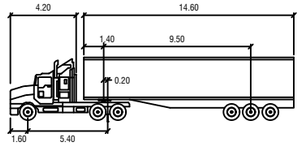
SWEPT PATH LEGEND

- Vehicle Path
- Vehicle Body
- 500mm Body Clearance



HRV

	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 36.7



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 2.5 5 7.5 10
METRES

SCALE 1:250

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Swept Path Assessment
AV Sheet 2 of 4

FIGURE SK06

CONCEPT ONLY

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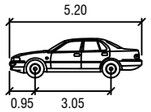
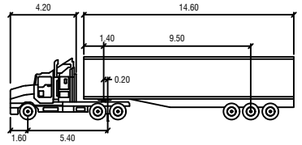
Certified by:	-
Sheet Size:	A3
Projection:	-

SWEPT PATH LEGEND
- Vehicle Path
- Vehicle Body
- 500mm Body Clearance



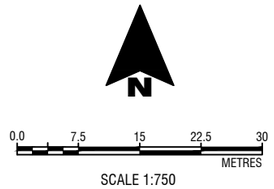
B99

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



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		



SCALE 1:750

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Swept Path Assessment
AV Sheet 3 of 4

FIGURE SK07

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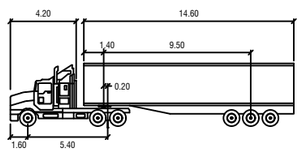
Projection:	-

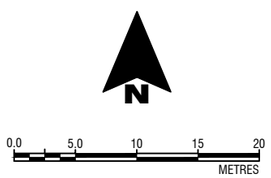
SWEPT PATH LEGEND

- Vehicle Path
- Vehicle Body
- 500mm Body Clearance



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		



SCALE 1:500

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Swept Path Assessment
AV Sheet 4 of 4

FIGURE SK08

CONCEPT ONLY

SLR

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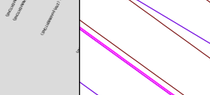
Certified by:	-
Sheet Size:	A3
Projection:	-

SWEPT PATH LEGEND

- Vehicle Path
- Vehicle Body
- 500mm Body Clearance



HRV

	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 36.7

SCALE 1:500

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North Shore Shopping Centre

Swept Path Assessment
HRV Sheet 1 of 2

FIGURE SK09

CONCEPT ONLY

LEVEL 16, 175 EAGLE ST
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Project No:	620.041996
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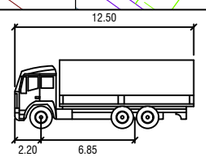
Certified by:	-
Sheet Size:	A3
Projection:	-

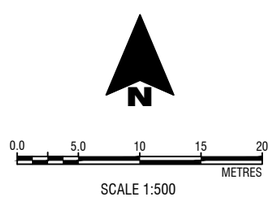
SWEPT PATH LEGEND

- Vehicle Path
- Vehicle Body
- 500mm Body Clearance



HRV

	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 36.7



SCALE 1:500

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Swept Path Assessment
HRV Sheet 2 of 2

FIGURE SK10

CONCEPT ONLY

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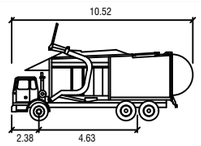
Sheet Size:	A3
Projection:	-

SWEPT PATH LEGEND

- Vehicle Path
- Vehicle Body
- 500mm Body Clearance



Front Lift RCV

meters	
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 28.0

N

0.0 5.0 10 15 20
METRES

SCALE 1:500

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North Shore Shopping Centre

Swept Path Assessment
Front Load RCV Sheet 1 of 2

FIGURE SK11

CONCEPT ONLY

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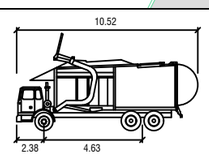
Certified by:	-
Sheet Size:	A3
Projection:	-

SWEPT PATH LEGEND

- Vehicle Path
- Vehicle Body
- 500mm Body Clearance



Front Lift RCV

	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 28.0

N

0.0 5.0 10 15 20
METRES

SCALE 1:500

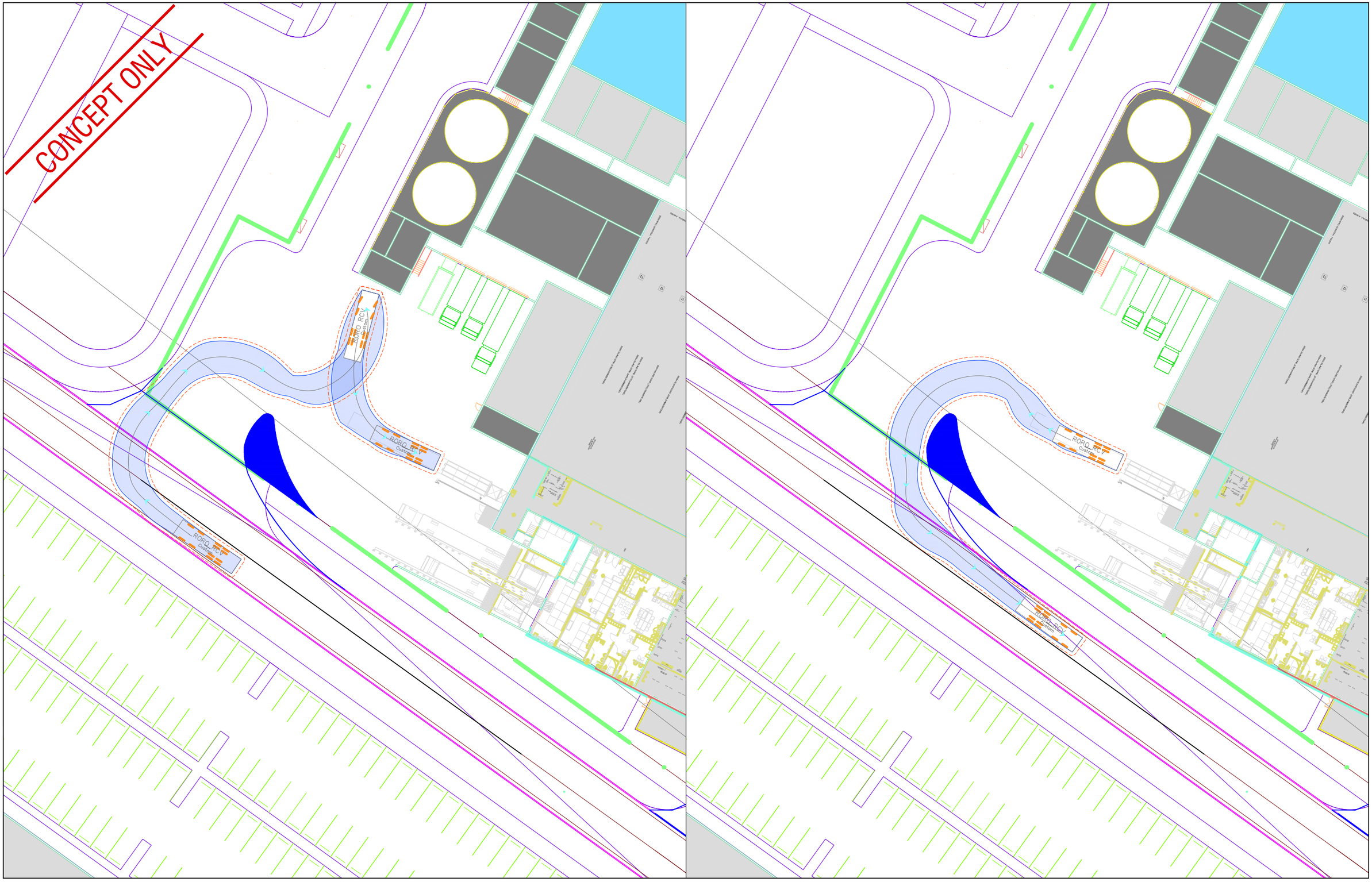
Oreana

North Shore Shopping Centre

Swept Path Assessment
Front Load RCV Sheet 2 of 2

FIGURE SK012

CONCEPT ONLY



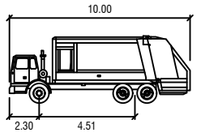
LEVEL 16, 175 EAGLE ST
BRISBANE
QUEENSLAND 4000
AUSTRALIA
T: 61 7 3858 4800

www.slrconsulting.com

Project No:	620.041996
Date:	04/02/26
Drawn by:	ME
Certified by:	-
Sheet Size:	A3
Projection:	-

SWEPT PATH LEGEND

- Vehicle Path
- Vehicle Body
- 500mm Body Clearance



RORO RCV

	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 27.0

N

0.0 5.0 10 15 20
METRES

SCALE 1:500

Oreana

North Shore Shopping Centre

Swept Path Assessment
RORO RCV Sheet 1 of 2

FIGURE SK13

CONCEPT ONLY

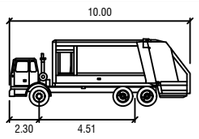
LEVEL 16, 175 EAGLE ST
BRISBANE
QUEENSLAND 4000
AUSTRALIA
T: 61 7 3858 4800

www.slrconsulting.com

Project No:	620.041996
Date:	04/02/26
Drawn by:	ME
Certified by:	-
Sheet Size:	A3
Projection:	-

SWEPT PATH LEGEND

- Vehicle Path
- Vehicle Body
- 500mm Body Clearance



RORO RCV

	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 27.0

N

0.0 5.0 10 15 20
METRES

SCALE 1:500

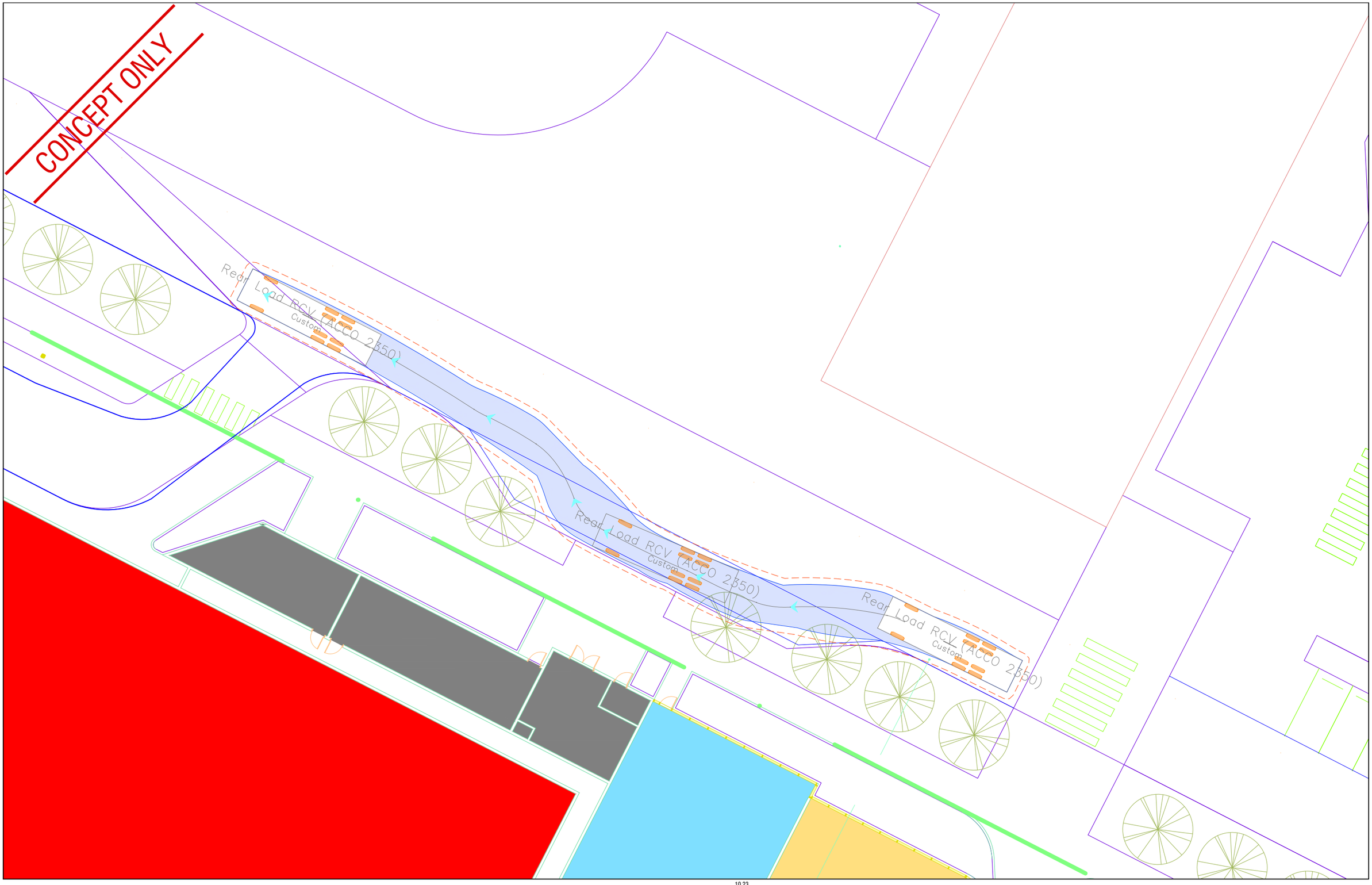
Oreana

North Shore Shopping Centre

Swept Path Assessment
RORO RCV Sheet 2 of 2

FIGURE SK13

CONCEPT ONLY

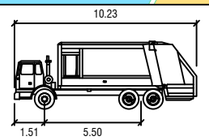


SLR
LEVEL 16, 175 EAGLE ST
BRISBANE
QUEENSLAND 4000
AUSTRALIA
T: 61 7 3858 4800
www.slrconsulting.com

Project No:	620.041996
Date:	04/02/26
Drawn by:	ME
Certified by:	-
Sheet Size:	A3
Projection:	-

SWEPT PATH LEGEND

- Vehicle Path
- Vehicle Body
- 500mm Body Clearance



Rear Load RCV (ACCO 2350)

meters

Width	:	2.50
Track	:	2.50
Lock to Lock Time	:	6.0
Steering Angle	:	40.3

N

0.0 5.0 10 15 20
METRES

SCALE 1:500

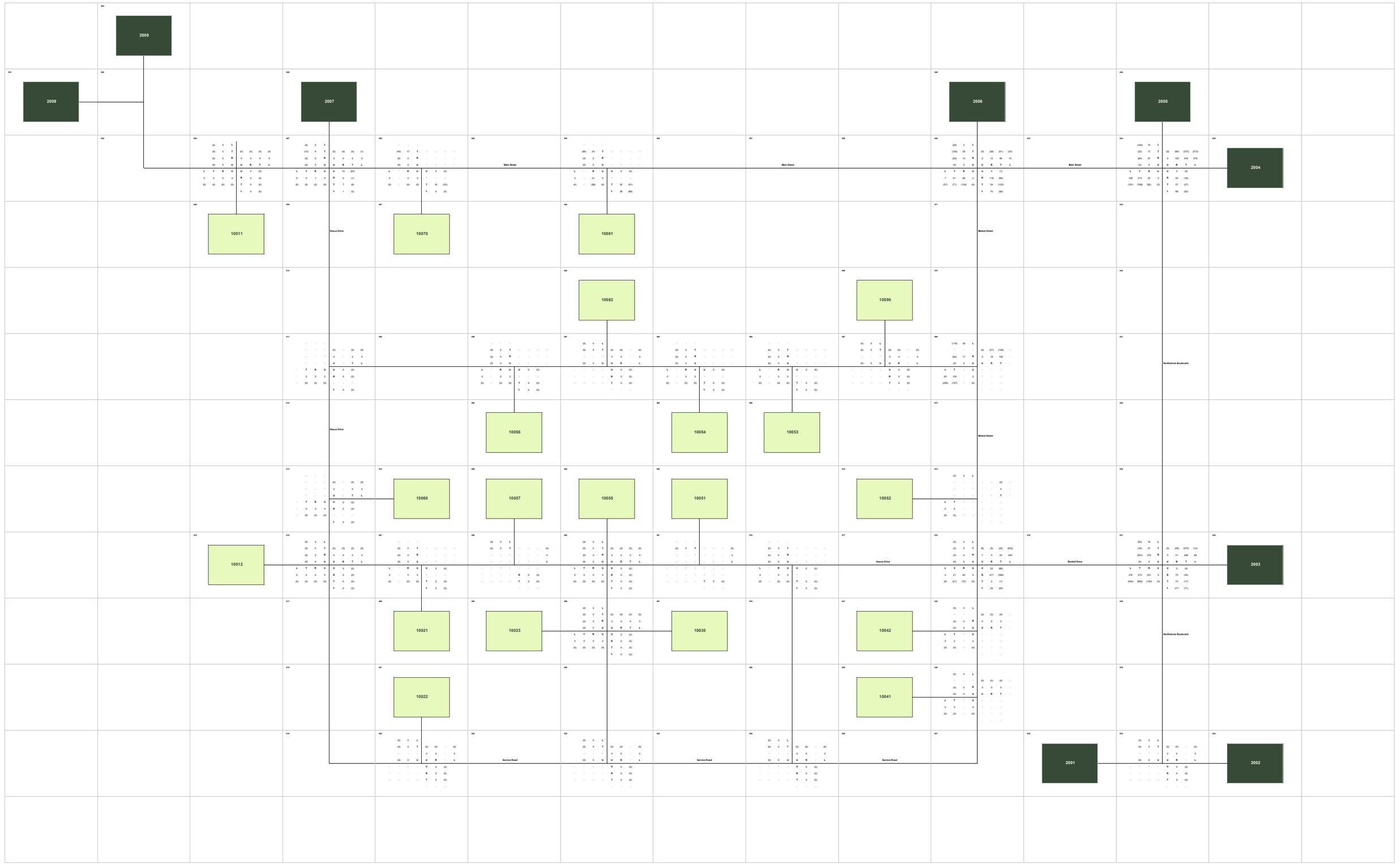
Oreana

North Shore Shopping Centre

Swept Path Assessment
Rearlift RCV Sheet 1 of 1

FIGURE SK15

Appendix C Assessment Traffic Volumes

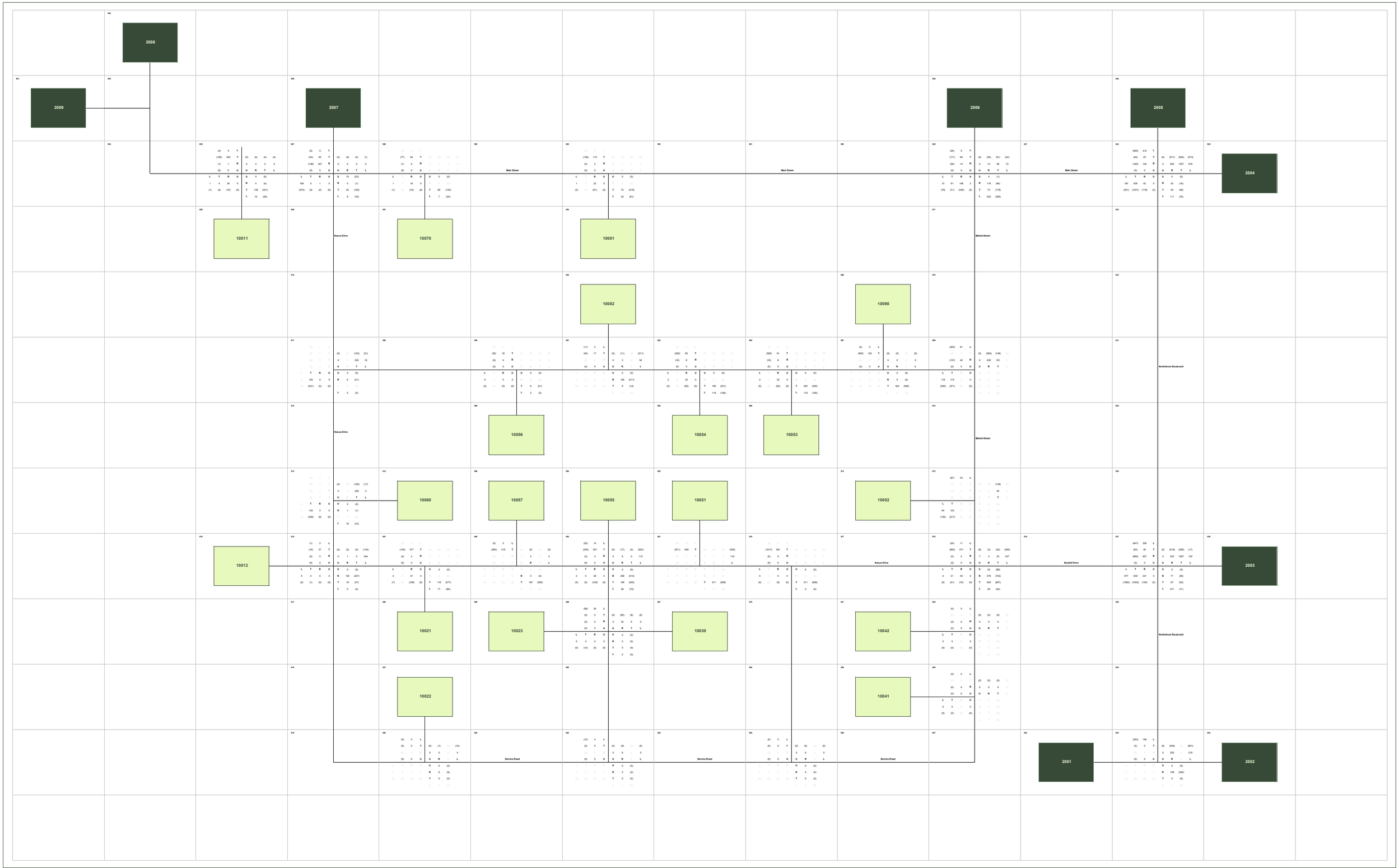


1
Survey Traffic Volumes
620.041996.00002
North Shore Central Development - 13 Market Street, Burdell

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

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

N



2

Ultimate Development Traffic Volumes

620.041996.00002

North Shore Central Development - 13 Market Street, Burdell

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

Legend

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

N

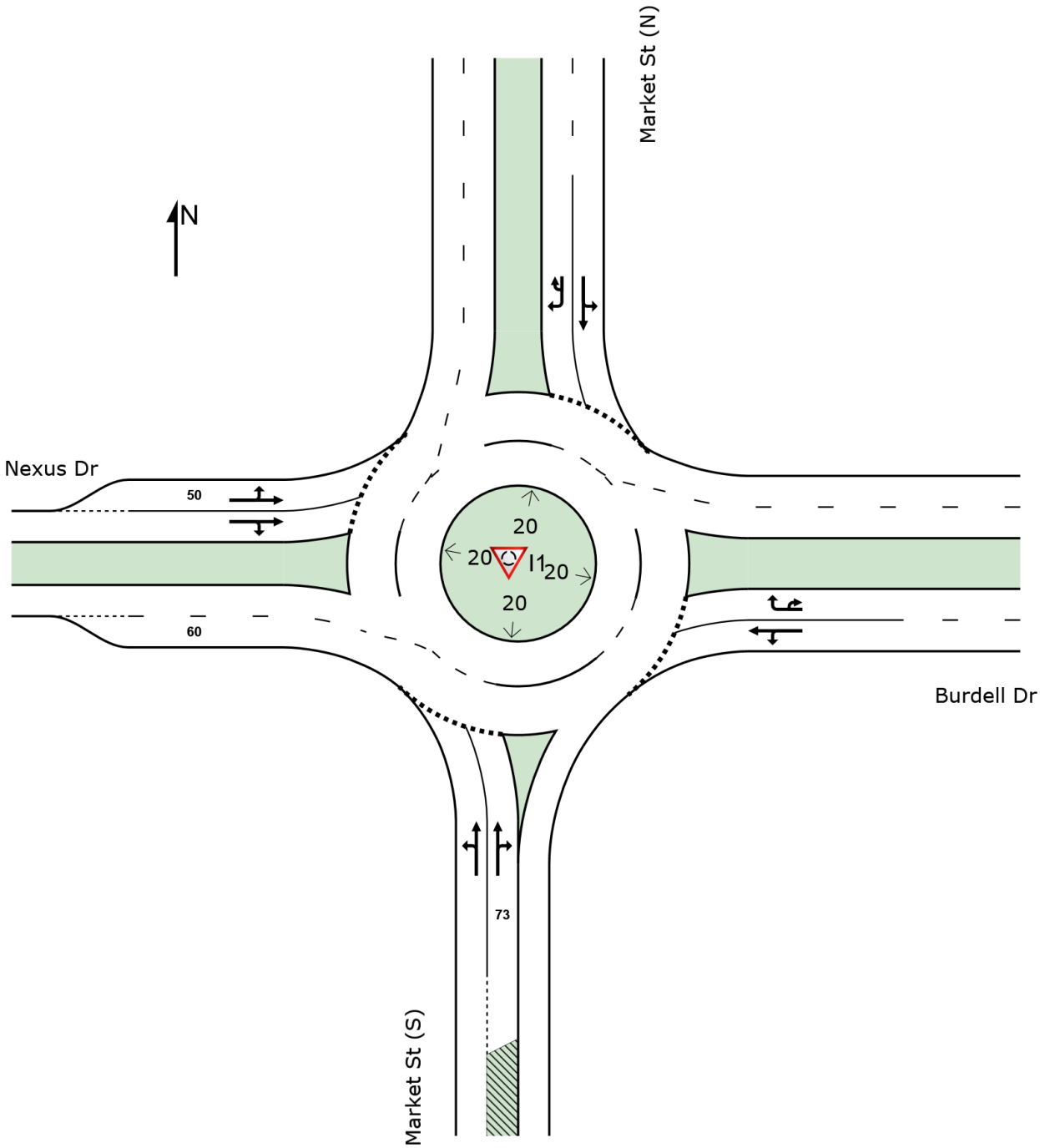
Appendix D Detailed SIDRA Outputs

SITE LAYOUT

Site: I1 [I1 - ULT DEV AM (Site Folder: General)]

Market St/Nexus Dr/Burdell Dr Roundabout
Prepared by: DN
Reviewed by: CL
Site Category: Proposed Design
Roundabout

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



MOVEMENT SUMMARY

Site: I1 [I1 - ULT DEV AM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Market St/Nexus Dr/Burdell Dr Roundabout
Prepared by: DN
Reviewed by: CL
Site Category: Proposed Design
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Market St (S)															
1	L2	All MCs	1	1.0	1	1.0	0.029	7.2	LOS A	0.1	0.9	0.58	0.61	0.58	26.8
2	T1	All MCs	22	1.0	22	1.0	0.029	7.1	LOS A	0.1	0.9	0.58	0.61	0.58	43.0
3	R2	All MCs	42	1.0	42	1.0	0.041	11.3	LOS B	0.2	1.4	0.57	0.70	0.57	34.8
Approach			65	1.0	65	1.0	0.041	9.8	LOS A	0.2	1.4	0.57	0.67	0.57	37.4
East: Burdell Dr															
4	L2	All MCs	31	1.0	31	1.0	0.360	4.5	LOS A	2.0	14.3	0.13	0.41	0.13	42.8
5	T1	All MCs	536	1.0	536	1.0	0.360	4.4	LOS A	2.0	14.3	0.13	0.41	0.13	35.9
6	R2	All MCs	503	1.0	503	1.0	0.390	9.0	LOS A	2.3	15.9	0.15	0.62	0.15	39.5
6u	U	All MCs	55	1.0	55	1.0	0.390	11.2	LOS B	2.3	15.9	0.15	0.62	0.15	36.6
Approach			1124	1.0	1124	1.0	0.390	6.8	LOS A	2.3	15.9	0.14	0.51	0.14	38.1
North: Market St (N)															
7	L2	All MCs	365	1.0	365	1.0	0.396	6.4	LOS A	2.1	14.9	0.64	0.70	0.65	42.0
8	T1	All MCs	24	1.0	24	1.0	0.396	6.5	LOS A	2.1	14.9	0.64	0.70	0.65	42.9
9	R2	All MCs	2	1.0	2	1.0	0.016	11.9	LOS B	0.1	0.4	0.56	0.74	0.56	28.4
9u	U	All MCs	7	1.0	7	1.0	0.016	14.0	LOS B	0.1	0.4	0.56	0.74	0.56	38.7
Approach			399	1.0	399	1.0	0.396	6.6	LOS A	2.1	14.9	0.64	0.70	0.65	41.9
West: Nexus Dr															
10	L2	All MCs	11	1.0	11	1.0	0.316	6.3	LOS A	2.2	15.5	0.65	0.58	0.65	41.1
11	T1	All MCs	601	1.0	601	1.0	0.316	6.7	LOS A	2.2	15.5	0.66	0.59	0.66	37.9
12	R2	All MCs	5	1.0	5	1.0	0.316	11.4	LOS B	2.1	14.8	0.66	0.60	0.66	36.5
Approach			617	1.0	617	1.0	0.316	6.7	LOS A	2.2	15.5	0.66	0.59	0.66	38.0
All Vehicles			2206	1.0	2206	1.0	0.396	6.8	LOS A	2.3	15.9	0.39	0.57	0.39	38.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: I1 [I1 - ULT DEV PM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Market St/Nexus Dr/Burdell Dr Roundabout
Prepared by: DN
Reviewed by: CL
Site Category: Proposed Design
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Market St (S)															
1	L2	All MCs	1	1.0	1	1.0	0.068	10.3	LOS B	0.4	2.9	0.77	0.70	0.77	24.7
2	T1	All MCs	43	1.0	43	1.0	0.068	10.3	LOS B	0.4	2.9	0.77	0.70	0.77	39.6
3	R2	All MCs	76	1.0	76	1.0	0.088	14.1	LOS B	0.6	4.5	0.80	0.72	0.80	32.2
Approach			120	1.0	120	1.0	0.088	12.7	LOS B	0.6	4.5	0.79	0.71	0.79	34.7
East: Burdell Dr															
4	L2	All MCs	25	1.0	25	1.0	0.558	4.5	LOS A	4.8	33.9	0.18	0.41	0.18	42.3
5	T1	All MCs	870	1.0	870	1.0	0.558	4.5	LOS A	4.8	33.9	0.18	0.41	0.18	35.5
6	R2	All MCs	739	1.0	739	1.0	0.567	9.1	LOS A	4.8	33.9	0.20	0.61	0.20	39.2
6u	U	All MCs	72	1.0	72	1.0	0.567	11.2	LOS B	4.8	33.9	0.20	0.61	0.20	36.3
Approach			1706	1.0	1706	1.0	0.567	6.8	LOS A	4.8	33.9	0.19	0.50	0.19	37.6
North: Market St (N)															
7	L2	All MCs	410	1.0	410	1.0	0.643	10.2	LOS B	4.8	34.0	0.90	0.96	1.15	38.1
8	T1	All MCs	23	1.0	23	1.0	0.643	10.3	LOS B	4.8	34.0	0.90	0.96	1.15	39.0
9	R2	All MCs	3	1.0	3	1.0	0.022	13.2	LOS B	0.1	0.7	0.72	0.83	0.72	27.6
9u	U	All MCs	6	1.0	6	1.0	0.022	15.3	LOS B	0.1	0.7	0.72	0.83	0.72	37.7
Approach			443	1.0	443	1.0	0.643	10.3	LOS B	4.8	34.0	0.90	0.95	1.14	38.1
West: Nexus Dr															
10	L2	All MCs	25	1.0	25	1.0	0.679	17.1	LOS B	10.6	74.6	1.00	0.95	1.43	29.5
11	T1	All MCs	1045	1.0	1045	1.0	0.679	18.0	LOS B	10.6	74.6	1.00	0.95	1.45	25.0
12	R2	All MCs	5	1.0	5	1.0	0.679	23.2	LOS C	9.8	69.1	1.00	0.96	1.46	24.1
Approach			1076	1.0	1076	1.0	0.679	18.0	LOS B	10.6	74.6	1.00	0.95	1.44	25.1
All Vehicles			3344	1.0	3344	1.0	0.679	11.0	LOS B	10.6	74.6	0.56	0.71	0.74	33.3

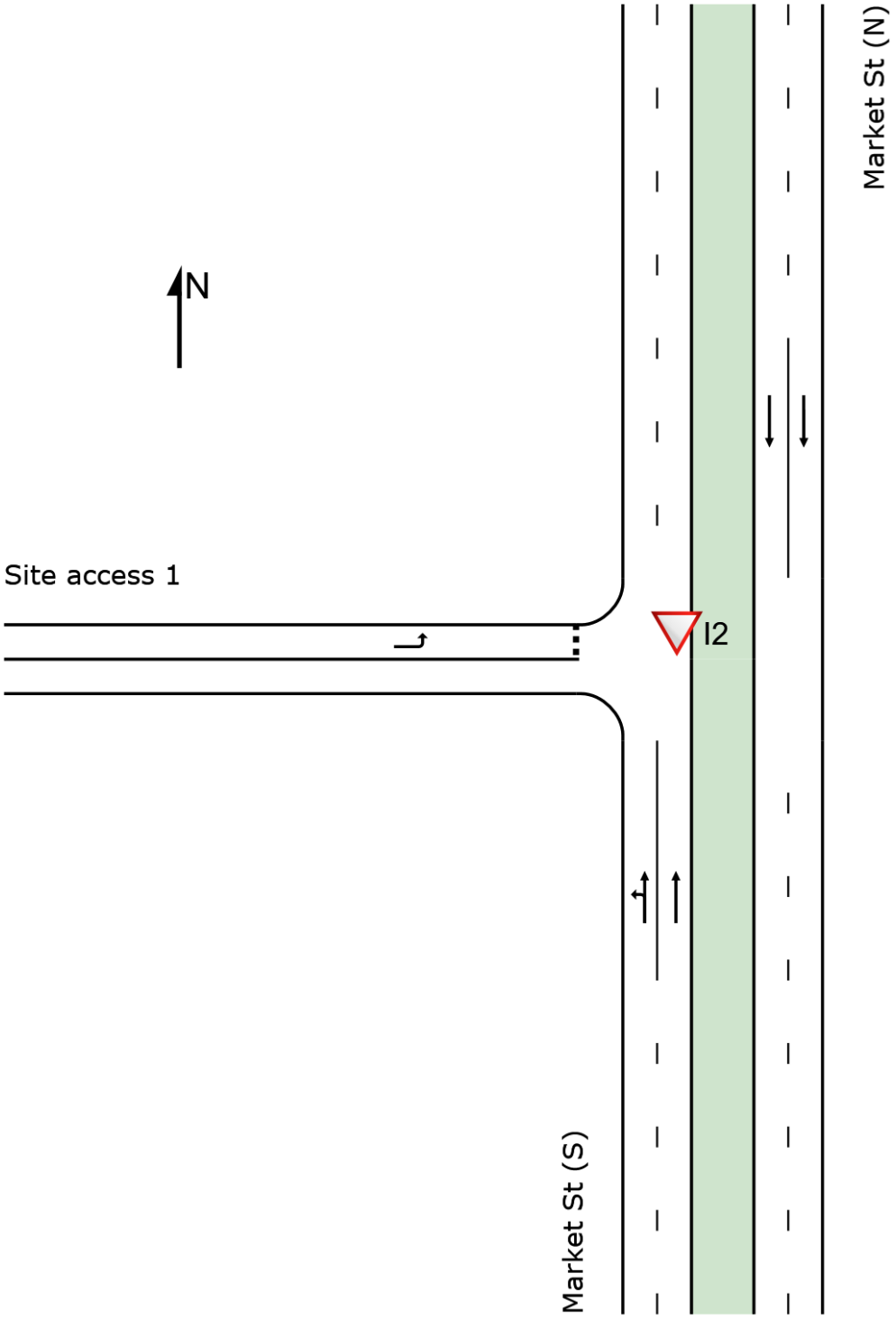
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

Site: I2 [I2 - ULT DEV AM (Site Folder: General)]

Market St/Site access 1 Intersection
Prepared by: DN
Reviewed by: CL
Site Category: Proposed Design
Give-Way (Two-Way)

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



MOVEMENT SUMMARY

Site: I2 [I2 - ULT DEV AM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Market St/Site access 1 Intersection
Prepared by: DN
Reviewed by: CL
Site Category: Proposed Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Market St (S)															
1	L2	All MCs	99	1.0	99	1.0	0.060	5.5	LOS A	0.0	0.0	0.00	0.51	0.00	48.0
2	T1	All MCs	130	1.0	130	1.0	0.060	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	57.5
Approach			229	1.0	229	1.0	0.060	2.4	NA	0.0	0.0	0.00	0.25	0.00	50.8
North: Market St (N)															
8	T1	All MCs	46	1.0	46	1.0	0.012	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach			46	1.0	46	1.0	0.012	0.0	NA	0.0	0.0	0.00	0.00	0.00	60.0
West: Site access 1															
10	L2	All MCs	36	1.0	36	1.0	0.027	5.6	LOS A	0.1	0.7	0.06	0.55	0.06	46.4
Approach			36	1.0	36	1.0	0.027	5.6	LOS A	0.1	0.7	0.06	0.55	0.06	46.4
All Vehicles			311	1.0	311	1.0	0.060	2.4	NA	0.1	0.7	0.01	0.25	0.01	50.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: I2 [I2 - ULT DEV PM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Market St/Site access 1 Intersection
Prepared by: DN
Reviewed by: CL
Site Category: Proposed Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Market St (S)															
1	L2	All MCs	153	1.0	153	1.0	0.100	5.5	LOS A	0.0	0.0	0.00	0.48	0.00	48.5
2	T1	All MCs	228	1.0	228	1.0	0.100	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	56.6
Approach			381	1.0	381	1.0	0.100	2.2	NA	0.0	0.0	0.00	0.23	0.00	51.1
North: Market St (N)															
8	T1	All MCs	147	1.0	147	1.0	0.038	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach			147	1.0	147	1.0	0.038	0.0	NA	0.0	0.0	0.00	0.00	0.00	60.0
West: Car Park Access															
10	L2	All MCs	102	1.0	102	1.0	0.079	5.7	LOS A	0.3	2.1	0.10	0.55	0.10	46.2
Approach			102	1.0	102	1.0	0.079	5.7	LOS A	0.3	2.1	0.10	0.55	0.10	46.2
All Vehicles			629	1.0	629	1.0	0.100	2.3	NA	0.3	2.1	0.02	0.23	0.02	50.8

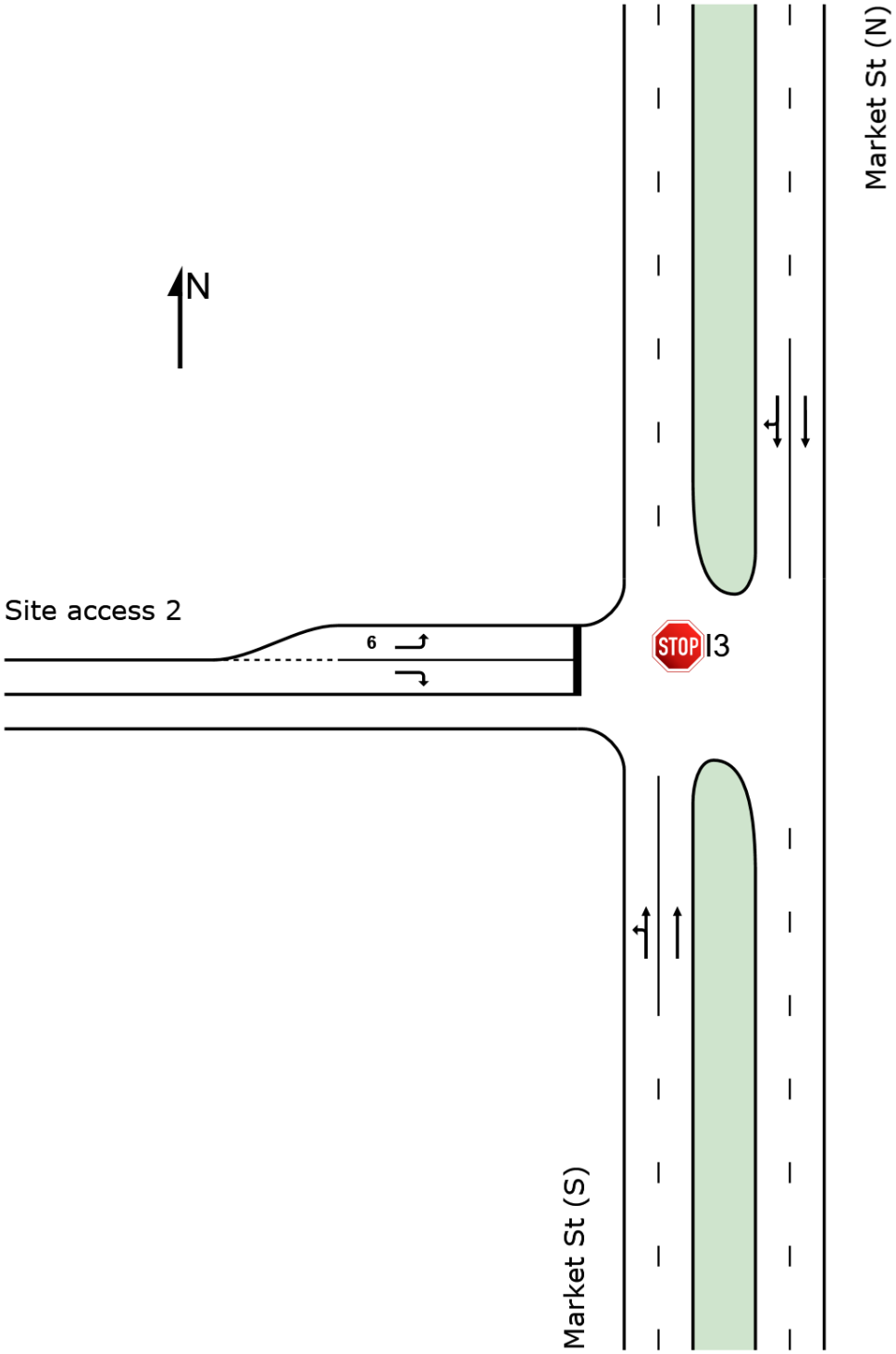
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

Site: I3 [I3 - ULT DEV AM (Site Folder: General)]

Market St/Site access 2 Intersection
Prepared by: DN
Reviewed by: CL
Site Category: Proposed Design
Stop (Two-Way)

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



MOVEMENT SUMMARY

Site: I3 [I3 - ULT DEV AM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Market St/Site access 2 Intersection
Prepared by: DN
Reviewed by: CL
Site Category: Proposed Design
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Market St (S)															
1	L2	All MCs	124	1.0	124	1.0	0.081	5.6	LOS A	0.0	0.0	0.00	0.48	0.00	49.7
2	T1	All MCs	183	1.0	183	1.0	0.081	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	58.0
Approach			307	1.0	307	1.0	0.081	2.2	NA	0.0	0.0	0.00	0.24	0.00	53.1
North: Market St (N)															
8	T1	All MCs	169	1.0	169	1.0	0.087	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
9	R2	All MCs	238	1.0	238	1.0	0.225	7.2	LOS A	1.0	7.0	0.43	0.63	0.43	46.0
Approach			407	1.0	407	1.0	0.225	4.2	NA	1.0	7.0	0.25	0.37	0.25	49.5
West: Site access 2															
10	L2	All MCs	85	1.0	85	1.0	0.073	8.2	LOS A	0.3	1.9	0.10	0.93	0.10	45.0
12	R2	All MCs	44	1.0	44	1.0	0.116	16.1	LOS C	0.4	2.9	0.64	1.00	0.64	40.3
Approach			129	1.0	129	1.0	0.116	10.9	LOS B	0.4	2.9	0.28	0.96	0.28	43.2
All Vehicles			843	1.0	843	1.0	0.225	4.5	NA	1.0	7.0	0.16	0.41	0.16	49.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Organisation: SLR CONSULTING AUSTRALIA | Licence: NETWORK / 1PC | Processed: Thursday, 19 February 2026 2:50:15 PM
Project: \\au.slr.local\Corporate\Projects-SLR\620-BNE\620-BNE\620.041996.00001 Townsville, North Shore - Ongo\02 Analysis\2026 02 - Sensitivity Test\620.041996 SIDRA 20260219.sip9

MOVEMENT SUMMARY

Site: I3 [I3 - ULT DEV PM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Market St/Site access 2 Intersection
Prepared by: DN
Reviewed by: CL
Site Category: Proposed Design
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Market St (S)															
1	L2	All MCs	210	1.0	210	1.0	0.131	5.6	LOS A	0.0	0.0	0.00	0.50	0.00	49.4
2	T1	All MCs	285	1.0	285	1.0	0.131	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	58.3
Approach			495	1.0	495	1.0	0.131	2.4	NA	0.0	0.0	0.00	0.25	0.00	52.9
North: Market St (N)															
8	T1	All MCs	156	1.0	156	1.0	0.081	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
9	R2	All MCs	404	1.0	404	1.0	0.472	10.0	LOS B	3.2	22.3	0.63	0.86	0.87	43.4
Approach			561	1.0	561	1.0	0.472	7.2	NA	3.2	22.3	0.45	0.62	0.63	45.8
West: Site access 2															
10	L2	All MCs	277	1.0	277	1.0	0.240	8.2	LOS A	1.1	7.5	0.13	0.92	0.13	45.0
12	R2	All MCs	144	1.0	144	1.0	0.671	38.5	LOS E	3.5	24.8	0.92	1.20	1.66	28.5
Approach			421	1.0	421	1.0	0.671	18.6	LOS C	3.5	24.8	0.40	1.01	0.65	37.2
All Vehicles			1477	1.0	1477	1.0	0.671	8.8	NA	3.5	24.8	0.28	0.61	0.43	44.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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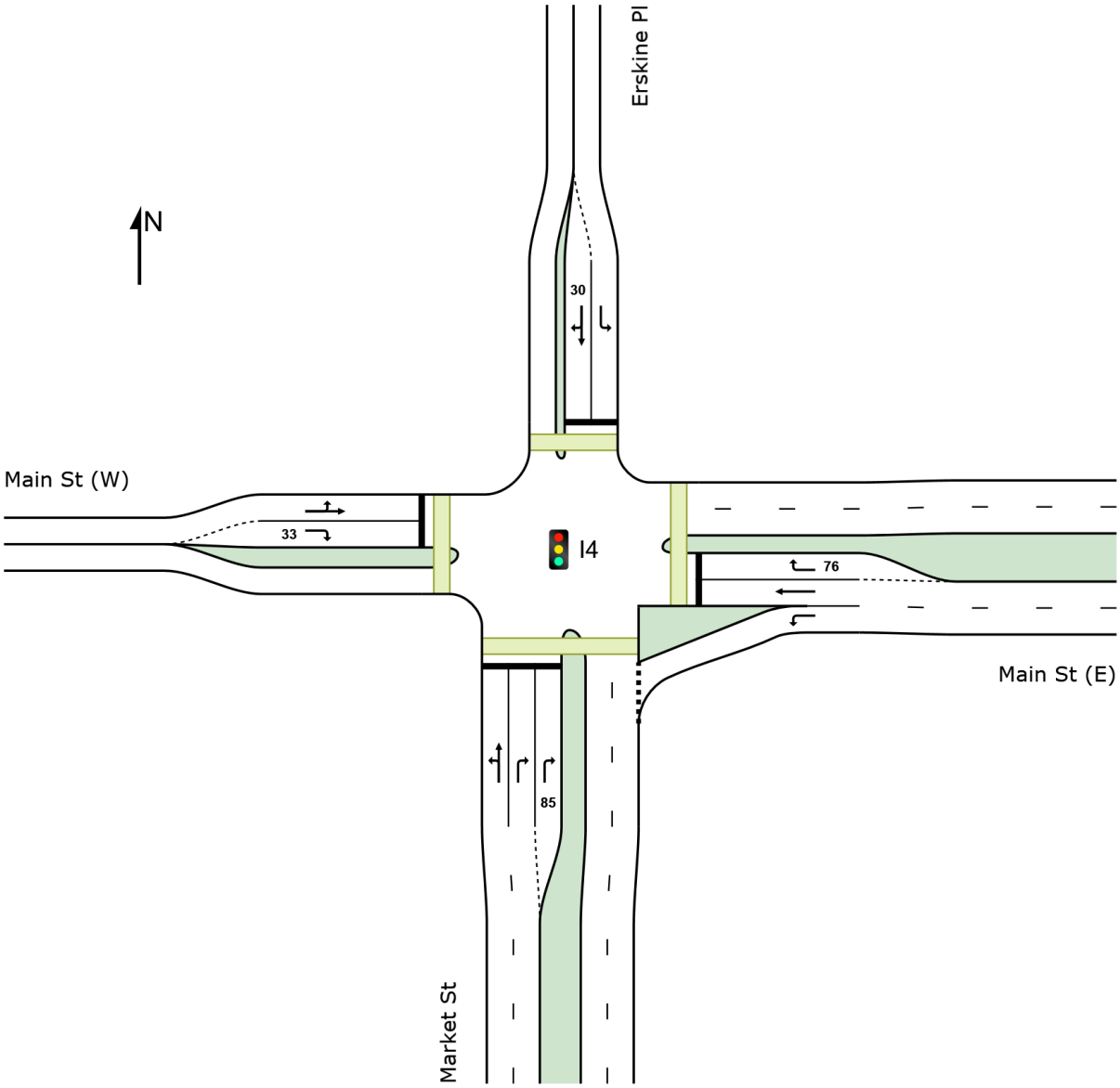
Project: \\au.slr.local\Corporate\Projects-SLR\620-BNE\620-BNE\620.041996.00001 Townsville, North Shore - Ongo\02 Analysis\2026 02 - Sensitivity Test\620.041996 SIDRA 20260219.sip9

SITE LAYOUT

Site: I4 [I4 - ULT DEV AM (Site Folder: General)]

Market St/Main St/Erskine Pl Intersection
Prepared by: DN
Reviewed by: CL
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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



Organisation: SLR CONSULTING AUSTRALIA | Licence: NETWORK / 1PC | Created: Thursday, 19 February 2026 3:07:04 PM
Project: \\au.slr.local\Corporate\Projects-SLR\620-BNE\620-BNE\620.041996.00001 Townsville, North Shore - Ongo\02 Analysis\2026 02 - Sensitivity Test\620.041996 SIDRA 20260219.sip9

MOVEMENT SUMMARY

Site: I4 [I4 - ULT DEV AM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Market St/Main St/Erskine Pl Intersection
Prepared by: DN
Reviewed by: CL
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Market St															
1	L2	All MCs	15	1.0	15	1.0	0.267	42.6	LOS D	3.2	22.4	0.92	0.72	0.92	22.3
2	T1	All MCs	64	1.0	64	1.0	* 0.267	37.0	LOS D	3.2	22.4	0.92	0.72	0.92	25.8
3	R2	All MCs	153	1.0	153	1.0	0.267	42.7	LOS D	3.1	21.6	0.92	0.76	0.92	14.6
Approach			233	1.0	233	1.0	0.267	41.1	LOS D	3.2	22.4	0.92	0.74	0.92	18.6
East: Main St (E)															
4	L2	All MCs	244	1.0	244	1.0	0.167	6.3	LOS A	1.1	7.9	0.19	0.61	0.19	37.5
5	T1	All MCs	76	1.0	76	1.0	0.101	21.3	LOS C	2.1	14.9	0.67	0.64	0.67	29.6
6	R2	All MCs	122	1.0	122	1.0	* 0.271	35.6	LOS D	4.4	31.0	0.85	0.77	0.85	26.7
Approach			443	1.0	443	1.0	0.271	17.0	LOS B	4.4	31.0	0.46	0.66	0.46	30.7
North: Erskine Pl															
7	L2	All MCs	16	1.0	16	1.0	0.070	44.2	LOS D	0.6	4.4	0.91	0.69	0.91	23.6
8	T1	All MCs	48	1.0	48	1.0	* 0.265	40.0	LOS D	2.6	18.1	0.95	0.72	0.95	24.7
9	R2	All MCs	14	1.0	14	1.0	0.265	45.6	LOS D	2.6	18.1	0.95	0.72	0.95	27.7
Approach			78	1.0	78	1.0	0.265	41.9	LOS D	2.6	18.1	0.94	0.72	0.94	25.1
West: Main St (W)															
10	L2	All MCs	5	1.0	5	1.0	0.279	23.5	LOS C	1.8	12.8	0.93	0.71	0.93	34.1
11	T1	All MCs	72	1.0	72	1.0	* 0.279	20.1	LOS C	1.8	12.8	0.93	0.71	0.93	29.3
12	R2	All MCs	15	1.0	15	1.0	0.120	48.3	LOS D	0.6	4.6	0.97	0.68	0.97	19.3
Approach			92	1.0	92	1.0	0.279	24.8	LOS C	1.8	12.8	0.94	0.70	0.94	27.5
All Vehicles			846	1.0	846	1.0	0.279	26.8	LOS C	4.4	31.0	0.68	0.69	0.68	25.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Market St												
P1	Full	5	5	39.2	LOS D	0.0	0.0	0.93	0.93	193.1	200.0	1.04

East: Main St (E)											
P2 Full	5	5	39.2	LOS D	0.0	0.0	0.93	0.93	193.1	200.0	1.04
North: Erskine Pl											
P3 Full	5	5	39.2	LOS D	0.0	0.0	0.93	0.93	193.1	200.0	1.04
West: Main St (W)											
P4 Full	5	5	39.2	LOS D	0.0	0.0	0.93	0.93	193.1	200.0	1.04
All Pedestrians	20	21	39.2	LOS D	0.0	0.0	0.93	0.93	193.1	200.0	1.04

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

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PHASING SUMMARY

Site: I4 [I4 - ULT DEV AM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Market St/Main St/Erskine Pl Intersection
Prepared by: DN
Reviewed by: CL
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)

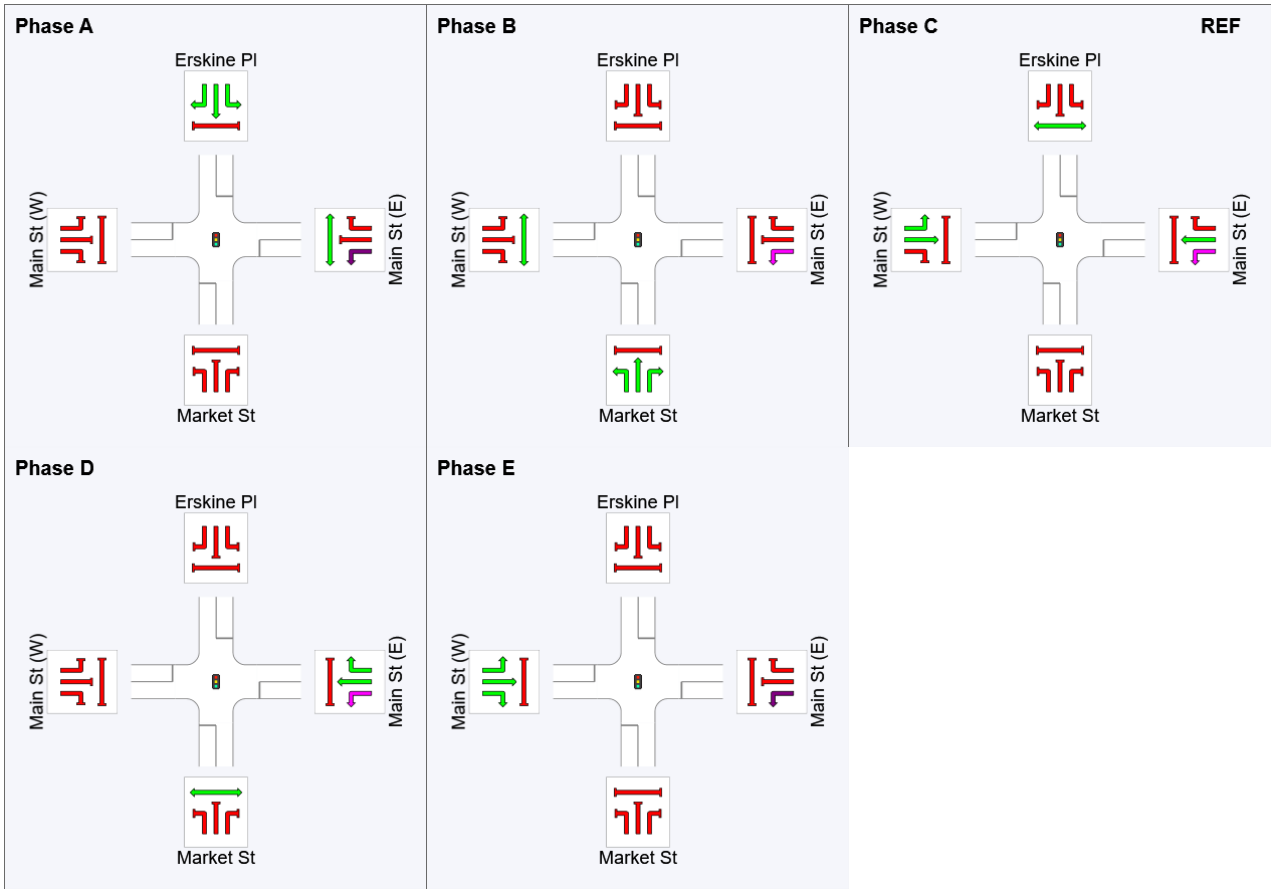
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Four-Phase Leading Right Turns
Input Phase Sequence: A, B, C, D, E
Output Phase Sequence: A, B, C, D, E
Reference Phase: Phase C

Phase Timing Summary

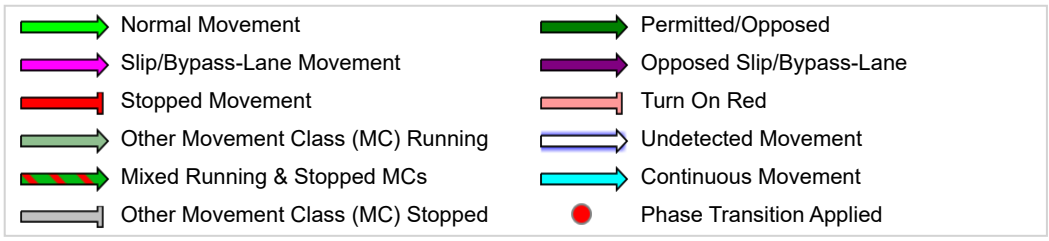
Phase	A	B	C	D	E
Phase Change Time (sec)	53	70	0	13	41
Green Time (sec)	11	14	7	22	6
Phase Time (sec)	17	20	13	28	12
Phase Split	19%	22%	14%	31%	13%
Phase Frequency (%)	100.0	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



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Project: \\au.slr.local\Corporate\Projects-SLR\620-BNE\620-BNE\620.041996.00001 Townsville, North Shore - Ongo\02 Analysis\2026 02 - Sensitivity Test\620.041996 SIDRA 20260219.sip9

MOVEMENT SUMMARY

Site: I4 [I4 - ULT DEV PM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Market St/Main St/Erskine Pl Intersection
Prepared by: DN
Reviewed by: CL
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Market St															
1	L2	All MCs	83	1.0	83	1.0	0.396	39.1	LOS D	6.1	43.0	0.91	0.77	0.91	22.7
2	T1	All MCs	75	1.0	75	1.0	0.396	33.6	LOS C	6.1	43.0	0.91	0.77	0.91	26.4
3	R2	All MCs	358	1.0	358	1.0	*0.460	39.8	LOS D	7.0	49.6	0.92	0.80	0.92	15.4
Approach			516	1.0	516	1.0	0.460	38.8	LOS D	7.0	49.6	0.92	0.79	0.92	18.6
East: Main St (E)															
4	L2	All MCs	322	1.0	322	1.0	0.227	6.5	LOS A	1.8	12.5	0.22	0.62	0.22	37.3
5	T1	All MCs	187	1.0	187	1.0	0.290	26.5	LOS C	6.1	42.9	0.78	0.72	0.78	27.4
6	R2	All MCs	88	1.0	88	1.0	*0.432	47.8	LOS D	3.8	26.9	0.98	0.77	0.98	22.6
Approach			597	1.0	597	1.0	0.432	18.9	LOS B	6.1	42.9	0.51	0.67	0.51	28.9
North: Erskine Pl															
7	L2	All MCs	23	1.0	23	1.0	0.113	45.7	LOS D	0.9	6.7	0.93	0.71	0.93	23.1
8	T1	All MCs	54	1.0	54	1.0	*0.450	42.3	LOS D	4.1	28.8	0.98	0.77	0.98	23.5
9	R2	All MCs	41	1.0	41	1.0	0.450	47.8	LOS D	4.1	28.8	0.98	0.77	0.98	26.8
Approach			118	1.0	118	1.0	0.450	44.9	LOS D	4.1	28.8	0.97	0.75	0.97	24.8
West: Main St (W)															
10	L2	All MCs	31	1.0	31	1.0	0.469	22.3	LOS C	5.6	39.7	0.91	0.75	0.91	34.5
11	T1	All MCs	180	1.0	180	1.0	*0.469	18.9	LOS B	5.6	39.7	0.91	0.75	0.91	29.7
12	R2	All MCs	31	1.0	31	1.0	0.213	47.6	LOS D	1.3	9.4	0.97	0.71	0.97	19.5
Approach			241	1.0	241	1.0	0.469	23.0	LOS C	5.6	39.7	0.92	0.74	0.92	28.7
All Vehicles			1471	1.0	1471	1.0	0.469	28.6	LOS C	7.0	49.6	0.75	0.73	0.75	24.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Market St												
P1	Full	5	5	39.2	LOS D	0.0	0.0	0.93	0.93	193.1	200.0	1.04

East: Main St (E)											
P2 Full	5	5	39.2	LOS D	0.0	0.0	0.93	0.93	193.1	200.0	1.04
North: Erskine Pl											
P3 Full	5	5	39.2	LOS D	0.0	0.0	0.93	0.93	193.1	200.0	1.04
West: Main St (W)											
P4 Full	5	5	39.2	LOS D	0.0	0.0	0.93	0.93	193.1	200.0	1.04
All Pedestrians	20	21	39.2	LOS D	0.0	0.0	0.93	0.93	193.1	200.0	1.04

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

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PHASING SUMMARY

Site: I4 [I4 - ULT DEV PM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Market St/Main St/Erskine Pl Intersection
Prepared by: DN
Reviewed by: CL
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)

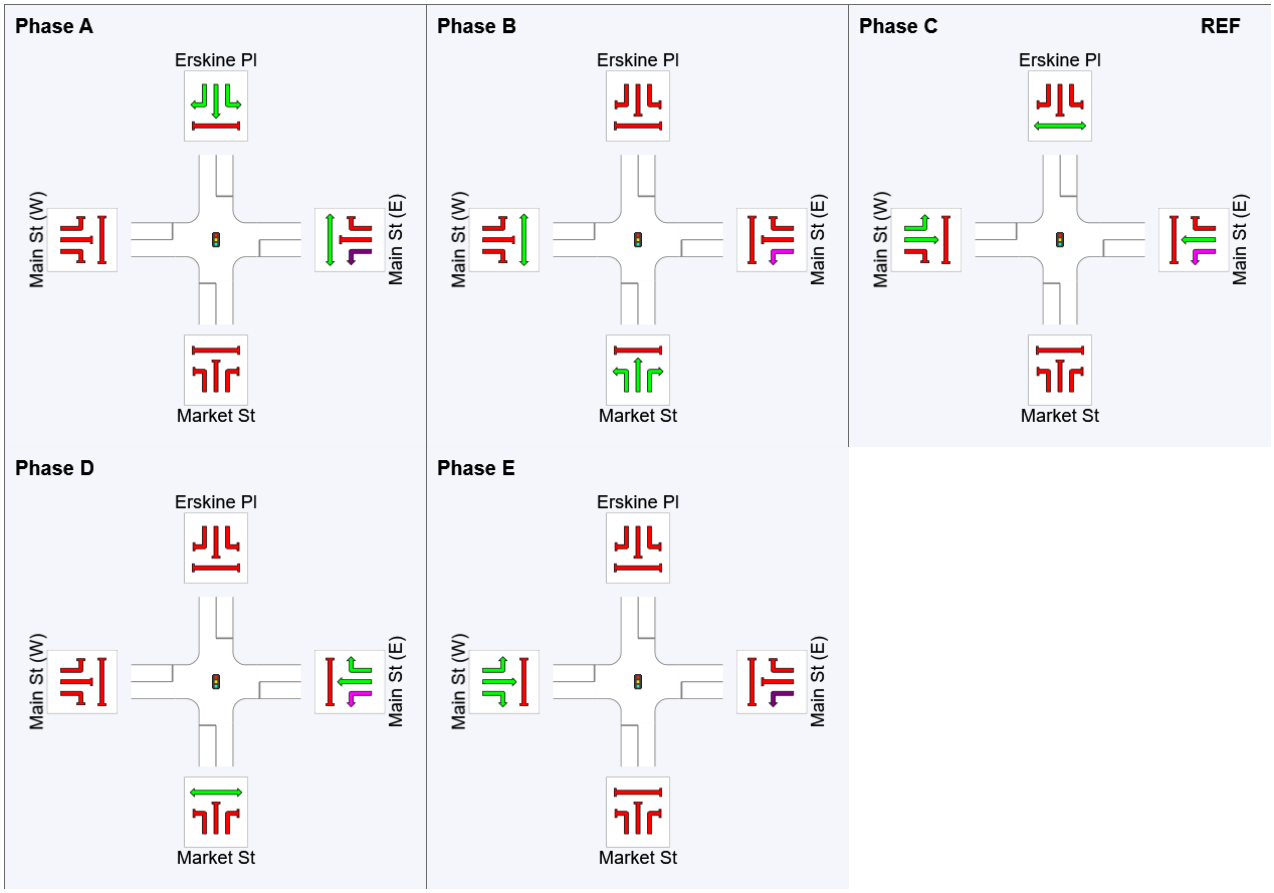
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: Four-Phase Leading Right Turns
Input Phase Sequence: A, B, C, D, E
Output Phase Sequence: A, B, C, D, E
Reference Phase: Phase C

Phase Timing Summary

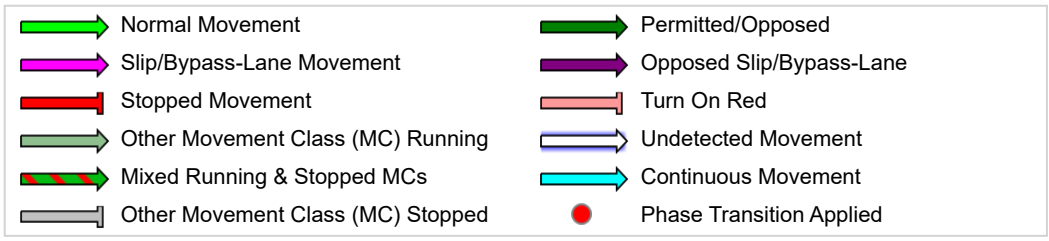
Phase	A	B	C	D	E
Phase Change Time (sec)	49	65	0	20	36
Green Time (sec)	10	19	14	10	7
Phase Time (sec)	16	25	20	16	13
Phase Split	18%	28%	22%	18%	14%
Phase Frequency (%)	100.0	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



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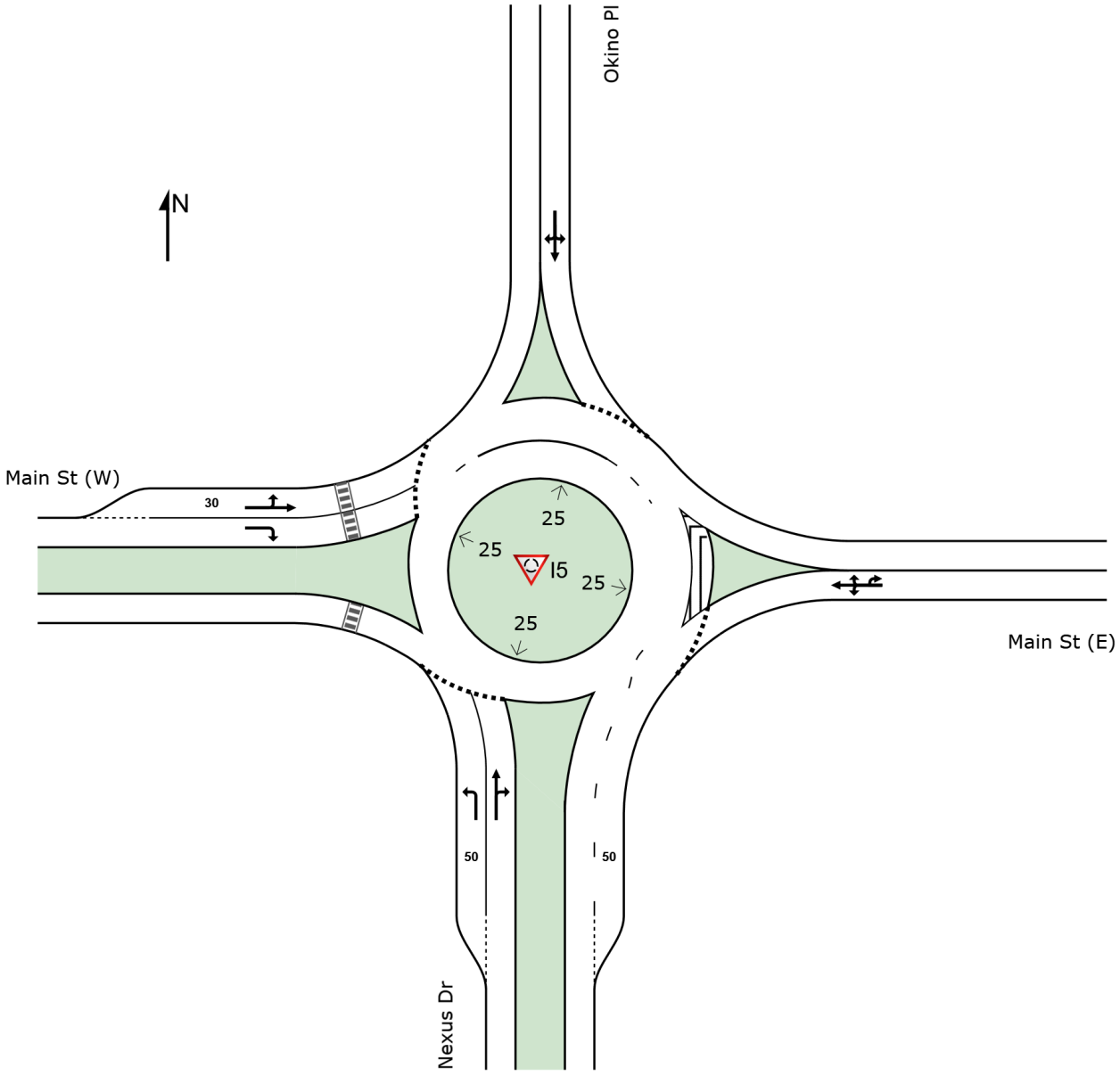
SITE LAYOUT

Site: I5 [I5 - ULT DEV AM (Site Folder: General)]

Main St/Nexus Dr/Okino Pl Roundabout
Prepared by: DN
Reviewed by: CL
Site Category: Existing Design
Roundabout

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



Organisation: SLR CONSULTING AUSTRALIA | Licence: NETWORK / 1PC | Created: Thursday, 19 February 2026 3:07:14 PM
Project: \\au.slr.local\Corporate\Projects-SLR\620-BNE\620-BNE\620.041996.00001 Townsville, North Shore - Ongo\02 Analysis\2026 02 - Sensitivity Test\620.041996 SIDRA 20260219.sip9

MOVEMENT SUMMARY

Site: I5 [I5 - ULT DEV AM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Main St/Nexus Dr/Okino Pl Roundabout
Prepared by: DN
Reviewed by: CL
Site Category: Existing Design
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Nexus Dr															
1	L2	All MCs	210	1.0	210	1.0	0.127	3.2	LOS A	0.7	5.1	0.19	0.42	0.19	45.5
2	T1	All MCs	1	1.0	1	1.0	0.002	3.1	LOS A	0.0	0.1	0.20	0.50	0.20	27.7
3	R2	All MCs	1	1.0	1	1.0	0.002	8.6	LOS A	0.0	0.1	0.20	0.50	0.20	41.8
Approach			212	1.0	212	1.0	0.127	3.2	LOS A	0.7	5.1	0.19	0.43	0.19	45.4
East: Main St (E)															
4	L2	All MCs	6	1.0	6	1.0	0.058	5.3	LOS A	0.3	2.0	0.39	0.51	0.39	42.0
5	T1	All MCs	48	1.0	48	1.0	0.058	4.6	LOS A	0.3	2.0	0.39	0.51	0.39	46.2
6	R2	All MCs	1	1.0	1	1.0	0.058	10.1	LOS B	0.3	2.0	0.39	0.51	0.39	33.0
6u	U	All MCs	11	0.0	11	0.0	0.058	12.3	LOS B	0.3	2.0	0.39	0.51	0.39	45.2
Approach			65	0.8	65	0.8	0.058	6.0	LOS A	0.3	2.0	0.39	0.51	0.39	45.5
North: Okino Pl															
7	L2	All MCs	1	1.0	1	1.0	0.003	4.8	LOS A	0.0	0.1	0.37	0.53	0.37	41.8
8	T1	All MCs	1	1.0	1	1.0	0.003	5.2	LOS A	0.0	0.1	0.37	0.53	0.37	35.7
9	R2	All MCs	1	1.0	1	1.0	0.003	9.8	LOS A	0.0	0.1	0.37	0.53	0.37	40.0
Approach			3	1.0	3	1.0	0.003	6.6	LOS A	0.0	0.1	0.37	0.53	0.37	39.5
West: Main St (W)															
10	L2	All MCs	1	1.0	1	1.0	0.069	3.9	LOS A	0.4	2.5	0.09	0.38	0.09	33.6
11	T1	All MCs	88	1.0	88	1.0	0.069	4.0	LOS A	0.4	2.5	0.09	0.38	0.09	49.2
12	R2	All MCs	260	1.0	260	1.0	0.149	8.9	LOS A	0.9	6.0	0.08	0.62	0.08	37.4
Approach			349	1.0	349	1.0	0.149	7.6	LOS A	0.9	6.0	0.08	0.56	0.08	40.4
All Vehicles			629	1.0	629	1.0	0.149	6.0	LOS A	0.9	6.0	0.15	0.51	0.15	42.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: I5 [I5 - ULT DEV PM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Main St/Nexus Dr/Okino Pl Roundabout
Prepared by: DN
Reviewed by: CL
Site Category: Existing Design
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Nexus Dr															
1	L2	All MCs	500	1.0	500	1.0	0.318	3.5	LOS A	2.1	15.0	0.34	0.45	0.34	44.4
2	T1	All MCs	1	1.0	1	1.0	0.003	3.5	LOS A	0.0	0.1	0.30	0.53	0.30	26.7
3	R2	All MCs	2	1.0	2	1.0	0.003	9.0	LOS A	0.0	0.1	0.30	0.53	0.30	40.2
Approach			503	1.0	503	1.0	0.318	3.6	LOS A	2.1	15.0	0.34	0.45	0.34	44.3
East: Main St (E)															
4	L2	All MCs	19	1.0	19	1.0	0.124	4.7	LOS A	0.6	4.4	0.33	0.48	0.33	42.7
5	T1	All MCs	107	1.0	107	1.0	0.124	4.2	LOS A	0.6	4.4	0.33	0.48	0.33	46.8
6	R2	All MCs	1	1.0	1	1.0	0.124	9.8	LOS A	0.6	4.4	0.33	0.48	0.33	33.4
6u	U	All MCs	23	0.0	23	0.0	0.124	11.9	LOS B	0.6	4.4	0.33	0.48	0.33	45.7
Approach			150	0.8	150	0.8	0.124	5.5	LOS A	0.6	4.4	0.33	0.48	0.33	46.1
North: Okino Pl															
7	L2	All MCs	1	1.0	1	1.0	0.003	4.4	LOS A	0.0	0.1	0.31	0.51	0.31	42.2
8	T1	All MCs	1	1.0	1	1.0	0.003	4.7	LOS A	0.0	0.1	0.31	0.51	0.31	36.1
9	R2	All MCs	1	1.0	1	1.0	0.003	9.5	LOS A	0.0	0.1	0.31	0.51	0.31	40.3
Approach			3	1.0	3	1.0	0.003	6.2	LOS A	0.0	0.1	0.31	0.51	0.31	39.9
West: Main St (W)															
10	L2	All MCs	1	1.0	1	1.0	0.047	4.0	LOS A	0.2	1.6	0.13	0.38	0.13	33.3
11	T1	All MCs	56	1.0	56	1.0	0.047	4.1	LOS A	0.2	1.6	0.13	0.38	0.13	48.8
12	R2	All MCs	166	1.0	166	1.0	0.100	8.9	LOS A	0.5	3.8	0.11	0.61	0.11	37.2
Approach			223	1.0	223	1.0	0.100	7.7	LOS A	0.5	3.8	0.12	0.55	0.12	40.2
All Vehicles			879	1.0	879	1.0	0.318	5.0	LOS A	2.1	15.0	0.28	0.48	0.28	43.5

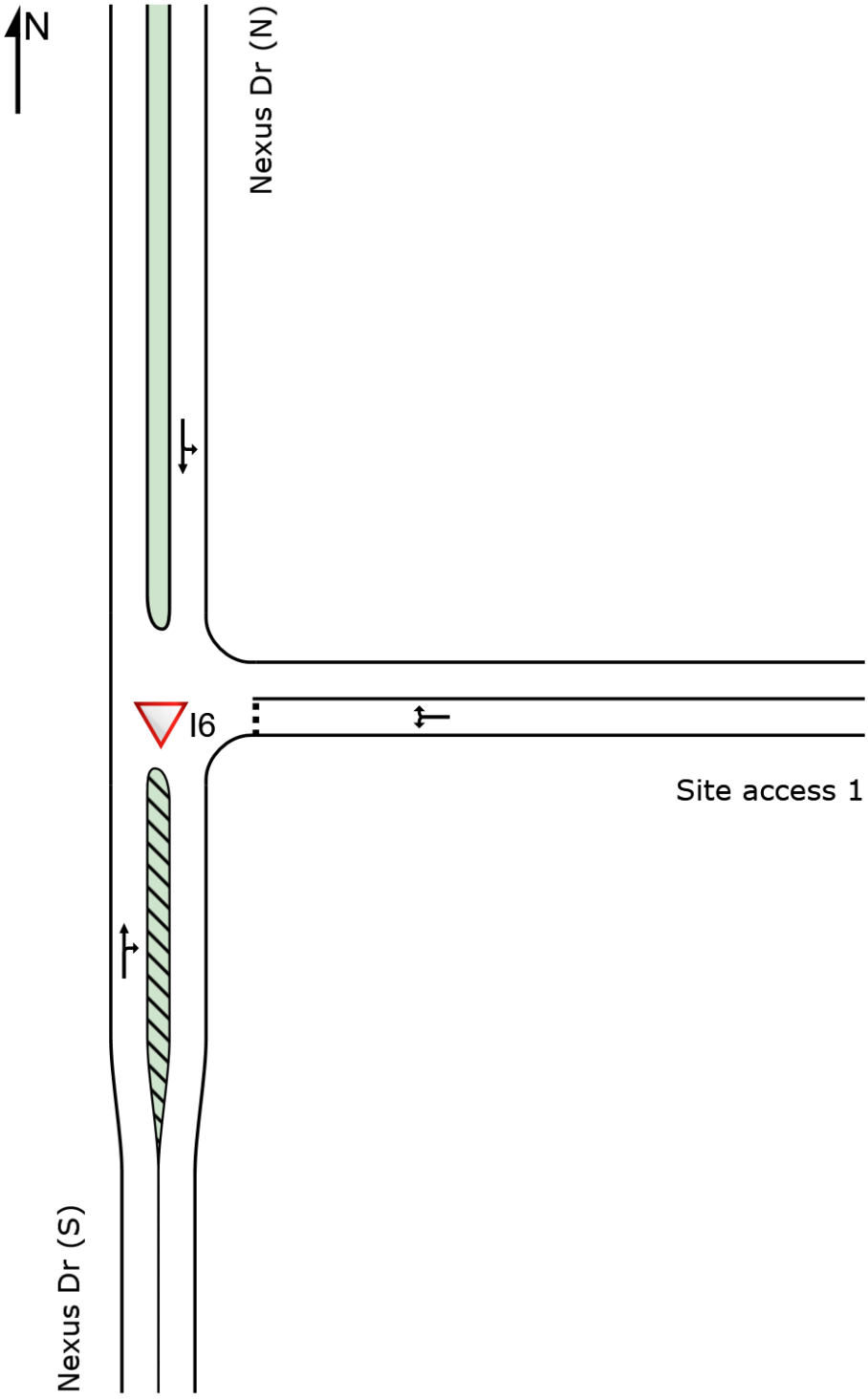
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

Site: I6 [I6 - ULT DEV AM (Site Folder: General)]

Nexus Drive/Site access 1 Intersection
Prepared by: DN
Reviewed by: CL
Site Category: Proposed Design
Give-Way (Two-Way)

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



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Project: \\au.slr.local\Corporate\Projects-SLR\620-BNE\620-BNE\620.041996.00001 Townsville, North Shore - Ongo\02 Analysis\2026 02 - Sensitivity Test\620.041996 SIDRA 20260219.sip9

MOVEMENT SUMMARY

Site: I6 [I6 - ULT DEV AM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Nexus Drive/Site access 1 Intersection
Prepared by: DN
Reviewed by: CL
Site Category: Proposed Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Nexus Dr (S)															
2	T1	All MCs	109	1.0	109	1.0	0.057	0.0	LOS A	0.0	0.1	0.01	0.01	0.01	59.7
3	R2	All MCs	1	1.0	1	1.0	0.057	5.7	LOS A	0.0	0.1	0.01	0.01	0.01	52.9
Approach			110	1.0	110	1.0	0.057	0.1	NA	0.0	0.1	0.01	0.01	0.01	59.6
East: Site access 1															
4	L2	All MCs	1	1.0	1	1.0	0.008	6.3	LOS A	0.0	0.2	0.35	0.59	0.35	42.5
6	R2	All MCs	7	1.0	7	1.0	0.008	6.9	LOS A	0.0	0.2	0.35	0.59	0.35	40.1
Approach			8	1.0	8	1.0	0.008	6.8	LOS A	0.0	0.2	0.35	0.59	0.35	40.4
North: Nexus Dr (N)															
7	L2	All MCs	19	1.0	19	1.0	0.137	5.6	LOS A	0.0	0.0	0.00	0.04	0.00	51.6
8	T1	All MCs	246	1.0	246	1.0	0.137	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	58.6
Approach			265	1.0	265	1.0	0.137	0.4	NA	0.0	0.0	0.00	0.04	0.00	58.0
All Vehicles			382	1.0	382	1.0	0.137	0.4	NA	0.0	0.2	0.01	0.04	0.01	57.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: I6 [I6 - ULT DEV PM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Nexus Drive/Site access 1 Intersection
Prepared by: DN
Reviewed by: CL
Site Category: Proposed Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Nexus Dr (S)															
2	T1	All MCs	253	1.0	253	1.0	0.132	0.0	LOS A	0.0	0.1	0.00	0.00	0.00	59.9
3	R2	All MCs	1	1.0	1	1.0	0.132	5.5	LOS A	0.0	0.1	0.00	0.00	0.00	53.0
Approach			254	1.0	254	1.0	0.132	0.0	NA	0.0	0.1	0.00	0.00	0.00	59.8
East: Site access 1															
4	L2	All MCs	1	1.0	1	1.0	0.026	6.0	LOS A	0.1	0.6	0.38	0.63	0.38	42.1
6	R2	All MCs	22	1.0	22	1.0	0.026	7.2	LOS A	0.1	0.6	0.38	0.63	0.38	39.7
Approach			23	1.0	23	1.0	0.026	7.1	LOS A	0.1	0.6	0.38	0.63	0.38	39.8
North: Nexus Dr (N)															
7	L2	All MCs	32	1.0	32	1.0	0.095	5.6	LOS A	0.0	0.0	0.00	0.11	0.00	50.3
8	T1	All MCs	150	1.0	150	1.0	0.095	0.0	LOS A	0.0	0.0	0.00	0.11	0.00	56.9
Approach			183	1.0	183	1.0	0.095	1.0	NA	0.0	0.0	0.00	0.11	0.00	55.5
All Vehicles			460	1.0	460	1.0	0.132	0.8	NA	0.1	0.6	0.02	0.08	0.02	56.5

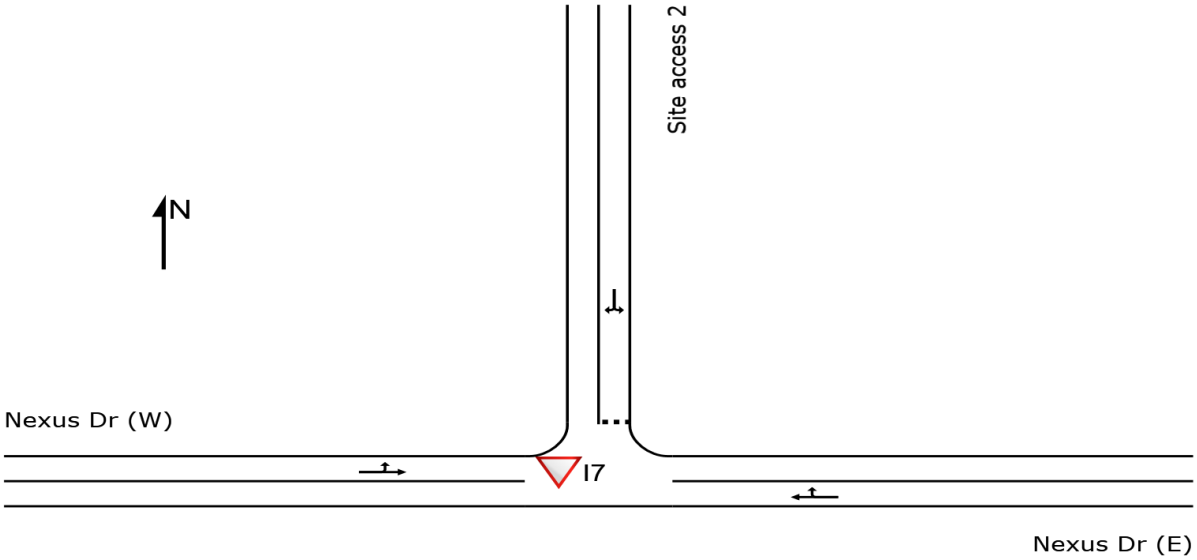
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

Site: I7 [I7 - ULT DEV AM (Site Folder: General)]

Nexus Dr/Site access 2 Intersection
Prepared by: DN
Reviewed by: CL
Site Category: Proposed Design
Give-Way (Two-Way)

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



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Project: \\au.slr.local\Corporate\Projects-SLR\620-BNE\620-BNE\620.041996.00001 Townsville, North Shore - Ongo\02 Analysis\2026 02 - Sensitivity Test\620.041996 SIDRA 20260219.sip9

MOVEMENT SUMMARY

Site: I7 [I7 - ULT DEV AM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Nexus Dr/Site access 2 Intersection
Prepared by: DN
Reviewed by: CL
Site Category: Proposed Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Nexus Dr (E)															
5	T1	All MCs	197	0.0	197	0.0	0.110	0.2	LOS A	0.1	0.7	0.05	0.05	0.05	58.3
6	R2	All MCs	5	100.0	5	100.0	0.110	9.8	LOS A	0.1	0.7	0.05	0.05	0.05	48.2
Approach			202	2.5	202	2.5	0.110	0.4	NA	0.1	0.7	0.05	0.05	0.05	57.5
North: Site access 2															
7	L2	All MCs	5	100.0	5	100.0	0.014	9.3	LOS A	0.0	0.5	0.45	0.64	0.45	42.9
9	R2	All MCs	5	0.0	5	0.0	0.014	7.7	LOS A	0.0	0.5	0.45	0.64	0.45	45.7
Approach			10	48.7	10	48.7	0.014	8.5	LOS A	0.0	0.5	0.45	0.64	0.45	44.3
West: Nexus Dr (W)															
10	L2	All MCs	5	100.0	5	100.0	0.177	5.8	LOS A	0.0	0.0	0.00	0.01	0.00	49.0
11	T1	All MCs	336	0.0	336	0.0	0.177	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.5
Approach			341	1.5	341	1.5	0.177	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.0
All Vehicles			553	2.8	553	2.8	0.177	0.4	NA	0.1	0.7	0.03	0.03	0.03	57.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: I7 [I7 - ULT DEV PM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Nexus Dr/Site access 2 Intersection
Prepared by: DN
Reviewed by: CL
Site Category: Proposed Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Nexus Dr (E)															
5	T1	All MCs	381	0.0	381	0.0	0.204	0.1	LOS A	0.1	0.7	0.02	0.02	0.02	59.2
6	R2	All MCs	5	100.0	5	100.0	0.204	8.5	LOS A	0.1	0.7	0.02	0.02	0.02	48.4
Approach			386	1.3	386	1.3	0.204	0.2	NA	0.1	0.7	0.02	0.02	0.02	58.7
North: Site access 2															
7	L2	All MCs	5	100.0	5	100.0	0.015	8.8	LOS A	0.1	0.5	0.45	0.63	0.45	42.8
9	R2	All MCs	5	0.0	5	0.0	0.015	8.6	LOS A	0.1	0.5	0.45	0.63	0.45	45.6
Approach			10	48.7	10	48.7	0.015	8.7	LOS A	0.1	0.5	0.45	0.63	0.45	44.1
West: Nexus Dr (W)															
10	L2	All MCs	5	100.0	5	100.0	0.148	5.8	LOS A	0.0	0.0	0.00	0.01	0.00	49.0
11	T1	All MCs	279	0.0	279	0.0	0.148	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.5
Approach			285	1.8	285	1.8	0.148	0.1	NA	0.0	0.0	0.00	0.01	0.00	58.9
All Vehicles			681	2.2	681	2.2	0.204	0.3	NA	0.1	0.7	0.02	0.03	0.02	58.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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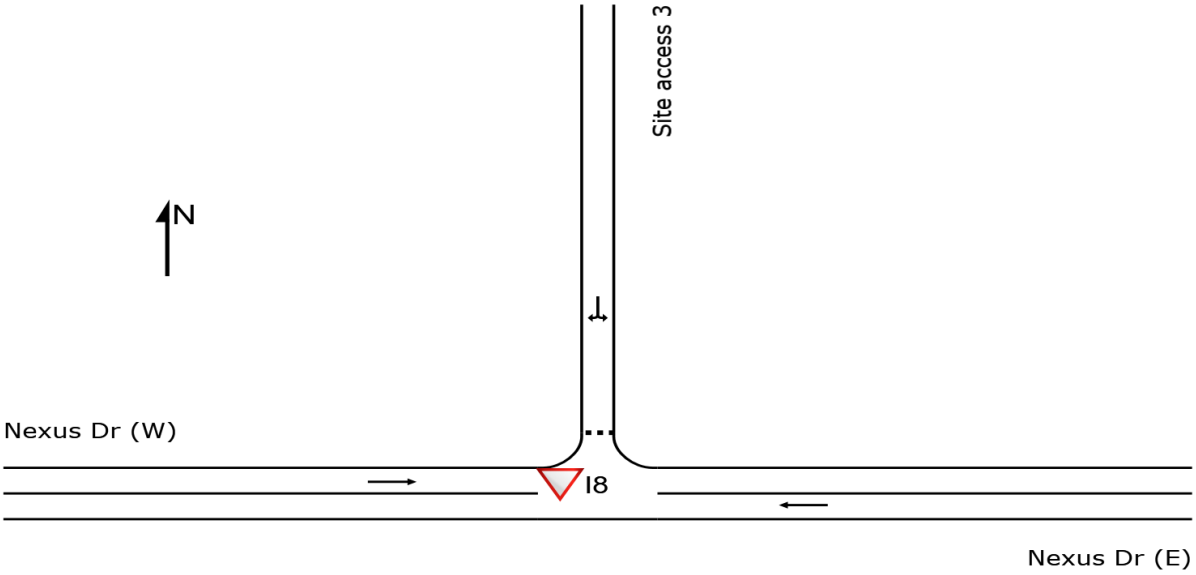
SITE LAYOUT

Site: I8 [I8 - ULT DEV AM (Site Folder: General)]

Nexus Dr/Site access 3 Intersection
Prepared by: DN
Reviewed by: CL
Site Category: Proposed Design
Give-Way (Two-Way)

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



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MOVEMENT SUMMARY

Site: I8 [I8 - ULT DEV AM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Nexus Dr/Site access 3 Intersection
Prepared by: DN
Reviewed by: CL
Site Category: Proposed Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Nexus Dr (E)															
5	T1	All MCs	202	0.0	202	0.0	0.104	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach			202	0.0	202	0.0	0.104	0.0	NA	0.0	0.0	0.00	0.00	0.00	60.0
North: Site access 3															
7	L2	All MCs	21	0.0	21	0.0	0.024	6.7	LOS A	0.1	0.6	0.39	0.61	0.39	46.9
9	R2	All MCs	5	0.0	5	0.0	0.024	8.1	LOS A	0.1	0.6	0.39	0.61	0.39	48.2
Approach			26	0.0	26	0.0	0.024	6.9	LOS A	0.1	0.6	0.39	0.61	0.39	47.2
West: Nexus Dr (W)															
11	T1	All MCs	341	0.0	341	0.0	0.175	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			341	0.0	341	0.0	0.175	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
All Vehicles			569	0.0	569	0.0	0.175	0.3	NA	0.1	0.6	0.02	0.03	0.02	58.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: I8 [I8 - ULT DEV PM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Nexus Dr/Site access 3 Intersection
Prepared by: DN
Reviewed by: CL
Site Category: Proposed Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Nexus Dr (E)															
5	T1	All MCs	386	0.0	386	0.0	0.198	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			386	0.0	386	0.0	0.198	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
North: Site access 3															
7	L2	All MCs	21	0.0	21	0.0	0.025	6.4	LOS A	0.1	0.6	0.38	0.60	0.38	47.0
9	R2	All MCs	5	0.0	5	0.0	0.025	8.9	LOS A	0.1	0.6	0.38	0.60	0.38	48.2
Approach			26	0.0	26	0.0	0.025	6.9	LOS A	0.1	0.6	0.38	0.60	0.38	47.3
West: Nexus Dr (W)															
11	T1	All MCs	284	0.0	284	0.0	0.146	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			284	0.0	284	0.0	0.146	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
All Vehicles			697	0.0	697	0.0	0.198	0.3	NA	0.1	0.6	0.01	0.02	0.01	58.5

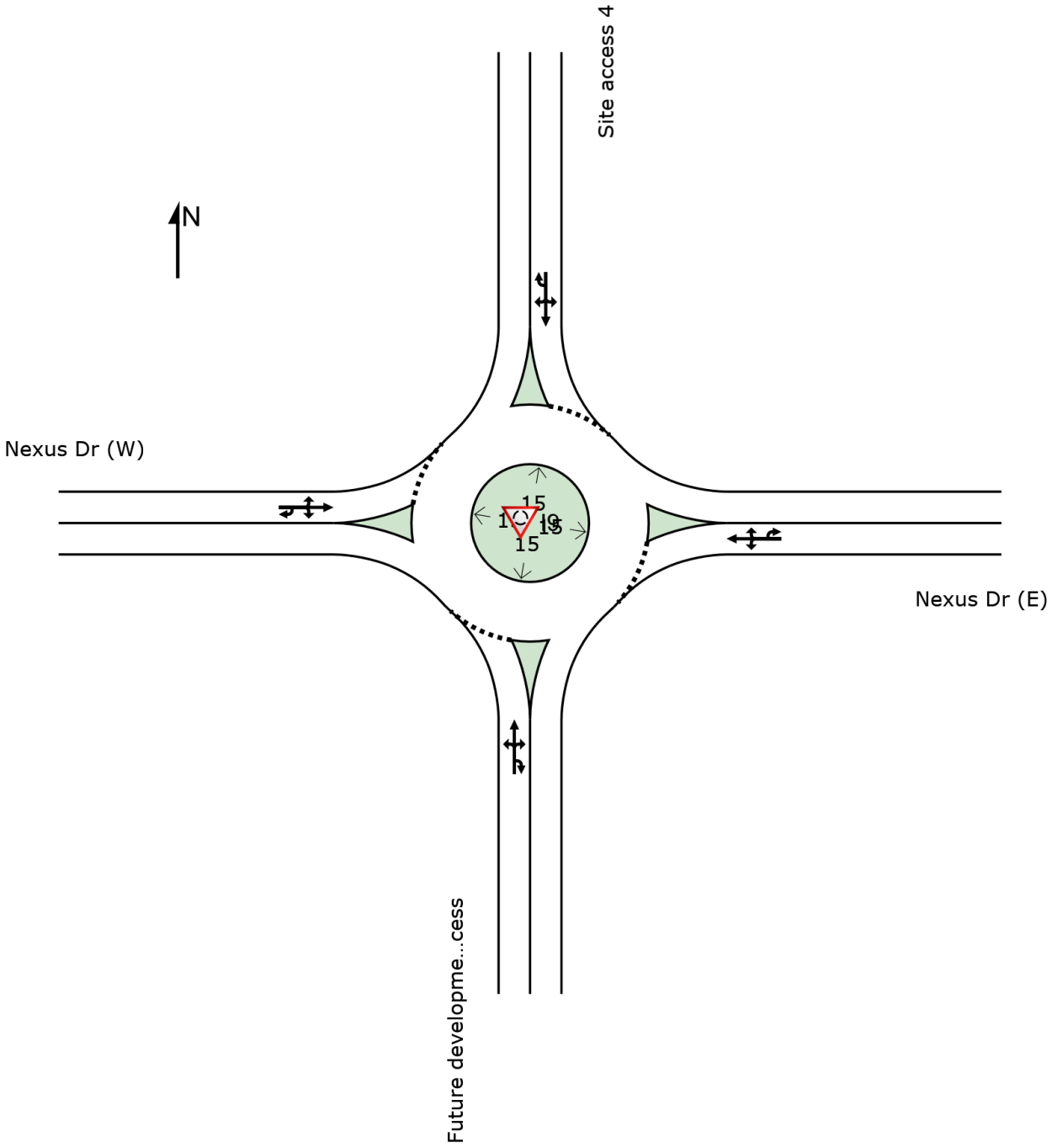
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

Site: I9 [I9 - ULT DEV AM (Site Folder: General)]

Nexus Dr/Site access 4 Roundabout
Prepared by: DN
Reviewed by: CL
Site Category: Proposed Design
Roundabout

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



MOVEMENT SUMMARY

Site: I9 [I9 - ULT DEV AM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Nexus Dr/Site access 4 Roundabout
Prepared by: DN
Reviewed by: CL
Site Category: Proposed Design
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Future development access															
1	L2	All MCs	2	1.0	2	1.0	0.049	6.2	LOS A	0.2	1.8	0.54	0.69	0.54	37.7
2	T1	All MCs	1	1.0	1	1.0	0.049	6.5	LOS A	0.2	1.8	0.54	0.69	0.54	27.9
3	R2	All MCs	41	1.0	41	1.0	0.049	10.5	LOS B	0.2	1.8	0.54	0.69	0.54	30.2
3u	U	All MCs	1	0.0	1	0.0	0.049	12.4	LOS B	0.2	1.8	0.54	0.69	0.54	28.9
Approach			45	1.0	45	1.0	0.049	10.3	LOS B	0.2	1.8	0.54	0.69	0.54	30.5
East: Nexus Dr (E)															
4	L2	All MCs	61	1.0	61	1.0	0.334	4.2	LOS A	2.3	16.5	0.10	0.56	0.10	35.2
5	T1	All MCs	194	1.0	194	1.0	0.334	4.4	LOS A	2.3	16.5	0.10	0.56	0.10	43.0
6	R2	All MCs	283	1.0	283	1.0	0.334	8.4	LOS A	2.3	16.5	0.10	0.56	0.10	32.4
6u	U	All MCs	1	0.0	1	0.0	0.334	10.3	LOS B	2.3	16.5	0.10	0.56	0.10	35.5
Approach			539	1.0	539	1.0	0.334	6.5	LOS A	2.3	16.5	0.10	0.56	0.10	37.5
North: Site access 4															
7	L2	All MCs	119	1.0	119	1.0	0.133	4.6	LOS A	0.7	5.3	0.54	0.59	0.54	34.9
8	T1	All MCs	1	1.0	1	1.0	0.133	5.0	LOS A	0.7	5.3	0.54	0.59	0.54	34.3
9	R2	All MCs	6	1.0	6	1.0	0.133	8.8	LOS A	0.7	5.3	0.54	0.59	0.54	41.8
9u	U	All MCs	1	0.0	1	0.0	0.133	10.6	LOS B	0.7	5.3	0.54	0.59	0.54	27.4
Approach			127	1.0	127	1.0	0.133	4.9	LOS A	0.7	5.3	0.54	0.59	0.54	35.4
West: Nexus Dr (W)															
10	L2	All MCs	15	1.0	15	1.0	0.335	6.3	LOS A	2.0	14.2	0.55	0.57	0.55	39.9
11	T1	All MCs	323	1.0	323	1.0	0.335	6.6	LOS A	2.0	14.2	0.55	0.57	0.55	42.3
12	R2	All MCs	3	1.0	3	1.0	0.335	10.6	LOS B	2.0	14.2	0.55	0.57	0.55	40.1
12u	U	All MCs	1	0.0	1	0.0	0.335	12.4	LOS B	2.0	14.2	0.55	0.57	0.55	44.7
Approach			342	1.0	342	1.0	0.335	6.6	LOS A	2.0	14.2	0.55	0.57	0.55	42.2
All Vehicles			1052	1.0	1052	1.0	0.335	6.5	LOS A	2.3	16.5	0.32	0.57	0.32	38.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: I9 [I9 - ULT DEV PM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Nexus Dr/Site access 4 Roundabout
Prepared by: DN
Reviewed by: CL
Site Category: Proposed Design
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Future development access															
1	L2	All MCs	5	1.0	5	1.0	0.174	9.5	LOS A	1.0	7.4	0.76	0.77	0.76	34.3
2	T1	All MCs	1	1.0	1	1.0	0.174	9.8	LOS A	1.0	7.4	0.76	0.77	0.76	24.2
3	R2	All MCs	110	1.0	110	1.0	0.174	13.8	LOS B	1.0	7.4	0.76	0.77	0.76	26.7
3u	U	All MCs	1	0.0	1	0.0	0.174	15.6	LOS B	1.0	7.4	0.76	0.77	0.76	25.5
Approach			117	1.0	117	1.0	0.174	13.6	LOS B	1.0	7.4	0.76	0.77	0.76	27.1
East: Nexus Dr (E)															
4	L2	All MCs	73	1.0	73	1.0	0.553	4.3	LOS A	5.6	39.5	0.21	0.52	0.21	34.6
5	T1	All MCs	363	1.0	363	1.0	0.553	4.6	LOS A	5.6	39.5	0.21	0.52	0.21	42.5
6	R2	All MCs	435	1.0	435	1.0	0.553	8.6	LOS A	5.6	39.5	0.21	0.52	0.21	31.8
6u	U	All MCs	1	0.0	1	0.0	0.553	10.5	LOS B	5.6	39.5	0.21	0.52	0.21	34.9
Approach			873	1.0	873	1.0	0.553	6.6	LOS A	5.6	39.5	0.21	0.52	0.21	37.5
North: Site access 4															
7	L2	All MCs	339	1.0	339	1.0	0.376	5.2	LOS A	2.5	17.7	0.64	0.62	0.64	33.8
8	T1	All MCs	1	1.0	1	1.0	0.376	5.6	LOS A	2.5	17.7	0.64	0.62	0.64	33.1
9	R2	All MCs	18	1.0	18	1.0	0.376	9.3	LOS A	2.5	17.7	0.64	0.62	0.64	40.9
9u	U	All MCs	1	0.0	1	0.0	0.376	11.2	LOS B	2.5	17.7	0.64	0.62	0.64	26.5
Approach			359	1.0	359	1.0	0.376	5.4	LOS A	2.5	17.7	0.64	0.62	0.64	34.3
West: Nexus Dr (W)															
10	L2	All MCs	23	1.0	23	1.0	0.333	7.9	LOS A	2.0	14.4	0.68	0.66	0.68	38.8
11	T1	All MCs	258	1.0	258	1.0	0.333	8.2	LOS A	2.0	14.4	0.68	0.66	0.68	41.1
12	R2	All MCs	3	1.0	3	1.0	0.333	12.2	LOS B	2.0	14.4	0.68	0.66	0.68	39.0
12u	U	All MCs	1	0.0	1	0.0	0.333	14.0	LOS B	2.0	14.4	0.68	0.66	0.68	43.7
Approach			285	1.0	285	1.0	0.333	8.2	LOS A	2.0	14.4	0.68	0.66	0.68	41.0
All Vehicles			1634	1.0	1634	1.0	0.553	7.1	LOS A	5.6	39.5	0.43	0.59	0.43	36.9

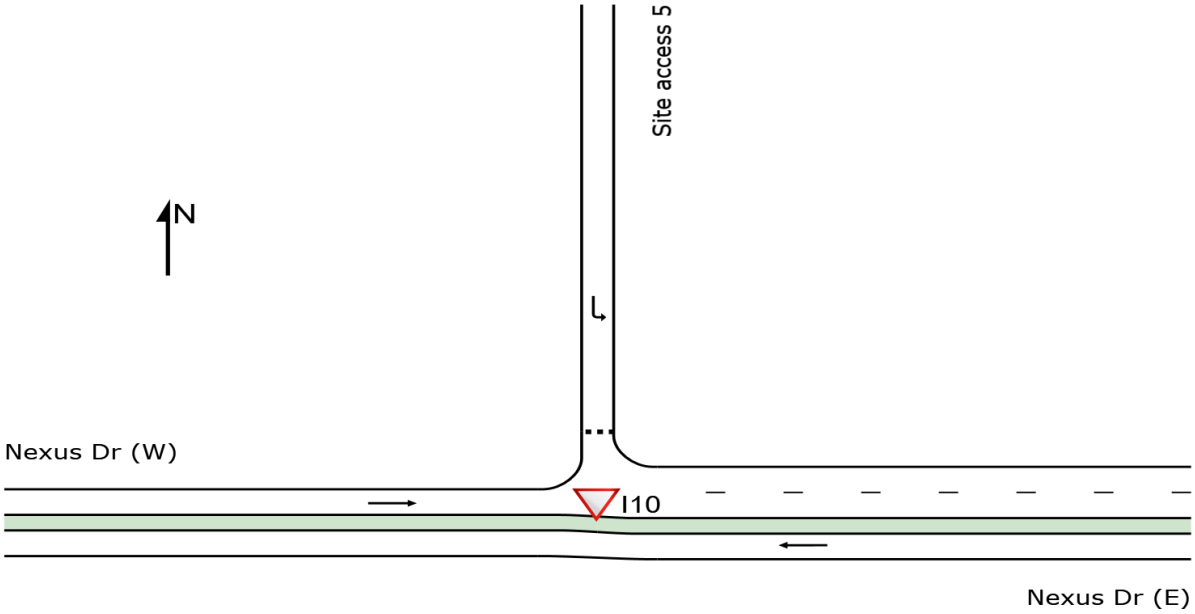
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

Site: I10 [I10 - ULT DEV AM (Site Folder: General)]

Nexus Dr/Site access 5 Intersection
Prepared by: DN
Reviewed by: CL
Site Category: Proposed Design
Give-Way (Two-Way)

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



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Project: \\au.slr.local\Corporate\Projects-SLR\620-BNE\620-BNE\620.041996.00001 Townsville, North Shore - Ongo\02 Analysis\2026 02 - Sensitivity Test\620.041996 SIDRA 20260219.sip9

MOVEMENT SUMMARY

Site: I10 [I10 - ULT DEV AM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Nexus Dr/Site access 5 Intersection
Prepared by: DN
Reviewed by: CL
Site Category: Proposed Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Nexus Dr (E)															
5	T1	All MCs	538	0.0	538	0.0	0.276	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach			538	0.0	538	0.0	0.276	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.8
North: Site access 5															
7	L2	All MCs	125	0.0	125	0.0	0.084	5.9	LOS A	0.3	2.4	0.22	0.55	0.22	47.7
Approach			125	0.0	125	0.0	0.084	5.9	LOS A	0.3	2.4	0.22	0.55	0.22	47.7
West: Nexus Dr (W)															
11	T1	All MCs	482	0.0	482	0.0	0.247	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			482	0.0	482	0.0	0.247	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
All Vehicles			1145	0.0	1145	0.0	0.276	0.7	NA	0.3	2.4	0.02	0.06	0.02	55.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: I10 [I10 - ULT DEV PM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Nexus Dr/Site access 5 Intersection
Prepared by: DN
Reviewed by: CL
Site Category: Proposed Design
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Nexus Dr (E)															
5	T1	All MCs	872	0.0	872	0.0	0.447	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.7
Approach			872	0.0	872	0.0	0.447	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.7
North: Site access 5															
7	L2	All MCs	356	0.0	356	0.0	0.254	6.2	LOS A	1.2	8.4	0.31	0.58	0.31	47.2
Approach			356	0.0	356	0.0	0.254	6.2	LOS A	1.2	8.4	0.31	0.58	0.31	47.2
West: Nexus Dr (W)															
11	T1	All MCs	707	0.0	707	0.0	0.362	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach			707	0.0	707	0.0	0.362	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.8
All Vehicles			1935	0.0	1935	0.0	0.447	1.2	NA	1.2	8.4	0.06	0.11	0.06	53.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Project: \\au.slr.local\Corporate\Projects-SLR\620-BNE\620-BNE\620.041996.00001 Townsville, North Shore - Ongo\02 Analysis\2026 02 - Sensitivity Test\620.041996 SIDRA 20260219.sip9

Appendix E TCC TIAP Code Responses

The subject development has been assessed against the requirements of the Townsville City Plan Version 2024/01 *Transport Impact, Access and Parking* (**TIAP**) Code in **Table 1** below.

Table 1 TIAP Code Compliance Review

Performance Outcomes	Acceptable Outcomes	Response
Transport impact **Editor's note—**Applicants should note that the Department of Transport and Main Roads may have additional requirements. **Editor's note—**Applicants should also note that a transport impact assessment may be required to demonstrate compliance with this code.		
PO1 The development is located on roads that are appropriate for the nature of traffic generated, having regard to the safety and efficiency of the transport network, and the functions and characteristics identified of the road hierarchy. The road hierarchy is shown on Figure 9.5 — Road hierarchy existing and Figure 9.6 Road Hierarchy Future	**AO1** No acceptable outcome is nominated. Editor's note— Applicants should refer to the Development manual planning scheme policy no. SC6.4 - SC6.4.5.1 Townsville Road Hierarchy, SC6.4.6.1 Geometric Road Design and SC6.4.5.2 Traffic Impact Assessment (TIA).	**Complies with PO1** The development is consistent with the envisaged use of the site, including previous approvals and infrastructure agreements. A comprehensive operational assessment demonstrates that, with the proposed site access arrangements and delivery of Nexus Drive, the development ensures the safety and efficiency of the surrounding transport networks. Refer to **Section 8** of the attached Traffic Impact Assessment prepared by SLR Consulting (**SLR TIA**) for further details.
PO2 Development does not compromise the orderly provision or upgrading of the transport network.	**AO2** No acceptable outcome is nominated. Editor's note— Applicants should refer to the Development manual planning scheme policy no. SC6.4 - SC6.4.5.1 Townsville Road Hierarchy, SC6.4.6.1 Geometric Road Design and SC6.4.5.2 Traffic Impact Assessment (TIA).	**Complies with PO2** The development facilitates the orderly provision of the transport network through upgrades to Nexus Drive. Refer to **Section 3** and **Section 8** of the attached SLR TIA for further details.

Performance Outcomes	Acceptable Outcomes	Response
PO3 On-site transport network infrastructure (including roads, parking, access and public transport, pedestrian and cyclist facilities) appropriately integrates and connects with surrounding networks. Editor's note—To demonstrate compliance with this performance outcome with regard to pedestrian and cyclist elements, applicants may be requested to provide a walk and cycle network plan to show connections to internal and external attractions, existing and proposed walk and cycle facilities and which respond to desire lines of all users.	**AO3** No acceptable outcome is nominated. Editor's note— Applicants should refer to the Development manual planning scheme policy no. SC6.4 - SC6.4.5.3 Public Transport Facilities, SC6.4.5.4 Car Parking, SC6.4.5.2 Traffic Impact Assessments (TIA), SC6.4.4 Active Transport Infrastructure, SC6.4.6.1 Geometric Road Designs, and SC6.4.5.1 Townsville Road Hierarchy. does not have a gate, door or similar device that restricts vehicular access by employees or visitors.	**Complies with PO3** The proposed development provides adequate connections to integrate with adjacent sites and the surrounding transport networks for all user types. Refer to **Section 3, Section 4** and **Section 5** of the attached SLR TIA for further details.
PO4 As far as practicable, development is designed to encourage travel by public transport, walking and cycling.	**AO4** No acceptable outcome is nominated. Editor's note— Applicants should refer to the Development manual planning scheme policy no. SC6.4 - SC6.4.5.3 Public Transport Facilities, SC6.4.5.4 Car Parking, SC6.4.5.2 Traffic Impact Assessments (TIA), SC6.4.4 Active Transport Infrastructure, SC6.4.6.1 Geometric Road Designs, and SC6.4.5.1 Townsville Road Hierarchy. does not have a gate, door or similar device that restricts vehicular access by employees or visitors.	**Complies with PO4** The proposed development is designed to encourage active and public transport use by providing active transport infrastructure with connections to the existing transport network.
Site access **Editor's note—**Local government (or other service owner) approval must be obtained before interfering with any infrastructure or undertaking works in the road reserve. In addition, be aware that the location of a driveway may be influenced by an approved plan of development that applies to the site or by the location of existing infrastructure or existing vehicle crossovers.		
PO5 Access arrangements are appropriate for: (a) the capacity of the parking area; (b) the volume, frequency and type of vehicle usage; (c) the function and characteristics of the access road and adjoining road network; and (d) the safety and efficiency of the road network.	**AO5** Access is provided in accordance with the standards identified in the Development manual planning scheme policy SC6.4 — SC6.4.5.5 Driveways, SC6.4.5.3 Public Transport Facilities and SC6.4.5.4 Car Parking. Editor's note— Applicants should refer to the Development manual planning scheme policy no. SC6.4 - SC6.4.5.1 Townsville Road Hierarchy and SC6.4.5.2 Traffic Impact Assessment (TIA).	**Complies with PO5** Access arrangements have been designed to accommodate the expected traffic volumes and anticipated design vehicles. Refer to **Section 5.2** and **Section 8.3** of the attached SLR TIA for further details.

Performance Outcomes	Acceptable Outcomes	Response
PO6 Where practical, access for cyclists and pedestrians is clearly distinguished from vehicle access.	**AO6** No acceptable outcome is nominated. Editor's note— Applicants should refer to the Development manual planning scheme policy no. SC6.4 - SC6.4.5.3 Public Transport Facilities and SC6.4.5.4 Car Parking.	**Complies with PO6** Accesses for cyclists and pedestrians are clearly distinguished from vehicle accesses.
PO7 Access is located and designed to provide safe and easy access to the site, having regard to its position, width and gradient.	**AO7** Access is provided in accordance with the standards identified in the Development manual planning scheme policy no. SC6.4 — SC6.4.5.5 Driveways and SC6.4.3 Standard Drawings Editor's note— Applicants should refer to the Development manual planning scheme policy no. SC6.4 - SC6.4.5.3 Public Transport Facilities, SC6.4.5.4 Car Parking, SC6.4.5.2 Traffic Impact Assessment (TIA) and SC6.4.5.1 Townsville Road Hierarchy.accommodates the design vehicle specified in Table 9.4.7.3.5 - Design vehicle for a manoeuvring area; complies with section 3.4.4.10 - Manoeuvring areas of Planning scheme policy 5 - Infrastructure.	**Complies with PO7** All proposed driveway crossovers are located and designed in accordance with AS2890 and the Institute of Public Works Engineering Australasia (**IPWEA**) standard drawings. Accordingly, accesses provide safe and easy access to the site. Refer to **Section 5.2** of the attached SLR TIA for further details.
PO8 All vehicles reasonably expected to use the site are able to travel the length of the driveway or driveway access without damage to vehicle or the driveway surface.	**AO8** Access is provided in accordance with the standards identified in the Development manual planning scheme policy no. SC6.4 — SC6.4.5.5 Driveways, SC6.4.5.3 Public Transport Facilities and SC6.4.5.4 Car Parking.	**Complies with PO8** All vehicles expected to access the site can enter and exit the site without impacting on the vehicle or surrounding infrastructure.
PO9 A driveway does not cause change in the level of a footpath that is unsafe or inaccessible for people with mobility difficulties.	**AO9** Access is provided in accordance with the standards identified in the Development manual planning scheme policy no. SC6.4 — SC6.4.5.5 Driveways and SC6.4.3 Standard Drawings.	**Complies with PO9** Proposed driveways do not cause a change in level of footpaths that would make the site inaccessible for people with mobility difficulties.
PO10 Driveways are designed to withstand loadings from all vehicles reasonably expected to use the site.	**AO10** Access is provided in accordance with the standards identified in the Development manual planning scheme policy no. SC6.4 — SC6.4.5.5 Driveways.	**Complies with PO10** Driveways are to be designed to withstand loadings from the anticipated design vehicles.

Performance Outcomes	Acceptable Outcomes	Response
PO11 A driveway does not allow water to pond on adjacent properties or adjacent buildings and does not allow water to enter a building or property.	**AO11** Access is provided in accordance with the standards identified in the Development manual planning scheme policy no. SC6.4 — SC6.4.5.5 Driveways.	**Complies with PO11** Driveways are to be designed to provide adequate drainage.
PO12 Construction of a driveway does not damage or interfere with the location, function of or access to any services and infrastructure.	**AO12** Access is provided in accordance with the standards identified in the Development manual planning scheme policy no. SC6.4 — SC6.4.5.5 Driveways, SC6.4.5.3 Public Transport Facilities, SC6.4.5.4 Car Parking and SC6.4.3 Standard Drawings	**Complies with PO12** Driveways are to be designed to provide adequate drainage.
PO13 All vehicles reasonably expected to access the site can safely manoeuvre to allow vehicles to exit and enter in a forward motion.	**AO13** Access is provided in accordance with the standards identified in Development manual planning scheme policy no. SC6.4 - SC6.4.5.5 Driveways, SC6.4.5.3 Public Transport Facilities, SC6.4.5.4 Car Parking and SC6.4.3 Standard Drawings such that all vehicles reasonably expected to access the site, can exit and enter in a forward motion with no more than a three-point turn.	**Complies with PO13** All driveway crossovers are designed to accommodate manoeuvring by the anticipated design vehicles and to allow for all vehicles to exit and enter the site in a forward direction. Refer to **Section 5** of the attached SLR TIA for further details.
Pedestrian and cyclist facilities		
PO14 Provision is made for the safe and convenient movement of pedestrians on-site and connecting to the external network, having regard to desire lines, legibility, safety, topographical constraints, shading and other weather protection and equitable access arrangements.	**AO14** No acceptable outcome is nominated. Editor's note— Applicants should refer to the Development manual planning scheme policy no.SC6.4 — SC6.4.5.3 Public Transport Facilities, SC6.4.5.4 Car Parking, SC6.4.4 Active Transport Infrastructure, SC6.4.5.1 Townsville Road Hierarchy, SC6.4.6.1 Geometric Road Design and SC6.4.12 Landscaping and Open Space to assist in complying with this outcome.	**Complies with PO14** The development proposes safe and convenient pedestrian infrastructure, providing a high level of connectivity with the proposed built form and the surrounding active transport networks.

Performance Outcomes	Acceptable Outcomes	Response
PO15 Provision is made for safe and convenient cycle movement to the site and within the site and connecting to the external network having regard to desire lines, users' needs, safety, topographical constraints and legibility. Editor's note—End of trip bicycle facilities will need to be provided for major development in accordance with the Queensland Development Code Mandatory Part 4.1 — Sustainable Buildings. "Major development" is defined in MP4.1.	**AO15** No acceptable outcome is nominated. Editor's note— Applicants should refer to the Development manual planning scheme policy no. SC6.4 — SC6.4.5.3 Public Transport Facilities, SC6.4.5.4 Car Parking, SC6.4.4 Active Transport Infrastructure, SC6.4.5.1 Townsville Road Hierarchy, SC6.4.6.1 Geometric Road Design and SC6.4.12 Landscaping and Open Space to assist in complying with this outcome.	**Complies with PO15** The development proposes safe and convenient active transport infrastructure, providing a high level of connectivity with the proposed built form and the surrounding active transport networks. Additionally, the development will provide bicycle parking and end of trip facilities in accordance with MP4.1. Refer to **Section 4.3** of the attached SLR TIA for further details.
PO16 Parking areas, pathways and other elements of transport network infrastructure are designed to enhance public safety by discouraging crime and antisocial behaviour, having regard to: (a) provision of opportunities for casual surveillance; (b) provision of lighting; (c) the use of fencing to define public and private spaces, whilst allowing for appropriate sight lines; (d) minimising potential concealment points and assault locations; (e) minimising opportunities for graffiti and other vandalism; and (f) restricting unlawful access to buildings and between buildings. Editor's note—Crime Prevention through Environmental Design Guidelines for Queensland prepared by the State Government may provide applicants with guidance on these matters.	**AO16** No acceptable outcome is nominated. Editor's note— Applicants should refer to the Development manual planning scheme policy no. SC6.4 — SC6.4.4 Active Transport Infrastructure, SC6.4.5.3 Public Transport Facilities, SC6.4.5.4 Car Parking, SC6.4.5.1 Townsville Road Hierarchy, SC6.4.6.1 Geometric Road Design, SC6.4.14.2 Public Lighting (Urban, Urban Residential and Rural), SC6.4.14.3 Utility Services and SC6.4.12 Landscaping and Open Space to assist in complying with this outcome.	**Complies with PO16** The proposed development will incorporate Crime Prevention through Environmental Design Guidelines principles appropriate to the use, including suitable lighting, surveillance cameras and fencing allowing sight lines and restricting public access outside of operating hours.
Parking		

Performance Outcomes	Acceptable Outcomes	Response
PO17 Provision is made for on-site vehicle parking to: (a) meet the demand likely to be generated by the development; and (b) avoid on street parking that would adversely impact on the safety or capacity of the road network or unduly impact on local amenity.	**AO17** Parking is provided in accordance with the standards identified in Parking rates planning scheme policy no. SC6.10. Editor's note— Applicants should refer to the Development manual planning scheme policy no. SC6.4 - SC6.4.5.3 Public Transport Facilities, SC6.4.5.4 Car Parking, SC6.4.5.2 Traffic Impact Assessments (TIA), SC6.4.6.1 Geometric Road Design, and SC6.4.5.1 Townsville Road Hierarchy to assist in complying with this outcome.	**Complies with AO17** The developments car parking provision readily satisfies the minimum parking provision specified in the *Parking rates planning scheme policy no. SC6.10.* Refer to **Section 4.1** of the attached SLR TIA for further details.
PO18 Parking ensures access is provided for people with disabilities.	**AO18** Parking areas are designed in accordance with the standards identified in the Development manual planning scheme policy no. SC6.4 — SC6.4.5.4 Car Parking.	**Complies with PO18** The development provides PWD car parking arrangements in accordance with NCC and AS2890.6. Refer to **Section 4.3** and **Section 5.3** of the attached SLR TIA for further details.
PO19 Where the nature of the proposed development creates a demand, provision is made for set-down and pick-up facilities by bus, taxis or private vehicle, which: (a) are safe for pedestrians and vehicles; (b) are conveniently connected to the main component of the development by pedestrian pathway; and (c) provide for pedestrian priority and clear sight lines.	**AO19** No acceptable outcome is nominated. Editor's note—Applicants should refer to the Development manual planning scheme policy no. SC6.4 - SC6.4.5.3 Public Transport Facilities, SC6.4.5.4 Car Parking, SC6.4.5.2 Traffic Impact Assessments (TIA), SC6.4.6.1 Geometric Road Design, SC6.4.5.1 Townsville Road Hierarchy and SC6.4.12 Landscaping and Open Space to assist in complying with this outcome.	**Complies with PO19** The development makes sufficient provisions for passenger setdown, buses and taxis to satisfy the demand anticipated to be generated by the development. Refer to **Section 4.4** of the attached SLR TIA for further details.

Performance Outcomes	Acceptable Outcomes	Response
PO20 Parking and servicing areas are designed to: (a) be clearly defined, marked and signed; (b) be convenient and accessible; (c) minimise large unbroken areas of hardstand to the extent practicable; (d) be safe for vehicles, pedestrians and cyclists; (e) provide shading; (f) be located to encourage multi-purpose trip ends and minimise vehicle movements within the site; and (g) minimise any adverse impacts on the amenity of surrounding land.	**AO20** No acceptable outcome is nominated. Editor's note—Applicants should refer to the Development manual planning scheme policy no. SC6.4 - SC6.4.5.3 Public Transport Facilities, SC6.4.5.4 Car Parking, SC6.4.5.5 Driveways, SC6.4.5.2 Traffic Impact Assessments (TIA), SC6.4.6.1 Geometric Road Design, and SC6.4.12 Landscaping and Open Space.	**Complies with PO20** The development's parking and servicing areas are designed in accordance with AS2890 requirements, providing safe and convenient parking. Refer to **Section 5** of the attached SLR TIA for further details.
PO21 Vehicle spaces have adequate dimensions to meet user requirements.	**AO21** Parking areas are designed in accordance with the standards identified in the Development manual planning scheme policy no. SC6.4 — SC6.4.5.3 Public Transport Facilities and SC6.4.5.4 Car Parking.	**Complies with PO21** The development's parking and servicing areas are designed in accordance with AS2890 requirements, providing adequate dimensions. Refer to **Section 6.3** of the attached SLR TIA for further details.
PO22 Pavement is constructed to an appropriate standard.	**AO22** No acceptable outcome is nominated.	**Complies with PO22** The pavement is to be constructed to an appropriate standard.
PO23 Parking and servicing areas are kept accessible and available for use as a parking area at all times during the normal business hours of the activity.	**AO23** No acceptable outcome is nominated.	**Complies with PO23** The development's parking and servicing areas are to be kept accessible and available to the appropriate users during normal business hours.
PO24 Visitor parking for accommodation activities remains accessible and useable to visitors at all times.	**AO24** No acceptable outcome is nominated.	**Not Applicable** The development does not include any accommodation activities

Performance Outcomes	Acceptable Outcomes	Response
PO25 Multi-level parking areas are designed, articulated and finished to make a positive contribution to the local external streetscape character, as well as the internal user experience of the facility ensuring way finding technologies and aesthetic treatments are provided.	**AO25** No acceptable outcome is nominated.	**Not Applicable** The development does not include a multi-level parking area.
Servicing		
PO26 Provision is made for the on-site loading, unloading, manoeuvring and access by service vehicles that: (a) are adequate to meet the demands generated by the development; (b) are able to accommodate the design service vehicle requirements; and (c) does not unduly impede vehicular, cyclist and pedestrian safety and convenience both within the site and external to the site.	**AO26** Servicing areas are provided and designed in accordance with the standards identified in the Development manual planning scheme policy no. SC6.4 – SC6.4.5.3 Public Transport Facilities and SC6.4.5.4 Car Parking.	**Complies with PO26** Provision for on-site loading, unloading and manoeuvring of service vehicles has been designed to accommodate the expected demand and is provided in accordance with the standards outlined in the Development Manual PSP. Refer to **Section 4.5** and **Section 5.4** of the attached SLR TIA for further details.
PO27 Refuse collection vehicles are able to safely access on-site refuse collection facilities.	**AO27** Refuse collection areas are provided and designed in accordance with the standards identified in the Development manual planning scheme policy no. SC6.4 – SC6.4.22 Waste Management, SC6.4.5.3 Public Transport Facilities and SC6.4.5.4 Car Parking.	**Complies with PO27** Refuse collection vehicles are able to safely access the on-site refuse collection facilities. Refer to **Section 5.4** of the attached SLR TIA for further details.

Performance Outcomes	Acceptable Outcomes	Response
PO28 Servicing arrangements minimise any adverse impact on the amenity of premises in the vicinity, having regard to operating hours, noise generation, proximity to sensitive uses, odour generation and dust.	**AO28** No acceptable outcome is nominated.	**Not assessed herein** These are not traffic engineering matters and have been assessed by others.

Appendix F QLD SDAP Code Responses

State code 6: Protection of state transport networks

Table 6.2 Development in general

Performance outcomes	Acceptable outcomes	Response
Network impacts		
PO1 Development does not compromise the safety of users of the **state-controlled road** network.	No acceptable outcome is prescribed.	**Complies with PO1** The development does not compromise the safety of users of the state-controlled road network. Further details are provided in **Section 7.1** of the attached Traffic Impact Assessment prepared by SLR (**SLR TIA**).
PO2 Development does not adversely impact the structural integrity or physical condition of a **state-controlled road** or **road transport infrastructure**.	No acceptable outcome is prescribed.	**Complies with PO2** The development is not located proximate to, and does not adversely impact the structural integrity or physical condition of, a state-controlled road or road transport infrastructure.
PO3 Development ensures **no net worsening** of the operating performance the **state-controlled road** network.	No acceptable outcome is prescribed.	**Complies with PO3** The development does not impact on the planned operational performance of the state-controlled road network. Further details are provided in **Section 7.1** of the attached SLR TIA.
PO4 Traffic movements are not directed onto a **state-controlled road** where they can be accommodated on the **local road** network.	No acceptable outcome is prescribed.	**Complies with PO4** All development traffic movements are directed onto local roads.
PO5 Development involving haulage exceeding 10,000 tonnes per year does not damage the pavement of a **state-controlled road**.	No acceptable outcome is prescribed.	**Not applicable** The development does not involve haulage.
PO6 Development does not require a new **railway** level crossing.	No acceptable outcome is prescribed.	**Complies with PO6** The development does not require a new railway level crossing.

Performance outcomes	Acceptable outcomes	Response
PO7 Development does not adversely impact the operating performance of an existing **railway crossing**.	No acceptable outcome is prescribed.	**Complies with PO7** The development is not located proximate to, and hence does not adversely impact upon the operating performance of, an existing railway level crossing.
PO8 Development does not adversely impact on the safety of an existing **railway crossing**.	No acceptable outcome is prescribed.	**Complies with PO8** The development is not located proximate to, and hence does not adversely impact upon the safety of, an existing railway level crossing.
PO9 Development is designed and constructed to allow for on-site circulation to ensure vehicles do not queue in a **railway crossing**.	No acceptable outcome is prescribed.	**Complies with PO9** The development is not located proximate to an existing railway level crossing.
PO10 Development does not create a safety hazard within the **railway corridor**.	No acceptable outcome is prescribed.	**Complies with PO10** The development is not located proximate to an existing railway corridor.
PO11 Development does not adversely impact the operating performance of the **railway corridor**.	No acceptable outcome is prescribed.	**Complies with PO11** The development is not located proximate to an existing railway corridor.
PO12 Development does not interfere with or obstruct the **railway transport infrastructure** or **other rail infrastructure**.	No acceptable outcome is prescribed.	**Complies with PO12** The development is not located proximate to existing railway transport or other rail infrastructure.
PO13 Development does not adversely impact the structural integrity or physical condition of a **railway corridor** or **rail transport infrastructure**.	No acceptable outcome is prescribed.	**Complies with PO13** The development is not located proximate to existing railway transport or other rail infrastructure.
Stormwater and overland flow		
PO14 Stormwater run-off or overland flow from the development site does not create or exacerbate a safety hazard for users of a **state transport corridor** or **state transport infrastructure**.	No acceptable outcome is prescribed.	**Not assessed herein** This is not a traffic engineering matter and hence has not been assessed herein.
PO15 Stormwater run-off or overland flow from the development site does not result in a	No acceptable outcome is prescribed.	**Not assessed herein**

Performance outcomes	Acceptable outcomes	Response
material worsening of operating performance of a **state transport corridor** or **state transport infrastructure**.		This is not a traffic engineering matter and hence has not been assessed herein.
PO16 Stormwater run-off or overland flow from the development site does not interfere with the structural integrity or physical condition of the **state transport corridor** or **state transport infrastructure**.	No acceptable outcome is prescribed.	**Not assessed herein** This is not a traffic engineering matter and hence has not been assessed herein.
PO17 Development associated with a **state-controlled road** or **road transport infrastructure** ensures that stormwater is lawfully discharged.	**AO17.1** Development does not create any new points of discharge to a **state transport corridor** or **state transport infrastructure**. AND **AO17.2** Development does not concentrate flows to a **state transport corridor**. AND **AO17.3** Stormwater run-off is discharged to a **lawful point of discharge**. AND **AO17.4** Development does not worsen the condition of an existing **lawful point of discharge** to a **state transport corridor** or **state transport infrastructure**.	**Not assessed herein** This is not a traffic engineering matter and hence has not been assessed herein.
Flooding		
PO18 Development does not result in a material worsening of flooding impacts within a **state transport corridor** or **state transport infrastructure**	*For a **state-controlled road** or **road transport infrastructure**, all of the following apply:* **AO18.1** For all flood events up to 1% **annual exceedance probability**, development ensures there are negligible impacts (within +/- 10mm) to existing flood levels within a **state transport corridor**.	**Not assessed herein** This is not a traffic engineering matter and hence has not been assessed herein.

Performance outcomes	Acceptable outcomes	Response
	AND **AO18.2** For all flood events up to 1% **annual exceedance probability**, development ensures there are negligible impacts (up to a 10% increase) to existing peak velocities within a **state transport corridor**. AND **AO18.3** For all flood events up to 1% annual exceedance probability, development ensures there are negligible impacts (up to a 10% increase) to existing time of submergence of a **state transport corridor**. *No acceptable outcome is prescribed for a **railway corridor** or **rail transport infrastructure**.*	
Drainage infrastructure		
PO19 Drainage infrastructure does not create a safety hazard in a **state transport corridor**.	*For a **state-controlled road** environment, both of the following apply:* **AO19.1** Drainage infrastructure associated with, or in a **state-controlled road** is wholly contained within the development site, except at the **lawful point of discharge**. AND **AO19.2** Drainage infrastructure can be maintained without requiring access to a **state transport corridor**. *For a **railway** environment both of the following apply:*	**Not assessed herein** This is not a traffic engineering matter and hence has not been assessed herein.

Performance outcomes	Acceptable outcomes	Response
	AO19.3 Drainage infrastructure associated with a **railway corridor** or **rail transport infrastructure** is wholly contained within the development site. AND **AO19.4** Drainage infrastructure can be maintained without requiring access to a **state transport corridor**.	
PO20 Drainage infrastructure associated with, or in a **state-controlled road** or **road transport infrastructure** is constructed and designed to ensure the structural integrity and physical condition of existing drainage infrastructure and the surrounding drainage network is maintained.	No acceptable outcome is prescribed.	**Not assessed herein** This is not a traffic engineering matter and hence has not been assessed herein.
Planned upgrades		
PO21 Development does not impede delivery of **planned upgrades** of **state transport infrastructure**.	No acceptable outcome is prescribed.	**Complies with PO21** The development is not located proximate to state transport infrastructure and hence does not interfere with any planned upgrades of state transport infrastructure.

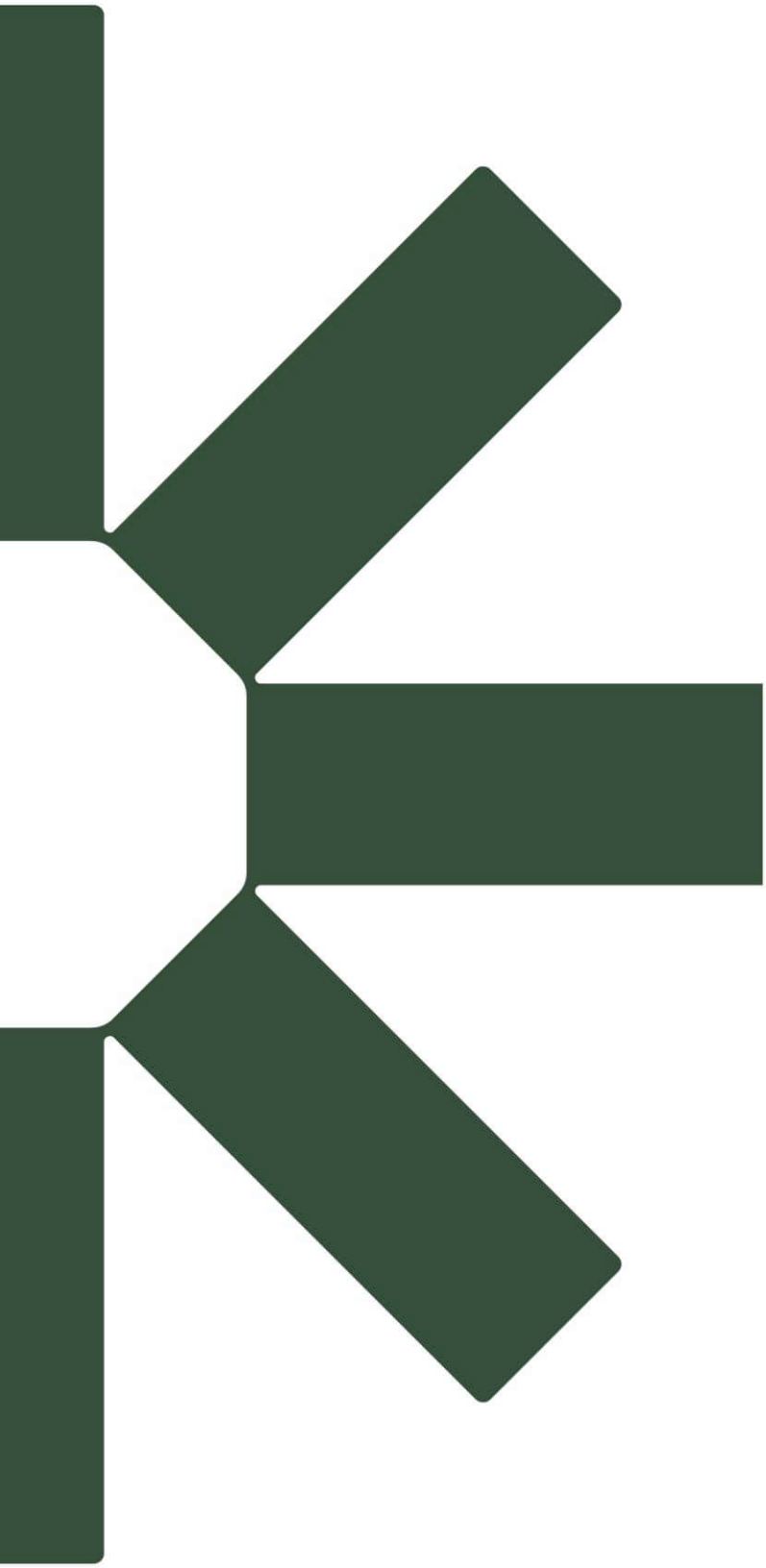
Table 6.3 Public passenger transport infrastructure and active transport

Performance outcomes	Acceptable outcomes	Response
PO22 Development does not damage or interfere with **public passenger transport infrastructure**, **active transport infrastructure** or **public passenger services**.	No acceptable outcome is prescribed.	**Complies with PO22** The development does not damage or interfere with existing active or public transport infrastructure.
PO23 Development does not compromise the safety of **public passenger transport infrastructure**, **public passenger services** and **active transport infrastructure**.	No acceptable outcome is prescribed.	**Complies with PO23** The development does not compromise the safety of active or public transport infrastructure or services.
PO24 Development does not adversely impact the operating performance of **public passenger transport infrastructure, public passenger services** and **active transport infrastructure**.	No acceptable outcome is prescribed.	**Complies with PO24** The development does not impact on the operation of existing active or public transport infrastructure.
PO25 Development does not adversely impact the structural integrity or physical condition of **public passenger transport infrastructure** and **active transport infrastructure**.	No acceptable outcome is prescribed.	**Complies with PO25** The development does not impact on the structural integrity or physical condition of existing active or public transport infrastructure.
PO26 Upgraded or new **public passenger transport infrastructure** and **active transport infrastructure** is provided to accommodate the demand for **public passenger transport** and **active transport** generated by the development.	No acceptable outcome is prescribed.	**Complies with PO26** The development will provide new pedestrian connections to the surrounding active transport networks, which in turn connect with existing bus stops on Main Street. Refer to **Section 3** of the attached SLR TIA.
PO27 Development is designed to ensure the location of **public passenger transport infrastructure** prioritises and enables efficient **public passenger services**.	No acceptable outcome is prescribed.	**Complies with PO27** The development will provide new pedestrian connections to the surrounding active transport networks, which in turn connect with existing bus stops on Main Street. Refer to **Section 3** of the attached SLR TIA.
PO28 Development enables the provision or extension of **public passenger services**, **public passenger transport infrastructure** and **active transport infrastructure** to the development and avoids creating indirect or inefficient routes for **public passenger services**.	No acceptable outcome is prescribed.	**Complies with PO28** The development will provide new pedestrian connections to the surrounding active transport networks, which in turn connect with existing bus stops on Main Street. Refer to **Section 3** of the attached SLR TIA.

Performance outcomes	Acceptable outcomes	Response
PO29 New or modified road networks are designed to enable development to be serviced by **public passenger services**.	**AO29.1** Roads catering for buses are arterial or **sub-arterial roads**, collector or their equivalent. AND **AO29.2** Roads intended to accommodate buses are designed and constructed in accordance with: 1. Road Planning and Design Manual, 2nd Edition, Volume 3 – Guide to Road Design; Department of Transport and Main Roads; 2. Supplement to Austroads Guide to Road Design (Parts 3, 4-4C and 6), Department of Transport and Main Roads; 3. Austroads Guide to Road Design (Parts 3, 4-4C and 6); 4. Austroads Design Vehicles and Turning Path Templates; 5. Queensland Manual of Uniform Traffic Control Devices, Part 13: Local Area Traffic Management and AS 1742.13-2009 Manual of Uniform Traffic Control Devices – Local Area Traffic Management; AND **AO29.3** Traffic calming devices are not installed on roads used for buses in accordance with section 2.3.2 Bus Route Infrastructure, Public Transport Infrastructure Manual, Department of Transport and Main Roads, 2015.	**Not applicable** Nexus Drive is not envisaged as a bus route. Refer to **Section 3** of the attached SLR TIA.
PO30 Development provides safe, direct and convenient access to existing and future **public passenger transport infrastructure** and **active transport infrastructure**.	No acceptable outcome is prescribed.	**Complies with PO30** The development will provide new pedestrian connections to the surrounding active transport networks, which in turn connect with existing bus stops on Main Street. Refer to **Section 3** of the attached SLR TIA.

Performance outcomes	Acceptable outcomes	Response
PO31 On-site vehicular circulation ensures the safety of both **public passenger transport services** and pedestrians.	No acceptable outcome is prescribed.	**Complies with PO31** The design of on-site vehicular circulation is appropriate and will not detrimentally impact on the safety of pedestrians or public transport services. Refer to **Section 5** of the attached SLR TIA.
PO32 Taxi facilities are provided to accommodate the demand generated by the development.	No acceptable outcome is prescribed.	**Complies with PO32** The development makes adequate provisions for passenger setdown (i.e. by taxi, rideshare, buses and private vehicles) in close proximity to main building pedestrian entrances. Refer to **Section 4.4** of the attached SLR TIA.
PO33 Facilities are provided to accommodate the demand generated by the development for community transport services, courtesy transport services, and **booked hire services** other than taxis.	No acceptable outcome is prescribed.	**Complies with PO33** The development makes adequate provisions for passenger setdown (i.e. by taxi, rideshare, buses and private vehicles) in close proximity to main building pedestrian entrances. Refer to **Section 4.4** of the attached SLR TIA.
PO34 Taxi facilities are located and designed to provide convenient, safe and equitable access for passengers.	**AO34.1** A **taxi facility** is provided parallel to the kerb and adjacent to the main entrance. AND **AO34.2 Taxi facilities** are designed in accordance with: 1. AS2890.5–1993 Parking facilities – on-street parking and AS1428.1–2009 Design for access and mobility – general requirements for access – new building work; 2. AS1742.11–1999 Parking controls – manual of uniform traffic control devices 3. AS/NZS 2890.6–2009 Parking facilities –off street parking for people with disabilities; 4. Disability standards for accessible public 5. transport 2002 made under section 31(1) of the Disability Discrimination Act 1992; 6. AS/NZS 1158.3.1 – Lighting for roads and public spaces, Part 3.1: Pedestrian area	**Complies with PO34** The development makes adequate provisions for passenger setdown (i.e. by taxi, rideshare, buses and private vehicles) in close proximity to main building pedestrian entrances. Refer to **Section 4.4** of the attached SLR TIA.

Performance outcomes	Acceptable outcomes	Response
	(category P) lighting – Performance and design requirements; 7. Chapter 7 Taxi Facilities, Public Transport Infrastructure Manual, Department of Transport and Main Roads, 2015.	
PO35 Educational establishments are designed to ensure the safe and efficient operation of **public passenger services**, pedestrian and cyclist access and **active transport infrastructure**.	**AO35.1** Educational establishments are designed in accordance with the provisions of the Planning for Safe Transport Infrastructure at Schools, Department of Transport and Main Roads, 2011.	**Complies with PO35** The development does not involve an educational establishment.



Making Sustainability Happen