

APPENDIX H

Transport Engineering Report

Prepared by:

Colliers

Transport Engineering Report

286 Lakeside Drive, Oonoonba

Proposed Mixed Use Development

Spring Projects Pty Ltd



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Revision Record

No.	Author	Reviewed/Approved	Description	Date
A.	E.N.Seneviratne		DA Report (DRAFT)	31/07/2026
B.	E.N.Seneviratne		DA Report (DRAFT)	04/08/2026
1	E.N.Seneviratne	S.Crank RPEQ: 18360 	DA Report (FINAL)	07/08/2026

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1. Introduction

1.1. Purpose

Colliers International Engineering and Design (TTMC) Pty Ltd has been engaged by Spring Projects Pty Ltd to prepare a Transport Engineering Report (TER) investigating a proposed Mixed-Use Development at 286 Lakeside Drive, Oonoonba.

The site is located within the Oonoonba Priority Development Area (Oonoonba PDA). Assessments within the Oonoonba PDA area are assessed against the Oonoonba Urban Development Area Development Scheme (Oonoonba UDA Development Scheme). Where the Oonoonba UDA Development scheme is silent in relation to transport-related matters, reference has been made to the Townsville Planning Scheme.

It is understood that this report will accompany a Development Application (DA) to be lodged with Economic Development Queensland (EDQ), with internal referral to the Department of Transport and Main Roads (DTMR).

1.2. Background

Colliers (formerly known as TTM) have prepared a TER (dated 25th June 2021) for a proposed food and drink outlet and service station at the subject site. It is understood that the former TER formed part of a DA lodged with EDQ, which was subsequently withdrawn.

It is noted that the former application intended to establish a range of land uses including a food and drink outlet and service station as part of Stage 1.

As part of that application, the Lakeside Drive / Riveredge Boulevard intersection was proposed to be signalised with vehicle access to the subject site solely proposed as the fourth leg to the intersection. The Council reference number for that application is MCU21/0085 and EDQ Reference number is DEV2021/1199.

It is understood that concerns were raised in relation to the signalisation of the Lakeside Drive / Riveredge Boulevard intersection due to the potential for signal-related queuing to extend across the adjacent railway crossing. Accordingly, the proposed access strategy has been revised to comprise two priority-controlled intersections onto Lakeside Drive, consisting of a left-in/left-out (LILO) access and a separate all-movements access, respectively.

It is noted that the revised access arrangement now achieves a broader benefit by enabling a proportion of through volumes along Lakeside Drive to bypass the intersection with Riveredge Boulevard, effectively reducing the through volumes at this existing priority-controlled intersection.

1.3. Scope

The scope of the transport aspects investigated includes:

- Reviewing the prevailing traffic and transport conditions surrounding the site.

- Identifying parking supply required to cater for development demands.
- Assessing the parking layout to provide efficient and safe internal circulation and manoeuvring.
- Assessing the access configuration to provide efficient and safe manoeuvring between the site and the public road network for cars and service vehicles.
- Identifying the service vehicle needs for the site
- Assessing the internal service vehicle layouts to provide efficiency and safety for on-site service vehicle operation
- Reviewing access to a suitable level of public and active transport provisions.
- Identification of likely traffic volumes and traffic distribution from the development.
- Identification of likely traffic impacts of development on the surrounding road network.

The development plans have been assessed against the following guidelines and planning documents:

- Oonoonba Urban Development Area – Development Scheme
- Townsville City Council (TCC) Planning Scheme, specifically:
 - Transport Impact, Access and Parking Code
 - Development Manual Planning Scheme Policy
 - Section 6.4.5.2 – Traffic impact assessments (TIA)
 - Section 6.4.5.4 – Car Parking
 - Section 6.4.5.5 – Driveways
 - Australian Standard 2890 series

2. Site Location

The site is located at 286 Lakeside Drive, Oonoonba, directly to the east of the intersection of Lakeside Drive and Riveredge Boulevard, as shown in Figure 2-1. The property description is Lot 6000 on SP302846.

The site has road frontage onto Lakeside Drive and Riveredge Boulevard to the west and is currently undeveloped.



Source: Nearmaps

Figure 2-1: Site location (Surrounding Context)

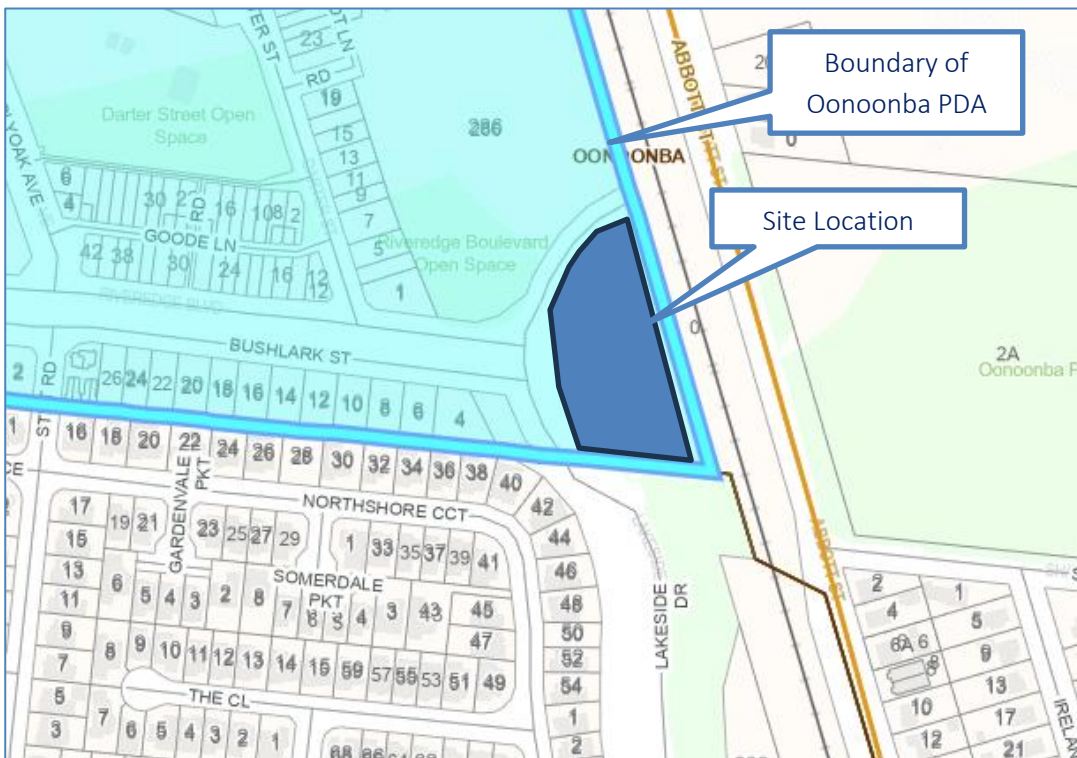


Figure 2-2.2: Site Area

Key site characteristics from a planning perspective include:

- 8,673 m² site area
- 'Community Facilities' zoning
- Located within the Ooononba PDA (6km south of the city centre)
- Site is 'Future Retail Development' under recent 'The Village Ooononba' figures

3. Site Travel Environment

3.1. The Road Network

3.1.1. Road Hierarchy

The hierarchy and characteristics of roads in the immediate vicinity of the site are shown in Table 3-1.

Table 3-1: Surrounding Road Hierarchy

Road	Speed Limit	Road Configuration			Classification	Authority
		Reserve Width	Carriageway Width	Lane Configuration		
Lakeside Drive	40km/h-60km/h (40km/h advisory speed provided in front of the site)	Varying width 23m – 94m	Varying width 12-23m	2 traffic lanes plus additional turn lanes near intersection with Riveredge Boulevard. Median separated. No standing on the road, no parking lanes on this road.	Arterial Road	Council ²
Riveredge Boulevard	50km/h ¹	20m	10m	2 traffic lanes separated by a solid median. Kerbside parking provided along one or both sides	Major Collector	TCC
Abbott Street	60km/h-80km/h	30m	12.5m	2 traffic lanes with additional turn lanes provided near intersections. No parking provided.	Arterial Road	DTMR

¹Default speed limit on unsigned roads in built up areas in Queensland.

²Formerly classified as a State Controlled Road and under DTMR authority

The intersections of Lakeside Drive / Riveredge Boulevard and Lakeside Drive / Abbott Street are both priority-controlled.

3.2. Transport Planning

A review of the TCC's City Plan indicates that there are no planned road upgrades within the vicinity of the subject site.

Colliers has also reviewed the DTMR QTRIP program for the Northern Region (2026-27 to 2029-30) which indicates there are no planned road upgrades within the vicinity of the subject site.

3.3. Public Transport Facilities and Services

3.3.1. Bus Services

The site is in close proximity to local bus stops on Shannon Street, less than 450m walking distance from the site to the south-east. These bus stops services TransLink Route 208.

Route 208 runs between Willows Shopping Centre and Townsville City bus hub servicing suburbs in between including, Thuringowa Central, Annandale and Oonoonba. This service runs on all days, with peak hour frequencies of 60 minutes.

3.4. Active Transport Facilities

3.4.1. Cyclists

Dedicated on-street cycle lanes are provided along Lakeside Drive and Riveredge Boulevard (near the intersection with Lakeside Drive).

3.4.2. Pedestrians

Formal pedestrian footpaths are not provided along the Lakeside Drive frontage. Pedestrian paths are provided along Riveredge Boulevard (west of the intersection with Lakeside Drive).

4. The Proposed Development

4.1. Development Profile

The proposed land uses for this development are summarised in Table 4-1.

Table 4-1: Proposed land uses

Land Use	Area/Qty
Service Station (T1)	240m ²
Fast Food Outlet:	
• T2	185m ² GFA
• T3	264m ² GFA

A copy of the development plans, prepared by Verve Design Group, is included in **Appendix A**.

4.2. Access

Vehicle access to the site is proposed via two (2) new accesses onto Lakeside Drive, located near the northern and southern ends of the site.

The proposed 'Northern access' will be restricted to left-in/left-out (LILO) movements only with an all movements access proposed near the southern end of the site ('Southern access').

Further details regarding the proposed access arrangements are included in **Section 9**.

4.3. Parking

The development plan includes the following parking supply:

- Service Centre (T1) / Food & Drink Outlet (T2) - 17 visitor/general spaces (incl. 1 PWD space) plus 2 'Waiting Bays'
- Food & Drink Outlet (T3) - 15 visitor/general spaces (incl. 1 PWD space) plus 2 'Waiting Bays'

Further details regarding the proposed car parking provisions are included in **Section 10**.

4.4. Servicing

A shared loading bay is proposed for the Service Centre / Food & Drink outlet (T2) land use. The proposed loading bay is located to the south of the T1 building, adjacent to the drive-thru entrance.

Additionally, a dedicated loading bay is proposed for the Food & Drink outlet (T3) land use.

For each use, the respective bays will accommodate both deliveries and refuse collection of the adjacent tenancies.

Further details regarding the proposed servicing arrangements are included in **Section 11**.

5. Development Transport Demands

5.1. Traffic Generation Rates

To estimate the traffic generation of the proposed land uses, reference is made to:

- RTA Guide to Traffic Generating Developments (RTA Guidelines)
- TfNSW Guide to Transport Impact Assessment (GTIA)

Colliers have been informed that the proposed Food and Drink Outlet tenancies are expected to cater for an Oporto's (T2) and a Red Rooster (T3). On this basis, the following traffic generation rates have been adopted for each tenancy and are outlined in Table 5.1.

Table 5-1: Traffic Generation Rates – Network Peak Hours

Land Use	Generation Rate	Source
Service Station	0.66vph/m ² GFA for AM/PM peak hour	RTA Guidelines
Fast Food Outlet (T2)	29 vph/site for AM peak hour ¹ 41 vph/site for PM peak hour only	GTIA
Fast Food Outlet (T3)	25 vph/site for AM peak hour ¹ 35 vph/site for PM peak hour only	GTIA

¹AM peak hour derived as 70% of PM peak rate

It is noted that the above rates reflect the expected trip generation at the site during the AM & PM network peak periods. It is understood that the proposed food and drink outlet tenancies will operate 24/7. While there is no trip rate identified for the network morning peak hour for the above Fast food tenancies, this has been estimated as 70% of the PM peak hour rate.

The PM site peak hour for fast food development, where development traffic is essentially doubled, is expected to occur after 6pm. This would add approximately 80 vehicles per hour to the development generation. This is partially offset as the service station would generate less at this time with reduced passing traffic. The increased development traffic is minimal when compared to the lower traffic volumes operating on the road network after 6pm (approximately 60-70% less than peak hour volumes¹).

Application of the above rates and directional splits would result in proposed development traffic demand estimates as shown in Table 8 2.

¹ Queensland Government Traffic Analysis and Reporting System AADT Segment Report (Segment Site 92196 , Traffic year 2019)

Table 5-2: Development volumes

Land Use	Yield	Generation Rate	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
T1 – Service Centre	240m2 GFA	AM – 0.66vph per m2 GFA PM – 0.66vph per m2 GFA	79vph	80vph	159vph	79vph	80vph	159vph
T2 – Food and drink (Oportos)	1 tenancy	AM – N/a PM – 41vph	14	15	29	20vph	21vph	41vph
T3 – Food and drink (Red Rooster)	1 tenancy	AM – N/a PM – 35vph	13	12	25	18vph	17vph	35vph
Total			106vph	107vph	213vph	117vph	118vph	235vph

5.2. Trip Segmentation

Table 5.2 details the assumed drop-in vs. new trip splits for this scheme. Further justification is provided below. In all cases, the portion of new trips vs. drop in trips is generally consistent with existing approvals and accepted traffic engineering practice.

Table 5-3: New Trip / Drop In Distribution

Land Use	New Trip (%)	Drop In Trip (%)
Service Station (T1)	10%	90%
Fast Food Outlet (T2&T3)	50%	50%

For the proposed service station and fast food uses, it is anticipated that existing road users will divert to the site. The allocated drop-in rates reflect this driver behaviour.

5.3. Inbound / Outbound Splits

Table 5.3 details the inbound / outbound splits for the proposed development. The proposed splits are consistent with existing approvals and accepted engineering practice.

Table 5-4: Inbound / Outbound Splits

Land Use	% Split (In / Out)	
	AM	PM
Service Station	50 / 50	50 / 50
Fast Food Outlet	50 / 50	50 / 50

5.4. Shared Trips

Given the mix of land uses proposed, it is anticipated that there will be an element of shared trips and therefore, a 10% reduction has been applied across all land uses of the development.

The proposed traffic volumes are included as **Diagram 7**, included in **Appendix C**.

5.5. Traffic Distribution

Consistent with the previous assessments at the site, the traffic distribution has been developed taking into consideration existing land uses within the catchment, location of similar uses outside of the catchment and the employment and residential catchment. Drop-in trips vary dependent on the following:

- Land use
- Path of travel to key employment and residential zones

The traffic distribution for the proposed scheme is included as **Diagram 2 and 3**, included in **Appendix C**.

6. Existing Traffic Volumes

6.1. Intersection Survey Data

Colliers have previously undertaken traffic surveys at the intersection of Riveredge Boulevard / Lakeside Drive and Lakeside Drive / Abbott Street on Thursday 25th March 2021. The 2021 peak hour traffic volumes are presented in **Diagram 1**, included in **Appendix C**.

The surveyed weekday peak hour periods are summarised in Table 6.1.

Table 6-1: Surveyed Peak Hours

Site	AM Peak Hour	PM Peak Hour
Riveredge Boulevard / Lakeside Drive	7:45 – 8:45am	4:45 – 5:45pm
Lakeside Drive / Abbott Street	7:45 – 8:45am	4:45 – 5:45pm

As shown above, the PM peak hour at the existing intersections occurs between 4:45 pm and 5:45 pm. In contrast, the PM peak traffic generated by the proposed development is anticipated to occur after 6:00 pm on weekdays. Accordingly, there is a clear temporal separation between the network peak and the development-generated peak demand. Furthermore, traffic volumes on Lakeside Drive adjacent to the site are expected to be approximately 60-70% of the network PM peak hour, which represents approximately 400 vehicle per hour less than the network peak. On this basis, the assessment has focused solely on the network peak periods.

7. Future Traffic Demands

7.1. Assessment Years

Based on the above, the opening year scenario for the proposed development is noted below.

- Opening Year (Completion of development) 2028

7.2. Growth Rate

Lakeside Drive

It is noted that a Traffic Impact Assessment² (TIA) has been submitted to EDQ in relation to The Village development within the Oonoonba PDA area (referred to as 'The Village TIA' within this report). That assessment assumes no background traffic growth on Lakeside Drive beyond that associated with PDA development, based on a comparison of surveyed 2024 traffic volumes and projected 2036 traffic volumes.

Additionally, Colliers have compared the projected 2036 traffic volumes with the 2021 surveyed traffic volumes. The comparison indicates that the combined through traffic volumes on Lakeside Drive at the intersection with Riveredge Boulevard are generally comparable, with:

- AM peak hour: 1,210 vph in 2021 compared with 1,157 vph projected for 2036 (-53 vph); and
- PM peak hour: 1,097 vph in 2021 compared with 1,114 vph projected for 2036 (+17 vph).

The differences between the survey and projected traffic volumes are relatively negligible and indicate that the projected 2036 traffic demands are generally consistent with 2021 survey volumes and therefore no background growth along this corridor has been adopted as part of this assessment.

Accordingly, the 2021 surveyed traffic volumes have been used for the 2028 Opening Year assessment. However, traffic volumes associated with the potential residential developments within the PDA area, as outlined in The Village TIA, have been included separately. This is summarised in Section 7.3 below.

Abbott Street

Similar to former assessments undertaken at the site, a 2% compound annual growth rate (CAGR) has been applied to the through volumes along Abbott Street. It is noted that this is applied to the through volumes only as no background growth is assumed on Lakeside Drive, as outlined above.

7.3. Potential (PDA) Residential Development Traffic Demands

Two potential future residential developments were identified within The Village TIA, including a 127-unit residential dwellings and 48 social housing units.

² Technical Memorandum - Traffic Impact Assessment (prepared by URBIS, dated 15/05/2026)

Trip generations associated with these developments has been extracted from The Village TIA report as well as minor adjustments to the turning movements to generally align with the overall anticipated PDA volumes. As these developments are identified as being completed and operational by the future year 2027, the associated traffic demands have been included within the 2028 Opening Year (Base) scenario as part of this assessment.

The peak hour traffic volumes associated with the potential future residential developments is illustrated in **Diagram 7**, included in **Appendix C**.

7.4. Assessment Scenarios

The following assessment scenarios have been derived for the purposes of the TIA:

- 2028 Base Scenario: Establishes the base operations at Opening year, considering the 2021 surveyed volumes plus traffic volumes associated with the two potential residential developments within the PDA area. This will be used to compare the net impact of the proposed development traffic demands against.
- 2028 Base + Development Case Scenario: This will be used to determine road network operations with inclusion of the proposed development at the opening years. Comparison against the base scenarios will determine the overall impact of the proposed development and any necessary mitigation works required.

Based on the development transport demand estimates (Section 5) and base traffic growth (Section 7) traffic network diagrams have been prepared showing traffic movements on the roads/intersections surrounding the development site.

These network diagrams are included in **Appendix C** with the respective diagrams identified as follows:

- Traffic Network Diagram 1: Existing 2021 (Surveyed) Peak Hour Traffic Volumes
- Traffic Network Diagram 2: Development Traffic 'New Trips' Distribution (%)
- Traffic Network Diagram 3: Development Traffic 'Drop-In Trips' Distribution (%)
- Traffic Network Diagram 4: Development Traffic 'New Trips' Volumes (vph)
- Traffic Network Diagram 5: Development Traffic 'Drop-In Trips' Volumes (vph)
- Traffic Network Diagram 6: Development Traffic Volumes (vph) - Total
- Traffic Network Diagram 7: Potential Residential Development (PDA area) Traffic Distribution (vph)
- Traffic Network Diagram 8: 2028 Base Case Traffic Volumes
 - This has been calculated by applying annual growth to base volumes (Diagram 1) and adding committed development volumes (Diagram 7).
- Traffic Network Diagram 9: 2028 Base + Development Case Traffic Volumes

- This has been calculated by adding the proposed development volumes (Diagram 6) to the base volumes (Diagram 8).

8. Traffic Impact Assessment

8.1. Extent of Assessment

Traffic operations have been assessed at the following locations:

- Riveredge Boulevard / Lakeside Drive
- Lakeside Drive / Abbott Street
- Northern Site Access / Lakeside Drive
- Southern Site Access / Lakeside Drive

The following sections outline the assessment of both intersections and the proposed access points for the Opening Year 2028 scenario only. As no background traffic growth has been assumed on Lakeside Drive, a separate 10-year design horizon assessment is not considered necessary.

In accordance with DTMR's GTIA, a net delay assessment has also been undertaken for the Lakeside Drive / Abbott Street (SCR) intersection.

8.2. Lakeside Drive / Abbott Street Intersection Assessment

An assessment of the Lakeside Drive / Abbott Street intersection has been undertaken using SIDRA Intersection 10.0 software package to assess the future traffic operations of the intersection for the Opening year 2028.

Figure 8-1 shows the configuration of the Lakeside Drive / Abbott Street intersection adopted in the SIDRA analysis. All default SIDRA inputs were used for the analysis.

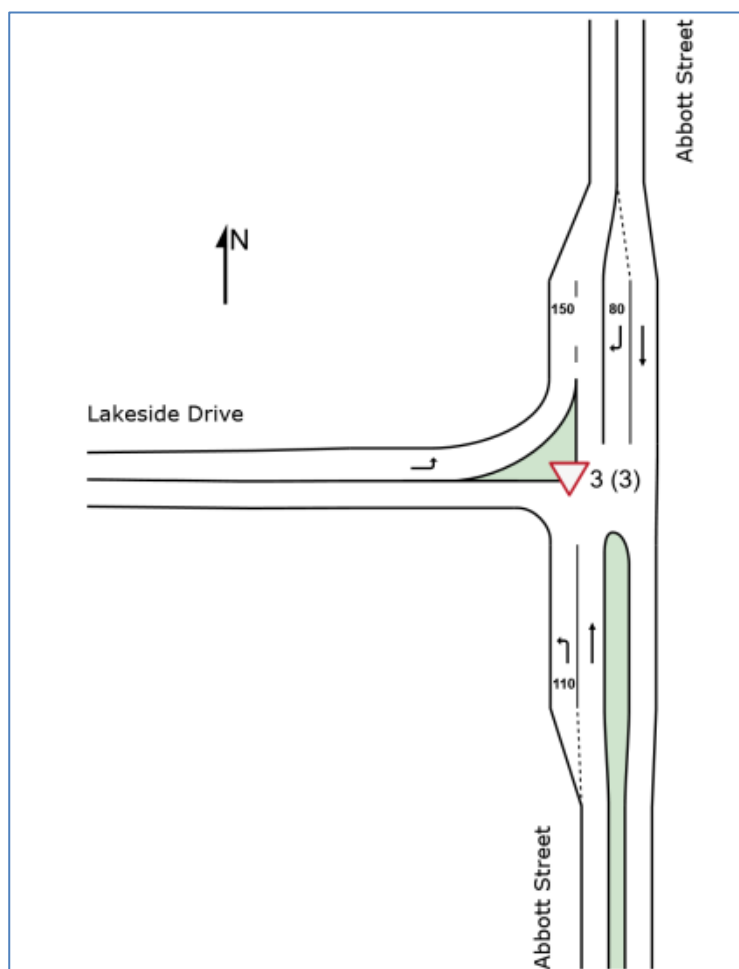


Figure 8-1: Lakeside Drive / Abbott Street Intersection – SIDRA Layout

The results of the SIDRA analysis under the Opening Year 2028 with and without the proposed development volumes are summarised in Table 8-1. Detailed SIDRA output data is also included in **Appendix D**.

Table 8-1: Lakeside Drive / Abbott Street Intersection – SIDRA Results Summary

Scenario	DOS	Average Delay		LOS	95th Percentile Critical Queue (m)			
		Overall	Worst Movement		South	East	North	West
AM Peak Hour								
2028 Base	56%	5 sec	11 sec	B	0m	-	28m	0m
2028 Base + Development	56%	5 sec	11 sec	B	0m	-	30m	0m
PM Peak Hour								
2028 Base	74%	6 sec	11 sec	B	0m	-	79m	0m
2028 Base + Development	75%	6 sec	11 sec	B	0m	-	82m	0m

The results show that the intersection will operate at acceptable levels of service (LOS A or B) during the AM peak hour under both the existing and post development scenarios with the maximum degree of saturation (DoS) of 0.56.

During the PM peak hour, the intersection is expected to operate below the practical degree of saturation for a priority-controlled intersection (0.71 and 0.75 vs. 0.8). All movements are expected to continue operating at LOS A or B with the 95th percentile back of queue length on the northern approach expected to remain within the available storage length, with any queue overflow extending only into the painted chevron area (regardless of the proposed development). As such, the proposed development is not expected to result in any material adverse impacts on intersection performance.

Although eastbound traffic volumes approaching Abbott Street are relatively high, no adverse impacts or delay are expected at the proposed northern site access, as all access movements are restricted to left-in/left-out by the existing median on Lakeside Drive (physically separating these movements).

8.3. Lakeside Drive / Riveredge Boulevard Intersection Assessment

Figure 8-1 shows the configuration of the Lakeside Drive / Riveredge Boulevard intersection adopted in the SIDRA analysis. All default SIDRA inputs were used for the analysis, including gap acceptance parameters.

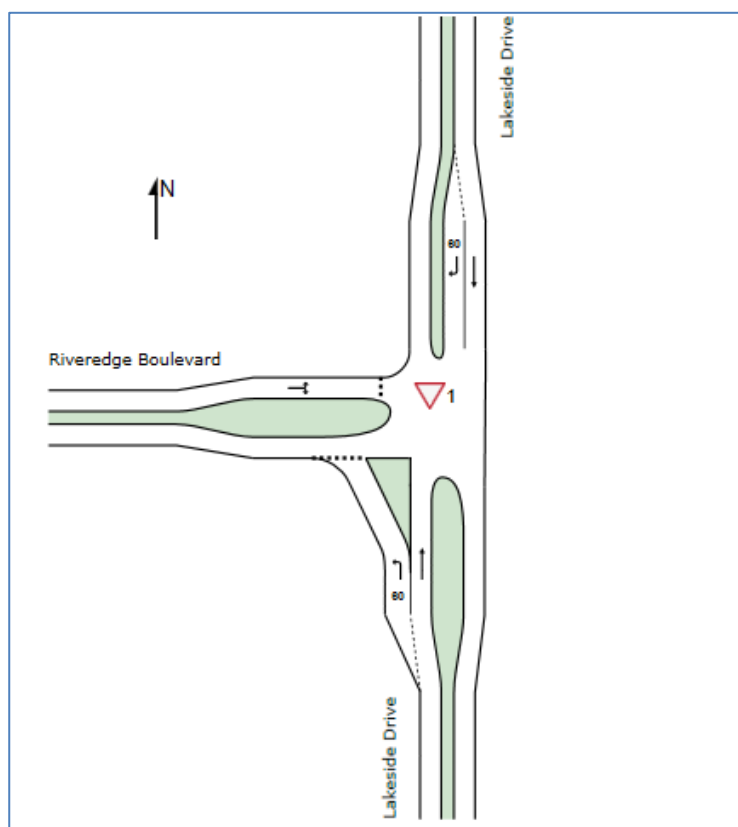


Figure 8-2: Lakeside Drive / Abbott Street Intersection – SIDRA Layout

The results of the SIDRA analysis under the Opening Year 2028 with and without the proposed development volumes are summarised in Table 8-2. Detailed SIDRA output data is also included in **Appendix D**.

Table 8-2: Lakeside Drive / Riveredge Boulevard Street Intersection – SIDRA Results Summary

Scenario	DOS	Average Delay		LOS	95th Percentile Critical Queue (m)			
		Overall	Worst Movement		South	East	North	West
AM Peak Hour								
2028 Base	122%	45 sec	251 sec	F	1m	-	3m	301m
2028 Base + Development	126%	53 sec	266 sec	F	1m	-	3m	342m
PM Peak Hour								
2028 Base	74%	5 sec	51 sec	F	3m	-	7m	30m
2028 Base + Development	76%	6 sec	51 sec	F	3m	-	7m	32m

The SIDRA assessment indicates that under the AM base scenario, the intersection is expected to operate beyond the practical degree of saturation for a priority-controlled intersection, with degrees of Saturation (DoS) of 1.21. This outcome is primarily attributable to the western approach, which is expected to operate at LOS F, with average delays exceeding 250 seconds, excluding the proposed development traffic.

While the proposed development is expected to generate only a marginal increase in demand on this approach, with a net increase of up to 5 vph during the peak periods, the above assessment indicates the intersection is already expected to operate above capacity during the Opening Year 2028 AM peak hour as a result of existing and cumulative network demands (excluding the site traffic). Accordingly, any mitigation measures required at this intersection would be expected to be considered by EDQ as part of the broader transport strategy for the PDA area.

Notably, the proposed site access arrangement allows for development traffic to utilise the main internal accessway to bypass the Riveredge Drive intersection when continuing southbound along Lakeside Drive. As a result, a proportion of existing traffic is expected to redistribute through the development, thereby reducing traffic demand at the intersection and partially offsetting development-generated vehicle movements.

Most significantly with respect to the operation of the local road network all instances of future intersection operation have queuing on the norther approach of up to 1 vehicle. The operation as a priority-controlled intersection ensures no potential for queues to form to the north, potentially impacting the level crossing.

Moreover, the proposed development will provide a local service station and food and drink outlet for the surrounding PDA catchment, helping to retain trips within the local area and reducing the need for travel on the wider road network.

8.4. Lakeside Drive / Northern Site Access

Figure 8-1 shows the configuration of the Lakeside Drive / Northern site access adopted in the SIDRA analysis. All default SIDRA inputs were used for the analysis.

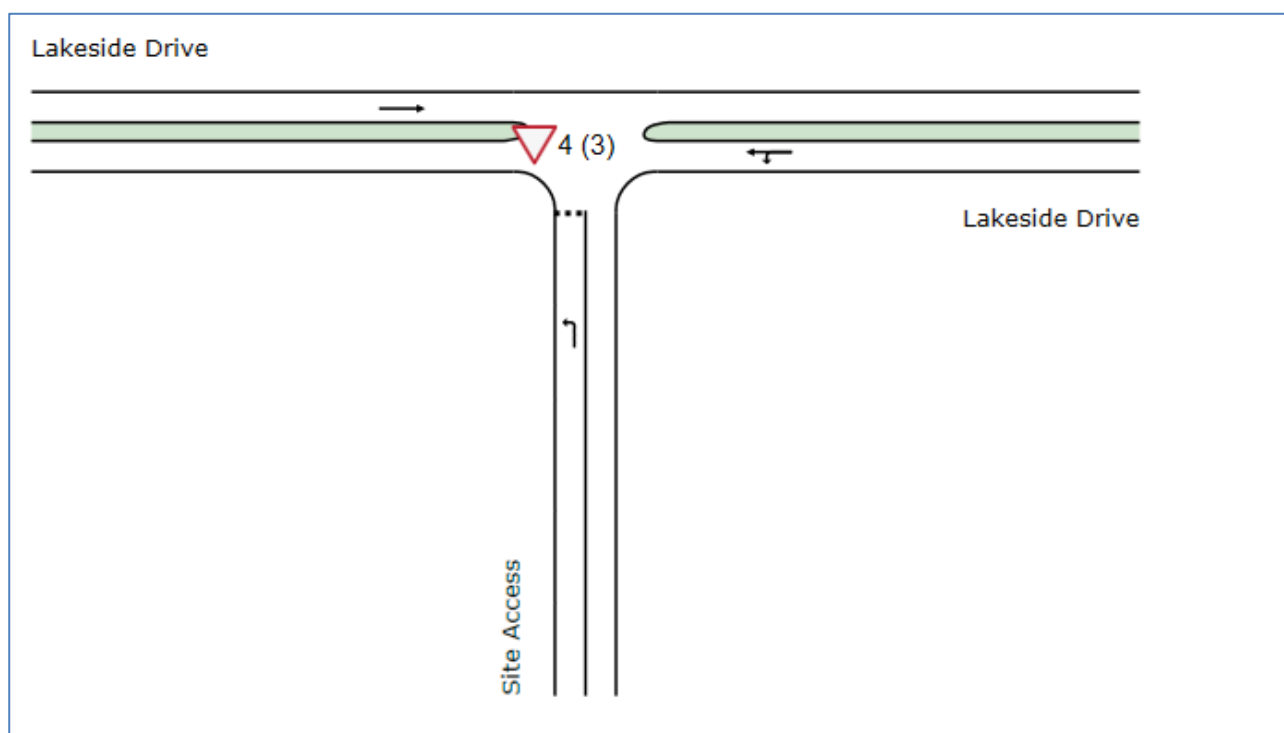


Figure 8-3: Northern Access / Lakeside Drive – SIDRA Layout

The results of the SIDRA analysis under the Opening Year 2028 with and without the proposed development volumes are summarised in Table 8-2. Detailed SIDRA output data is also included in **Appendix D**.

Table 8-3: Lakeside Drive / Southern site access – SIDRA Results Summary

Scenario	DOS	Average Delay		LOS	95th Percentile Critical Queue (m)				
		Overall	Worst Movement		South	East	North	West	
AM Peak Hour									
2028 Base Development	+	53%	<1 sec	7 sec	A	<1m	0m		0m
PM Peak Hour									
2028 Base Development	+	44%	<1 sec	10 sec	A	<1m	0m		0m

Based on the above assessment, all turning movements are expected to operate well below capacity with a maximum degree of saturation of 42% during the AM peak hour. Notably, no queues are expected to form on the eastern approach for vehicles turning left into the site.

8.5. Lakeside Drive / Southern Site Access Assessment

Figure 8-1 shows the configuration of the Lakeside Drive / Southern site access adopted in the SIDRA analysis. All default SIDRA inputs were used for the analysis.

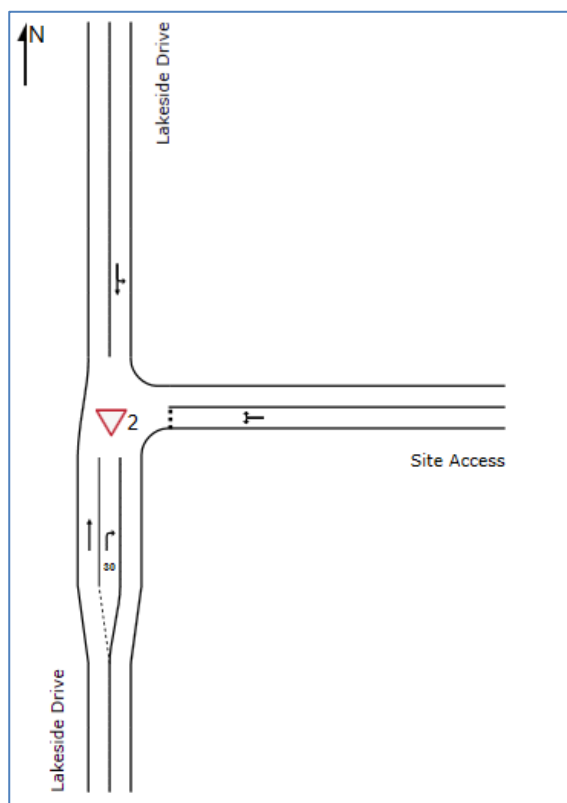


Figure 8-4: Lakeside Drive / Southern Site Access – SIDRA Layout

The results of the SIDRA analysis under the Opening Year 2028 with and without the proposed development volumes are summarised in Table 8-2. Detailed SIDRA output data is also included in **Appendix D**.

Table 8-4: Lakeside Drive / Southern site access Intersection – SIDRA Results Summary

Scenario	DOS	Average Delay		LOS	95th Percentile Critical Queue (m)					
		Overall	Worst Movement		South	East	North	West		
AM Peak Hour										
2028 Base Development	+	46%	2 sec	44 sec	E	1m	13m	0m	-	
PM Peak Hour										
2028 Base Development	+	37%	2 sec	33 sec	D	2m	10m	0m	-	

Based on the above assessment, all turning movements are expected to operate well below capacity with a maximum degree of saturation of 46% during the peak hours. Notably, the 95thile back of queue for the right turn movement into the site is less than 1 vehicle (2m) therefore the proposed right turn storage length is considered sufficient to cater for the proposed development volumes.

8.5.1. Net Delay Assessment

In line with the requirements of the DTMR GTIA, the net impact of the development traffic on the SCR network in terms of delays has also been quantified. Based on the respective SIDRA analysis results for the 2028 Base and Base + Development scenarios, a comparison of the net intersection delay of the SCR network with and without the proposed development is shown in Table 8.5.

Table 8.5: SCR Intersection – Net Intersection Delay Comparison

Intersection / Scenario	2028 Base Net Intersection Delay	2028 Base + Development Net Intersection Delay*
Lakeside Drive / Abbott Street Intersection - AM Peak Hour	201 vehicle-minutes	180 vehicle-minutes
Lakeside Drive / Abbott Street Intersection - PM Peak Hour	214 vehicle-minutes	217 vehicle-minutes
Total SCR Network Delay for All Peak Periods	414 vehicle-minutes	397 vehicle-minutes
Net Change in Delay	-	-17 vehicle-minutes (-4.1%)

*As per Section 8.3.1 of the DTMR GTIA, the net intersection delay of the development case has been calculated by adopting the '2028. Base + Development' movement delays (as derived from SIDRA) to the '2028 Base' traffic volumes to ensure that the net impact does not include additional delays to development traffic movements within the calculations.

As shown in Table 8.5, the development is predicted to result in a 4.1% reduction in average intersection delay at the Abbott Street / Lakeside Drive intersection. Review of the SIDRA movement performance outputs indicates that this reduction is primarily attributable to a decrease in average delay for the left-turn movement onto Abbott Street, from 5.9 seconds to 4.7 seconds. Given the forecast increase in traffic demand at the intersection is relatively minor (approximately 10-12 vph during the peak periods), this apparent improvement is likely a consequence of redistribution of volumes and capacity constraints within the modelled network rather than a material change in operational performance at the intersection. Accordingly, even if delay at the intersection were assumed to remain unchanged during the AM peak hour, the resulting change in average intersection delay would remain well below the adopted 5% significance threshold.

Section 11.3.1 of the DTMR GTIA indicates that mitigation works are only required to offset any development which results in more than a 5% increase to net intersection delays across the SRC network. As such, the above assessment indicates that no mitigation measures are necessary to the SCR network in accordance with the DTMR GTIA.

9. Proposed Site Access

The proposal includes two vehicular accesses onto Lakeside Drive to serve the development, including:

- A northern left-in / left-out (LILO) access onto Lakeside Drive
- A southern all-movements access onto Lakeside Drive

The proposed access points will connect to either end of a shared internal accessway extending along the eastern boundary of the site. Individual internal driveways will branch from the main accessway to provide access to the proposed land uses (T1-T3 buildings).

The adequacy of each of the proposed accesses is addressed in the following sections.

9.1. Lakeside Drive Northern Access

The proposed northern access to Lakeside Drive will operate as a left-in/left-out (LILLO) access. By restricting right turn movements, the access arrangement reduces potential conflict points and minimises the potential for vehicle delays and associated queueing at the site access. This treatment is considered appropriate given the proximity of the access to the existing railway line, as it reduces the potential for vehicles to queue near the rail corridor.

The northern access is expected to cater for ingress movements for up to an 19.0m long Articulated Vehicle (AV) to undertake refuelling at the service station. It is noted that an AV exiting the service station will need to utilise the entry into the service station to continue south along the internal road towards Lakeside Drive. Swept path analysis at the Northern site access has been provided in Colliers Diagrams in Appendix B.

9.1.1. Access Crossover Design

In lieu of specific vehicle access requirements within the Oonoonba Urban Development Scheme, reference has been made to the Townsville City Council Planning Scheme.

Table 6.1 summarises the relevant access design and location requirements and demonstrates compliance of the proposed northern access with these provisions.

Table 9-1: Northern Site Access Requirements

Design Aspect	AS2890 Requirement	Proposed Provision	Compliance
Category	3	3	Generally compliant – refer to note below
Crossover Width	6-8m entry / 1-3m separator / 6-8m exit	9.8m (two-way) combined access (measured along the site boundary)	Alternate layout – see note below
Sight Distance (design speed of 40km/h) ¹	73m	76m approx. (up to intersection with Abbott Street)	Compliant with 40km/h design speed
Pedestrian Visibility Splays	2m x 2.5m	2m x 2.5m (min)	Compliant

Design Aspect	AS2890 Requirement	Proposed Provision	Compliance
Maximum driveway grade	1:20 (5%) for 6m in length	-	Recommended design parameter

¹Sight distance has been assessed using Austroads Guide to Road Design Part 4A using a 40km/h speed (given proximity to the intersection)

The proposed arrangements, with the recommendations outlined above, will generally comply with the design requirements however an alternate solution is proposed for the crossover width.

As outlined within Section 8 above, the SIDRA modelling indicates that no 95%ile back of queue length on the eastern approach (entering the site access) is anticipated as a result of the proposed development.

Crossover Width

The proposed northern access is located on a major road, will serve between 25 and 100 parking spaces, and provides access to User Class 3A parking. Accordingly, Category 3 access is identified as per AS2890.1:2004 requirements. Section 3.2.3(b) of AS 2890.1:2004 indicates that a Category 3 access located on an arterial road is to be designed and constructed as intersection treatments.

The proposal includes a combined two-way access onto Lakeside Drive, with movements restricted to left-in/left-out due to the presence of a central island.

While no separator is proposed between the entry and exit access points, this is considered acceptable for the following reasons:

- The access operates as a left-in/left-out arrangement only, eliminating right-turn entry and exit movements and reducing the number of vehicle conflict points.
- The access has been designed to accommodate simultaneous two-way movements using a B99 (Large) car car.
- Service vehicles including a Heavy Rigid Vehicle (HRV) and 19m long AV are expected to utilise the full crossover width when entering the site. These vehicle movements comprise a minor proportion of the overall traffic expected to utilise the site access.
- Two connections are proposed onto Lakeside Drive thereby allowing egress movements to be distributed between the two access points and reducing reliance on a single access point.

Overall, the proposed combined access arrangement is considered acceptable for the anticipated traffic demands of the development.

9.1.2. Turn warrant assessment

To determine the appropriate configuration of the proposed northern access, a turn warrants assessment has been conducted using Figure 2.25(c) of the Austroads Guide to Traffic Management Part 6.

The turn warrant assessment considers the 2028 Base + Development Case traffic demands.

Figure 9-1 illustrates the turn warrant assessment at the proposed LILO access intersection.

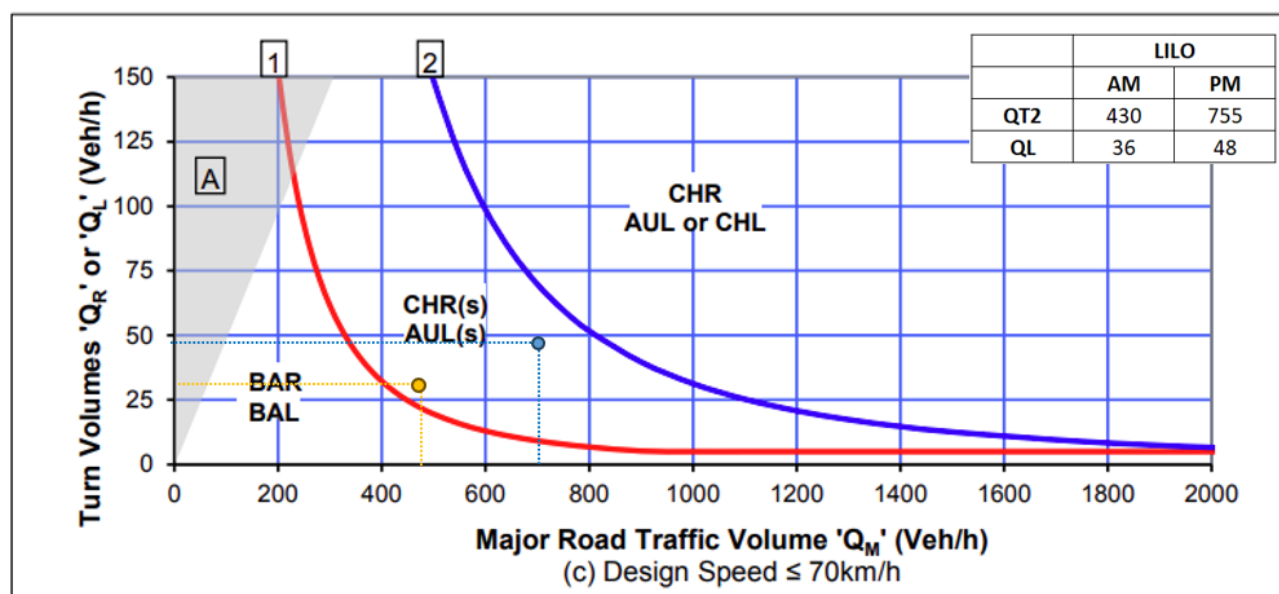


Figure 9-1: Turn warrant assessment for left turn into the site (LILO access)

Based on the above assessment, an AUL(S) is warranted on the eastern approach to facilitate left-turn movements into the site. Accordingly, an AUL(S) treatment has been incorporated at the proposed northern access and has been designed generally in accordance with a 50 km/h design speed.

Given the proximity of the northern access to the rail corridor and Abbot Street intersection, it is anticipated that vehicle speeds approaching the site are expected to be relatively low and therefore the design speed adopted is considered acceptable.

It is noted the extent of the AUL (S) slightly encroaches into the railway corridor, however the extent of the encroachment is expected to be restricted to line marking only. Specifically, no pavement widening or civil works are proposed as part of this development.

9.2. Lakeside Drive Southern Access

The proposed southern access onto Lakeside Drive allows for all movements. The proposed access is positioned as far as practicable to the west of the intersection with Riveredge Boulevard. Vehicle movements to / from these side roads will therefore be via a right-out / left-in manoeuvre thereby minimising disruption to through movements along Lakeside Drive.

To facilitate turning movements into the site, a CHR(S) is proposed at the southern access to allow a dedicated space for right-turn (entry) movements to wait without obstructing through (eastbound) volumes. The proposed turn treatment has been designed generally in accordance with Austroads Guide to Road Design Part 4A under a 70km/h design speed. As outlined within Section 8 above, the maximum 85thile back of queue length from the right turn movement is 2m (up to 1 vehicle) therefore the proposed storage length is considered sufficient to cater for the proposed development volumes.

It is noted that the site is expected to cater for up to a 19.0m long AV to undertake refuelling at the service station. The proposed southern access has been designed to allow for up an 19m long AV to exit the site via a left turn onto Lakeside Drive without crossing the centreline. Ingress movements for an AV are proposed to occur via the northern access only.

9.2.1. Access Crossover Design

Table 6.1 summarises the relevant access design and location requirements and demonstrates compliance of the proposed northern access with these provisions.

Table 9-2: Southern Site Access Requirements

Design Aspect	AS2890 Requirement	Proposed Provision	Compliance
Category	3	3	Generally compliant – refer to note below
Crossover Width	6-8m entry / 1-3m separator / 6-8m exit	8.9m (two-way) combined access (measured along the site boundary) 10.6m (approx.) measured 4.75m from the hold line	Alternate layout – see note below
Sight Distance (design speed of 50km/h) ¹	97m	103m to the east >200m to the west	Compliant
Pedestrian Visibility Splays	2m x 2.5m	2m x 2.5m (min)	Compliant
Maximum driveway grade	1 in 20 (5%) for 6m in length	-	Recommended design parameter

¹Sight distance has been assessed using Austroads Guide to Road Design Part 4A using a 50km/h design speed (based on 40km/h advisory speed sign approaching the access)

The proposed arrangements, with the recommendations outlined above, will generally comply with the design requirements however an alternate solution is proposed for the crossover width.

Crossover Width

The proposed southern access is located on a major road, will serve between 25 and 100 parking spaces, and provides access to User Class 3A parking. Accordingly, Category 3 access is identified as per AS2890.1:2004 requirements. Section 3.2.3(b) of AS 2890.1:2004 indicates that a Category 3 access located on an arterial road is to be designed and constructed as intersection treatments.

The proposal includes a combined two-way access onto Lakeside Drive, with all movements permitted.

While no separation is proposed between the entry and exit access points, this is considered acceptable given that the access has sufficient space to accommodate simultaneous movement by up to a Heavy Rigid Vehicle (HRV) and for a 19.0m long AV (exiting the site) vs. B99 (Large) car (entering the site).

In addition, it is noted that two connections are proposed onto Lakeside Drive thereby allowing egress movements to be distributed between the two access points and reducing potential for conflicts.

Overall, the proposed combined access arrangement is considered acceptable for the anticipated traffic demands of the development.

9.2.2. Turn Warrant Assessment

Figure 9-2 and Figure 9-3 illustrates the turn warrant assessment at the southern (all-movements) access intersection onto Lakeside Drive.

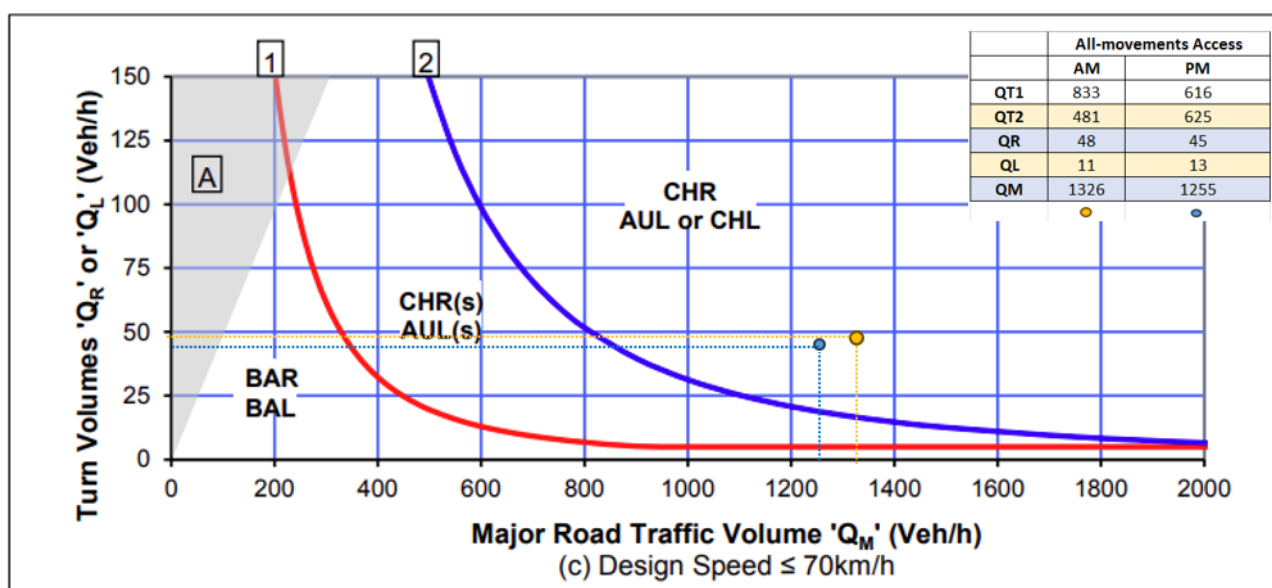


Figure 9-2: Turn warrant assessment for right turn into the site (southern all-movements access)

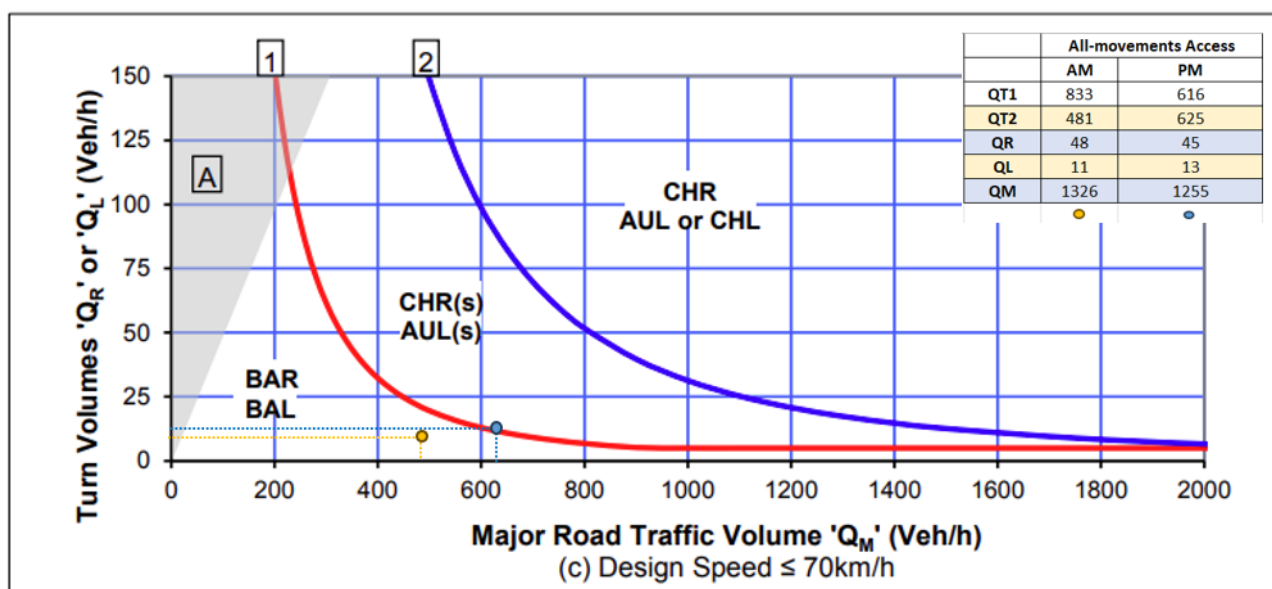


Figure 9-3: Turn warrant assessment for left turn into the site (southern all-movements access)

Based on this assessment, the proposed southern access requires provision for:

- CHR on the Lakeside Drive (western approach)
- AUL(S) on the Lakeside Drive (eastern approach)

A review of the turn warrant assessment indicates that a CHR and AUL(S) treatment is warranted for the western and eastern approaches, respectively, for the future opening year 2028.

To facilitate turning movements into the site, a CHR(S) is proposed at the southern access to allow a dedicated space for right-turning vehicles to temporarily wait without obstructing through (eastbound volumes). The proposed turn treatment has been designed generally in accordance with Austroads Guide to Road Design Part 4A using a 70km/h design speed.

While a CHR treatment is technically warranted, it is noted that an existing right-turn lane is provided to the south, serving the River Boulevard / Lakeside Drive intersection. To minimise impacts on this existing infrastructure, the proposed design has been developed to tie into the commencement of the existing chevron marking while maximising separation from the Riveredge Boulevard intersection (approximately 110m centre line to centreline).

Furthermore, although the posted speed limit along Lakeside Drive is 60km/h, it is noted that 40km/h advisory speed signs are provided on both approaches to the proposed access, encouraging lower operating speeds in the vicinity of the site. Based on the above factors, the proposed right turn treatment is considered acceptable.

While no formal left turn treatment is proposed for vehicles entering the site, this is considered acceptable given there is:

- Low inbound left-turn demand, with approximately 11-13 vehicles per hour during commuter peak periods (less than one vehicle every 4 minutes).
- Advisory speed signs encouraging lower speeds (40 km/h) provided on the approach to the southern access (both sides).
- Adequate sight lines allowing through drivers sufficient opportunity to identify and react to vehicles slowing to enter the site.

Based on the above, the proposed turn treatments are considered acceptable to serve the proposed development. It is noted that amendments to the western approach to Riveredge Boulevard are proposed to incorporate the CHR (S) at the southern site access and includes pavement widening on the western side of Lakeside Drive. The exact extent of the external road network amendments will be refined as part of the detailed design stage.

10. Parking Arrangements

10.1. Parking Supply

10.1.1. Car parking

The car parking supply requirements for the proposed development land uses have been determined in line with the Oonoonba UDA Development Scheme. Specifically, Section 3.3.3 of the Oonoonba UDA Development Scheme identifies that for business, retail and community and service uses, the applicable parking rate is 1 space per 30m² GFA.

Table 10-1 provides a summary of the parking supply requirements in line with the Oonoonba UDA Development rates, and the proposed provisions, for the development scheme.

Table 10-1: Oonoonba PDADS Car Parking Supply Requirement

Land Use / Component	Oonoonba PDA Requirement	Extent	Requirement	Provision
Service Station + Food & Drink Outlet (T1&T2):			15 spaces (total)	17 spaces (inc 1 PWD space)
• Service Station	1 space/30m ² GFA	240 m ²	8 spaces	
• Food & Drink Outlet (T2)	1 space/30m ² GFA	185 m ²	7 spaces	
Food & Drink Outlet (T3):	1 space/30m ² GFA	264 m ²	9 spaces (total)	17 spaces (incl 1 PWD space and 2 waiting bays)
Total			24 spaces	34 spaces

As seen in Table 10-1, the development scheme proposes a total of 34 car parking spaces which meets the required Oonoonba UDA Development Scheme provision of 24 car parking spaces.

On this basis, and with the above recommendations, the car parking supply is considered acceptable.

10.1.2. PWD Parking

In lieu of an accessible parking rate within the Oonoonba UDA Development Scheme, reference has been made to the Townsville City Plan and National Construction Code (NCC). Based on the proposed land uses, both buildings are classed as a 'Building 6' within the NCC.

Section D4D6 of the NCC identifies a rate of 1 accessible space for every 50 carparking spaces or part thereof for a Class 6 building.

It is noted that the parking supply for the service centre / food & drink outlet (T2) is proposed within an at-grade carpark area therefore it is anticipated that these spaces will be shared between both land uses (including the proposed PWD bay).

The proposal includes a total of 34 carparking spaces, including two (2) PWD bays therefore satisfies the above requirement. It is noted that one (1) PWD bay is proposed to serve the service station / T2 building and one serving the T3 building, respectively.

All PWD car parking spaces must be designed in accordance with AS2890.6 (including grades).

10.2. Parking Layout

Table 10-2 identifies the characteristics of the proposed parking layouts with respect to the TAPS PSP design provisions.

Table 10-2: AS2890.1:2004 Parking Design Requirements

Design Aspect	AS2890.1:2004 Standard	Proposed Provision	Compliance
Car Parking			
Parking space length:			
– Standard bay (User Class 3A)	5.4m	5.4m	Compliant
– PWD space	5.4m	5.4m	Compliant
Parking space width:			
– Visitor (User Class 3A)	2.6m	2.6m	Compliant
– PWD space	2.4m + 2.4m 'shared space'	2.4m	Compliant
Aisle Width:			
• Parking aisle	6.6m (min)	8.2m	Compliant
• 2-way Circulation road/ramp	5.5m (min)	5.5m (min)	AS2890.1 Compliant
• 1-way Circulation road/ramp	3.0m (min)	3.0m (min)	AS2890.1 Compliant – refer to notes below
Maximum Gradient:			
– PWD parking	1:40 (2.5%)	-	Recommended design parameter
– Parking bay	1:20 (5.0%)	-	Recommended design parameter
– Parking aisle	1:16 (6.25%)	-	Recommended design parameter

The development parking layouts are generally consistent with the provisions of the AS2890.1:2004 design requirements.

In addition to the above, the following is outlined for the internal circulation areas within the carpark.

Internal Drive-through facility

AS2890.1:2004 outlines a minimum of 3.0m width (kerb to kerb) for one-way aisles plus 300mm clearance to any physical obstruction greater than 0.15m in height. Where multiple queueing lanes are proposed, queueing lanes are to be reduced to 2.7m - noting that 0.3m clearance to physical obstructions must be provided.

The proposed drive-through arrangement includes the following:

- **Single queue lane** - 3.0m (min) width (kerb to kerb) - plus 300mm clearance where adjacent to a building); and

- **Multiple queue lane** - 2.7m (min) width for plus 0.3m clearance to a structure on one or both sides of the aisle.

In addition to the above, swept path analysis has been undertaken using a B99 (Large) car and illustrates there is sufficient space for a vehicle to manoeuvre through each drive-thru facility. The swept path diagrams are included in Colliers Diagrams in Appendix B.

Internal queueing areas

In addition to the above, Section SC6.10 of Council's PSP outlines the following for a '*Food and Drink Outlet*' with a drive-through facility:

- queuing space within the site for ten (10) vehicles being served or awaiting service, with three (3) of those queuing spaces to be provided prior to arriving at the ordering point

In this regard, sufficient on-site space is provided to accommodate the required queue storage lengths. The T3 drive-thru facility provides capacity for three (3) vehicles between the site entry and the ordering point, while the T2 drive-thru facility can achieve the same outcome through a minor adjustment to the ordering point location. Accordingly, the proposed development is capable of satisfying the relevant queue storage requirements.

Turn Around Bay

It is noted that while not technically forming a blind aisle, a turn-around bay is recommended at the end of the T3 building, as illustrated in Colliers Drawings in Appendix B to facilitate vehicles exiting the site – noting that with this amendment, the overall car parking supply for the proposed T3 land-use remains compliant with the Oonoonba UDA Development Scheme.

Based on the above assessment, and with recommendations outlined above, the proposed carpark layout generally complies with AS2890.1 requirements and is therefore suitable.

11. Service Vehicle Arrangements

The servicing requirements for the proposed development is detailed below.

With respect to the service vehicle arrangements, the Oonoonba UDA Development Scheme is silent. As such, the proposed development has been assessed against the requirements of the TCC Planning Scheme.

11.1. Council Requirements

TCC requirements for service vehicles are:

- development must make adequate on-site provision for the access, loading, unloading and manoeuvring of service vehicles
- design must ensure the safety of other vehicles, pedestrians and cyclists and that other users are not inconvenienced
- design of this layout must conform to AS2890.2.
- provision within the site to allow all vehicles servicing the development to enter and exit the site in a forward direction only.

11.2. Proposed Arrangements

The proposed access arrangements are detailed below.

Dedicated loading bays are provided for each of the tenancies. To access the loading bay, vehicles will enter via Lakeside Drive, utilising the internal aisle to reverse into the bay. Vehicle access to/from the main aisle connecting to Lakeside Drive will be in a forward gear for all vehicles.

Service Station / Food & Drink Outlet (T2)

A 13.5m long x 3.8m wide loading bay is located at the southern side of the T1 building, adjacent the drive thru facility. This bay will accommodate both HRV and RCV access to the site. This will serve as a shared loading bay for the T2 tenancy. Swept path analysis using a 12.5m Heavy Rigid Vehicle (HRV) is illustrated in Colliers diagrams in Appendix B. This demonstrates there is sufficient space on-site for a HRV to manoeuvre to/from the main accessway in a forward direction.

Additionally, the site caters for the forward-in/forward-out movement of a 19m AV to allow fuel delivery. The site accesses have been designed to allow an 19.0m AV to enter the site via the northern access with exit manoeuvres proposed to occur via the southern access. Swept path analysis demonstrates that with minor kerb modification as outlined in Colliers Diagrams in Appendix B, there is sufficient space on-site for an AV to enter via the northern access, manoeuvre around on-site and exit via the southern access in a forward gear.

Food & Drink Outlet (T3)

A separate loading area is provided for the T3 food & drink tenancy. The bay is located at the southern side of the building, adjacent the drive-thru exit. The bay dimensions are 13.7m long x 5.3m wide which accommodates a HRV and RCV.

Swept path analysis using a 12.5m Heavy Rigid Vehicle (HRV) is illustrated in Colliers diagrams in Appendix B. This demonstrates there is sufficient space on-site for a HRV to manoeuvre to/from the main accessway in a forward direction.

It is recommended that the proposed internal accessway grades are designed in accordance with AS2890.2 requirements (including connections to the existing road network).

A minimum of 4.5m vertical height clearance (clear of services) will be required under the canopy to cater for an AV truck.

12. Summary and Conclusions

12.1. Proposed Development

The proposed development comprises a service station (240m² GFA) and two food and drink outlet tenancies (185m² GFA and 264m² GFA) at 286 Lakeside Drive, Oonoonba.

12.2. Traffic Impact Assessment

Lakeside Drive / Abbott Street Intersection

The SIDRA assessment indicates that the Lakeside Drive / Abbott Street intersection will continue to operate at acceptable levels of service during both the AM and PM peak periods under the 2028 Opening Year scenarios, regardless of the proposed development.

The results of the net delay assessment show that the impact of the proposed development is less than 5% on the state-controlled road network.

Lakeside Drive / Riveredge Boulevard Intersection

The assessment indicates that the Lakeside Drive / Riveredge Boulevard intersection is expected to operate above capacity during the AM peak period under the Opening Year 2028 (base) scenario. This is primarily associated with existing and cumulative background traffic demands, with the western approach expected to experience delays of more than 250 seconds irrespective of the proposed development.

The proposed development is expected to generate only a slight increase in traffic demand on the western (side) approach (net increase of up to 5 vph) and therefore is not expected to materially alter the operation of the intersection. Any future mitigation or upgrade requirements at this location are expected to be associated with the broader transport planning outcomes for the Oonoonba PDA rather than the proposed development in isolation.

Site Access Arrangements

The proposed development will be served by a northern left-in/left-out (LILO) access and a southern all-movements access onto Lakeside Drive. SIDRA analysis indicates that both accesses will operate well below capacity during the AM and PM peak periods, with the maximum 85thile back of queue accommodated within the proposed turn treatments.

Overall, the proposed access arrangements are considered suitable to cater for the anticipated development traffic volumes.

12.3. Access Arrangements

The proposed development is to be served by two vehicle access points onto Lakeside Drive comprising:

- A northern left-in / left-out (LILO) access.

- A southern all-movements access.

The proposed access arrangements have been designed to incorporate an AUL (S) for the northern access and CHR (S) for the southern access.

SIDRA analysis of both site accesses indicates that all turning movements will operate well below capacity during the weekday network AM and PM peak periods, with acceptable delays and queue lengths.

12.4. Parking Arrangements

The Oonoonba UDA Development Scheme requires a total of 24 parking spaces for the proposed development.

The proposal includes:

- 34 car parking spaces in total.
- Two (2) PWD parking spaces.
- Four (4) drive-thru waiting bays.

Based on the above, the proposed parking supply exceeds the minimum parking requirements of the Oonoonba UDA Development Scheme therefore is considered appropriate.

Assessment of the parking layout indicates that the proposed parking bays, aisle widths and circulation arrangements generally comply with AS2890.1:2004 requirements and with minor recommendations in relation to provision of turn around facilities and location of order points, is considered acceptable.

Overall, the parking supply and layout are considered suitable for the proposed development. It is recommended that the proposed internal accessway and parking grades are designed in accordance with AS2890.1 and AS2890.2 requirements (including connections to the existing road network).

12.5. Service Vehicle Arrangements

The development includes a shared loading bay serving the service station and T2 food and drink outlet, with a dedicated loading bay for the T3 food and drink outlet.

The proposed access arrangement has been designed to accommodate a 19m AV associated with fuel deliveries to the service station. Vehicle movements for an AV are to be restricted to entry via the Northern access, with egress movements proposed via the Southern access.

Swept path analysis using a HRV and 19m AV is provided in Colliers diagrams in Appendix B. This demonstrates there is sufficient space on-site for all servicing vehicles to manoeuvre to/from the main accessway (extending along the eastern boundary of the site) in a forward direction.

It is recommended that the proposed internal accessway grades are designed in accordance with AS2890.2 requirements (including connections to the existing road network).

12.6. Conclusion

Based on the assessment contained within this report, including recommendations, Colliers see no traffic engineering reason why the relevant approvals should not be granted.

Appendix A Development Plans

ARCHITECTURAL DA DRAWINGS

PROPOSED MIXED USE DEVELOPMENT

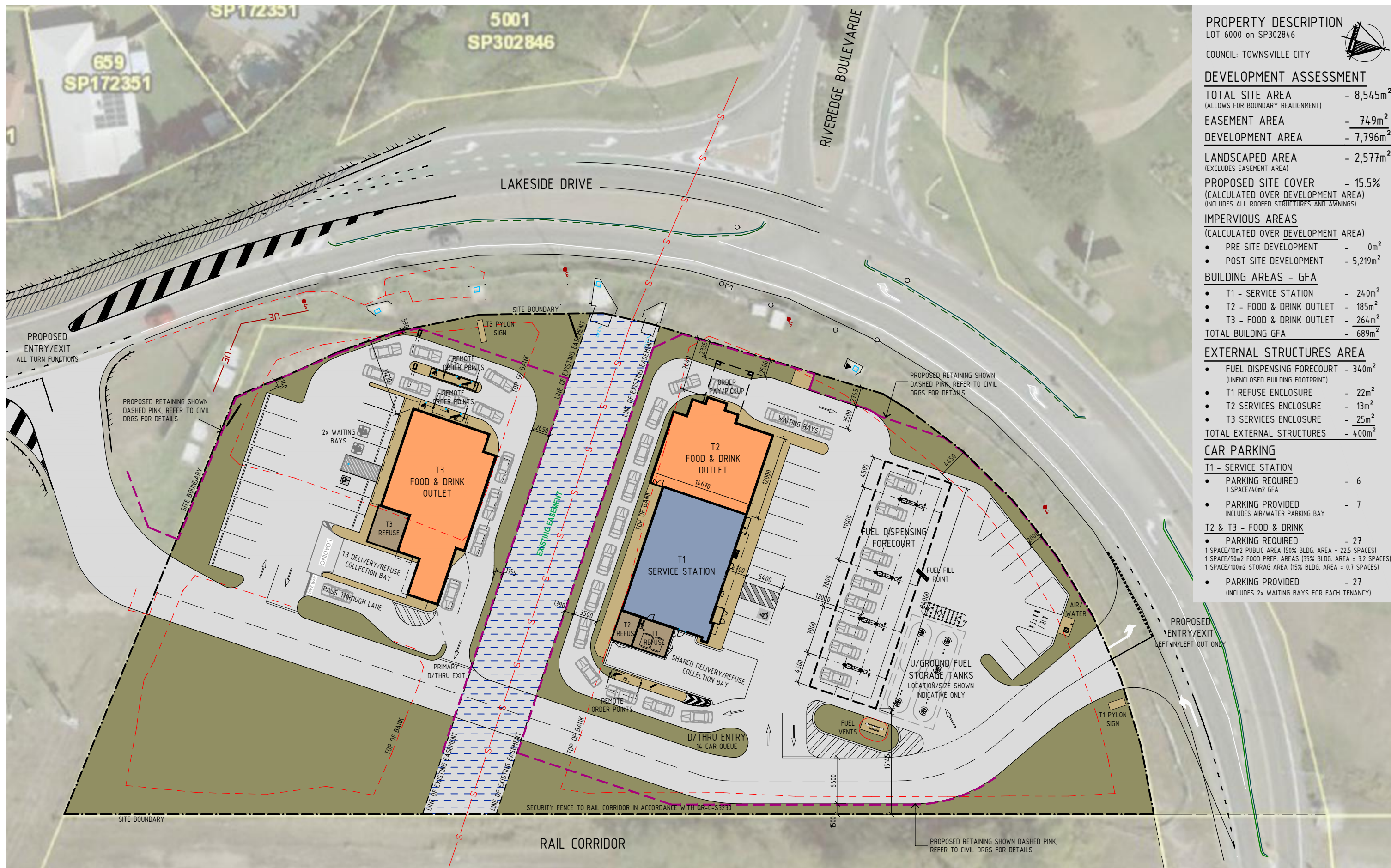
286 LAKESIDE DRIVE, OONOONBA QLD 4811



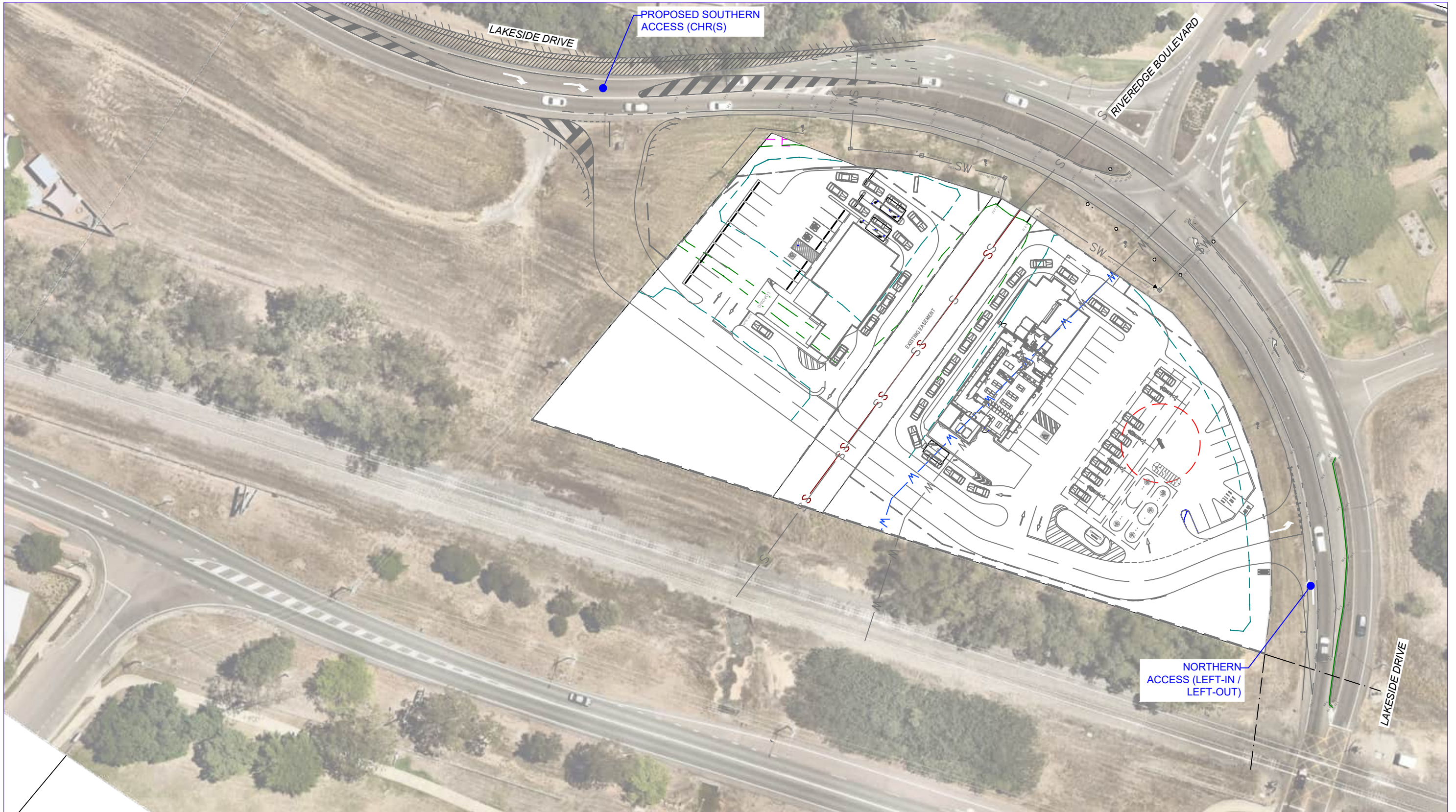
LOCATION MAP
NOT TO SCALE

ARCHITECTURAL DRAWINGS - DA	
DRG No.	DRAWING TITLE
DA01	COVER PAGE
DA02	PROPOSED SITE PLAN
DA03	CONCEPT SITE PLAN - T1/T2
DA04	BUILDING ELEVATIONS & PERSPECTIVES - T1/T2
DA05	BUILDING ELEVATIONS & PERSPECTIVES - T1/T2
DA06	BUILDING ELEVATIONS & PERSPECTIVES - T3

THIS DRAWING PACKAGE IS FOR D.A. PURPOSES ONLY AND IS NOT TO BE USED FOR TENDER PURPOSES.
ALL DESIGN COMPONENTS ARE SHOWN INDICATIVE ONLY AND ARE SUBJECT TO FINAL DESIGN DURING DETAILED DESIGN BY THE RESPECTIVE CONSULTANT.
ANY PRICING BASED UPON THE DETAILS SHOWN IN THESE DRAWINGS ARE COMPLETELY AT THE RESPONSIBILITY OF THE TENDERER.
VERVE BUILDING DESIGN CO. SHALL NOT BE HELD RESPONSIBLE FOR ANY REQUIRED CHANGES OR UPDATES TO THE DESIGN, POST D.A. THAT ARE PRICE IMPACTED.



Appendix B Colliers Drawings



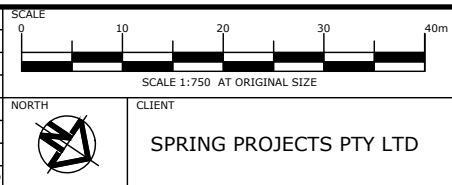
NOTES:

1. MAPPING UNDERLAY PROVIDED BY NEARMAP. MAY BE SUBJECT TO DETAILED DESIGN & SITE SURVEY.
2. ALL UNITS SHOWN ARE IN METERS (m) UNLESS OTHERWISE NOTED

**PRELIMINARY
ADVICE ONLY**

1 August 2026

REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
D	01-08-26	REVISED ARCHITECTURAL BASE	DSF	NS	SC
C	19-06-26	REVISED ARCHITECTURAL BASE	NS	NS	SC
B	18-02-26	LAKESIDE DRIVE PROVIDED AS CHR(S)	DSF	SC	SC
A	30-01-26	ORIGINAL ISSUE	DSF	SC	SC

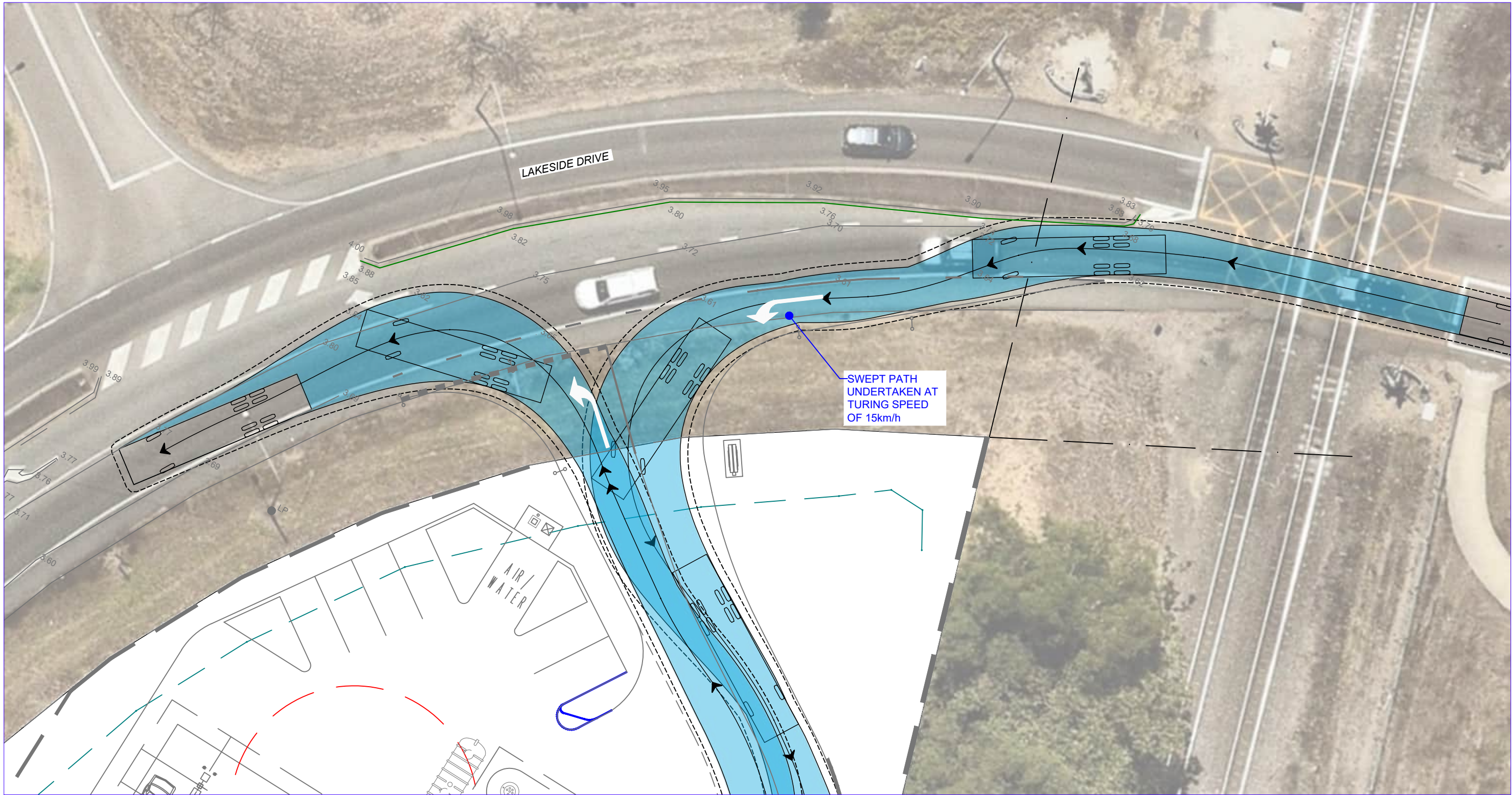


Colliers International Engineering
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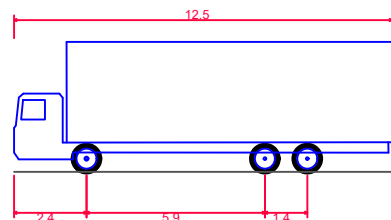
PROJECT
**PROPOSED MIXED USE DEVELOPMENT
286 LAKESIDE DRIVE, OONOOBA, QLD 4811**

DRAWING TITLE
FUNCTIONAL CONCEPT - LAKESIDE DRIVE (OVERALL)
PROPOSED NORTHERN AND WESTERN ACCESS CONCEPTS

PROJECT NUMBER 20BRT0472	ORIGINAL SIZE A3
DRAWING NUMBER 20BRT0472-20	REVISION D
DATE 1 Aug 2026	SHEET 1 OF 1



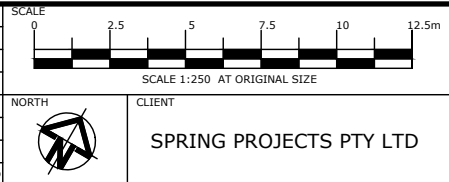
- NOTES:**
1. MAPPING UNDERLAY PROVIDED BY NEARMAP. MAY BE SUBJECT TO DETAILED DESIGN & SITE SURVEY.
 2. ALL UNITS SHOWN ARE IN METERS (m) UNLESS OTHERWISE NOTED



HRV 12.5m
Overall Length 12.500m
Overall Width 2.500m
Overall Body Height 4.300m
Min Body Ground Clearance 0.417m
Track Width 2.500m
Lock-to-lock time 6.00s
Curb to Curb Turning Radius 12.500m
Design Speed Forward 5.00km/h
Clearance Envelope 0.500m

**PRELIMINARY
ADVICE ONLY**
1 August 2026

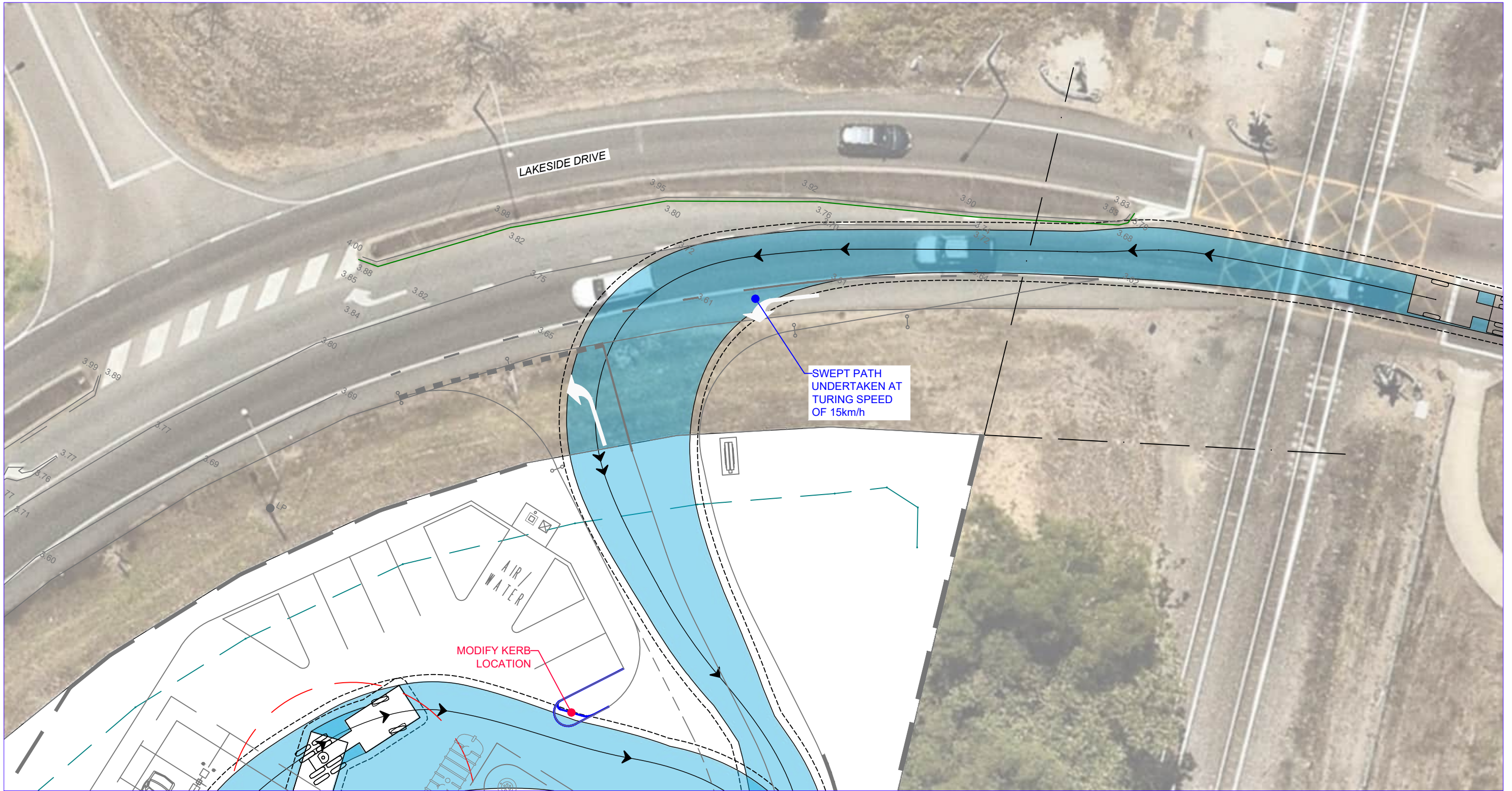
REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
D	01-08-26	REVISED ARCHITECTURAL BASE	DSF	NS	SC
C	19-06-26	REVISED ARCHITECTURAL BASE	DSF	NS	SC
B	18-02-26	LAKESIDE DRIVE PROVIDED AS CHR(S)	DSF	SC	SC
A	30-01-26	ORIGINAL ISSUE	DSF	SC	SC



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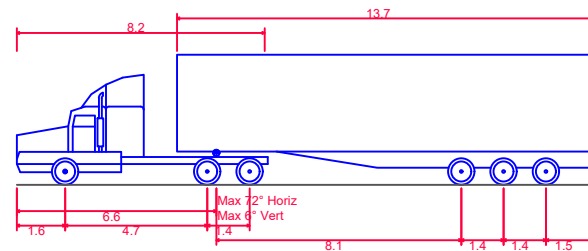
PROJECT	PROPOSED MIXED USE DEVELOPMENT 286 LAKESIDE DRIVE, OONOOBA, QLD 4811
DRAWING TITLE	SWEPT PATH ANALYSIS (SOUTHERN ACCESS) 12.5m HEAVY RIGID VEHICLE

PROJECT NUMBER	20BRT0472	ORIGINAL SIZE	A3
DRAWING NUMBER	20BRT0472-22	REVISION	D
DATE	1 Aug 2026	SHEET	1 OF 1



NOTES:

1. MAPPING UNDERLAY PROVIDED BY NEARMAP. MAY BE SUBJECT TO DETAILED DESIGN & SITE SURVEY.
2. ALL UNITS SHOWN ARE IN METERS (m) UNLESS OTHERWISE NOTED



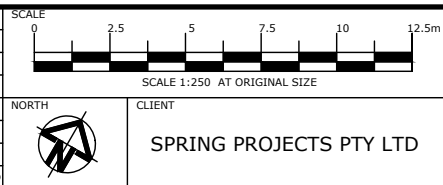
AV - Articulated Vehicle

Overall Length	19.000m
Overall Width	2.500m
Overall Body Height	4.301m
Min Body Ground Clearance	0.418m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12.500m
Design Speed Forward	5.00km/h
Clearance Envelope	0.500m

**PRELIMINARY
ADVICE ONLY**

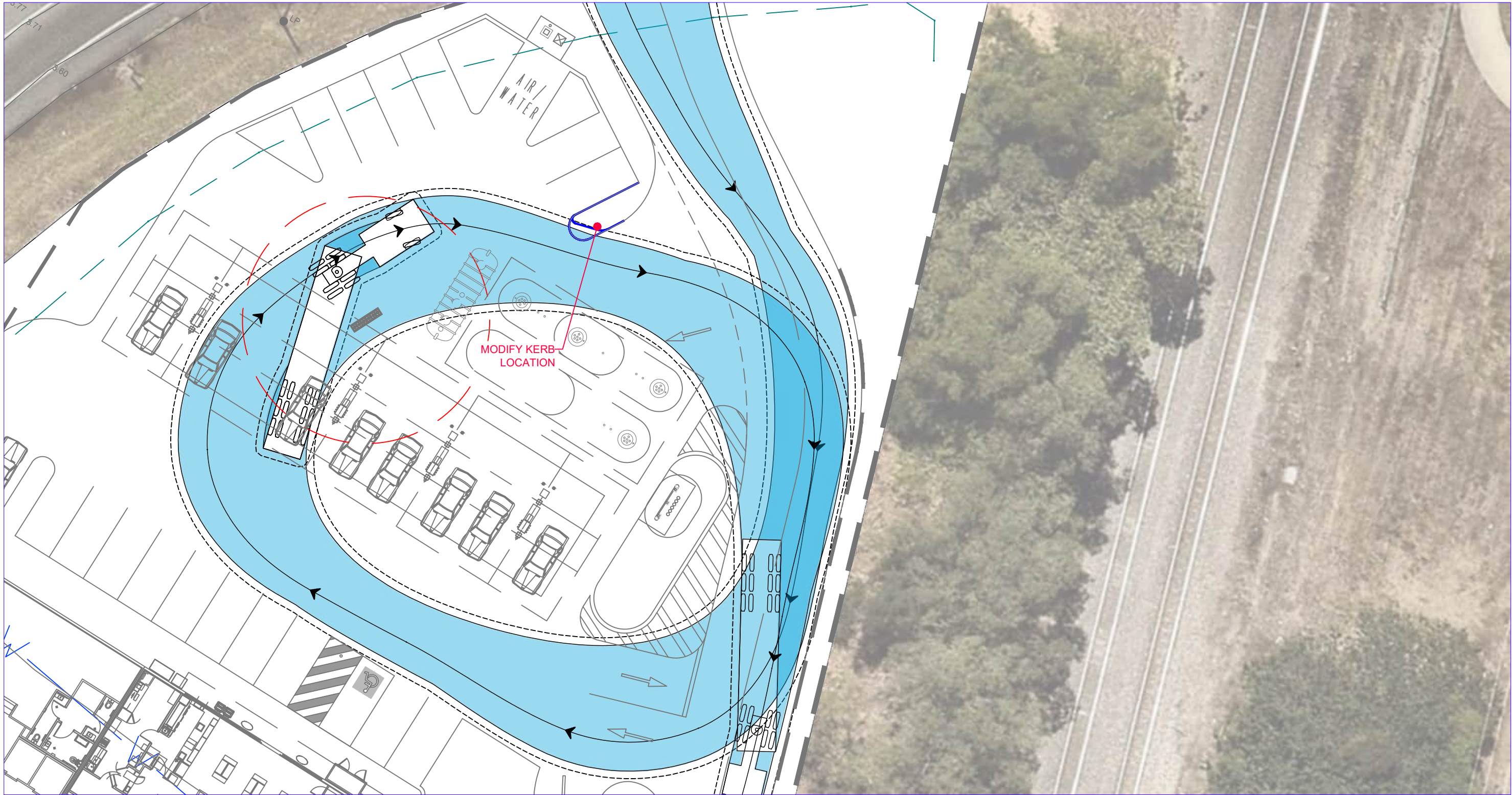
1 August 2026

REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
D	01-08-26	REVISED ARCHITECTURAL BASE	DSF	NS	SC
C	19-06-26	REVISED ARCHITECTURAL BASE	DSF	NS	SC
B	18-02-26	LAKESIDE DRIVE PROVIDED AS CHR(S)	DSF	SC	SC
A	30-01-26	ORIGINAL ISSUE	DSF	SC	SC



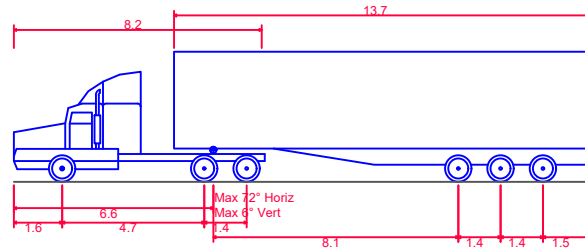
Colliers Colliers International Engineering & Design (TTMC) Pty Ltd
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PROJECT PROPOSED MIXED USE DEVELOPMENT 286 LAKESIDE DRIVE, OONOOBA, QLD 4811	PROJECT NUMBER 20BRT0472	ORIGINAL SIZE A3
DRAWING TITLE SWEPT PATH ANALYSIS (SOUTHERN ACCESS) 19.0m SEMI-TRAILER (ACCESS AREA)	DRAWING NUMBER 20BRT0472-23	REVISION D
	DATE 1 Aug 2026	SHEET 1 OF 1



NOTES:

1. MAPPING UNDERLAY PROVIDED BY NEARMAP. MAY BE SUBJECT TO DETAILED DESIGN & SITE SURVEY.
2. ALL UNITS SHOWN ARE IN METERS (m) UNLESS OTHERWISE NOTED



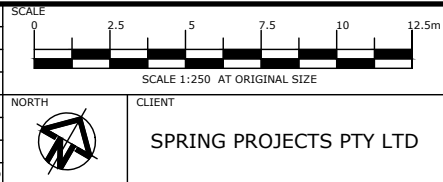
AV - Articulated Vehicle

Overall Length	19.000m
Overall Width	2.500m
Overall Body Height	4.301m
Min Body Ground Clearance	0.418m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12.500m
Design Speed Forward	5.00km/h
Clearance Envelope	0.500m

**PRELIMINARY
ADVICE ONLY**

1 August 2026

REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
D	01-08-26	REVISED ARCHITECTURAL BASE	DSF	NS	SC
C	19-06-26	REVISED ARCHITECTURAL BASE	DSF	NS	SC
B	18-02-26	LAKESIDE DRIVE PROVIDED AS CHR(S)	DSF	SC	SC
A	30-01-26	ORIGINAL ISSUE	DSF	SC	SC



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PROJECT PROPOSED MIXED USE DEVELOPMENT 286 LAKESIDE DRIVE, OONOOBA, QLD 4811
DRAWING TITLE SWEPT PATH ANALYSIS (SOUTHERN ENTRY ACCESS) OPTION 1 - 19.0m SEMI-TRAILER (INTERNAL AREA)

PROJECT NUMBER 20BRT0472	ORIGINAL SIZE A3
DRAWING NUMBER 20BRT0472-24	REVISION D
DATE 1 Aug 2026	SHEET 1 OF 1



NOTES:

1. MAPPING UNDERLAY PROVIDED BY NEARMAP. MAY BE SUBJECT TO DETAILED DESIGN & SITE SURVEY.
2. ALL UNITS SHOWN ARE IN METERS (m) UNLESS OTHERWISE NOTED

**PRELIMINARY
ADVICE ONLY**
1 August 2026

REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
D	01-08-26	REVISED ARCHITECTURAL BASE	DSF	NS	SC
C	19-06-26	REVISED ARCHITECTURAL BASE	DSF	NS	SC
B	18-02-26	LAKESIDE DRIVE PROVIDED AS CHR(S)	DSF	SC	SC
A	30-01-26	ORIGINAL ISSUE	DSF	SC	SC

SCALE
0 10 20 30 40m
SCALE 1:750 AT ORIGINAL SIZE

NORTH

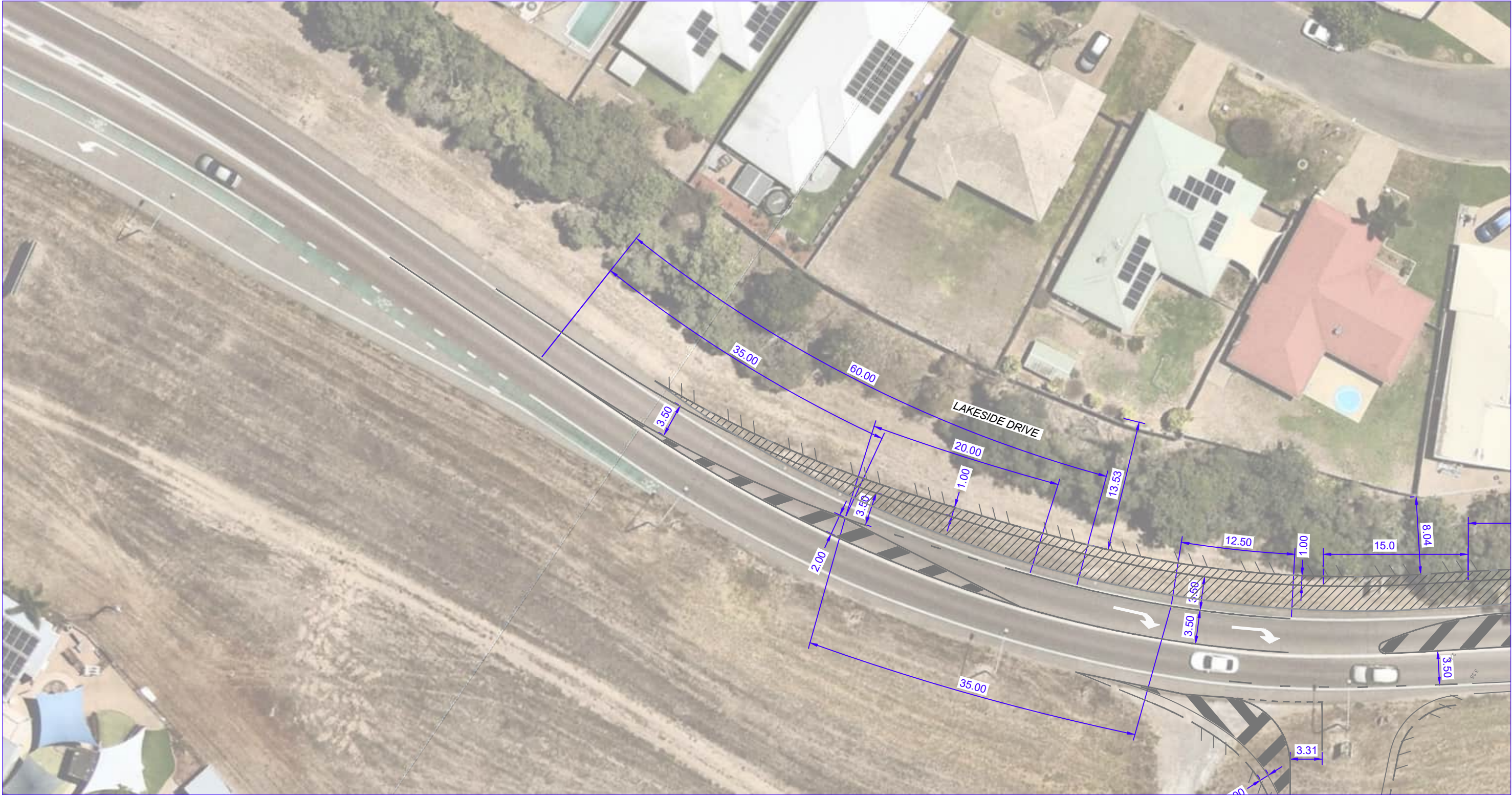
CLIENT
SPRING PROJECTS PTY LTD

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PROJECT
**PROPOSED MIXED USE DEVELOPMENT
286 LAKESIDE DRIVE, OONOOBA, QLD 4811**

DRAWING TITLE
**FUNCTIONAL CONCEPT - LAKESIDE DRIVE (SOUTHERN ACCESS)
PROPOSED CHR(S) SITE ACCESS (OVERALL)**

PROJECT NUMBER 20BRT0472	ORIGINAL SIZE A3
DRAWING NUMBER 20BRT0472-25	REVISION D
DATE 1 Aug 2026	SHEET 1 OF 1



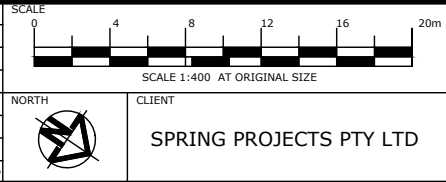
NOTES:

1. MAPPING UNDERLAY PROVIDED BY NEARMAP. MAY BE SUBJECT TO DETAILED DESIGN & SITE SURVEY.
2. ALL UNITS SHOWN ARE IN METERS (m) UNLESS OTHERWISE NOTED

**PRELIMINARY
ADVICE ONLY**

1 August 2026

REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
D	01-08-26	REVISED ARCHITECTURAL BASE	DSF	NS	SC
C	19-06-26	REVISED ARCHITECTURAL BASE	DSF	NS	SC
B	18-02-26	LAKESIDE DRIVE PROVIDED AS CHR(S)	DSF	SC	SC
A	30-01-26	ORIGINAL ISSUE	DSF	SC	SC

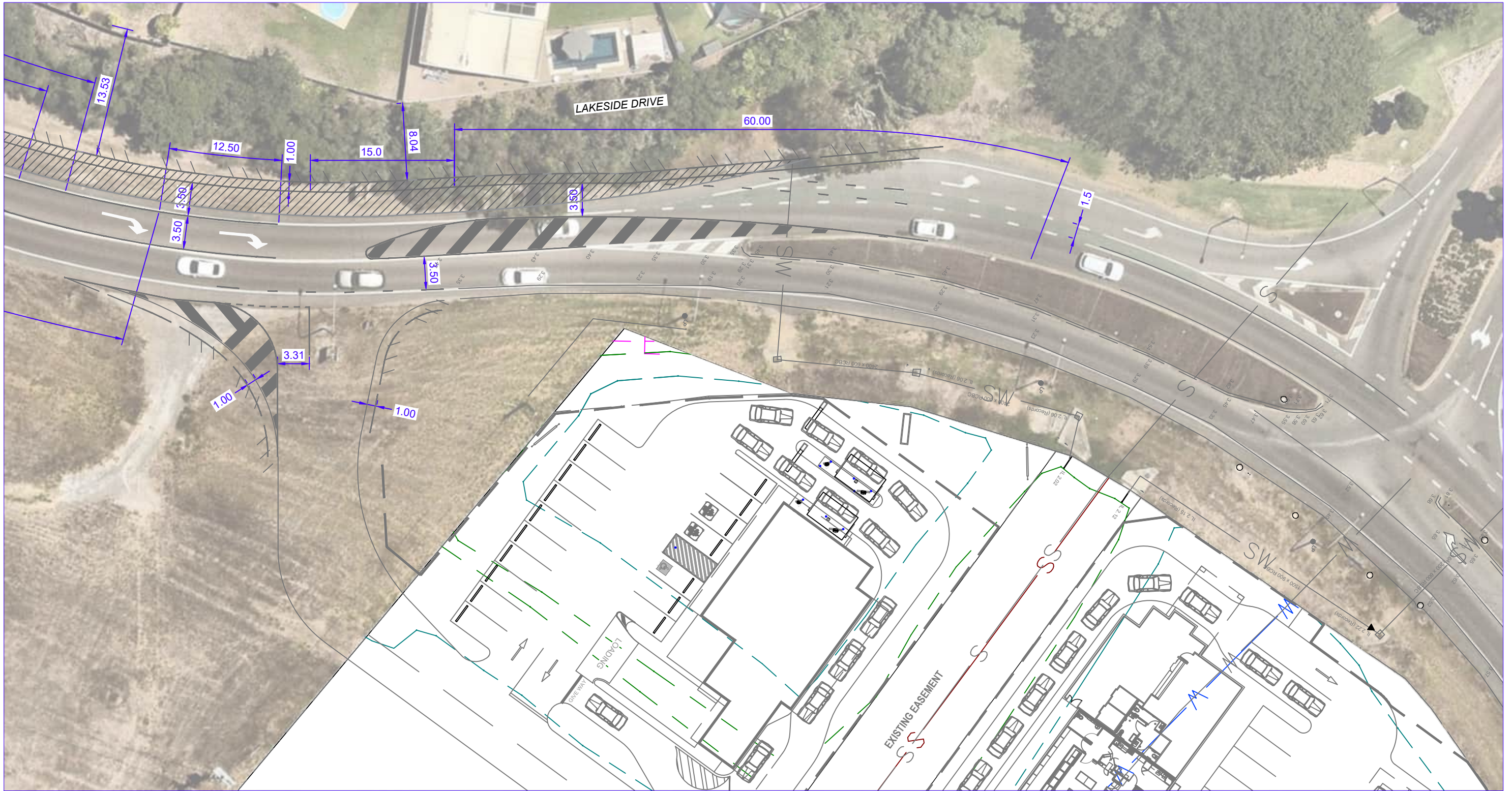


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PROJECT PROPOSED MIXED USE DEVELOPMENT 286 LAKESIDE DRIVE, OONOOBA, QLD 4811
DRAWING TITLE FUNCTIONAL CONCEPT - LAKESIDE DRIVE (SOUTHERN ACCESS) DIMENSIONS FOR PROPOSED CHR(S) SITE ACCESS (SOUTHERN AREA)

PROJECT NUMBER 20BRT0472	ORIGINAL SIZE A3
DRAWING NUMBER 20BRT0472-26	REVISION D
DATE 1 Aug 2026	SHEET 1 OF 1



- NOTES:**
- MAPPING UNDERLAY PROVIDED BY NEARMAP. MAY BE SUBJECT TO DETAILED DESIGN & SITE SURVEY.
 - ALL UNITS SHOWN ARE IN METERS (m) UNLESS OTHERWISE NOTED

**PRELIMINARY
ADVICE ONLY**
1 August 2026

REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
D	01-08-26	REVISED ARCHITECTURAL BASE	DSF	NS	SC
C	19-06-26	REVISED ARCHITECTURAL BASE	DSF	NS	SC
B	18-02-26	LAKESIDE DRIVE PROVIDED AS CHR(S)	DSF	SC	SC
A	30-01-26	ORIGINAL ISSUE	DSF	SC	SC

SCALE 0 4 8 12 16 20m SCALE 1:400 AT ORIGINAL SIZE	NORTH 	CLIENT SPRING PROJECTS PTY LTD
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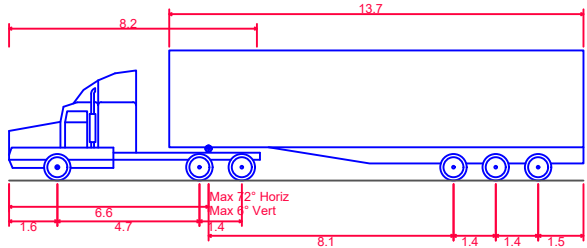
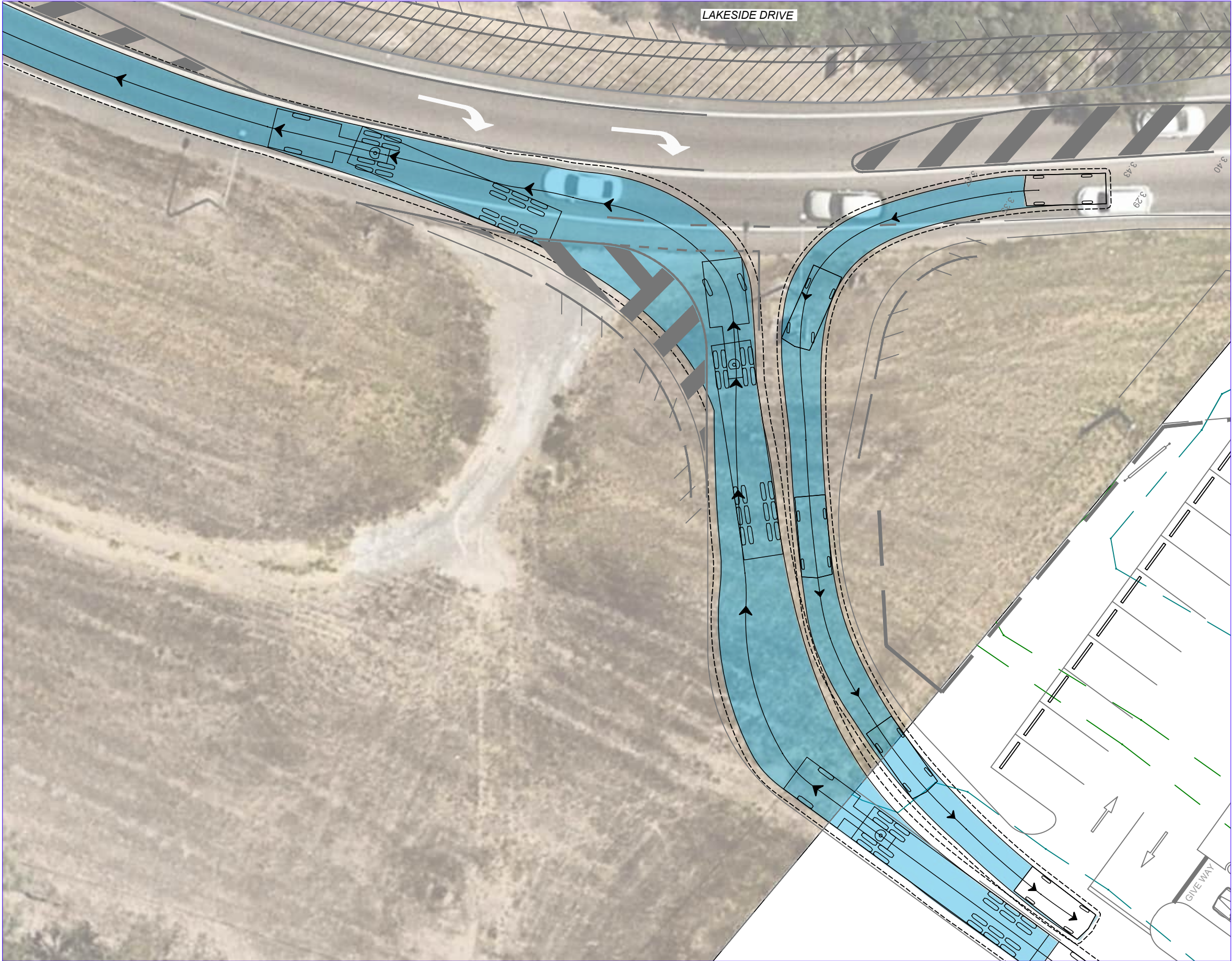


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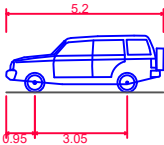
PROJECT PROPOSED MIXED USE DEVELOPMENT 286 LAKESIDE DRIVE, OONOOBA, QLD 4811	PROJECT NUMBER 20BRT0472
DRAWING TITLE FUNCTIONAL CONCEPT - LAKESIDE DRIVE (SOUTHERN ACCESS) DIMENSIONS FOR PROPOSED CHR(S) SITE ACCESS (NORTHERN AREA)	DRAWING NUMBER 20BRT0472-27
	DATE 1 Aug 2026

ORIGINAL SIZE A3	REVISION D
SHEET 1 OF 1	

20BRT0472-F05 V00 LAYOUT REVIEW.DWG



AV - Articulated Vehicle
Overall Length 19.000m
Overall Width 2.500m
Overall Body Height 4.301m
Min Body Ground Clearance 0.418m
Track Width 2.500m
Lock-to-lock time 6.00s
Curb to Curb Turning Radius 12.500m
Design Speed Forward 5.00km/h
Clearance Envelope 0.500m

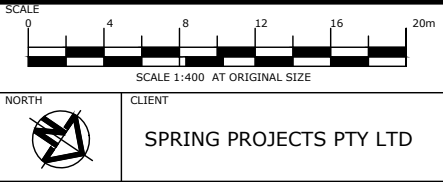


B99 Vehicle (Realistic min radius) (2004)
Overall Length 5.200m
Overall Width 1.940m
Overall Body Height 1.878m
Min Body Ground Clearance 0.272m
Track Width 1.840m
Lock-to-lock time 6.00s
Curb to Curb Turning Radius 6.250m
Design Speed Forward 5.00km/h
Clearance Envelope 0.300m

**PRELIMINARY
ADVICE ONLY**
1 August 2026

- NOTES:**
- MAPPING UNDERLAY PROVIDED BY NEARMAP. MAY BE SUBJECT TO DETAILED DESIGN & SITE SURVEY.
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REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
D	01-08-26	REVISED ARCHITECTURAL BASE	DSF	NS	SC
C	19-06-26	REVISED ARCHITECTURAL BASE	DSF	NS	SC
B	18-02-26	LAKESIDE DRIVE PROVIDED AS CHR(S)	DSF	SC	SC
A	30-01-26	ORIGINAL ISSUE	DSF	SC	SC

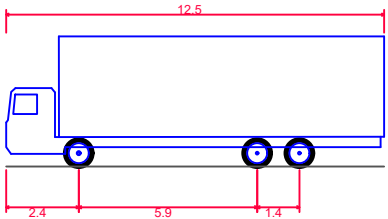
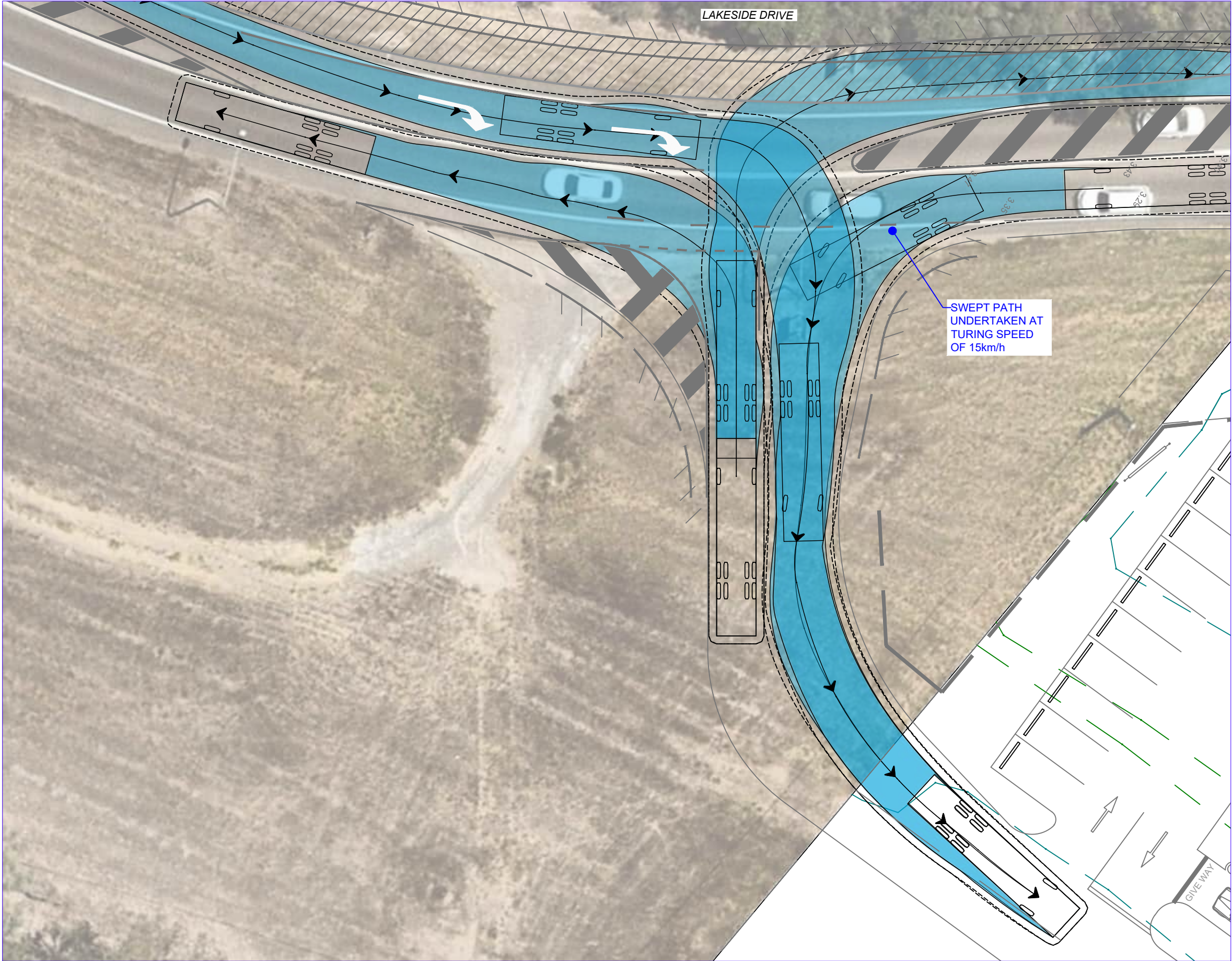




Colliers International Engineering & Design (TTMC) Pty Ltd
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CLIENT
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PROJECT PROPOSED MIXED USE DEVELOPMENT 286 LAKESIDE DRIVE, OONOOBA, QLD 4811	PROJECT NUMBER 20BRT0472	ORIGINAL SIZE A3
DRAWING TITLE SWEPT PATH ANALYSIS (SOUTHERN ACCESS) 19.0m SEMI-TRAILER WITH PASSING 5.2m (B99) LARGE CAR	DRAWING NUMBER 20BRT0472-28	REVISION D
	DATE 1 Aug 2026	SHEET 1 OF 1



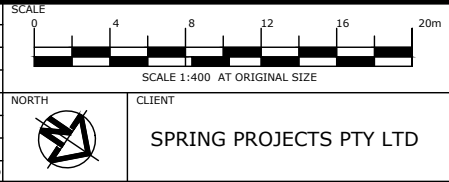
HRV 12.5m
Overall Length 12.500m
Overall Width 2.500m
Overall Body Height 4.300m
Min Body Ground Clearance 0.417m
Track Width 2.500m
Lock-to-lock time 6.00s
Curb to Curb Turning Radius 12.500m
Design Speed Forward 5.00km/h
Clearance Envelope 0.500m

**PRELIMINARY
ADVICE ONLY**

1 August 2026

- NOTES:**
- MAPPING UNDERLAY PROVIDED BY NEARMAP. MAY BE SUBJECT TO DETAILED DESIGN & SITE SURVEY.
 - ALL UNITS SHOWN ARE IN METERS (m) UNLESS OTHERWISE NOTED

REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
D	01-08-26	REVISED ARCHITECTURAL BASE	DSF	NS	SC
C	19-06-26	REVISED ARCHITECTURAL BASE	DSF	NS	SC
B	18-02-26	LAKESIDE DRIVE PROVIDED AS CHR(S)	DSF	SC	SC
A	30-01-26	ORIGINAL ISSUE	DSF	SC	SC





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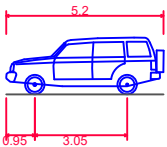
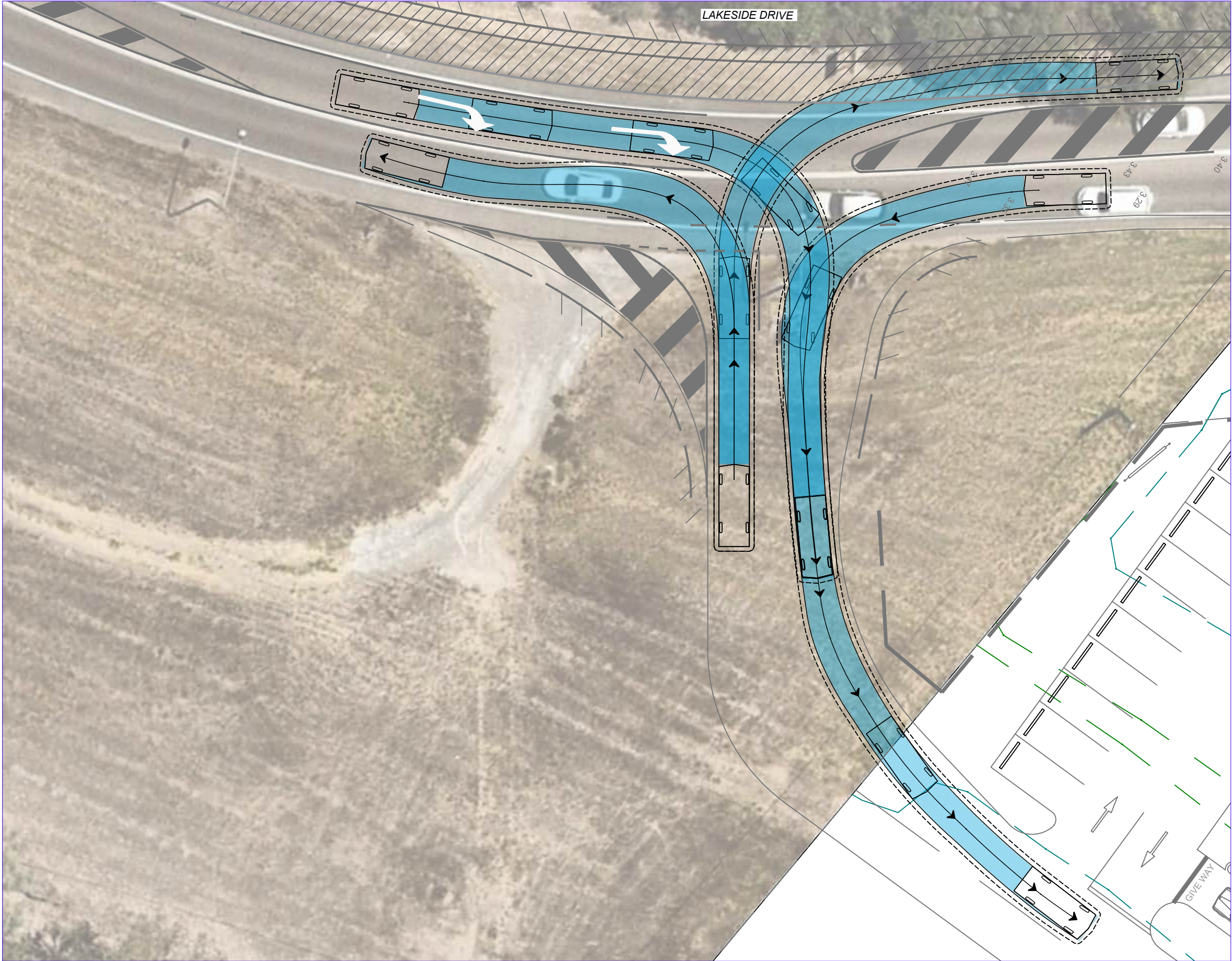
CLIENT
SPRING PROJECTS PTY LTD

PROJECT
PROPOSED MIXED USE DEVELOPMENT
286 LAKESIDE DRIVE, OONOOBA, QLD 4811

DRAWING TITLE
SWEPT PATH ANALYSIS (SOUTHERN ACCESS)
12.5m HEAVY RIGID VEHICLE

PROJECT NUMBER 20BRT0472	ORIGINAL SIZE A3
DRAWING NUMBER 20BRT0472-29	REVISION D
DATE 1 Aug 2026	SHEET 1 OF 1

20BRT0472-F05 V00 LAYOUT REVIEW.DWG

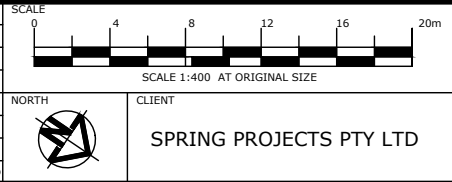


B99 Vehicle (Realistic min radius) (2004)
Overall Length 5.200m
Overall Width 1.940m
Overall Body Height 1.878m
Min Body Ground Clearance 0.272m
Track Width 1.840m
Lock-to-lock time 6.00s
Curb to Curb Turning Radius 6.250m
Design Speed Forward 15.00km/h
Clearance Envelope 0.300m

**PRELIMINARY
ADVICE ONLY**
1 August 2026

- NOTES:**
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REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
D	01-08-26	REVISED ARCHITECTURAL BASE	DSF	NS	SC
C	19-06-26	REVISED ARCHITECTURAL BASE	DSF	NS	SC
B	18-02-26	LAKESIDE DRIVE PROVIDED AS CHR(S)	DSF	SC	SC
A	30-01-26	ORIGINAL ISSUE	DSF	SC	SC

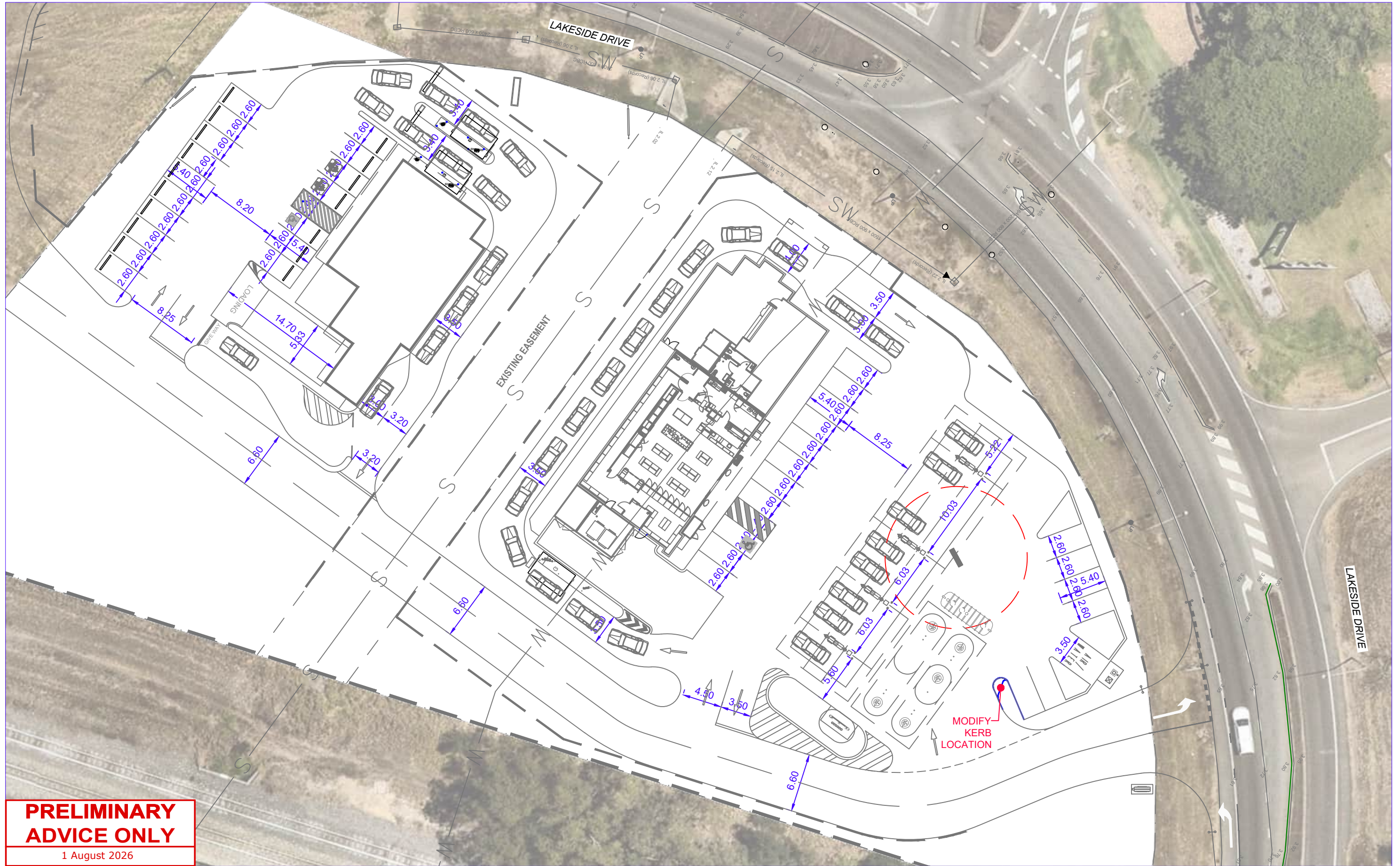


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PROJECT
PROPOSED MIXED USE DEVELOPMENT
286 LAKESIDE DRIVE, OONOOBA, QLD 4811
DRAWING TITLE
FUNCTIONAL CONCEPT - LAKESIDE DRIVE (SOUTHERN ACCESS)
5.2m (B99) LARGE CAR

PROJECT NUMBER	20BRT0472	ORIGINAL SIZE	A3
DRAWING NUMBER	20BRT0472-30	REVISION	D
DATE	1 Aug 2026	SHEET	1 OF 1

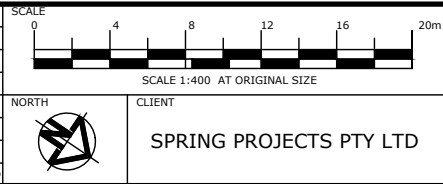
20BRT0472-F05 V00 LAYOUT REVIEW.DWG



**PRELIMINARY
ADVICE ONLY**

1 August 2026

REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
B	01-08-26	REVISED ARCHITECTURAL BASE	DSF	NS	SC
A	19-06-26	ORIGINAL ISSUE	DSF	NS	SC

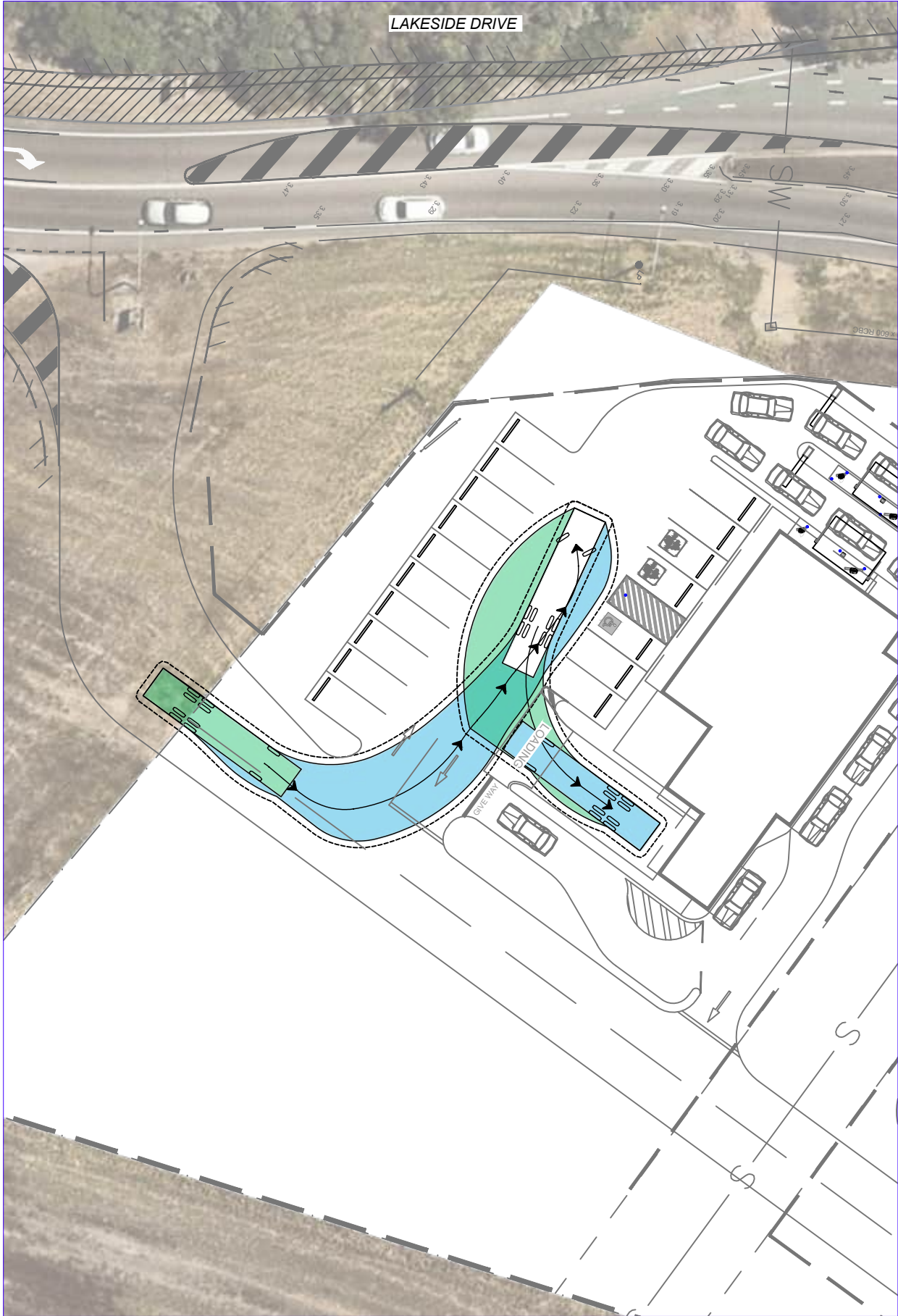


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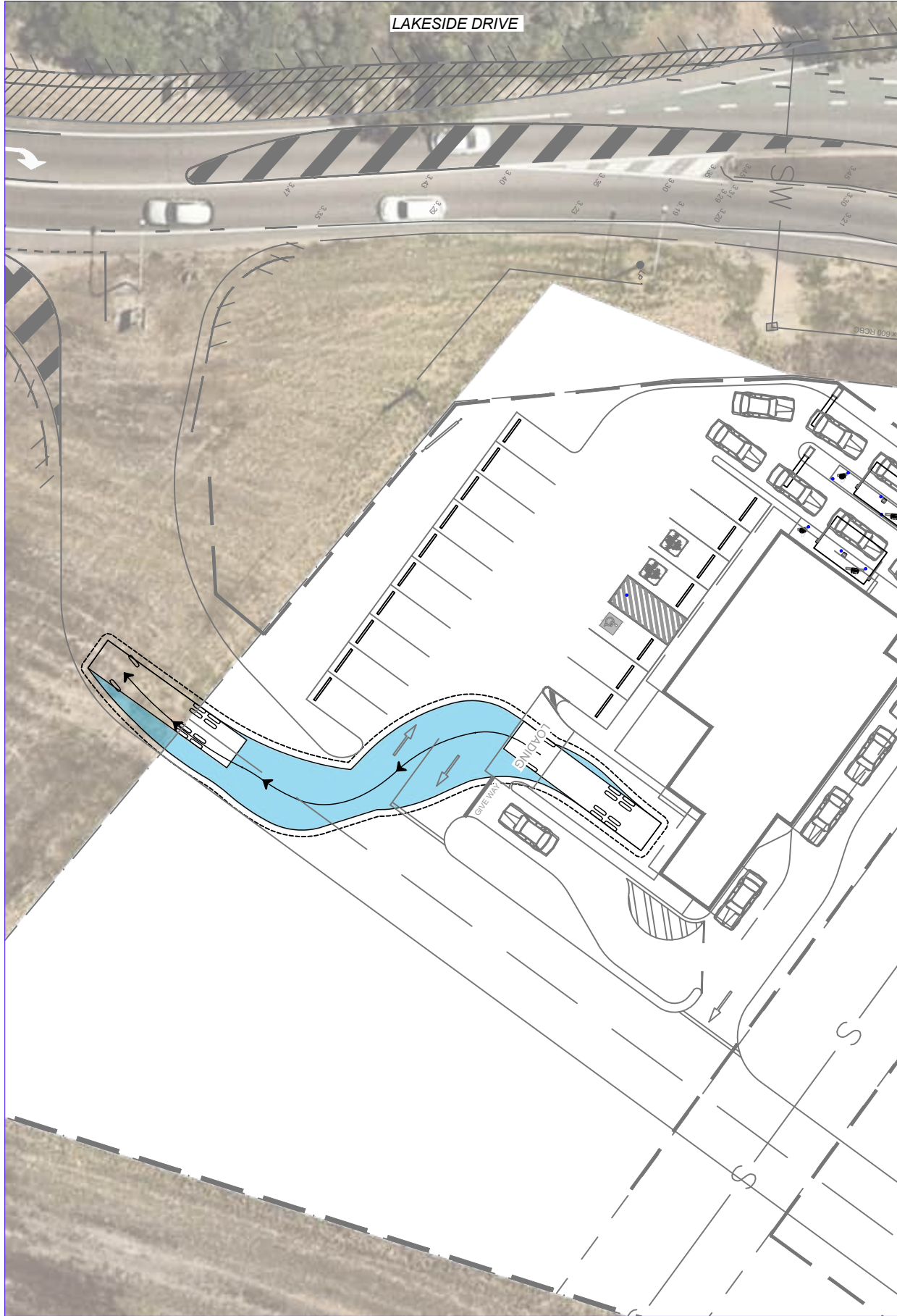
PROJECT **PROPOSED MIXED USE DEVELOPMENT
286 LAKESIDE DRIVE, OONOOBA, QLD 4811**

DRAWING TITLE **SWEPT PATH ANALYSIS - SOUTHERN TENANCY
12.5m HEAVY RIGID VEHICLE ACCESSING LOADING BAY**

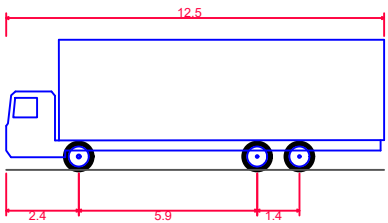
PROJECT NUMBER 20BRT0472	ORIGINAL SIZE A3
DRAWING NUMBER 20BRT0472-31	REVISION B
DATE 1 Aug 2026	SHEET 1 OF 1



INGRESS MANOEUVRE



INGRESS MANOEUVRE



HRV 12.5m
Overall Length 12.500m
Overall Width 2.500m
Overall Body Height 4.300m
Min Body Ground Clearance 0.417m
Track Width 2.500m
Lock-to-lock time 6.00s
Curb to Curb Turning Radius 12.500m
Design Speed Forward 5.00km/h
Clearance Envelope 0.500m

**PRELIMINARY
ADVICE ONLY**
1 August 2026

REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
B	01-08-26	REVISED ARCHITECTURAL BASE	DSF	NS	SC
A	19-06-26	ORIGINAL ISSUE	DSF	NS	SC

SCALE 0 4 8 12 16 20m
SCALE 1:400 AT ORIGINAL SIZE

NORTH

CLIENT
SPRING PROJECTS PTY LTD

Colliers

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PROJECT **PROPOSED MIXED USE DEVELOPMENT
286 LAKESIDE DRIVE, OONOOBA, QLD 4811**

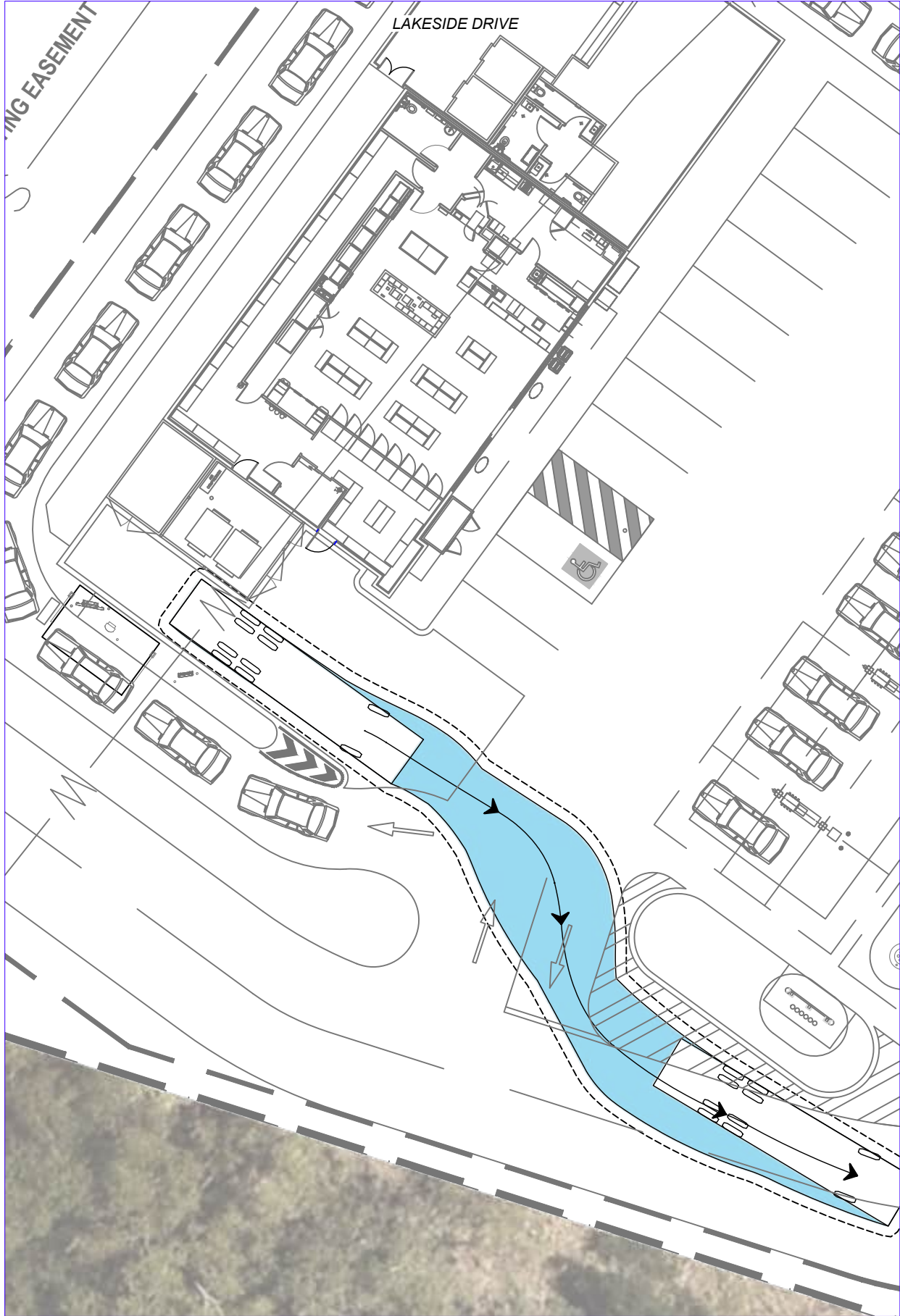
DRAWING TITLE **SWEPT PATH ANALYSIS - SOUTHERN TENANCY
12.5m HEAVY RIGID VEHICLE ACCESSING LOADING BAY**

PROJECT NUMBER 20BRT0472	ORIGINAL SIZE A3
DRAWING NUMBER 20BRT0472-32	REVISION B
DATE 1 Aug 2026	SHEET 1 OF 1

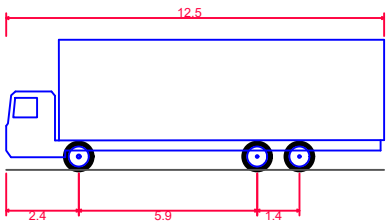
20BRT0472-F05 V00 LAYOUT REVIEW.DWG



INGRESS MANOEUVRE



INGRESS MANOEUVRE



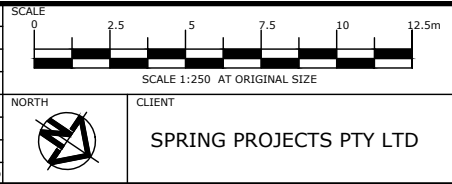
HRV 12.5m
Overall Length 12.500m
Overall Width 2.500m
Overall Body Height 4.300m
Min Body Ground Clearance 0.417m
Track Width 2.500m
Lock-to-lock time 6.00s
Curb to Curb Turning Radius 12.500m
Design Speed Forward 5.00km/h
Clearance Envelope 0.500m

**PRELIMINARY
ADVICE ONLY**

1 August 2026

20BRT0472-F05 V00 LAYOUT REVIEW.DWG

REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
B	01-08-26	REVISED ARCHITECTURAL BASE	DSF	NS	SC
A	19-06-26	ORIGINAL ISSUE	DSF	NS	SC



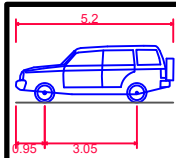
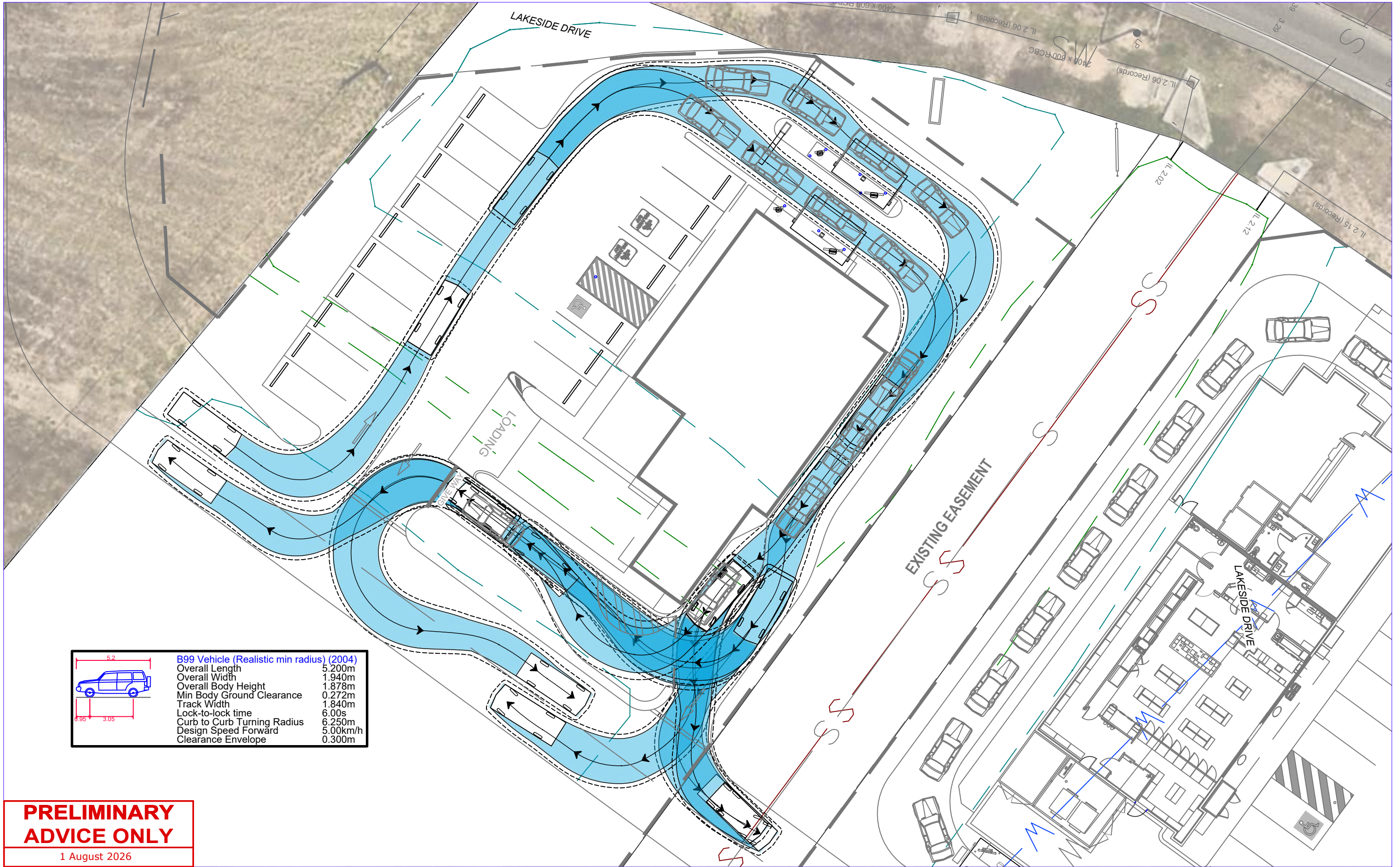


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PROJECT **PROPOSED MIXED USE DEVELOPMENT
286 LAKESIDE DRIVE, OONOOBA, QLD 4811**

DRAWING TITLE **SWEPT PATH ANALYSIS - NORTHERN TENANCY
12.5m HEAVY RIGID VEHICLE ACCESSING LOADING BAY**

PROJECT NUMBER 20BRT0472	ORIGINAL SIZE A3
DRAWING NUMBER 20BRT0472-33	REVISION B
DATE 1 Aug 2026	SHEET 1 OF 1



B99 Vehicle (Realistic min radius) (2004)
Overall Length 5.200m
Overall Width 1.940m
Overall Body Height 1.878m
Min Body Ground Clearance 0.272m
Track Width 1.840m
Lock-to-lock time 6.00s
Curb to Curb Turning Radius 6.250m
Design Speed Forward 5.00km/h
Clearance Envelope 0.300m

**PRELIMINARY
ADVICE ONLY**

1 August 2026



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**Colliers International Engineering
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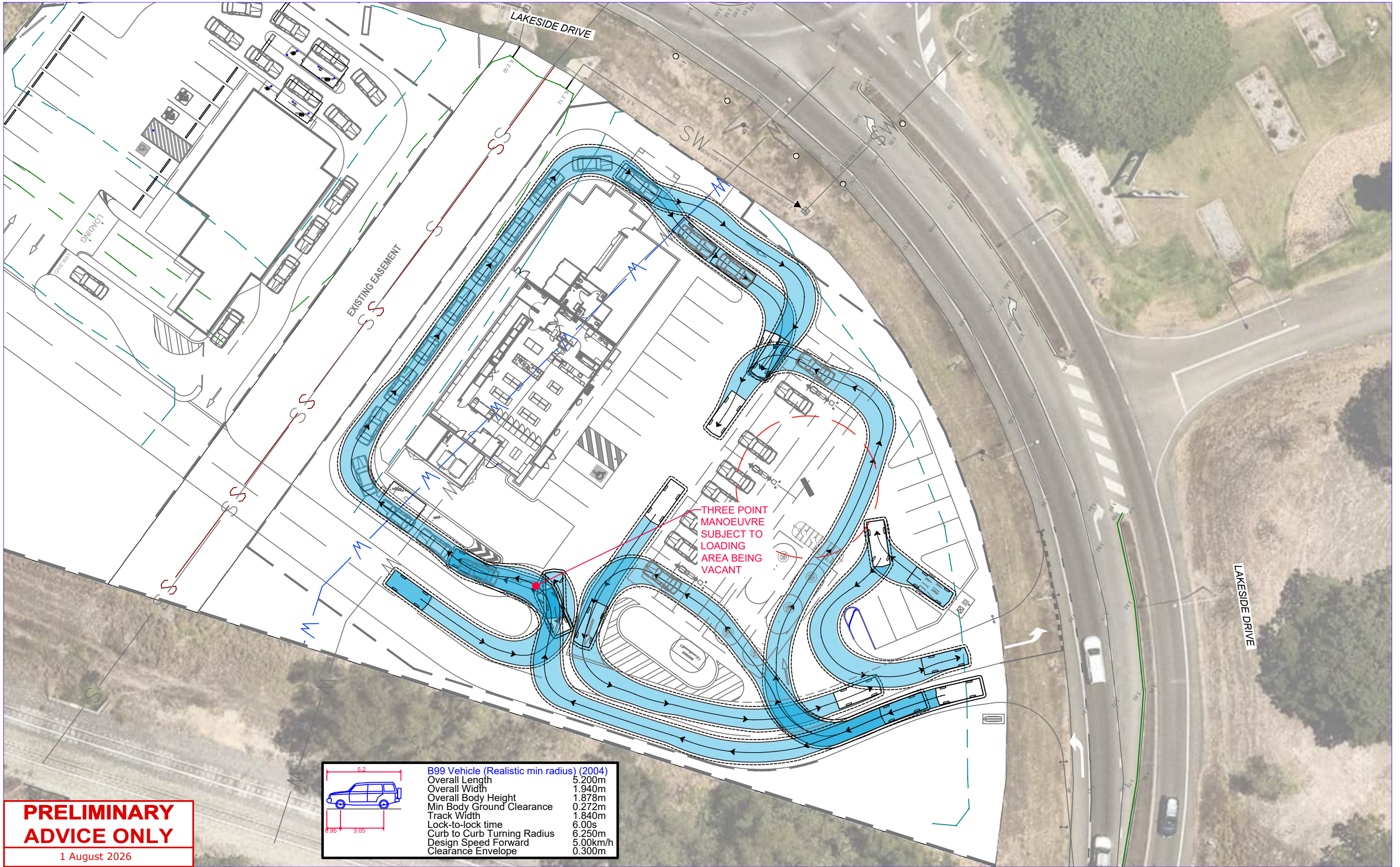
PROJECT
**PROPOSED MIXED USE DEVELOPMENT
286 LAKESIDE DRIVE, OONOOBA, QLD 4811**

DRAWING TITLE
**SWEPT PATH ANALYSIS - SOUTHERN TENANCY
5.2m (B99) LARGE CAR**

PROJECT NUMBER
20BRT0472 ORIGINAL SIZE
A3

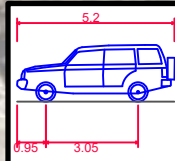
DRAWING NUMBER
20BRT0472-34 REVISION
B

DATE
1 Aug 2026 SHEET
1 OF 1



**PRELIMINARY
ADVICE ONLY**

1 August 2026



B99 Vehicle (Realistic min radius) (2004)
Overall Length 5.200m
Overall Width 1.940m
Overall Body Height 1.878m
Min Body Ground Clearance 0.272m
Track Width 1.840m
Lock-to-lock time 6.00s
Curb to Curb Turning Radius 6.250m
Design Speed Forward 5.00km/h
Clearance Envelope 0.300m



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PROJECT
**PROPOSED MIXED USE DEVELOPMENT
286 LAKESIDE DRIVE, OONOOBA, QLD 4811**

DRAWING TITLE
**SWEPT PATH ANALYSIS - NORTHERN TENANCY
5.2m (B99) LARGE CAR**

PROJECT NUMBER
20BRT0472

ORIGINAL SIZE
A3

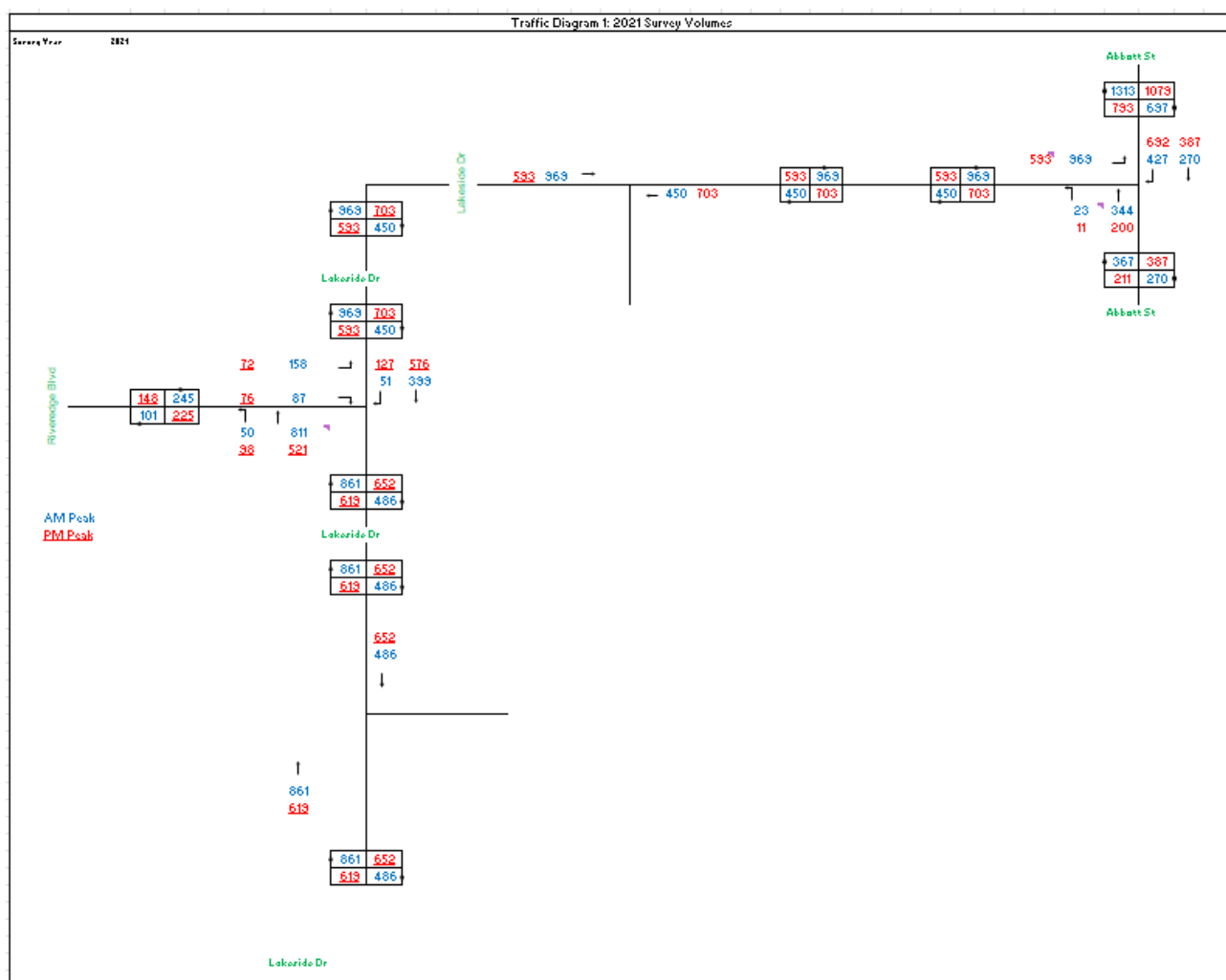
DRAWING NUMBER
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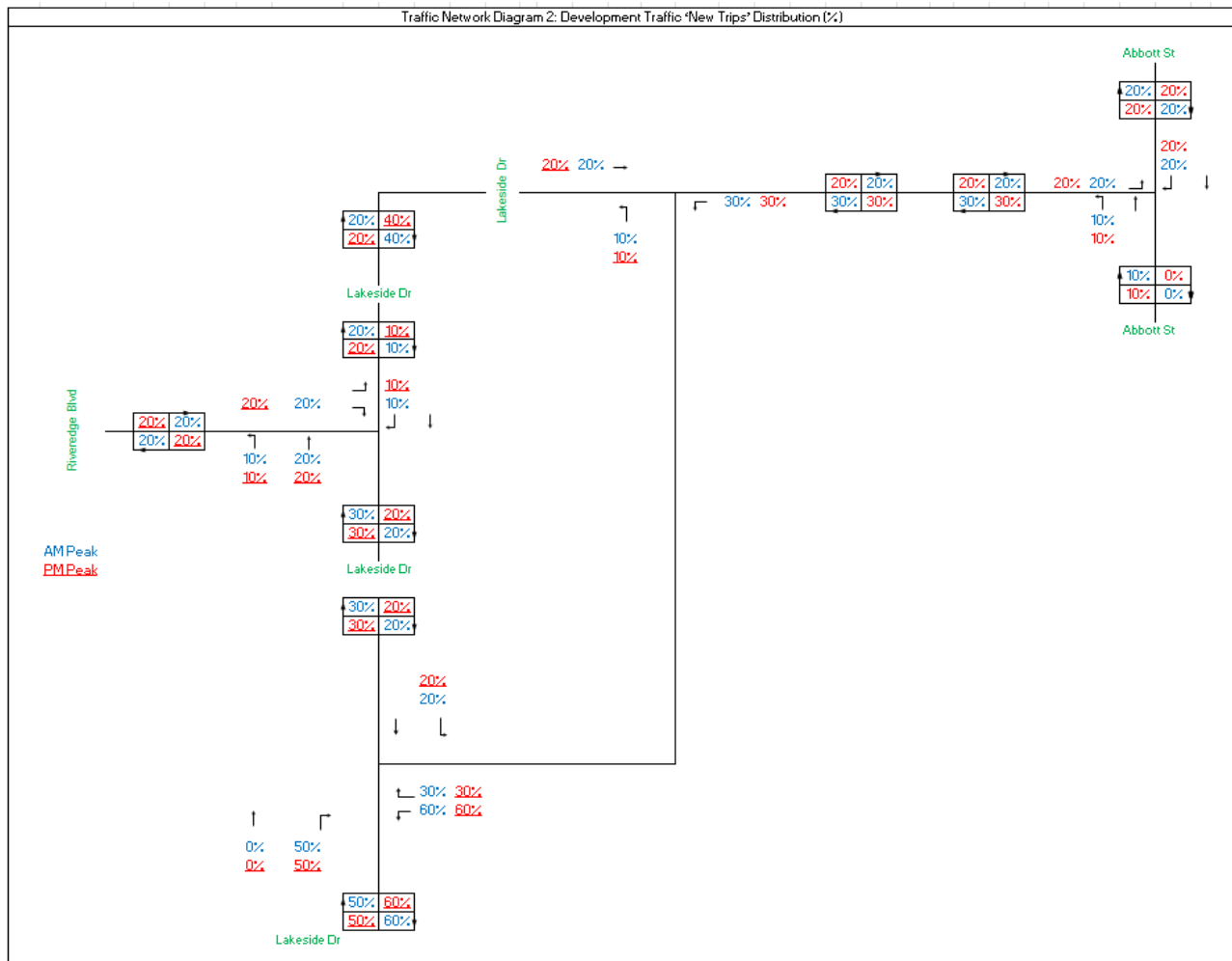
REVISION
B

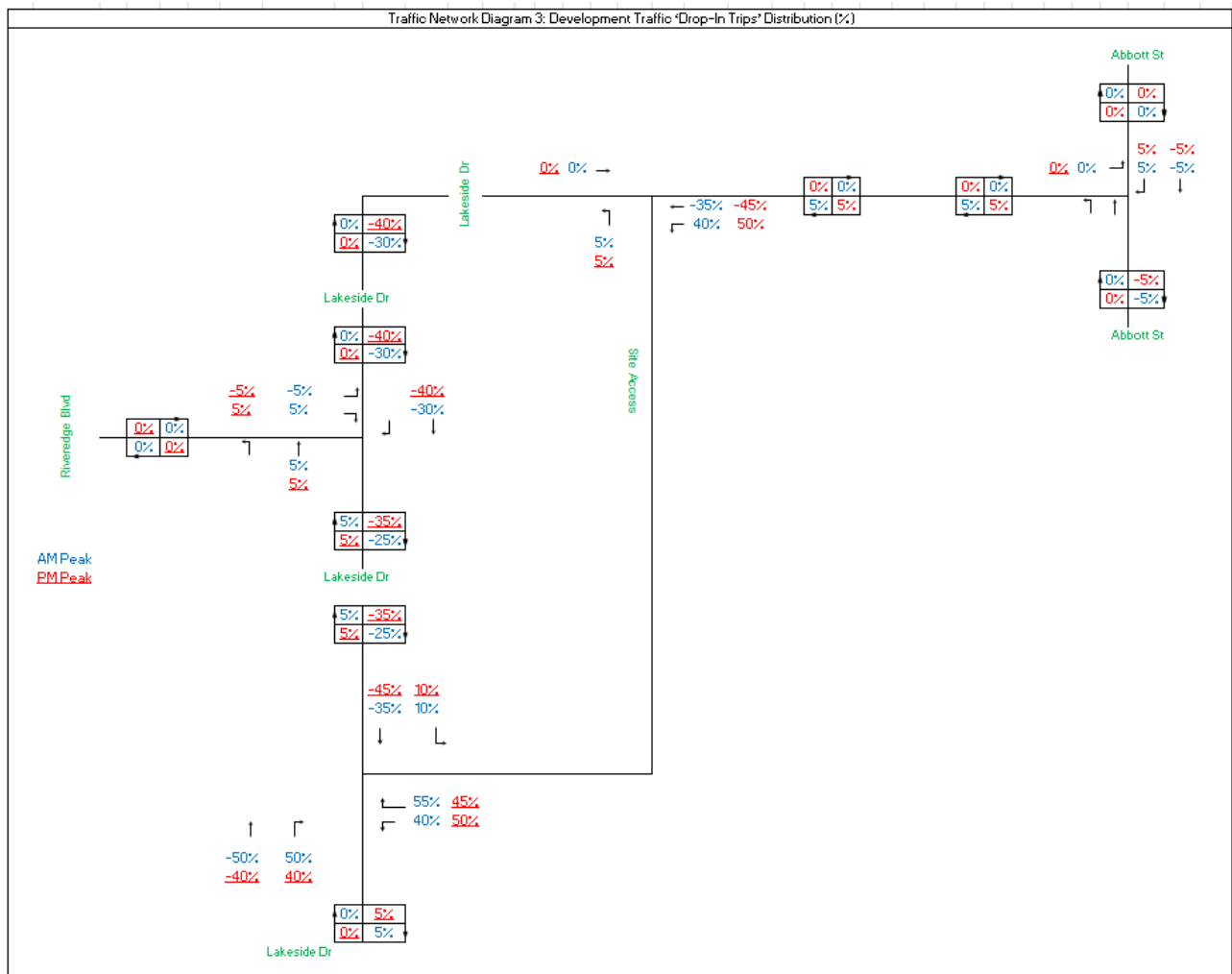
DATE
1 Aug 2026

SHEET
1 OF 1

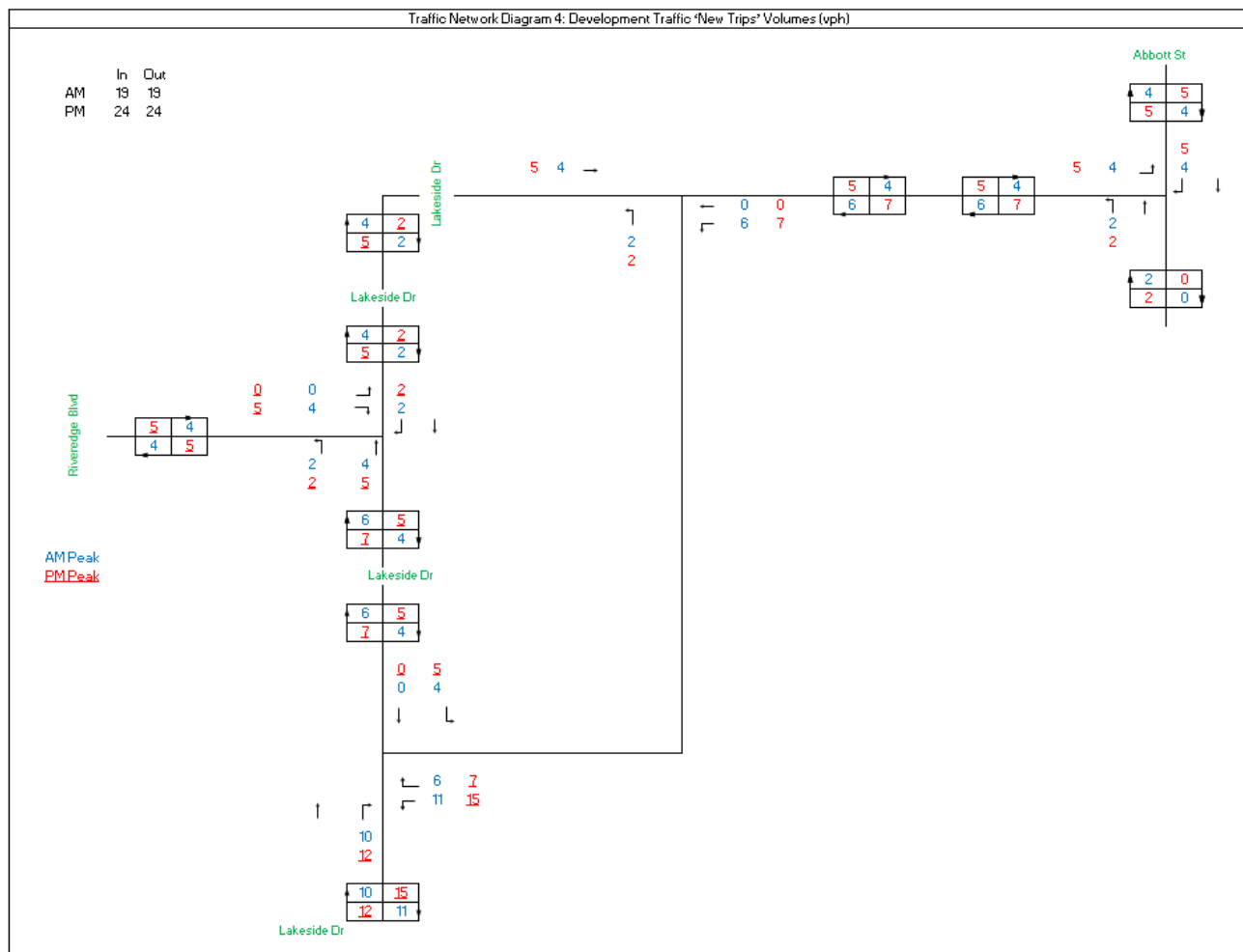
Appendix C Traffic Network Diagrams







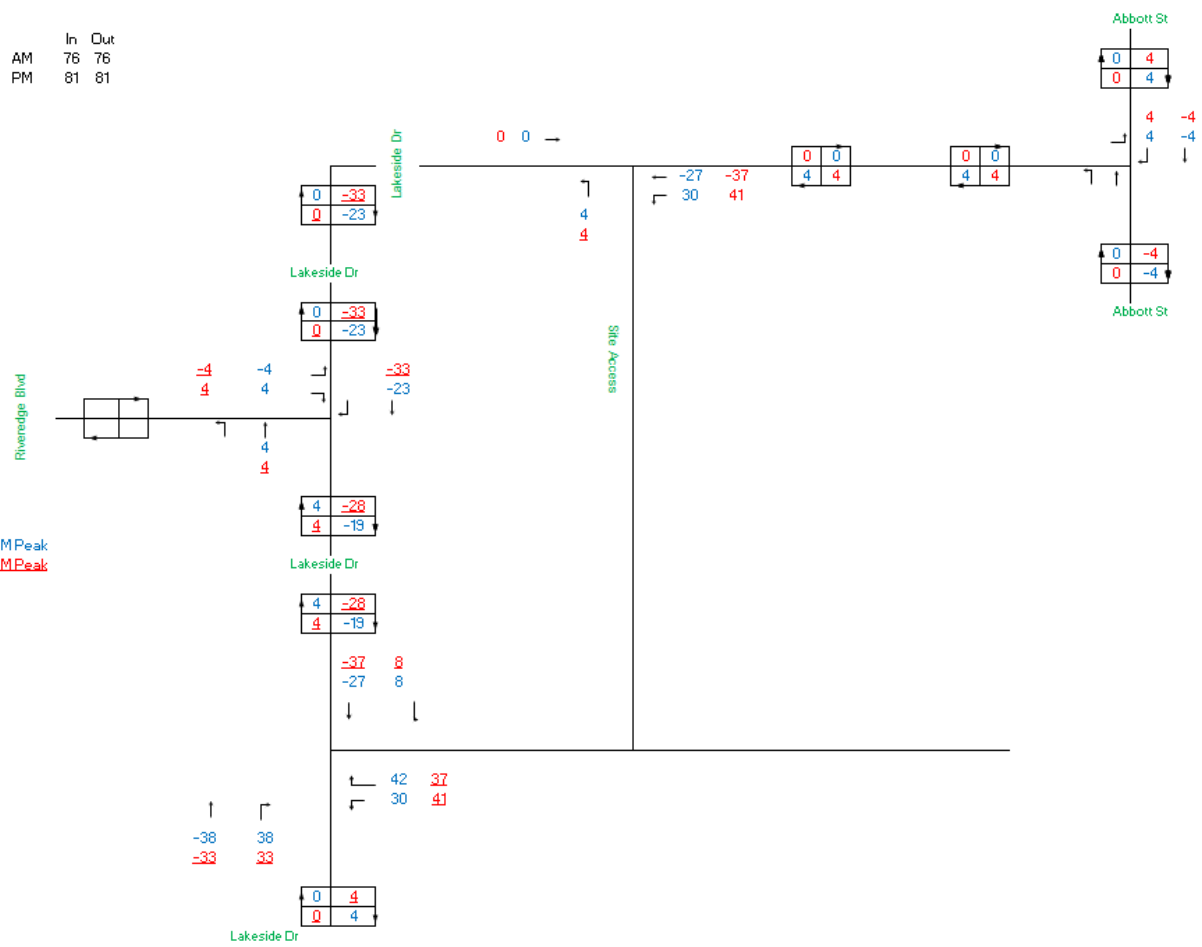
Traffic Network Diagram 4: Development Traffic 'New Trips' Volumes (vph)



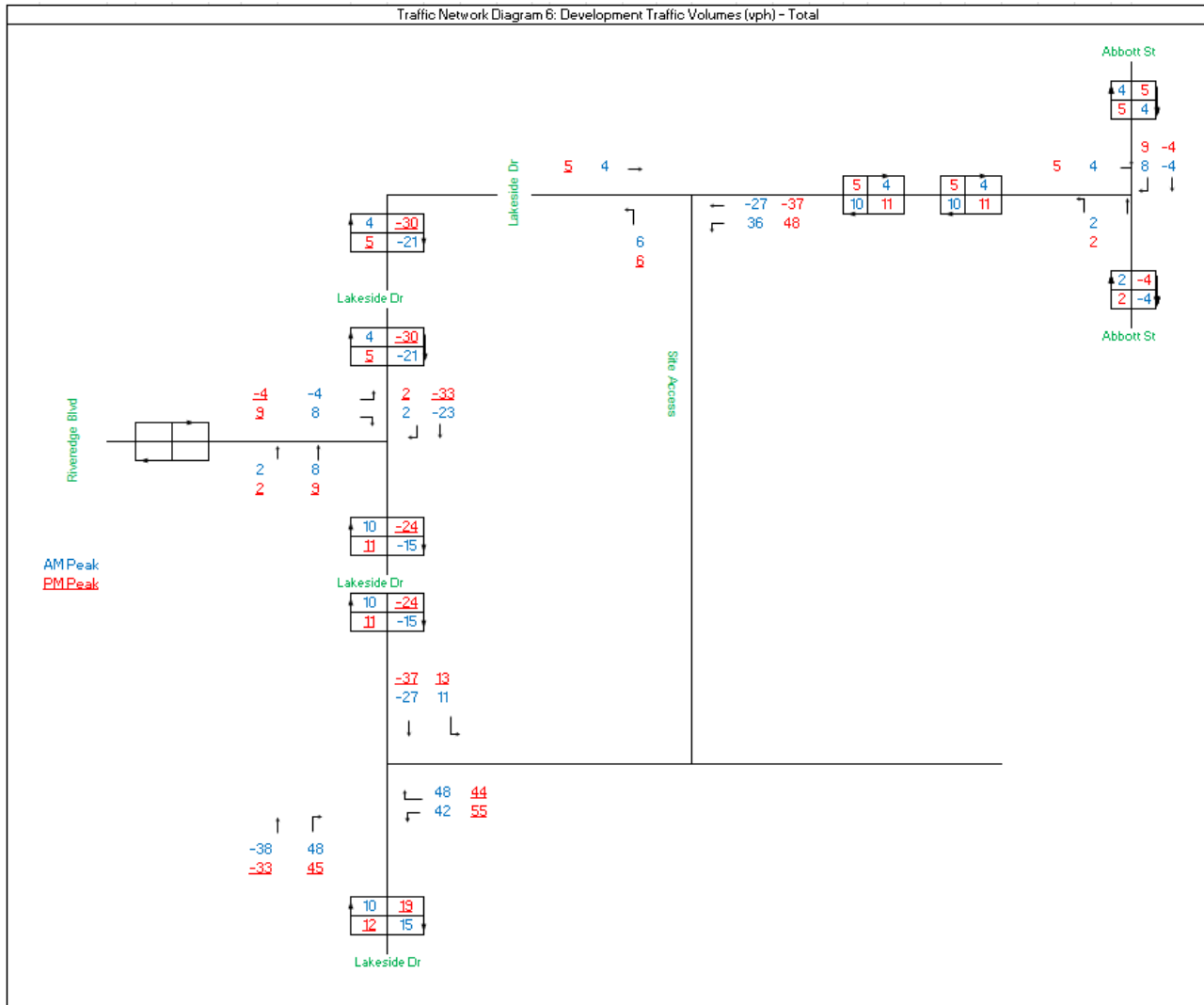
Traffic Network Diagram 5: Development Traffic "Drop-In Trips" Volumes (vph)

	In	Out
AM	76	76
PM	81	81

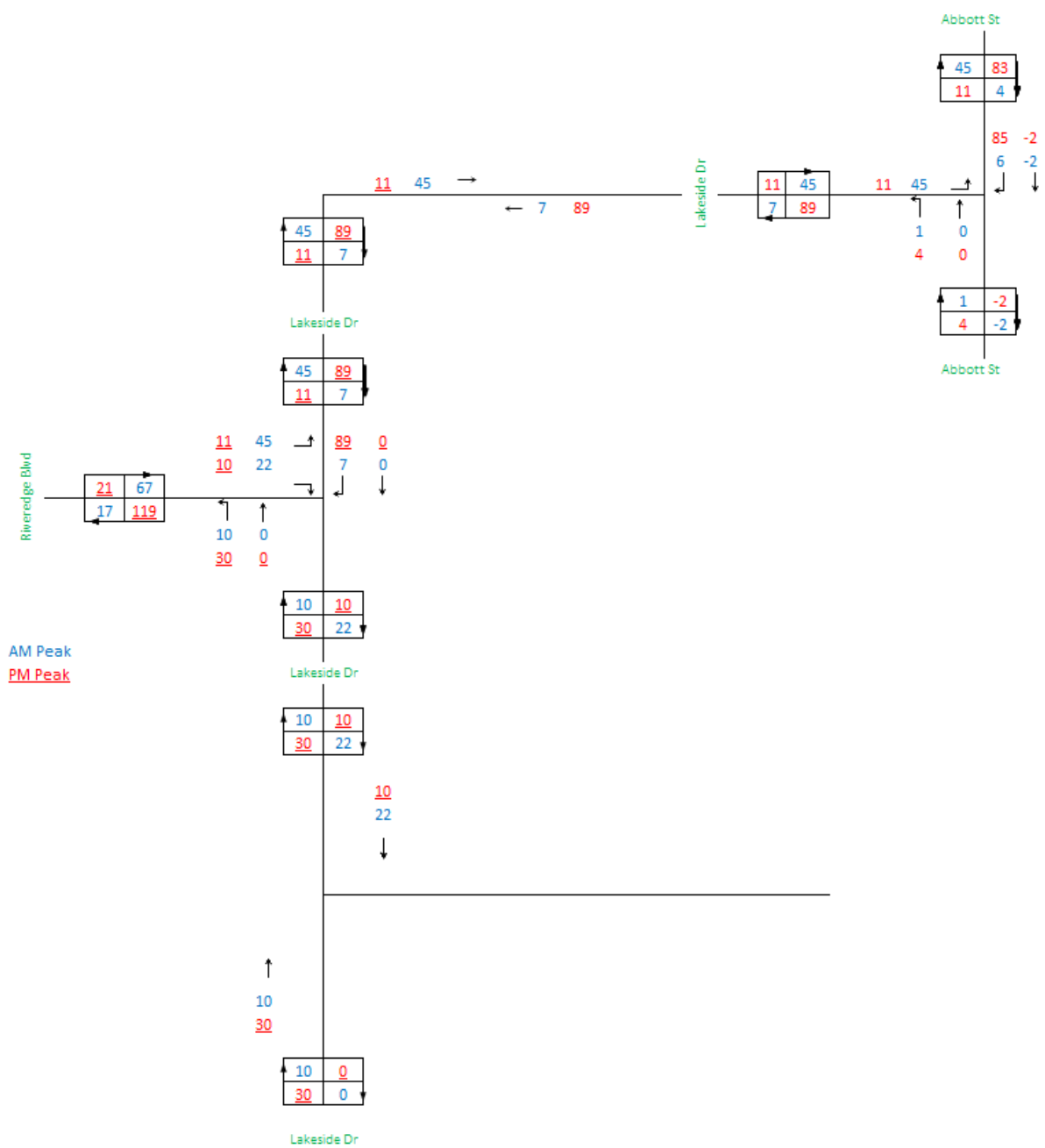
AM Peak
PM Peak



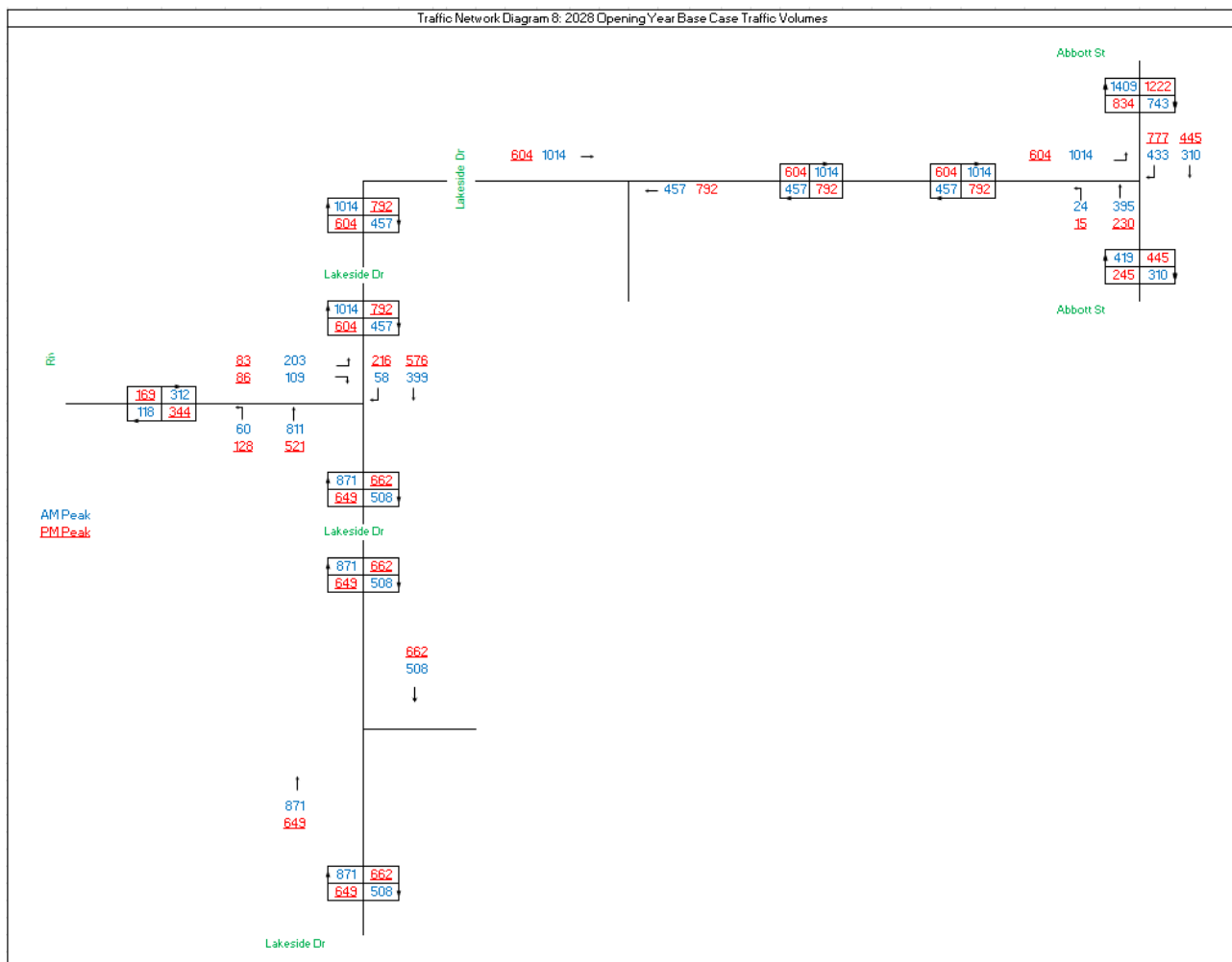
Traffic Network Diagram 6: Development Traffic Volumes (vph) - Total



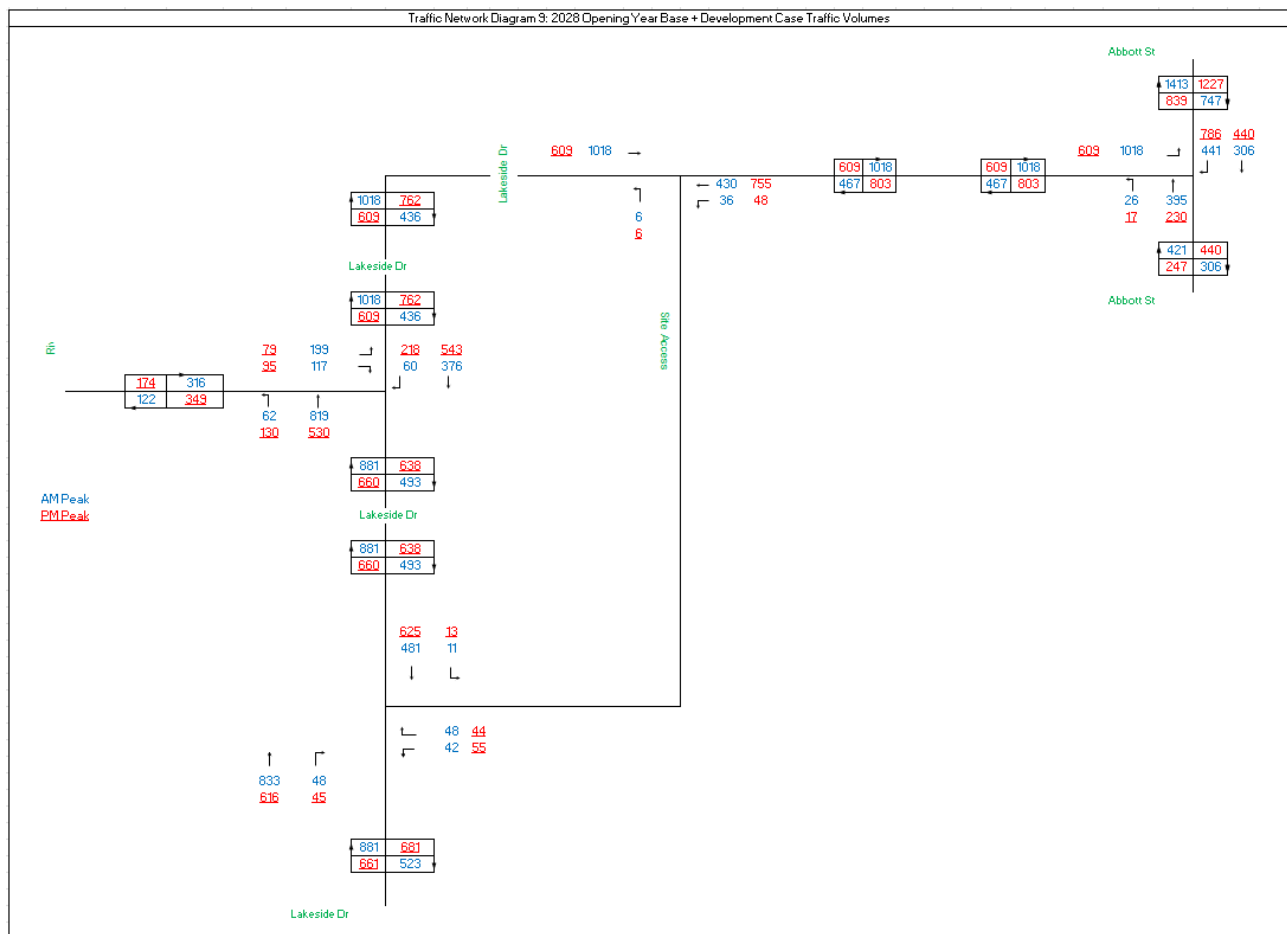
Traffic Network Diagram 7: Potential Residential Development (/PDA area) Traffic Distribution (vph) - extracted from URBIS Report



Traffic Network Diagram 8: 2028 Opening Year Base Case Traffic Volumes



Traffic Network Diagram 9: 2028 Opening Year Base + Development Case Traffic Volumes



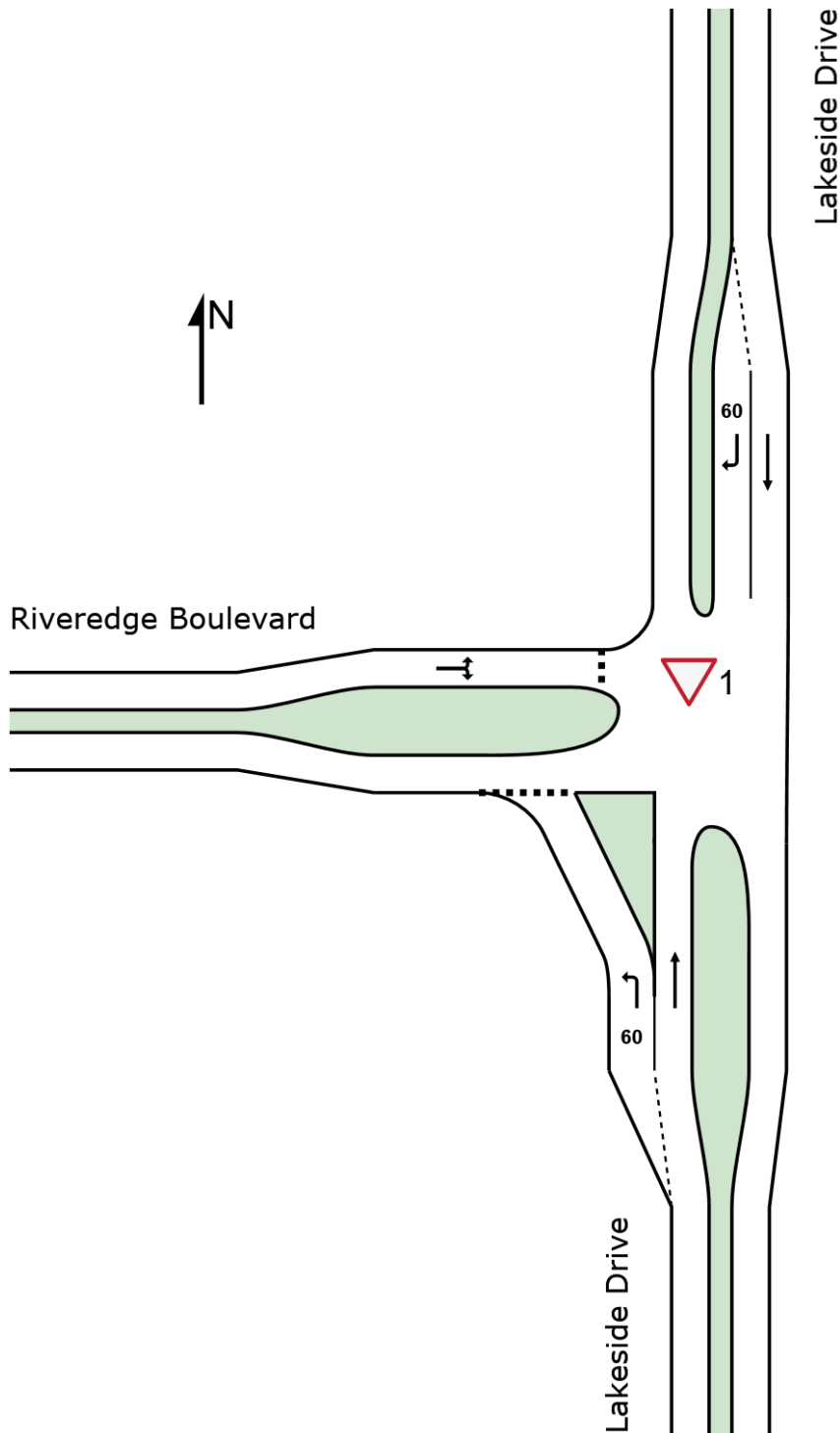
Appendix D SIDRA Output Reports

SITE LAYOUT

▽ Site: [1] Riveredge Boulevard/Lakeside Drive Int_Opening Yr
2028_Base AM (AM)

New Site
Site Category: (None)
Give-Way (Two-Way)
Site Scenario: 1 | Local Volumes

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



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Wednesday, 5 August 2026 3:06:07 PM

Project: C:\Users\Nilu.Seneviratne\OneDrive - Colliers International\2020 Synergy Projects - 20BRT0472 Lakeside Drive, Oonoonba\6 - Analysis
\New 2026 DA Application\20BRT0472 SA01_C.sipx

MOVEMENT SUMMARY

Site: [1] Riveredge Boulevard/Lakeside Drive Int_Opening Yr
2028_Base AM (AM)
Network: [1] 2028_AM Base (Folder1)
Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site
Site Category: (None)
Give-Way (Two-Way)
Network Scenario: 1 | Local Volumes Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Rate	Number Cycles to Depart	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Lakeside Drive															
1	L2	All MCs	63	0.0	63	0.0	0.041	5.8	LOS A	0.2	1.1	0.14	0.52	0.14	52.7
2	T1	All MCs	854	2.0	854	2.0	0.443	0.2	LOS A	0.0	0.0	0.00	0.00	0.00	59.7
Approach			917	1.9	917	1.9	0.443	0.6	LOS A	0.2	1.1	0.01	0.04	0.01	58.7
North: Lakeside Drive															
8	T1	All MCs	420	2.0	420	2.0	0.218	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	All MCs	61	0.0	61	0.0	0.098	10.6	LOS B	0.4	2.6	0.68	0.86	0.68	45.0
Approach			481	1.7	481	1.7	0.218	1.4	NA	0.4	2.6	0.09	0.11	0.09	57.5
West: Riveredge Boulevard															
10	L2	All MCs	214	0.0	214	0.0	1.216	222.5	LOS F	42.9	300.6	1.00	3.82	11.36	8.5
12	R2	All MCs	115	0.0	115	0.0	1.216	251.3	LOS F	42.9	300.6	1.00	3.82	11.36	14.5
Approach			328	0.0	328	0.0	1.216	232.5	LOS F	42.9	300.6	1.00	3.82	11.36	10.8
All Vehicles			1726	1.5	1726	1.5	1.216	44.9	NA	42.9	300.6	0.22	0.78	2.19	29.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data 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: [1 (3)] Riveredge Boulevard/Lakeside Drive Int_Opening
Yr 2028_Proposed AM (AM)
Network: [2] 2028_AM Proposed (Folder1)
Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site
Site Category: (None)
Give-Way (Two-Way)
Network Scenario: 1 | Local Volumes Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Lakeside Drive															
1	L2	All MCs	65	0.0	65	0.0	0.042	5.7	LOS A	0.2	1.2	0.14	0.52	0.14	48.8
2	T1	All MCs	862	2.0	862	2.0	0.448	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.7
Approach			927	1.9	927	1.9	0.448	0.4	LOS A	0.2	1.2	0.01	0.04	0.01	55.9
North: Lakeside Drive															
8	T1	All MCs	396	2.0	396	2.0	0.206	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	All MCs	63	0.0	63	0.0	0.103	9.5	LOS A	0.4	2.7	0.68	0.86	0.68	44.5
Approach			459	1.7	459	1.7	0.206	1.3	NA	0.4	2.7	0.09	0.12	0.09	50.3
West: Riveredge Boulevard															
10	L2	All MCs	209	0.0	209	0.0	1.260	259.9	LOS F	48.9	342.1	1.00	4.10	12.47	7.7
12	R2	All MCs	123	0.0	123	0.0	1.260	287.8	LOS F	48.9	342.1	1.00	4.10	12.47	7.7
Approach			333	0.0	333	0.0	1.260	270.2	LOS F	48.9	342.1	1.00	4.10	12.47	7.7
All Vehicles			1719	1.5	1719	1.5	1.260	52.9	NA	48.9	342.1	0.22	0.84	2.44	14.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data 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: [1 (6)] Riveredge Boulevard/Lakeside Drive Int_Opening
Yr 2028_Base PM (PM)
Network: [3] 2028_PM Base (Folder1)
Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site
Site Category: (None)
Give-Way (Two-Way)
Network Scenario: 1 | Local Volumes Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]		[Total HV]					[Veh. veh	Dist] m				km/h
			veh/h	%	veh/h	%	v/c	sec							
South: Lakeside Drive															
1	L2	All MCs	135	0.0	135	0.0	0.101	5.2	LOS A	0.4	2.9	0.32	0.56	0.32	49.0
2	T1	All MCs	548	2.0	548	2.0	0.285	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach			683	1.6	683	1.6	0.285	1.0	LOS A	0.4	2.9	0.06	0.11	0.06	52.2
North: Lakeside Drive															
8	T1	All MCs	606	2.0	606	2.0	0.315	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
9	R2	All MCs	227	0.0	227	0.0	0.225	8.2	LOS A	1.0	7.0	0.57	0.75	0.57	47.2
Approach			834	1.5	834	1.5	0.315	2.2	NA	1.0	7.0	0.16	0.20	0.16	52.3
West: Riveredge Boulevard															
10	L2	All MCs	87	0.0	87	0.0	0.741	21.2	LOS C	4.3	30.0	0.93	1.28	1.96	27.7
12	R2	All MCs	91	0.0	91	0.0	0.741	50.8	LOS F	4.3	30.0	0.93	1.28	1.96	28.5
Approach			178	0.0	178	0.0	0.741	36.3	LOS E	4.3	30.0	0.93	1.28	1.96	28.1
All Vehicles			1695	1.4	1695	1.4	0.741	5.3	NA	4.3	30.0	0.20	0.28	0.31	44.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data 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: [1 (7)] Riveredge Boulevard/Lakeside Drive Int_Opening
Yr 2028_Proposed PM (PM)
Network: [4] 2028_PM Proposed (Folder1)
Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site
Site Category: (None)
Give-Way (Two-Way)
Network Scenario: 1 | Local Volumes Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Lakeside Drive															
1	L2	All MCs	137	0.0	137	0.0	0.102	6.3	LOS A	0.4	2.9	0.32	0.57	0.32	47.9
2	T1	All MCs	558	2.0	558	2.0	0.290	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach			695	1.6	695	1.6	0.290	1.3	LOS A	0.4	2.9	0.06	0.11	0.06	52.2
North: Lakeside Drive															
8	T1	All MCs	572	2.0	572	2.0	0.297	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
9	R2	All MCs	229	0.0	229	0.0	0.230	7.0	LOS A	1.0	7.2	0.58	0.75	0.58	47.0
Approach			801	1.4	801	1.4	0.297	2.0	NA	1.0	7.2	0.17	0.21	0.17	49.6
West: Riveredge Boulevard															
10	L2	All MCs	83	0.0	83	0.0	0.764	22.9	LOS C	4.6	32.1	0.93	1.30	2.07	27.0
12	R2	All MCs	100	0.0	100	0.0	0.764	50.5	LOS F	4.6	32.1	0.93	1.30	2.07	27.0
Approach			183	0.0	183	0.0	0.764	38.0	LOS E	4.6	32.1	0.93	1.30	2.07	27.0
All Vehicles			1679	1.3	1679	1.3	0.764	5.6	NA	4.6	32.1	0.21	0.29	0.33	42.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data 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: [3 (3)] Abbott St/Lakeside Drive Int_Opening Yr
2028_Proposed AM (AM)

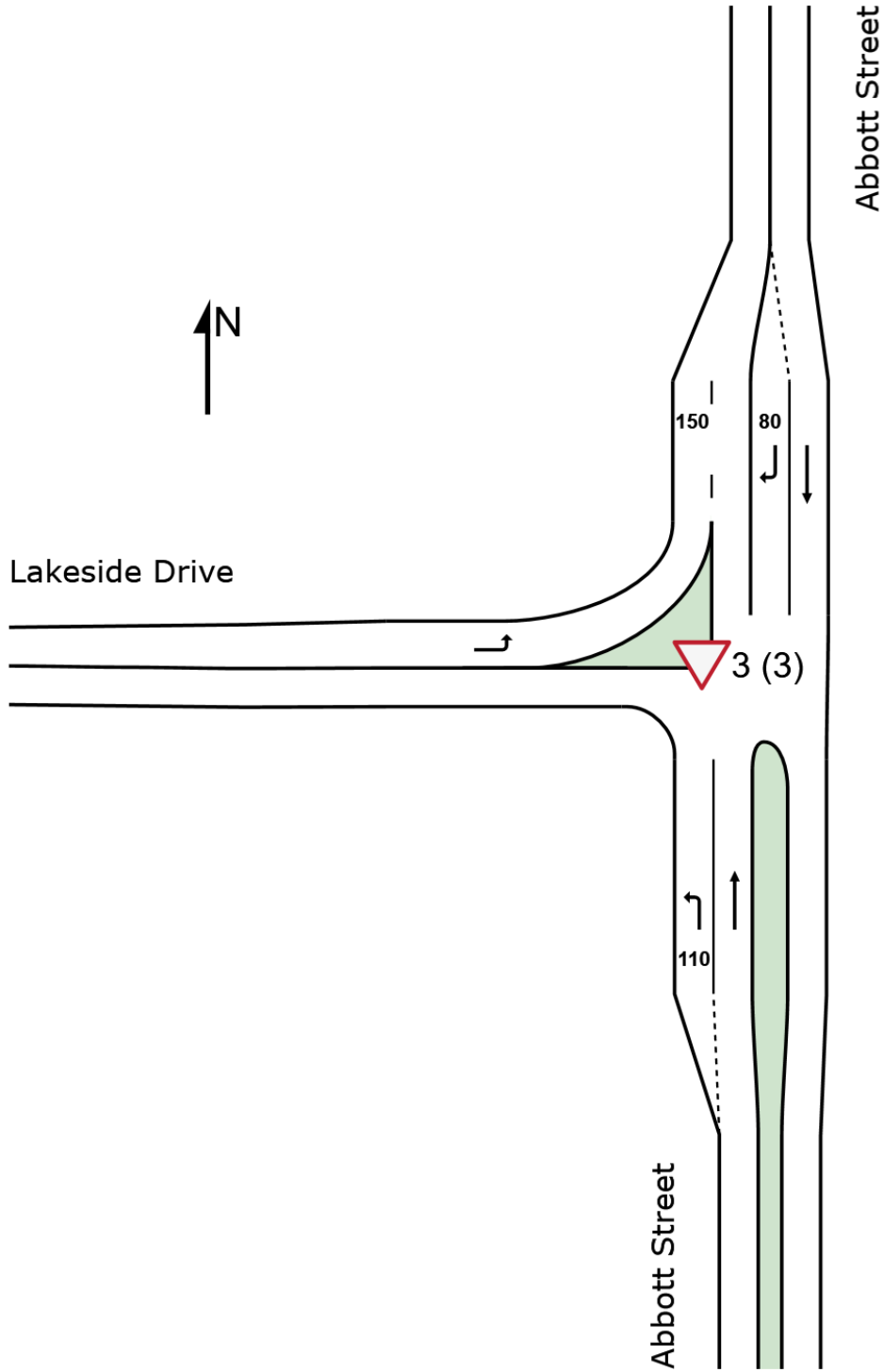
New Site

Site Category: (None)

Give-Way (Two-Way)

Site Scenario: 1 | Local Volumes

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



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Project: C:\Users\Nilu.Seneviratne\OneDrive - Colliers International\2020 Synergy Projects - 20BRT0472 Lakeside Drive, Oonoonba\6 - Analysis
\New 2026 DA Application\20BRT0472 SA01_C.sipx

MOVEMENT SUMMARY

Site: [3] Abbott St/Lakeside Drive Int_Opening Yr 2028_Base
AM (AM)

Network: [1] 2028_AM Base (Folder1)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site
Site Category: (None)
Give-Way (Two-Way)
Network Scenario: 1 | Local Volumes Site Scenario: 1 | Local Volumes

Vehicle Movement Performance														
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m		Rate to Depart	km/h
South: Abbott Street														
1	L2	All MCs	25	0.0	25	0.0	0.014	5.5	LOS A	0.0	0.0	0.00	0.58	50.9
2	T1	All MCs	416	9.0	416	9.0	0.226	1.9	LOS A	0.0	0.0	0.00	0.00	59.9
Approach			441	8.5	441	8.5	0.226	2.1	NA	0.0	0.0	0.00	0.03	59.6
North: Abbott Street														
8	T1	All MCs	326	15.0	326	15.0	0.184	0.1	LOS A	0.0	0.0	0.00	0.00	59.9
9	R2	All MCs	456	3.0	456	3.0	0.533	10.5	LOS B	3.9	28.3	0.65	0.91	44.8
Approach			782	8.0	782	8.0	0.533	6.1	NA	3.9	28.3	0.38	0.53	52.6
West: Lakeside Drive														
10	L2	All MCs	1067	1.0	1029	1.0	0.558	5.9	LOS A	0.0	0.0	0.00	0.53	50.2
Approach			1067	1.0	1029	1.0	0.558	5.9	NA	0.0	0.0	0.00	0.53	50.2
All Vehicles			2291	4.8	2253	4.9	0.558	5.2	NA	3.9	28.3	0.13	0.43	53.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data 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: [3 (3)] Abbott St/Lakeside Drive Int_Opening Yr
2028_Proposed AM (AM)
Network: [2] 2028_AM Proposed (Folder1)
Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site
Site Category: (None)
Give-Way (Two-Way)
Network Scenario: 1 | Local Volumes Site Scenario: 1 | Local Volumes

Vehicle Movement Performance														
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m		Rate to Depart	km/h
South: Abbott Street														
1	L2	All MCs	27	0.0	27	0.0	0.015	5.5	LOS A	0.0	0.0	0.00	0.58	0.00
2	T1	All MCs	416	9.0	416	9.0	0.226	1.9	LOS A	0.0	0.0	0.00	0.00	0.00
Approach			443	8.4	443	8.4	0.226	2.1	NA	0.0	0.0	0.00	0.04	0.00
North: Abbott Street														
8	T1	All MCs	322	15.0	322	15.0	0.181	0.1	LOS A	0.0	0.0	0.00	0.00	0.00
9	R2	All MCs	464	3.0	464	3.0	0.544	10.6	LOS B	4.1	29.5	0.65	0.92	1.00
Approach			786	7.9	786	7.9	0.544	6.3	NA	4.1	29.5	0.39	0.54	0.59
West: Lakeside Drive														
10	L2	All MCs	1072	1.0	1028	1.0	0.558	4.7	LOS A	0.0	0.0	0.00	0.52	0.00
Approach			1072	1.0	1028	1.0	0.558	4.7	NA	0.0	0.0	0.00	0.52	0.00
All Vehicles			2301	4.8	2258	4.9	0.558	4.8	NA	4.1	29.5	0.13	0.43	0.21

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data 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: [3 (2)] Abbott St/Lakeside Drive Int_Opening Yr
2028_Base PM (PM)
Network: [3] 2028_PM Base (Folder1)
Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site
Site Category: (None)
Give-Way (Two-Way)
Network Scenario: 1 | Local Volumes Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Abbott Street															
1	L2	All MCs	16	0.0	16	0.0	0.009	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	50.9
2	T1	All MCs	242	6.0	242	6.0	0.129	0.3	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			258	5.6	258	5.6	0.129	0.7	NA	0.0	0.0	0.00	0.04	0.00	59.6
North: Abbott Street															
8	T1	All MCs	468	2.0	468	2.0	0.294	0.4	LOS A	1.5	10.9	0.38	0.08	0.38	58.4
9	R2	All MCs	818	0.0	818	0.0	0.739	10.8	LOS B	11.2	78.6	0.70	0.89	1.15	44.4
Approach			1286	0.7	1286	0.7	0.739	7.0	NA	11.2	78.6	0.58	0.60	0.87	50.8
West: Lakeside Drive															
10	L2	All MCs	636	1.0	636	1.0	0.345	5.7	LOS A	0.0	0.0	0.00	0.53	0.00	50.3
Approach			636	1.0	636	1.0	0.345	5.7	NA	0.0	0.0	0.00	0.53	0.00	50.3
All Vehicles			2180	1.4	2180	1.4	0.739	5.9	NA	11.2	78.6	0.34	0.51	0.51	51.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data 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: [3 (4)] Abbott St/Lakeside Drive Int_Opening Yr
2028_Proposed PM (PM)
Network: [4] 2028_PM Proposed (Folder1)
Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site
Site Category: (None)
Give-Way (Two-Way)
Network Scenario: 1 | Local Volumes Site Scenario: 1 | Local Volumes

Vehicle Movement Performance														
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m		Rate to Depart	km/h
South: Abbott Street														
1	L2	All MCs	18	0.0	18	0.0	0.010	5.5	LOS A	0.0	0.0	0.00	0.58	50.9
2	T1	All MCs	242	6.0	242	6.0	0.129	0.2	LOS A	0.0	0.0	0.00	0.00	59.9
Approach			260	5.6	260	5.6	0.129	0.6	NA	0.0	0.0	0.00	0.04	59.6
North: Abbott Street														
8	T1	All MCs	463	2.0	463	2.0	0.291	0.4	LOS A	1.5	10.9	0.38	0.08	58.4
9	R2	All MCs	827	0.0	827	0.0	0.749	11.0	LOS B	11.7	82.2	0.71	0.91	44.2
Approach			1291	0.7	1291	0.7	0.749	7.2	NA	11.7	82.2	0.59	0.61	50.6
West: Lakeside Drive														
10	L2	All MCs	641	1.0	641	1.0	0.348	5.8	LOS A	0.0	0.0	0.00	0.53	50.3
Approach			641	1.0	641	1.0	0.348	5.8	NA	0.0	0.0	0.00	0.53	50.3
All Vehicles			2192	1.4	2192	1.4	0.749	6.0	NA	11.7	82.2	0.35	0.52	51.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data 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: [4 (2)] Site Access/Lakeside Drive Int LILO_Opening Yr
2028_Proposed AM (AM)

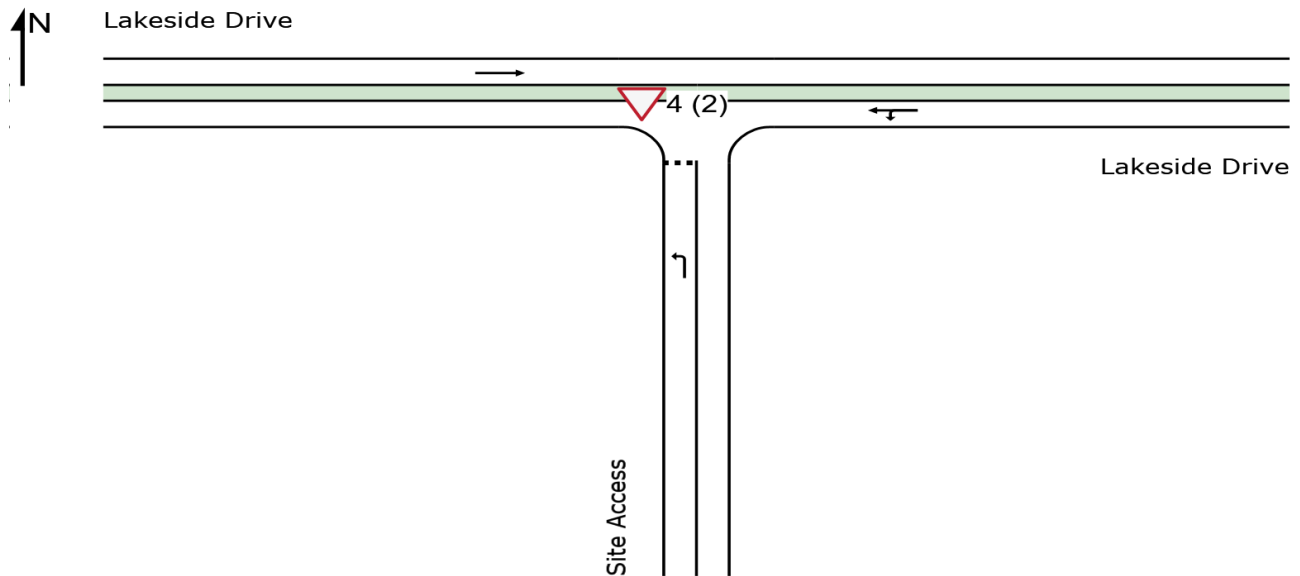
New Site

Site Category: (None)

Give-Way (Two-Way)

Site Scenario: 1 | Local Volumes

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



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Wednesday, 5 August 2026 3:06:20 PM

Project: C:\Users\Nilu.Seneviratne\OneDrive - Colliers International\2020 Synergy Projects - 20BRT0472 Lakeside Drive, Oonoomba\6 - Analysis
New 2026 DA Application\20BRT0472 SA01_C.sipx

MOVEMENT SUMMARY

Site: [4 (2)] Site Access/Lakeside Drive Int LILO_Opening Yr 2028_Proposed AM (AM)
Network: [2] 2028_AM Proposed (Folder1)
Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site
Site Category: (None)
Give-Way (Two-Way)
Network Scenario: 1 | Local Volumes Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Site Access															
1	L2	All MCs	6	0.0	6	0.0	0.006	7.1	LOS A	0.0	0.2	0.44	0.59	0.44	48.5
Approach			6	0.0	6	0.0	0.006	7.1	LOS A	0.0	0.2	0.44	0.59	0.44	48.5
East: Lakeside Drive															
4	L2	All MCs	38	0.0	38	0.0	0.256	4.3	LOS A	0.0	0.0	0.00	0.05	0.00	55.1
5	T1	All MCs	453	2.0	453	2.0	0.256	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	55.4
Approach			491	1.8	491	1.8	0.256	0.3	NA	0.0	0.0	0.00	0.05	0.00	55.3
West: Lakeside Drive															
11	T1	All MCs	1072	1.0	1028	1.0	0.531	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.5
Approach			1072	1.0	1028	1.0	0.531	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.5
All Vehicles			1568	1.3	1525	1.3	0.531	0.2	NA	0.0	0.2	0.00	0.02	0.00	57.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data 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: [4 (3)] Site Access/Lakeside Drive Int LILLO_Opening Yr 2028_Proposed PM (PM)
Network: [4] 2028_PM Proposed (Folder1)
Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site
Site Category: (None)
Give-Way (Two-Way)
Network Scenario: 1 | Local Volumes Site Scenario: 1 | Local Volumes

Vehicle Movement Performance														
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Rate	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m			km/h
South: Site Access														
1	L2	All MCs	6	0.0	6	0.0	0.010	9.6	LOS A	0.0	0.2	0.61	0.72	45.8
Approach			6	0.0	6	0.0	0.010	9.6	LOS A	0.0	0.2	0.61	0.72	45.8
East: Lakeside Drive														
4	L2	All MCs	51	0.0	51	0.0	0.440	4.4	LOS A	0.0	0.0	0.00	0.03	55.1
5	T1	All MCs	795	2.0	795	2.0	0.440	0.0	LOS A	0.0	0.0	0.00	0.03	56.2
Approach			845	1.9	845	1.9	0.440	0.3	NA	0.0	0.0	0.00	0.03	55.8
West: Lakeside Drive														
11	T1	All MCs	641	1.0	641	1.0	0.331	0.0	LOS A	0.0	0.0	0.00	0.00	59.8
Approach			641	1.0	641	1.0	0.331	0.0	NA	0.0	0.0	0.00	0.00	59.8
All Vehicles			1493	1.5	1493	1.5	0.440	0.2	NA	0.0	0.2	0.00	0.02	56.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data 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.

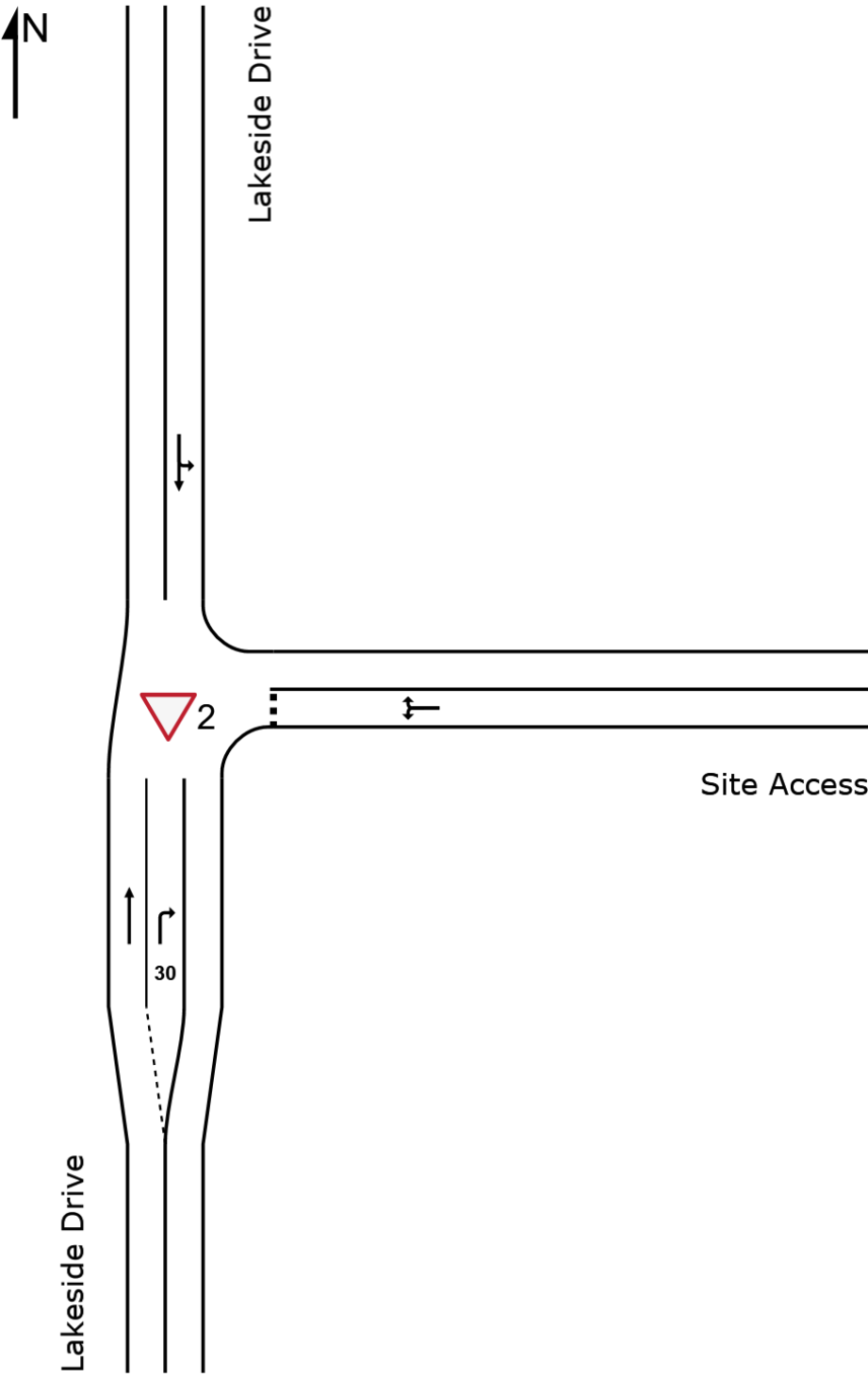
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

▽ Site: [2] Site Access/Lakeside Drive Int_Opening Yr
2028_Proposed AM (AM)

New Site
Site Category: (None)
Give-Way (Two-Way)
Site Scenario: 1 | Local Volumes

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



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Wednesday, 5 August 2026 3:06:24 PM

Project: C:\Users\Nilu.Seneviratne\OneDrive - Colliers International\2020 Synergy Projects - 20BRT0472 Lakeside Drive, Oonoonba\6 - Analysis
\New 2026 DA Application\20BRT0472 SA01_C.sipx

MOVEMENT SUMMARY

Site: [2] Site Access/Lakeside Drive Int_Opening Yr
2028_Proposed AM (AM)
Network: [2] 2028_AM Proposed (Folder1)
Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site
Site Category: (None)
Give-Way (Two-Way)
Network Scenario: 1 | Local Volumes Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Lakeside Drive															
2	T1	All MCs	877	2.0	877	2.0	0.456	0.2	LOS A	0.0	0.0	0.00	0.00	0.00	59.7
3	R2	All MCs	51	0.0	51	0.0	0.047	7.4	LOS A	0.2	1.3	0.50	0.67	0.50	51.2
Approach			927	1.9	927	1.9	0.456	0.6	NA	0.2	1.3	0.03	0.04	0.03	58.7
East: Site Access															
4	L2	All MCs	44	0.0	44	0.0	0.458	12.2	LOS B	1.8	12.8	0.87	1.05	1.21	39.5
6	R2	All MCs	51	0.0	51	0.0	0.458	43.4	LOS E	1.8	12.8	0.87	1.05	1.21	31.0
Approach			95	0.0	95	0.0	0.458	28.8	LOS D	1.8	12.8	0.87	1.05	1.21	35.9
North: Lakeside Drive															
7	L2	All MCs	12	0.0	11	0.0	0.256	5.5	LOS A	0.0	0.0	0.00	0.01	0.00	55.6
8	T1	All MCs	506	2.0	482	2.1	0.256	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.7
Approach			518	2.0	493	2.1	0.256	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.6
All Vehicles			1540	1.8	1515	1.8	0.458	2.2	NA	1.8	12.8	0.07	0.09	0.09	56.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data 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: [2 (2)] Site Access/Lakeside Drive Int_Opening Yr
2028_Proposed PM (PM)
Network: [4] 2028_PM Proposed (Folder1)
Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site
Site Category: (None)
Give-Way (Two-Way)
Network Scenario: 1 | Local Volumes Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Lakeside Drive															
2	T1	All MCs	648	2.0	648	2.0	0.337	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
3	R2	All MCs	47	0.0	47	0.0	0.056	8.6	LOS A	0.2	1.5	0.58	0.75	0.58	50.4
Approach			696	1.9	696	1.9	0.337	0.7	NA	0.2	1.5	0.04	0.05	0.04	58.4
East: Site Access															
4	L2	All MCs	58	0.0	58	0.0	0.370	11.1	LOS B	1.5	10.2	0.83	1.00	1.06	43.2
6	R2	All MCs	46	0.0	46	0.0	0.370	33.4	LOS D	1.5	10.2	0.83	1.00	1.06	35.7
Approach			104	0.0	104	0.0	0.370	21.0	LOS C	1.5	10.2	0.83	1.00	1.06	40.7
North: Lakeside Drive															
7	L2	All MCs	14	0.0	14	0.0	0.349	5.5	LOS A	0.0	0.0	0.00	0.01	0.00	55.6
8	T1	All MCs	658	2.0	658	2.0	0.349	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.6
Approach			672	2.0	672	2.0	0.349	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.5
All Vehicles			1472	1.8	1472	1.8	0.370	1.9	NA	1.5	10.2	0.08	0.10	0.09	56.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data 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.