From: "Ben Collings - BNC Planning" <bnc@bncplanning.com.au>
Sent: Thu, 27 Mar 2025 08:57:48 +1000
To: "Taryn Pace" <taryn.pace@townsville.qld.gov.au>
Cc: "Development Assessment" <developmentassessment@townsville.qld.gov.au>
Subject: MCU24/0108 - 1-105 Racecourse Road, Cluden
Attachments: Combined RFI AN Response.zip

Hi Taryn,

Please find attached the combined response to both the Townsville City Council information request and the SARA information request and advice notice associated with the above referenced development application. A copy has also been lodged with SARA.

As a quick forward to the attached response, it is important to reiterate that, until such time as the specific land use mix, scale and intensity are known and are applied for, trying to design and locate micro-level use specific elements such active transport facilities or the exact location of reticulated infrastructure is premature, would be purely speculative, would ultimately change substantially and hence would not value add to the current assessment. The more pertinent query should be whether the applicant can establish a reasonable level of certainty that any such requirements can be addressed and implemented at the appropriate time. This is a vacant, greenfield, infill development where these types of strategic outcomes can easily be acknowledged and integrated into the overall design of the development from inception. Again noting that any development (other than the bulk earthworks) cannot proceed until the subsequent detailed MCU and OPW applications are lodged and processed.

I would like the opportunity to run through the POD changes with you once you have reviewed the response. Please reach out when you are ready and we can organise a time.

We have now commenced preparation of the public notification material. Thank you and please let me know if there are any further issues raised.

Kind regards,

Benjamin Collings
Director

Office 7 / Ground Floor / 41 Denham Street TOWNSVILLE CITY QLD 4810
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BNC Ref. DA041-24
TCC Ref. MCU24/0108 & RAL24/0067
SARA Ref. 2411-43466 SRA

Date >> 26 March 2025

ASSESSMENT MANAGER
TOWNSVILLE CITY COUNCIL
PO BOX 1268
TOWNSVILLE QLD 4810
Attention: Taryn Pace

and

STATE ASSESSMENT AND REFERRAL AGENCY
PO BOX 5666
TOWNSVILLE QLD 4810
Attention: Helena Xu

RE: APPLICANT COMBINED RESPONSE TO ASSESSMENT MANAGER INFORMATION REQUEST & REFERRAL AGENCY INFORMATION REQUEST AND ADVICE NOTICE

PRELIMINARY APPROVAL - VARIATION REQUEST TO OVERRIDE THE PLANNING SCHEME TO FACILITATE DEVELOPMENT IN ACCORDANCE WITH THE TOWNSVILLE WATERPARK, HOTEL, AND BEACHCLUB PLAN OF DEVELOPMENT COMBINED WITH DEVELOPMENT PERMIT - RECONFIGURING A LOT (BOUNDARY REALIGNMENT)

1-105 RACECOURSE ROAD CLUDEN QLD 4811 - LOT 2 RP 748152 & LOT 1 SP 101275

BNC Planning acting on behalf of the applicant submits this response to the *information requests* issued by the Townsville City Council as assessment manager and State Assessment and Referral Agency (SARA) as a referral agency, in accordance with section 13 of the Development Assessment Rules. The assessment manager information request is dated 10 December 2024, the SARA information request is dated 11 December 2024 and are associated with a development application seeking a preliminary approval for a variation request to override the planning scheme (Townsville Waterpark, Hotel, and Beach Club Plan of Development) and a development permit for reconfiguring a lot (boundary realignment) over the above referenced premises.

The applicant also provides a response to the *advice notice* issued by the State Assessment and Referral Agency (SARA) in their role as a referral agency, in accordance with section 35 of the Development Assessment Rules. The notice is dated 17 December 2024.

The applicant has responded by providing all of the information requested or has provided a suitable alternative outcome. A detailed response to each item from the notice is provided below.

TOWNSVILLE CITY COUNCIL - ASSESSMENT MANAGER

BNC Planning Pty Ltd
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Request Item 1 – Revised Plan of Development

The applicant is requested to provide a revised Plan of Development addressing the following matters:

- *Provision of an updated Precinct Plan clearly showing the entire Plan of Development Area and precinct boundaries;*
- *Establishment of separate Tables of Assessment and assessment provisions for all Precincts. Assessment provisions must be revised to correlate with land uses and levels of assessment nominated for each Precinct;*
- *Establishment of staging provisions aligning with the Purpose Statement of the proposed Plan of Development;*
- *Removal of Showroom and large format retail land uses from the Plan of Development.*

Reason

To demonstrate compliance with the Townsville City Plan.

Applicant's response

The applicant provides the attached updated Plan of Development (POD) in response to this item.

Request Item 2 – Economic Impact Assessment

The applicant is requested to provide an Economic Impact Assessment prepared in accordance with SC6.5 Economic Impact Assessment Planning Scheme Policy of the Development Manual.

All uses proposed as part of the Plan of Development which are not ordinarily contemplated within the Sport and recreation zone code of the Townsville City Plan must be considered as part of the Economic Impact Assessment.

Reason

To demonstrate compliance with the Townsville City Plan.

Advice

Outcomes / recommendations of the Economic Impact Assessment are to be considered when responding to Request Item 1.

Applicant's response

The applicant has amended the POD to remove uses that are listed as accepted development, accepted development subject to requirements or code assessable within the existing Sport and recreation zoning that applies to the site. Some of these uses are however considered to be ordinarily contemplated within the existing Sport and recreation zoning, despite inheriting an impact level of assessment. The relevant uses are listed below.

- Multiple dwelling
- Rooming accommodation
- Hotel
- Short-term accommodation
- Tourist attraction
- Tourist park

It is not considered necessary to conduct an economic impact assessment to establish reasonable grounds to conclude that *multiple dwelling* or *rooming accommodation* uses are in critical demand across the region, state and nationally.

A *Tourist attraction* use in the form proposed (i.e. water play theme park) is generally consistent with the sport and recreation zoning despite not being nominated as code assessable or lower. There is in fact no zone where this use is anything other than impact assessment due to the dynamic and varied nature of any given proposal. There is not considered to be any need for an economic impact investigation into the inclusion of this use in the POD. Similarly, the need to provide accommodation land uses (i.e. *Short-term accommodation* and *Tourist park*) to compliment and reinforce the primary land

uses and build commercial resilience is considered obvious and justified. Reference is made to the Economic Impact Assessment lodged with the originating development application which provides further justification for the economic benefits these uses will deliver.

With regard to a *Hotel* use, the applicant relies upon the recommendations of the attached Market Potential Assessment prepared by LocationIQ. Though not an economic impact assessment prepared specifically in accordance with the Planning Scheme Policy, the robustness of the analysis is nevertheless compelling enough to be relied upon. While the conclusions of the assessment do state that there is currently an opportunity for a new hotel/tavern in this location, it goes on to say that this may be undermined if the new hotel/tavern proposed at the Fairfield Waters district centre establishes. However, it does rightly point out that there are a wide variety of *Hotel* products that each attracts a different parentage and hence not all *Hotel* uses can be considered in equal or direct competition in the market place. Given the presence of the Cluden Park Racecourse, the opportunity exists for a boutique offering such as a micro-brewery, which would offer an endemic destinational appeal. As such, there remains merit in the retention of a *Hotel* use within the code assessable category in the table of assessment.

Request Item 3 – Noise Impact Assessment

The applicant is requested to submit a Noise Impact Assessment, prepared by a suitably qualified person as per SC6.4.19 Noise and Vibration of the Development Manual.

Reason

To demonstrate compliance with the Townsville City Plan.

Applicant's response

The applicant provides the attached supporting Noise Assessment prepared by SLR Consulting Australia, who constitute a *suitably qualified person* as per SC6.4.19 Noise and Vibration of the Development Manual.

Request Item 4 – Public and Active Transport Masterplan

The applicant is requested to provide a Public and Active Transport Masterplan, demonstrating appropriate internal and external connections to established transport infrastructure.

Reason

To demonstrate compliance with the Transport impact, access and parking code of the Townsville City Plan.

Applicant's response

At this stage of the development lifestyle, the applicant is seeking preliminary approval for a Plan of Development to override some of the current planning scheme provisions in the interest of establishing a more streamlined and efficient framework to apply for specific development rights in the future. Until such time as the specific land use mix, scale and intensity are known and are applied for, trying to design and locate micro-level use specific active transport facilities is premature, would be purely speculative, would ultimately change substantially and hence would not value add to the current assessment. The more pertinent query should be whether the applicant can establish a reasonable level of certainty that an appropriate Active Transport Strategy can be prepared and implemented at the appropriate time.

The Plan of Development has been amended to include additional supporting plans, including a *Masterplan – Active Transport Node* plan. This shows a high-level internal road network layout with nominated active transport hub locations. These would be based around bus stops but would also include ride share facilities, bike or scooter lock up options and designated pedestrian crossings. The access points to the external network remain clearly shown at Racecourse Road and Stuart Drive, with the secondary access point on to Stuart Drive now removed. These active transport hubs will evolve, move and adapt as more development specific detail is known and additional traffic impact investigations are undertaken. It is noted that the need for active transport considerations is integrated into the purpose of the POD.

There is no reasonable basis to conclude that a suitable Active Trasport Strategy cannot be designed and integrated into the final development.

Council is directed to the Traffic Impact Assessment and response provided by Geleon to Item 1 of the SARA Advice Notice as further supporting information in response to this item.

Request Item 5 – Flood Impact Assessment

The applicant is requested to provide an amended Floor Impact Assessment (FIA) to address the following:

- *There are conflicts apparent between the development layouts and FIA figures, in particular the building footprints are shown overlapping with detention basins. The plans and/or flood study is requested to be updated to clarify this;*
- *The FIA has considered only the 1% and 20% AEP design storm events. The FIA is requested to be amended to consider the full suite of standard design storm AEPs; and*
- *The report makes reference to a critical duration discrepancy in the Ross River 2021 model, however it is unclear what this is referring to. The relevant critical duration data and mapping was supplied with the model files.*

Reason

To demonstrate compliance with the Flood hazard overlay code of the Townsville City Plan.

Applicant's response

The applicant provides the attached correspondence from Northern Consulting Engineering directly responding to this item.

Request Item 6 – Water & Sewer

The applicant is requested to provide clarification on the following from the Engineering Report:

- *Regarding sewer Option 3, the applicant is requested to provide in principle support from the Department of Transport and Main Roads (or other relevant department) to locating a pressure sewer main along the eastern verge of Stuart Drive; and*
- *The applicant is requested to identify the likely location of the sewer pump station within the development site for Options 3 and 4.*

Reason

To demonstrate compliance with the Works code of the Townsville City Plan.

Applicant's response

At this stage of the development life cycle and based on the best available information currently, Option 3 is the preferred option. Again, given this development application is for a Plan of Development not any specific development rights, there is no reasonable need to seek DTMR certainty at this stage. The approach is to show that options have been investigated, that there is no reasonable basis to conclude that solutions cannot be reached and acknowledge that the preferred option will be put forward, along with the required detail and justification, at the subsequent MCU and OPW approval stage.

The pump station can be located anywhere on site, but due to the site contains, it would logically be in the north / north-west of the site. It will require all weather accessibility on a standalone lot via a reserve / easement. A rising main will be required to be installed from the pump station to the north and across the Bruce Highway. Again, all matters that are to be addressed as part of the subject MCU and OPW application and approval stage. Below is a further response to this item provided by the design engineers Northern Consulting Engineers:

- **Option 3 Pressure Main DTMR Approval.** All sewer options will have some impact on DTMR corridors with the need to have new/upgraded sewer infrastructure crossing under the Bruce Hwy and then potentially along Stuart Drive (for Option 3). For initial development planning and option assessments, in-principal approval is not given by DTMR. It is not practical to request and expect DTMR to provide any level of approvals for a range of possible water & sewer

infrastructure options for a development. Once the preferred option/s are confirmed then further discussions with DTMR will be held to get their requirements for having additional water & sewer infrastructure in their corridor.

- **Pump Station Location.** The location of the sewage pump station for all sewer options is not critical and can be determined as part of the detailed development layout and sewer system design. The pump station could essentially be located anywhere on the development site. The location of the local development pump station will be determined as part of the design of the development and would need to consider:
  - The incoming gravity sewer depth generally being minimised and not exceeding TCC design standards of being greater than 5.5m deep.
  - PS being readily accessible at all hours for TCC vehicles for ongoing operation and maintenance.
  - Normally PS needs to be on a separate TCC freehold land parcel once completed including the access.
  - Minimise where practical the sewer infrastructure required (ie length and depth of the gravity sewers and length of the sewer pressure main).
  - Consideration of noise and odour from the PS in relation to the proposed development uses.

STATE ASSESSMENT REFERRAL AGENCY - REFERRAL AGENCY

INFORMATION REQUEST RESPONSE

ACTIVE TRANSPORT ACCESS TO PUBLIC PASSENGER TRANSPORT	
1.	***Issue:*** *The existing information is not sufficient for SARA to conduct assessment against the provisions of State Code 6: Protection of state transport networks (State code 6) of the SDAP. The proposed development will generate demand for an active transport network to facilitate access to the existing urban bus stops in Stuart Drive and on-site public passenger transport. The Masterplan and Masterplan Bubble Diagram do not show an active transport network to service the demand generated by the development.*

Applicant's response

At this stage of the development lifestyle, the applicant is seeking preliminary approval for a Plan of Development to override some of the current planning scheme provisions in the interest of establishing a more streamlined and efficient framework to apply for specific development rights in the future. Until such time as the specific land use mix, scale and intensity are known and are applied for, trying to design and locate micro-level use specific active transport facilities is premature, would be purely speculative, would ultimately change substantially and hence would not value add to the current assessment. The more pertinent query should be whether the applicant can establish a reasonable level of certainty that an appropriate Active Transport Strategy can be prepared and implemented at the appropriate time.

The Plan of Development has been amended to include additional supporting plans, including a *Masterplan – Active Transport Node* plan. This shows a high-level internal road network layout with nominated active transport hub locations. These would be based around bus stops but can also include ride share facilities, bike or scooter lock up options, dedicated taxi set down areas and designated pedestrian crossings. The access points to the external network remain clearly shown at Racecourse Road and Stuart Drive, with the secondary access point on to Stuart Drive now removed. These active transport hubs will evolve, move and adapt as more development specific detail is known and additional traffic impact investigations are undertaken.

There is no reasonable basis to conclude that a suitable Active Trasport Strategy cannot be designed and integrated into the final development. It is noted that the need for active transport considerations is integrated into the purpose of the POD.

SARA is directed to the response provided below by Geleon to the SARA Advice Notice as further supporting information in response to this item.

STATE ASSESSMENT REFERRAL AGENCY - REFERRAL AGENCY

ADVICE NOTICE RESPONSE

TRAFFIC IMPACT ASSESSMENT	
1.	***Issue:*** *The Traffic Impact Assessment (TIA) prepared by Geleon, dated 20 September 2024, reference 50890-RP02-A, does not clearly demonstrate that the proposed development can comply with PO15 – PO17 and PO25 – PO27 of State code 1: Development in a state-controlled road environment (State code 1) along with PO1-PO3 of State code 6: Protection of state transport networks (State code 6). A detailed assessment of SARA's concerns has been provided below.* ***Access*** • *The TIA states that all internal roads will be accessed via an internal four-way roundabout; however, the development plans include three separate T-intersections along a 'New Road' extending from Lakeside Drive.* • *The proposed development plans include 3 direct access driveways to Stuart Drive* *However, no review / justification has been included within the report to support these driveways.* • *It is unclear how the Townsville Turf Club and 'Future Development Site 1; will be accessed* ***Traffic Generation Rate***

	• *Initial Distribution:*
	  ○ *The traffic distribution has reportedly been based solely on the existing survey data. This is not considered appropriate noting the low volumes of traffic generated by the existing development over the subject site and that development generated traffic will likely be new trips to network. Further, it results in major inconsistencies, such as ~90% of all inbound traffic arriving from the north along Lakeside Drive and only ~25% travelling north outbound.*
	• *Background Traffic Distribution Post Connection to Stuart Drive:*
	  ○ *The background traffic volumes have been redistributed to account for a new connection between Lakeside Drive and Stuart Drive that allows for a "rat-run" through the site between the two (2) state-controlled roads.*
	  ○ *It is unclear how the percentage of traffic being distributed has been determined and if it is considered representative of the expected traffic conditions.*
	  ○ *It is recommended that all assumptions are outlined and justified as part of the traffic redistribution. This should include reasoning to support the adopted percentages of traffic being redistributed.*
	• *Development Traffic Redistribution Post Connection to Stuart Drive:*
	  ○ *The development traffic has been redistributed to account for the new connection from Stuart Drive. This results in significant changes in the reported traffic catchment, such as the volume of traffic arriving from the north on Lakeside Drive decreases from ~90% to ~60%*
	  ○ *It is unclear how this 90% northern catchment has reduced to now have ~30% arrive from the south.*
	  ○ *It is recommended that the redistribution is amended to retain similar development catchments as the original traffic distribution (pre connection to Stuart Drive)*
	
	Scoping Assessment
	• *A 5% scoping assessment has reportedly been undertaken in accordance with the GTIA, however, it has not been included in the TIA.*
	• *Based on the assumed development traffic volumes and distributions, the adopted impact assessment area may require further intersections noting that ~90% of traffic was assumed to arrive from the state-controlled Lakeside Drive / Darcy Drive intersection.*
	• *However, noting that the adopted traffic distribution is required to be amended, it is recommended that a 5% scoping assessment is undertaken to determine the impact assessment area based on the updated distribution.*
	Delay Assessment
	• *A 5% delay assessment excluding the extension of Lakeside Drive was undertaken, which identified significant (>5%) delay impacts. As part of the mitigation measures, a new connection has been provided to Stuart Drive, which required the external traffic to be redistributed. However, an amended 5% delay assessment has not been undertaken demonstrating the proposed development will result in >5% delay impacts. As such, it is recommended that a delay assessment is undertaken considering the mitigation measures to demonstrate the net delay impacts.*
	• *It is expected that the following new access intersections would be excluded from the delay assessment as they do not have a background intersection configuration / delay to compare against and instead would need to demonstrate operation for the year of opening and 10- year design horizon:*
	  ○ *Stuart Drive / Edison Street / Site Access roundabout*
	  ○ *Lakeside Drive / Precinct 1-3 access road roundabout*
	
	Safety Risk Assessment
	• *In line with the abovementioned changes, the existing safety risk assessment will need to be updated.*

Applicant's response

The applicant provides the attached correspondence from Geleon directly responding to this item, which includes an updated Traffic Impact Assessment.

IMPACT ON URBAN BUS SERVICES	
2.	***Issue:*** *Section 5.1 and Appendix F of the TIA indicates that the upgrades to the Stuart Drive/Edison Street/Lakeside Drive roundabout are likely to impact on existing urban bus stop pair, 'Stuart Dr at Edison St, Cluden' (ID: 890681 and 890388) and urban bus routes.*

	Additionally, the Masterplan and Masterplan Bubble Diagram indicate that potential vehicle access for the proposed car parks on Stuart Drive may potentially impact on urban bus stop pair, 'Stuart Dr at Watt St, Cluden' (ID:890389 and 890297).

Applicant's response

In response this item, the applicant provides the attached correspondence from Geleon which includes an updated Traffic Impact Assessment, and reiterates the response provided to item 1.

SHORT-TERM ACCOMMODATION – PUBLIC PASSENGER TRANSPORT DEMAND	
3.	***Issue:*** *The application does not demonstrate compliance with PO26 – PO29 and PO32-PO34 of State code 6. The proposed Short-term accommodation (highrise hotel) will have 209 suites initially (potentially 418+ people). There is potential for the hotel to expand by an extra 72 or 196 rooms (up to 810 people in total). This will generate demand for setdown facilities to be provided for private/chartered buses/coaches, mini-buses and shuttles. Additionally, the short-term accommodation use will generate a relatively high demand for the setdown of taxis and booked hire services such as rideshare. Despite this the Masterplan and Masterplan Bubble Diagram only show a VIP drop-off of limited capacity for the Beachclub VIP area.*

Applicant's response

In response this item, the applicant provides the attached correspondence from Geleon which includes an updated Traffic Impact Assessment, and reiterates the response provided to item 1. Again, the ability to provide the level of detail requested in this item at this stage does not exist. This development application is not seeking the right to proceed with the development of the short-term accommodation uses or any land uses. This will come as a subsequent material change of use development application with specific built form, scale and capacity information, and updated traffic impact investigations. This subsequent development application will involve referral to SARA/DTMR at which time a fully comprehensive response to these items can be provided.

Until such time as the specific land use mix, scale and intensity are known and are applied for, trying to design and locate micro-level use specific active transport facilities is premature, would be purely speculative, would ultimately change substantially and hence would not value add to the current assessment. The more pertinent query should be whether the applicant can establish a reasonable level of certainty that an appropriate Active Transport Strategy can be prepared and implemented at the appropriate time. To which the answer is yes given this is a vacant, greenfield, infill development where these types of strategic outcomes can easily be acknowledged and integrated into the overall design of the development from inception. It is noted that the need for active transport considerations is integrated into the purpose of the POD.

WATER THEME PARK AND BEACHCLUB – PUBLIC PASSENGER TRANSPORT DEMAND	
4.	***Issue:*** *The application does not demonstrate compliance with PO26 – PO29 and PO32-PO34 of State code 6. The proposed development relates to a large, multi-faceted water theme park and is expected to form a regional tourist attraction. This will generate demand for the setdown and lay-by of private/chartered buses and coaches for tours, excursions and interest groups. The tourist attraction is also likely to have a relatively high proportion of visitors travelling by personalised passenger transport, namely taxis and rideshare.* *It is not clear that the waterpark drop-off area shown on the Masterplan and the area for 'buses' indicated on this plan and the Masterplan Bubble Diagram will have adequate capacity or a design that is fit for purpose. In particular, a bus setdown facility does not appear to have been provided.*

Applicant's response

In response this item, the applicant provides the attached correspondence from Geleon which includes an updated Traffic Impact Assessment, and reiterates the response provided to item 1. Again, the ability to provide the level of detail requested in this item at this stage does not exist. This development application is not seeking the right to proceed with the development of the waterpark and beach club uses or any land uses. This will come as a subsequent material change of use development application with specific built form, scale and capacity information, and updated traffic impact invitations. This

subsequent development application will involve referral to SARA/DTMR at which time a fully comprehensive response to these items can be provided.

Until such time as the specific land use mix, scale and intensity are known and are applied for, trying to design and locate micro-level use specific active transport facilities is premature, would be purely speculative, would ultimately change substantially and hence would not value add to the current assessment. The more pertinent query should be whether the applicant can establish a reasonable level of certainty that an appropriate Active Transport Strategy can be prepared and implemented at the appropriate time. To which the answer is yes given this is a vacant, greenfield, infill development where these types of strategic outcomes can easily be acknowledged and integrated into the overall design of the development from inception. It is noted that the need for active transport considerations is integrated into the purpose of the POD.

STORMWATER AND FLOODING	
5.	***Issue:*** *The application does not demonstrate compliance with PO12 – PO16 of State code 2 and PO14-PO16 and PO18 - PO19 of State code 6. Namely, the proposed development relies on floodwater and stormwater mitigation measures that are still within the assessment process associated with 2311-37917 SRA for Operational work. Information has not yet been provided to SARA to satisfy that the proposed floodwater and stormwater regimes associated with the Engineering Report and the Flood Impact Assessment, both prepared by Northern Consulting Engineers, dated 16/08/2024, document reference BNC0084, revision A, will not result in adverse impacts to the State-controlled transport corridors.* *In particular:* • *The stormwater quantity assessment only modelled impacts in the 1% and 20% AEP events. Given the strategic importance of the racecourse for stormwater and flood management for the local area and the proximity of the site to the railway corridor, further modelling is required to ensure no worsening across all potential flood events;* • *The Flood Impact Assessment has addressed afflux and velocity impacts but has not considered the time of submergence. Given the railway corridor is already flood prone, the potential for prolonged submergence due to increased runoff from the development is critical to evaluate; and* • *The staging and timing of mitigation works is unclear, both are crucial to ensuring no worsening occurs during all phases of development.*

Applicant's response

The applicant provides the attached correspondence from Northern Consulting Engineering directly responding to this item.

PROPOSED ALLOTMENT LAYOUT PLAN	
6.	***Issue:*** *In accordance with the abovementioned concerns with the proposed development and accompanying reports, amendments to the 'Plan of Development – Precinct Plan' that informs the 'Townsville Waterpark, Hotel and Beachclub Plan of Development' are required to demonstrate compliance with State Code 1, 2 and 6 of the State Development Assessment Provisions.*

Applicant's response

This item is titled 'Proposed Allotment Layout Plan' but the wording is clearly referring to the POD plans, not the Allotment Layout Plan (ALP). Regardless, the ALP has been amended to address the matters raised in this item as follows:

- For clarity, the RAL component is for a preparatory boundary realignment as a standalone development to ensure that the land title boundaries match the extent of development, specifically the stormwater drainage and detention features. As such, there is no reasonable need to show precinct boundaries on the ALP, this is more appropriately left to the POD plans. The ALP needs to remain a purely cadastral based document to ensure it clearly shows the proposed boundary changes and does not create interpretation issues by overlapping MCU and RAL detail across the eventual decision notice conditions.
- An access and services easement has been identified providing context to how the Townsville Turf Club will be provided with access.

The POD plans have been amended to address the matters raised in this item as follows:

- They clearly show the relationship between the boundary realignment and the precinct boundaries.
- They reflect the access route and easement for the Townsville Turf Club
- The secondary access point onto Stuart Drive has been removed.
- A round about icon has been added at the internal T-intersection, noting that the POD Plans in no way dictate what the traffic solution will be here.
- No further amendments are necessary to these plans in response to the TIA
- Hypothetical active transport hubs have been nominated. Extensive commentary has already been provided on this matter elsewhere in this response.

ADDITIONAL ADVICE	
7.	*The applicant is advised that:* • *One consolidated bus lay-by parking area is able to be provided for all uses triggering this demand, although buses will need to be able to safety and efficiently re-circulate to the bus setdown facilities and vice versa.* • *If one strategically located bus setdown facility is to be provided, this must be convenient to all the venue entries (waterpark, beachclub and short-term accommodation) and have sufficient capacity (number of buses that can concurrently park) to cater for the setdown demand of the uses combined. This should consider the initial and ultimate hotel development.* • *Setdown facilities for personalised public passenger transport (taxis and rideshare) should be provided directly adjacent to the entry of each of the uses as these are likely to cater to vulnerable people who find it difficult to walk a distance (elderly, children, persons with a disability) and those with luggage, prams and the like.* *The applicant could consider altering the 'extra hotel carpark 24 cars' shown on the Masterplan to a dedicated parallel to kerb setdown facility to cater for the likely demand as this is strategically placed in proximity to the entries of the venues. Separate zones should be dedicated to buses, taxis and rideshare.*

Applicant's response

Noted and can be integrated into the detailed design documentation required to support the subsequent MCU and OPW development applications which will seek specific development rights.

Summary

I trust the additional common material included in this response provides sufficient information to allow the assessment of the development application to proceed. Should there be any issues, or should additional information be required, please contact me.

Kind regards,

Benjamin Collings
Director

Att.

PLAN OF DEVELOPMENT

TOWNSVILLE WATERPARK, HOTEL AND BEACHCLUB PLAN OF DEVELOPMENT

ASSOCIATED WITH A DEVELOPMENT APPLICATION FOR A PRELIMINARY APPROVAL
PLANNING ACT 2016

IMPACT ASSESSABLE MATERIAL CHANGE OF USE – VARIATION REQUEST UNDER s50 OF THE *PLANNING ACT 2016*

1-105 RACECOURSE ROAD
CLUDEN QLD 4811

being

LOT 1 ON SP101275 AND LOT 2 ON RP748152

BNC Planning Pty Ltd
ABN 80 147 498 397

DOCUMENT CONTROL

Prepared by	**Client**	**Report**
BNC Planning	MCK TSV Pty Ltd	Report No. DA041-24-POD March 2025 Version 1.0

Version	Date	Author
1.0	October 2024	BNC:BNC
2.0	March 2025	BNC:BNC

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Contents

APPENDICIES

1.0 Preliminary

1.1 Introduction

The *Townsville Waterpark, Hotel and Beach Club Plan of Development* (the Plan of Development) has been prepared as a framework for managing the future development of land addressed as 1-105 Racecourse Road, Cluden QLD 4811 more particularly described as being Lot 1 on SP101275 and Lot 2 on RP748152. See **Appendix 1 – Plan of Development Area**.

1.2 Masterplan Vision

Located in a greenfield site in Cluden, the Townsville Waterpark, Hotel and Beach Club masterplan project proposes to establish a mixed-use, tourism, recreation, entertainment and accommodation hub anchored by a water play based theme park.

As a sunny coastal city where the vibrant community thrives amidst its tropical climate, the addition of a waterpark and beach club serves as a fitting oasis for locals and tourists alike. The facility will serve not just as a recreational asset, but as a testament to the city's commitment to leisure, entertainment, and embracing its natural surroundings.

Townsville's warm climate provides the perfect backdrop for a waterpark adventure. This is bolstered by Townsville's strong emphasis on community and outdoor recreation, with a waterpark catering to a diverse range of age groups and interests, fostering a sense of unity and camaraderie among residents.

Likewise, the beach club aligns with the city's lifestyle and love for entertainment and is further reinforced through Townsville's thriving tourism industry and affluent demographic making it an ideal location to create a popular destination for both domestic and international travellers. By hosting curated events and live performances, the beach club becomes a focal point for entertainment and leisure in the city.

Supported by short and long term accommodation and a boutique hotel/tavern, the development will become a hub of entertainment and social activity, further enhancing and complimenting the city's established vibrant waterfront scene and adding to the depth and dynamism of the city's social fabric, attracting a diverse audience and fostering a sense of community pride and belonging.

1.3 Character

The intention is to create a unique community destination providing for a range of integrated water play based recreation and entertainment activities, supported by sustainable framing commercial and accommodation land uses. The greenfield site is an urban infill property which offers the opportunity to create a new, modern, endemic sense of place through considered place-making urban design outcomes. This involves making use of the open space assets available both within the development and as shared with the adjoining Townsville Turf Club. The character and streetscape should foster a clear sense of destination and place making.

1.4 Applicability

The provisions of the Plan of Development apply to the Plan of Development Area identified in **Appendix 1**.

1.5 Extent of Variation

The intent of the Plan of Development and the extent to which it seeks to vary the Townsville City Plan is described below:

- define the extent to which the associated development application seeks to vary the effect of the Townsville City Plan;
- establish the area to which the Plan of Development is applicable (the Plan of Development Area);
- set levels of assessment for future development by way of a Table of Assessment;
- set assessment benchmarks for future development by way of a Table of Assessment;
- establish a Plan of Development Code applicable to development within the Plan of Development Area;
- establish an ongoing application framework which will ensure an efficient development assessment process for future uses.

Note – the Plan of Development involves new codes and assessment benchmarks as well as new tables of assessment which seek to change the current categories of development and assessment applied under the planning scheme.

1.6 Relationship with the Planning Act 2016

The Plan of Development forms part of the parent development application made under section 50 of the *Planning Act 2016* (the Act) seeking a Preliminary Approval to vary the effect of a local planning instrument (Townsville City Plan) as it applies to the Plan of Development Area, pursuant to section 61 of the Act.

2.0 Purpose Statement

(1) The purpose of the Plan of Development is to create a unique, landmark community destination providing for a range of integrated tourism, recreation, entertainment and accommodation activities that takes advantage of the sites sport and recreation zoning, proximity to high order transport infrastructure and high level of access to other existing urban infrastructure networks.

More specially, the purpose and vision of the Plan of Development is to establish a planning framework to deliver a landmark, integrated 'waterplay' based tourism and entertainment destination supported by a mix of support services that will establish a State significant social infrastructure asset for the community.

(2) The purpose of the PoD will be achieved through the outcomes identified within the Townsville Waterpark, Hotel and Beach Club Plan of Development Code.

3.0 Categories of Development and Assessment

3.1 Preliminary

The table of assessment identifies the categories of development and assessment and the assessment criteria for development within the Plan of Development Area.

3.2 Reading the Table of Assessment

The table identifies the following:

(1) The category of development:
  (a) prohibited;
  (b) accepted, including accepted with requirements; and
  (c) assessable development that requires code or impact assessment

(2) The category of assessment, being code or impact, for assessable development in:
  (a) The Plan of Development area and, where used, a precinct or sub-precinct;
  (b) an overlay, where used.

(3) the assessment benchmarks for assessable development and requirements for accepted development, including:
  (a) whether a Plan of Development code or specific provisions in the Plan of Development code apply (shown in the 'assessment benchmarks for assessable development and requirements for accepted development' column);
  (b) if there is an overlay:
    (i) whether an overlay code applies (shown in Table 5.9.1 of the Townsville City Plan); or
    (ii) whether the assessment benchmarks as shown on the overlay map (noted in the 'assessment benchmarks for assessable development and requirements for accepted development' column) applies;
  (c) any other applicable code(s) (shown in the 'assessment benchmarks for assessable development and requirements for accepted development' column).
  (d) any requirements for accepted development which will need to be met in order for the development to remain accepted.

(4) any variation to the category of assessment (shown as an 'if' in the 'Categories of development and assessment' column) that applies to the development.

3.3 Determining the Categories of Development and Assessment

The process for determining a category of development and category of assessment is:

For a material change of use:

(a) establish the use by reference to the use definitions in Schedule 1;

(b) identify the precinct that applies to the development area, by reference to the Masterplan - Precinct Plan in Appendix 1;
(c) identify if an overlay's apply to the development area, by reference to the overlay mapping in Schedule 2 of the Townsville City Plan;
(d) determine the category of development and assessment by reference to *Table 1 – Categories of Development and Assessment – Plan of Development*;
(e) determine the assessment benchmarks by reference to *Table 1 – Categories of Development and Assessment – Plan of Development*;
(f) if an overlay applies, refer to section 5.9 Categories of development and assessment-Overlays within the Townsville City Plan, to determine if the overlay further changes the category of development or assessment.

For other development types (Reconfiguring a lot, Operational works and Building works) the provisions of the Townsville City Plan apply.

3.4 Categories of Development and Assessment – Plan of Development

The following table identifies the categories of development and assessment and the corresponding assessment benchmarks for assessable development and accepted development for material change of use development within the Plan of Development area. The Plan of Development only applies to material change of use development. For other development types the provisions of the Townsville City Plan apply.

Table 1 – Categories of Development and Assessment – Plan of Development

Use	**Categories of development and assessment**	**Assessment benchmarks for assessable development and requirements for accepted development**
Park	**Accepted development**	
		No assessment benchmarks apply
Major electricity infrastructure Substation Utility installation	**Accepted development**	
	If provided by a public sector entity.	No assessment benchmarks apply
Telecommunications facility	**Accepted development**	
	If aerial cabling for broadband purposes.	No assessment benchmarks apply
	Assessable development - Code assessment	
	Otherwise	Plan of Development Code **and the following codes from the Townsville City Plan:** Telecommunications facilities and utilities code Healthy waters code

		Landscape code Transport impact, access and parking code Works code
Caretaker's accommodation	**Accepted development subject to requirements**	
		Plan of Development Code **and the following codes from the Townsville City Plan:** Works code
Bar Club Shop	**Assessable development - Code assessment**	
		Plan of Development Code **and the following codes from the Townsville City Plan:** Healthy waters code Landscape code Transport impact, access and parking code Works code
Food and drink outlet	**Accepted development subject to requirements**	
	If within an existing building and not involving more than minor building work.	Plan of Development Code **and the following codes from the Townsville City Plan:** Works code
	Assessable development - Code assessment	
	If: (a) located in Precinct 2; and (b) the gross floor area does not exceed 600m^2. ***Editor's note—****The gross floor area threshold is calculated for a new use or an extension to an existing use. It is not the cumulative total of the existing use and the additional gross floor area forming part of the development application.*	Plan of Development Code **and the following codes from the Townsville City Plan:** Healthy waters code Landscape code Transport impact, access and parking code Works code

Multiple dwelling Rooming accommodation	**Assessable development - Code assessment**	
		Plan of Development Code **and the following codes from the Townsville City Plan:** Healthy waters code Landscape code Transport impact, access and parking code Works code
Community use Educational establishment Emergency services Hotel Indoor sport and recreation Short-term accommodation	**Assessable development – Code assessment**	
		Plan of Development Code **and the following codes from the Townsville City Plan:** Healthy waters code Landscape code Transport impact, access and parking code Works code
Function facility Tourist attraction Tourist park	**Assessable development – Code assessment**	
	If within Precinct 1.	Plan of Development Code **and the following codes from the Townsville City Plan:** Healthy waters code Landscape code Transport impact, access and parking code Works code
Child care centre Health care services	**Assessable development – Code assessment**	
	If within Precinct 2.	Plan of Development Code **and the following codes from the Townsville City Plan:** Healthy waters code Landscape code Transport impact, access and parking code

		Works code
Any other use not listed in this table. Any other undefined use.	**Assessable development - Impact assessable**	
		The Townsville City Plan The Plan of Development

SCHEDULE 1

DEFINITIONS

SCHEDULE 1 Use definitions

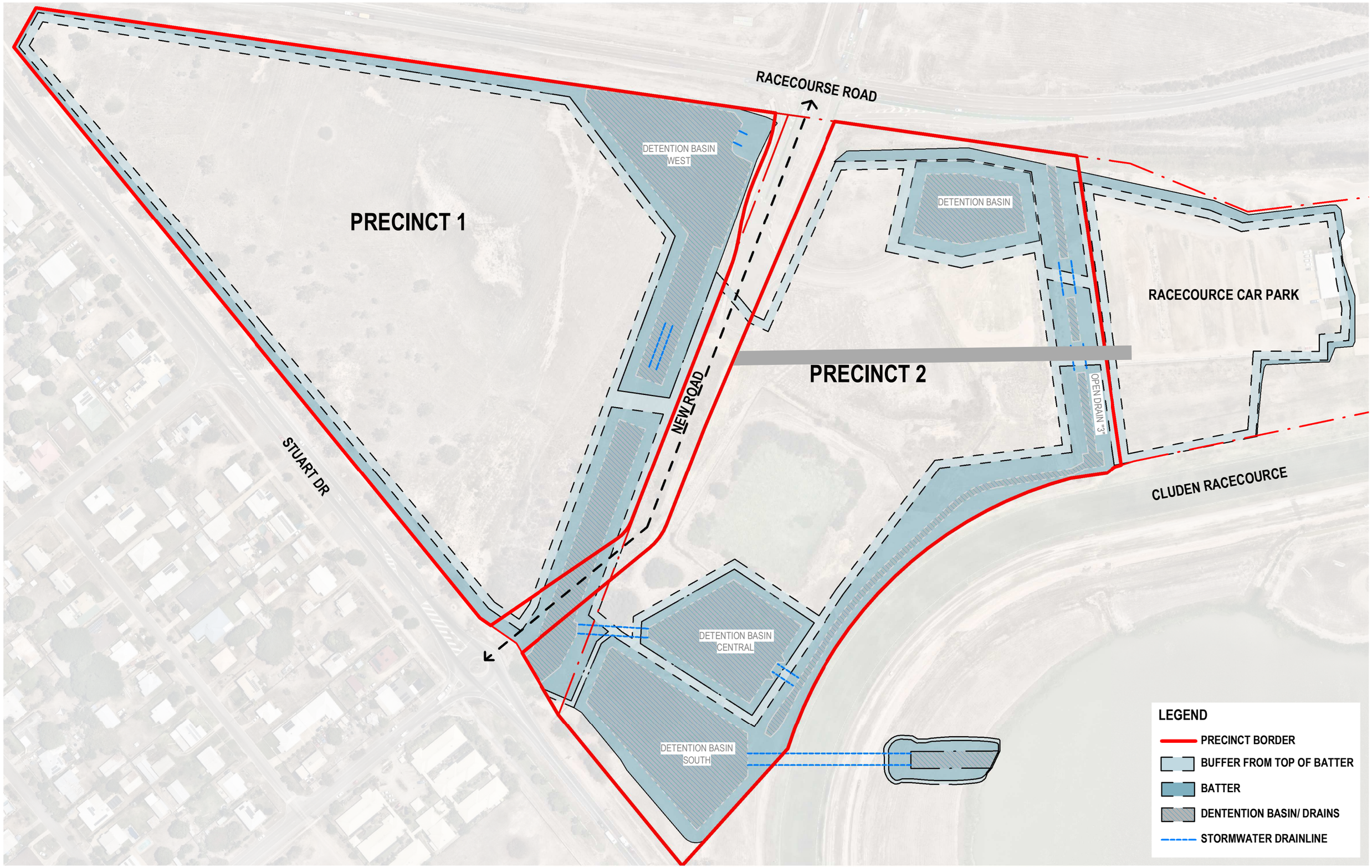
All use definitions applicable for the purpose of applying this Plan of Development are to be taken from Schedule 1 of the Townsville City Council Planning Scheme 2014 (City Plan 2014) as it occurs at the date of the approval of this Plan of Development, with the exception of any variations outlined in **Table SC1.0** below:

Table SC1.0–Use definitions

Column 1 **Use**	**Column 2** **Definition**	**Column 3** **Examples include**	**Column 4** **Does not include the following examples**

APPENDIX 1

PLAN OF DEVELOPMENT AREA AND PRECINCT PLAN



2407 TSV Hotel & Water Park

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Cairns | Brisbane | Townsville | Darwin
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Masterplan -Precinct Plan

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APPENDIX 2

CONCEPT MASTERPLAN

SUMMARY

WEST SITES

17,300m²	WATER PARK
2,150m²	HOTEL
4,000m²	ACCOMMODATION
5,230m²	VIP
3,350m²	DEVELOPMENT SITE 1
14,900m²	DEVELOPMENT SITE 2

EAST SITES- RETAIL

2,600m²	FAST FOOD (SITE)
2,090m²	COMMERCIAL 1
1,570m²	COMMERCIAL 2
7,030m²	COMMERCIAL 3
3,130m²	MIXED-USE (SITE)

-Taven on ground
- Apartments above
150 Apartments
(Based on 15 Storey)

CAR PARKING

290 CARS	WATER PARK
84 CARS	HOTEL
215 CARS	RETAIL + LARGE FORMAT
188 CARS	PARKING LOT
40 CARS	FAST FOOD
150 CARS	RESIDENTAL PARKING (LOCATED UNDER PODIUM)

LEGEND

- BUFFER FROM TOP OF BATTER
- BATTER
- DENTENTION BASIN/ DRAINS
- STORMWATER DRAINLINE

2407 TSV Hotel & Water Park

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Masterplan - Town Planning

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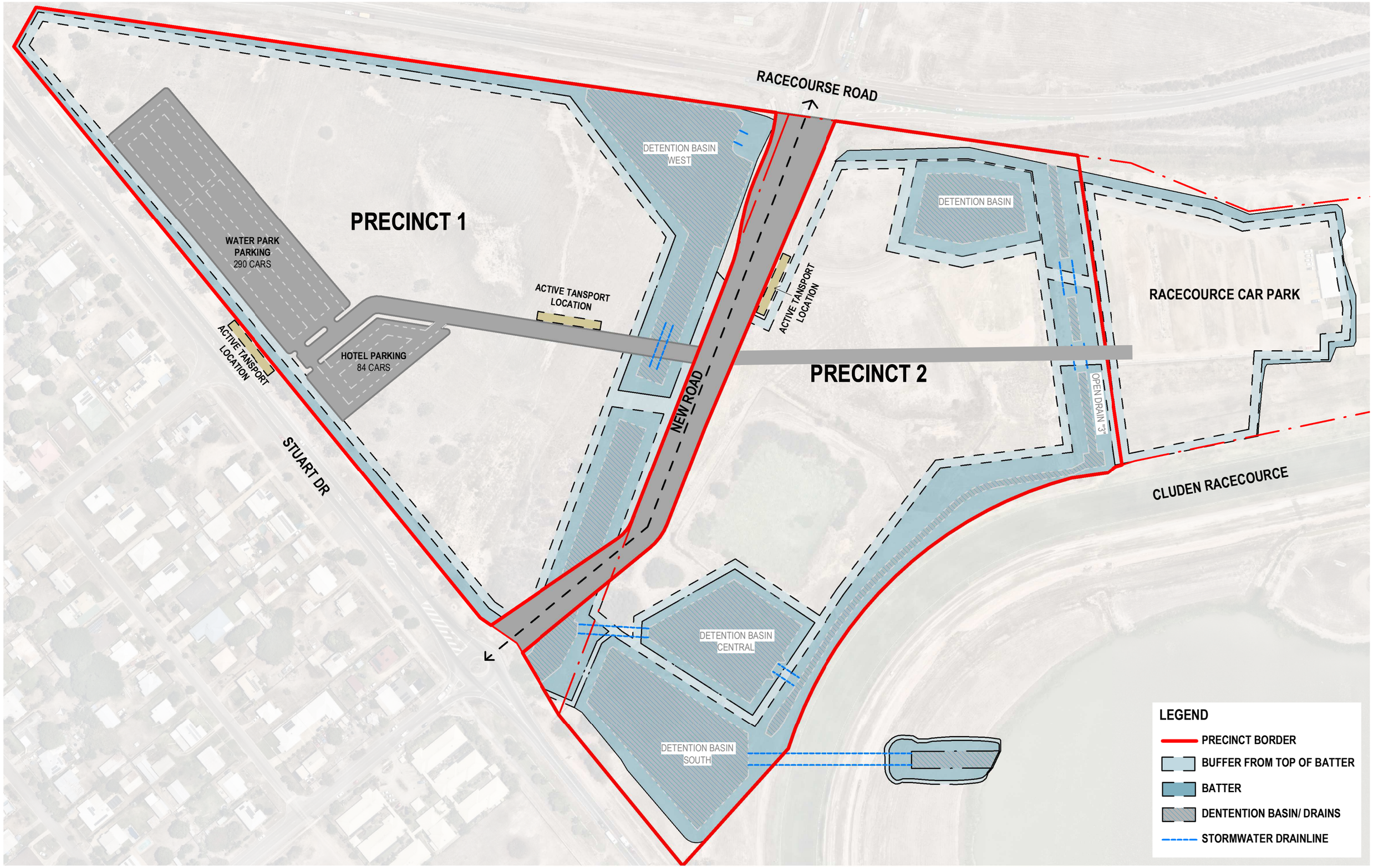

2407 TSV Hotel & Water Park

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Masterplan - Active Transport Node

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APPENDIX 3

TOWNSVILLE WATERPARK, HOTEL AND BEACH CLUB PLAN OF DEVELOPMENT CODE

Townsville Waterpark, Hotel and Beach Club Plan of Development Code

Application

This code applies to development where the code is identified as applicable in the categories of development and assessment.

Purpose

1. The purpose of the Townsville Waterpark, Hotel and Beach Club Plan of Development Code (the POD Code) is:

   To create a unique, landmark community destination providing for a range of integrated tourism, recreation, entertainment and accommodation activities that takes advantage of the sites sport and recreation zoning, proximity to high order transport infrastructure and high level of access to other existing urban infrastructure networks.

   More specifically, the POD Code will support the delivery of the *masterplan vision* and *purpose statement* of the Townsville Waterpark, Hotel and Beach Club Plan of Development.

2. The Purpose of the POD Code will be achieved through the following overall outcomes:

   (a) development directly supports the primary tourism, recreation, entertainment and accommodation function of the site;

   (b) development provides for the co-location of complementary and compatible commercial and community-related activities.

   (c) development does not restrict public access and does not detract from the primary function of the site for tourism, recreation, entertainment and accommodation activities;

   (d) built form and landscaping create an attractive, pedestrian oriented streetscape, and visual amenity along major roads is improved;

   (e) development provides safe and convenient internal pedestrian and cyclist pathways and external connections to existing and proposed public transport infrastructure and surrounding activities wherever possible;

   (f) design of built form and public spaces facilitates safe and secure environments and discourages antisocial behaviour;

(g) development is designed and operated to minimise adverse impacts on the amenity of surrounding residential neighbourhoods;

(h) development does not involve industrial uses;

(i) development does not compromise the intended role or successful functioning of surrounding centres;

(j) Development does not involve full line supermarkets, discount department stores or department stores;

(k) development does not compromise the ongoing operation of the Cluden racecourse;

(l) high-quality public spaces are created that optimise opportunities for community interaction;

(m) the design of development assists in preventing antisocial behaviour and supporting personal safety;

(n) Development applies urban design practices that achieve:

i. strong integration and consolidation through built form and layout;
ii. a high quality public realm, with attractive, safe and useable public spaces and streets;
iii. active uses that attract people on key pedestrian circulation streets and major frontages;
iv. buildings constructed at or close to the street on key frontages and parking areas and access ways that do not dominate major frontages and pedestrian routes;
v. a high level of pedestrian and cyclist accessibility and accessibility by public transport;
vi. a human scale and pedestrian comfort (shelter and shade), at street level;
vii. climate responsive design, with the opportunity to adopt sustainable building designs beyond current best practice; and
viii. connectedness between green spaces and the wider network of natural assets, where practicable.

3. The purpose of the POD Code will also be achieved through the following additional overall outcomes for particular precincts:

Precinct 1 – Waterpark, Hotel & Beach Club

(a) establishes a new water play based theme park, entertainment and bar areas, restaurant and food and drink offerings, a range of complimentary small scale shop and retail outlets internalised to the theme park and integrated short-term accommodation;
(b) is to be the primary and dominate land use outcome for the overall development;

(c) maintains and supports further development of tourism, recreation, entertainment and accommodation uses in areas identified for future development;
(d) provides integrated pedestrian pathways that achieve a high level of permeability throughout the precinct, with the greater Plan of Development area and the greater locality; and
(e) buildings, excluding water slide structures, within this precinct are generally up to 15 storeys.

Precinct 2 – Supporting Mixed Use

(a) accommodates mixed use development in the form of residential, commercial and some retail uses which provide an interface between Precinct 1 and the Townsville Turf Club.
(b) development does not compromise the intended role or successful functioning of other centres.
(c) the precinct evolves to contain a mix of drive through food and drink, hotel/tavern, indoor sport and recreation, specialty retail and educational services, community support services as well as medium density residential and rooming accommodation products.
(d) where residential uses are proposed, development provides a high quality residential environment which capitalises on the precinct's proximity to Precinct 1, the Townsville Turf Club and the Idalia district centre precinct; and
(e) buildings within the precinct are generally up to 12 storeys.

Assessment Benchmarks

Table 1.0 – Accepted development subject to requirements and assessable development

Performance outcomes	Acceptable outcomes
For accepted development subject to requirements and assessable development	
Amenity	
PO1 Refuse storage areas and storage of goods, vehicles, machinery or materials in open areas is presented in a manner that does not detract from the visual amenity of the site or local area.	**AO1.1** The open area used for the storage of refuse, vehicles, machinery, goods and materials on the site is: (a) located no closer than 3m from any boundary; and (b) are screened from view by a 1.8m high solid screen fence.
PO2 Where provided, outdoor lighting does not adversely affect the amenity of adjoining properties or create a traffic hazard on adjacent roads.	**AO2.1** Light emanating from any source complies with *Australian Standard AS 4282 Control of the Obtrusive Effects of Outdoor Lighting*.
	AO2.2 Outdoor lighting is provided in accordance with *Australian Standard AS 1158.1.1 –Road Lighting – Vehicular Traffic (Category V) Lighting – Performance and Installation Design Requirements*.
PO3 Residential uses are provided with a reasonable level of privacy.	**AO3.1** Windows, balconies, and terraces of any residential use are screened where overlooking a habitable room or private open space of another dwelling within 9m. Where required, screening is a solid translucent screen or perforated panels or trellises which have a maximum of 50% openings.
PO4 Residential uses are provided with a reasonable level of private outdoor living space.	**AO4.1** Dwellings are provided with private open space or a balcony directly accessible from a habitable room with: (a) a minimum area of $9m^2$; (b) a minimum dimension of 3m; and (c) clear of any utilities such as gas, water tanks and air conditioning units.

Caretaker's accommodation	
PO5 Development does not compromise the effective operation of the primary use.	**AO5.1** No more than one (1) caretaker's accommodation unit is provided on the site.
	AO5.2 The caretaker's accommodation unit has a gross floor area of no more than 70m^2.
For assessable development	
Role and function	
PO6 Development does not prejudice or detract from the primary purpose of the Townsville Waterpark, Hotel and Beach Club Plan of Development.	No acceptable outcome is nominated.
PO7 Uses occur where they: (a) directly support or are directly allied with the primary purpose of the Townsville Waterpark, Hotel and Beach Club Plan of Development; or (b) are subordinate to that primary function.	No acceptable outcome is nominated.
PO8 Development is consistent with the intended role, scale and character of the Townsville Waterpark, Hotel and Beach Club Plan of Development and does not compromise the intended role or successful functioning of the centres hierarchy. **Editor's note—**Applicants should have regard to Economic impact assessment planning scheme policy SC6.5 from the Townsville City Plan for guidance on how to demonstrate compliance with this performance outcome.	No acceptable outcome is nominated.
Design and built form	
PO9 The design of the precinct provides for: (a) efficient use of the available land; (b) a coherent and integrated built form, public realm and circulation networks; (c) central, accessible and attractive public spaces for people to congregate and interact; (d) continuity and complementarity of streetscape and landscape characteristics;	No acceptable outcome is nominated.

(e) pedestrian friendly and visually interesting frontages to streets and public spaces; (f) optimum energy efficiency; (g) a compatible mix of uses; (h) connectivity of pedestrian and cyclist paths and spaces internal and external to the centre; and (i) sensitive transitioning of built form and uses to surrounding land. **Editor's note**—Applicants may be requested to prepare centre design master plans to demonstrate compliance with this performance outcome.	
PO10 Building setbacks and orientation provide for an attractive streetscape and character, that is also sympathetic to existing characteristics of the local area.	No acceptable outcome is nominated.
PO11 Development is sympathetic to the scale of surrounding buildings, avoids expanses of blank walls and includes features that contribute to an attractive streetscape.	**AO11.1** The maximum length of any unarticulated wall is 15m, without a change in plane of at least 0.75m.
	AO11.2 Landscaping is provided along the street frontage, including substantive planting along at least 50% of the length of the frontage.
PO12 Streetscape treatments and street trees are provided along the street frontage to create a visually cohesive precinct and enhance pedestrian amenity and contribute positively to the city image.	No acceptable outcome is nominated.
PO13 Building caps and rooftops create an attractive roofscape and screen plant and equipment.	No acceptable outcome is nominated.
PO14 Built form maximises use of natural ventilation, solar heating/cooling and water conservation through building orientation and design, landscaping, building materials and on-site infrastructure.	No acceptable outcome is nominated.
PO15 Parking facilities are located to be concealed from public view to ensure an attractive streetscape.	**AO15.1** Vehicle parking structures are located: (a) behind the building setback; or (b) behind the building; or (c) at basement level.

Crime prevention through environmental design	
PO16 Development facilitates the security of people and property having regard to: (a) opportunities for casual surveillance and sight lines; (b) exterior building design that promotes safety; (c) adequate lighting; (d) appropriate signage and wayfinding; (e) minimisation of entrapment locations; and (f) building entrances, loading and storage areas that are well lit and lockable after hours. **Editor's note—**Applicants should have regard to Crime Prevention through Environmental Design Guidelines for Queensland.	No acceptable outcome is nominated.
Accessibility	
PO17 Convenient and legible connections are provided for pedestrians and cyclists to the site, particularly having regard to linkages with existing and proposed public transport infrastructure, the open space network, centres and other community-related activities. **Editor's note—**Applicants should seek to address this PO through a traffic impact assessment prepared by a suitably qualified professional that includes details on an Active Transport Strategy.	No acceptable outcome is nominated.
PO18 Safe and convenient pedestrian and cyclist circulation is provided for as an integrated component of the site layout. **Editor's note—**Applicants should seek to address this PO through a traffic impact assessment prepared by a suitably qualified professional that includes details on an Active Transport Strategy.	No acceptable outcome is nominated.
Amenity	
PO19 Development maintains a high level of general amenity within the site and for surrounding areas, having regard to: (a) noise; (b) hours of operation; (c) traffic; (d) visual impact; (e) signage;	No acceptable outcome is nominated.

(f) odour and emissions; (g) lighting; (h) access to sunlight; (i) privacy; and (j) outlook. **Editor's note—**Applicants may be required to engage specialists to provide detailed investigations into the above matters in order to demonstrate compliance with this performance criterion.	
PO20 Landscaping is provided to enhance the appearance of development, screen unsightly components, create an attractive on-site environment and provide shading.	No acceptable outcome is nominated.
For a Multiple dwelling or Rooming accommodation use with a building height of 3 storeys or less	
PO21 Building design and setbacks: (a) create an attractive, consistent and cohesive scale along the streetscape; (b) maintain appropriate levels of light and solar penetration, air circulation, privacy and amenity for existing and future buildings; and (c) do not prejudice the development of adjoining sites.	**AO21.1** Buildings are set back from street frontages: (a) within 20% of the average front setback of adjoining buildings; or **(b)** where there are no adjoining buildings, 3m.
	AO21.2 The side boundary setback, except for a wall built to the boundary, is a minimum of: (a) 1.5m for a wall up to 4.5m high; (b) 2m for a wall up to 7.5m high; and (c) 2.5m for any part of a wall over 7.5m high.
	AO21.3 A landscape area with a minimum dimension of 1.5m is provided along the full frontage of any road frontage (excluding crossover and pedestrian access only).
PO22 Built to boundary walls do not impact on the amenity or privacy of adjoining premises. Editor's note–Built to boundary wall heights and lengths may be increased where abutting an existing or proposed built to boundary wall on an adjoining property.	**AO22.1** Built to boundary walls: (a) are for non-habitable rooms or spaces only; (b) are not located within 1.5m of a habitable room or house on an adjoining site; (c) are not located within the front or rear setback; (d) have a maximum height of 3m; and

	(e) have a maximum length of 15m.
PO23 Roof form assists in reducing the appearance of building bulk by: (a) articulating individual dwellings; and (b) incorporating variety in design through use of roof pitch, height, gables and skillions.	No acceptable outcome is nominated.
PO24 Development provides private open space that is: (a) well-proportioned, appealing, functional and easily accessible, and promotes outdoor living as an extension of the dwelling; (b) provides a high level of privacy for residents and neighbours; and (c) has sufficient size and shape to meet the needs of a diversity of potential residents.	**AO24.1** For a ground floor dwelling, ground floor private open space is provided with: (a) a minimum area of 25m²; (b) a minimum dimension of 4m; and (c) clear of any utilities such as gas, water tanks or air-conditioning units
	AO24.2 Balconies are provided with a minimum area of 9m² for a 1 bedroom unit or 16m² for a 2 or more bedroom unit, with a minimum dimension of 4m and clear of any air conditioning unit or drying space.
	AO24.3 Where clothes drying areas are provided on private balconies they are screened from public view.
	AO24.4 Private open space is located or screened so it does not directly overlook main living areas or private open space of adjoining dwellings.
PO25 Sufficient communal open space is provided to create flexible spaces suitable for a range of activities.	No acceptable outcome is nominated.
PO26 Communal open space provides facilities including landscaping and shade treatments such as green roofs, green walls or community gardens contribute to the attractiveness of these spaces.	No acceptable outcome is nominated.
For a Multiple dwelling or Rooming accommodation uses with a building height of 4 storeys or more	
PO27 Building design creates an enjoyable pedestrian	No acceptable outcome is nominated.

environment and experience through the use of: (a) design elements that promote a sense of human scale at the street level, including use of awnings where appropriate; (b) design that breaks up the ground floor elevation on the principle street frontage into distinct elements; and (c) articulation of the built form above ground floor through use of balconies, recesses and changes in material.	
PO28 Building design and setbacks: (a) create an attractive, consistent and cohesive scale along the streetscape; (b) maintain appropriate levels of light and solar penetration, air circulation, privacy, landscaping and amenity for existing and future buildings; and (c) do not prejudice the development of adjoining land.	**AO28.1** Buildings are set back from street frontages: (a) within 20% of the average front setback of adjoining buildings; or (b) where there are no adjoining buildings, 6m.
	AO28.2 The side boundary setback, except for a wall built to the boundary, is a minimum of: (a) 1.5m for a wall up to 4.5m high; (b) 2m for a wall up to 7.5m high; and (c) 2.5m for any part of a wall over 7.5m high.
	AO28.3 A deep planting landscape area with a minimum width of 2.0m is provided along the full frontage of any road frontage (excluding crossover and pedestrian access).
	AO28.4 A deep planting landscape area with a minimum width of 2.0m is provided along the rear site boundary.
PO29 Roof forms assist in articulating the facade as a combination of distinct elements integrated with the facade design.	No acceptable outcome is nominated.
PO30 Roof top plant and equipment are contained within roof forms and are screened from the street and from adjoining buildings using a consistent range of non-reflective materials to provide a cohesive design element.	No acceptable outcome is nominated.

PO31 Development provides private open space that is: (a) well-proportioned, appealing and functional and easily accessible, and promotes outdoor living as an extension of the dwelling; (b) provides a high level of privacy for residents and neighbours; and (c) has sufficient size and shape to meet the needs of a diversity of potential residents.	**AO31.1** Balconies are provided with a minimum area of 9m² for a 1 bedroom unit or 16m² for 2 or more bedroom unit, with a minimum dimension of 4m and clear of any air conditioning unit or drying space.
	AO31.2 Where clothes drying areas are provided on private balconies they are screened from public view.
	AO31.3 Private open space is located or screened so it does not directly overlook main living areas or private open space of adjoining dwellings.
PO32 Sufficient communal open space is provided to create flexible spaces suitable for a range of activities and to mitigate the intensity of the built form.	No acceptable outcome is nominated.
PO33 Communal open space provides facilities including seating, shade, flexible spaces suitable for a range of activities. Treatments such as green roofs, green walls or community gardens contribute to the attractiveness of these spaces.	No acceptable outcome is nominated.
Precinct 1 – Waterpark, Hotel and Beach Club	
PO34 Precinct 1 is to deliver a new water play based theme park, entertainment and bar areas, restaurant and food and drink offerings, a range of small internalised shops and retail outlets and short term accommodation.	**AO34.1** The Waterpark, Hotel and Beach Club are to be developed generally in accordance with the Concept Master Plan attached as Appendix 2 of this Plan of Development.
	AO34.2 No acceptable outcome is nominated.
PO35 Building height creates a high-rise environment.	**AO35.1** Building height does not exceed 15 storeys.
Precinct 2 – Supporting Mixed Use	
PO36 Building height creates a high-rise environment	**AO36.1** Building height does not exceed 12 storeys.
PO37 Building design and setbacks:	No acceptable outcome is nominated.

(a) create an attractive, consistent and cohesive scale along the streetscape; (b) maintain appropriate levels of light and solar penetration, air circulation, privacy and amenity for existing and future buildings; (c) do not prejudice the development or amenity of adjoining land; (d) retain the openness of street vistas, including to the sky, along major elements of the city grid; and (e) transition to lower scale heritage places and precincts.	
PO38 The size of the development site allows for primary orientation of buildings to the street, and the provision of building setbacks, on-site services and circulation and open space at ground storey.	**AO38.1** Where accommodating a building of 5 storeys or more, development sites have a minimum size of 1,000m^2.

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Our Ref: **BNC0084/04:AW**
Your Ref: **MCU24/108 & RAL24/0067**

February 26, 2025

The Chief Executive Officer
Townsville City Council
PO Box 1268
TOWNSVILLE QLD 4810

Attention: Manager – Planning and Development

To whom it may concern,

RE: **TOWNSVILLE TURF CLUB – 1–105 RACECOURSE ROAD CLUDEN (MCU24/0108 & RAL24/0067) – RESPONSE TO INFORMATION REQUEST IN RELATION TO DEVELOPMENT APPLICATION – FLOOD ASSESSMENT ITEM**

An Information Request has been received in relation to the development application for the above-mentioned project, dated 10 December 2024.

In accordance with the Development Assessment Rules under the Planning Act 2016 and on behalf of our client MCK TSV Pty Ltd, we provide all information requested to the items noted within the above-mentioned Information Request, as follows:

Request Item 5 – (Flood Impact Assessment)

The applicant is requested to provide an amended Flood Impact Assessment (FIA) to address the following:

- There are conflicts apparent between the development layouts and FIA figures, in particular the building footprints are shown overlapping with detention basins. The plans and/or flood study is requested to be updated to clarify this;
- The FIA has considered only the 1% and 20% AEP design storm events. The FIA is requested to be amended to consider the full suite of standard design storm AEPs; and
- The report makes reference to a critical duration discrepancy in the Ross River 2021 model, however it is unclear what this is referring to. The relevant critical duration data and mapping was supplied with the model files.

Applicant's Response

- **First Dot point** - The latest Plan of Development has been included for information. However, as this is the POD stage, the project layout is understood to be evolving. In any case, the

development proposal will be required to comply with the flood impact assessment. Whilst the exact detention basin arrangement and shape can be modified slightly, the volumes, areas, inflow and outflow configurations are required to be carried out as shown in order to comply with the FIA outcomes. NCE propose that the approval includes a condition stating that the flood mitigation be implemented in accordance with the FIA or as otherwise updated and approved by Council.

- **Second dot point -** NCE carried out flood assessments of the major, 1% AEP event and the minor, 20% AEP event (as defined in TCC's planning scheme). Various storm durations were considered with the 9 hour and 1.5 hour events found to dominate the 1% AEP and the 2 hour event dominated the 20% AEP event. Whilst the 1% AEP 1.5 hour event was assessed to ensure non-worsening, the 9 hour event was found to dominate flood levels across all areas of the site and in particular around the state controlled infrastructure. Therefore, only the 9 hour event was mapped in the report. Also refer to the further event information discussed in the third dot point relating to the critical duration.

  As a result of the critical duration discrepancies discussed below, please note that NCE had previously carried out a comprehensive assessment based on the 1.5 hour event which, at the time was understood to be the critical duration based on Ross River Flood (2021) Map D1. It should be noted that NCE were able to address the mitigation based on the 1.5 hour event relatively easily and without all the detention basins that were ultimately required for the 9 hour event.

  The 1.5 hour event only require the most upstream detention basin and diversion into the lake in order to mitigate impacts off site. The 1% AEP 9 hour event however, in conjunction with the 20% AEP 2 hour event required the additional and extensive multi-tiered detention basin and flow restriction arrangements shown in the ultimate FIA. As a result of this additional comprehensive second assessment, and based on the fact that the 1% AEP 1.5 hour event required a fraction of the detention storage compared to the 9 hour event, it is considered that this detention arrangement nominated in the FIA is suitable and no further events are warranted.

  However, to further support the proposal, NCE carried out additional assessment of the time of submergence which also included stage hydrographs at the north-east of the site within the rail corridor. These plots shown in Fig 1 and Fig 2 below indicate the time of submergence at a reporting location in the middle of the rail corridor near the maximum depth of inundation (Fig 3). This additional assessment shows that whilst the events that were modelled demonstrate non-worsening, in addition to the report mapping, the time of submergence does not increase in this critical location.

  Additionally, the primary sensitive receptors of the model are the surrounding, adjacent state controlled infrastructure (to the south-west, north and east) as well as the existing turf club infrastructure. NCE have demonstrated non-worsening and in addition, DTMR (via SARA), have confirmed they do not require all events to be assessed.

Fig 1 – 1% AEP Railway Corridor Time of Submergence

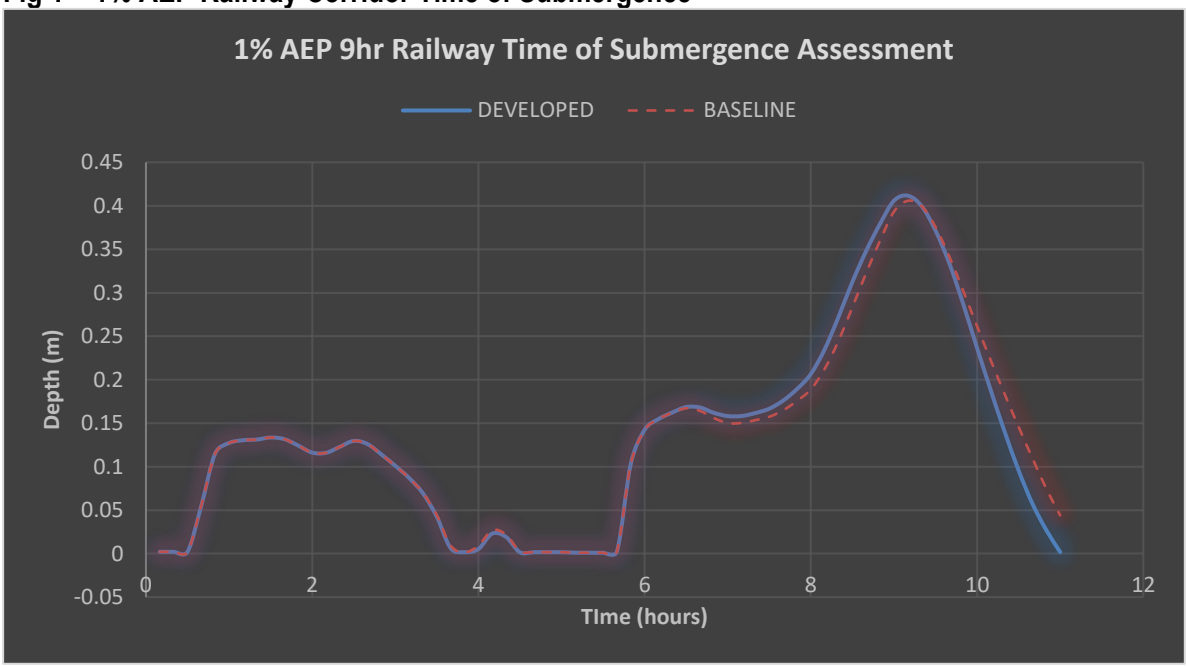


Fig 2 – 20% AEP Railway Corridor Time of Submergence

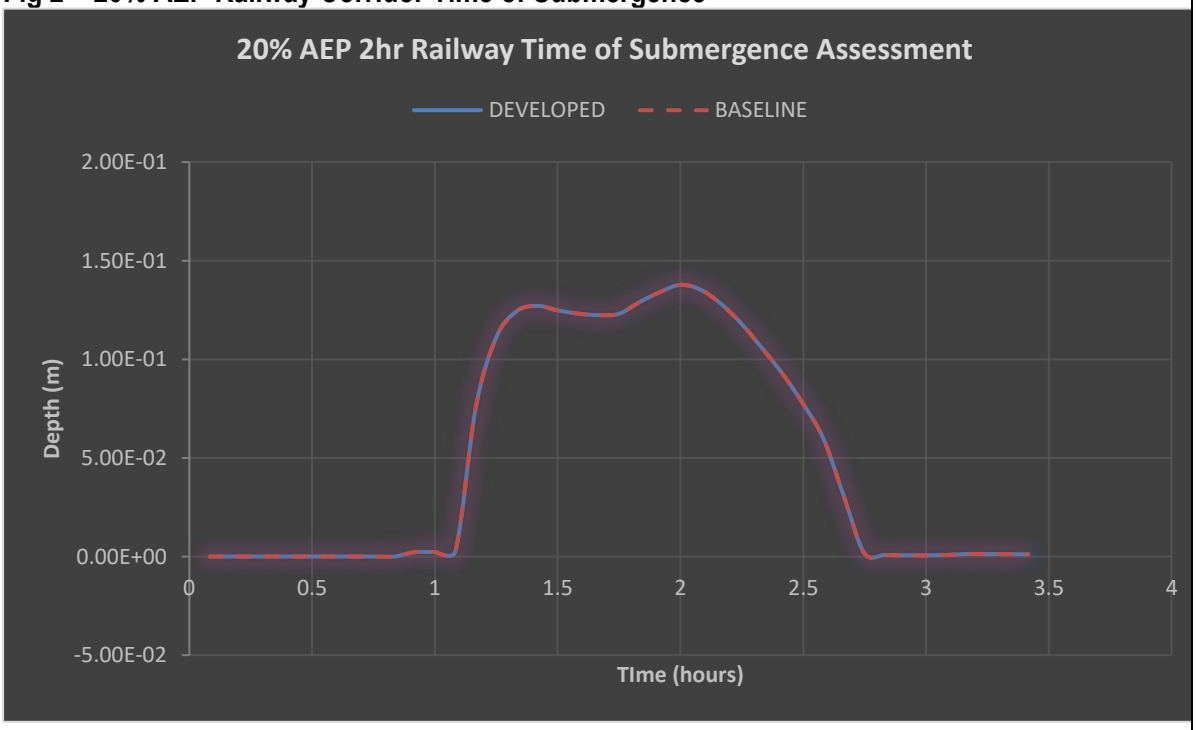
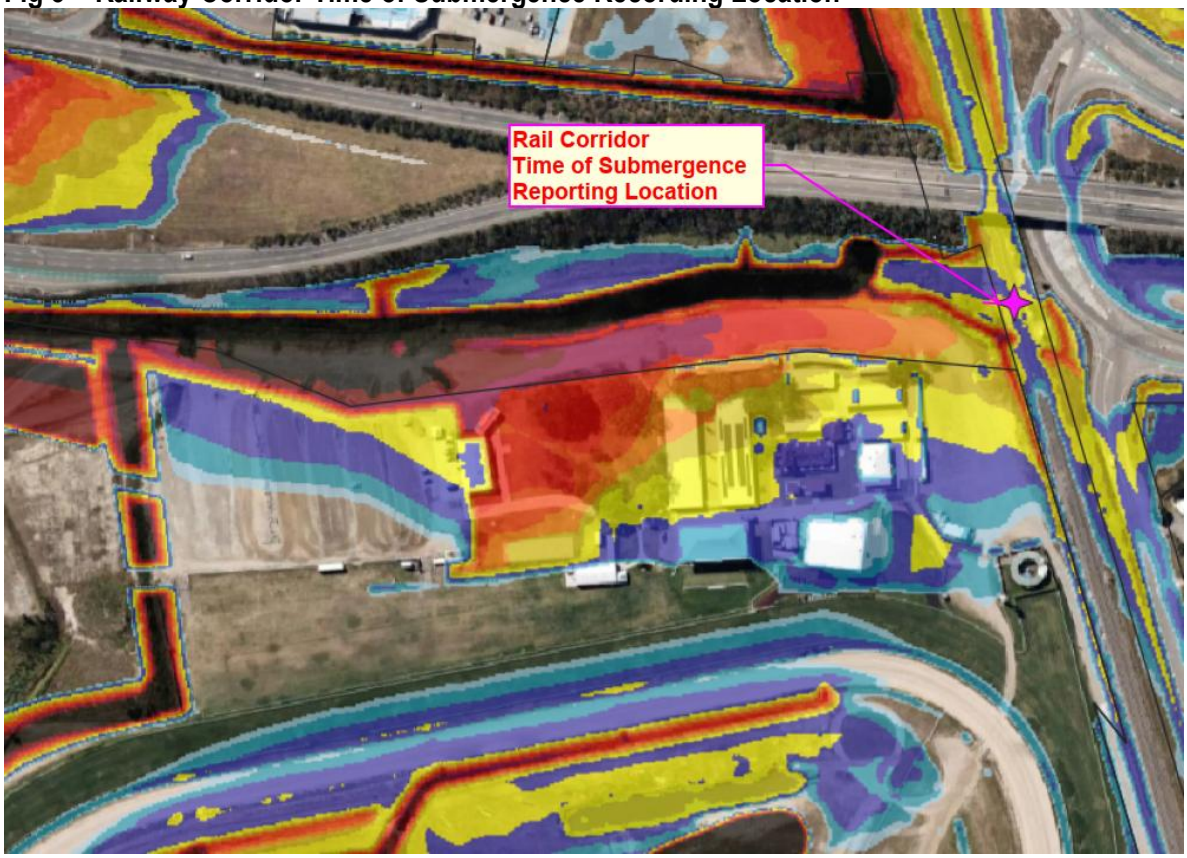


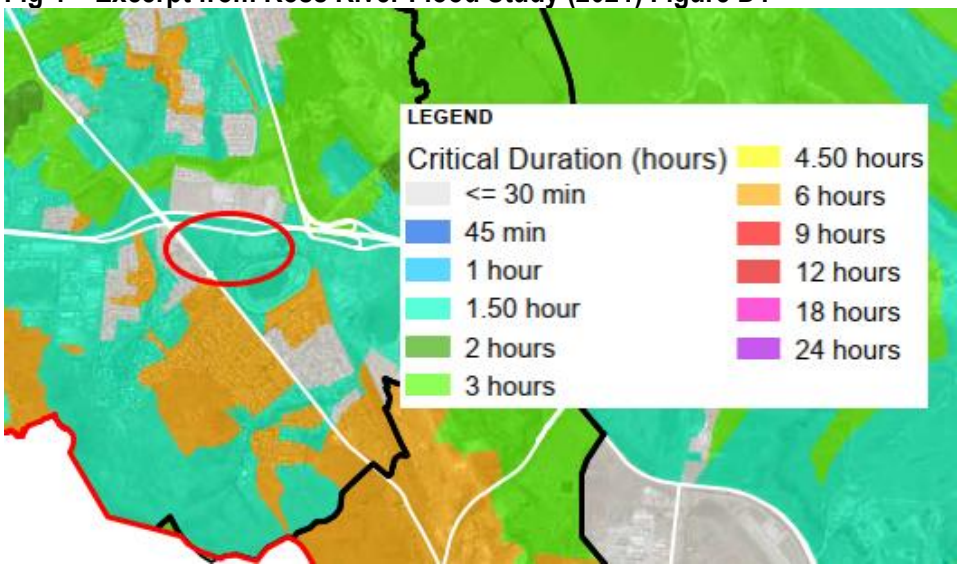
Fig 3 – Railway Corridor Time of Submergence Recording Location



- **Third dot point -** In relation to the critical duration discrepancies, it's considered that Council are aware of this given that when this matter was first raised, Council supplied NCE with the raw scr file that showed the corrected critical durations. NCE have since carried out detailed manual verification of the critical durations which show that the supplied scr file is correct and that the mapped critical durations are not correct. NCE considers that this has been suitably addressed in the report. However, NCE provide the following information to assist.
  The raw file provided was labelled:
  RR_DAM_n_E01_1pAEP_MHWS_5m_R1_001_{ZoneA}_h_Max_MAXMAX_src.flt

  The below Fig 4 is a marked up excerpt from the Ross River Flood Study (2021) of Map D1. This would indicate that critical duration at the site is the 1.5 hour event and downstream in the Lakes area is the 3 hour event. However, when the actual critical duration event maximum flood levels are reviewed manually, these events are shown to not be the actual critical durations causing the highest flood levels. The scr file demonstrates that at both locations (except for the far upstream section of the site), the 9 hour event is found to be the critical duration. When the raw water surface elevation results files are scrutinised, the 9 hour event is confirmed to be correct.

Fig 4 – Excerpt from Ross River Flood Study (2021) Figure D1



I trust the additional information and clarifications above meet with your approval, and I look forward to receiving your assessment.

Please do not hesitate to contact the undersigned on TEL: 07 4725 5550 if you have any questions regarding this response.

Yours sincerely,

ANDREW WALLACE
Director

NORTHERN CONSULTING engineers

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Web: www.nceng.com.au
50 Punari Street Currajong Qld 4812

Our Ref: **BNC0084/05:AW**
SARA Ref: **MCU24/0108 & RAL24/0067**

26 February 2025

A/Manager (Planning)
State Assessment and Referral Agency
North and North West Regional Office
PO Box 5666
TOWNSVILLE QLD 4810

Attention: Principal Planning Officer – Helena Xu

Dear Helena,

RE: **1–105 RACECOURSE ROAD CLUDEN (MCU24/0108 & RAL24/0067) – RESPONSE TO SARA ADVICE NOTICE IN RELATION TO DEVELOPMENT APPLICATION – FLOOD MATTERS**

A SARA Advice Notice has been issued in relation to the development application for the above-mentioned project, dated 4 November 2024. It is noted that the matters raised were not issued as part of a formal information request. This response relates to Item 5, the stormwater and flooding related matters.

NCE also make reference to the meeting held via video conference on the 13/11/24 where the specifics of the request items relating to the bulk earthworks Advice Notice were discussed. This response letter aligns with that meeting as well as the associated response to those items. The current Advice Item 5 Issue states that the information relating to the bulk earthworks Advice Notice had not yet been provided to SARA. It is noted that the response was issued on the 18th December which was the day after the latest DA Advice Notice had been issued (but prior to us receiving it). This response also refers to the NCE Flood Impact Assessment document reference BNC0084-FIA dated 16/08/24.

Item 5 – Flood Impacts on the State-Controlled Transport Corridors

Action:
You are advised to provide a revised Flood Impact Assessment and revised Engineering Report.

The revised Flood Impact Assessment and Engineering Report should demonstrate that the management of stormwater and flooding post development can achieve a no worsening impact (on the pre-development condition) for all flood and stormwater events that exist prior to development and up to a 1% Annual Exceedance Probability (AEP). This should include at least the following flood and stormwater events: 63.2%, 50%, 20%, 10%, 5%, 2% and 1% AEP. Stormwater management for the proposed development must ensure no worsening to the railway corridor, including rail transport infrastructure, caused by peak discharges, flow velocities, water quality, sedimentation and scour effects. The report should also demonstrate that flood storage capacity is maintained on the site with the development. Overland flow paths/ hydraulic conveyance should be maintained on the site as part of the proposed development. The flood immunity of the railway corridor should not be worsened.

In particular, the following should be addressed:

(a) Revised water quantity assessment – Provide updated peak discharge analysis modelling for the pre and post development stormwater discharge for the following flood and stormwater events: 63.2%, 50%, 20%, 10%, 5%, 2% and 1% AEP. The design flood peak discharges should be shown for the mitigated case to demonstrate there is no worsening impact on the railway corridor.

(b) Revised flood impact assessment. Provide an updated hydraulic and hydrological analysis demonstrating the proposed development will not materially worsen the existing time of submergence for the railway corridor (NB: the top of formation is the control point for this assessment). The updated assessment should also address the following:

- The design flood peak discharges for the site and surrounding area which exist in the pre and post development scenarios for at least the following flood and stormwater events: 63.2%, 50%, 20%, 10%, 5%, 2% and 1% AEP.
- The flood model needs to adequately encompass the railway corridor.
- Mapping (afflux, water level/depth and velocity impact maps and time of submergence) should be provided to clearly illustrate the pre-development scenario, and the post development impacts for the above design events.
- Any staging of the proposed works and mitigation measures should be clearly detailed and explicitly analysed to ensure there is no worsening during all phases of development for the above design events.

Applicant's Response

(a) As noted above, this item is the same as the previous Advice Notice Item 1(a) and addressed similarly as follows:

During the meeting on the 13/11/24, NCE provided a summary of the model, the methodology and an overview of the report outcomes. The pre and post development flood scenarios were presented in video clips which demonstrated the flood response including in the various detention basins throughout the storm. As noted in the meeting, NCE carried out flood assessments of the major, 1% AEP event and the minor, 20% AEP event (as defined in TCC's planning scheme). Various storm durations were considered with the 9 hour and 1.5 hour events found to dominate the 1% AEP and the 2 hour event dominated the 20% event. Whilst the 1% AEP 1.5 hour event was assessed to ensure non-worsening, the 9 hour event was found to dominate flood levels across all areas of the site and in particular around the state controlled infrastructure. Therefore, only the 9 hour event was mapped in the report.

As a result of a critical duration discrepancy and prior to the rectification, please note that NCE had previously carried out a comprehensive assessment based on the 1.5 hour event which, at the time was understood to be the critical duration based on the Ross River Flood Study (2021) Map D1. It should be noted that NCE were able to address the mitigation based on the

1.5 hour event relatively easily and without all the detention basins that were ultimately required for the 9 hour event.

The 1.5 hour event only require the most upstream detention basin and diversion into the lake in order to mitigate impacts off site. The 1% AEP 9 hour event however, in conjunction with the 20% AEP 2 hour event required the additional and extensive multi-tiered detention basin arrangements shown in the ultimate FIA. As a result of this additional comprehensive second assessment, and based on the fact that the 1% AEP 1.5 hour event required a fraction of the detention storage compared to the 9 hour event, it is considered that this detention arrangement nominated in the FIA is suitable and no further events are warranted

As agreed in the meeting, no additional events were required to be assessed (with the additional information provided below).

(b) NCE provide the following hydrograph with a recording location at the rail corridor and provide the following responses.

- As agreed in the meeting, no additional events are required to be assessed.

- As described in the meeting, the flood model extends encompasses the rail corridor and the model extends well beyond to ensure that all relevant state controlled infrastructure is suitably considered.

- As noted in the meeting, the mapping included in the report extends beyond the rail corridor and show the extent of flooding and afflux. However, in addition to the report mapping and as presented in the meeting, NCE have also included stage hydrographs within the rail corridor. These plots shown in Fig 1 and Fig 2 below indicate the time of submergence at a reporting location in the middle of the rail corridor near the maximum depth of inundation. The outcomes of the 2 events are as follows:
    - The 1% AEP event shows there is no change to the time that submergence commences but later in the storm when the depth increases, the developed scenario increases very slightly earlier and also reduces earlier than the baseline scenario. Overall, the time of submergence does not increase within the rail corridor.
    - The 20% AEP event shows extremely small variations between the pre and post development scenarios but these are insignificant and therefore considered to represent no change.

  In summary, the above time of submergence carried out for the rail corridor at the east of the proposed development does not result in water level or velocity afflux and does not increase the time of submergence. This also represents a change that is far less than a 10% change to the time of submergence.

- There is no staging proposed as part of the bulk earthworks application and all works inclusive of the mitigation are proposed to be carried out in their entirety.

  The only difference between the bulk earthworks and the ultimate proposed waterpark, hotel and beach club, is the imperviousness of the ultimate development. The bulk earthworks construction includes all detention basins and flow restriction components of the proposal. The results of the report are based on the ultimate percent imperviousness and therefore considers the final ultimate outcomes.

Fig 1 – 1% AEP Railway Corridor Time of Submergence

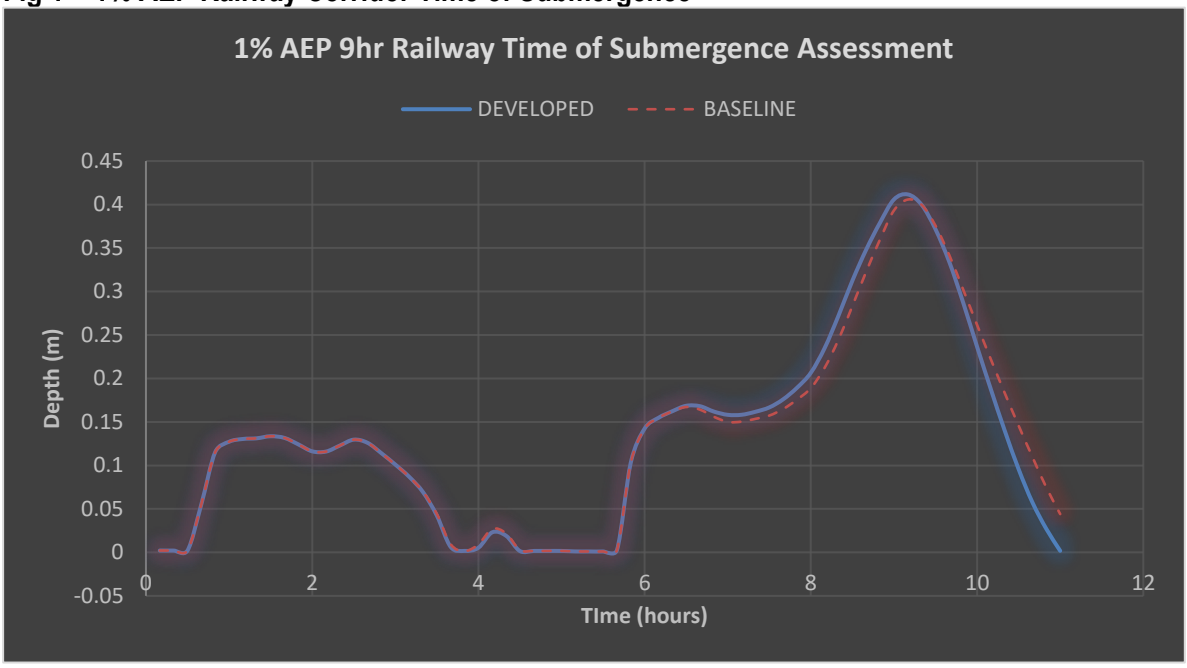


Fig 2 – 20% AEP Railway Corridor Time of Submergence

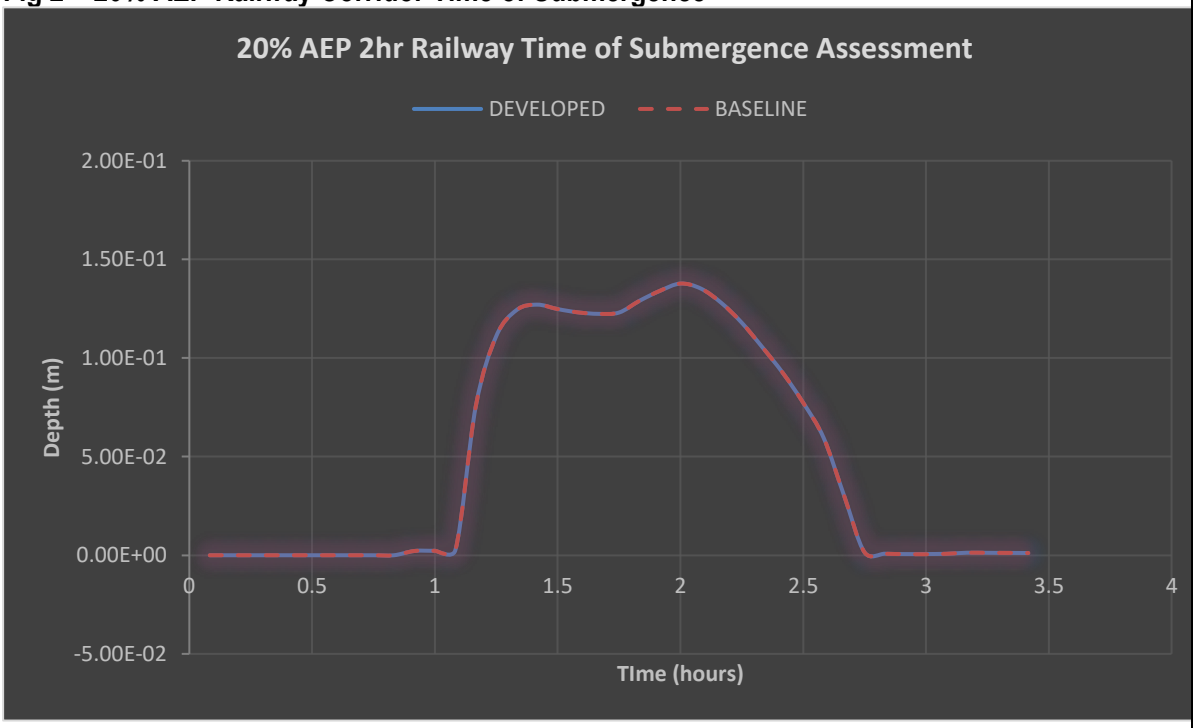
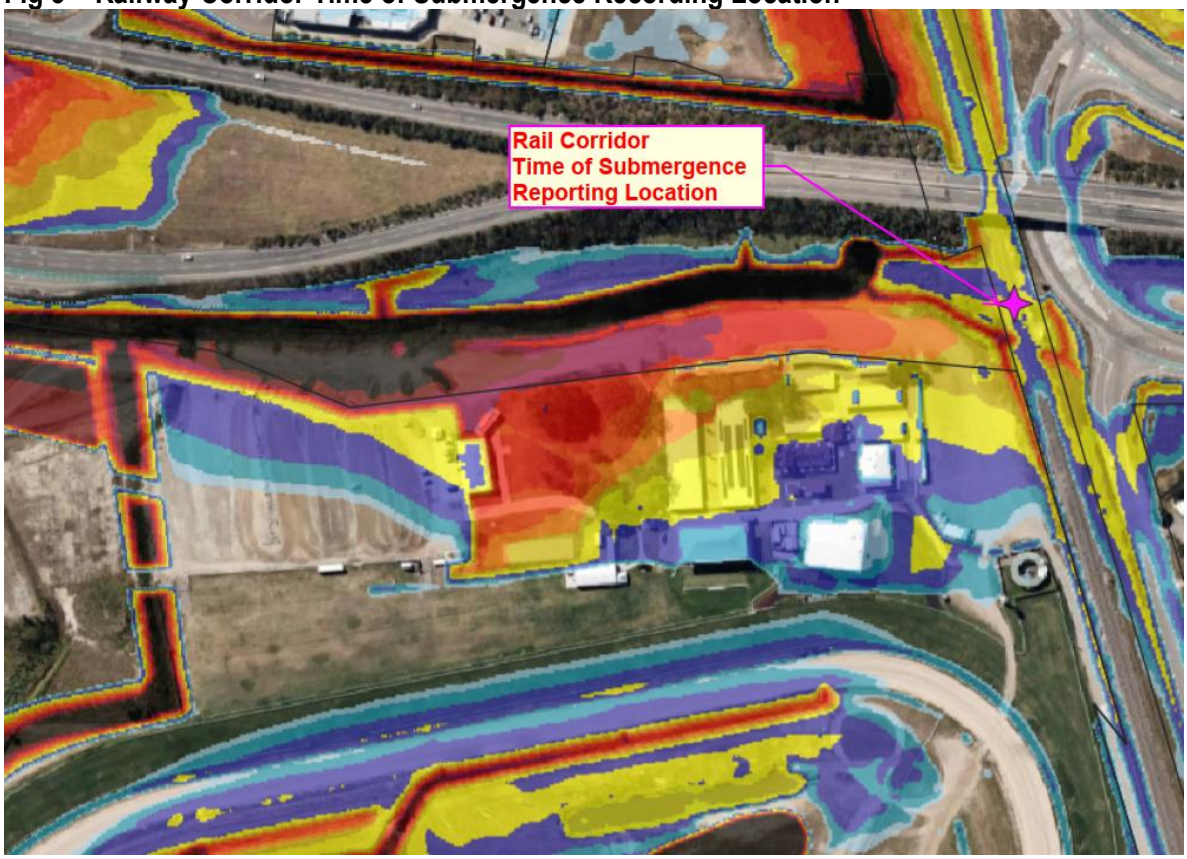


Fig 3 – Railway Corridor Time of Submergence Recording Location



This letter is very similar to the previous bulk earthworks Advice Notice response and considered to align with the responses required as agreed to in the meeting and we trust the above information meets with your approval. We look forward to receiving your assessment.

Please do not hesitate to contact the undersigned on TEL: 07 4725 5550 if you have any questions regarding this response.

Yours sincerely,

ANDREW WALLACE
Director

Our ref: 50890-LT01-A
Your ref: 2411-43466 SRA
Contact: James Goodman

11 March 2025

A/ Manager (Planning)
Department of State Development, Infrastructure and Planning
PO Box 5666
Townsville QLD 4810
NQSARA@dsdilgp.qld.gov.au
Attention: Helena Xu

Dear Helena,

Response to SARA Advice Notice – Application Number 2411-43466 SRA
Townsville Water Park, Beach Club and Hotel – 1-105 Racecourse Road, Cluden

Reference is made to an Advice Notice dated 17 December 2024 from the Department of State Development, Infrastructure and Planning (**DSDIP**) in relation to the abovementioned development application. The purpose of this letter is to provide a response to the 'Traffic Impact Assessment' items of the information request. This letter has been prepared following a video conference meeting with SARA and the Department of Transport and Main Roads (TMR) officers on Tuesday 14 January 2025.

1. Response to items – Traffic Impact Assessment

1. Active Transport Access to Public Passenger Transport

Issue:

The Traffic Impact Assessment (TIA) prepared by Geleon, dated 20 September 2024, reference 50890-RP02-A, does not clearly demonstrate that the proposed development can comply with PO15 – PO17 and PO25 – PO27 of State code 1: Development in a state-controlled road environment (State code 1) along with PO1-PO3 of State code 6: Protection of state transport networks (State code 6). A detailed assessment of SARA's concerns has been provided below.

Access

- The TIA states that all internal roads will be accessed via an internal four-way roundabout; however, the development plans include three separate T-intersections along a 'New Road' extending from Lakeside Drive
- The proposed development plans include 3 direct access driveways to Stuart Drive. However, no review / justification has been included within the report to support these driveways.
- It is unclear how the Townsville Turf Club and 'Future Development Site 1' will be accessed.

Traffic Generation Rate

- Initial Distribution
  - The traffic distribution has reportedly been based solely on the existing survey data. This is not considered appropriate noting the low volumes of traffic generated by the existing development over the subject site and that development generated traffic will likely be new trips to network. Further, it results in major inconsistencies, such as ~90% of all inbound traffic arriving from the north along Lakeside Drive and only ~25% travelling north outbound.

- Background Traffic Distribution Post Connection to Stuart Drive:
  - The background traffic volumes have been redistributed to account for a new connection between Lakeside Drive and Stuart Drive that allows for a "rat-run" through the site between the two (2) state-controlled roads.
  - It is unclear how the percentage of traffic being distributed has been determined and if it is considered representative of the expected traffic conditions.
  - It is recommended that all assumptions are outlined and justified as part of the traffic redistribution. This should include reasoning to support the adopted percentages of traffic being redistributed.
- Development Traffic Redistribution Post Connection to Stuart Drive:
  - The development traffic has been redistributed to account for the new connection from Stuart Drive. This results in significant changes in the reported traffic catchment, such as the volume of traffic arriving from the north on Lakeside Drive decreases from ~90% to ~60%
  - It is unclear how this 90% northern catchment has reduced to now have ~30% arrive from the south.
  - It is recommended that the redistribution is amended to retain similar development catchments as the original traffic distribution (pre connection to Stuart Drive)

Scoping Assessment

- A 5% scoping assessment has reportedly been undertaken in accordance with the GTIA, however, it has not been included in the TIA.
- Based on the assumed development traffic volumes and distributions, the adopted impact assessment may require further intersections noting that ~90% of traffic was assumed to arrive from the state-controlled Lakeside Drive / Darcy Drive intersection.
- However, noting that the adopted traffic distribution is required to be amended, it is recommended that a 5% scoping assessment is undertaken to determine the impact assessment area based on the updated distribution.

Delay Assessment

- A 5% delay assessment excluding the extension of Lakeside Drive was undertaken, which identified significant (>5%) delay impacts. As part of the mitigation measure, a new connection has been provided to Stuart Drive, which required the external traffic to be redistributed. However, an amended 5% delay assessment has not been undertaken demonstrating the proposed development will result in <5% delay impacts. As such, it is recommended that a delay assessment is undertaken considering the mitigation measures to demonstrate the net delay impacts.
- It is expected that the following new access intersections would be excluded from the delay assessment as they do not have a background intersection configuration / delay to compare against and instead would need to demonstrate operation for the year of opening and 10-year design horizon:
  - Stuart Drive / Edison Street / Site Access roundabout
  - Lakeside Drive / Precinct 1-3 access road roundabout.

Safety Risk Assessment

- In line with the abovementioned changes, the existing safety risk assessment will need to be updated.

Action:

You are advised to prepare an amended RPEQ certified TIA in accordance with DTMR's GTIA, which:

- Confirms the proposed ownership of the extension of Lakeside Drive. Will this be a public road or will it remain a private driveway?

Response to Item 1 (Part 1)

It is anticipated that the new Lakeside Drive extended road will be a public road designed as a two-lane, two-way road configuration in accordance with Council *Standard Drawing SD-002 – Typical Cross Sections, Major Collector Roads*.

- Confirms how the existing Townsville Turf Club will be accessed as part of the development.

Response to Item 1 (Part 2)

Access to the existing Townsville Turf Club will be provided via the new Precincts 1 and 2 access road that will connect to the Proposed Lakeside Drive extended / Development Access roundabout as shown in **Figure 1**.

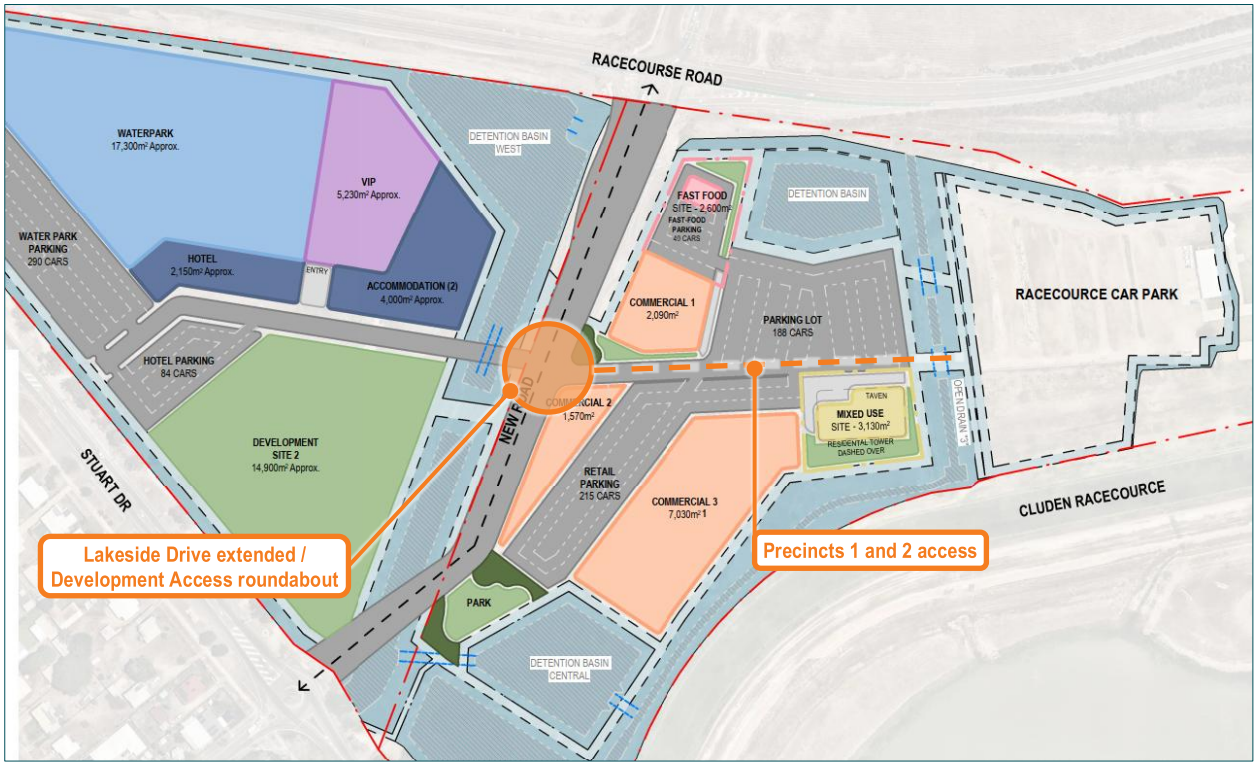


Figure 1 Access to existing Townsville Turf Club

- Includes concepts of the proposed accesses, with all accesses to / in the vicinity of the state-controlled network being reviewed considering the following:
  - proposed configurations
  - available sightlines
  - turn warrants Assessments (if necessary)
  - location / separation
  - swept path diagrams of the largest design vehicle.

Response to Item 1 (Part 3)

As discussed at the video conference meeting with SARA and TMR officers, this proposal relates to a zoning application with the provided development composition being theoretical for the purpose of formulating the traffic impact assessment. The subject site has sufficient land area available to ensure all transport infrastructure upgrades can be designed in accordance with TMR's *Road Planning and Design Manual, 2nd Edition* and Council's *Townsville City Plan (Version 2022/02)*.

Details, including concept drawings for the proposed transport infrastructure upgrades will be provided as part of a future development application when the actual development composition is known.

- Includes a review to demonstrate the internal configurations will not result in impacts to the state-controlled network via queuing or re-circulating vehicles. It is anticipated that significant internal changes will be required with the removal of the Stuart Drive driveways.

Response to Item 1 (Part 4)

Updated masterplan drawings are provided in an amended Geleon *Traffic Impact Assessment report: 50890-RP01-B* (*Geleon TIA*) (**Attachment A)** which details the anticipated access locations for a theoretical development. Direct access to Stuart Drive is not proposed. Direct property access to the new Lakeside Drive extension will not be permitted with all development traffic to flow through the eastbound and westbound approaches of the proposed Lakeside Drive extended / Development Access roundabout.

The proposed Lakeside Drive extended / Development Access roundabout is located at the midpoint between Racecourse Road and Stuart Drive which provides queueing up to 180m. The SIDRA analysis provided in the amended *Geleon TIA* confirms that vehicle queues on both Lakeside Drive extended approaches to the proposed roundabout are contained prior to Racecourse Road and Stuart Drive (**Attachment A**).

- Adopts amended traffic generation rates or provides suitable justification and sources to support the adopted rates. In accordance with the section on the Traffic Generation Rate above, the following rates require further review:
  - Fast food outlet
  - Tavern
  - Multiple Dwelling
  - Showroom
  - Water Park / Amusement Park
  - Hotel
  - Function Facility.

Response to Item 1 (Part 5)

Further details of the adopted traffic generation rates for the theoretical development are provided in *Table 3.1.1* of the amended *Geleon TIA* (**Attachment A**). The adopted traffic generation rates are considered appropriate and consistent with previous traffic impact assessments submitted to SARA.

- Amend the initial (pre connection to Stuart Drive) traffic directional distribution to reflect the surrounding traffic volumes, trip generators, residential areas, etc. Alternatively, justification should be provided to support the existing distribution.

Response to Item 1 (Part 6)

The adopted traffic distribution for the original Geleon *Traffic Impact Assessment report: 50890-RP01-A* dated 20 September 2024 (*original Geleon TIA*) was based on existing intersection directional splits from observed background traffic volumes at the key intersections. Following discussions with TMR officers, it is appreciated that the existing intersection directional splits result in a large portion of inbound trips coming from Lakeside Drive (north) and a large portion of outbound trips traveling to Racecourse Road (west). When the subject site is developed, existing travel patterns may become more evenly distributed, consistent with the road link directional splits observed at Racecourse Road and Lakeside Drive.

Table 1 provides the road link directional splits observed from the peak hour background traffic volumes at the key intersections. The calculated road link directional splits have been adopted for the development traffic distribution scenario included in the amended *Geleon TIA* (**Attachment A**).

Table 1 Road link peak hour directional splits

Road link	Direction	AM peak		PM peak		Weekend peak	
		Vehicles / hour	%	Vehicles / hour	%	Vehicles / hour	%
Lakeside Drive	North	689	28%	1,004	39%	985	42%
Racecourse Road	East	632	25%	762	29%	589	25%
Racecourse Road	West	1,180	47%	838	32%	793	33%

- Provide all assumptions and justification as part of the background traffic redistribution post Stuart Drive connection. This should include reasoning to support the adopted percentages of traffic being redistributed and redistributed routes.

Response to Item 1 (Part 7)

Further details on the assumptions made for the background traffic redistribution post the extension of Lakeside Drive to Stuart Drive are provided in *Section 5.2* of the amended *Geleon TIA* (**Attachment A**). The assumed traffic re-distribution accounts for vehicles travelling between the commercial land uses north of Racecourse Road and the residential catchment south of Stuart Drive, in addition to vehicles travelling to / from Racecourse Road east of Lakeside Drive. The nominal 10% has been adopted based on traffic engineering judgement and the traffic volumes expected for a typical two-lane, two-way road of this nature and location.

It is also important to note that this proposal relates to a zoning application with the provided development composition being theoretical for the purpose of formulating the traffic impact assessment. SARA will have the opportunity to assess the future development application, including the traffic impact assessment.

- Amend the post Stuart Drive connection development generated distribution to retain similar development catchments as the original traffic distribution (pre connection to Stuart Drive).

Response to Item 1 (Part 8)

As a result of providing a new road connection from Racecourse Road to Stuart Drive, the traffic distribution for the proposed development will change to reflect vehicles travelling to / from Stuart Drive (south). A portion of vehicles travelling to / from the west and east have been reduced to account for vehicles now travelling to / from the south. The percentage of vehicles that travel to / from the north remains unchanged.

Further details are provided in *Section 5.2.2* of the amended *Geleon TIA* (**Attachment A**).

- Undertake a 5% scoping assessment to determine the expected impact assessment area. Based on the current distribution, this is expected to also include the Lakeside Drive / D'Arcy Drive intersection at a minimum. If traffic is proposed to be re-distributed an amended 5% scoping assessment should be undertaken to determine the impact assessment area of the redistributed traffic volumes.

Response to Item 1 (Part 9)

As discussed at the video conference meeting with SARA and TMR officers, this proposal relates to a zoning application with the provided development composition being theoretical for the purpose of formulating the traffic impact assessment. However, the amended *Geleon TIA* details the percentage of net development generated traffic compared to existing background traffic to determine the expected impact assessment area for the identified intersections with background traffic data available (**Attachment A**).

Traffic count data is available for the Racecourse Road / Lakeside Drive and Racecourse Road / Lakeside Drive / Townsville Turf Club Access signalised intersections and the Stuart Drive / Edison Street roundabout which directly front the subject site and will have the most immediate impact from the development. While a 5% scoping assessment may determine a wider impact assessment area, the nominated assessment area for the purpose of this zoning application is considered appropriate. Further analysis of the wider network will be provided as part of a future development application when the

actual development composition is known. The traffic impact assessment prepared for this zoning application is theoretical for the purpose of demonstrating that a functional transport network in the immediate vicinity of the subject site can be achieved.

Additionally, it is important to note that SARA will have the opportunity to assess the future development application, including the traffic impact assessment where the impact assessment area can be scrutinized, and the required transport infrastructure upgrades can be appropriately conditioned based on the actual development being proposed at that time.

- Undertake an amended 5% delay impact and if required, identify appropriate mitigation measures. If mitigation measures are provided, a second 5% delay assessment should be undertaken to demonstrate the development impacts are below 5%. As part of any mitigation measures proposed (if required), a suitable concept should be provided demonstrating the changes and that the largest design vehicles can still suitably manoeuvre through the intersection.

Response to Item 1 (Part 10)

As discussed at the video conference meeting with SARA and TMR officers, this proposal relates to a zoning application with the provided development composition being theoretical for the purpose of formulating the traffic impact assessment. Details, including concept drawings and swept paths sketches for the proposed transport infrastructure upgrades will be provided as part of a future development application when the actual development composition is known.

As discussed with TMR officers, due to the scale of the theoretical development presented in the traffic impact assessment and the mitigation measures including signal phasing adjustments to the existing Racecourse Road eastbound / Lakeside Drive and Racecourse Road westbound / Lakeside Drive / Townsville Turf Club Access signalised intersections, an outcome where the mitigation measures return the development's impact to less than 5% of the base aggregate-intersection-delay is not possible. Rather the purpose of the traffic impact assessment is to demonstrate that the proposed infrastructure upgrades will result in a transport network that operates within acceptable performance criteria in the year of opening (2029) and the 10-year design horizon (2039). This is demonstrated in the amended *Geleon TIA* (**Attachment A**).

- Provide an amended safety risk assessment reflecting the abovementioned changes to the assessment criteria. The safety risk assessment should also provide a comparison of the identified risk during the background and development scenarios to demonstrate a no net worsening outcome as a result of the proposed development. This should include (but is not limited to):
  - A review of intensified turning movements on the State-controlled network
  - A review of intensified queuing within the impact area
  - Consideration of intensified movements / queueing as part of the Lakeside Drive extension.

Response to Item 1 (Part 11)

While the risk assessment included in the *original Geleon TIA* already demonstrates a need to mitigate, the amended *Geleon TIA* includes the additional risk assessment items raised by SARA (**Attachment A**).

Consistent with the outcome of the risk assessment provided in the *original Geleon TIA*, capacity issues and increased road safety risks are noted for the Racecourse Road / Lakeside Drive signalised intersection in the development scenario. In response, the following mitigation measures are proposed:

- extend Lakeside Drive, connecting Racecourse Road to Stuart Drive to reroute some vehicle movements away from Racecourse Road, and
- apply a common control group (CCG) phasing sequence to the existing Racecourse Road eastbound / Lakeside Drive and Racecourse Road westbound / Lakeside Drive / Townsville Turf Club Access signalised intersections and modify the phasing sequence and timing to cater for existing and development generated traffic.

In terms of considering intensified movements / queueing on the state-controlled road network as part of the Lakeside Drive extension to Stuart Drive, these factors have been considered while developing the proposed transport infrastructure upgrades with the objective being a transport network that operates within acceptable performance criteria in the year of

opening (2029) and the 10-year design horizon (2039). This is demonstrated in *Section 5.5* of the amended *Geleon TIA* (**Attachment A**).

Specifically, the proposed Lakeside Drive extended / Development Access roundabout is located at the midpoint between Racecourse Road and Stuart Drive which provides queueing up to 180m. The SIDRA analysis provided in *Section 5.5* of the amended *Geleon TIA* confirms vehicle queueing from the proposed roundabout does not extend to the Stuart Drive and Racecourse Road intersections, and vice versa queueing from the Stuart Drive and Racecourse Road intersections does not extend to the proposed roundabout.

2. Conclusion

As a result of the responses provided to the matters raised, we conclude that the proposed development addresses all 'traffic impact assessment' items raised in the Advice Note in relation to the proposed development.

Should you have any questions or need anything clarified, please contact our office.

Yours sincerely

Luke Seeney, RPEQ 23542
Director | Principal Engineer

Attach.

Attachment A Amended Traffic Impact Assessment Report: 50890-RP02-B

Traffic Impact Assessment

Townsville Water Park, Beach Club and Hotel

1-105 Racecourse Road, Cluden

11 March 2025

Prepared for:
MCK TSV Pty Ltd
Report: 50890-RP02-B

GELEON

Document Control Information

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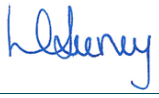
Prepared for:	MCK TSV Pty Ltd
Prepared by:	James Goodman
Reviewed by:	Luke Seeney
Project Reference:	50890

Revision History

Authorised for issue

Version	Issue Date	Purpose of Issue	Details	Name / Position	Signature
A	20 September 2024	To support development application	Original issue	Luke Seeney | RPEQ 23542 Engineering Principal	Original signed by L. Seeney
B	11 March 2025	Information request stage	Updated in response to SARA advice notice	Luke Seeney | RPEQ 23542 Engineering Principal	

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Appendices

1. Introduction

1.1 Project background

Geleon has been engaged by MCK TSV Pty Ltd (the **Applicant**) to prepare a Traffic Impact Assessment (**TIA**) to accompany a Development Application (**DA**) to establish the Townsville Water Park, Beach Club and Hotel at 1-105 Racecourse Road, Cluden (Lot 1 SP101275 and Lot 2 RP748152) (**Figure 1.1**). The existing 52.301-hectare site is currently occupied by the Cluden Park Racecourse in the eastern portion, with this application related to the western portion of the site that is currently vacant.

Figure 1.1 Locality plan

1.2 Development details

The proposed development encompasses several land uses across three precincts, including food and drink outlet, shop, hotel, multiple dwelling, showroom, outdoor sport and recreation, short-term accommodation and function facility land uses. Specifically, the outdoor sport and recreation land use aims to establish a waterpark on the subject site. Within Precinct 3, the short-term accommodation, food and drink outlet, and function facility will be consolidated within a single hotel establishment.

It is understood that all three precincts will be constructed concurrently and will be operational within five years (2029).

Access to and from the three precincts will be facilitated by internal private roads connecting to the current Townsville Turf Club Access via a new four-leg, single-lane roundabout. Prior to commencement, the Townsville Turf Club Access will extend as part of Lakeside Drive, connecting Racecourse Road to Stuart Drive. Direct property access to the new extension of Lakeside Drive from the proposed land uses will be prohibited.

Details of the proposed development are provided in **Table 1.2**, with the site plan shown in **Figure 1.2**. Other relevant plans of development have been included in **Appendix A**.

Table 1.2 Development details

ID	Land Use	Quantity	
Precinct 1			
1	Food and drink outlet (fast food)	560	m^2 GFA
2	Shop / food and drink outlet (restaurant / café)	1,590	m^2 GFA
3	Hotel (Tavern)	1,215	m^2 GFA
Precinct 2			
4	Multiple dwelling	230	Units
Or			
4	Showroom	5,500	m^2 GFA
Precinct 3			
5	Outdoor sport and recreation (Waterpark)	371	parking spaces
6	Short-term accommodation	209	Rooms
7	Food and drink outlet (restaurant / café)	204	m^2 GFA
8	Function facility	1,523	m^2 GFA

Figure 1.2 Master plan

1.3 Applicable planning scheme

The proposed development site falls under the jurisdiction of the City of Townsville (**Council**) and is governed by the *Townsville City Plan (Version 2022/02)*.

1.4 Scope

The scope of the assessment presented in this report is as follows:

- assessment of public transport, pedestrian and cycling accessibility to / from site
- calculation of the anticipated development traffic generation and its impact to the external road network, and
- completion of Council and State development code templates to accompany the development application.

1.5 Limitations

While the calculations and analysis undertaken as part of the assessment and documented in this report are considered appropriate for the assessment, the following limitations should be noted:

- large events at the Cluden Park Racecourse have been not considered as these events would comprise event specific traffic management plans
- background traffic count data utilised in the assessment has been based on traffic counts which may not be 100% representative of the typical traffic volumes on the external road network, and
- background growth rates adopted for this study have been based on historical background traffic growth. While the use of these growth rates to establish traffic forecasts is considered acceptable for the short term (10-20 years), estimates become less reliable the further out they are calculated. This is due to potential changes in traffic conditions as a result of changes to the wider road network and different shifts in traffic generators and attractors and route choices. As such, the assessment contained in this report should be revisited should any significant changes in volumes at the intersections or adjacent road links be identified.

2. Existing conditions

2.1 Road network

2.1.1 Key roads

The hierarchy of the road network surrounding the development is shown in **Table 2.1.1**.

Table 2.1.1 Surrounding road network

Road name	Jurisdiction	No. of lanes	Speed limit	Median divided	Road hierarchy	Footpath / bicycle lanes	On-street parking
Bruce Highway (‘*Racecourse Road*’)	TMR [1]	4	80km/h	Yes	Highway	No footpaths / bicycle lanes on both sides	Nil
Townsville Connection Road (‘*Stuart Drive*’)	TMR [1]	2	70km/h	No	Highway	Footpath / off road bicycle path on southern side	Nil near subject site
Abbott Street Connection Road (‘*Lakeside Drive*’)	TMR [1]	2-4	60km/h	Partly	Trafficable Road	Partial footpaths both sides / bicycle lanes on both sides	Nil
Edison Street	Council	2	60km/h	No	Trafficable Road	Footpaths both sides / no bicycle provisions	Informal both sides
Townsville Turf Club Access	Private road	2	N/A	No	Private	Footpath on western side / bicycle lanes at intersection	Nil

Notes:
1. Department of Transport and Main Roads

2.1.2 Key intersections

In addition to the surrounding road network, there are three key intersections in proximity to the subject site which development generated traffic will utilise once Lakeside Drive is extended from Racecourse Road to Stuart Drive. These intersections are located as shown in **Figure 2.1.2** and are identified as:

1. Racecourse Road / Lakeside Drive signalised intersection
2. Racecourse Road / Lakeside Drive / Townsville Turf Club Access signalised intersection
3. Stuart Drive / Edison Street three-leg single lane roundabout.

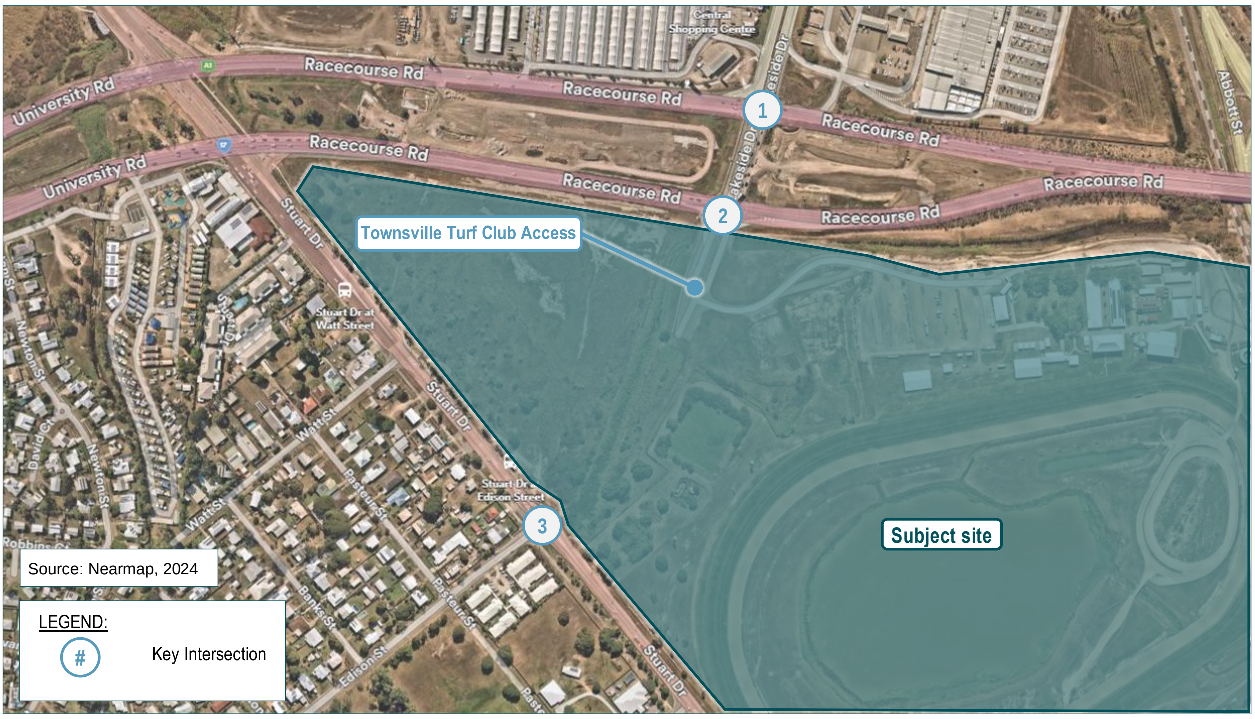

Figure 2.1.2 Key intersections

2.2 Public transport

The development site is located within walking distance (<400m) of approximately 14 public transport stops (Stop ID's 890300, 890313, 890314, 890315, 890299, 890386, 890387, 890298, 890681, 890388, 890389, 890297, 890683, 890707).

Three bus stops are located directly adjacent the development site, known as 'Stuart Drive at Watt Street' (Stop ID: 890297), 'Stuart Drive at Edison Street' (Stop ID: 890681) and Stuart Drive at Marconi Street (Stop ID: 890298). These stops are serviced by two public bus routes, known as '207', '209', except for 'Stuart Drive at Edison Street' which is only serviced by '207'.

The closest Lakeside Drive bus stop known as Lakeside Drive near D'Arcy Drive hail 'n' ride (Stop ID: 890707) is serviced by one public bus route, '207'.

Locations of all stops within proximity to the development site are provided in **Figure 2.2.**

Figure 2.2 Public transport in proximity to site

2.3 Active transport

The subject site is located adjacent to Racecourse Road and Stuart Drive which forms part of TMR's *North Queensland Principal Cycle Network* and includes on-road and off-road bicycle provisions, respectively. The principal cycle network surrounding the proposed development and route priorities are illustrated in **Figure 2.3.1** and **Figure 2.3.2**.

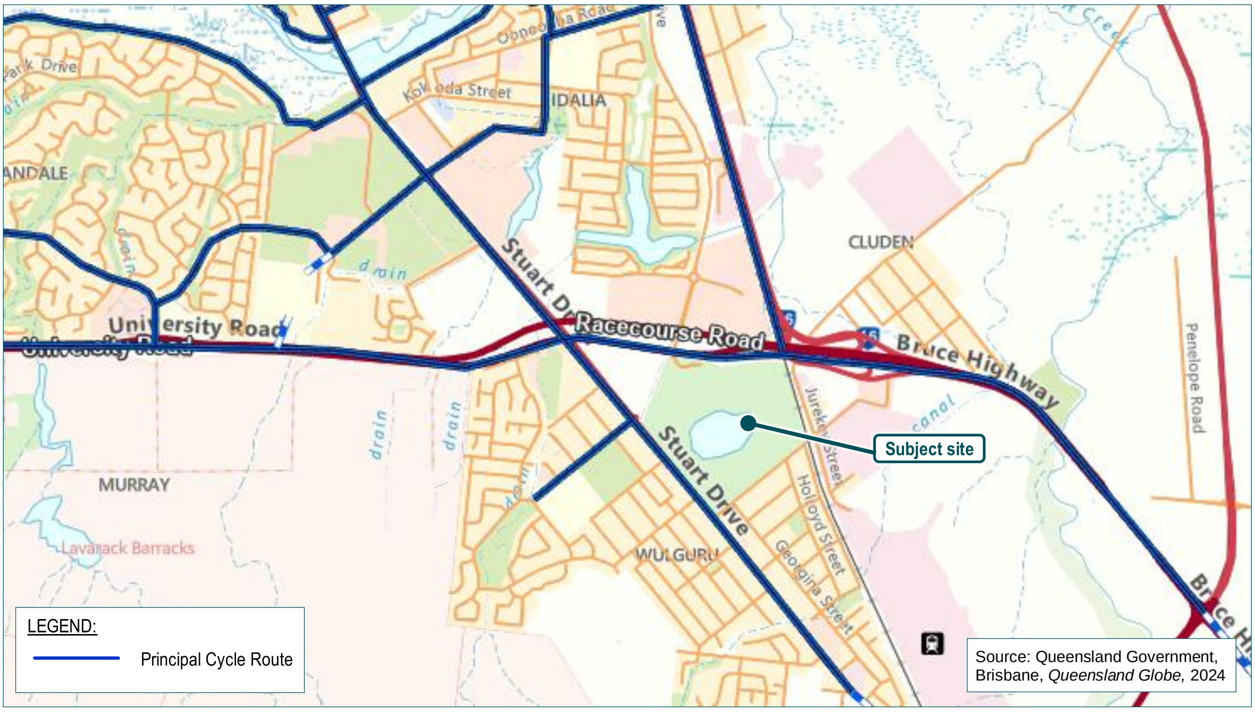

Figure 2.3.1 Principal cycle network

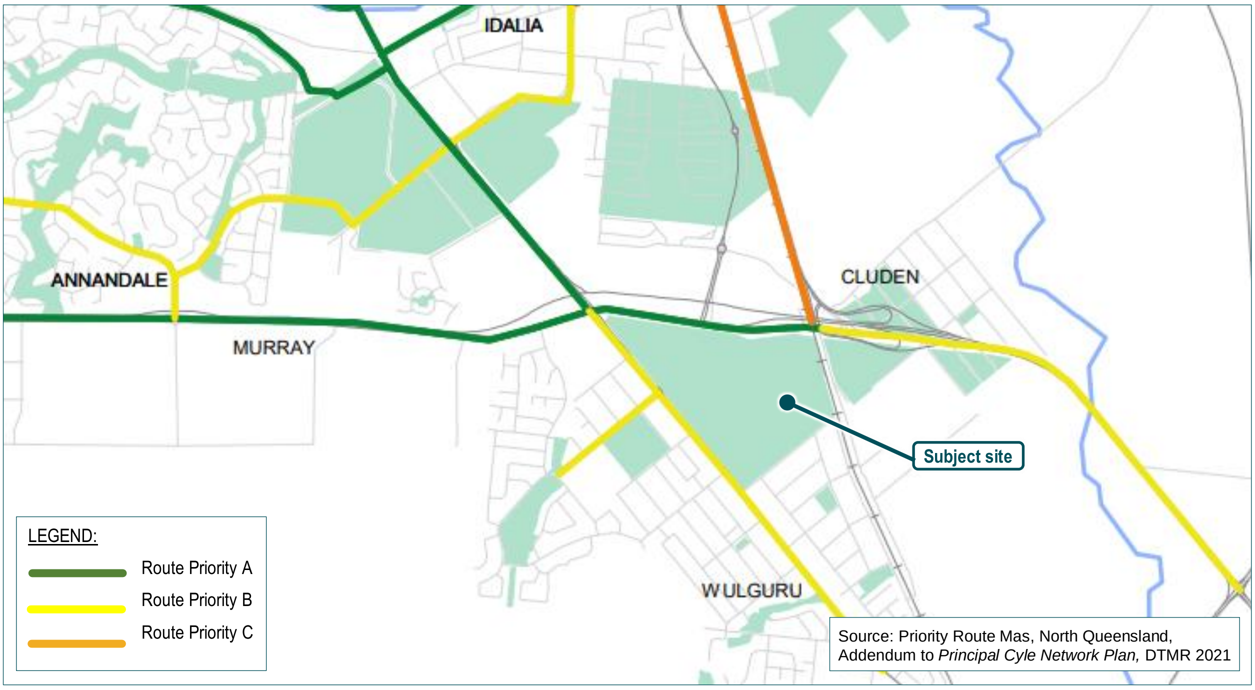

Figure 2.3.2 Priority route map

2.4 Road crash history

Crash data near the key intersections identified in **Section 2.1.2** was sourced from TMR and is summarised in **Table 2.4**. Data for the period between 2018 and 2024 can be categorised as follows:

- fatal crashes from 1 January 2018 to 30 April 2024, and
- non-fatal casualty (hospitalisation, medical treatment, and minor injury) crashes from 1 January 2018 to 30 November 2023.

Analysis of the crash data indicates that 12 crashes have occurred in proximity to the key intersections identified in **Section 2.1.2** (**Figure 2.4**). Three crashes have occurred at the Racecourse Road / Lakeside Drive / Townsville Turf Club Access intersection, two relating to vehicle adjacent approach crashes and the other relating to a vehicle travelling off the carriageway. Therefore, no crash clusters are present at this intersection.

Five crashes resulting in injury have occurred at the Racecourse Road / Lakeside Drive intersection with four relating to vehicle adjacent approach: through – through related crashes. It is therefore apparent that the Racecourse Road / Lakeside Drive intersection consists of a crash cluster.

Three crashes have occurred at the Stuart Drive / Edison Street roundabout with all three relating to rear end related crashes. However, the three rear end related crashes occur on each of the intersection approaches (one crash per intersection approach). Therefore, no crash clusters are considered present at this intersection.

Table 2.4 Crash details

Crash No.	Crash year	Road	DCA code	Crash DCA group description	Crash severity
1	2020	Lakeside Drive	101	Vehicles adjacent approach: through-through	Medical treatment
2	2019	Lakeside Drive	708	Off path-straight: mounts traffic island	Minor injury
3	2023	Lakeside Drive	101	Vehicles adjacent approach: through-through	Hospitalisation
4	2023	Lakeside Drive	101	Vehicles adjacent approach: through-through	Medical treatment
5	2023	Lakeside Drive	308	Vehicles same direction: right turn side swipe	Hospitalisation
6	2023	Lakeside Drive	101	Vehicles adjacent approach: through-through	Hospitalisation
7	2023	Edison Street	302	Vehicles same direction: left rear	Minor injury
8	2018	Lakeside Drive	101	Vehicles adjacent approach: through-through	Hospitalisation
9	2018	Lakeside Drive	101	Vehicles adjacent approach: through-through	Hospitalisation
10	2021	Stuart Drive	301	Vehicles same direction: rear end	Minor injury
11	2021	Lakeside Drive	301	Vehicles same direction: rear end	Medical treatment
12	2022	Stuart Drive	301	Vehicles same direction: rear end	Hospitalisation

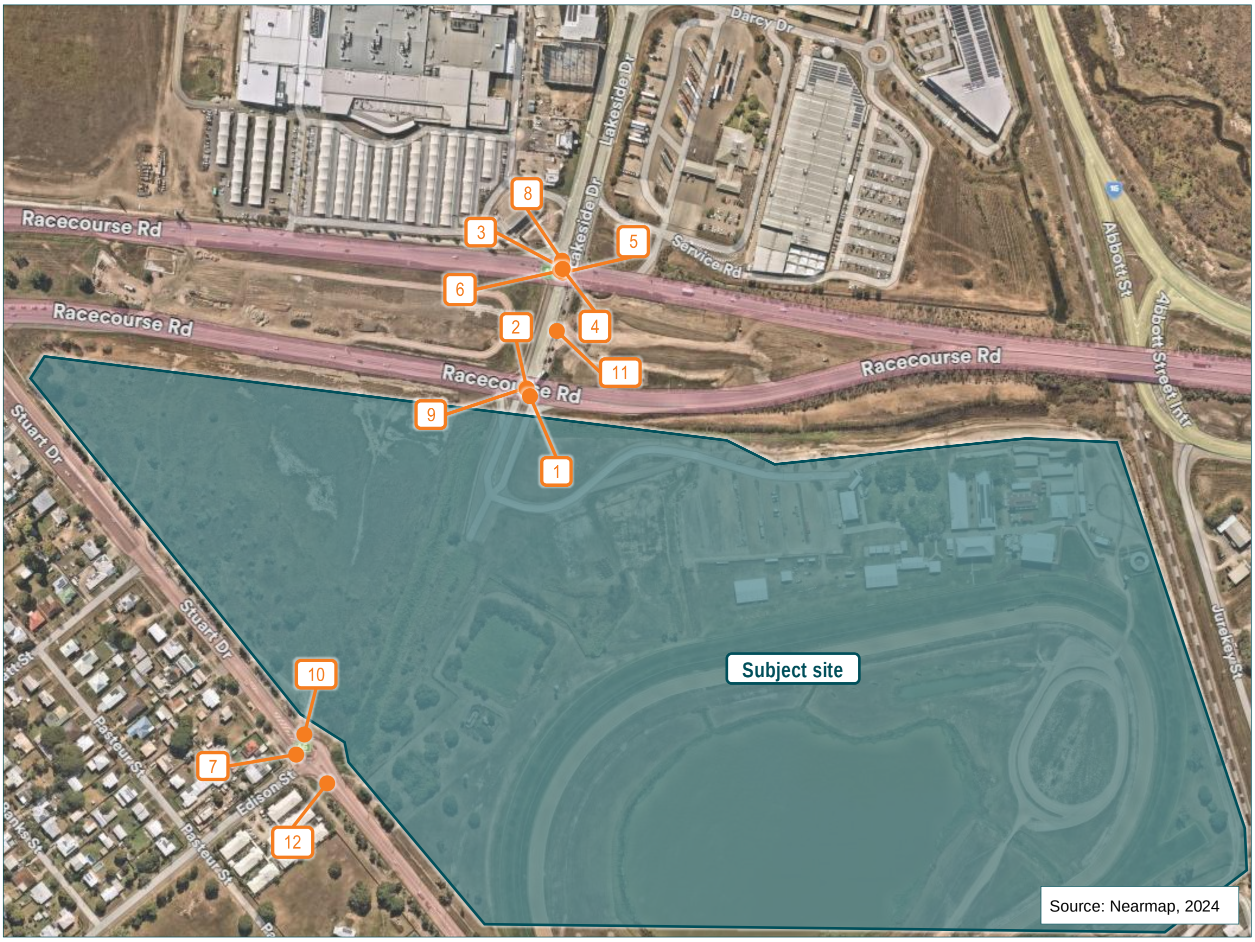

Figure 2.4 Crash data

2.5 Background traffic volumes

Traffic count data for the key intersections identified in **Section 2.1.2** was sourced from an intersection count conducted by Northern Consulting in May 2024 for a Thursday and Saturday of the same week (**Appendix B**). Typical peak periods for the intersections, as sourced from the provided count data, are presented in **Table 2.5.1**. Existing 2024 peak hour intersection traffic volumes are shown in **Figure 2.5**.

Table 2.5.1 Intersection peak periods

Intersection	AM peak	PM peak	Weekend peak
Racecourse Road / Lakeside Drive	7:45am – 8:45am	4:00pm – 5:00pm	11:15am – 12:15pm
Racecourse Road / Lakeside Drive / Townsville Turf Club Access	7:45am – 8:45am	4:15pm – 5:15pm	12:30pm – 1:30pm
Stuart Drive / Edison Street	7:45am – 8:45am	4:15pm – 5:15pm	11:00am – 12:00pm

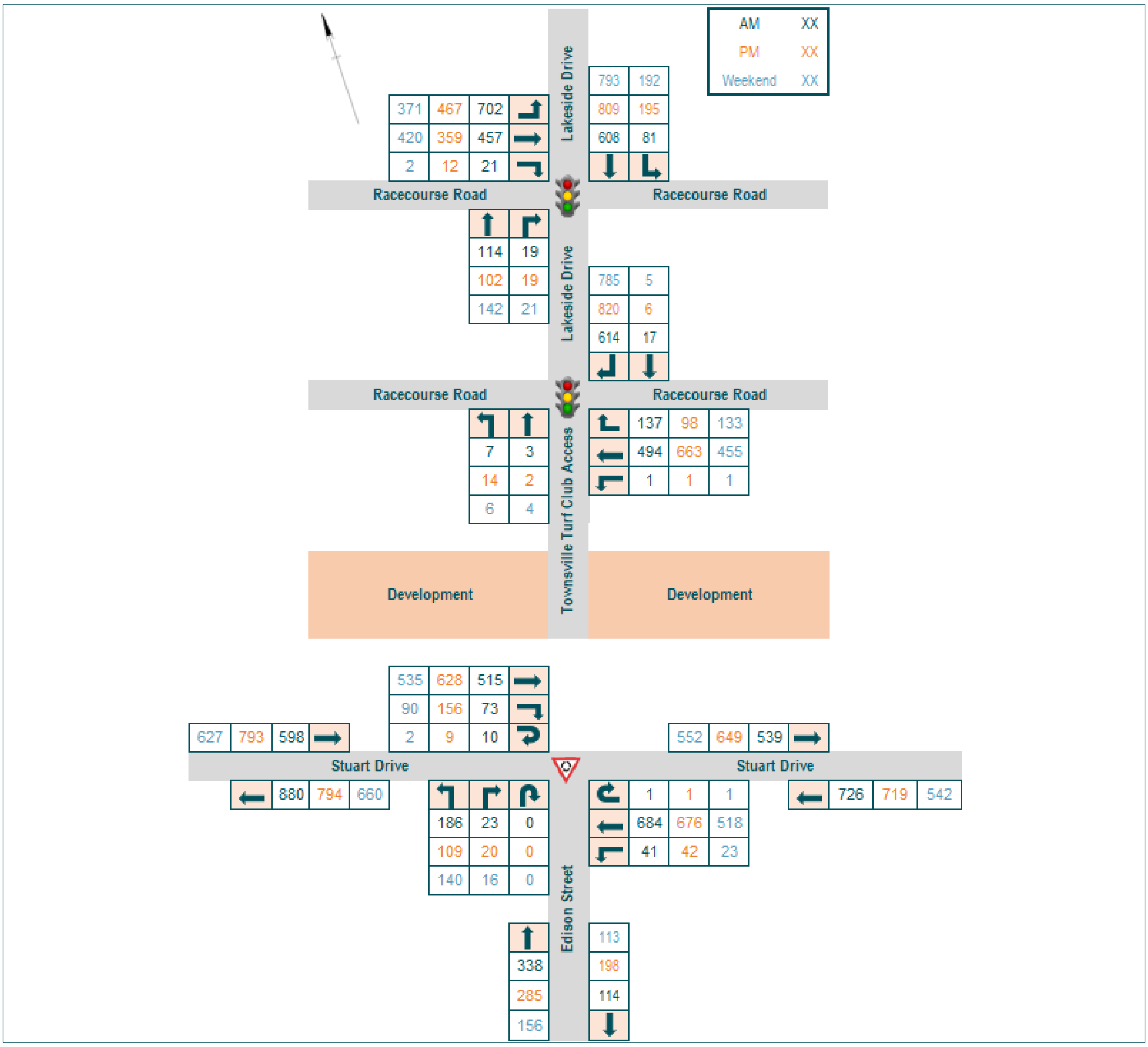

Figure 2.5 2024 background traffic volumes

In addition to the intersection count, annual volume data was sourced from TMR's *Open Data Portal – 2022 traffic census data*[1] for Racecourse Road and Lakeside Drive as detailed in **Table 2.5.2**. In addition, 2023 annual volume data for the below sites have been provided from TMR and are included as **Appendix C**. The 2023 annual volume data does not include growth rate data and therefore the 2022 10-year growth rates have been considered for this traffic impact assessment.

Table 2.5.2 Annual volume data

Road link	Count year	TAR Site ID	Count location	Travel Direction	AADT	10-year growth rate
Bruce Highway ('*Racecourse Road*')	2022	92204	200m west of Cluden Park Racecourse	With gazettal	6,877 vpd	-
				Against gazettal	7,147 vpd	-
				Both directions	14,024 vpd	0.7%
Abbott Street Connection Road ('*Lakeside Drive*')	2022	160693	Between Lakeland Drive and Oononba Road	With gazettal	5,469 vpd	-
				Against gazettal	5,007 vpd	-
				Both directions	10,476 vpd	-
Townsville Connection Road ('*Stuart Drive*')	2022	92191	Stuart Drive 100m west of Edison Street	With gazettal	7,543 vpd	2.99%
				Against gazettal	7,740 vpd	2.88%
				Both directions	15,283 vpd	2.93%

[1] Department of Transport and Main Roads (13 December 2022), *Open Data Portal – 2022 traffic census data*.

2.6 Intersection operation

Using the available background traffic data, an assessment of the existing operational performance of the intersections identified in **Section 2.1.2** has been undertaken using SIDRA 9.1 intersection analysis software.

2.6.1 Intersection performance criteria

Principal criteria against which intersection performance is assessed are:

- the intersection degree of saturation (DOS), which is the ratio of maximum movement demand volume to capacity at an intersection
- level of service (LOS) expressed as a function of the movement delay, and
- queue lengths on intersection legs.

For the purposes of this assessment, criteria outlined in Austroads *Guide to Traffic Management Part 3: Transport Studies and Analysis Methods (2020)* have been adopted. Austroads suggests that for intersections, LOS and DOS are the criteria upon which performance is measured. **Table 2.6.1.1** shows the maximum degree of saturation[2] for the various intersection types.

Table 2.6.1.1 Maximum degree of saturation for road intersections

Intersection type	Maximum degree of saturation
signalised intersection	0.9
roundabout	0.85
unsignalised intersection	0.8

While DOS is an important measure of the capacity and operational performance of an intersection, several other factors are also important, in particular, intersection and individual movement level of service (LOS) and delay, as well as the impact of identified vehicle queue lengths. While delay is calculated for all types of intersections, it is most critical for priority or sign-controlled intersections, where excessive delays to vehicle movements exiting minor side roads can lead to motorists accepting smaller gaps in the opposing traffic flows thereby increasing safety conflicts.

The LOS and delay criteria adopted for this assessment have been taken from the SIDRA Intersection 9.1 *User Guide*[3] and for ease of reference are summarised in **Table 2.6.1.2**.

For this assessment, where an intersection has been analysed and the outcome from that analysis indicates a level of service of LOS C or better based on the average delay per vehicle, then that intersection has been deemed to perform in a satisfactory or better manner. Delays producing a LOS D or LOS E have been deemed to be excessive and are considered to increase the potential for both unsafe operation and capacity constraints of the intersection.

Table 2.6.1.2 LOS criteria for road intersections using delay

Level of service	Average delay per vehicle (d) in seconds		
	Signalised intersections (SIDRA)	Roundabouts (SIDRA)	Unsignalised intersections (RTA NSW)
A	d ≤ 10	d ≤ 10	d < 14.5
B	10 < d ≤ 20	10 < d ≤ 20	14.5 < d <28.5
C	20 < d ≤ 35	20 < d ≤ 35	28.5 < d < 42.5
D	35 < d ≤ 55	35 < d ≤ 50	42.5 < d < 56.5
E	55 < d ≤ 80	50 < d ≤ 70	56.5 < d < 70.5
F	80 < d	70 < d	70.5 < d

[2] Austroads (2020), *Guide to Traffic Management Part 3: Transport Studies and Analysis Methods, Sydney*, s.4.2.4, p.37.
[3] Akcelik & Associates Pty Ltd (December 2022), *Sidra Intersection 9.1 User Guide*, s.5.14.1, Table 5.14.1, Table 5.14.3, p.480-481.

2.7 Intersection assessment

As the Racecourse Road / Lakeside Drive and Racecourse Road / Lakeside Drive / Townsville Turf Club Access signalised intersections are in proximity to one another, the assessment of existing operational performance has been undertaken based on a modelled network approach (**Figure 2.7**). Based on TMR phasing data, a 120-second cycle time has been adopted for this analysis with both signalised intersections coordinated in the model.

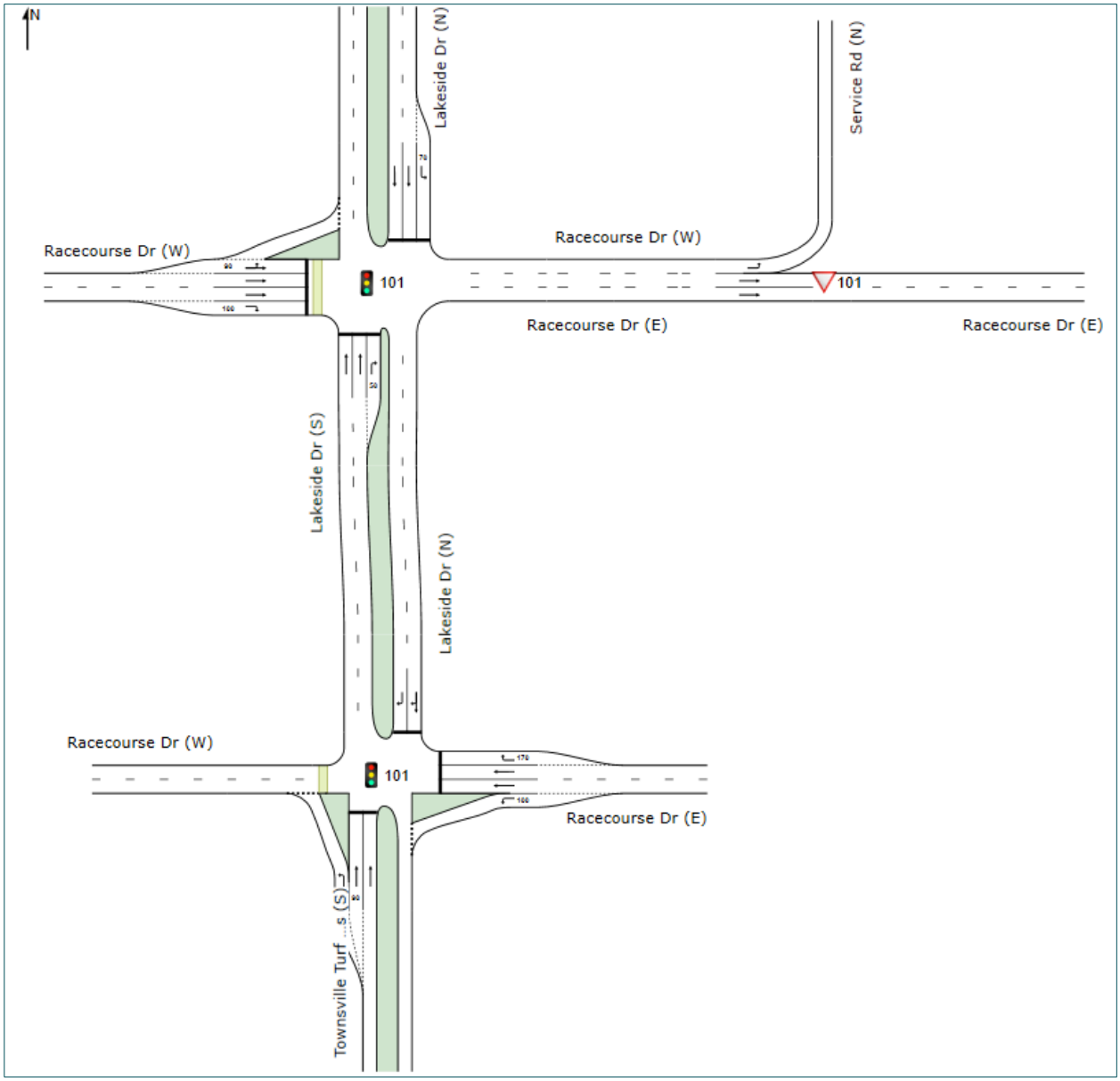

Figure 2.7 SIDRA network layout

2.7.1 Racecourse Road / Lakeside Drive

The existing intersection configuration is shown in **Figure 2.7.1** and the layout modelled in SIDRA is shown in **Figure 2.7**. A summary of the key performance indicators is provided in **Table 2.7.1**.

The results of the SIDRA analysis demonstrate that, under the existing conditions, the Lakeside Drive approaches of the intersection have exceeded capacity in terms of average delay, however overall, the signalised intersection still operates within acceptable key performance indicators for a signalised intersection. High delays of this nature for the minor legs of a signalised intersection are considered typical, as in most cases vehicles approaching the intersection on minor legs would wait an entire cycle before being given a green phase.

SIDRA outputs for the assessment are provided in **Appendix D**.

Figure 2.7.1 Existing Racecourse Road / Lakeside Drive layout

Table 2.7.1 2024 SIDRA results – Racecourse Road / Lakeside Drive

Approach	Degree of saturation	Average delay (s)	Level of service	95% back of queue (m)
2024 AM				
Lakeside Drive (S)	0.264	44.0	D	24.7
Lakeside Drive (N)	0.614	41.0	D	119.2
Racecourse Road (W)	0.575	9.3	A	66.6
2024 PM				
Lakeside Drive (S)	0.272	33.1	C	20.6
Lakeside Drive (N)	0.504	26.4	C	126.9
Racecourse Road (W)	0.431	13.5	B	73.1
2024 Weekend				
Lakeside Drive (S)	0.262	29.4	C	28.0
Lakeside Drive (N)	0.445	22.3	C	111.6
Racecourse Road (W)	0.380	17.1	B	75.1

2.7.2 Racecourse Road / Lakeside Drive / Townsville Turf Club Access

The existing intersection configuration is shown in **Figure 2.7.2** and the layout modelled in SIDRA is shown in **Figure 2.7**. A summary of the key performance indicators is provided in **Table 2.7.2**.

The results of the SIDRA analysis indicate that the existing Racecourse Road / Lakeside Drive / Townsville Turf Club Access signalised intersection operates within acceptable key performance indicators for a signalised intersection. Moderate delays were recorded for the right and through movements of the Racecourse Road eastern approach; however, these delays are not considered significant.

SIDRA outputs for the assessment are provided in **Appendix D**.

Figure 2.7.2 Existing Racecourse Road / Lakeside Drive / Townsville Turf Club Access layout

Table 2.7.2 2024 SIDRA results – Racecourse Road / Lakeside Drive / Townsville Turf Club

Approach	Degree of saturation	Average delay (s)	Level of service	95% back of queue (m)
2024 AM				
Townsville Turf Club Access (S)	0.016	22.1	C	0.9
Racecourse Road (E)	0.436	34.2	C	92.9
Lakeside Drive (N)	0.436	5.7	A	6.9
2024 PM				
Townsville Turf Club Access (S)	0.035	15.3	B	1.9
Racecourse Road (E)	0.563	35.3	D	124.6
Lakeside Drive (N)	0.560	7.1	A	24.5
2024 Weekend				
Townsville Turf Club Access (S)	0.012	26.1	C	0.8
Racecourse Road (E)	0.455	39.6	D	83.5
Lakeside Drive (N)	0.465	5.6	A	6.7

2.7.3 Stuart Drive / Edison Street

The existing intersection configuration is shown in **Figure 2.7.3.1** and the layout modelled in SIDRA is shown in **Figure 2.7.3.2**. A summary of the key performance indicators is provided in **Table 2.7.3**.

Figure 2.7.3.1 Existing Stuart Drive / Edison Street layout

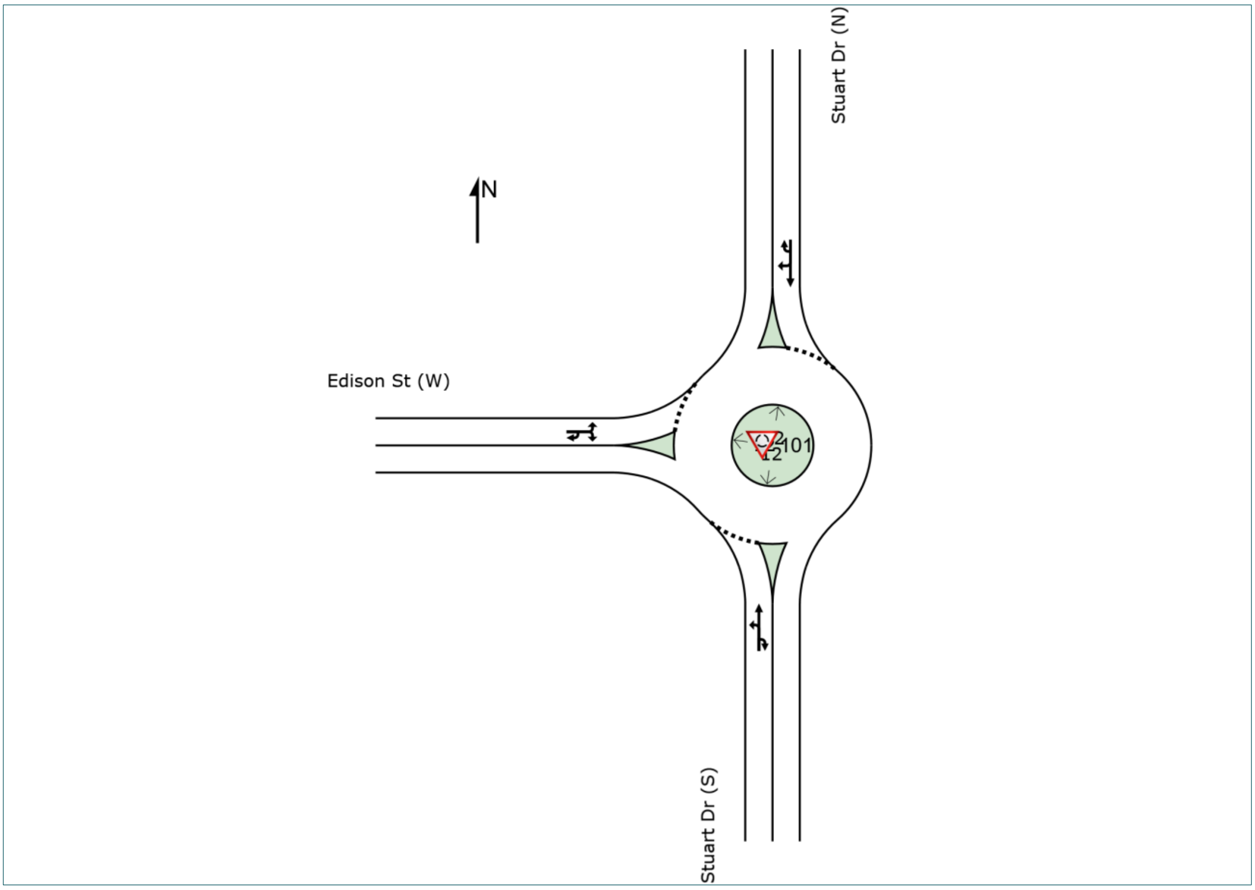

Figure 2.7.3.2 Existing Stuart Drive / Edison Street SIDRA layout

The results of the SIDRA analysis indicate that the existing Stuart Drive / Edison Street intersection operates within acceptable key performance indicators for a roundabout.

SIDRA outputs for the assessment are provided in **Appendix D**.

Table 2.7.3 2024 SIDRA results – Stuart Drive / Edison Street

Approach	Degree of saturation	Average delay (s)	Level of service	95% back of queue (m)
2024 AM				
Stuart Drive (S)	0.589	6.6	A	40.6
Stuart Drive (N)	0.433	6.5	A	29.5
Edison Street (W)	0.372	11.4	B	17.2
2024 PM				
Stuart Drive (S)	0.644	7.5	A	43.3
Stuart Drive (N)	0.544	6.6	A	42.3
Edison Street (W)	0.244	10.9	B	11.1
2024 Weekend				
Stuart Drive (S)	0.445	6.4	A	23.5
Stuart Drive (N)	0.429	6.3	A	26.8
Edison Street (W)	0.224	8.8	A	9.2

3. Traffic impact assessment

3.1 Traffic generation

A review of Council's *Townsville City Plan (Version 2022/02)* has not identified traffic generation rates for the proposed land uses. In lieu of Council specific traffic generation rates, traffic generation rates for the development have been based on the rates provided in the RTA's *Guide to Traffic Generating Developments (GTGD)*, the updated RMS *Guide to Traffic Generating Developments – Technical Direction (TDT 2013/04)*, the Institute of Transportation Engineers (ITE) *Traffic Generation Data Trip Generation Manual (11th Edition)*, TMR's *Road Planning and Design Manual* (RPDM) and TMR's *Traffic Generation Data - 2006 – 2018* (**Table 3.1.1**).

Table 3.1.1 Traffic generation rates

Land use	Source	Source reference	Notes
Food and drink outlet (fast food)	TMR's Traffic Generation Data (2006 – 2018)	Fast food drive through	- calculated using the average traffic volume for the fast food drive through sites
Shop	RTA's GTGD	Speciality shops and secondary retail	- daily traffic back calculated based on peak hour traffic being 10% of the daily traffic
Food and drink outlet (restaurant / café)	RTA's GTGD	Restaurants	- peak hour rates applied to both AM and PM peak hours
Hotel (Tavern)	TMR's Traffic Generation Data (2006 – 2018)	Taverns and bottle shops	- calculated using the average traffic volume for tavern and bottle shop sites - no AM peak hour volumes available, analysis assumes 50% of the PM peak hour volumes account for the AM peak hour volumes
Multiple dwelling	RMS GTGD – Technical Direction	High density residential flat dwellings	- rates based on number of units
Showroom	RMS GTGD – Technical Direction	Bulky goods retail stores	- assumed rate applied to AM peak to account for staff - daily traffic back calculated based on peak hour traffic being 10% of the daily traffic
Outdoor sport and recreation (Waterpark)	ITE's Traffic Generation Data Trip Generation Manual	Water slide park	- daily traffic back calculated based on peak hour traffic being 10% of the daily traffic
Hotel	TMR's Traffic Generation Data (2006 – 2018)	Hotels and motels	- calculated using the average traffic volume for the hotel and motel sites
Function facility	TMR's RPDM	Amusement centre	- daily traffic back calculated based on peak hour traffic being 10% of the daily traffic

For the food and drink and function facility land uses within Precinct 3, appropriate trip generation 'discounts' have been applied as a percentage of external trips given that the development concept is a multi-purpose facility where uses will be primarily used by on site hotel guests or comprise multi-purpose trips. No discounts have been applied to the short-term accommodation component. A summary of the expected development traffic generation is shown in **Table 3.1.2**.

Table 3.1.2 Development traffic generation

ID	Land Use	Quantity		Peak Period	Traffic Generation Rate		External trip %	Traffic Generation Volume
Precinct 1								
1	Food and drink outlet (fast food)	560	m^2 GFA	AM	30	trips per 100m^2 GFA	100%	168
				PM	38	trips per 100m^2 GFA	100%	213
				Weekend	40	trips per 100m^2 GFA	100%	224
				Daily	370	trips per 100m^2 GFA	100%	2,072
2	Shop / food and drink outlet (restaurant / café)	1,590	m^2 GFA	AM	5	trips per 100m^2 GFA	100%	80
				PM	5	trips per 100m^2 GFA	100%	80
				Weekend	5	trips per 100m^2 GFA	100%	80
				Daily	60	trips per 100m^2 GFA	100%	954

Table 3.1.2 Development traffic generation (continued)

ID	Land Use	Quantity		Peak Period	Traffic Generation Rate		External trip %	Traffic Generation Volume
3	Hotel (Tavern)	1,215	m^2 GFA	AM	4.1	trips per $100m^2$ GFA[1]	100%	50
				PM	8.2	trips per $100m^2$ GFA	100%	100
				Weekend	8.4	trips per $100m^2$ GFA	100%	103
				Daily	69	trips per $100m^2$ GFA	100%	839
							Sub -total AM peak hour trips	298
							Sub -total PM peak hour trips	393
							Sub -total Weekend peak hour trips	407
							Sub -total Daily trips	3,865
Precinct 2								
4	Multiple dwelling	230	Units	AM	0.53	trips per unit	100%	122
				PM	0.32	trips per unit	100%	74
				Weekend	0.53	trips per unit	100%	122
				Daily	4.6	trips per unit	100%	1,058
					Or			
4	Showroom	5,500	m^2 GFA	AM	0.2	trips per $100m^2$ GFA	100%	11
				PM	2.7	trips per $100m^2$ GFA	100%	149
				Weekend	3.9	trips per $100m^2$ GFA	100%	215
				Daily	19	trips per $100m^2$ GFA	100%	1,045
							Sub -total AM peak hour trips	122
							Sub -total PM peak hour trips	149
							Sub -total Weekend peak hour trips	215
							Sub -total Daily trips	1,058
Precinct 3								
5	Outdoor sport and recreation (Waterpark)	371	Parking spaces	AM	0.28	trips per parking space	100%	104
				PM	0.28	trips per parking space	100%	104
				Weekend	0.28	trips per parking space	100%	104
				Daily	2.8	trips per parking space	100%	1,039
6	Hotel	209	Rooms	AM	0.25	trips per bed	100%	53
				PM	0.24	trips per bed	100%	51
				Weekend	0.25	trips per bed	100%	53
				Daily	2.7	trips per bed	100%	565
7	Food and drink outlet (restaurant / café)	204	m^2 GFA	AM	5	trips per $100m^2$ GFA	50%	6
				PM	5	trips per $100m^2$ GFA	50%	6
				Weekend	5	trips per $100m^2$ GFA	50%	6
				Daily	60	trips per $100m^2$ GFA	50%	62
8	Function facility	1,523	m^2 GFA	AM	10	trips per $100m^2$ GFA	50%	77
				PM	10	trips per $100m^2$ GFA	50%	77
				Weekend	10	trips per $100m^2$ GFA	50%	77
				Daily	100	trips per $100m^2$ GFA	50%	762
							Sub-total AM peak hour trips	240
							Sub -total PM peak hour trips	238
							Sub -total Weekend peak hour trips	240
							Sub -total Daily trips	2,428
							Total AM peak hour trips	660
							Total PM peak hour trips	780
							Total Weekend peak hour trips	862
							Total Daily hour trips	7,351

3.2 Trip distribution

3.2.1 In / Out directional splits

TMR's Guide to Traffic Impact Assessment (GTIA) stipulates[4]:

"*Peak hour development-generated traffic volumes need to be split into entry (IN) and exit (OUT) volumes for assignment of this traffic to the access intersection and to the surrounding road network*."

Typical In / Out traffic splits were utilised for the residential components (i.e. 30% In / 70% Out in the AM peak hour, and 60% In / 40% Out during the PM peak hour). For the weekend peak hour, traffic splits of 40% In / 60% Out have been adopted. It is expected that short-term accommodation guests will behave in a similar manner.

For the commercial land uses, it is expected that regular ingress / egress trips would occur throughout the day, rather than concentrated in the peak hours. Therefore, for commercial activities, traffic splits of 50% 'In' and 50% 'Out' have been adopted for the peak hour trips.

For the outdoor sport and recreation (waterpark) land use, it is expected that most visitors will arrive in the morning and leave in the afternoon, therefore traffic splits of 90% In / 10% Out in the AM peak hour and 10% In / 90% Out in the PM peak hour have been adopted. For the weekend peak, being around midday, it is expected that visitor arrival / departure will vary when compared to weekday travel patterns, therefore traffic splits of 70% 'In' and 30% 'Out' have been adopted.

For Precinct 2 which will either comprise dwelling unit or showroom land uses, the land use with the highest traffic generation has been adopted for this assessment. Based on the traffic generation calculations shown in **Table 3.1**, the dwelling unit land use has the higher traffic generation in the AM peak hour, however in the PM peak hour and weekend peak hour, the showroom land use has the higher traffic generation.

The peak hour traffic splits of the generated vehicle trips are provided in **Table 3.2.1**.

[4] Department of Transport and Main Roads (December 2018), *Guide to Traffic Impact Assessment (Version no. 1.2)* s.8.2.2, p.31.

Table 3.2.1 Development traffic splits

ID	Land Use	Traffic Generation	Peak Period	IN%	IN Trips	OUT %	OUT TRIPS
Precinct 1							
1	Food and drink (fast food)	168	AM Peak	50%	84	50%	84
		213	PM Peak	50%	106.5	50%	106.5
		224	Weekend Peak	50%	112	50%	112
2	Shop / food and drink outlet (restaurant / café)	80	AM Peak	50%	40	50%	40
		80	PM Peak	50%	40	50%	40
		80	Weekend Peak	50%	40	50%	40
3	Hotel (Tavern)	50	AM Peak	50%	25	50%	25
		100	PM Peak	50%	50	50%	50
		103	Weekend Peak	50%	51.5	50%	51.5
Sub-total AM peak hour In trips					149	Sub-total AM peak hour Out trips	149
Sub-total PM peak hour In trips					196.5	Sub-total PM peak hour Out trips	196.5
Sub-total Weekend peak hour In trips					203.5	Sub-total Weekend peak hour Out trips	203.5
Precinct 2							
4 & 5	Dwelling unit or showroom	122	AM Peak	30%	37	70%	85
		149	PM Peak	50%	74.5	50%	74.5
		215	Weekend Peak	50%	107.5	50%	107.5
Precinct 3							
6	Outdoor sport and recreation (Waterpark)	104	AM Peak	90%	94	10%	10
		104	PM Peak	10%	10	90%	94
		104	Weekend Peak	70%	73	30%	31
7	Hotel	53	AM Peak	30%	16	70%	37
		51	PM Peak	60%	31	40%	20
		53	Weekend Peak	40%	21	60%	32
8	Food and drink outlet (restaurant / café)	6	AM Peak	50%	3	50%	3
		6	PM Peak	50%	3	50%	3
		6	Weekend Peak	50%	3	50%	3
9	Function facility	77	AM Peak	50%	38.5	50%	38.5
		77	PM Peak	50%	38.5	50%	38.5
		77	Weekend Peak	50%	38.5	50%	38.5
Sub-total AM peak hour In trips					151.5	Sub-total AM peak hour Out trips	88.5
Sub-total PM peak hour In trips					82.5	Sub-total PM peak hour Out trips	155.5
Sub-total Weekend peak hour In trips					135.5	Sub-total Weekend peak hour Out trips	104.5
Total AM peak IN trips					338	Total AM peak OUT trips	322
Total PM peak IN trips					354	Total PM peak OUT trips	426
Total Weekend peak IN trips					446	Total Weekend peak OUT trips	416

3.3 Traffic distribution

The development traffic distribution to / from the site on the surrounding road network has been calculated based on the development's location to key activity generators (town centres, schools, shopping centres, quarries etc.) and existing road link directional splits from observed background traffic volumes at the key intersections identified in **Section 2.1.2**.

Under the existing scenario, the road extension of Lakeside Drive from Racecourse Road to Stuart Drive, as mentioned in **Section 1.2**, does not exist, therefore traffic distribution only considers the Racecourse Road signalised intersections. The anticipated development traffic distribution percentages are shown in **Figure 3.3.1**, with the resultant traffic volumes shown in **Figure 3.3.2**.

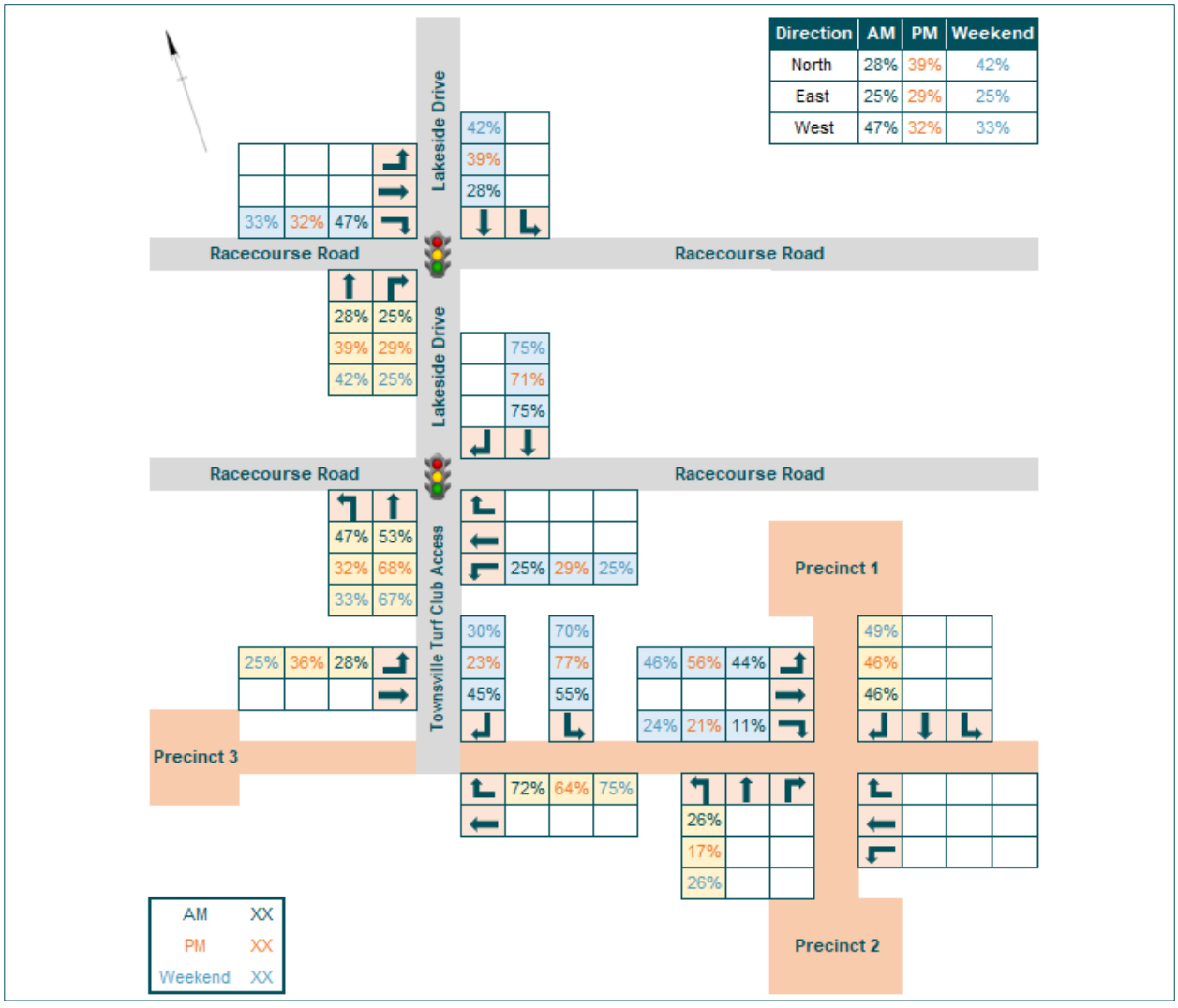

Figure 3.3.1 Development distributions (%)

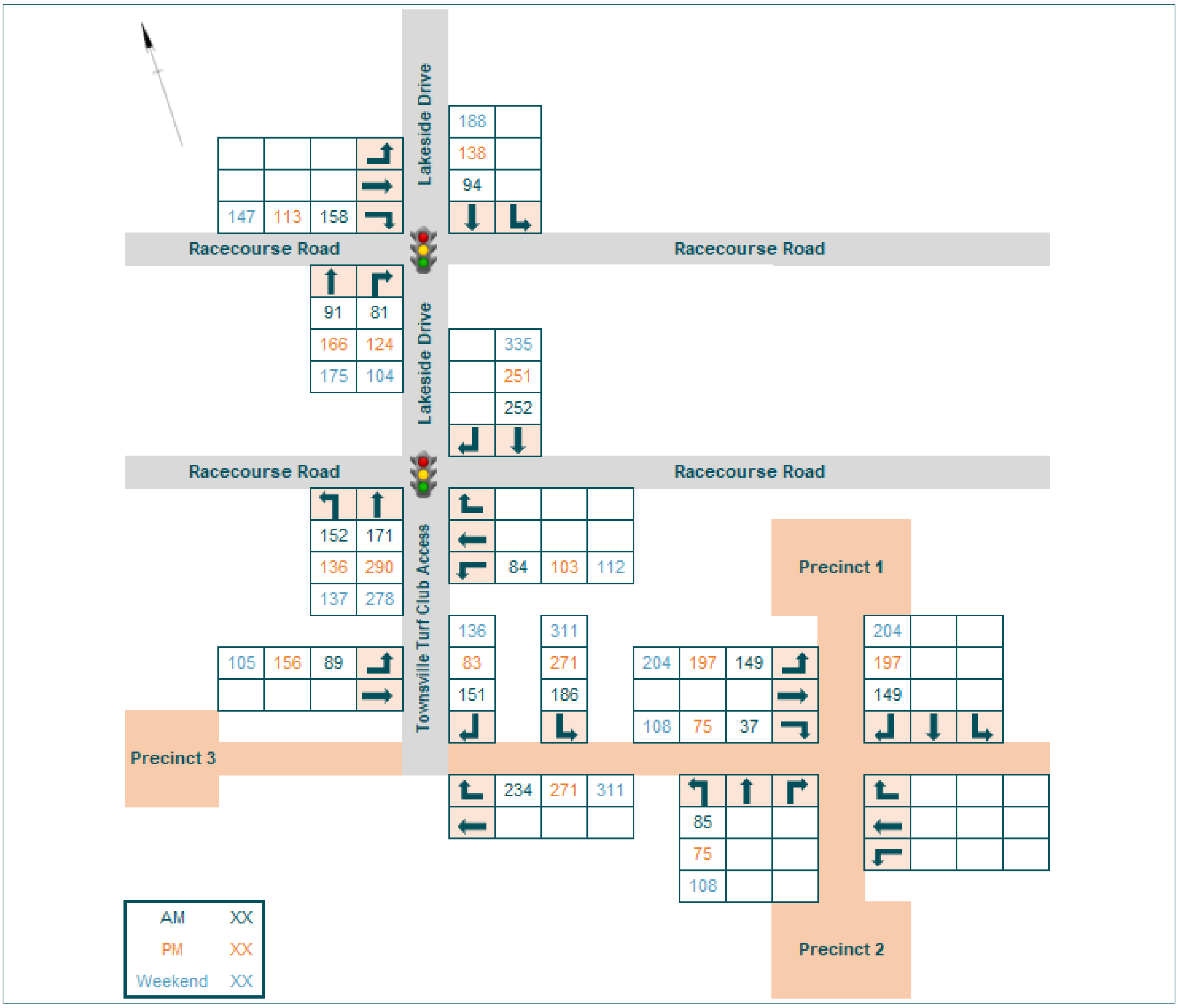

Figure 3.3.2 Development distributions (vehicles)

3.4 Assessment of development traffic impacts

3.4.1 Assumptions

The following assumptions have been relied upon for the purposes of undertaking this traffic assessment:

- the proposed development will not be staged, and the ultimate development will commence operation by 2029, and
- 2% compounding growth rate applied to traffic volumes on Lakeside Drive and Racecourse Road.

Based on these assumptions, the following scenarios have been analysed for the potentially affected intersections:

1. 2029 – Base case (existing with no development)
2. 2029 – Development case (existing with development)

3.5 Base case traffic volumes

Base case traffic volumes have been determined for the year of opening (2029) by applying the compounding annual growth rates (CAGR) determined in **Section 3.4.1**, to the background traffic volumes, the results of which are presented in **Figure 3.5**.

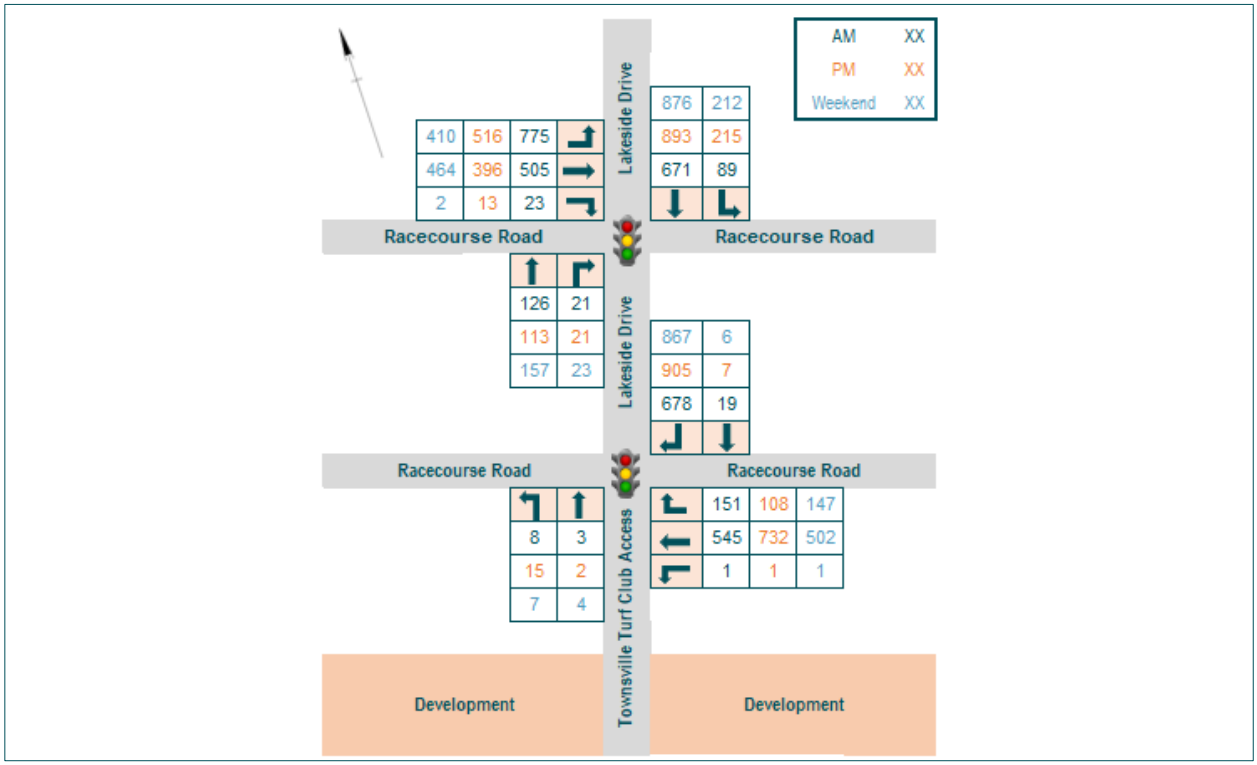

Figure 3.5 2029 – Base case traffic volumes (existing with no development)

3.6 Development traffic volumes

Development case traffic volumes have been calculated by adding development generated traffic to the existing (or background traffic) for the year of opening (2029), the results of which are presented in **Figure 3.6**.

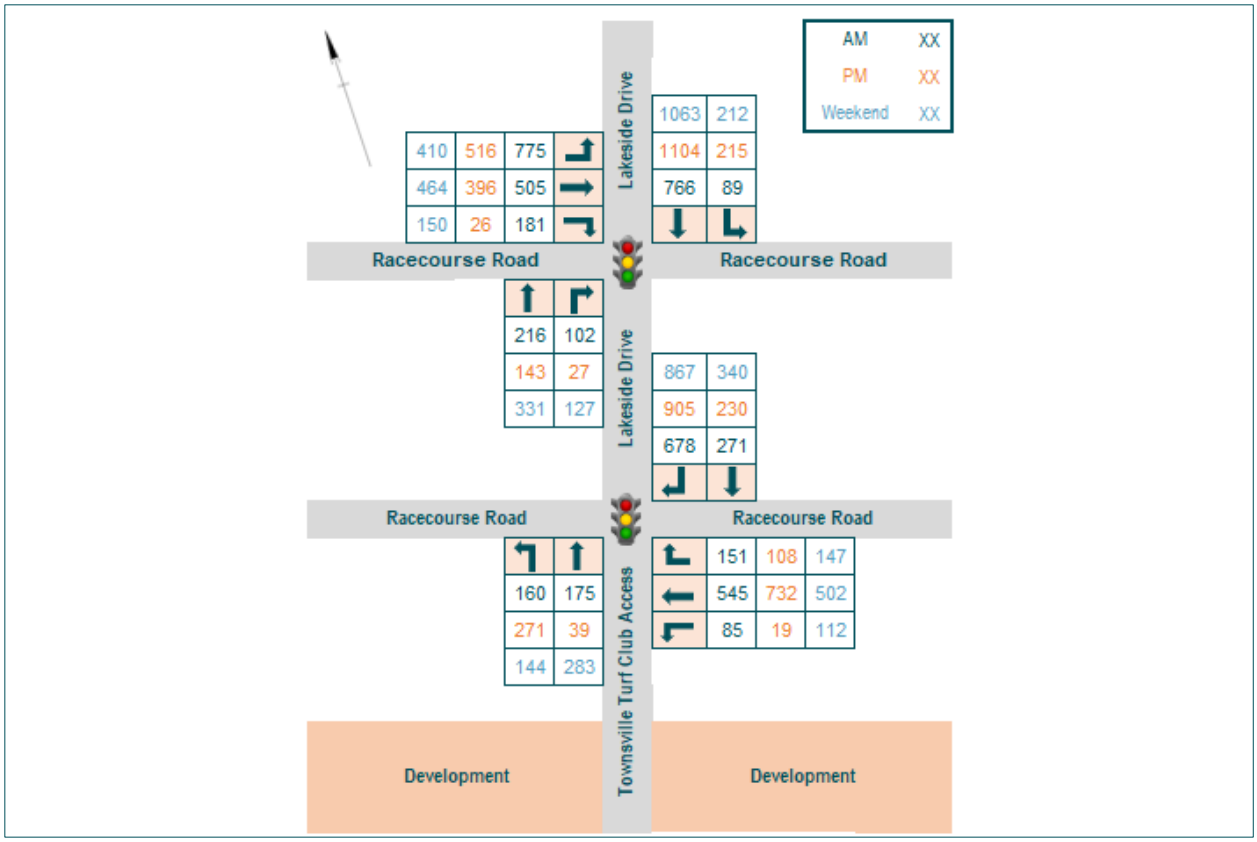

Figure 3.6 2029 – Development case traffic volumes (existing with development)

4. Intersection analysis

4.1 Study area

The extent of the study area adopted for this intersection analysis has been based on *Section 6.4* of TMR's *GTIA*, in particular any key road link or intersection movements with background traffic data available when the development generated traffic exceeds the base traffic by 5%. The percentage of net development generated traffic compared to existing background traffic is shown in **Figure 4.1.1**.

Based on the below figures, the extent of the study area adopted for this assessment is detailed in **Table 4.1** and shown in **Figure 4.1.2**.

Using the design traffic volumes determined for each scenario, intersection analysis using SIDRA 9.1 intersection analysis software was undertaken for the Racecourse Road / Lakeside Drive signalised intersection and Racecourse Road / Lakeside Drive / Townsville Turf Club Access signalised intersection for each of the scenarios outlined in **Section 3.4.1**.

Table 4.1 Study area

Intersection	Included in assessment
Racecourse Road / Lakeside Drive	✓
Racecourse Road / Lakeside Drive / Townsville Turf Club Access	✓

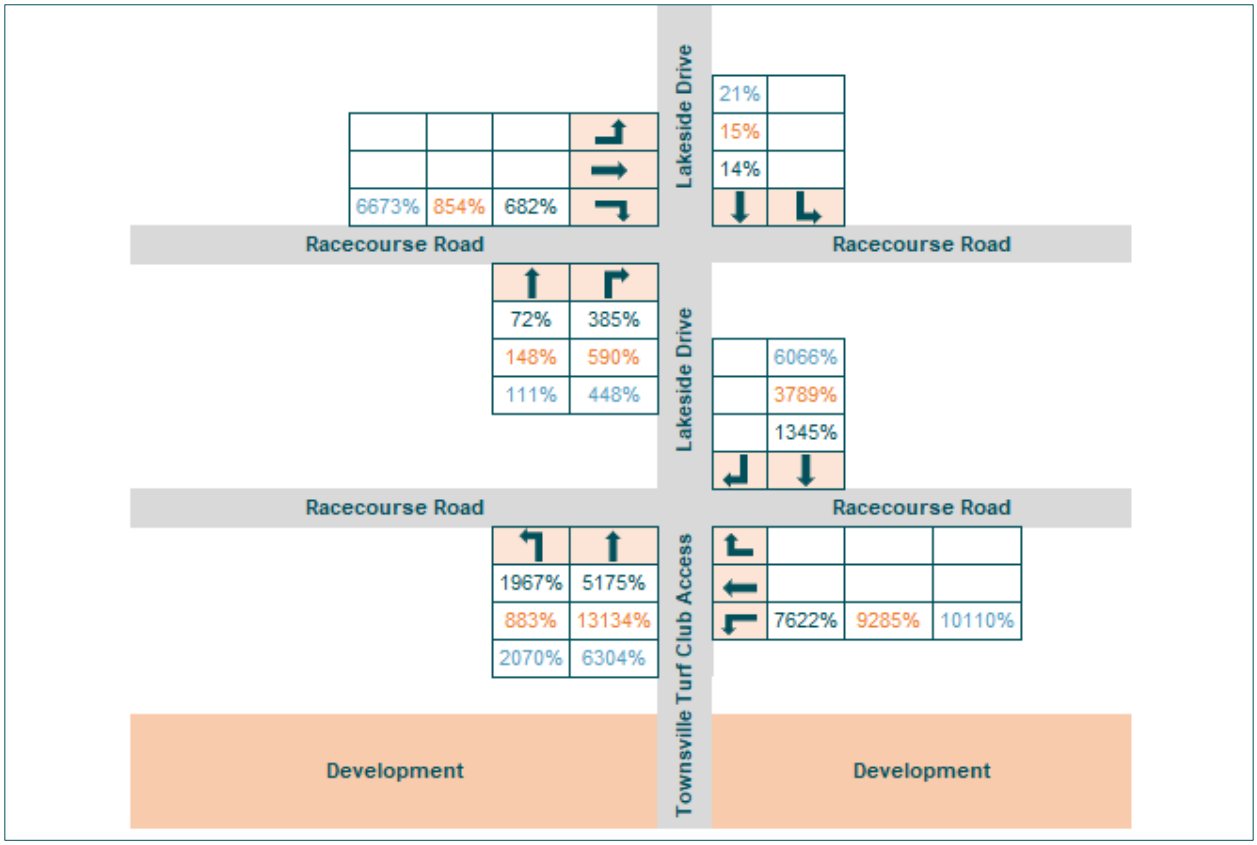

Figure 4.1.1 Development proportion of background traffic

Figure 4.1.2 Study area

4.2 Racecourse Road / Lakeside Drive

A summary of the key performance indicators as determined by the SIDRA analysis for the year of opening (2029) base case and development case scenarios is presented in **Table 4.2**. The assessment considers the ultimate development being operational by 2029.

The results of the SIDRA analysis demonstrate that the Racecourse Road / Lakeside Drive signalised intersection exceeds acceptable key performance criteria in the year of opening (2029) development scenario in terms of degree of saturation, average delay and 95th percentile back of queue. SIDRA outputs are included in **Appendix D** and **Appendix E**.

Table 4.2 Lakeside Drive SIDRA results – year of opening (2029) – Base vs. Development

Approach	Max degree of saturation (DOS)		Average delay (s)		Average level of service (LOS)		Max 95% back of queue (m)	
2029 AM peak hour	Base	Dev	Base	Dev	Base	Dev	Base	Dev
Lakeside Drive (S)	0.291	1.210	44.2	101.2	D	F	27.3	99.1
Lakeside Drive (N)	0.685	0.790	43.4	49.9	D	D	136.3	169.8
Racecourse Road (W)	0.637	0.648	9.7	11.2	A	B	94.8	108.3
2029 PM peak hour	Base	Dev	Base	Dev	Base	Dev	Base	Dev
Lakeside Drive (S)	0.300	1.533	32.8	193.5	C	F	22.7	122.4
Lakeside Drive (N)	0.559	0.839	27.6	35.6	C	D	146.7	280.4
Racecourse Road (W)	0.480	0.497	13.7	16.4	B	B	81.6	85.1
2029 Weekend peak hour	Base	Dev	Base	Dev	Base	Dev	Base	Dev
Lakeside Drive (S)	0.290	1.378	29.5	122.3	C	F	30.9	122.4
Lakeside Drive (N)	0.496	0.798	23.3	29.2	C	C	128.5	257.1
Racecourse Road (W)	0.419	0.435	17.2	20.8	B	C	84.1	87.8

4.3 Racecourse Road / Lakeside Drive / Townsville Turf Club Access

A summary of the key performance indicators as determined by the SIDRA analysis for the year of opening (2029) base case and development case scenarios is presented in **Table 4.3**. The assessment considers the ultimate development being operational by 2029.

The results of the SIDRA analysis demonstrate that the Racecourse Road / Lakeside Drive / Townsville Turf Club Access signalised intersection exceeds acceptable key performance criteria in the year of opening (2029) development scenario in terms of degree of saturation and average delay.

SIDRA outputs are included in **Appendix D** and **Appendix E**.

Table 4.3 Turf Club Access SIDRA results – year of opening (2029) – Base vs. Development

Approach	Max degree of saturation (DOS)		Average delay (s)		Average level of service (LOS)		Max 95% back of queue (m)	
2029 AM peak hour	Base	Dev	Base	Dev	Base	Dev	Base	Dev
Townsville Turf Club Access (S)	0.019	0.610	22.4	35.9	C	D	1.0	45.2
Racecourse Road (E)	0.482	0.482	34.7	34.7	C	C	104.5	104.5
Lakeside Drive (N)	0.482	0.642	5.7	7.2	A	A	8.2	70.3
2029 PM peak hour	Base	Dev	Base	Dev	Base	Dev	Base	Dev
Townsville Turf Club Access (S)	0.042	1.147	16.3	142.2	B	F	2.5	160.3
Racecourse Road (E)	0.621	0.621	36.1	36.1	D	C	141.0	141.0
Lakeside Drive (N)	0.618	0.778	7.4	10.7	A	B	33.8	122.4
2029 Weekend peak hour	Base	Dev	Base	Dev	Base	Dev	Base	Dev
Townsville Turf Club Access (S)	0.015	1.109	26.4	120.4	C	F	0.9	142.5
Racecourse Road (E)	0.502	0.628	40.2	40.2	D	D	93.6	93.6
Lakeside Drive (N)	0.513	0.701	5.6	9.4	A	A	7.5	122.4

4.4 Intersection delay

An assessment of aggregate-intersection-delay impact 'with development traffic' has been undertaken for the Racecourse Road / Lakeside Drive signalised intersection and Racecourse Road / Lakeside Drive / Townsville Turf Club Access signalised intersection in accordance with *Section 11.3.1* of TMR's *GTIA,* the results of which are shown in **Table 4.4**.

Table 4.4 Aggregate-intersection-delay-impact 'with development'

2029 Background delay impact (veh-min)			2029 Design delay impact (veh-min)			Net change (%)		
AM	PM	Weekend	AM	PM	Weekend	AM	PM	Weekend
1,412.6	1,493.7	1,350.5	1,569.6	1,863.5	1,655.3	11.1%	24.8%	22.6%

The assessment indicates that the aggregate-intersection-delay impact 'with development' is greater than 5%, and therefore mitigation measures are triggered by the aggregate-intersection-delay assessment.

4.5 Road safety assessment

A road safety assessment of the existing surrounding road network characteristics has been undertaken in accordance with *Section 9* of TMR's *GTIA* to determine whether development related traffic adversely impacts the safety and efficiency of the existing State-controlled road network, the results of which are shown in **Table 4.5**.

Table 4.5 Road safety assessment

Risk Item	Without development			With development			Mitigation measures / comments	With development and mitigation		
	Likelihood	Consequence	Risk Score	Likelihood	Consequence	Risk Score		Likelihood	Consequence	Risk Score
Increase of intensified turning movements at the Racecourse Road / Lakeside Drive signalised intersection. Potential for rear end, vehicle adjacent approach and vehicle opposite approach related crashes.	1	5	M	3	5	H	Existing road safety issues are present at the intersection with a crash cluster shown for vehicle adjacent approach: through – through related crashes. Additionally, the results of the SIDRA analysis for the 2029 – Development case (existing with development) scenario shows capacity issues. Based on the above, it is proposed to implement the mitigation measures discussed in *Section 5.1*.	2	5	M
Increase of intensified turning movements at the Racecourse Road / Lakeside Drive / Townsville Turf Club Access intersection. Potential for rear end, vehicle adjacent approach and vehicle opposite approach related crashes.	1	5	M	3	5	H	A review of previous 5-year crash data demonstrates no crash trends at the Racecourse Road / Lakeside Drive / Townsville Turf Club Access intersection. However, the results of the SIDRA analysis for the 2029 – Development case (existing with development) scenario shows capacity issues. Based on the above, it is proposed to implement the mitigation measures discussed in *Section 5.1*.	2	5	M
Increase in vehicle queueing at the Racecourse Road / Lakeside Drive and Racecourse Road / Lakeside Drive / Townsville Turf Club Access signalised intersections. Potential for rear end crashes.	1	4	M	3	4	M	No action: - A review of previous 5-year crash data demonstrates no rear end crash trends at the Racecourse Road / Lakeside Drive / Townsville Turf Club Access intersections. - large queues are expected; however the likelihood of a rear end crash does not increase to a level that would require mitigation measures in relation to vehicle queueing.	N/A		

5. Proposed infrastructure upgrades

5.1 Mitigation measures

As outlined in **Section 4.4**, an assessment of aggregate-intersection delay impact 'with development' has been undertaken for the Racecourse Road / Lakeside Drive signalised intersection and Racecourse Road / Lakeside Drive / Townsville Turf Club Access signalised intersection in accordance with *Section 11.3.1* of *GTIA*, which concludes that mitigation measures are triggered as a result of the development's aggregate-intersection-delay impact.

In addition, **Section 4.5** concludes that mitigation measures at the Racecourse Road / Lakeside Drive signalised intersection are triggered to address road safety issues.

To ensure the safety and efficiency of the State-controlled road network is maintained post development, the following infrastructure upgrades are proposed:

- apply a common control group (CCG) phasing sequence to the existing Racecourse Road / Lakeside Drive and Racecourse Road / Lakeside Drive / Townsville Turf Club Access signalised intersections and modify the phasing sequence and timing to cater for existing and development generated traffic, as well as a new road connection to Stuart Drive
- provide a new road connection between Racecourse Road and Stuart Drive connecting to the Stuart Drive / Edison Street roundabout in the south and Racecourse Road / Lakeside Drive signalised intersection in the north. The road connection will be to a two-lane, two-way road configuration in accordance with Council *Standard Drawing SD-002 – Typical Cross Sections, Major Collector Roads* and direct property access will be prohibited
- provide a new four-leg single lane roundabout at the midpoint between Racecourse Road and Stuart Drive. The eastbound and westbound approaches to this roundabout will facilitate access to the proposed development, and
- upgrade the existing Stuart Drive / Edison Street three-leg roundabout to a four-leg double lane roundabout in the north-south direction. A four-lane, two-way carriageway on both Stuart Drive approaches will be required for 130m on the approach and 170m on the departure side of the roundabout.

All transport infrastructure upgrades will be required prior to commencement of the development (year of opening (2029)) and will be designed in accordance with the TMR's *Road Planning and Design Manual, 2nd Edition* and Council's *Townsville City Plan (Version 2022/02)*.

Civil engineering drawings for the site are provided in **Appendix F**.

5.2 Revised traffic distribution

As a result of providing a new road connection between Racecourse Road and Stuart Drive, the traffic distribution of the surrounding road network will change. The following sections detail the changes to existing background traffic and development generated traffic as a result of Lakeside Drive being extended from Racecourse Road to Stuart Drive.

5.2.1 Revised background traffic distribution

Once Lakeside Drive is extended from Racecourse Road to Stuart Drive, it is expected that a proportion of existing traffic volumes at the key intersections identified in **Section 2.1.2** will reroute to the new 'Lakeside Drive extended' to travel between Racecourse Road and Stuart Drive. The following assumptions shown in **Table 5.2.1** and **Figure 5.2.1.1** have been made with the impacted traffic volumes shown in **Figure 5.2.1.2**.

The assumed traffic re-distribution accounts for vehicles travelling between the commercial land uses north of Racecourse Road and the residential catchment south of Stuart Drive, in addition to vehicles travelling to / from Racecourse Road east of Lakeside Drive. The nominal 10% has been adopted based on traffic engineering judgement and the traffic volumes expected for a typical two-lane, two-way road of this nature and location.

Based on the above, revised 2024 background traffic volumes are shown in **Figure 5.2.1.3**.

Table 5.2.1 Background traffic redistribution assumptions

Intersection	Existing configuration	Movement	Road corridor changes
Racecourse Road / Lakeside Drive	Signalised intersection	1	10% of eastbound through and left turning traffic originating from the south, added to northbound through and right turn traffic on Lakeside Drive extended
Racecourse Road / Lakeside Drive / Townsville Turf Club Access	Signalised intersection	1	Increase in northbound traffic at the Racecourse Road / Lakeside Drive intersection added to northbound through traffic
		2	10% of southbound right turning traffic added to southbound through traffic
		2	10% of westbound through traffic added to westbound left turning traffic
Stuart Drive / Edison Street	3-leg single lane roundabout	1	Increase in northbound traffic at the Racecourse Road / Lakeside Drive intersection added to northbound movements into Lakeside Drive extended
		2	Increase in southbound traffic at the Racecourse Road / Lakeside Drive intersection added to southbound movements out of Lakeside Drive extended

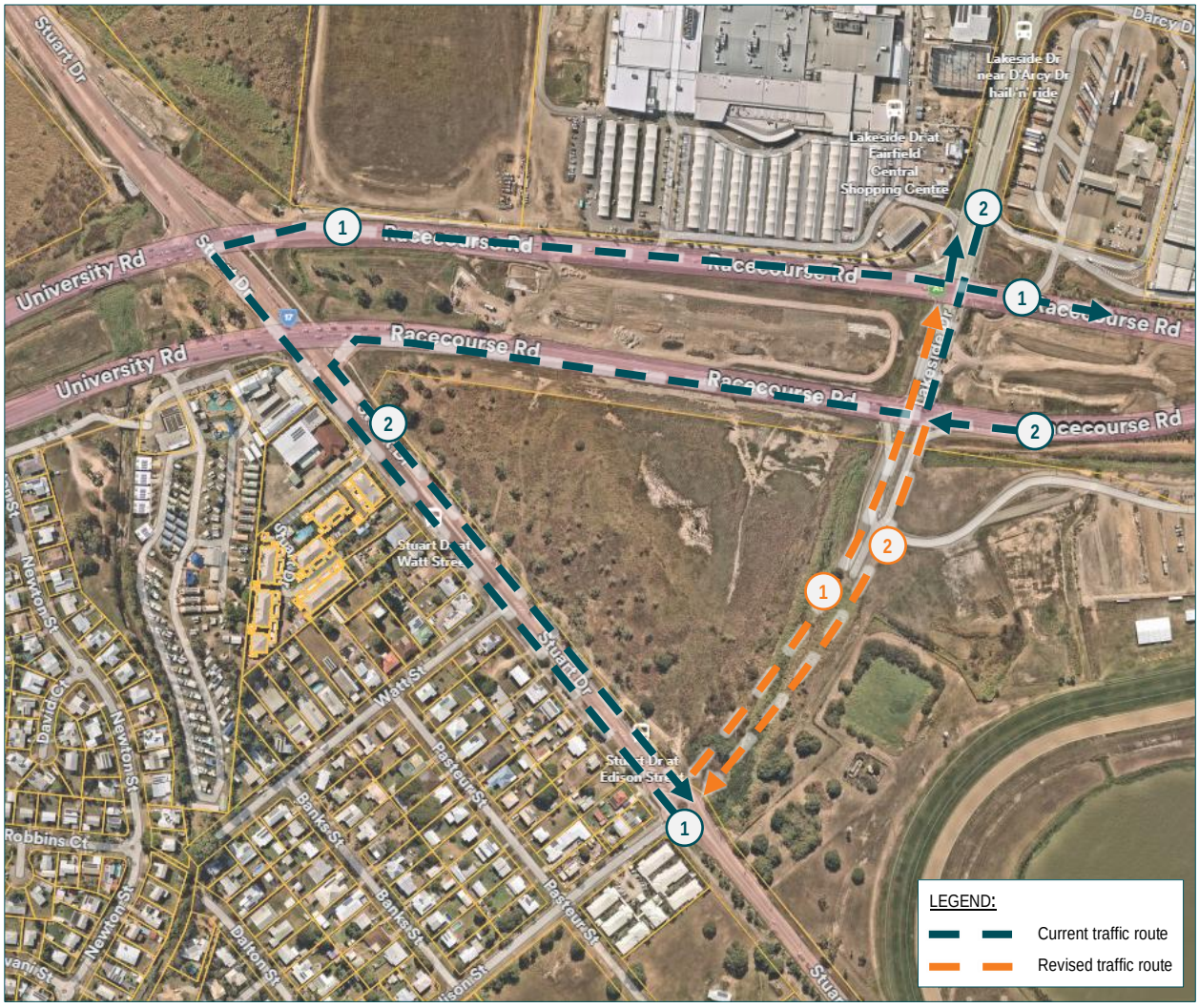

Figure 5.2.1.1 Redistributed traffic movements

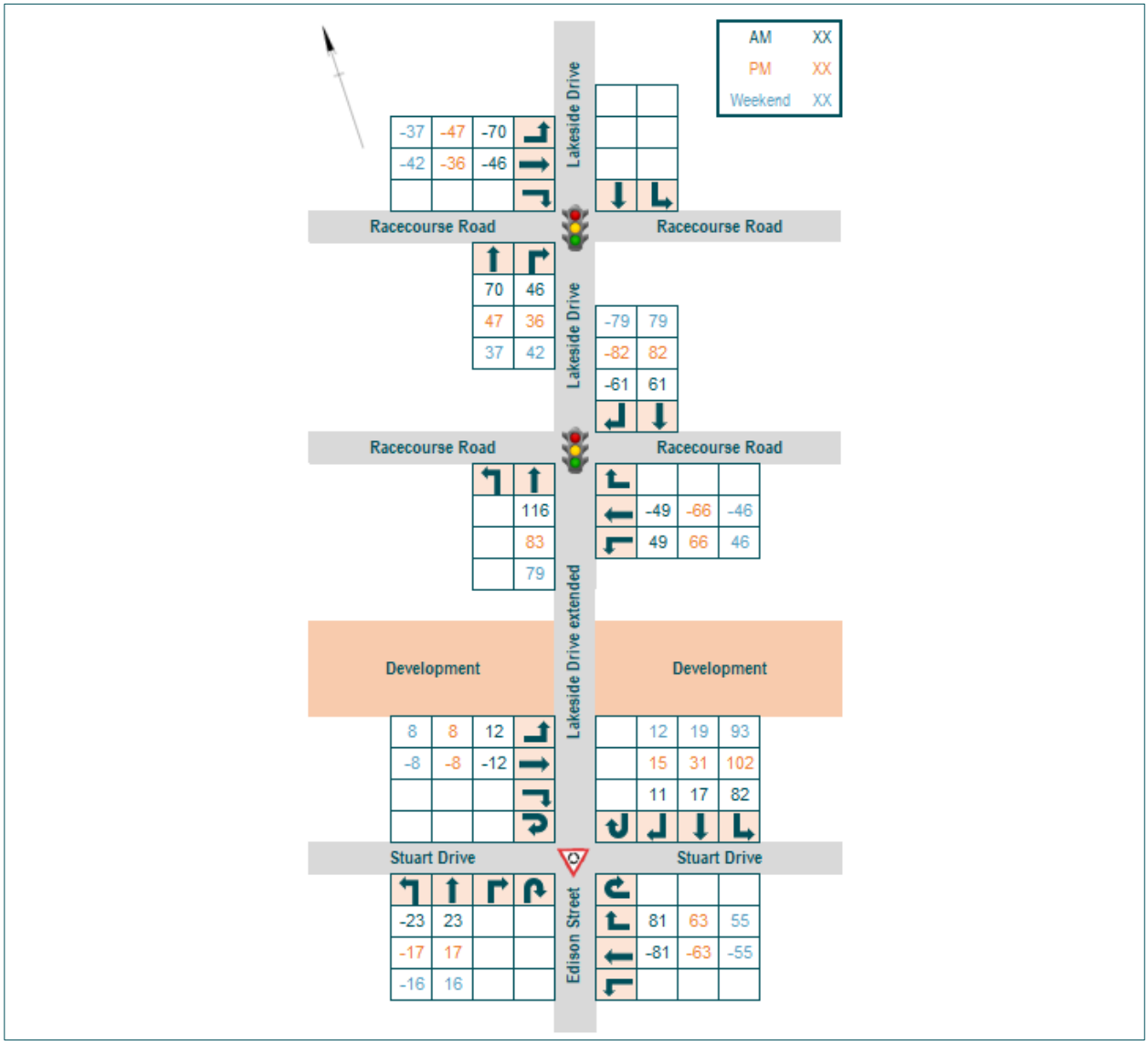

Figure 5.2.1.2 Redistributed traffic volumes

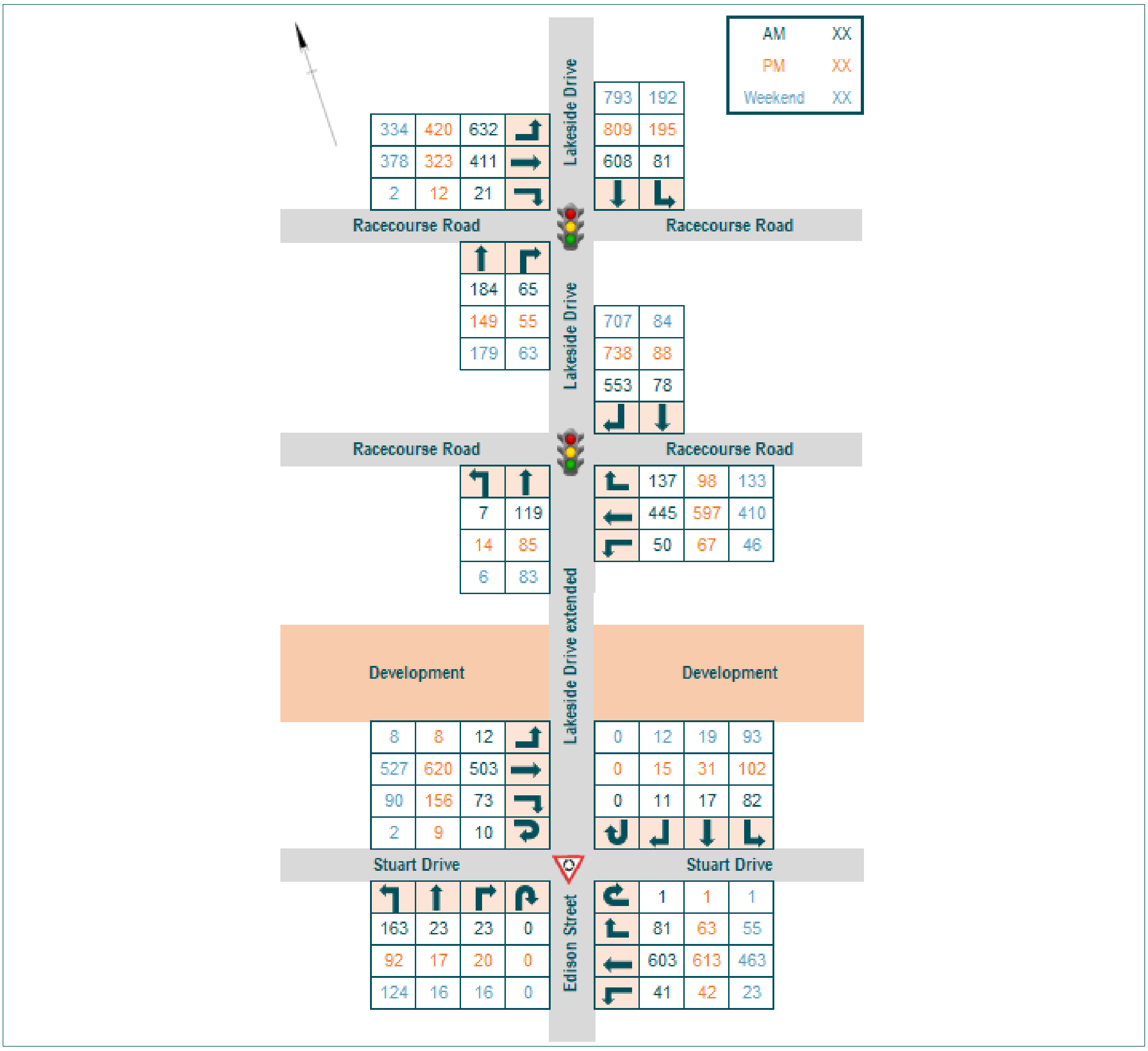

Figure 5.2.1.3 2024 redistributed traffic volumes

5.2.2 Revised development traffic distribution

As a result of providing a new road connection from Racecourse Road to Stuart Drive, the traffic distribution for the proposed development will change to reflect vehicles travelling to / from Stuart Drive (south). **Table 5.2.2** shows the percentage of vehicles from the 2024 background traffic data using either the Racecourse Road / Lakeside Drive intersections or the Stuart Drive / Edison Street roundabout. Based on the data, the percentage of vehicles using the Stuart Drive / Edison Street roundabout has been taken from the west and east directions and added to the south. The percentage of vehicles that travel to / from the north remains unchanged.

The modified development traffic distribution percentages are shown in **Figure 5.2.2.1**, with the resultant traffic volumes shown in **Figure 5.2.2.2**.

Table 5.2.2 Intersection volume splits

Intersection	AM peak	PM peak	Weekend peak
Racecourse Road / Lakeside Drive and Racecourse Road / Lakeside Drive / Townsville Turf Club Access	68%	68%	72%
Stuart Drive / Edison Street	32%	32%	28%

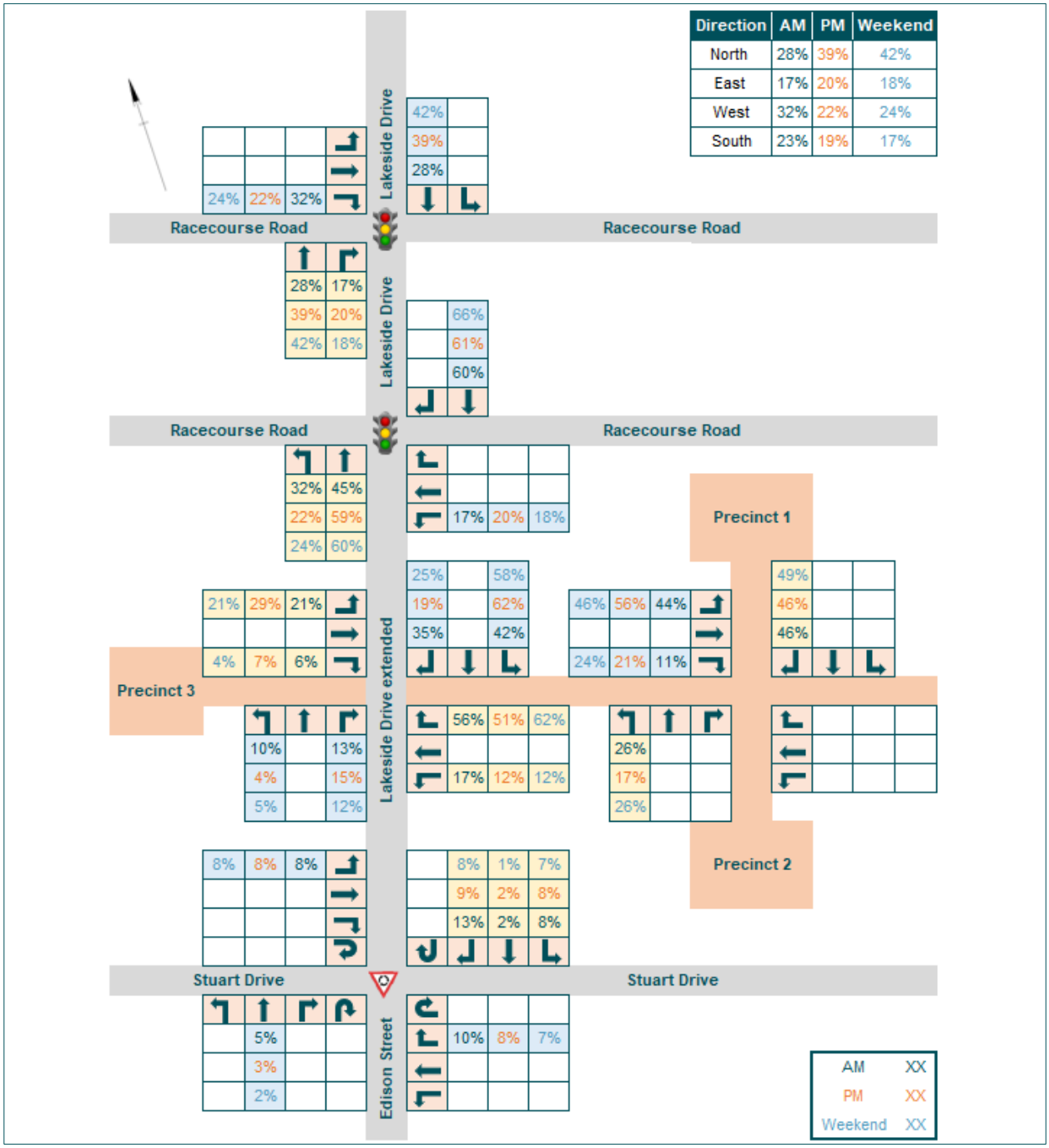

Figure 5.2.2.1 Post upgrades development distributions (%)

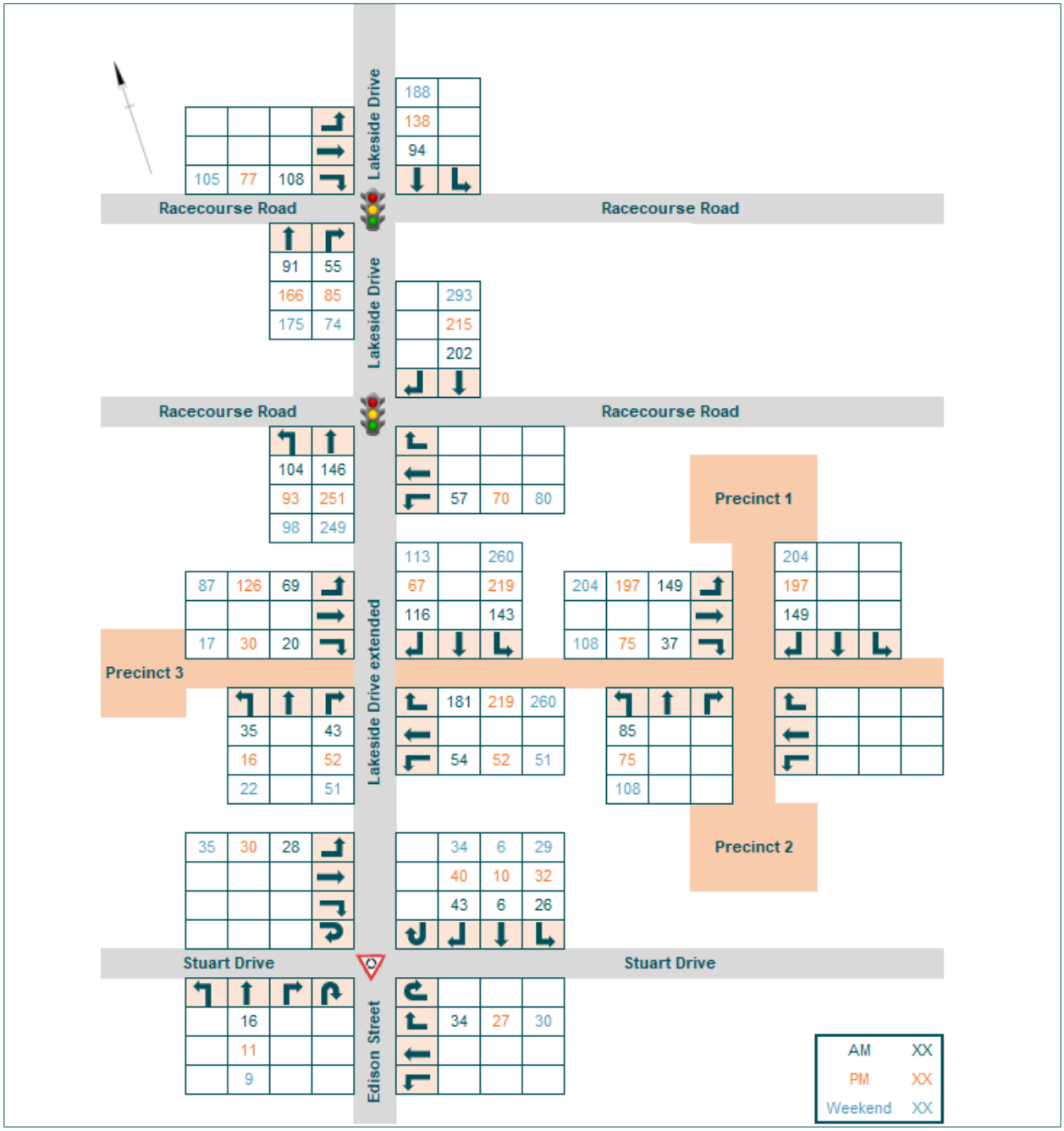

Figure 5.2.2.2 Post upgrades development distributions (vehicles)

5.3 Assessment of traffic impacts

5.3.1 Assumptions

The following assumptions have been relied upon for the purposes of undertaking this traffic assessment:

- the development will not be staged with the ultimate development expected to commence operation by 2029
- all transport infrastructure will be operational prior to commencement
- the 10-year design horizon is 2039
- 2% compounding growth rate applied to traffic volumes on Lakeside Drive, Racecourse Road and the future Lakeside Drive extension
- 3% compounding growth rate applied to traffic volumes on Stuart Drive, and
- 1% compounding growth rate applied to traffic volumes on Edison Street.

Based on these assumptions, the following scenarios have been analysed for the key intersections identified in **Section 2.1.2**:

1. 2029 – Design case (redistributed traffic with development)
2. 2039 – Design case (redistributed traffic with development).

5.4 Design traffic volumes

Design case traffic volumes have been calculated by adding development generated traffic to the redistributed traffic volumes for the year of opening (2029) (**Figure 5.4.1**) and the 10-year design horizon (2039) (**Figure 5.4.2**).

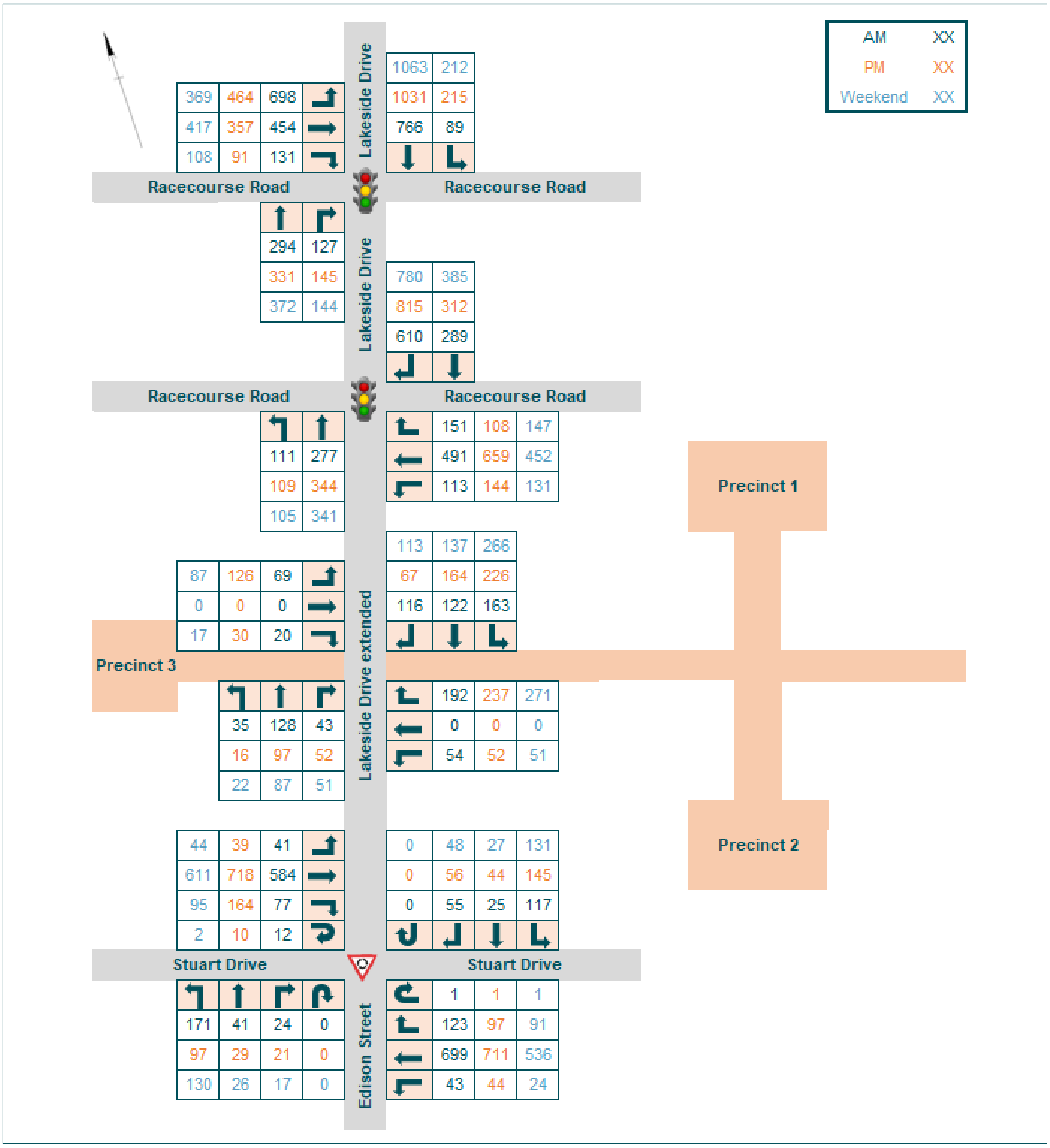

Figure 5.4.1 2029 – Design case traffic volumes (redistributed traffic with development)

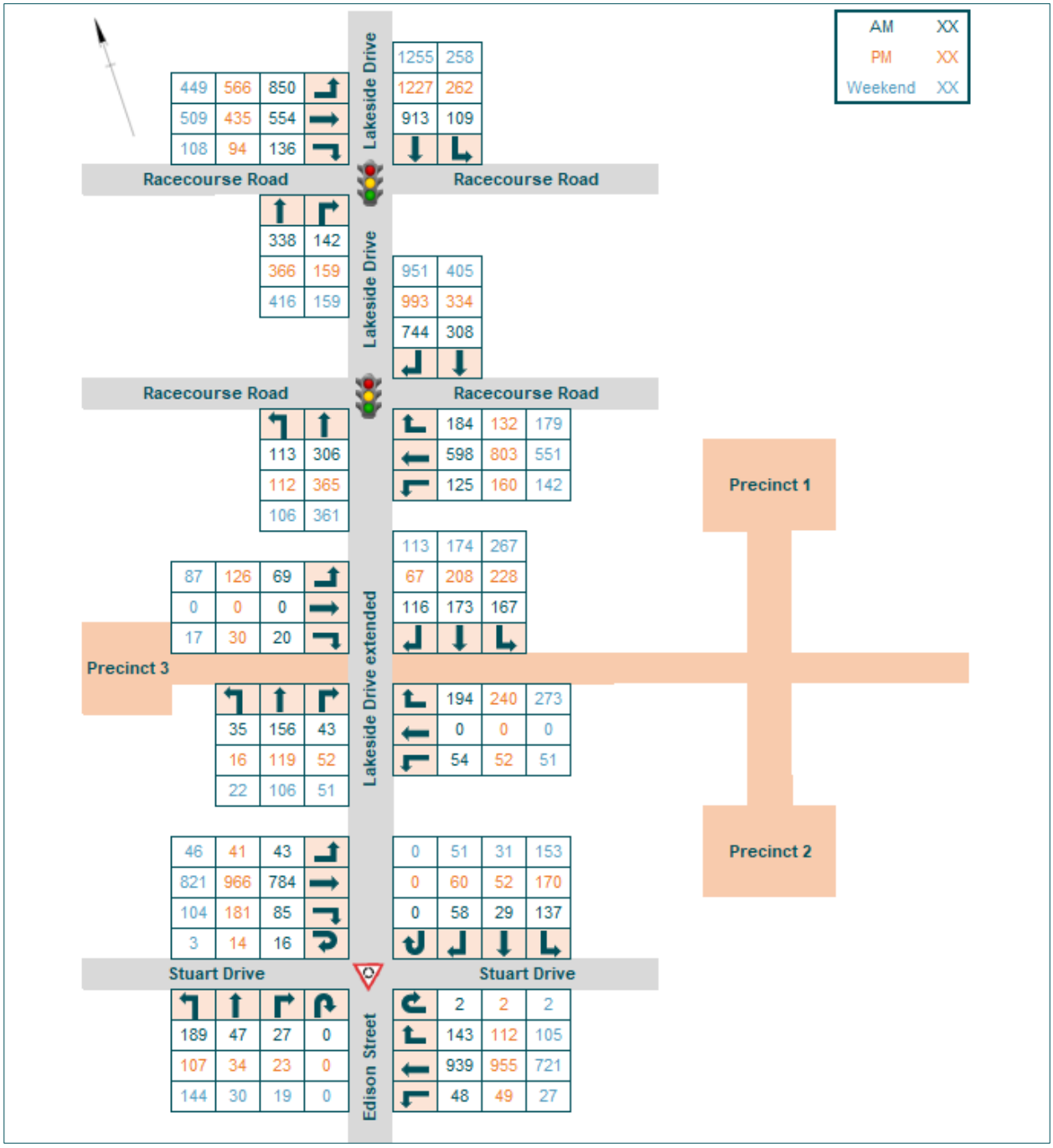

Figure 5.4.2 2039 - Design case traffic volumes (redistributed traffic with development)

5.5 Design case intersection analysis

Intersection analysis using SIDRA 9.1 intersection analysis software was undertaken for the scenarios mentioned in **Section 5.3.1** for the proposed transport infrastructure upgrades which includes the following intersections:

1. Racecourse Road / Lakeside Drive / Lakeside Drive extended signalised intersections
2. Lakeside Drive extended / Development Access 4-leg single lane roundabout
3. Stuart Drive / Lakeside Drive extended / Edison Street 4-leg double lane roundabout.

5.5.1 Racecourse Road / Lakeside Drive / Lakeside Drive extended

As part of the proposed transport infrastructure upgrades, a CCG phasing sequence will be applied to the Racecourse Road / Lakeside Drive / Lakeside Drive extended signalised intersections with the phasing sequence and timing designed to cater for increased traffic movements in and out of the proposed development via Lakeside Drive extended. Maintaining a cycle time of 120 seconds, the proposed CCG phasing sequence is shown in **Figure 5.5.1**.

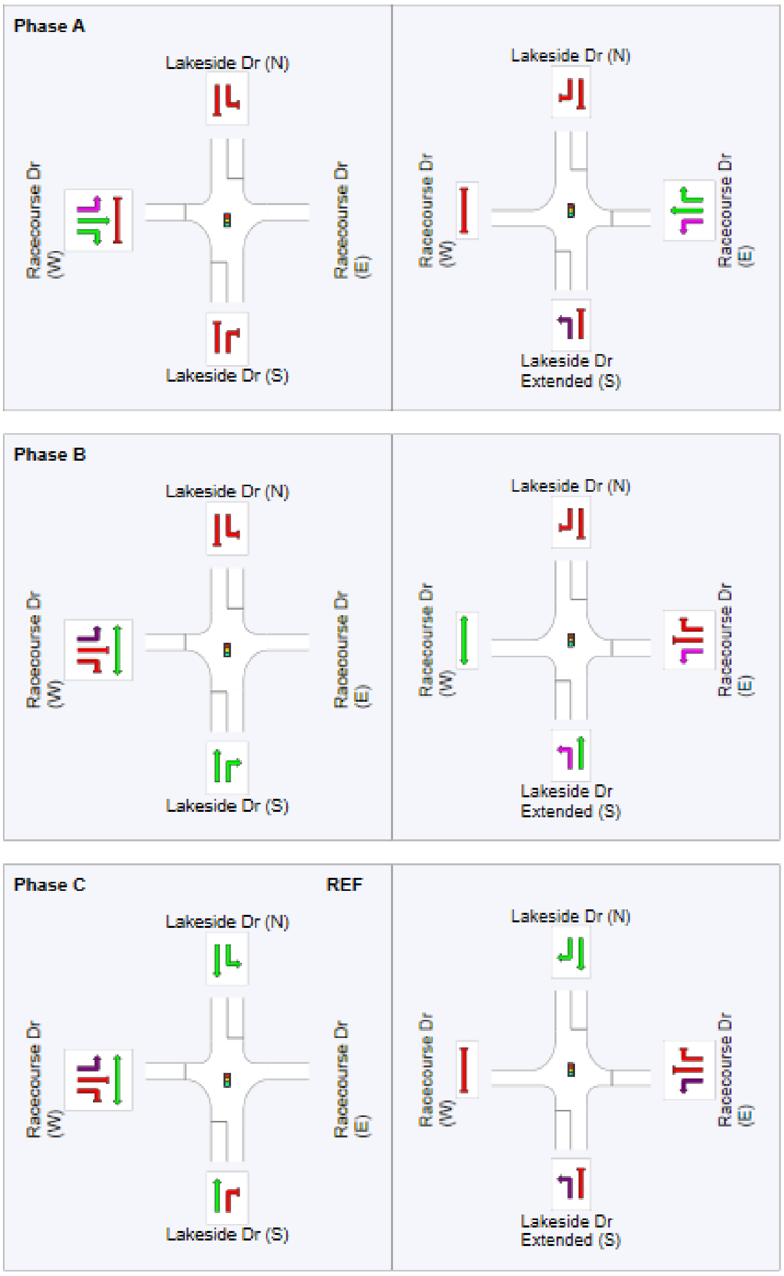

Figure 5.5.1 Proposed Racecourse Road / Lakeside Drive / Lakeside Drive extended phasing

A summary of the key performance indicators as determined by the SIDRA analysis for the year of opening (2029) and 10-year design horizon (2039) design case scenarios for the proposed Racecourse Road / Lakeside Drive / Lakeside Drive extended signalised intersections are presented in **Table 5.5.1.1** and **Table 5.5.1.2** with SIDRA outputs being provided in **Appendix G**.

The results of the SIDRA analysis demonstrate that the proposed Racecourse Road / Lakeside Drive / Lakeside Drive extended signalised intersections will operate within acceptable performance criteria in the year of opening (2029) and 10-year design horizon (2039) scenarios. Vehicle queues on all intersection approaches are contained prior to the next upstream intersection and within the proposed turn pockets.

Table 5.5.1.1 Racecourse Road design case SIDRA results – year of opening (2029)

Approach	Degree of saturation	Average delay (s)	Level of service	95% back of queue (m)
Racecourse Road / Lakeside Drive				
2029 AM				
Lakeside Drive (S)	0.777	21.8	C	56.4
Lakeside Drive (N)	0.599	35.4	D	140.8
Racecourse Road (W)	0.682	14.2	B	119.7
2029 PM				
Lakeside Drive (S)	0.746	15.6	B	56.7
Lakeside Drive (N)	0.623	27.7	C	174.9
Racecourse Road (W)	0.534	18.4	B	75.2
2029 Weekend				
Lakeside Drive (S)	0.717	15.3	B	55.0
Lakeside Drive (N)	0.520	18.1	B	142.6
Racecourse Road (W)	0.587	26.9	C	77.6
Racecourse Road / Lakeside Drive / Lakeside Drive extended				
2029 AM				
Lakeside Drive extended (S)	0.768	46.7	D	65.0
Racecourse Road (E)	0.369	25.5	C	83.7
Lakeside Drive (N)	0.721	13.1	B	119.3
2029 PM				
Lakeside Drive extended (S)	0.804	49.7	D	79.6
Racecourse Road (E)	0.722	38.5	D	140.2
Lakeside Drive (N)	0.673	9.1	A	109.6
2029 Weekend				
Lakeside Drive extended (S)	0.793	48.7	D	77.9
Racecourse Road (E)	0.711	44.6	D	97.7
Lakeside Drive (N)	0.576	8.3	A	104.0

Table 5.5.1.2 Racecourse Road design case SIDRA results – 10-year design horizon (2039)

Approach	Degree of saturation	Average delay (s)	Level of service	95% back of queue (m)
Racecourse Road / Lakeside Drive				
2039 AM				
Lakeside Drive (S)	0.878	24.5	C	69.9
Lakeside Drive (N)	0.731	40.4	D	183.0
Racecourse Road (W)	0.853	21.7	C	266.6
2039 PM				
Lakeside Drive (S)	0.819	17.5	B	68.7
Lakeside Drive (N)	0.768	32.3	C	239.5
Racecourse Road (W)	0.658	18.8	B	95.6
2039 Weekend				
Lakeside Drive (S)	0.795	17.0	B	66.6
Lakeside Drive (N)	0.639	21.2	C	193.6
Racecourse Road (W)	0.716	27.3	C	98.9
Racecourse Road / Lakeside Drive / Lakeside Drive extended				
2039 AM				
Lakeside Drive extended (S)	0.850	51.5	D	75.2
Racecourse Road (E)	0.450	26.6	C	106.1
Lakeside Drive (N)	0.846	14.7	B	122.4
2039 PM				
Lakeside Drive extended (S)	0.853	53.6	D	87.3
Racecourse Road (E)	0.881	47.9	D	201.9
Lakeside Drive (N)	0.793	9.4	A	122.4
2039 Weekend				
Lakeside Drive extended (S)	0.841	51.6	D	85.1
Racecourse Road (E)	0.867	51.2	D	133.4
Lakeside Drive (N)	0.672	8.2	A	122.4

5.5.2 Lakeside Drive extended / Development Access

As part of the proposed transport infrastructure upgrades a new four-leg single lane roundabout will be provided at the midpoint between Racecourse Road and Stuart Drive. Direct property access to the new Lakeside Drive extended will not be permitted with all development traffic to flow through the eastbound and westbound approaches to this roundabout. The SIDRA layout for the proposed roundabout is shown in **Figure 5.5.2**.

A summary of the key performance indicators as determined by the SIDRA analysis for the year of opening (2029) and 10-year design horizon (2039) design case scenarios for the proposed Lakeside Drive extended / Development Access roundabout are presented in **Table 5.5.2.1** and **Table 5.5.2.2** with SIDRA outputs being provided in **Appendix G**.

The results of the SIDRA analysis demonstrate that the proposed Lakeside Drive extended / Development Access roundabout will operate within acceptable performance criteria in the year of opening (2029) and 10-year design horizon (2039) scenarios. Vehicle queues on both Lakeside Drive approaches are contained prior to Racecourse Road and Stuart Drive.

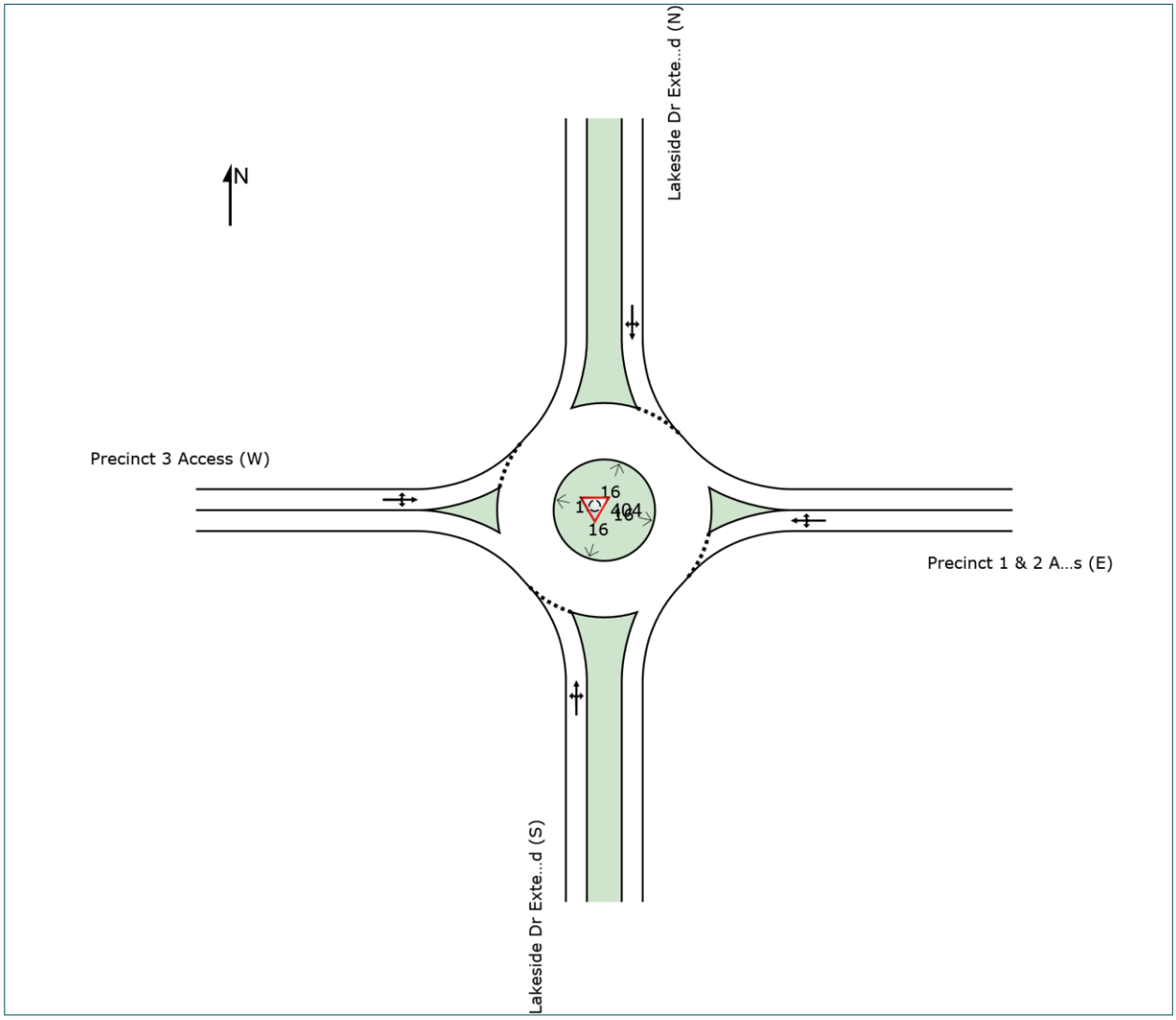

Figure 5.5.2 Proposed Lakeside Drive extended / Development Access roundabout SIDRA layout

Table 5.5.2.1 Development access design case SIDRA results – year of opening (2029)

Approach	Degree of saturation	Average delay (s)	Level of service	95% back of queue (m)
2029 AM				
Lakeside Drive extended (S)	0.222	7.6	A	10.7
Precincts 1 and 2 access (E)	0.246	9.6	A	12.3
Lakeside Drive extended (N)	0.306	5.9	A	14.7
Precinct 3 access (W)	0.100	7.4	A	4.1
2029 PM				
Lakeside Drive extended (S)	0.177	7.8	A	8.1
Precincts 1 and 2 access (E)	0.291	9.8	A	14.6
Lakeside Drive extended (N)	0.356	5.5	A	18.2
Precinct 3 access (W)	0.178	7.6	A	7.8
2029 Weekend				
Lakeside Drive extended (S)	0.187	8.5	A	8.6
Precincts 1 and 2 access (E)	0.325	10.0	A	16.6
Lakeside Drive extended (N)	0.390	5.7	A	21.2
Precinct 3 access (W)	0.125	7.6	A	5.3

Table 5.5.2.2 Development access design case SIDRA results – 10-year design horizon (2039)

Approach	Degree of saturation	Average delay (s)	Level of service	95% back of queue (m)
2039 AM				
Lakeside Drive extended (S)	0.253	7.6	A	12.6
Precincts 1 and 2 access (E)	0.251	9.8	A	12.9
Lakeside Drive extended (N)	0.326	5.9	A	15.9
Precinct 3 access (W)	0.103	7.6	A	4.3
2039 PM				
Lakeside Drive extended (S)	0.202	7.8	A	9.5
Precincts 1 and 2 access (E)	0.301	10.1	A	15.4
Lakeside Drive extended (N)	0.383	5.5	A	19.8
Precinct 3 access (W)	0.183	7.8	A	8.0
2039 Weekend				
Lakeside Drive extended (S)	0.210	8.4	A	9.9
Precincts 1 and 2 access (E)	0.334	10.2	B	17.3
Lakeside Drive extended (N)	0.411	5.6	A	22.8
Precinct 3 access (W)	0.127	7.7	A	5.5

5.5.3 Stuart Drive / Lakeside Drive extended / Edison Street

As part of the proposed transport infrastructure upgrades, the existing Stuart Drive / Edison Street three-leg roundabout will be upgraded to a four-leg double lane roundabout in the north-south direction. A four-lane, two-way carriageway on both Stuart Drive approaches will be required for 130m on the approach and 170m on the departure side of the roundabout. The SIDRA layout for the proposed roundabout is shown in **Figure 5.5.3**.

A summary of the key performance indicators as determined by the SIDRA analysis for the year of opening (2029) and 10-year design horizon (2039) design case scenarios for the proposed Stuart Drive / Lakeside Drive extended / Edison Street roundabout are presented in **Table 5.5.3.1** and **Table 5.5.3.2** with SIDRA outputs being provided in **Appendix G**.

The results of the SIDRA analysis demonstrate that the proposed Stuart Drive / Lakeside Drive extended / Edison Street roundabout will operate within acceptable performance criteria in the year of opening (2029) and 10-year design horizon (2039) scenarios. Vehicle queues on all intersection approaches are contained prior to the next upstream intersection.

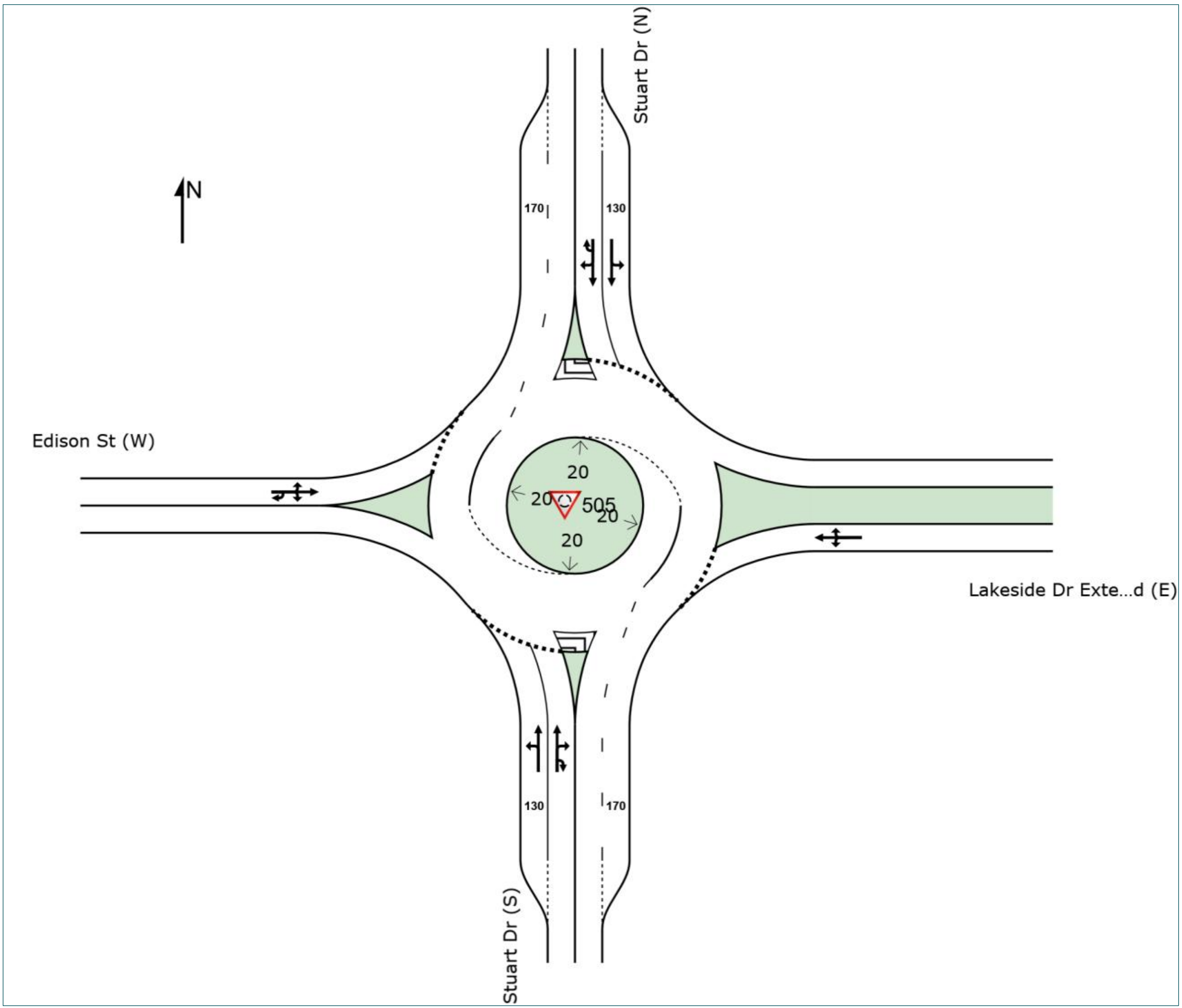

Figure 5.5.3 Stuart Drive / Lakeside Drive extended / Edison Street roundabout SIDRA layout

Table 5.5.3.1 Stuart Drive design case SIDRA results – year of opening (2029)

Approach	Degree of saturation	Average delay (s)	Level of service	95% back of queue (m)
2029 AM				
Stuart Drive (S)	0.358	7.9	A	18.0
Lakeside Drive Extended (E)	0.274	8.7	A	8.6
Stuart Drive (N)	0.304	7.5	A	14.5
Edison Street (W)	0.396	10.2	B	13.4
2029 PM				
Stuart Drive (S)	0.378	8.2	A	18.4
Lakeside Drive Extended (E)	0.366	9.5	A	12.2
Stuart Drive (N)	0.367	7.6	A	18.4
Edison Street (W)	0.257	9.4	A	7.9
2029 Weekend				
Stuart Drive (S)	0.265	7.3	A	11.7
Lakeside Drive Extended (E)	0.271	8.3	A	8.1
Stuart Drive (N)	0.292	7.0	A	13.1
Edison Street (W)	0.255	8.0	A	7.6

Table 5.5.3.2 Stuart Drive design case SIDRA results – 10-year design horizon (2039)

Approach	Degree of saturation	Average delay (s)	Level of service	95% back of queue (m)
2039 AM				
Stuart Drive (S)	0.475	8.9	A	27.3
Lakeside Drive Extended (E)	0.359	10.3	B	12.3
Stuart Drive (N)	0.408	8.3	A	21.8
Edison Street (W)	0.525	13.8	B	20.2
2039 PM				
Stuart Drive (S)	0.510	9.3	A	28.5
Lakeside Drive Extended (E)	0.499	12.4	B	19.4
Stuart Drive (N)	0.484	8.5	A	28.0
Edison Street (W)	0.348	11.7	B	11.7
2039 Weekend				
Stuart Drive (S)	0.352	7.7	A	17.0
Lakeside Drive Extended (E)	0.351	9.7	A	11.4
Stuart Drive (N)	0.384	7.6	A	19.2
Edison Street (W)	0.322	9.4	A	10.0

5.6 Design case road link assessment

Adopting industry accepted typical midblock capacity volumes, the trigger for road link duplication based on background traffic growth alone for the year of opening (2029) and 10-year design horizon (2039) scenarios is shown in **Table 5.6.1**.

Based on background traffic growth alone, the existing four-lane, two-way configuration of Lakeside Drive and Racecourse Road is suitable up to the 10-year design horizon (2039). Stuart Drive however, triggers duplication to a four-lane, two-way carriageway at the year of opening (2029) based on background traffic growth alone.

Table 5.6.1 Midblock capacity assessment – background traffic

Road link	Existing configuration	AADT (2024)	Duplication AADT (vpd)	Growth rate	AADT (2029)	AADT (2039)
Lakeside Drive	Four-lane, two-way road	9,684	37,600	2%	11,798	14,382
Racecourse Road	Four-lane, one-way road	23,528	37,600	2%	25,977	31,666
Stuart Drive	Two-lane, two-way road	14,042	16,000	3%	16,279	21,877

Introducing development generated traffic to the year of opening (2029) and 10-year design horizon (2039) scenarios, the trigger for road link duplication is shown in **Table 5.6.2**.

Table 5.6.2 Midblock capacity assessment – background plus development traffic

Road link	Configuration	AADT (2024)	Duplication AADT (vpd)	Development traffic	AADT (2029)	AADT (2039)
Lakeside Drive	Four-lane, two-way road	9,684	37,600	3,087	14,885	17,469
Racecourse Road	Four-lane, one-way road	23,528	37,600	3,605	29,582	35,271
Stuart Drive	Two-lane, two-way road	14,042	16,000	784	17,063	22,661
Lakeside Drive extended	Two-lane, two-way road	2,550 [1]	16,000	7,351	10,223	10,852

Note:
1. Redistributed background traffic via new road connection between Racecourse Road and Stuart Drive

The existing four-lane, two-way configuration of Lakeside Drive and Racecourse Road and the proposed two-lane, two-way configuration for the new Lakeside Drive extended road has capacity to accommodate development generated traffic and background traffic in the 10-year design horizon (2039).

Regarding Stuart Drive, duplication to a four-lane, two-way carriageway is required in the year of opening (2029) and 10-year design horizon (2039) scenarios, however the need to upgrade is triggered by background traffic growth only, irrespective of whether the proposed development is introduced. Additionally, as detailed in **Section 5.5.3** a suitable four-leg double lane roundabout can be established for the Stuart Drive / Lakeside Drive extended / Edison Street intersection using short entry and exit lanes to provide a four-lane, two-way carriageway for Stuart Drive through the roundabout.

Based on the above, it would not be reasonable for the Applicant to be required to upgrade Stuart Drive to a four-lane, two-way configuration as part of this development application, given that duplication is required as a consequence of background traffic growth alone, not as a consequence of the proposed development.

6. Response to development codes

A detailed review of the proposed development against the *Townsville City Plan (Version 2022/02) – Transport impact, access and parking code* and the relevant sections of the Department of State Development, Infrastructure, Local Government and Planning *State Code 1: Development in a state-controlled road environment* and *State Code 6: Protecting the state-controlled road network* are provided in **Appendix H**.

7. Conclusions

This report presents the findings related to assessment of traffic impact related matters for a proposed development located at 1-105 Racecourse Road, Cluden. Based on the presented findings, it can be concluded that the proposed development will not introduce any adverse traffic impacts which would prevent its approval with appropriate conditions.

8. References

1. City of Townsville, *Townsville City Plan (Version 2022/02)*, February 2022, Townsville.
2. Austroads, *Guide to Traffic Management Part 3: Transport Studies and Analysis Methods*, 2020, Sydney.
3. Akcelik & Associates, *SIDRA Intersection User Guide for Version 9.1*, 9th Edition, 2022, Melbourne.
4. Austroads, *Guide to Traffic Management Part 12: Traffic Impacts of Developments*, 2016, Sydney.
5. Queensland Government (Department of Transport and Main Roads), *Guide to Traffic Impact Assessment*, December 2018, Brisbane.
6. New South Wales Government (Roads and Traffic Authority), *Guide to Traffic Generating Developments – Issue 2.2*, 2002, Sydney.
7. New South Wales Government (Roads and Maritime Services), *Guide to Traffic Generating Developments - Technical Direction (TDT2013/04)*, 2014, Sydney.
8. Institute of Transportation Engineers, *Trip Generation Manual (10th Edition)*, 2017, Washington.
9. Queensland Government (Department of Transport and Main Roads), *Traffic Generation Data - 2006 - 2018*, November 2018, Brisbane.
10. Queensland Government (Department of Main Roads), *Road Planning and Design Manual: Chapter 3 Road Planning and Design Fundamentals*, December 2005, Brisbane.

Appendix A Plans of development

SUMMARY

WEST SITES

17,300m²	WATER PARK
2,150m²	HOTEL
4,000m²	ACCOMMODATION
5,230m²	VIP
3,350m²	DEVELOPMENT SITE 1
14,900m²	DEVELOPMENT SITE 2

EAST SITES- RETAIL

2,600m²	FAST FOOD (SITE)
2,090m²	COMMERCIAL 1
1,570m²	COMMERCIAL 2
7,030m²	COMMERCIAL 3
3,130m²	MIXED-USE (SITE)

-Taven on ground
- Apartments above
150 Apartments
(Based on 15 Storey)

CAR PARKING

290 CARS	WATER PARK
84 CARS	HOTEL
215 CARS	RETAIL + LARGE FORMAT
188 CARS	PARKING LOT
40 CARS	FAST FOOD
150 CARS	RESIDENTAL PARKING (LOCATED UNDER PODIUM)

LEGEND

- BUFFER FROM TOP OF BATTER
- BATTER
- DENTENTION BASIN/ DRAINS
- STORMWATER DRAINLINE

2407 TSV Hotel & Water Park

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Masterplan - Town Planning

2407_ PD 003 | 13/02/2025 12:13:51 PM | Shaun McCarthy | 1 : 2000 @ A3
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Appendix B Intersection count data

Leg	Lakeside Dr North						East			Lakeside Dr South						Racecourse Rd West						
Direction	Southbound						Westbound			Northbound						Eastbound						
Start Time	Thru	Left	U-Turn	**App Total**	Peds CW	Peds CCW	**App Total**	Peds CW	Peds CCW	Right	Thru	U-Turn	**App Total**	Peds CW	Peds CCW	Right	Thru	Left	**App Total**	Peds CW	Peds CCW	**Int Total**
2024-05-09 06:00:00	59	34	0	**93**	0	0	**0**	0	0	2	6	0	**8**	0	0	0	153	34	**187**	0	0	**288**
2024-05-09 06:15:00	80	32	0	**112**	0	0	**0**	0	0	4	13	0	**17**	0	0	0	145	53	**198**	0	0	**327**
2024-05-09 06:30:00	80	23	0	**103**	0	0	**0**	0	0	1	8	1	**10**	0	0	2	148	63	**213**	0	0	**326**
2024-05-09 06:45:00	102	22	0	**124**	0	0	**0**	0	0	5	10	0	**15**	0	0	0	123	76	**199**	0	0	**338**
2024-05-09 07:00:00	88	16	0	**104**	0	0	**0**	0	0	4	9	0	**13**	0	0	0	120	95	**215**	0	0	**332**
2024-05-09 07:15:00	145	21	0	**166**	0	0	**0**	0	0	8	25	0	**33**	0	0	2	130	94	**226**	0	0	**425**
2024-05-09 07:30:00	115	16	0	**131**	0	0	**0**	0	0	11	14	0	**25**	0	0	7	115	159	**281**	1	0	**437**
2024-05-09 07:45:00	159	13	0	**172**	0	0	**0**	0	0	4	24	0	**28**	0	0	4	103	165	**272**	0	0	**472**
2024-05-09 08:00:00	143	17	0	**160**	0	0	**0**	0	0	3	18	0	**21**	0	0	7	106	179	**292**	0	0	**473**
2024-05-09 08:15:00	110	28	0	**138**	0	0	**0**	0	0	8	42	0	**50**	0	0	5	126	201	**332**	0	0	**520**
2024-05-09 08:30:00	196	23	0	**219**	0	0	**0**	0	0	4	30	0	**34**	0	0	5	122	157	**284**	0	0	**537**
2024-05-09 08:45:00	140	27	0	**167**	0	0	**0**	0	0	2	24	0	**26**	0	0	2	114	119	**235**	0	0	**428**
2024-05-09 09:00:00	145	38	0	**183**	0	0	**0**	0	0	5	25	0	**30**	0	0	6	92	80	**178**	0	0	**391**
2024-05-09 09:15:00	116	32	0	**148**	0	0	**0**	0	0	8	29	0	**37**	0	0	3	105	75	**183**	0	0	**368**
2024-05-09 09:30:00	119	30	0	**149**	0	0	**0**	0	0	6	21	0	**27**	0	0	7	78	70	**155**	0	0	**331**
2024-05-09 09:45:00	129	27	0	**156**	0	0	**0**	0	0	6	33	0	**39**	0	0	4	72	58	**134**	0	0	**329**
2024-05-09 10:00:00	114	36	0	**150**	0	0	**0**	0	0	7	19	0	**26**	0	0	3	85	63	**151**	0	0	**327**
2024-05-09 10:15:00	138	25	0	**163**	0	0	**0**	0	0	9	24	0	**33**	0	0	6	111	61	**178**	0	0	**374**
2024-05-09 10:30:00	136	34	0	**170**	0	0	**0**	0	0	7	30	0	**37**	0	0	4	81	77	**162**	0	0	**369**
2024-05-09 10:45:00	106	31	0	**137**	0	0	**0**	0	0	4	18	0	**22**	0	0	2	100	69	**171**	0	1	**330**
2024-05-09 11:00:00	132	36	0	**168**	0	0	**0**	0	0	4	30	0	**34**	0	0	2	86	60	**148**	0	0	**350**
2024-05-09 11:15:00	145	36	0	**181**	0	0	**0**	0	0	6	18	0	**24**	0	0	5	86	76	**167**	0	0	**372**
2024-05-09 11:30:00	128	30	0	**158**	0	0	**0**	0	0	9	13	0	**22**	0	0	2	84	66	**152**	0	0	**332**
2024-05-09 11:45:00	135	48	0	**183**	0	0	**0**	0	0	3	37	0	**40**	0	0	3	79	70	**152**	0	0	**375**
2024-05-09 12:00:00	126	57	0	**183**	0	0	**0**	0	0	5	26	0	**31**	0	0	2	73	83	**158**	0	0	**372**
2024-05-09 12:15:00	148	34	0	**182**	0	0	**0**	0	0	2	19	0	**21**	0	0	4	90	92	**186**	0	0	**389**
2024-05-09 12:30:00	184	22	0	**206**	0	0	**0**	0	0	2	26	0	**28**	0	0	2	102	91	**195**	0	0	**429**
2024-05-09 12:45:00	172	49	0	**221**	0	0	**0**	0	0	3	17	0	**20**	0	0	4	74	69	**147**	0	0	**388**
2024-05-09 13:00:00	154	50	0	**204**	0	0	**0**	0	0	2	25	0	**27**	0	0	3	84	68	**155**	0	0	**386**
2024-05-09 13:15:00	144	39	0	**183**	0	0	**0**	0	0	6	14	0	**20**	0	0	3	104	63	**170**	0	0	**373**
2024-05-09 13:30:00	137	42	0	**179**	0	0	**0**	0	0	5	20	0	**25**	0	0	4	94	55	**153**	0	0	**357**
2024-05-09 13:45:00	118	43	0	**161**	0	0	**0**	0	0	7	28	0	**35**	0	0	2	77	68	**147**	0	0	**343**
2024-05-09 14:00:00	140	37	0	**177**	0	0	**0**	0	0	5	23	0	**28**	0	0	2	90	69	**161**	0	0	**366**
2024-05-09 14:15:00	147	25	0	**172**	0	0	**0**	0	0	4	31	0	**35**	0	0	5	89	76	**170**	0	0	**377**
2024-05-09 14:30:00	142	23	0	**165**	0	0	**0**	0	0	7	24	0	**31**	0	0	2	85	93	**180**	0	0	**376**
2024-05-09 14:45:00	126	38	0	**164**	0	0	**0**	0	0	6	25	0	**31**	0	0	2	94	122	**218**	0	0	**413**
2024-05-09 15:00:00	164	45	0	**209**	0	0	**0**	0	0	7	28	0	**35**	0	0	4	105	95	**204**	0	0	**448**
2024-05-09 15:15:00	146	47	0	**193**	0	0	**0**	0	0	5	27	0	**32**	0	0	2	108	159	**269**	0	0	**494**
2024-05-09 15:30:00	159	60	0	**219**	0	0	**0**	0	0	8	19	0	**27**	0	0	3	110	96	**209**	0	0	**455**
2024-05-09 15:45:00	151	42	0	**193**	0	0	**0**	0	0	8	39	0	**47**	0	0	1	107	133	**241**	1	0	**481**
2024-05-09 16:00:00	168	60	0	**228**	0	0	**0**	0	0	4	27	0	**31**	0	0	3	80	133	**216**	0	0	**475**
2024-05-09 16:15:00	220	49	0	**269**	0	0	**0**	0	0	9	17	0	**26**	0	0	3	84	130	**217**	0	0	**512**
2024-05-09 16:30:00	196	38	0	**234**	0	0	**0**	0	0	1	30	0	**31**	0	0	6	103	119	**228**	0	0	**493**
2024-05-09 16:45:00	225	48	0	**273**	0	0	**0**	0	0	5	28	0	**33**	0	0	0	92	85	**177**	0	0	**483**
2024-05-09 17:00:00	183	37	0	**220**	0	0	**0**	0	0	1	18	0	**19**	0	0	0	98	101	**199**	0	0	**438**
2024-05-09 17:15:00	218	62	0	**280**	0	0	**0**	0	0	3	18	0	**21**	0	0	2	99	88	**189**	0	0	**490**
2024-05-09 17:30:00	183	37	0	**220**	0	0	**0**	0	0	5	22	0	**27**	0	0	2	107	108	**217**	0	0	**464**
2024-05-09 17:45:00	160	37	0	**197**	0	0	**0**	0	0	2	24	0	**26**	0	0	2	75	91	**168**	0	0	**391**
2024-05-09 18:00:00	154	30	0	**184**	0	0	**0**	0	0	4	20	0	**24**	0	0	1	69	86	**156**	0	0	**364**
2024-05-09 18:15:00	134	32	0	**166**	0	0	**0**	0	0	5	17	0	**22**	0	0	0	80	89	**169**	0	0	**357**
2024-05-09 18:30:00	105	32	0	**137**	0	0	**0**	0	0	4	5	0	**9**	0	0	0	50	66	**116**	0	0	**262**
2024-05-09 18:45:00	101	24	0	**125**	0	0	**0**	0	0	4	13	0	**17**	0	0	0	49	53	**102**	0	0	**244**
2024-05-09 19:00:00	128	21	0	**149**	0	0	**0**	0	0	0	7	0	**7**	0	0	0	37	50	**87**	0	0	**243**
2024-05-09 19:15:00	92	5	0	**97**	0	0	**0**	0	0	2	6	0	**8**	0	0	0	49	45	**94**	0	0	**199**
2024-05-09 19:30:00	73	14	0	**87**	0	0	**0**	0	0	2	6	0	**8**	0	0	0	33	47	**80**	0	0	**175**
2024-05-09 19:45:00	60	15	0	**75**	0	0	**0**	0	0	4	10	0	**14**	0	0	0	42	28	**70**	0	0	**159**
2024-05-09 20:00:00	97	18	0	**115**	0	0	**0**	0	0	2	7	0	**9**	0	0	0	27	33	**60**	0	0	**184**
2024-05-09 20:15:00	78	13	0	**91**	0	0	**0**	0	0	0	3	0	**3**	0	0	1	16	25	**42**	0	0	**136**
2024-05-09 20:30:00	69	11	0	**80**	0	0	**0**	0	0	2	5	0	**7**	0	0	0	20	26	**46**	0	0	**133**
2024-05-09 20:45:00	53	11	0	**64**	0	0	**0**	0	0	1	4	0	**5**	0	0	0	10	25	**35**	0	0	**104**
2024-05-09 21:00:00	62	9	0	**71**	0	0	**0**	0	0	1	2	0	**3**	0	0	1	23	30	**54**	0	0	**128**
2024-05-09 21:15:00	43	6	0	**49**	0	0	**0**	0	0	4	1	0	**5**	0	0	0	24	24	**48**	0	0	**102**
2024-05-09 21:30:00	32	3	0	**35**	0	0	**0**	0	0	2	1	0	**3**	0	0	1	13	19	**33**	0	0	**71**
2024-05-09 21:45:00	27	4	0	**31**	0	0	**0**	0	0	2	0	0	**2**	0	0	0	13	12	**25**	0	0	**58**
2024-05-11 06:00:00	23	10	0	**33**	0	0	**0**	0	0	2	4	0	**6**	0	0	1	48	19	**68**	0	0	**107**
2024-05-11 06:15:00	24	9	0	**33**	0	0	**0**	0	0	3	0	0	**3**	0	0	0	58	31	**89**	0	0	**125**
2024-05-11 06:30:00	29	10	0	**39**	0	0	**0**	0	0	5	4	0	**9**	0	0	2	56	36	**94**	0	0	**142**
2024-05-11 06:45:00	31	8	0	**39**	0	0	**0**	0	0	4	11	0	**15**	0	0	0	39	31	**70**	0	0	**124**
2024-05-11 07:00:00	36	7	0	**43**	0	0	**0**	0	0	1	6	0	**7**	0	0	2	55	37	**94**	0	0	**144**
2024-05-11 07:15:00	40	16	0	**56**	0	0	**0**	0	0	1	7	0	**8**	0	0	2	58	39	**99**	0	0	**163**

2024-05-11 07:30:00	51	8	0	**59**	0	0	**0**	0	0	6	11	0	**17**	0	0	2	69	62	**133**	0	0	**209**
2024-05-11 07:45:00	77	19	0	**96**	0	0	**0**	0	0	3	25	0	**28**	0	0	0	72	71	**143**	0	0	**267**
2024-05-11 08:00:00	66	12	0	**78**	0	0	**0**	0	0	4	22	0	**26**	0	0	1	67	90	**158**	0	0	**262**
2024-05-11 08:15:00	75	23	0	**98**	0	0	**0**	0	0	5	32	0	**37**	0	0	0	77	59	**136**	0	0	**271**
2024-05-11 08:30:00	75	29	0	**104**	0	0	**0**	0	0	2	26	0	**28**	0	0	3	79	79	**161**	0	0	**293**
2024-05-11 08:45:00	114	29	0	**143**	0	0	**0**	0	0	7	24	0	**31**	0	0	2	88	91	**181**	0	0	**355**
2024-05-11 09:00:00	121	37	0	**158**	0	0	**0**	0	0	6	30	0	**36**	0	0	2	108	58	**168**	0	0	**362**
2024-05-11 09:15:00	135	26	0	**161**	0	0	**0**	0	0	4	26	0	**30**	0	0	1	93	76	**170**	0	0	**361**
2024-05-11 09:30:00	149	21	0	**170**	0	0	**0**	0	0	8	38	0	**46**	0	0	1	105	94	**200**	0	1	**416**
2024-05-11 09:45:00	147	40	0	**187**	0	0	**0**	0	0	8	44	0	**52**	0	0	1	82	99	**182**	0	0	**421**
2024-05-11 10:00:00	162	37	0	**199**	0	0	**0**	0	0	8	35	0	**43**	0	0	1	96	80	**177**	0	0	**419**
2024-05-11 10:15:00	178	37	0	**215**	0	0	**0**	0	0	4	41	0	**45**	0	0	1	95	91	**187**	0	0	**447**
2024-05-11 10:30:00	175	47	0	**222**	0	0	**0**	0	0	4	36	0	**40**	0	0	2	86	92	**180**	0	0	**442**
2024-05-11 10:45:00	211	25	0	**236**	0	0	**0**	0	0	5	32	0	**37**	0	0	0	104	91	**195**	0	0	**468**
2024-05-11 11:00:00	180	50	1	**231**	0	0	**0**	0	0	6	37	0	**43**	0	0	0	101	99	**200**	0	0	**474**
2024-05-11 11:15:00	191	50	0	**241**	0	0	**0**	0	0	8	33	0	**41**	0	0	0	122	89	**211**	0	0	**493**
2024-05-11 11:30:00	203	44	0	**247**	0	0	**0**	0	0	5	34	0	**39**	0	0	0	95	100	**195**	0	0	**481**
2024-05-11 11:45:00	191	47	0	**238**	0	0	**0**	0	0	2	33	0	**35**	0	0	0	105	99	**204**	0	0	**477**
2024-05-11 12:00:00	208	51	0	**259**	0	0	**0**	0	0	6	42	0	**48**	0	0	2	98	83	**183**	0	0	**490**
2024-05-11 12:15:00	205	51	0	**256**	0	0	**0**	0	0	3	36	0	**39**	0	0	1	99	95	**195**	0	0	**490**
2024-05-11 12:30:00	199	43	0	**242**	0	0	**0**	0	0	6	24	0	**30**	0	0	0	82	59	**141**	0	0	**413**
2024-05-11 12:45:00	154	54	0	**208**	0	0	**0**	0	0	6	36	0	**42**	0	0	5	101	83	**189**	0	0	**439**
2024-05-11 13:00:00	210	47	0	**257**	0	0	**0**	0	0	6	19	0	**25**	0	0	0	91	85	**176**	0	0	**458**
2024-05-11 13:15:00	184	62	0	**246**	0	0	**0**	0	0	8	34	0	**42**	0	0	0	111	68	**179**	0	0	**467**
2024-05-11 13:30:00	175	59	0	**234**	0	0	**0**	0	0	4	25	0	**29**	0	0	1	98	63	**162**	0	0	**425**
2024-05-11 13:45:00	160	57	0	**217**	0	0	**0**	0	0	5	17	0	**22**	0	0	2	77	78	**157**	0	0	**396**
2024-05-11 14:00:00	176	49	0	**225**	0	0	**0**	0	0	4	32	0	**36**	0	0	2	79	58	**139**	0	0	**400**
2024-05-11 14:15:00	176	54	0	**230**	0	0	**0**	0	0	1	30	0	**31**	0	0	8	89	79	**176**	0	0	**437**
2024-05-11 14:30:00	183	61	0	**244**	0	0	**0**	0	0	3	26	0	**29**	0	0	6	96	81	**183**	0	0	**456**
2024-05-11 14:45:00	172	57	0	**229**	0	0	**0**	0	0	3	26	0	**29**	0	0	4	88	60	**152**	0	0	**410**
2024-05-11 15:00:00	170	47	0	**217**	0	0	**0**	0	0	8	38	0	**46**	0	0	2	86	69	**157**	0	0	**420**
2024-05-11 15:15:00	157	59	0	**216**	0	0	**0**	0	0	4	21	0	**25**	0	0	1	96	81	**178**	0	0	**419**
2024-05-11 15:30:00	168	34	0	**202**	0	0	**0**	0	0	3	26	0	**29**	0	0	0	82	69	**151**	0	0	**382**
2024-05-11 15:45:00	159	29	0	**188**	0	0	**0**	0	0	1	22	0	**23**	0	0	1	77	87	**165**	0	0	**376**
2024-05-11 16:00:00	169	37	0	**206**	0	0	**0**	0	0	8	20	0	**28**	0	0	1	90	73	**164**	0	0	**398**
2024-05-11 16:15:00	181	42	0	**223**	0	0	**0**	0	0	1	24	0	**25**	0	0	4	73	101	**178**	0	0	**426**
2024-05-11 16:30:00	137	39	0	**176**	0	0	**0**	0	0	2	18	0	**20**	0	0	2	68	92	**162**	0	0	**358**
2024-05-11 16:45:00	136	38	0	**174**	0	0	**0**	0	0	3	29	0	**32**	0	0	1	57	81	**139**	0	0	**345**
2024-05-11 17:00:00	137	42	0	**179**	0	0	**0**	0	0	2	22	0	**24**	0	0	5	60	78	**143**	0	0	**346**
2024-05-11 17:15:00	130	31	0	**161**	0	0	**0**	0	0	2	18	0	**20**	0	0	2	49	75	**126**	0	0	**307**
2024-05-11 17:30:00	117	26	0	**143**	0	0	**0**	0	0	4	10	0	**14**	0	0	2	58	100	**160**	0	0	**317**
2024-05-11 17:45:00	132	23	0	**155**	0	0	**0**	0	0	0	13	0	**13**	0	0	3	40	83	**126**	0	0	**294**
2024-05-11 18:00:00	100	14	0	**114**	0	0	**0**	0	0	0	8	0	**8**	0	0	0	42	72	**114**	0	0	**236**
2024-05-11 18:15:00	93	12	0	**105**	0	0	**0**	0	0	2	5	0	**7**	0	0	0	32	75	**107**	0	0	**219**
2024-05-11 18:30:00	62	9	0	**71**	0	0	**0**	0	0	1	10	0	**11**	0	0	1	26	79	**106**	0	0	**188**
2024-05-11 18:45:00	71	9	0	**80**	0	0	**0**	0	0	0	8	0	**8**	0	0	0	39	70	**109**	0	0	**197**
2024-05-11 19:00:00	67	5	0	**72**	0	0	**0**	0	0	5	4	0	**9**	0	0	1	38	55	**94**	0	0	**175**
2024-05-11 19:15:00	71	17	0	**88**	0	0	**0**	0	0	3	6	0	**9**	0	0	1	29	48	**78**	0	0	**175**
2024-05-11 19:30:00	59	7	0	**66**	0	0	**0**	0	0	2	1	0	**3**	0	0	0	27	36	**63**	0	0	**132**
2024-05-11 19:45:00	60	7	0	**67**	0	0	**0**	0	0	2	4	0	**6**	0	0	1	18	29	**48**	0	0	**121**
2024-05-11 20:00:00	44	8	0	**52**	0	0	**0**	0	0	2	4	0	**6**	0	0	0	20	34	**54**	0	0	**112**
2024-05-11 20:15:00	57	10	0	**67**	0	0	**0**	0	0	4	3	0	**7**	0	0	1	21	35	**57**	0	0	**131**
2024-05-11 20:30:00	47	7	0	**54**	0	0	**0**	0	0	1	7	0	**8**	0	0	0	24	32	**56**	0	0	**118**
2024-05-11 20:45:00	37	5	0	**42**	0	0	**0**	0	0	1	6	0	**7**	0	0	0	25	35	**60**	0	0	**109**
2024-05-11 21:00:00	52	4	0	**56**	0	0	**0**	0	0	2	2	0	**4**	0	0	0	24	0	**24**	0	0	**84**
2024-05-11 21:15:00	66	10	0	**76**	0	0	**0**	0	0	4	5	0	**9**	0	0	1	34	0	**35**	0	0	**120**
2024-05-11 21:30:00	47	25	0	**72**	0	0	**0**	0	0	1	2	0	**3**	0	0	1	38	0	**39**	0	0	**114**
2024-05-11 21:45:00	44	16	0	**60**	0	0	**0**	0	0	0	2	0	**2**	0	0	0	27	0	**27**	0	1	**89**
Grand Total	15835	3842	1	**19678**	0	0	**0**	0	0	515	2478	1	**2994**	0	0	234	9710	9359	**19303**	2	3	**41975**
% Approach	80.5%	19.5%	0.0%							17.2%	82.8%	0.0%				1.2%	50.3%	48.5%				
% Total	37.7%	9.2%	0.0%	**46.9%**			**0.0%**			1.2%	5.9%	0.0%	**7.1%**			0.6%	23.1%	22.3%	**46.0%**			
Lights	15441	3549	1	**18991**			**0**			361	2383	1	**2745**			125	8636	9189	**17950**			**39686**
% Lights	97.5%	92.4%	100.0%	**96.5%**						70.1%	96.2%	100.0%	**91.7%**			53.4%	88.9%	98.2%	**93.0%**			**94.5%**
Articulated Trucks	139	170	0	**309**			**0**			102	11	0	**113**			3	508	27	**538**			**960**
% Articulated Trucks	0.9%	4.4%	0.0%	**1.6%**						19.8%	0.4%	0.0%	**3.8%**			1.3%	5.2%	0.3%	**2.8%**			**2.3%**
Buses and Single-Unit Trucks	245	121	0	**366**			**0**			51	80	0	**131**			106	562	139	**807**			**1304**
% Buses and Single-Unit Trucks	1.5%	3.1%	0.0%	**1.9%**						9.9%	3.2%	0.0%	**4.4%**			45.3%	5.8%	1.5%	**4.2%**			**3.1%**
Bicycles on Road	10	2	0	**12**			**0**			1	4	0	**5**			0	4	4	**8**			**25**
% Bicycles on Road	0.1%	0.1%	0.0%	**0.1%**						0.2%	0.2%	0.0%	**0.2%**			0.0%	0.0%	0.0%	**0.0%**			**0.1%**
Pedestrians					0	0		0	0					0	0					0	3	
% Pedestrians					0.0%	0.0%		0.0%	0.0%					0.0%	0.0%					0.0%	100.0%	
Bicycles on Crosswalk					0	0		0	0					0	0					2	0	
% Bicycles on Crosswalk					0.0%	0.0%		0.0%	0.0%					0.0%	0.0%					100.0%	0.0%	

Leg	Lakeside Dr						Racecourse Rd East						Turf Club Access						Racecourse Rd West			
Direction	Southbound						Westbound						Northbound						Eastbound			
Start Time	Right	Thru	U-Turn	**App Total**	Peds CW	Peds CCW	Right	Thru	Left	**App Total**	Peds CW	Peds CCW	Thru	Left	U-Turn	**App Total**	Peds CW	Peds CCW	**App Total**	Peds CW	Peds CCW	**Int Total**
2024-05-09 06:00:00	58	0	0	**58**	0	0	7	67	1	**75**	1	0	0	2	0	**2**	0	0	**0**	0	0	**135**
2024-05-09 06:15:00	75	0	0	**75**	0	0	12	73	0	**85**	0	0	0	0	0	**0**	0	0	**0**	0	0	**160**
2024-05-09 06:30:00	89	1	0	**90**	0	0	11	99	1	**111**	0	0	1	2	0	**3**	0	0	**0**	0	0	**204**
2024-05-09 06:45:00	91	1	0	**92**	0	0	15	120	0	**135**	0	0	2	0	0	**2**	0	0	**0**	0	0	**229**
2024-05-09 07:00:00	102	0	0	**102**	0	0	16	87	2	**105**	0	0	0	0	0	**0**	0	0	**0**	0	0	**207**
2024-05-09 07:15:00	153	6	0	**159**	0	0	29	98	0	**127**	0	0	2	0	0	**2**	0	0	**0**	0	0	**288**
2024-05-09 07:30:00	145	3	0	**148**	0	0	24	137	1	**162**	0	0	0	0	0	**0**	0	0	**0**	0	0	**310**
2024-05-09 07:45:00	160	6	0	**166**	0	0	28	131	0	**159**	0	0	0	2	0	**2**	0	0	**0**	0	0	**327**
2024-05-09 08:00:00	157	2	0	**159**	0	0	28	128	0	**156**	0	0	1	3	0	**4**	0	0	**0**	0	0	**319**
2024-05-09 08:15:00	129	3	0	**132**	0	0	48	133	0	**181**	0	0	1	0	0	**1**	0	0	**0**	0	0	**314**
2024-05-09 08:30:00	168	6	0	**174**	0	0	33	102	1	**136**	0	0	1	2	0	**3**	0	0	**0**	0	0	**313**
2024-05-09 08:45:00	151	2	0	**153**	0	0	22	90	0	**112**	0	0	1	0	0	**1**	0	0	**0**	0	0	**266**
2024-05-09 09:00:00	139	4	0	**143**	0	0	30	81	0	**111**	0	0	1	0	0	**1**	0	0	**0**	0	0	**255**
2024-05-09 09:15:00	117	2	0	**119**	0	0	34	84	0	**118**	0	0	0	3	0	**3**	0	0	**0**	0	0	**240**
2024-05-09 09:30:00	123	5	1	**129**	0	0	31	117	0	**148**	0	0	2	3	0	**5**	0	0	**0**	0	0	**282**
2024-05-09 09:45:00	131	3	0	**134**	0	0	30	93	0	**123**	0	0	1	2	0	**3**	0	0	**0**	0	0	**260**
2024-05-09 10:00:00	132	3	0	**135**	0	0	24	100	0	**124**	0	0	1	1	0	**2**	0	0	**0**	0	0	**261**
2024-05-09 10:15:00	141	6	0	**147**	0	0	37	87	0	**124**	0	0	1	2	0	**3**	0	0	**0**	0	0	**274**
2024-05-09 10:30:00	141	0	1	**142**	0	0	32	80	1	**113**	0	0	0	1	0	**1**	0	0	**0**	0	0	**256**
2024-05-09 10:45:00	111	0	0	**111**	0	0	26	86	0	**112**	0	0	0	2	0	**2**	0	0	**0**	0	0	**225**
2024-05-09 11:00:00	140	4	0	**144**	0	0	26	89	0	**115**	0	0	1	0	0	**1**	0	0	**0**	0	0	**260**
2024-05-09 11:15:00	149	3	1	**153**	0	0	20	80	0	**100**	0	0	2	3	0	**5**	0	0	**0**	0	0	**258**
2024-05-09 11:30:00	130	3	0	**133**	0	0	27	90	1	**118**	0	0	1	2	0	**3**	0	0	**0**	0	0	**254**
2024-05-09 11:45:00	135	5	0	**140**	0	0	32	64	0	**96**	0	0	2	1	0	**3**	0	0	**0**	0	0	**239**
2024-05-09 12:00:00	132	1	0	**133**	0	0	30	103	1	**134**	0	0	2	4	0	**6**	0	0	**0**	0	0	**273**
2024-05-09 12:15:00	147	3	0	**150**	0	0	20	94	0	**114**	0	0	2	2	0	**4**	0	0	**0**	0	0	**268**
2024-05-09 12:30:00	187	6	0	**193**	0	0	25	113	0	**138**	0	0	3	2	0	**5**	0	0	**0**	0	0	**336**
2024-05-09 12:45:00	173	1	0	**174**	0	0	22	84	1	**107**	0	0	1	1	0	**2**	0	0	**0**	0	0	**283**
2024-05-09 13:00:00	153	5	0	**158**	0	0	21	99	0	**120**	0	0	0	0	0	**0**	0	0	**0**	0	0	**278**
2024-05-09 13:15:00	139	2	0	**141**	0	0	20	84	0	**104**	0	0	1	0	0	**1**	0	0	**0**	0	0	**246**
2024-05-09 13:30:00	119	4	0	**123**	0	0	37	109	1	**147**	0	0	2	1	0	**3**	0	0	**0**	0	0	**273**
2024-05-09 13:45:00	119	0	0	**119**	0	0	29	102	0	**131**	0	0	1	0	0	**1**	0	0	**0**	0	0	**251**
2024-05-09 14:00:00	136	5	0	**141**	0	0	32	123	1	**156**	0	0	2	0	0	**2**	0	0	**0**	0	0	**299**
2024-05-09 14:15:00	151	2	0	**153**	0	0	26	129	0	**155**	0	0	1	2	0	**3**	0	0	**0**	0	0	**311**
2024-05-09 14:30:00	146	1	0	**147**	0	0	39	154	2	**195**	0	0	0	4	0	**4**	0	0	**0**	0	0	**346**
2024-05-09 14:45:00	139	4	0	**143**	0	0	30	142	1	**173**	0	0	2	2	0	**4**	0	0	**0**	0	0	**320**
2024-05-09 15:00:00	163	3	0	**166**	0	0	30	154	0	**184**	0	0	3	2	0	**5**	0	0	**0**	0	0	**355**
2024-05-09 15:15:00	158	2	0	**160**	0	0	31	191	2	**224**	0	0	1	2	0	**3**	0	0	**0**	0	0	**387**
2024-05-09 15:30:00	159	3	0	**162**	0	0	27	177	1	**205**	0	0	2	1	0	**3**	0	0	**0**	0	0	**370**
2024-05-09 15:45:00	166	4	0	**170**	0	0	47	155	0	**202**	0	0	1	1	0	**2**	0	0	**0**	0	0	**374**
2024-05-09 16:00:00	147	0	0	**147**	0	0	34	132	0	**166**	0	0	1	2	0	**3**	0	0	**0**	0	0	**316**
2024-05-09 16:15:00	247	1	0	**248**	0	0	26	178	0	**204**	0	0	0	5	0	**5**	0	0	**0**	0	0	**457**
2024-05-09 16:30:00	191	3	0	**194**	0	0	30	185	0	**215**	0	0	2	4	0	**6**	0	0	**0**	0	0	**415**
2024-05-09 16:45:00	225	0	0	**225**	0	0	29	156	0	**185**	0	0	0	2	0	**2**	0	0	**0**	1	0	**412**
2024-05-09 17:00:00	157	2	0	**159**	0	0	13	144	0	**157**	0	0	0	3	0	**3**	0	0	**0**	0	0	**319**
2024-05-09 17:15:00	192	2	0	**194**	0	0	28	130	1	**159**	0	0	2	3	0	**5**	0	0	**0**	0	0	**358**
2024-05-09 17:30:00	182	0	0	**182**	0	0	19	112	0	**131**	0	0	0	1	0	**1**	0	0	**0**	0	0	**314**
2024-05-09 17:45:00	140	0	0	**140**	0	0	26	100	0	**126**	0	0	1	0	0	**1**	0	0	**0**	0	0	**267**
2024-05-09 18:00:00	178	1	0	**179**	0	0	26	75	0	**101**	0	0	0	2	0	**2**	0	0	**0**	0	0	**282**
2024-05-09 18:15:00	129	1	0	**130**	0	0	13	63	0	**76**	0	0	1	0	0	**1**	0	0	**0**	0	0	**207**
2024-05-09 18:30:00	121	0	0	**121**	0	0	11	44	0	**55**	0	0	0	0	0	**0**	0	0	**0**	0	0	**176**
2024-05-09 18:45:00	113	0	0	**113**	0	0	15	30	0	**45**	0	0	0	0	0	**0**	0	0	**0**	0	0	**158**
2024-05-09 19:00:00	122	1	0	**123**	0	0	7	43	0	**50**	0	0	1	0	0	**1**	0	0	**0**	0	0	**174**
2024-05-09 19:15:00	94	0	0	**94**	0	0	8	10	0	**18**	0	0	0	0	0	**0**	0	0	**0**	0	0	**112**
2024-05-09 19:30:00	79	0	0	**79**	0	0	10	18	0	**28**	0	0	0	0	0	**0**	0	0	**0**	0	0	**107**
2024-05-09 19:45:00	60	0	0	**60**	0	0	12	27	0	**39**	0	0	0	0	0	**0**	0	0	**0**	0	0	**99**
2024-05-09 20:00:00	85	0	0	**85**	0	0	10	23	0	**33**	0	0	0	0	0	**0**	0	0	**0**	0	0	**118**
2024-05-09 20:15:00	74	0	0	**74**	0	0	4	5	0	**9**	0	0	0	0	0	**0**	0	0	**0**	0	0	**83**
2024-05-09 20:30:00	71	0	0	**71**	0	0	5	15	0	**20**	0	0	0	0	0	**0**	0	0	**0**	0	0	**91**
2024-05-09 20:45:00	47	0	0	**47**	0	0	7	19	0	**26**	0	0	0	0	0	**0**	0	0	**0**	0	0	**73**
2024-05-09 21:00:00	71	0	0	**71**	0	0	3	21	0	**24**	0	0	0	0	0	**0**	0	0	**0**	0	0	**95**
2024-05-09 21:15:00	37	0	0	**37**	0	0	4	21	0	**25**	0	0	0	0	0	**0**	0	0	**0**	0	0	**62**
2024-05-09 21:30:00	39	0	0	**39**	0	0	2	13	0	**15**	0	0	0	0	0	**0**	0	0	**0**	0	0	**54**
2024-05-09 21:45:00	26	0	0	**26**	0	0	2	25	0	**27**	0	0	0	0	0	**0**	0	0	**0**	0	0	**53**
2024-05-11 06:00:00	24	2	0	**26**	0	0	2	30	0	**32**	0	0	1	0	0	**1**	0	0	**0**	0	0	**59**
2024-05-11 06:15:00	25	0	0	**25**	0	0	4	42	0	**46**	0	0	1	1	0	**2**	0	0	**0**	0	0	**73**
2024-05-11 06:30:00	33	1	0	**34**	0	0	10	57	1	**68**	0	0	3	3	0	**6**	0	0	**0**	0	0	**108**
2024-05-11 06:45:00	27	1	0	**28**	0	0	12	28	0	**40**	0	0	0	1	0	**1**	0	0	**0**	0	0	**69**
2024-05-11 07:00:00	38	3	0	**41**	0	0	8	38	0	**46**	0	0	0	2	0	**2**	0	0	**0**	0	0	**89**
2024-05-11 07:15:00	41	3	0	**44**	0	0	5	37	0	**42**	0	0	1	0	0	**1**	0	0	**0**	0	0	**87**

2024-05-11 07:30:00	49	1	0	**50**	0	0	23	57	0	**80**	0	0	0	0	0	**0**	0	0	**0**	0	0	**130**
2024-05-11 07:45:00	66	0	0	**66**	0	0	27	52	0	**79**	0	0	0	0	0	**0**	0	0	**0**	0	0	**145**
2024-05-11 08:00:00	77	0	0	**77**	0	0	32	59	0	**91**	0	0	0	1	0	**1**	0	0	**0**	0	0	**169**
2024-05-11 08:15:00	85	0	0	**85**	0	0	31	63	0	**94**	0	0	0	0	0	**0**	0	0	**0**	0	0	**179**
2024-05-11 08:30:00	74	3	0	**77**	0	0	28	85	0	**113**	0	0	0	0	0	**0**	0	0	**0**	0	0	**190**
2024-05-11 08:45:00	103	1	0	**104**	0	0	30	91	0	**121**	0	0	0	0	0	**0**	0	0	**0**	0	0	**225**
2024-05-11 09:00:00	135	4	0	**139**	0	0	35	82	0	**117**	0	0	2	0	0	**2**	0	0	**0**	0	0	**258**
2024-05-11 09:15:00	115	0	0	**115**	0	0	31	99	0	**130**	0	0	0	4	0	**4**	0	0	**0**	0	0	**249**
2024-05-11 09:30:00	170	1	0	**171**	0	0	55	92	0	**147**	0	0	1	0	0	**1**	0	0	**0**	0	0	**319**
2024-05-11 09:45:00	136	0	0	**136**	0	0	50	111	0	**161**	0	0	0	0	0	**0**	0	0	**0**	0	0	**297**
2024-05-11 10:00:00	162	2	0	**164**	0	0	32	91	0	**123**	0	0	1	1	0	**2**	0	0	**0**	0	0	**289**
2024-05-11 10:15:00	184	4	0	**188**	0	0	40	100	0	**140**	0	0	0	0	0	**0**	0	0	**0**	0	0	**328**
2024-05-11 10:30:00	170	1	0	**171**	0	0	39	88	1	**128**	0	0	0	2	0	**2**	0	0	**0**	0	0	**301**
2024-05-11 10:45:00	207	0	0	**207**	0	0	41	82	0	**123**	0	0	0	0	0	**0**	0	0	**0**	0	0	**330**
2024-05-11 11:00:00	179	0	0	**179**	0	0	38	87	0	**125**	0	0	0	0	0	**0**	0	0	**0**	0	0	**304**
2024-05-11 11:15:00	197	0	0	**197**	1	0	42	99	0	**141**	0	0	0	0	0	**0**	0	0	**0**	1	0	**338**
2024-05-11 11:30:00	204	3	0	**207**	0	0	41	99	0	**140**	0	0	0	2	0	**2**	0	0	**0**	0	0	**349**
2024-05-11 11:45:00	193	2	0	**195**	0	0	38	94	0	**132**	0	0	2	0	0	**2**	0	0	**0**	0	0	**329**
2024-05-11 12:00:00	204	3	0	**207**	0	0	50	81	0	**131**	0	0	1	0	0	**1**	0	0	**0**	0	0	**339**
2024-05-11 12:15:00	213	0	0	**213**	0	0	26	107	0	**133**	0	0	0	0	0	**0**	0	0	**0**	0	0	**346**
2024-05-11 12:30:00	206	0	0	**206**	0	0	35	94	0	**129**	0	0	1	4	0	**5**	0	0	**0**	0	0	**340**
2024-05-11 12:45:00	158	4	0	**162**	0	0	37	84	0	**121**	0	0	0	1	0	**1**	0	0	**0**	0	0	**284**
2024-05-11 13:00:00	216	0	0	**216**	0	0	27	104	0	**131**	0	0	3	1	0	**4**	0	0	**0**	0	0	**351**
2024-05-11 13:15:00	205	1	0	**206**	0	0	34	173	0	**207**	0	0	0	0	0	**0**	0	0	**0**	0	0	**413**
2024-05-11 13:30:00	196	0	0	**196**	0	0	23	97	0	**120**	0	0	2	2	0	**4**	0	0	**0**	0	0	**320**
2024-05-11 13:45:00	179	0	0	**179**	0	0	35	88	0	**123**	0	0	2	1	0	**3**	0	0	**0**	0	0	**305**
2024-05-11 14:00:00	178	7	0	**185**	0	0	28	91	2	**121**	0	0	2	0	0	**2**	0	0	**0**	0	0	**308**
2024-05-11 14:15:00	169	12	0	**181**	0	0	28	86	1	**115**	0	0	2	6	0	**8**	0	0	**0**	0	0	**304**
2024-05-11 14:30:00	169	7	0	**176**	0	0	32	83	0	**115**	0	0	3	0	0	**3**	0	0	**0**	0	0	**294**
2024-05-11 14:45:00	168	7	0	**175**	0	0	38	103	1	**142**	0	0	0	3	0	**3**	0	0	**0**	0	0	**320**
2024-05-11 15:00:00	164	3	1	**168**	0	0	41	103	2	**146**	0	0	1	2	0	**3**	0	0	**0**	0	0	**317**
2024-05-11 15:15:00	156	0	0	**156**	0	0	27	63	0	**90**	0	0	0	0	0	**0**	0	0	**0**	0	0	**246**
2024-05-11 15:30:00	168	0	0	**168**	0	0	27	91	0	**118**	0	0	0	0	0	**0**	0	0	**0**	0	0	**286**
2024-05-11 15:45:00	149	0	0	**149**	0	0	19	88	0	**107**	0	0	0	0	0	**0**	0	0	**0**	0	0	**256**
2024-05-11 16:00:00	171	1	1	**173**	0	0	25	72	0	**97**	0	0	0	2	0	**2**	0	0	**0**	0	0	**272**
2024-05-11 16:15:00	150	5	0	**155**	0	0	20	62	1	**83**	0	0	8	6	0	**14**	0	0	**0**	0	0	**252**
2024-05-11 16:30:00	153	5	0	**158**	0	0	21	79	2	**102**	0	0	1	2	0	**3**	0	0	**0**	0	0	**263**
2024-05-11 16:45:00	132	1	0	**133**	0	0	24	65	1	**90**	0	0	3	0	0	**3**	0	0	**0**	0	0	**226**
2024-05-11 17:00:00	138	7	0	**145**	0	0	21	75	1	**97**	0	0	2	3	0	**5**	0	0	**0**	0	0	**247**
2024-05-11 17:15:00	142	5	0	**147**	0	0	18	78	0	**96**	0	0	0	0	0	**0**	0	0	**0**	0	0	**243**
2024-05-11 17:30:00	114	1	0	**115**	0	0	15	70	0	**85**	0	0	0	0	0	**0**	0	0	**0**	0	0	**200**
2024-05-11 17:45:00	119	4	0	**123**	0	0	12	65	0	**77**	0	0	0	0	0	**0**	0	0	**0**	0	0	**200**
2024-05-11 18:00:00	112	1	0	**113**	0	0	6	54	1	**61**	0	0	0	1	0	**1**	0	0	**0**	0	0	**175**
2024-05-11 18:15:00	96	0	0	**96**	0	0	7	59	0	**66**	0	0	1	0	0	**1**	0	0	**0**	0	0	**163**
2024-05-11 18:30:00	76	0	0	**76**	0	0	12	42	0	**54**	0	0	0	0	0	**0**	0	0	**0**	0	0	**130**
2024-05-11 18:45:00	71	0	0	**71**	0	0	7	34	0	**41**	0	0	0	0	0	**0**	0	0	**0**	0	0	**112**
2024-05-11 19:00:00	66	0	0	**66**	0	0	6	25	0	**31**	0	0	1	0	0	**1**	0	0	**0**	0	0	**98**
2024-05-11 19:15:00	75	1	0	**76**	0	0	10	33	0	**43**	0	0	0	1	0	**1**	0	0	**0**	0	0	**120**
2024-05-11 19:30:00	56	1	0	**57**	0	0	3	29	0	**32**	0	0	1	0	0	**1**	0	0	**0**	0	0	**90**
2024-05-11 19:45:00	57	1	0	**58**	0	0	6	21	0	**27**	0	0	0	1	0	**1**	0	0	**0**	0	0	**86**
2024-05-11 20:00:00	51	0	0	**51**	0	0	5	19	0	**24**	0	0	0	0	0	**0**	0	0	**0**	0	0	**75**
2024-05-11 20:15:00	55	0	0	**55**	0	0	13	27	0	**40**	0	0	0	0	0	**0**	0	0	**0**	0	0	**95**
2024-05-11 20:30:00	46	0	0	**46**	0	0	4	23	0	**27**	0	0	1	1	0	**2**	0	0	**0**	0	0	**75**
2024-05-11 20:45:00	36	1	0	**37**	0	0	5	19	0	**24**	0	0	2	3	0	**5**	0	0	**0**	0	0	**66**
2024-05-11 21:00:00	47	2	0	**49**	0	0	7	25	0	**32**	0	0	0	1	0	**1**	0	0	**0**	0	0	**82**
2024-05-11 21:15:00	67	1	0	**68**	0	0	5	22	0	**27**	0	0	0	6	0	**6**	0	0	**0**	0	0	**101**
2024-05-11 21:30:00	51	1	0	**52**	0	0	2	29	1	**32**	0	0	1	1	0	**2**	0	0	**0**	0	0	**86**
2024-05-11 21:45:00	42	1	0	**43**	0	0	2	25	0	**27**	0	0	0	0	0	**0**	0	0	**0**	0	0	**70**
Grand Total	15996	240	5	**16241**	1	0	2889	10269	34	**13192**	1	0	103	142	0	**245**	0	0	**0**	2	0	**29678**
% Approach	98.5%	1.5%	0.0%				21.9%	77.8%	0.3%				42.0%	58.0%	0.0%							
% Total	53.9%	0.8%	0.0%	**54.7%**			9.7%	34.6%	0.1%	**44.5%**			0.3%	0.5%	0.0%	**0.8%**			**0.0%**			
Lights	15590	159	5	**15754**			2678	9283	28	**11989**			79	86	0	**165**			**0**			**27908**
% Lights	97.5%	66.3%	100.0%	**97.0%**			92.7%	90.4%	82.4%	**90.9%**			76.7%	60.6%	0.0%	**67.3%**						**94.0%**
Articulated Trucks	146	5	0	**151**			108	448	0	**556**			1	5	0	**6**			**0**			**713**
% Articulated Trucks	0.9%	2.1%	0.0%	**0.9%**			3.7%	4.4%	0.0%	**4.2%**			1.0%	3.5%	0.0%	**2.4%**						**2.4%**
Buses and Single-Unit Trucks	255	76	0	**331**			94	524	6	**624**			22	50	0	**72**			**0**			**1027**
% Buses and Single-Unit Trucks	1.6%	31.7%	0.0%	**2.0%**			3.3%	5.1%	17.6%	**4.7%**			21.4%	35.2%	0.0%	**29.4%**						**3.5%**
Bicycles on Road	5	0	0	**5**			9	14	0	**23**			1	1	0	**2**			**0**			**30**
% Bicycles on Road	0.0%	0.0%	0.0%	**0.0%**			0.3%	0.1%	0.0%	**0.2%**			1.0%	0.7%	0.0%	**0.8%**						**0.1%**
Pedestrians					1	0					0	0					0	0		1	0	
% Pedestrians					100.0%	0.0%					0.0%	0.0%					0.0%	0.0%		50.0%	0.0%	
Bicycles on Crosswalk					0	0					1	0					0	0		1	0	
% Bicycles on Crosswalk					0.0%	0.0%					100.0%	0.0%					0.0%	0.0%		50.0%	0.0%	

Leg	Stuart Dr North						Stuart Dr South						Edison St						
Direction	Southbound						Northbound						Eastbound						
Start Time	Right	Thru	U-Turn	**App Total**	Peds CW	Peds CCW	Thru	Left	U-Turn	**App Total**	Peds CW	Peds CCW	Right	Left	U-Turn	**App Total**	Peds CW	Peds CCW	**Int Total**
2024-05-09 06:00:00	10	89	1	**100**	0	0	65	2	0	**67**	0	0	3	14	0	**17**	0	0	**184**
2024-05-09 06:15:00	6	131	4	**141**	0	0	79	3	0	**82**	0	0	6	15	0	**21**	1	1	**244**
2024-05-09 06:30:00	2	172	1	**175**	0	0	134	5	0	**139**	0	0	4	15	0	**19**	1	0	**333**
2024-05-09 06:45:00	6	150	1	**157**	0	0	96	1	0	**97**	0	0	4	17	0	**21**	0	0	**275**
2024-05-09 07:00:00	10	108	1	**119**	0	0	129	2	0	**131**	0	0	4	25	0	**29**	1	0	**279**
2024-05-09 07:15:00	8	115	1	**124**	0	0	139	6	0	**145**	0	0	8	32	0	**40**	2	0	**309**
2024-05-09 07:30:00	9	117	3	**129**	0	0	167	6	0	**173**	0	0	1	50	0	**51**	2	0	**353**
2024-05-09 07:45:00	14	126	3	**143**	0	0	164	7	0	**171**	0	0	7	46	0	**53**	0	0	**367**
2024-05-09 08:00:00	24	123	2	**149**	0	0	198	10	0	**208**	0	0	5	56	0	**61**	2	0	**418**
2024-05-09 08:15:00	21	129	4	**154**	0	0	169	12	0	**181**	0	0	5	44	0	**49**	3	4	**384**
2024-05-09 08:30:00	14	137	1	**152**	0	0	153	12	1	**166**	0	0	6	40	0	**46**	0	0	**364**
2024-05-09 08:45:00	25	111	1	**137**	0	0	116	9	1	**126**	0	0	14	31	0	**45**	0	0	**308**
2024-05-09 09:00:00	18	108	0	**126**	0	0	126	5	0	**131**	0	0	11	31	0	**42**	1	0	**299**
2024-05-09 09:15:00	20	119	2	**141**	0	0	113	5	0	**118**	0	0	3	20	0	**23**	1	0	**282**
2024-05-09 09:30:00	16	105	0	**121**	0	0	120	3	0	**123**	0	0	7	29	0	**36**	0	0	**280**
2024-05-09 09:45:00	15	97	1	**113**	0	0	122	8	0	**130**	0	0	4	17	1	**22**	1	0	**265**
2024-05-09 10:00:00	9	124	0	**133**	0	0	124	6	0	**130**	0	0	2	26	0	**28**	0	0	**291**
2024-05-09 10:15:00	14	105	1	**120**	0	0	114	3	0	**117**	0	0	7	21	0	**28**	0	1	**265**
2024-05-09 10:30:00	21	106	2	**129**	0	0	119	3	0	**122**	0	0	1	20	0	**21**	1	0	**272**
2024-05-09 10:45:00	13	105	1	**119**	0	0	126	1	0	**127**	0	0	3	18	0	**21**	0	0	**267**
2024-05-09 11:00:00	19	92	0	**111**	0	0	115	4	0	**119**	0	0	2	18	0	**20**	0	1	**250**
2024-05-09 11:15:00	16	111	3	**130**	0	0	116	3	0	**119**	0	0	3	18	0	**21**	0	0	**270**
2024-05-09 11:30:00	22	91	1	**114**	0	0	83	6	0	**89**	0	0	8	13	0	**21**	0	0	**224**
2024-05-09 11:45:00	29	114	0	**143**	0	0	109	9	0	**118**	0	0	5	19	0	**24**	0	0	**285**
2024-05-09 12:00:00	16	124	0	**140**	0	0	119	3	0	**122**	0	0	6	25	0	**31**	0	0	**293**
2024-05-09 12:15:00	17	114	0	**131**	0	0	116	5	0	**121**	0	0	5	19	0	**24**	0	1	**276**
2024-05-09 12:30:00	21	117	3	**141**	0	0	98	6	0	**104**	0	0	6	13	0	**19**	0	0	**264**
2024-05-09 12:45:00	11	125	0	**136**	0	0	105	6	0	**111**	0	0	4	14	0	**18**	0	0	**265**
2024-05-09 13:00:00	16	121	1	**138**	0	0	109	7	1	**117**	0	0	3	12	0	**15**	0	0	**270**
2024-05-09 13:15:00	18	108	1	**127**	0	0	101	4	0	**105**	0	0	3	17	0	**20**	1	2	**252**
2024-05-09 13:30:00	17	114	2	**133**	0	0	102	1	0	**103**	0	0	4	16	0	**20**	1	1	**256**
2024-05-09 13:45:00	14	108	1	**123**	0	0	102	3	0	**105**	0	0	3	20	1	**24**	0	0	**252**
2024-05-09 14:00:00	17	127	0	**144**	0	0	141	2	0	**143**	0	0	5	17	0	**22**	2	2	**309**
2024-05-09 14:15:00	24	109	0	**133**	0	0	128	9	0	**137**	0	0	5	25	0	**30**	0	1	**300**
2024-05-09 14:30:00	21	112	0	**133**	0	0	126	12	0	**138**	0	0	8	19	0	**27**	0	0	**298**
2024-05-09 14:45:00	41	122	1	**164**	0	0	141	22	1	**164**	0	0	2	24	0	**26**	1	0	**354**
2024-05-09 15:00:00	32	174	2	**208**	0	0	152	9	0	**161**	0	0	17	43	0	**60**	0	2	**429**
2024-05-09 15:15:00	31	171	2	**204**	0	0	119	7	0	**126**	0	0	12	29	0	**41**	2	0	**371**
2024-05-09 15:30:00	32	184	2	**218**	0	0	158	11	0	**169**	0	0	5	22	1	**28**	0	0	**415**
2024-05-09 15:45:00	33	175	1	**209**	0	0	151	9	0	**160**	0	0	12	29	0	**41**	0	0	**410**
2024-05-09 16:00:00	30	147	3	**180**	0	0	176	11	0	**187**	0	0	4	23	0	**27**	2	0	**394**
2024-05-09 16:15:00	31	157	0	**188**	0	0	153	9	1	**163**	0	0	3	27	0	**30**	0	0	**381**
2024-05-09 16:30:00	40	158	4	**202**	0	0	173	5	0	**178**	0	0	4	29	0	**33**	0	0	**413**
2024-05-09 16:45:00	47	153	5	**205**	0	0	156	17	0	**173**	0	0	8	22	0	**30**	0	0	**408**
2024-05-09 17:00:00	38	160	0	**198**	0	0	194	11	0	**205**	0	0	5	31	0	**36**	1	0	**439**
2024-05-09 17:15:00	33	148	6	**187**	0	0	148	2	0	**150**	0	0	5	26	0	**31**	1	0	**368**
2024-05-09 17:30:00	30	148	4	**182**	0	0	127	2	0	**129**	0	0	2	21	0	**23**	1	2	**334**
2024-05-09 17:45:00	32	137	4	**173**	0	0	107	6	1	**114**	0	0	6	39	0	**45**	0	3	**332**
2024-05-09 18:00:00	27	114	5	**146**	0	0	130	2	0	**132**	0	0	8	27	0	**35**	2	0	**313**
2024-05-09 18:15:00	18	107	5	**130**	0	0	117	3	0	**120**	0	0	8	20	0	**28**	0	1	**278**
2024-05-09 18:30:00	27	98	1	**126**	0	0	109	5	0	**114**	0	0	6	14	0	**20**	0	1	**260**
2024-05-09 18:45:00	32	74	4	**110**	0	0	81	3	0	**84**	0	0	3	10	0	**13**	0	0	**207**
2024-05-09 19:00:00	19	69	0	**88**	0	0	43	4	0	**47**	0	0	2	15	0	**17**	0	0	**152**
2024-05-09 19:15:00	19	70	5	**94**	0	0	50	5	0	**55**	0	0	2	8	0	**10**	0	0	**159**
2024-05-09 19:30:00	17	61	2	**80**	0	0	37	1	0	**38**	0	0	2	10	0	**12**	0	0	**130**
2024-05-09 19:45:00	9	44	1	**54**	0	0	33	3	0	**36**	0	0	1	4	0	**5**	0	1	**95**
2024-05-09 20:00:00	12	49	1	**62**	0	0	30	0	0	**30**	0	0	4	10	0	**14**	2	0	**106**
2024-05-09 20:15:00	11	30	0	**41**	0	0	16	1	0	**17**	0	0	0	2	0	**2**	1	0	**60**
2024-05-09 20:30:00	10	49	1	**60**	0	0	25	0	0	**25**	0	0	0	3	0	**3**	0	0	**88**

2024-05-09 20:45:00	7	35	1	**43**	0	0	29	0	0	**29**	0	0	0	4	0	**4**	0	0	**76**
2024-05-09 21:00:00	6	42	0	**48**	0	0	23	0	0	**23**	0	0	1	2	0	**3**	0	0	**74**
2024-05-09 21:15:00	4	32	0	**36**	0	0	17	1	0	**18**	0	0	2	5	0	**7**	0	0	**61**
2024-05-09 21:30:00	4	25	1	**30**	0	0	15	2	0	**17**	0	0	1	2	0	**3**	0	1	**50**
2024-05-09 21:45:00	4	18	1	**23**	0	0	22	2	0	**24**	0	0	0	18	0	**18**	0	0	**65**
2024-05-11 06:00:00	4	61	0	**65**	0	0	8	2	0	**10**	0	0	1	6	0	**7**	1	1	**82**
2024-05-11 06:15:00	1	68	0	**69**	0	0	33	0	1	**34**	0	0	0	5	0	**5**	0	1	**108**
2024-05-11 06:30:00	2	99	0	**101**	0	0	62	1	0	**63**	0	0	2	9	0	**11**	0	0	**175**
2024-05-11 06:45:00	1	95	1	**97**	0	0	55	2	0	**57**	0	0	3	8	0	**11**	0	1	**165**
2024-05-11 07:00:00	4	55	0	**59**	0	0	59	1	0	**60**	0	0	1	9	0	**10**	1	1	**129**
2024-05-11 07:15:00	3	54	1	**58**	0	0	58	1	0	**59**	0	0	3	9	0	**12**	0	0	**129**
2024-05-11 07:30:00	7	75	0	**82**	0	0	71	3	0	**74**	0	0	0	23	0	**23**	0	0	**179**
2024-05-11 07:45:00	5	74	0	**79**	0	0	105	4	0	**109**	0	0	4	24	0	**28**	0	0	**216**
2024-05-11 08:00:00	11	72	1	**84**	0	0	80	2	0	**82**	0	0	4	18	0	**22**	0	0	**188**
2024-05-11 08:15:00	10	95	0	**105**	0	0	99	4	0	**103**	0	0	6	13	1	**20**	0	1	**228**
2024-05-11 08:30:00	17	84	0	**101**	0	0	122	2	0	**124**	0	0	2	21	0	**23**	0	1	**248**
2024-05-11 08:45:00	26	79	0	**105**	0	0	101	2	0	**103**	0	0	11	34	0	**45**	0	0	**253**
2024-05-11 09:00:00	19	100	2	**121**	0	0	147	3	0	**150**	0	0	6	23	0	**29**	0	0	**300**
2024-05-11 09:15:00	16	102	1	**119**	0	0	118	5	2	**125**	0	0	6	32	0	**38**	0	0	**282**
2024-05-11 09:30:00	17	105	0	**122**	0	0	140	2	0	**142**	0	0	3	35	0	**38**	0	0	**302**
2024-05-11 09:45:00	21	114	2	**137**	0	0	162	0	0	**162**	0	0	5	31	0	**36**	1	0	**335**
2024-05-11 10:00:00	20	117	1	**138**	0	0	136	4	0	**140**	0	0	6	28	0	**34**	1	0	**312**
2024-05-11 10:15:00	22	120	0	**142**	0	0	153	2	0	**155**	0	0	4	39	0	**43**	0	0	**340**
2024-05-11 10:30:00	17	152	0	**169**	0	0	115	6	0	**121**	0	0	4	31	0	**35**	2	0	**325**
2024-05-11 10:45:00	21	122	0	**143**	0	0	153	3	0	**156**	0	0	3	32	0	**35**	0	0	**334**
2024-05-11 11:00:00	19	119	0	**138**	0	0	139	9	0	**148**	0	0	1	26	0	**27**	0	1	**313**
2024-05-11 11:15:00	25	116	0	**141**	0	0	143	5	0	**148**	0	0	6	28	0	**34**	0	0	**323**
2024-05-11 11:30:00	25	150	0	**175**	0	0	134	4	0	**138**	0	0	5	37	0	**42**	0	0	**355**
2024-05-11 11:45:00	21	150	2	**173**	0	0	102	5	1	**108**	0	0	4	49	0	**53**	0	2	**334**
2024-05-11 12:00:00	22	130	1	**153**	0	0	121	7	0	**128**	0	0	7	25	0	**32**	1	0	**313**
2024-05-11 12:15:00	32	131	3	**166**	0	0	109	4	0	**113**	0	0	7	27	0	**34**	0	0	**313**
2024-05-11 12:30:00	31	120	1	**152**	0	0	104	2	0	**106**	0	0	2	18	0	**20**	0	0	**278**
2024-05-11 12:45:00	30	118	1	**149**	0	0	117	2	0	**119**	0	0	2	15	0	**17**	1	1	**285**
2024-05-11 13:00:00	26	122	1	**149**	0	0	96	3	0	**99**	0	0	4	20	0	**24**	0	0	**272**
2024-05-11 13:15:00	23	140	1	**164**	0	0	101	4	0	**105**	0	0	7	12	0	**19**	0	1	**288**
2024-05-11 13:30:00	17	111	0	**128**	0	0	117	4	0	**121**	0	0	4	26	1	**31**	0	0	**280**
2024-05-11 13:45:00	20	113	0	**133**	0	0	99	4	0	**103**	0	0	8	28	0	**36**	0	0	**272**
2024-05-11 14:00:00	15	107	3	**125**	0	0	110	7	1	**118**	0	0	2	17	0	**19**	0	0	**262**
2024-05-11 14:15:00	28	98	0	**126**	0	0	106	4	0	**110**	0	0	1	19	0	**20**	0	0	**256**
2024-05-11 14:30:00	17	107	1	**125**	0	0	107	4	0	**111**	0	0	6	22	0	**28**	0	1	**264**
2024-05-11 14:45:00	32	97	0	**129**	0	0	101	6	0	**107**	0	0	8	18	0	**26**	0	0	**262**
2024-05-11 15:00:00	31	97	2	**130**	0	0	102	4	0	**106**	0	0	3	24	0	**27**	0	0	**263**
2024-05-11 15:15:00	22	93	0	**115**	0	0	87	4	0	**91**	0	0	2	21	0	**23**	0	0	**229**
2024-05-11 15:30:00	18	109	1	**128**	0	0	84	3	0	**87**	0	0	5	20	0	**25**	0	0	**240**
2024-05-11 15:45:00	18	96	0	**114**	0	0	81	9	0	**90**	0	0	5	26	0	**31**	0	0	**235**
2024-05-11 16:00:00	21	105	0	**126**	0	0	77	2	0	**79**	0	0	3	19	0	**22**	1	0	**227**
2024-05-11 16:15:00	10	107	1	**118**	0	0	88	6	0	**94**	0	0	6	16	0	**22**	0	0	**234**
2024-05-11 16:30:00	22	114	1	**137**	0	0	88	5	0	**93**	0	0	8	30	0	**38**	0	0	**268**
2024-05-11 16:45:00	22	99	2	**123**	0	0	108	7	0	**115**	0	0	6	22	0	**28**	0	0	**266**
2024-05-11 17:00:00	20	82	0	**102**	0	0	71	5	0	**76**	0	0	3	24	0	**27**	0	0	**205**
2024-05-11 17:15:00	20	104	0	**124**	0	0	98	5	1	**104**	0	0	3	19	0	**22**	1	0	**250**
2024-05-11 17:30:00	24	103	1	**128**	0	0	108	5	0	**113**	0	0	2	22	0	**24**	2	2	**265**
2024-05-11 17:45:00	26	68	2	**96**	0	0	72	1	0	**73**	0	0	7	13	0	**20**	0	1	**189**
2024-05-11 18:00:00	20	82	1	**103**	0	0	69	3	0	**72**	0	0	5	12	0	**17**	1	2	**192**
2024-05-11 18:15:00	11	78	3	**92**	0	0	70	4	1	**75**	0	0	1	16	0	**17**	1	0	**184**
2024-05-11 18:30:00	12	66	3	**81**	0	0	103	4	0	**107**	0	0	4	18	0	**22**	0	0	**210**
2024-05-11 18:45:00	11	54	3	**68**	0	0	78	2	0	**80**	0	0	2	13	0	**15**	1	0	**163**
2024-05-11 19:00:00	7	52	2	**61**	0	0	51	1	0	**52**	0	0	1	16	0	**17**	0	1	**130**
2024-05-11 19:15:00	10	50	0	**60**	0	0	54	3	0	**57**	0	0	2	8	0	**10**	0	0	**127**
2024-05-11 19:30:00	5	46	1	**52**	0	0	26	4	0	**30**	0	0	6	12	0	**18**	0	0	**100**
2024-05-11 19:45:00	10	41	0	**51**	0	0	42	3	0	**45**	0	0	0	10	0	**10**	0	0	**106**
2024-05-11 20:00:00	12	37	0	**49**	0	0	42	1	0	**43**	0	0	2	9	0	**11**	0	0	**103**

2024-05-11 20:15:00	6	39	1	**46**	0	0	21	0	0	**21**	0	0	2	4	0	**6**	0	0	**73**
2024-05-11 20:30:00	6	28	0	**34**	0	0	31	3	0	**34**	0	0	0	12	0	**12**	0	0	**80**
2024-05-11 20:45:00	4	30	0	**34**	0	0	36	6	0	**42**	0	0	4	7	0	**11**	0	0	**87**
2024-05-11 21:00:00	9	25	2	**36**	0	0	34	1	0	**35**	0	0	2	3	0	**5**	0	0	**76**
2024-05-11 21:15:00	5	45	0	**50**	0	0	30	1	0	**31**	0	0	0	5	0	**5**	0	0	**86**
2024-05-11 21:30:00	7	32	2	**41**	0	0	26	1	0	**27**	0	0	1	5	0	**6**	3	0	**74**
2024-05-11 21:45:00	3	34	0	**37**	0	0	25	1	0	**26**	0	0	1	3	0	**4**	0	3	**67**
Grand Total	2248	12703	155	**15106**	0	0	12560	559	13	**13132**	0	0	534	2577	5	**3116**	51	46	**31354**
% Approach	14.9%	84.1%	1.0%				95.6%	4.3%	0.1%				17.1%	82.7%	0.2%				
% Total	7.2%	40.5%	0.5%	**48.2%**			40.1%	1.8%	0.0%	**41.9%**			1.7%	8.2%	0.0%	**9.9%**			
Lights	2197	11944	147	**14288**			11761	533	13	**12307**			510	2512	5	**3027**			**29622**
% Lights	97.7%	94.0%	94.8%	**94.6%**			93.6%	95.3%	100.0%	**93.7%**			95.5%	97.5%	100.0%	**97.1%**			**94.5%**
Articulated Trucks	0	198	0	**198**			208	0	0	**208**			2	6	0	**8**			**414**
% Articulated Trucks	0.0%	1.6%	0.0%	**1.3%**			1.7%	0.0%	0.0%	**1.6%**			0.4%	0.2%	0.0%	**0.3%**			**1.3%**
Buses and Single-Unit Trucks	49	532	8	**589**			558	23	0	**581**			21	56	0	**77**			**1247**
% Buses and Single-Unit Trucks	2.2%	4.2%	5.2%	**3.9%**			4.4%	4.1%	0.0%	**4.4%**			3.9%	2.2%	0.0%	**2.5%**			**4.0%**
Bicycles on Road	2	29	0	**31**			33	3	0	**36**			1	3	0	**4**			**71**
% Bicycles on Road	0.1%	0.2%	0.0%	**0.2%**			0.3%	0.5%	0.0%	**0.3%**			0.2%	0.1%	0.0%	**0.1%**			**0.2%**
Pedestrians					0	0					0	0					31	30	
% Pedestrians					0.0%	0.0%					0.0%	0.0%					60.8%	65.2%	
Bicycles on Crosswalk					0	0					0	0					20	16	
% Bicycles on Crosswalk					0.0%	0.0%					0.0%	0.0%					39.2%	34.8%	

Appendix C TMR 2023 road link count data

AADT: Complete Report

Area
Region: 315 - North Queensland
District: 408 - Northern
Road: 842 - ABBOTT STREET CONNECTION ROAD

Site
ID: 160693
Type: C - Coverage
Description: Between Lakeland Dr & Oononba Rd

Spatial
TDist: 1.23 km
Latitude: -19.306431
Longitude: 146.818628

1. Select - **Traffic Year**
2. Select - **Road**
3. Select individual **Traffic Sites** using map select

Traffic Year
2023

Region
315 - North Queensland

District
408 - Northern

Road
All

Site Type
P - Permanent
C - Coverage

Direction of Travel
With Gazettal
Against Gazettal
Both Directions

Quick Facts (Both Directions only)

AADT: 9,494

Collection year: 2023

Week day % of AADT: 103.83 %

Weekend day % of AADT: 90.42 %

total days in year: 365

days with data: 19

% of year with data 5.21%

Average daily traffic: 11,436

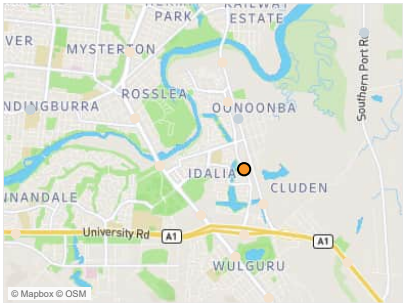
Growth % last year: -9.37 %

Growth % last 5 years: None

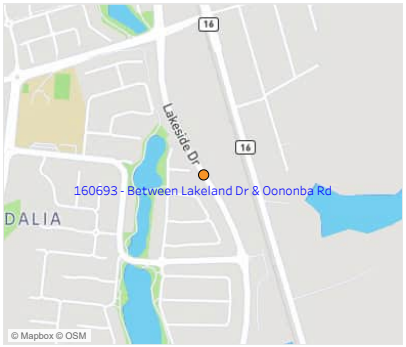
Growth % last 10 years: None

Site selection: 160693

Click anywhere on the map to DESELECT a site or click on a different site to CHANGE selection.

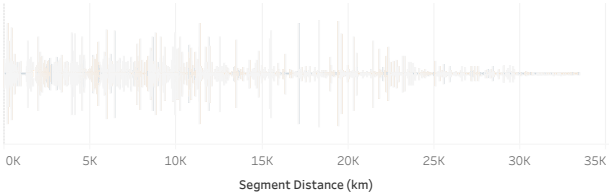


Local area zoom (visible once a single site is selected)



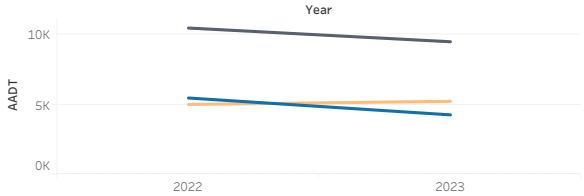
Segments overview for All

Selected road section with segment width and height proportional to length and AADT respectively.



AADT History: 160693

Historical Annual Average Daily Traffic (AADT) values for the Site by Year and Direction of Travel.



AADT and VKT totals by Vehicle Class and Direction of Travel: 160693

The below chart displays Annual Average Daily Traffic (AADT) and yearly Vehicle Kilometers Travelled (VKT 'millions') by Vehicle Class and Direction of Travel.

		With Gazettal			Against Gazettal			Both Directions		
Vehicle Class Bins	Vehicle Class	AADT	% of AADT Total	VKT	AADT	% of AADT Total	VKT	AADT	% of AADT Total	VKT
1 Bin	00 - All Vehicles	4,262	100.00%	2.7379	5,232	100.00%	3.3610	9,494	100.00%	6.0989
2 Bins	0A - Light Vehicles	4,067	95.42%	2.6125	4,927	94.18%	3.1654	8,997	94.76%	5.7794
	0B - Heavy Vehicles	195	4.58%	0.1254	305	5.82%	0.1956	497	5.24%	0.3196
4 Bins	1A -Short Vehicles	4,067	95.42%	2.6125	4,927	94.18%	3.1654	8,997	94.76%	5.7794
	1B - Trucks and Buses	185	4.34%	0.1188	286	5.47%	0.1838	471	4.96%	0.3025
	1C - Articulated Vehicles	9	0.22%	0.0060	16	0.31%	0.0104	25	0.26%	0.0159
	1D - Road Trains	1	0.02%	0.0005	2	0.04%	0.0013	2	0.02%	0.0012
12 Bins	2A - Short 2-Axle Vehicles	4,021	94.35%	2.5832	4,879	93.25%	3.1342	8,903	93.77%	5.7190
	2B - Short Vehicles Towing	46	1.07%	0.0293	49	0.93%	0.0313	94	0.99%	0.0604
	2C - 2-Axle Trucks and Buses	176	4.14%	0.1133	272	5.19%	0.1744	448	4.72%	0.2879
	2D - 3-Axle Trucks and Buses	6	0.14%	0.0038	10	0.20%	0.0067	16	0.17%	0.0104
	2E - 4-Axle Trucks	3	0.06%	0.0016	4	0.08%	0.0027	7	0.07%	0.0043
	2F - 3-Axle Articulate	3	0.07%	0.0019	5	0.10%	0.0034	8	0.08%	0.0049
	2G - 4-Axle Articulate	3	0.07%	0.0019	5	0.09%	0.0030	8	0.08%	0.0049
	2H - 5-Axle Articulate	0	0.01%	0.0003	1	0.02%	0.0007	1	0.01%	0.0006
	2I - 6-Axle Articulate	3	0.07%	0.0019	5	0.10%	0.0034	9	0.09%	0.0055
	2J - B Double	1	0.02%	0.0005	2	0.03%	0.0010	2	0.02%	0.0012
	2K - Double Road Trains	0	0.00%	0.0000	0	0.00%	0.0000	0	0.00%	0.0000
	2L - Triple Road Trains	0	0.00%	0.0000	1	0.01%	0.0003	0	0.00%	0.0000

AADT: Complete Report

Area
Region: 315 - North Queensland
District: 408 - Northern
Road: 10M - BRUCE HIGHWAY (TOWNSVILLE - INGHAM)

Site
ID: 92204
Type: C - Coverage
Description: 200m West of Cluden Racecourse

Spatial
TDist: 2.88 km
Latitude: -19.318083
Longitude: 146.818648

1. Select - **Traffic Year**
2. Select - **Road**
3. Select individual **Traffic Sites** using map select

Traffic Year
2023

Region
315 - North Queensland

District
408 - Northern

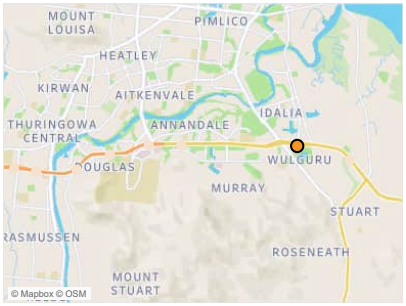
Road
10M - BRUCE HIGHWAY (TOWNSVILLE - INGHAM)

Site Type
P - Permanent
C - Coverage

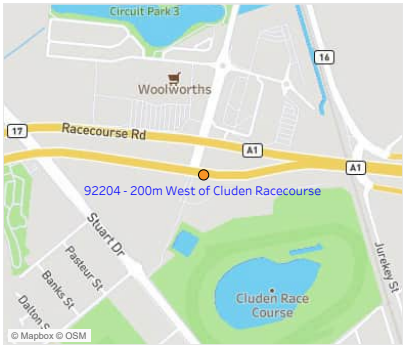
Direction of Travel
With Gazettal
Against Gazettal
Both Directions

Site selection: 92204

Click anywhere on the map to DESELECT a site or click on a different site to CHANGE selection.



Local area zoom (visible once a single site is selected)



Quick Facts (Both Directions only)

AADT: 23,066

Collection year: 2023

Week day % of AADT: 105.17 %

Weekend day % of AADT: 87.07 %

total days in year: 365

days with data: 20

% of year with data 5.48%

Average daily traffic: 25,588

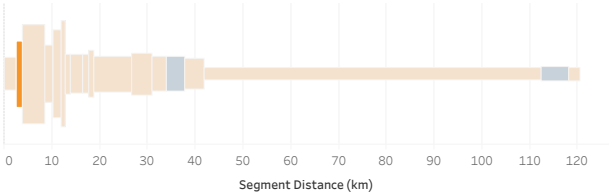
Growth % last year: 64.48 %

Growth % last 5 years: None

Growth % last 10 years: None

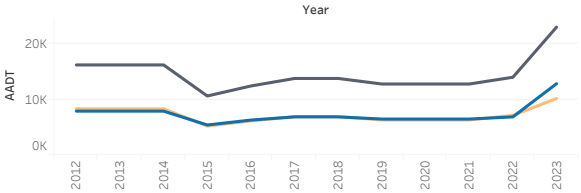
Segments overview for 10M - BRUCE HIGHWAY (TOWNSVILLE - INGHAM)

Selected road section with segment width and height proportional to length and AADT respectively.



AADT History: 92204

Historical Annual Average Daily Traffic (AADT) values for the Site by Year and Direction of Travel.



AADT and VKT totals by Vehicle Class and Direction of Travel: 92204

The below chart displays Annual Average Daily Traffic (AADT) and yearly Vehicle Kilometers Travelled (VKT 'millions') by Vehicle Class and Direction of Travel.

		With Gazettal			Against Gazettal			Both Directions		
Vehicle Class Bins	Vehicle Class	AADT	% of AADT Total	VKT	AADT	% of AADT Total	VKT	AADT	% of AADT Total	VKT
1 Bin	00 - All Vehicles	12,867	100.00%	6.1477	10,199	100.00%	4.8729	23,066	100.00%	11.0206
2 Bins	0A - Light Vehicles	11,498	89.36%	5.4935	8,914	87.40%	4.2589	20,411	88.49%	9.7521
	0B - Heavy Vehicles	1,369	10.64%	0.6541	1,285	12.60%	0.6140	2,655	11.51%	1.2685
4 Bins	1A -Short Vehicles	11,498	89.36%	5.4935	8,914	87.40%	4.2589	20,411	88.49%	9.7521
	1B - Trucks and Buses	970	7.54%	0.4635	930	9.12%	0.4444	1,903	8.25%	0.9092
	1C - Articulated Vehicles	237	1.84%	0.1131	225	2.21%	0.1077	461	2.00%	0.2204
	1D - Road Trains	162	1.26%	0.0775	130	1.27%	0.0619	291	1.26%	0.1389
12 Bins	2A - Short 2-Axle Vehicles	11,134	86.53%	5.3196	8,543	83.76%	4.0816	19,675	85.30%	9.4006
	2B - Short Vehicles Towing	364	2.83%	0.1740	371	3.64%	0.1774	736	3.19%	0.3516
	2C - 2-Axle Trucks and Buses	816	6.34%	0.3898	786	7.71%	0.3757	1,603	6.95%	0.7659
	2D - 3-Axle Trucks and Buses	106	0.82%	0.0504	101	0.99%	0.0482	208	0.90%	0.0992
	2E - 4-Axle Trucks	49	0.38%	0.0234	43	0.42%	0.0205	92	0.40%	0.0441
	2F - 3-Axle Articulate	30	0.23%	0.0141	33	0.32%	0.0156	62	0.27%	0.0298
	2G - 4-Axle Articulate	48	0.37%	0.0227	52	0.51%	0.0249	99	0.43%	0.0474
	2H - 5-Axle Articulate	18	0.14%	0.0086	19	0.19%	0.0093	37	0.16%	0.0176
	2I - 6-Axle Articulate	142	1.10%	0.0676	121	1.19%	0.0580	263	1.14%	0.1256
	2J - B Double	151	1.17%	0.0719	120	1.18%	0.0575	270	1.17%	0.1289
	2K - Double Road Trains	12	0.09%	0.0055	9	0.09%	0.0044	21	0.09%	0.0099
	2L - Triple Road Trains	0	0.00%	0.0000	0	0.00%	0.0000	0	0.00%	0.0000

AADT: Complete Report

Area
Region: 315 - North Queensland
District: 408 - Northern
Road: 830 - TOWNSVILLE CONNECTION ROAD

Site
ID: 92191
Type: C - Coverage
Description: Stuart Dr 100m West of Edison St

Spatial
TDist: 3.41 km
Latitude: -19.321975
Longitude: 146.817015

1. Select - **Traffic Year**
2. Select - **Road**
3. Select individual **Traffic Sites** using map select

Traffic Year
2023

Region
315 - North Queensland

District
408 - Northern

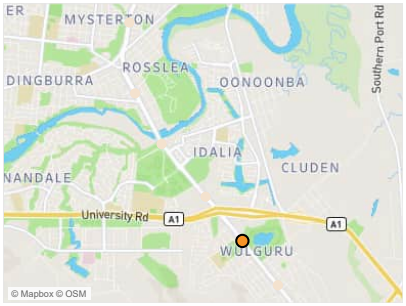
Road
830 - TOWNSVILLE CONNECTION ROAD

Site Type
P - Permanent
C - Coverage

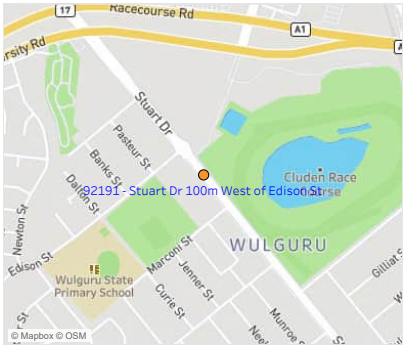
Direction of Travel
With Gazettal
Against Gazettal
Both Directions

Site selection: 92191

Click anywhere on the map to DESELECT a site or click on a different site to CHANGE selection.



Local area zoom (visible once a single site is selected)



Quick Facts (Both Directions only)

AADT: 13,633

Collection year: 2023

Week day % of AADT: 107.82 %

Weekend day % of AADT: 80.46 %

total days in year: 365

days with data: 19

% of year with data 5.21%

Average daily traffic: 14,141

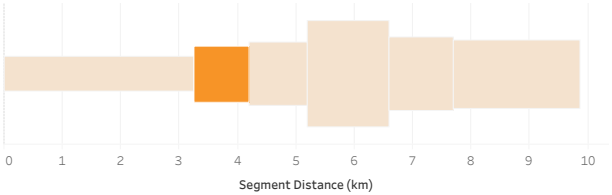
Growth % last year: -10.80 %

Growth % last 5 years: None

Growth % last 10 years: None

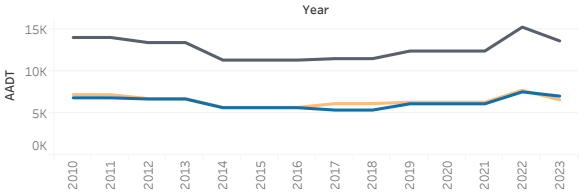
Segments overview for 830 - TOWNSVILLE CONNECTION ROAD

Selected road section with segment width and height proportional to length and AADT respectively.



AADT History: 92191

Historical Annual Average Daily Traffic (AADT) values for the Site by Year and Direction of Travel.



AADT and VKT totals by Vehicle Class and Direction of Travel: 92191

The below chart displays Annual Average Daily Traffic (AADT) and yearly Vehicle Kilometers Travelled (VKT 'millions') by Vehicle Class and Direction of Travel.

Vehicle Class Bins	Vehicle Class	With Gazettal			Against Gazettal			Both Directions		
		AADT	% of AADT Total	VKT	AADT	% of AADT Total	VKT	AADT	% of AADT Total	VKT
1 Bin	00 - All Vehicles	7,037	100.00%	2.4298	6,596	100.00%	2.2775	13,633	100.00%	4.7073
2 Bins	0A - Light Vehicles	6,065	86.19%	2.0942	5,913	89.65%	2.0418	11,978	87.86%	4.1359
	0B - Heavy Vehicles	972	13.81%	0.3356	683	10.35%	0.2357	1,655	12.14%	0.5715
4 Bins	1A -Short Vehicles	6,065	86.19%	2.0942	5,913	89.65%	2.0418	11,978	87.86%	4.1359
	1B - Trucks and Buses	832	11.83%	0.2874	576	8.74%	0.1991	1,408	10.33%	0.4863
	1C - Articulated Vehicles	110	1.56%	0.0379	85	1.29%	0.0294	196	1.44%	0.0678
	1D - Road Trains	30	0.42%	0.0102	21	0.32%	0.0073	50	0.37%	0.0174
12 Bins	2A - Short 2-Axle Vehicles	5,917	84.09%	2.0432	5,762	87.35%	1.9894	11,679	85.67%	4.0328
	2B - Short Vehicles Towing	148	2.10%	0.0510	152	2.30%	0.0524	299	2.19%	0.1031
	2C - 2-Axle Trucks and Buses	708	10.06%	0.2444	469	7.11%	0.1619	1,177	8.63%	0.4062
	2D - 3-Axle Trucks and Buses	87	1.23%	0.0299	76	1.15%	0.0262	162	1.19%	0.0560
	2E - 4-Axle Trucks	38	0.54%	0.0131	32	0.48%	0.0109	70	0.51%	0.0240
	2F - 3-Axle Articulate	21	0.30%	0.0073	13	0.19%	0.0043	34	0.25%	0.0118
	2G - 4-Axle Articulate	28	0.40%	0.0097	20	0.31%	0.0071	49	0.36%	0.0169
	2H - 5-Axle Articulate	8	0.12%	0.0029	7	0.10%	0.0023	15	0.11%	0.0052
	2I - 6-Axle Articulate	52	0.74%	0.0180	46	0.69%	0.0157	98	0.72%	0.0339
	2J - B Double	29	0.41%	0.0100	20	0.31%	0.0071	49	0.36%	0.0169
	2K - Double Road Trains	1	0.01%	0.0002	1	0.01%	0.0002	1	0.01%	0.0005
	2L - Triple Road Trains	0	0.00%	0.0000	0	0.00%	0.0000	0	0.00%	0.0000

AADT: Complete Report

Area
Region: 315 - North Queensland
District: 408 - Northern
Road: 10M - BRUCE HIGHWAY (TOWNSVILLE - INGHAM)

Site
ID: 92178
Type: C - Coverage
Description: 10M 250m East Mark Reid Dr adj VMS

Spatial
TDist: 7.81 km
Latitude: -19.317895
Longitude: 146.775643

1. Select - **Traffic Year**
2. Select - **Road**
3. Select individual **Traffic Sites** using map select

Traffic Year
2023

Region
315 - North Queensland

District
408 - Northern

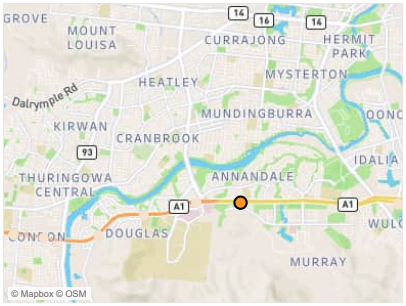
Road
10M - BRUCE HIGHWAY (TOWNSVILLE - INGHAM)

Site Type
P - Permanent
C - Coverage

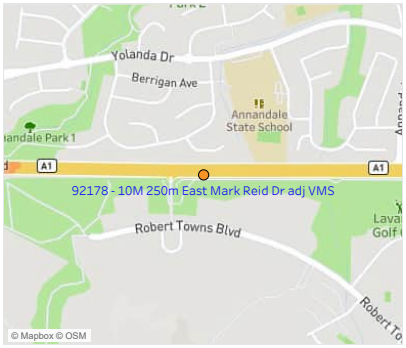
Direction of Travel
With Gazettal
Against Gazettal
Both Directions

Site selection: 92178

Click anywhere on the map to DESELECT a site or click on a different site to CHANGE selection.



Local area zoom (visible once a single site is selected)



Quick Facts (Both Directions only)

AADT: 34,164

Collection year: 2023

Week day % of AADT: 110.30 %

Weekend day % of AADT: 74.26 %

total days in year: 365

days with data: 20

% of year with data 5.48%

Average daily traffic: 35,408

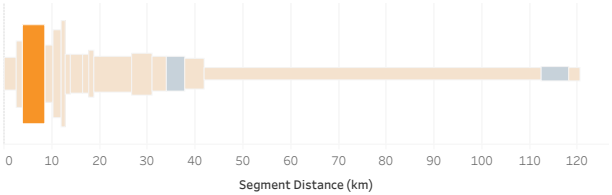
Growth % last year: -4.74 %

Growth % last 5 years: 0.71 %

Growth % last 10 years: None

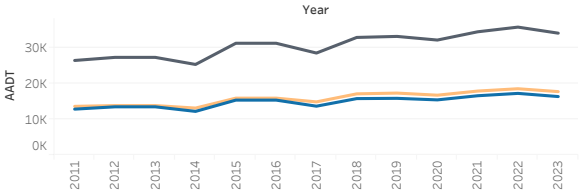
Segments overview for 10M - BRUCE HIGHWAY (TOWNSVILLE - INGHAM)

Selected road section with segment width and height proportional to length and AADT respectively.



AADT History: 92178

Historical Annual Average Daily Traffic (AADT) values for the Site by Year and Direction of Travel.



AADT and VKT totals by Vehicle Class and Direction of Travel: 92178

The below chart displays Annual Average Daily Traffic (AADT) and yearly Vehicle Kilometers Travelled (VKT 'millions') by Vehicle Class and Direction of Travel.

Vehicle Class Bins	Vehicle Class	With Gazettal			Against Gazettal			Both Directions		
		AADT	% of AADT Total	VKT	AADT	% of AADT Total	VKT	AADT	% of AADT Total	VKT
1 Bin	00 - All Vehicles	16,391	100.00%	28.6093	17,773	100.00%	31.0215	34,164	100.00%	59.6309
2 Bins	0A - Light Vehicles	14,506	88.50%	25.3193	15,354	86.39%	26.7995	29,859	87.40%	52.1174
	0B - Heavy Vehicles	1,885	11.50%	3.2901	2,419	13.61%	4.2220	4,305	12.60%	7.5135
4 Bins	1A -Short Vehicles	14,506	88.50%	25.3193	15,354	86.39%	26.7995	29,859	87.40%	52.1174
	1B - Trucks and Buses	1,415	8.63%	2.4690	1,889	10.63%	3.2976	3,304	9.67%	5.7663
	1C - Articulated Vehicles	288	1.76%	0.5035	341	1.92%	0.5956	629	1.84%	1.0972
	1D - Road Trains	182	1.11%	0.3176	188	1.06%	0.3288	372	1.09%	0.6500
12 Bins	2A - Short 2-Axle Vehicles	14,114	86.11%	24.6355	14,940	84.06%	26.0767	29,053	85.04%	50.7101
	2B - Short Vehicles Towing	392	2.39%	0.6838	414	2.33%	0.7228	806	2.36%	1.4073
	2C - 2-Axle Trucks and Buses	1,193	7.28%	2.0828	1,671	9.40%	2.9160	2,863	8.38%	4.9971
	2D - 3-Axle Trucks and Buses	149	0.91%	0.2603	146	0.82%	0.2544	294	0.86%	0.5128
	2E - 4-Axle Trucks	72	0.44%	0.1259	73	0.41%	0.1272	147	0.43%	0.2564
	2F - 3-Axle Articulate	43	0.26%	0.0744	64	0.36%	0.1117	106	0.31%	0.1849
	2G - 4-Axle Articulate	59	0.36%	0.1030	76	0.43%	0.1334	133	0.39%	0.2326
	2H - 5-Axle Articulate	21	0.13%	0.0372	25	0.14%	0.0434	48	0.14%	0.0835
	2I - 6-Axle Articulate	166	1.01%	0.2890	176	0.99%	0.3071	342	1.00%	0.5963
	2J - B Double	170	1.04%	0.2975	178	1.00%	0.3102	348	1.02%	0.6082
	2K - Double Road Trains	11	0.07%	0.0200	11	0.06%	0.0186	24	0.07%	0.0417
	2L - Triple Road Trains	0	0.00%	0.0000	0	0.00%	0.0000	0	0.00%	0.0000

Appendix D SIDRA outputs (existing)

MOVEMENT SUMMARY

Site: 101 [Racecourse_Lakeside_Existing_2024_AM (WEST) (Site Folder: Existing - Racecourse Rd / Lakeside Dr)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Racecourse_Lakeside_Townsville Turf Club Access_Existing_2024_AM (Network Folder: Existing)]

2024 Background Traffic Volumes
Site Category: Base Year
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lakeside Dr (S)															
2	T1	All MCs	120	5.3	120	5.3	0.085	39.5	LOS D	3.4	24.7	1.00	0.65	1.00	20.1
3	R2	All MCs	20	31.6	20	31.6	* 0.264	70.7	LOS E	1.2	11.1	1.00	0.72	1.00	4.2
Approach			140	9.1	140	9.1	0.264	44.0	LOS D	3.4	24.7	1.00	0.66	1.00	17.3
North: Lakeside Dr (N)															
7	L2	All MCs	85	11.1	85	11.1	0.180	41.3	LOS D	3.8	29.1	0.80	0.75	0.80	16.3
8	T1	All MCs	640	4.4	640	4.4	* 0.614	41.0	LOS D	16.4	119.2	0.93	0.80	0.93	16.4
Approach			725	5.2	725	5.2	0.614	41.0	LOS D	16.4	119.2	0.91	0.79	0.91	16.4
West: Racecourse Dr (W)															
10	L2	All MCs	739	2.0	739	2.0	0.575	5.9	LOS A	9.2	66.6	0.28	0.60	0.28	50.3
11	T1	All MCs	481	14.7	481	14.7	* 0.575	14.1	LOS B	9.2	66.6	0.50	0.50	0.50	41.6
12	R2	All MCs	22	47.6	22	47.6	0.030	20.6	LOS C	0.6	6.0	0.50	0.66	0.50	36.4
Approach			1242	7.7	1242	7.7	0.575	9.3	LOS A	9.2	66.6	0.37	0.56	0.37	47.1
All Vehicles			2107	6.9	2107	6.9	0.614	22.5	LOS C	16.4	119.2	0.60	0.65	0.60	33.7

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
West: Racecourse Dr (W)											
P4	Full	5	54.2	LOS E	0.0	0.0	0.95	0.95	208.0	200.0	0.96
All Pedestrians		5	54.2	LOS E	0.0	0.0	0.95	0.95	208.0	200.0	0.96

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

MOVEMENT SUMMARY

Site: 101 [Racecourse_Lakeside_Existing_2024_PM (WEST) (Site Folder: Existing - Racecourse Rd / Lakeside Dr)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Racecourse_Lakeside_Townsville Turf Club Access_Existing_2024_PM (Network Folder: Existing)]

2024 Background Traffic Volumes
Site Category: Base Year
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lakeside Dr (S)															
2	T1	All MCs	107	3.9	107	3.9	0.052	26.1	LOS C	2.8	20.6	0.93	0.47	0.93	25.9
3	R2	All MCs	20	36.8	20	36.8	* 0.272	70.6	LOS E	1.2	11.5	1.00	0.72	1.00	4.2
Approach			127	9.1	127	9.1	0.272	33.1	LOS C	2.8	20.6	0.94	0.51	0.94	20.8
North: Lakeside Dr (N)															
7	L2	All MCs	205	4.6	205	4.6	0.258	28.6	LOS C	7.5	54.4	0.67	0.76	0.67	21.2
8	T1	All MCs	852	1.9	852	1.9	* 0.504	25.9	LOS C	17.8	126.9	0.77	0.68	0.77	22.5
Approach			1057	2.4	1057	2.4	0.504	26.4	LOS C	17.8	126.9	0.75	0.69	0.75	22.1
West: Racecourse Dr (W)															
10	L2	All MCs	492	0.9	492	0.9	0.431	5.7	LOS A	4.5	32.1	0.23	0.56	0.23	50.9
11	T1	All MCs	378	9.2	378	9.2	* 0.431	22.9	LOS C	9.7	73.1	0.62	0.61	0.62	34.6
12	R2	All MCs	13	75.0	13	75.0	0.029	33.0	LOS C	0.5	5.5	0.67	0.67	0.67	29.4
Approach			882	5.5	882	5.5	0.431	13.5	LOS B	9.7	73.1	0.40	0.59	0.40	43.5
All Vehicles			2066	4.2	2066	4.2	0.504	21.3	LOS C	17.8	126.9	0.61	0.64	0.61	32.4

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
West: Racecourse Dr (W)											
P4	Full	5	54.2	LOS E	0.0	0.0	0.95	0.95	208.0	200.0	0.96
All Pedestrians		5	54.2	LOS E	0.0	0.0	0.95	0.95	208.0	200.0	0.96

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

MOVEMENT SUMMARY

Site: 101 [Racecourse_Lakeside_Existing_2024_Weekend (WEST) (Site Folder: Existing - Racecourse Rd / Lakeside Dr)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Racecourse_Lakeside_Townsville Turf Club Access_Existing_2024_Weekend (Network Folder: Existing)]

2024 Background Traffic Volumes
Site Category: Base Year
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lakeside Dr (S)															
2	T1	All MCs	149	2.1	149	2.1	0.067	23.3	LOS C	3.9	28.0	0.91	0.43	0.91	27.6
3	R2	All MCs	22	14.3	22	14.3	* 0.262	70.3	LOS E	1.4	10.7	1.00	0.72	1.00	4.2
Approach			172	3.7	172	3.7	0.262	29.4	LOS C	3.9	28.0	0.92	0.47	0.92	22.8
North: Lakeside Dr (N)															
7	L2	All MCs	202	5.2	202	5.2	0.234	24.7	LOS C	6.8	49.6	0.62	0.74	0.62	23.0
8	T1	All MCs	835	0.6	835	0.6	* 0.445	21.7	LOS C	15.9	111.6	0.71	0.62	0.71	24.9
Approach			1037	1.5	1037	1.5	0.445	22.3	LOS C	15.9	111.6	0.69	0.64	0.69	24.5
West: Racecourse Dr (W)															
10	L2	All MCs	391	2.8	391	2.8	0.380	5.7	LOS A	3.8	27.0	0.25	0.56	0.25	50.8
11	T1	All MCs	442	4.5	442	4.5	* 0.380	27.1	LOS C	10.3	75.1	0.68	0.64	0.68	32.2
12	R2	All MCs	2	0.0	2	0.0	0.004	34.9	LOS C	0.1	0.6	0.70	0.62	0.70	28.2
Approach			835	3.7	835	3.7	0.380	17.1	LOS B	10.3	75.1	0.48	0.60	0.48	40.5
All Vehicles			2043	2.6	2043	2.6	0.445	20.7	LOS C	15.9	111.6	0.62	0.61	0.62	32.4

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
West: Racecourse Dr (W)											
P4	Full	5	54.2	LOS E	0.0	0.0	0.95	0.95	208.0	200.0	0.96
All Pedestrians		5	54.2	LOS E	0.0	0.0	0.95	0.95	208.0	200.0	0.96

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

MOVEMENT SUMMARY

Site: 101 [Racecourse_Lakeside_Townsville Turf Club Access_Existing_2024_AM (Site Folder: Existing - Racecourse Rd / Lakeside Dr)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Racecourse_Lakeside_Townsville Turf Club Access_Existing_2024_AM (Network Folder: Existing)]

2024 Background traffic volumes
Site Category: Base Year
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Townsville Turf Club Access (S)															
1	L2	All MCs	7	57.1	7	57.1	0.016	8.2	LOS A	0.1	0.8	0.23	0.57	0.23	45.6
2	T1	All MCs	3	66.7	3	66.7	0.013	54.5	LOS D	0.1	0.9	0.93	0.57	0.93	9.3
Approach			11	60.0	11	60.0	0.016	22.1	LOS C	0.1	0.9	0.44	0.57	0.44	33.2
East: Racecourse Dr (E)															
4	L2	All MCs	1	0.0	1	0.0	0.001	5.9	LOS A	0.0	0.0	0.10	0.56	0.10	49.7
5	T1	All MCs	520	14.0	520	14.0	* 0.436	33.5	LOS C	11.9	92.9	0.83	0.71	0.83	38.8
6	R2	All MCs	144	8.8	144	8.8	0.248	36.8	LOS D	6.1	45.9	0.77	0.76	0.77	27.5
Approach			665	12.9	665	12.9	0.436	34.2	LOS C	11.9	92.9	0.82	0.72	0.82	36.9
North: Lakeside Dr (N)															
8	T1	All MCs	18	23.5	18	23.5	* 0.436	0.7	LOS A	0.7	5.0	0.04	0.55	0.04	43.6
9	R2	All MCs	646	5.0	646	5.0	0.436	5.9	LOS A	0.9	6.9	0.05	0.56	0.05	48.3
Approach			664	5.5	664	5.5	0.436	5.7	LOS A	0.9	6.9	0.04	0.56	0.04	48.2
All Vehicles			1340	9.6	1340	9.6	0.436	20.0	LOS B	11.9	92.9	0.43	0.64	0.43	40.6

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
West: Racecourse Dr (W)											
P4	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	208.1	200.0	0.96
All Pedestrians		53	54.3	LOS E	0.2	0.2	0.95	0.95	208.1	200.0	0.96

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

MOVEMENT SUMMARY

Site: 101 [Racecourse_Lakeside_Townsville Turf Club Access_Existing_2024_PM (Site Folder: Existing - Racecourse Rd / Lakeside Dr)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Racecourse_Lakeside_Townsville Turf Club Access_Existing_2024_PM (Network Folder: Existing)]

2024 Background traffic volumes
Site Category: Base Year
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Townsville Turf Club Access (S)															
1	L2	All MCs	15	35.7	15	35.7	0.035	9.8	LOS A	0.2	1.9	0.30	0.60	0.30	44.9
2	T1	All MCs	2	0.0	2	0.0	0.006	53.4	LOS D	0.1	0.4	0.93	0.55	0.93	9.5
Approach			17	31.2	17	31.2	0.035	15.3	LOS B	0.2	1.9	0.38	0.60	0.38	39.8
East: Racecourse Dr (E)															
4	L2	All MCs	1	0.0	1	0.0	0.001	5.9	LOS A	0.0	0.0	0.10	0.56	0.10	49.7
5	T1	All MCs	698	7.4	698	7.4	* 0.563	35.3	LOS D	16.7	124.6	0.88	0.76	0.88	38.1
6	R2	All MCs	103	5.1	103	5.1	0.173	35.8	LOS D	4.2	31.0	0.75	0.75	0.75	27.9
Approach			802	7.1	802	7.1	0.563	35.3	LOS D	16.7	124.6	0.86	0.76	0.86	37.1
North: Lakeside Dr (N)															
8	T1	All MCs	6	66.7	6	66.7	* 0.560	1.8	LOS A	2.5	18.1	0.11	0.59	0.11	41.0
9	R2	All MCs	863	2.0	863	2.0	0.560	7.1	LOS A	3.4	24.5	0.13	0.60	0.13	47.0
Approach			869	2.5	869	2.5	0.560	7.1	LOS A	3.4	24.5	0.13	0.60	0.13	47.0
All Vehicles			1688	5.0	1688	5.0	0.563	20.6	LOS C	16.7	124.6	0.48	0.67	0.48	40.6

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
West: Racecourse Dr (W)											
P4	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	208.1	200.0	0.96
All Pedestrians		53	54.3	LOS E	0.2	0.2	0.95	0.95	208.1	200.0	0.96

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

MOVEMENT SUMMARY

Site: 101 [Racecourse_Lakeside_Townsville Turf Club Access_Existing_2024_Weekend (Site Folder: Existing - Racecourse Rd / Lakeside Dr)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Racecourse_Lakeside_Townsville Turf Club Access_Existing_2024_Weekend (Network Folder: Existing)]

2024 Background traffic volumes
Site Category: Base Year
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Townsville Turf Club Access (S)															
1	L2	All MCs	6	33.3	6	33.3	0.012	7.8	LOS A	0.1	0.5	0.22	0.57	0.22	46.8
2	T1	All MCs	4	0.0	4	0.0	0.012	53.7	LOS D	0.1	0.8	0.93	0.57	0.93	9.4
Approach			11	20.0	11	20.0	0.012	26.1	LOS C	0.1	0.8	0.50	0.57	0.50	30.0
East: Racecourse Dr (E)															
4	L2	All MCs	1	0.0	1	0.0	0.001	5.9	LOS A	0.0	0.0	0.10	0.56	0.10	49.7
5	T1	All MCs	479	2.9	479	2.9	* 0.455	38.8	LOS D	11.6	83.5	0.88	0.74	0.88	36.7
6	R2	All MCs	140	5.3	140	5.3	0.284	42.4	LOS D	6.4	47.2	0.83	0.78	0.83	25.3
Approach			620	3.4	620	3.4	0.455	39.6	LOS D	11.6	83.5	0.87	0.75	0.87	34.7
North: Lakeside Dr (N)															
8	T1	All MCs	5	0.0	5	0.0	* 0.465	0.7	LOS A	0.9	6.2	0.04	0.57	0.04	43.4
9	R2	All MCs	826	0.6	826	0.6	0.465	5.7	LOS A	1.0	6.7	0.04	0.57	0.04	48.7
Approach			832	0.6	832	0.6	0.465	5.6	LOS A	1.0	6.7	0.04	0.57	0.04	48.7
All Vehicles			1462	1.9	1462	1.9	0.465	20.2	LOS C	11.6	83.5	0.39	0.65	0.39	40.0

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
West: Racecourse Dr (W)											
P4	Full	53	54.3	LOS E	0.2	0.2	0.95	0.95	208.1	200.0	0.96
All Pedestrians		53	54.3	LOS E	0.2	0.2	0.95	0.95	208.1	200.0	0.96

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

MOVEMENT SUMMARY

Site: 101 [Stuart_Edison_Existing_2024_AM (Site Folder: Existing - Stuart Drive)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

2024 Background Traffic Volumes
Site Category: Base Year
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Stuart Dr (S)															
1	L2	All MCs	43	14.6	43	14.6	0.589	6.3	LOS A	5.4	40.6	0.42	0.49	0.42	54.5
2	T1	All MCs	720	8.3	720	8.3	0.589	6.6	LOS A	5.4	40.6	0.42	0.49	0.42	56.5
3u	U	All MCs	1	0.0	1	0.0	0.589	11.9	LOS B	5.4	40.6	0.42	0.49	0.42	57.6
Approach			764	8.6	764	8.6	0.589	6.6	LOS A	5.4	40.6	0.42	0.49	0.42	56.4
North: Stuart Dr (N)															
8	T1	All MCs	542	10.3	542	10.3	0.433	5.9	LOS A	3.9	29.5	0.20	0.50	0.20	56.6
9	R2	All MCs	77	2.7	77	2.7	0.433	9.4	LOS A	3.9	29.5	0.20	0.50	0.20	55.0
9u	U	All MCs	11	0.0	11	0.0	0.433	11.3	LOS B	3.9	29.5	0.20	0.50	0.20	58.2
Approach			629	9.2	629	9.2	0.433	6.5	LOS A	3.9	29.5	0.20	0.50	0.20	56.4
West: Edison St (W)															
10	L2	All MCs	196	2.1	196	2.1	0.372	10.9	LOS B	2.4	17.2	0.83	0.78	0.84	51.1
12	R2	All MCs	24	0.0	24	0.0	0.372	14.7	LOS B	2.4	17.2	0.83	0.78	0.84	51.1
12u	U	All MCs	1	0.0	1	0.0	0.372	16.5	LOS B	2.4	17.2	0.83	0.78	0.84	48.7
Approach			221	1.9	221	1.9	0.372	11.4	LOS B	2.4	17.2	0.83	0.78	0.84	51.0
All Vehicles			1615	7.9	1615	7.9	0.589	7.2	LOS A	5.4	40.6	0.39	0.53	0.39	55.6

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

Organisation: GELEON | Licence: NETWORK / 1PC | Processed: Tuesday, 6 August 2024 10:02:51 AM
Project: P:\50890 BNC (1-105 Racecourse Rd, Cluden)\02. D&D\05. SIDRA\Masterplan\Existing_Bruce Hwy_Lakeside Dr_Townsville Turf Club Access_Stuart Dr.sip9

MOVEMENT SUMMARY

Site: 101 [Stuart_Edison_Existing_2024_PM (Site Folder: Existing - Stuart Drive)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

2024 Background Traffic Volumes
Site Category: Base Year
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Stuart Dr (S)															
1	L2	All MCs	44	0.0	44	0.0	0.644	6.9	LOS A	6.0	43.3	0.61	0.56	0.61	54.2
2	T1	All MCs	712	4.4	712	4.4	0.644	7.5	LOS A	6.0	43.3	0.61	0.56	0.61	56.6
3u	U	All MCs	1	0.0	1	0.0	0.644	12.8	LOS B	6.0	43.3	0.61	0.56	0.61	56.7
Approach			757	4.1	757	4.1	0.644	7.5	LOS A	6.0	43.3	0.61	0.56	0.61	56.4
North: Stuart Dr (N)															
8	T1	All MCs	661	3.9	661	3.9	0.544	5.9	LOS A	5.9	42.3	0.22	0.50	0.22	58.0
9	R2	All MCs	164	0.6	164	0.6	0.544	9.4	LOS A	5.9	42.3	0.22	0.50	0.22	54.9
9u	U	All MCs	9	0.0	9	0.0	0.544	11.3	LOS B	5.9	42.3	0.22	0.50	0.22	58.0
Approach			835	3.2	835	3.2	0.544	6.6	LOS A	5.9	42.3	0.22	0.50	0.22	57.3
West: Edison St (W)															
10	L2	All MCs	115	6.4	115	6.4	0.244	10.3	LOS B	1.5	11.1	0.80	0.76	0.80	50.5
12	R2	All MCs	21	0.0	21	0.0	0.244	13.8	LOS B	1.5	11.1	0.80	0.76	0.80	51.5
12u	U	All MCs	1	0.0	1	0.0	0.244	15.6	LOS B	1.5	11.1	0.80	0.76	0.80	49.1
Approach			137	5.4	137	5.4	0.244	10.9	LOS B	1.5	11.1	0.80	0.76	0.80	50.6
All Vehicles			1728	3.8	1728	3.8	0.644	7.3	LOS A	6.0	43.3	0.44	0.55	0.44	56.4

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

Organisation: GELEON | Licence: NETWORK / 1PC | Processed: Tuesday, 6 August 2024 10:16:03 AM
Project: P:\50890 BNC (1-105 Racecourse Rd, Cluden)\02. D&D\05. SIDRA\Masterplan\Existing_Bruce Hwy_Lakeside Dr_Townsville Turf Club Access_Stuart Dr.sip9

MOVEMENT SUMMARY

Site: 101 [Stuart_Edison_Existing_2024_Weekend (Site Folder: Existing - Stuart Drive)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

2024 Background Traffic Volumes
Site Category: Base Year
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Stuart Dr (S)															
1	L2	All MCs	24	8.7	24	8.7	0.445	6.1	LOS A	3.2	23.5	0.36	0.50	0.36	55.0
2	T1	All MCs	545	4.4	545	4.4	0.445	6.4	LOS A	3.2	23.5	0.36	0.50	0.36	57.7
3u	U	All MCs	1	0.0	1	0.0	0.445	11.8	LOS B	3.2	23.5	0.36	0.50	0.36	57.9
Approach			571	4.6	571	4.6	0.445	6.4	LOS A	3.2	23.5	0.36	0.50	0.36	57.6
North: Stuart Dr (N)															
8	T1	All MCs	563	2.8	563	2.8	0.429	5.8	LOS A	3.7	26.8	0.16	0.50	0.16	58.7
9	R2	All MCs	95	2.2	95	2.2	0.429	9.3	LOS A	3.7	26.8	0.16	0.50	0.16	55.3
9u	U	All MCs	2	0.0	2	0.0	0.429	11.2	LOS B	3.7	26.8	0.16	0.50	0.16	58.4
Approach			660	2.7	660	2.7	0.429	6.3	LOS A	3.7	26.8	0.16	0.50	0.16	58.2
West: Edison St (W)															
10	L2	All MCs	147	0.7	147	0.7	0.224	8.3	LOS A	1.3	9.2	0.67	0.70	0.67	53.3
12	R2	All MCs	17	12.5	17	12.5	0.224	12.8	LOS B	1.3	9.2	0.67	0.70	0.67	50.3
12u	U	All MCs	1	0.0	1	0.0	0.224	13.9	LOS B	1.3	9.2	0.67	0.70	0.67	50.5
Approach			165	1.9	165	1.9	0.224	8.8	LOS A	1.3	9.2	0.67	0.70	0.67	53.0
All Vehicles			1396	3.4	1396	3.4	0.445	6.7	LOS A	3.7	26.8	0.30	0.52	0.30	57.3

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

Organisation: GELEON | Licence: NETWORK / 1PC | Processed: Tuesday, 6 August 2024 10:19:35 AM
Project: P:\50890 BNC (1-105 Racecourse Rd, Cluden)\02. D&D\05. SIDRA\Masterplan\Existing_Bruce Hwy_Lakeside Dr_Townsville Turf Club Access_Stuart Dr.sip9

MOVEMENT SUMMARY

Site: 101 [Racecourse_Lakeside_Existing_2029_AM (WEST) (Site Folder: Existing - Racecourse Rd / Lakeside Dr)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Racecourse_Lakeside_Townsville Turf Club Access_Existing_2029_AM (Network Folder: Existing)]

2024 Background Traffic Volumes
Site Category: Base Year
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network User-Given Cycle Time)
Design Life Analysis (Final Year): Results for 5 years

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lakeside Dr (S)															
2	T1	All MCs	132	5.3	132	5.3	0.094	39.7	LOS D	3.7	27.3	1.00	0.65	1.00	20.0
3	R2	All MCs	22	31.6	22	31.6	* 0.291	70.9	LOS E	1.4	12.3	1.00	0.72	1.00	4.2
Approach			155	9.1	155	9.1	0.291	44.2	LOS D	3.7	27.3	1.00	0.66	1.00	17.2
North: Lakeside Dr (N)															
7	L2	All MCs	94	11.1	94	11.1	0.199	44.2	LOS D	4.2	32.4	0.81	0.76	0.81	16.2
8	T1	All MCs	707	4.4	707	4.4	* 0.685	43.3	LOS D	18.8	136.3	0.95	0.82	0.95	16.1
Approach			801	5.2	801	5.2	0.685	43.4	LOS D	18.8	136.3	0.94	0.81	0.94	15.7
West: Racecourse Dr (W)															
10	L2	All MCs	816	2.0	816	2.0	0.637	6.0	LOS A	13.1	94.8	0.35	0.62	0.35	49.9
11	T1	All MCs	531	14.7	531	14.7	* 0.637	14.8	LOS B	13.1	94.8	0.53	0.52	0.53	41.3
12	R2	All MCs	24	47.6	24	47.6	0.034	20.6	LOS C	0.7	6.7	0.50	0.66	0.50	36.4
Approach			1371	7.7	1371	7.7	0.637	9.7	LOS A	13.1	94.8	0.42	0.58	0.42	46.7
All Vehicles			2327	6.9	2327	6.9	0.685	23.6	LOS C	18.8	136.3	0.64	0.67	0.64	33.0

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
West: Racecourse Dr (W)											
P4	Full	6	54.2	LOS E	0.0	0.0	0.95	0.95	208.0	200.0	0.96
All Pedestrians		6	54.2	LOS E	0.0	0.0	0.95	0.95	208.0	200.0	0.96

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

MOVEMENT SUMMARY

Site: 101 [Racecourse_Lakeside_Existing_2029_PM (WEST) (Site Folder: Existing - Racecourse Rd / Lakeside Dr)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Racecourse_Lakeside_Townsville Turf Club Access_Existing_2029_PM (Network Folder: Existing)]

2024 Background Traffic Volumes
Site Category: Base Year
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network User-Given Cycle Time)
Design Life Analysis (Final Year): Results for 5 years

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lakeside Dr (S)															
2	T1	All MCs	119	3.9	119	3.9	0.057	25.7	LOS C	3.1	22.7	0.93	0.46	0.93	26.2
3	R2	All MCs	22	36.8	22	36.8	* 0.300	70.8	LOS E	1.4	12.7	1.00	0.72	1.00	4.2
Approach			141	9.1	141	9.1	0.300	32.8	LOS C	3.1	22.7	0.94	0.51	0.94	21.0
North: Lakeside Dr (N)															
7	L2	All MCs	227	4.6	227	4.6	0.280	30.1	LOS C	8.2	60.0	0.67	0.76	0.67	21.4
8	T1	All MCs	940	1.9	940	1.9	* 0.559	27.0	LOS C	20.6	146.7	0.79	0.70	0.79	22.4
Approach			1167	2.4	1167	2.4	0.559	27.6	LOS C	20.6	146.7	0.77	0.71	0.77	21.5
West: Racecourse Dr (W)															
10	L2	All MCs	543	0.9	543	0.9	0.480	5.7	LOS A	5.5	39.3	0.24	0.56	0.24	50.9
11	T1	All MCs	417	9.2	417	9.2	* 0.480	23.4	LOS C	10.8	81.6	0.63	0.63	0.63	34.2
12	R2	All MCs	14	75.0	14	75.0	0.033	33.8	LOS C	0.5	6.1	0.68	0.67	0.68	29.1
Approach			974	5.5	974	5.5	0.480	13.7	LOS B	10.8	81.6	0.41	0.59	0.41	43.4
All Vehicles			2281	4.2	2281	4.2	0.559	22.0	LOS C	20.6	146.7	0.63	0.65	0.63	32.0

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
West: Racecourse Dr (W)											
P4	Full	6	54.2	LOS E	0.0	0.0	0.95	0.95	208.0	200.0	0.96
All Pedestrians		6	54.2	LOS E	0.0	0.0	0.95	0.95	208.0	200.0	0.96

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

MOVEMENT SUMMARY

Site: 101 [Racecourse_Lakeside_Existing_2029_Weekend (WEST) (Site Folder: Existing - Racecourse Rd / Lakeside Dr)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Racecourse_Lakeside_Townsville Turf Club Access_Existing_2029_Weekend (Network Folder: Existing)]

2029 Background Traffic Volumes
Site Category: Future Conditions 1
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network Site User-Given Phase Times)
Design Life Analysis (Final Year): Results for 5 years

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lakeside Dr (S)															
2	T1	All MCs	165	2.1	165	2.1	0.074	23.4	LOS C	4.3	30.9	0.91	0.44	0.91	27.5
3	R2	All MCs	24	14.3	24	14.3	* 0.290	70.4	LOS E	1.5	11.9	1.00	0.73	1.00	4.2
Approach			189	3.7	189	3.7	0.290	29.5	LOS C	4.3	30.9	0.92	0.47	0.92	22.8
North: Lakeside Dr (N)															
7	L2	All MCs	223	5.2	223	5.2	0.258	25.7	LOS C	7.6	55.6	0.63	0.75	0.63	22.8
8	T1	All MCs	922	0.6	922	0.6	* 0.496	22.7	LOS C	18.3	128.5	0.73	0.65	0.73	24.5
Approach			1145	1.5	1145	1.5	0.496	23.3	LOS C	18.3	128.5	0.71	0.67	0.71	23.9
West: Racecourse Dr (W)															
10	L2	All MCs	431	2.8	431	2.8	0.419	5.7	LOS A	4.5	32.0	0.25	0.56	0.25	50.8
11	T1	All MCs	488	4.5	488	4.5	* 0.419	27.3	LOS C	11.6	84.1	0.69	0.65	0.69	32.1
12	R2	All MCs	2	0.0	2	0.0	0.004	34.9	LOS C	0.1	0.6	0.70	0.62	0.70	28.2
Approach			922	3.7	922	3.7	0.419	17.2	LOS B	11.6	84.1	0.48	0.61	0.48	40.4
All Vehicles			2256	2.6	2256	2.6	0.496	21.3	LOS C	18.3	128.5	0.64	0.63	0.64	32.0

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
West: Racecourse Dr (W)											
P4	Full	6	54.2	LOS E	0.0	0.0	0.95	0.95	208.0	200.0	0.96
All Pedestrians		6	54.2	LOS E	0.0	0.0	0.95	0.95	208.0	200.0	0.96

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

MOVEMENT SUMMARY

Site: 101 [Racecourse_Lakeside_Townsville Turf Club Access_Existing_2029_AM (Site Folder: Existing - Racecourse Rd / Lakeside Dr)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Racecourse_Lakeside_Townsville Turf Club Access_Existing_2029_AM (Network Folder: Existing)]

2024 Background traffic volumes
Site Category: Base Year
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network User-Given Cycle Time)
Design Life Analysis (Final Year): Results for 5 years

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Townsville Turf Club Access (S)															
1	L2	All MCs	8	57.1	8	57.1	0.019	8.6	LOS A	0.1	0.9	0.25	0.58	0.25	45.3
2	T1	All MCs	3	66.7	3	66.7	0.014	54.6	LOS D	0.1	1.0	0.93	0.58	0.93	9.3
Approach			12	60.0	12	60.0	0.019	22.4	LOS C	0.1	1.0	0.45	0.58	0.45	33.0
East: Racecourse Dr (E)															
4	L2	All MCs	1	0.0	1	0.0	0.001	5.9	LOS A	0.0	0.0	0.10	0.56	0.10	49.7
5	T1	All MCs	574	14.0	574	14.0	* 0.482	34.1	LOS C	13.3	104.5	0.85	0.72	0.85	38.5
6	R2	All MCs	159	8.8	159	8.8	0.273	37.1	LOS D	6.8	51.2	0.78	0.77	0.78	27.4
Approach			735	12.9	735	12.9	0.482	34.7	LOS C	13.3	104.5	0.83	0.73	0.83	36.7
North: Lakeside Dr (N)															
8	T1	All MCs	20	23.5	20	23.5	* 0.482	0.7	LOS A	0.8	5.9	0.04	0.55	0.04	43.5
9	R2	All MCs	714	5.0	714	5.0	0.482	5.9	LOS A	1.1	8.2	0.05	0.56	0.05	48.3
Approach			733	5.5	733	5.5	0.482	5.7	LOS A	1.1	8.2	0.05	0.56	0.05	48.3
All Vehicles			1479	9.6	1479	9.6	0.482	20.3	LOS C	13.3	104.5	0.44	0.65	0.44	40.4

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
West: Racecourse Dr (W)											
P4	Full	58	54.3	LOS E[12]	0.2	0.2	0.95	0.95	208.1	200.0	0.96
All Pedestrians		58	54.3	LOS E[12]	0.2	0.2	0.95	0.95	208.1	200.0	0.96

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

MOVEMENT SUMMARY

Site: 101 [Racecourse_Lakeside_Townsville Turf Club Access_Existing_2029_PM (Site Folder: Existing - Racecourse Rd / Lakeside Dr)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Racecourse_Lakeside_Townsville Turf Club Access_Existing_2029_PM (Network Folder: Existing)]

2024 Background traffic volumes
Site Category: Base Year
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network User-Given Cycle Time)
Design Life Analysis (Final Year): Results for 5 years

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Townsville Turf Club Access (S)															
1	L2	All MCs	16	35.7	16	35.7	0.042	11.0	LOS B	0.3	2.5	0.34	0.61	0.34	43.9
2	T1	All MCs	2	0.0	2	0.0	0.007	53.4	LOS D	0.1	0.4	0.93	0.55	0.93	9.5
Approach			19	31.2	19	31.2	0.042	16.3	LOS B	0.3	2.5	0.42	0.61	0.42	39.1
East: Racecourse Dr (E)															
4	L2	All MCs	1	0.0	1	0.0	0.001	5.9	LOS A	0.0	0.0	0.10	0.56	0.10	49.7
5	T1	All MCs	771	7.4	771	7.4	* 0.621	36.2	LOS D	18.9	141.0	0.90	0.78	0.90	37.7
6	R2	All MCs	114	5.1	114	5.1	0.191	36.0	LOS D	4.7	34.4	0.75	0.75	0.75	27.8
Approach			886	7.1	886	7.1	0.621	36.1	LOS D	18.9	141.0	0.88	0.78	0.88	36.8
North: Lakeside Dr (N)															
8	T1	All MCs	7	66.7	7	66.7	* 0.618	2.2	LOS A	3.7	26.6	0.14	0.60	0.14	40.3
9	R2	All MCs	953	2.0	953	2.0	0.618	7.5	LOS A	4.8	33.8	0.16	0.61	0.16	46.7
Approach			960	2.5	960	2.5	0.618	7.4	LOS A	4.8	33.8	0.16	0.61	0.16	46.6
All Vehicles			1864	5.0	1864	5.0	0.621	21.1	LOS C	18.9	141.0	0.51	0.69	0.51	40.2

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
West: Racecourse Dr (W)											
P4	Full	58	54.3	LOS E[12]	0.2	0.2	0.95	0.95	208.1	200.0	0.96
All Pedestrians		58	54.3	LOS E[12]	0.2	0.2	0.95	0.95	208.1	200.0	0.96

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

MOVEMENT SUMMARY

Site: 101 [Racecourse_Lakeside_Townsville Turf Club Access_Existing_2029_Weekend (Site Folder: Existing - Racecourse Rd / Lakeside Dr)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Racecourse_Lakeside_Townsville Turf Club Access_Existing_2029_Weekend (Network Folder: Existing)]

2029 Background traffic volumes
Site Category: Future Conditions 1
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network Site User-Given Phase Times)
Design Life Analysis (Final Year): Results for 5 years

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Townsville Turf Club Access (S)															
1	L2	All MCs	7	33.3	7	33.3	0.015	8.1	LOS A	0.1	0.7	0.24	0.58	0.24	46.5
2	T1	All MCs	5	0.0	5	0.0	0.013	53.7	LOS D	0.1	0.9	0.93	0.58	0.93	9.4
Approach			12	20.0	12	20.0	0.015	26.4	LOS C	0.1	0.9	0.51	0.58	0.51	29.8
East: Racecourse Dr (E)															
4	L2	All MCs	1	0.0	1	0.0	0.001	5.9	LOS A	0.0	0.0	0.10	0.56	0.10	49.7
5	T1	All MCs	529	2.9	529	2.9	* 0.502	39.5	LOS D	13.0	93.6	0.89	0.76	0.89	36.5
6	R2	All MCs	155	5.3	155	5.3	0.314	42.8	LOS D	7.2	52.6	0.84	0.78	0.84	25.2
Approach			685	3.4	685	3.4	0.502	40.2	LOS D	13.0	93.6	0.88	0.76	0.88	34.5
North: Lakeside Dr (N)															
8	T1	All MCs	6	0.0	6	0.0	* 0.513	0.7	LOS A	1.1	7.5	0.04	0.57	0.04	43.4
9	R2	All MCs	912	0.6	912	0.6	0.513	5.6	LOS A	1.1	7.5	0.04	0.57	0.04	48.7
Approach			918	0.6	918	0.6	0.513	5.6	LOS A	1.1	7.5	0.04	0.57	0.04	48.7
All Vehicles			1614	1.9	1614	1.9	0.513	20.4	LOS C	13.0	93.6	0.40	0.65	0.40	39.9

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
West: Racecourse Dr (W)											
P4	Full	58	54.3	LOS E[12]	0.2	0.2	0.95	0.95	208.1	200.0	0.96
All Pedestrians		58	54.3	LOS E[12]	0.2	0.2	0.95	0.95	208.1	200.0	0.96

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

Appendix E SIDRA outputs (development)

MOVEMENT SUMMARY

Site: 101 [Racecourse_Lakeside_Development_2029_AM (WEST) (Site Folder: Development- Racecourse Rd / Lakeside Dr)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Racecourse_Lakeside_Townsville Turf Club Access_Development_2029_AM (Network Folder: Existing)]

2029 Development Traffic Volumes
Site Category: Future Conditions 1
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network Site User-Given Phase Times)
Design Life Analysis (Final Year): Results for 5 years

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lakeside Dr (S)															
2	T1	All MCs	228	3.1	228	3.1	0.159	23.6	LOS C	4.0	28.9	0.64	0.52	0.64	27.4
3	R2	All MCs	107	6.5	107	6.5	* 1.210	266.0	LOS F	13.4	99.1	1.00	1.35	2.48	1.2
Approach			336	4.2	336	4.2	1.210	101.2	LOS F	13.4	99.1	0.75	0.78	1.23	7.9
North: Lakeside Dr (N)															
7	L2	All MCs	94	11.1	94	11.1	0.199	49.2	LOS D	4.2	32.4	0.81	0.76	0.81	16.2
8	T1	All MCs	806	3.9	806	3.9	* 0.790	50.0	LOS D	23.4	169.8	0.99	0.91	1.05	15.0
Approach			900	4.6	900	4.6	0.790	49.9	LOS D	23.4	169.8	0.97	0.89	1.03	14.1
West: Racecourse Dr (W)															
10	L2	All MCs	816	2.0	816	2.0	0.648	6.1	LOS A	15.0	108.3	0.39	0.64	0.39	49.7
11	T1	All MCs	531	14.7	531	14.7	* 0.648	15.3	LOS B	15.0	108.3	0.54	0.52	0.54	41.1
12	R2	All MCs	191	6.1	191	6.1	0.204	21.7	LOS C	5.8	43.0	0.57	0.72	0.57	35.4
Approach			1538	6.9	1538	6.9	0.648	11.2	LOS B	15.0	108.3	0.46	0.61	0.46	45.3
All Vehicles			2773	5.8	2773	5.8	1.210	34.7	LOS C	23.4	169.8	0.66	0.72	0.74	26.7

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
West: Racecourse Dr (W)											
P4	Full	6	54.2	LOS E	0.0	0.0	0.95	0.95	208.0	200.0	0.96
All Pedestrians		6	54.2	LOS E	0.0	0.0	0.95	0.95	208.0	200.0	0.96

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

MOVEMENT SUMMARY

Site: 101 [Racecourse_Lakeside_Townsville Turf Club Access_Development_2029_AM (Site Folder: Development-Racecourse Rd / Lakeside Dr)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Racecourse_Lakeside_Townsville Turf Club Access_Development_2029_AM (Network Folder: Existing)]

2029 Development Traffic Volumes
Site Category: Future Conditions 1
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network Site User-Given Phase Times)
Design Life Analysis (Final Year): Results for 5 years

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Townsville Turf Club Access (S)															
1	L2	All MCs	168	2.8	168	2.8	0.279	9.9	LOS A	2.9	20.6	0.37	0.66	0.37	46.0
2	T1	All MCs	183	1.3	183	1.3	* 0.610	59.8	LOS E[11]	6.4	45.2	1.00	0.81	1.04	8.6
Approach			352	2.0	352	2.0	0.610	35.9	LOS D	6.4	45.2	0.70	0.74	0.72	23.9
East: Racecourse Dr (E)															
4	L2	All MCs	90	0.0	90	0.0	0.066	6.4	LOS A	0.5	3.6	0.16	0.59	0.16	49.4
5	T1	All MCs	574	14.0	574	14.0	* 0.482	34.1	LOS C	13.3	104.5	0.85	0.72	0.85	38.5
6	R2	All MCs	159	8.8	159	8.8	0.393	39.1	LOS D	7.2	54.5	0.81	0.79	0.81	26.6
Approach			823	11.5	823	11.5	0.482	32.1	LOS C	13.3	104.5	0.77	0.72	0.77	37.3
North: Lakeside Dr (N)															
8	T1	All MCs	285	1.6	285	1.6	* 0.642	6.4	LOS A	9.8	70.3	0.36	0.48	0.36	37.7
9	R2	All MCs	714	5.0	714	5.0	0.642	7.6	LOS A	9.8	70.3	0.16	0.55	0.16	47.3
Approach			999	4.0	999	4.0	0.642	7.2	LOS A	9.8	70.3	0.21	0.53	0.21	45.7
All Vehicles			2173	6.5	2173	6.5	0.642	21.3	LOS C	13.3	104.5	0.50	0.64	0.50	37.6

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

11 Level of Service is worse than the Level of Service Target specified in the Parameter Settings dialog.
* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
West: Racecourse Dr (W)											
P4	Full	58	54.3	LOS E[12]	0.2	0.2	0.95	0.95	208.1	200.0	0.96
All Pedestrians		58	54.3	LOS E[12]	0.2	0.2	0.95	0.95	208.1	200.0	0.96

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.

MOVEMENT SUMMARY

Site: 101 [Racecourse_Lakeside_Development_2029_PM (WEST) (Site Folder: Development- Racecourse Rd / Lakeside Dr)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Racecourse_Lakeside_Townsville Turf Club Access_Development_2029_PM (Network Folder: Existing)]

2029 Development Traffic Volumes
Site Category: Future Conditions 1
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network Site User-Given Phase Times)
Design Life Analysis (Final Year): Results for 5 years

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lakeside Dr (S)															
2	T1	All MCs	293	1.6	272	1.7	0.128	11.6	LOS B	3.4	24.1	0.44	0.36	0.44	37.9
3	R2	All MCs	153	5.3	137	6.0	* 1.533	555.2	LOS F	16.6	122.4	1.00	1.80	3.68	0.6
Approach			446	2.9	408	3.1	1.533	193.5	LOS F	16.6	122.4	0.63	0.84	1.52	4.3
North: Lakeside Dr (N)															
7	L2	All MCs	227	4.6	227	4.6	0.280	27.7	LOS C	8.2	60.0	0.67	0.76	0.67	21.4
8	T1	All MCs	1085	1.6	1085	1.6	* 0.839	37.3	LOS D	39.4	280.4	0.95	0.92	1.04	17.5
Approach			1312	2.2	1312	2.2	0.839	35.6	LOS D	39.4	280.4	0.90	0.89	0.97	18.1
West: Racecourse Dr (W)															
10	L2	All MCs	543	0.9	543	0.9	0.497	5.7	LOS A	6.0	42.9	0.24	0.56	0.24	50.9
11	T1	All MCs	417	9.2	417	9.2	* 0.497	24.3	LOS C	11.3	85.1	0.65	0.63	0.65	33.8
12	R2	All MCs	133	7.9	133	7.9	0.216	34.9	LOS C	5.4	40.6	0.74	0.75	0.74	28.3
Approach			1093	4.9	1093	4.9	0.497	16.4	LOS B	11.3	85.1	0.46	0.61	0.46	41.1
All Vehicles			2851	3.3	2813	3.4	1.533	51.0	LOS D	39.4	280.4	0.69	0.78	0.85	19.2

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
West: Racecourse Dr (W)											
P4	Full	6	54.2	LOS E	0.0	0.0	0.95	0.95	208.0	200.0	0.96
All Pedestrians		6	54.2	LOS E	0.0	0.0	0.95	0.95	208.0	200.0	0.96

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

MOVEMENT SUMMARY

Site: 101 [Racecourse_Lakeside_Townsville Turf Club Access_Development_2029_PM (Site Folder: Development-Racecourse Rd / Lakeside Dr)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Racecourse_Lakeside_Townsville Turf Club Access_Development_2029_PM (Network Folder: Existing)]

2029 Development Traffic Volumes
Site Category: Future Conditions 1
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network Site User-Given Phase Times)
Design Life Analysis (Final Year): Results for 5 years

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Townsville Turf Club Access (S)															
1	L2	All MCs	159	3.6	159	3.6	0.341	15.6	LOS B	4.4	31.5	0.54	0.72	0.54	41.4
2	T1	All MCs	308	0.0	308	0.0	* 1.147	207.8	LOS F[11]	22.9	160.3	1.00	1.43	2.32	2.8
Approach			467	1.2	467	1.2	1.147	142.2	LOS F[11]	22.9	160.3	0.84	1.19	1.71	7.5
East: Racecourse Dr (E)															
4	L2	All MCs	110	0.0	110	0.0	0.082	6.9	LOS A	0.9	6.2	0.20	0.60	0.20	48.8
5	T1	All MCs	771	7.4	771	7.4	* 0.621	36.2	LOS D	18.9	141.0	0.90	0.78	0.90	37.7
6	R2	All MCs	114	5.1	114	5.1	0.381	39.3	LOS D	5.2	38.1	0.81	0.78	0.81	26.5
Approach			994	6.3	994	6.3	0.621	33.3	LOS C	18.9	141.0	0.81	0.76	0.81	37.4
North: Lakeside Dr (N)															
8	T1	All MCs	271	1.7	271	1.7	* 0.778	11.4	LOS B	17.2	122.4	0.62	0.68	0.62	30.3
9	R2	All MCs	953	2.0	953	2.0	0.778	10.5	LOS B	17.2	122.4	0.36	0.65	0.36	44.5
Approach			1224	1.9	1224	1.9	0.778	10.7	LOS B	17.2	122.4	0.42	0.66	0.42	42.4
All Vehicles			2685	3.4	2685	3.4	1.147	41.9	LOS D	22.9	160.3	0.64	0.79	0.79	28.2

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

11 Level of Service is worse than the Level of Service Target specified in the Parameter Settings dialog.
* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
West: Racecourse Dr (W)											
P4	Full	58	54.3	LOS E[12]	0.2	0.2	0.95	0.95	208.1	200.0	0.96
All Pedestrians		58	54.3	LOS E[12]	0.2	0.2	0.95	0.95	208.1	200.0	0.96

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.

MOVEMENT SUMMARY

Site: 101 [Racecourse_Lakeside_Development_2029_Weekend (WEST) (Site Folder: Development- Racecourse Rd / Lakeside Dr)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Racecourse_Lakeside_Townsville Turf Club Access_Development_2029_Weekend (Network Folder: Existing)]

2029 Development Traffic Volumes
Site Category: Future Conditions 1
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network Site User-Given Phase Times)
Design Life Analysis (Final Year): Results for 5 years

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lakeside Dr (S)															
2	T1	All MCs	349	1.0	335	1.0	0.148	12.1	LOS B	4.7	33.3	0.49	0.41	0.49	37.3
3	R2	All MCs	134	2.6	126	2.8	* 1.378	416.6	LOS F	17.1	122.4	1.00	1.60	3.16	0.8
Approach			483	1.4	460	1.5	1.378	122.3	LOS F	17.1	122.4	0.63	0.73	1.22	6.9
North: Lakeside Dr (N)															
7	L2	All MCs	223	5.2	223	5.2	0.258	25.0	LOS C	7.6	55.6	0.63	0.75	0.63	22.8
8	T1	All MCs	1120	0.5	1120	0.5	* 0.798	30.1	LOS C	36.5	257.1	0.91	0.85	0.94	20.3
Approach			1343	1.3	1343	1.3	0.798	29.2	LOS C	36.5	257.1	0.86	0.83	0.89	20.7
West: Racecourse Dr (W)															
10	L2	All MCs	431	2.8	431	2.8	0.435	5.8	LOS A	5.2	37.3	0.26	0.56	0.26	50.5
11	T1	All MCs	488	4.5	488	4.5	* 0.435	28.4	LOS C	12.1	87.8	0.71	0.66	0.71	31.5
12	R2	All MCs	157	0.0	157	0.0	0.267	38.3	LOS D	6.8	47.8	0.79	0.77	0.79	26.8
Approach			1076	3.2	1076	3.2	0.435	20.8	LOS C	12.1	87.8	0.54	0.64	0.54	37.7
All Vehicles			2902	2.0	2879	2.0	1.378	41.0	LOS D	36.5	257.1	0.70	0.74	0.81	21.8

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
West: Racecourse Dr (W)											
P4	Full	6	54.2	LOS E	0.0	0.0	0.95	0.95	208.0	200.0	0.96
All Pedestrians		6	54.2	LOS E	0.0	0.0	0.95	0.95	208.0	200.0	0.96

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.

MOVEMENT SUMMARY

Site: 101 [Racecourse_Lakeside_Townsville Turf Club Access_Development_2029_Weekend (Site Folder: Development- Racecourse Rd / Lakeside Dr)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Racecourse_Lakeside_Townsville Turf Club Access_Development_2029_Weekend (Network Folder: Existing)]

2029 Development Traffic Volumes
Site Category: Future Conditions 1
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 120 seconds (Network Site User-Given Phase Times)
Design Life Analysis (Final Year): Results for 5 years

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Townsville Turf Club Access (S)															
1	L2	All MCs	151	1.5	151	1.5	0.268	10.8	LOS B	2.8	20.2	0.39	0.67	0.39	45.2
2	T1	All MCs	297	0.0	297	0.0	* 1.109	176.2	LOS F [11]	20.4	142.5	1.00	1.36	2.16	3.2
Approach			448	0.5	448	0.5	1.109	120.4	LOS F [11]	20.4	142.5	0.80	1.13	1.56	8.6
East: Racecourse Dr (E)															
4	L2	All MCs	119	0.0	119	0.0	0.096	7.2	LOS A	1.1	7.7	0.22	0.61	0.22	48.5
5	T1	All MCs	529	2.9	529	2.9	0.502	39.5	LOS D	13.0	93.6	0.89	0.76	0.89	36.5
6	R2	All MCs	155	5.3	155	5.3	* 0.628	48.5	LOS D	8.3	60.6	0.93	0.83	0.94	23.4
Approach			802	2.9	802	2.9	0.628	36.4	LOS D	13.0	93.6	0.80	0.75	0.80	35.3
North: Lakeside Dr (N)															
8	T1	All MCs	358	0.0	358	0.0	* 0.701	10.9	LOS B	17.4	122.4	0.56	0.62	0.56	31.5
9	R2	All MCs	912	0.6	912	0.6	0.701	8.9	LOS A	17.4	122.4	0.22	0.60	0.22	46.2
Approach			1271	0.4	1271	0.4	0.701	9.4	LOS A	17.4	122.4	0.32	0.60	0.32	43.4
All Vehicles			2522	1.2	2522	1.2	1.109	37.8	LOS D	20.4	142.5	0.56	0.74	0.70	28.5

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

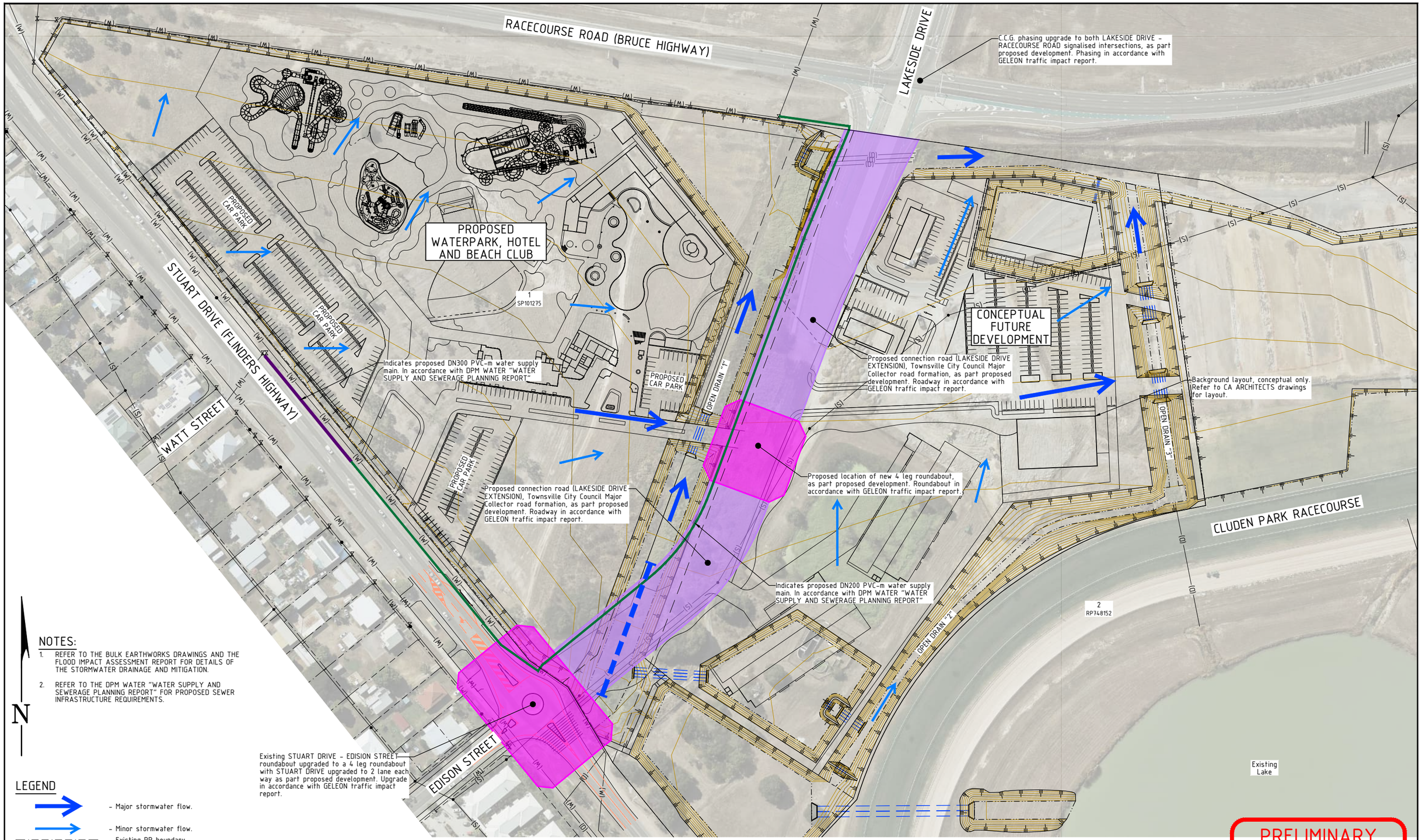
11 Level of Service is worse than the Level of Service Target specified in the Parameter Settings dialog.
* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
West: Racecourse Dr (W)											
P4	Full	58	54.3	LOS E [12]	0.2	0.2	0.95	0.95	208.1	200.0	0.96
All Pedestrians		58	54.3	LOS E [12]	0.2	0.2	0.95	0.95	208.1	200.0	0.96

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

Appendix F Civil engineering drawings



NOTES:

1. REFER TO THE BULK EARTHWORKS DRAWINGS AND THE FLOOD IMPACT ASSESSMENT REPORT FOR DETAILS OF THE STORMWATER DRAINAGE AND MITIGATION.
2. REFER TO THE DPM WATER "WATER SUPPLY AND SEWERAGE PLANNING REPORT" FOR PROPOSED SEWER INFRASTRUCTURE REQUIREMENTS.

LEGEND

- Major stormwater flow.
- Minor stormwater flow.
- Existing RP boundary.
- Proposed DN200 water main.
- Proposed DN200 water main.
- (S) – Existing sewer main.
- Existing sewer manhole.
- (D) – Existing stormwater drain line.
- (W) – Existing water main.
- Stormwater drain line.
- 4.0 – Bulk earthworks major contour.
- 4.5 – Bulk earthworks minor contour.
- Top of batter.
- Toe of batter.
- Change of grade.

LAYOUT PLAN

PRELIMINARY
NOT FOR CONSTRUCTION

Scale 1:1000 @ A1
0 10 20 30 40m

All work is to be carried out in accordance with LOCAL AUTHORITY'S standard details.

Issue	Description	Date
P1	PRELIMINARY – NOT FOR CONSTRUCTION – ISSUED FOR APPROVAL.	16/08/2024

ENGINEERING CERTIFICATION

Signed:

ANDREW IAN WALLACE – RPEQ No. 6743

THE ORIGINAL OF THIS DOCUMENT IS COMPLETED TO THE SCALE NOTED. AS REPRODUCTION CAN DISTORT SIZE & SHAPE USE ONLY THE DIMENSIONS PROVIDED ON ARCHITECTURAL &/OR ENGINEERING DRAWINGS. VERIFY DIMENSIONS ON SITE BEFORE CONSTRUCTION.

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Drawn	DC
Date	16/08/2024
Checked	AW
Approved	AW

In Association With
MCK TSV Pty Ltd

TOWNSVILLE WATERPARK AND HOTEL
STUART DRIVE, CLUDEN
(1 on SP101275, 2 on RP748152)

OVERALL CONCEPT LAYOUT AND SERVICES PLAN

Drawing Number BNC0084/C01

Issue P1

Appendix G SIDRA outputs (design)

MOVEMENT SUMMARY

Site: 404 [Precinct 1 & 2_Precinct 3_Design_2029_AM (Site Folder: Final Design 1)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Racecourse_Lakeside_Townsville Turf Club Access_Design_2029_AM (Network Folder: Design)]

2029 DesignTraffic Volumes
Site Category: Proposed Design 1
Roundabout
Design Life Analysis (Final Year): Results for 5 years

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lakeside Dr Extended (S)															
1	L2	All MCs	37	0.0	37	0.0	0.222	6.3	LOS A	1.5	10.7	0.58	0.58	0.58	44.0
2	T1	All MCs	135	6.9	135	6.9	0.222	6.9	LOS A	1.5	10.7	0.58	0.58	0.58	36.5
3	R2	All MCs	45	0.0	45	0.0	0.222	10.8	LOS B	1.5	10.7	0.58	0.58	0.58	43.3
Approach			217	4.3	217	4.3	0.222	7.6	LOS A	1.5	10.7	0.58	0.58	0.58	40.2
East: Precinct 1 & 2 Access (E)															
4	L2	All MCs	57	0.0	57	0.0	0.246	6.0	LOS A	1.7	12.3	0.54	0.61	0.54	38.5
5	T1	All MCs	1	0.0	1	0.0	0.246	6.3	LOS A	1.7	12.3	0.54	0.61	0.54	44.7
6	R2	All MCs	201	3.1	201	3.1	0.246	10.6	LOS B	1.7	12.3	0.54	0.61	0.54	38.5
Approach			259	2.4	259	2.4	0.246	9.6	LOS A	1.7	12.3	0.54	0.61	0.54	38.5
North: Lakeside Dr Extended (N)															
7	L2	All MCs	169	2.5	169	2.5	0.306	4.5	LOS A	2.0	14.7	0.25	0.52	0.25	45.5
8	T1	All MCs	129	9.0	129	9.0	0.306	5.0	LOS A	2.0	14.7	0.25	0.52	0.25	39.3
9	R2	All MCs	122	0.0	122	0.0	0.306	9.0	LOS A	2.0	14.7	0.25	0.52	0.25	45.1
Approach			421	3.8	421	3.8	0.306	5.9	LOS A	2.0	14.7	0.25	0.52	0.25	44.2
West: Precinct 3 Access (W)															
10	L2	All MCs	73	0.0	73	0.0	0.100	6.4	LOS A	0.6	4.1	0.57	0.62	0.57	41.1
11	T1	All MCs	1	0.0	1	0.0	0.100	6.8	LOS A	0.6	4.1	0.57	0.62	0.57	46.7
12	R2	All MCs	21	0.0	21	0.0	0.100	10.9	LOS B	0.6	4.1	0.57	0.62	0.57	41.1
Approach			95	0.0	95	0.0	0.100	7.4	LOS A	0.6	4.1	0.57	0.62	0.57	41.2
All Vehicles			991	3.2	991	3.2	0.306	7.4	LOS A	2.0	14.7	0.43	0.57	0.43	41.7

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

MOVEMENT SUMMARY

Site: 505 [Stuart_Edison_Design_2029_AM (Site Folder: Final Design 1)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Racecourse_Lakeside_Townsville Turf Club Access_Design_2029_AM (Network Folder: Design)]

2029 Design Traffic Volumes
Site Category: Proposed Design 1
Roundabout
Design Life Analysis (Final Year): Results for 5 years

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Stuart Dr (S)															
1	L2	All MCs	45	14.6	45	14.6	0.358	6.2	LOS A	2.4	18.0	0.42	0.50	0.42	55.0
2	T1	All MCs	736	8.5	736	8.5	0.358	7.4	LOS A	2.4	18.0	0.43	0.52	0.43	56.8
3	R2	All MCs	130	5.4	130	5.4	0.358	11.2	LOS B	2.3	17.5	0.44	0.56	0.44	52.9
3u	U	All MCs	1	0.0	1	0.0	0.358	13.4	LOS B	2.3	17.5	0.44	0.56	0.44	57.1
Approach			912	8.3	912	8.3	0.358	7.9	LOS A	2.4	18.0	0.43	0.53	0.43	56.3
East: Lakeside Dr Extended (E)															
4	L2	All MCs	123	6.6	123	6.6	0.274	7.7	LOS A	1.2	8.6	0.60	0.74	0.60	50.3
5	T1	All MCs	26	8.9	26	8.9	0.274	7.2	LOS A	1.2	8.6	0.60	0.74	0.60	48.8
6	R2	All MCs	58	2.0	58	2.0	0.274	11.6	LOS B	1.2	8.6	0.60	0.74	0.60	50.8
Approach			207	5.6	207	5.6	0.274	8.7	LOS A	1.2	8.6	0.60	0.74	0.60	50.2
North: Stuart Dr (N)															
7	L2	All MCs	43	2.7	43	2.7	0.304	6.0	LOS A	1.9	14.5	0.43	0.51	0.43	54.6
8	T1	All MCs	614	10.3	614	10.3	0.304	7.1	LOS A	1.9	14.5	0.44	0.53	0.44	56.3
9	R2	All MCs	81	2.7	81	2.7	0.304	11.2	LOS B	1.9	14.1	0.45	0.56	0.45	54.1
9u	U	All MCs	12	0.0	12	0.0	0.304	13.4	LOS B	1.9	14.1	0.45	0.56	0.45	57.1
Approach			750	8.9	750	8.9	0.304	7.5	LOS A	1.9	14.5	0.44	0.53	0.44	56.0
West: Edison St (W)															
10	L2	All MCs	180	1.2	180	1.2	0.396	10.0	LOS B	1.9	13.4	0.69	0.83	0.78	53.5
11	T1	All MCs	44	5.3	44	5.3	0.396	9.0	LOS A	1.9	13.4	0.69	0.83	0.78	46.5
12	R2	All MCs	25	0.0	25	0.0	0.396	13.3	LOS B	1.9	13.4	0.69	0.83	0.78	53.1
12u	U	All MCs	1	0.0	1	0.0	0.396	15.4	LOS B	1.9	13.4	0.69	0.83	0.78	50.6
Approach			250	1.8	250	1.8	0.396	10.2	LOS B	1.9	13.4	0.69	0.83	0.78	52.6
All Vehicles			2120	7.5	2120	7.5	0.396	8.1	LOS A	2.4	18.0	0.48	0.58	0.49	55.3

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

CCG MOVEMENT SUMMARY

Common Control Group: CCG1 [Racecourse Dr]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Racecourse_Lakeside_Townsville Turf Club Access_Design_2029_AM (Network Folder: Design)]

EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (CCG User-Given Phase Times)
Design Life Analysis (Final Year): Results for 5 years

Vehicle Movement Performance (CCG)

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
Site: 202 [Racecourse_Lakeside_Design_2029_AM (WEST)]															
South: Lakeside Dr (S)															
2	T1	All MCs	310	2.6	310	2.6	0.159	10.9	LOS B	4.6	32.8	0.38	0.32	0.38	38.8
3	R2	All MCs	133	11.3	133	11.3	*0.777	47.3	LOS D	7.3	56.4	0.93	0.80	0.98	6.1
Approach			443	5.2	443	5.2	0.777	21.8	LOS C	7.3	56.4	0.55	0.46	0.56	24.9
North: Lakeside Dr (N)															
7	L2	All MCs	94	11.1	94	11.1	0.153	36.6	LOS D	3.7	28.4	0.71	0.74	0.71	18.9
8	T1	All MCs	806	3.9	806	3.9	0.599	35.2	LOS D	19.4	140.8	0.87	0.76	0.87	18.8
Approach			900	4.6	900	4.6	0.599	35.4	LOS D	19.4	140.8	0.86	0.76	0.86	18.2
West: Racecourse Dr (W)															
10	L2	All MCs	735	2.1	735	2.1	0.682	5.9	LOS A	16.5	119.7	0.43	0.65	0.43	49.7
11	T1	All MCs	478	14.6	478	14.6	*0.682	21.4	LOS C	16.5	119.7	0.63	0.61	0.63	36.5
12	R2	All MCs	138	8.4	138	8.4	0.351	33.7	LOS C	5.8	43.4	0.75	0.77	0.75	28.8
Approach			1350	7.1	1350	7.1	0.682	14.2	LOS B	16.5	119.7	0.53	0.65	0.53	42.8
All Vehicles			2693	6.0	2693	6.0	0.777	22.5	LOS C	19.4	140.8	0.64	0.65	0.65	32.4
Site: 303 [Racecourse_Lakeside_Lakeside Extended_Design_2029_AM]															
South: Lakeside Dr Extended (S)															
1	L2	All MCs	118	3.9	118	3.9	0.172	9.7	LOS A	1.8	13.2	0.34	0.65	0.34	46.6
2	T1	All MCs	292	4.0	292	4.0	0.768	61.7	LOS E[11]	9.0	65.0	1.00	0.90	1.16	9.6
Approach			410	4.0	410	4.0	0.768	46.7	LOS D	9.0	65.0	0.81	0.83	0.92	18.1
East: Racecourse Dr (E)															
4	L2	All MCs	118	6.9	118	6.9	0.091	7.3	LOS A	1.1	8.1	0.22	0.61	0.22	48.7
5	T1	All MCs	517	13.9	517	13.9	0.369	27.7	LOS C	10.7	83.7	0.76	0.65	0.76	41.4
6	R2	All MCs	159	8.8	159	8.8	0.233	31.7	LOS C	6.2	46.5	0.71	0.75	0.71	29.7
Approach			795	11.9	795	11.9	0.369	25.5	LOS C	10.7	83.7	0.67	0.66	0.67	40.0
North: Lakeside Dr (N)															
8	T1	All MCs	303	2.7	303	2.7	*0.721	14.5	LOS B	16.5	119.3	0.63	0.64	0.63	15.2
9	R2	All MCs	643	5.1	643	5.1	0.721	12.5	LOS B	16.5	119.3	0.41	0.66	0.41	42.6
Approach			946	4.3	946	4.3	0.721	13.1	LOS B	16.5	119.3	0.48	0.65	0.48	37.9
All Vehicles			2150	7.0	2150	7.0	0.768	24.1	LOS C	16.5	119.3	0.61	0.69	0.63	34.6

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
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.

11 Level of Service is worse than the Level of Service Target specified in the Parameter Settings dialog.
* Critical Movement (Signal Timing)

Pedestrian Movement Performance (CCG)

Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE [Ped	Dist]	Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		ped	m			sec	m	m/sec
Site: 202 [Racecourse_Lakeside_Design_2029_AM (WEST)]											
West: Racecourse Dr (W)											
P4	Full	23	54.2	LOS E	0.1	0.1	0.95	0.95	208.0	200.0	0.96
All Pedestrians		23	54.2	LOS E	0.1	0.1	0.95	0.95	208.0	200.0	0.96
Site: 303 [Racecourse_Lakeside_Lakeside Extended_Design_2029_AM]											
West: Racecourse Dr (W)											
P4	Full	23	54.2	LOS E	0.1	0.1	0.95	0.95	208.0	200.0	0.96
All Pedestrians		23	54.2	LOS E	0.1	0.1	0.95	0.95	208.0	200.0	0.96

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

MOVEMENT SUMMARY

Site: 303 [Precinct 1 & 2_Precinct 3_Design_2029_PM (Site Folder: Final Design 1)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Racecourse_Lakeside_Townsville Turf Club Access_Design_2029_PM (Network Folder: Design)]

2029 Design Traffic Volumes
Site Category: Proposed Design 1
Roundabout
Design Life Analysis (Final Year): Results for 5 years

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lakeside Dr Extended (S)															
1	L2	All MCs	17	0.0	17	0.0	0.177	6.1	LOS A	1.1	8.1	0.57	0.59	0.57	43.7
2	T1	All MCs	102	4.5	102	4.5	0.177	6.6	LOS A	1.1	8.1	0.57	0.59	0.57	36.1
3	R2	All MCs	55	0.0	55	0.0	0.177	10.6	LOS B	1.1	8.1	0.57	0.59	0.57	43.0
Approach			174	2.7	174	2.7	0.177	7.8	LOS A	1.1	8.1	0.57	0.59	0.57	40.1
East: Precinct 1 & 2 Access (E)															
4	L2	All MCs	56	0.0	56	0.0	0.291	6.1	LOS A	2.1	14.6	0.56	0.62	0.56	38.2
5	T1	All MCs	1	0.0	1	0.0	0.291	6.4	LOS A	2.1	14.6	0.56	0.62	0.56	44.4
6	R2	All MCs	247	2.1	247	2.1	0.291	10.6	LOS B	2.1	14.6	0.56	0.62	0.56	38.2
Approach			304	1.7	304	1.7	0.291	9.8	LOS A	2.1	14.6	0.56	0.62	0.56	38.2
North: Lakeside Dr Extended (N)															
7	L2	All MCs	237	0.9	237	0.9	0.356	4.7	LOS A	2.6	18.2	0.31	0.50	0.31	46.1
8	T1	All MCs	172	4.7	172	4.7	0.356	5.1	LOS A	2.6	18.2	0.31	0.50	0.31	39.7
9	R2	All MCs	71	0.0	71	0.0	0.356	9.1	LOS A	2.6	18.2	0.31	0.50	0.31	45.4
Approach			479	2.1	479	2.1	0.356	5.5	LOS A	2.6	18.2	0.31	0.50	0.31	44.5
West: Precinct 3 Access (W)															
10	L2	All MCs	133	0.0	133	0.0	0.178	6.8	LOS A	1.1	7.8	0.61	0.63	0.61	40.7
11	T1	All MCs	1	0.0	1	0.0	0.178	7.1	LOS A	1.1	7.8	0.61	0.63	0.61	46.5
12	R2	All MCs	32	0.0	32	0.0	0.178	11.2	LOS B	1.1	7.8	0.61	0.63	0.61	40.7
Approach			165	0.0	165	0.0	0.178	7.6	LOS A	1.1	7.8	0.61	0.63	0.61	40.8
All Vehicles			1123	1.8	1123	1.8	0.356	7.3	LOS A	2.6	18.2	0.46	0.57	0.46	41.7

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

MOVEMENT SUMMARY

Site: 101 [Stuart_Edison_Design_2029_PM (Site Folder: Final Design 1)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Racecourse_Lakeside_Townsville Turf Club Access_Design_2029_PM (Network Folder: Design)]

2029 Design Traffic Volumes
Site Category: Proposed Design 1
Roundabout
Design Life Analysis (Final Year): Results for 5 years

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Stuart Dr (S)															
1	L2	All MCs	46	0.0	46	0.0	0.378	6.5	LOS A	2.6	18.4	0.53	0.55	0.53	55.0
2	T1	All MCs	748	3.9	748	3.9	0.378	7.8	LOS A	2.6	18.4	0.54	0.57	0.54	57.3
3	R2	All MCs	102	3.4	102	3.4	0.378	11.9	LOS B	2.5	17.9	0.55	0.60	0.55	52.3
3u	U	All MCs	1	0.0	1	0.0	0.378	14.1	LOS B	2.5	17.9	0.55	0.60	0.55	56.7
Approach			897	3.7	897	3.7	0.378	8.2	LOS A	2.6	18.4	0.54	0.57	0.54	56.9
East: Lakeside Dr Extended (E)															
4	L2	All MCs	152	3.1	152	3.1	0.366	8.8	LOS A	1.7	12.2	0.67	0.81	0.73	50.7
5	T1	All MCs	47	2.5	47	2.5	0.366	8.0	LOS A	1.7	12.2	0.67	0.81	0.73	48.4
6	R2	All MCs	60	2.0	60	2.0	0.366	12.6	LOS B	1.7	12.2	0.67	0.81	0.73	50.2
Approach			258	2.7	258	2.7	0.366	9.5	LOS A	1.7	12.2	0.67	0.81	0.73	50.1
North: Stuart Dr (N)															
7	L2	All MCs	41	0.0	41	0.0	0.367	5.8	LOS A	2.6	18.4	0.40	0.49	0.40	54.7
8	T1	All MCs	757	4.0	757	4.0	0.367	6.9	LOS A	2.6	18.4	0.41	0.52	0.41	57.8
9	R2	All MCs	173	0.6	173	0.6	0.367	10.9	LOS B	2.5	17.9	0.42	0.56	0.42	53.9
9u	U	All MCs	11	0.0	11	0.0	0.367	13.3	LOS B	2.5	17.9	0.42	0.56	0.42	56.8
Approach			981	3.2	981	3.2	0.367	7.6	LOS A	2.6	18.4	0.41	0.52	0.41	57.0
West: Edison St (W)															
10	L2	All MCs	102	6.5	102	6.5	0.257	9.1	LOS A	1.1	7.9	0.66	0.78	0.66	52.8
11	T1	All MCs	31	3.7	31	3.7	0.257	7.9	LOS A	1.1	7.9	0.66	0.78	0.66	47.2
12	R2	All MCs	22	0.0	22	0.0	0.257	12.4	LOS B	1.1	7.9	0.66	0.78	0.66	53.6
12u	U	All MCs	1	0.0	1	0.0	0.257	14.5	LOS B	1.1	7.9	0.66	0.78	0.66	51.0
Approach			156	5.0	156	5.0	0.257	9.4	LOS A	1.1	7.9	0.66	0.78	0.66	52.2
All Vehicles			2293	3.4	2293	3.4	0.378	8.2	LOS A	2.6	18.4	0.51	0.59	0.51	56.0

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

CCG MOVEMENT SUMMARY

Common Control Group: CCG1 [Racecourse Dr]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Racecourse_Lakeside_Townsville Turf Club Access_Design_2029_PM (Network Folder: Design)]

EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (CCG User-Given Phase Times)
Design Life Analysis (Final Year): Results for 5 years

Vehicle Movement Performance (CCG)

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
Site: 101 [Racecourse_Lakeside_Design_2029_PM (WEST)]															
South: Lakeside Dr (S)															
2	T1	All MCs	348	1.3	348	1.3	0.140	5.6	LOS A	3.6	25.6	0.27	0.23	0.27	46.9
3	R2	All MCs	153	7.6	153	7.6	0.746	38.4	LOS D	7.6	56.7	0.85	0.79	0.88	7.3
Approach			501	3.2	501	3.2	0.746	15.6	LOS B	7.6	56.7	0.45	0.40	0.46	29.8
North: Lakeside Dr (N)															
7	L2	All MCs	227	4.6	227	4.6	0.265	30.3	LOS C	7.9	57.2	0.64	0.75	0.64	22.5
8	T1	All MCs	1085	1.6	1085	1.6	0.623	27.2	LOS C	24.6	174.9	0.80	0.72	0.80	22.9
Approach			1312	2.2	1312	2.2	0.623	27.7	LOS C	24.6	174.9	0.77	0.72	0.77	21.4
West: Racecourse Dr (W)															
10	L2	All MCs	488	1.0	488	1.0	0.534	5.7	LOS A	5.9	42.1	0.30	0.58	0.30	50.8
11	T1	All MCs	375	9.3	375	9.3	0.534	27.9	LOS C	9.9	75.2	0.67	0.67	0.67	31.8
12	R2	All MCs	95	11.0	95	11.0	0.354	45.8	LOS D	4.7	35.7	0.86	0.78	0.86	24.3
Approach			959	5.2	959	5.2	0.534	18.4	LOS B	9.9	75.2	0.50	0.63	0.50	39.8
All Vehicles			2772	3.4	2772	3.4	0.746	22.3	LOS C	24.6	174.9	0.62	0.63	0.62	30.5
Site: 101 [Racecourse_Lakeside_Lakeside Extended_Design_2029_PM]															
South: Lakeside Dr Extended (S)															
1	L2	All MCs	114	5.1	114	5.1	0.228	12.7	LOS B	2.5	18.2	0.44	0.68	0.44	44.1
2	T1	All MCs	363	1.3	363	1.3	* 0.804	61.4	LOS E	11.2	79.6	1.00	0.93	1.18	9.7
Approach			477	2.2	477	2.2	0.804	49.7	LOS D	11.2	79.6	0.87	0.87	1.00	16.5
East: Racecourse Dr (E)															
4	L2	All MCs	152	3.8	152	3.8	0.121	7.0	LOS A	1.3	9.2	0.21	0.61	0.21	49.0
5	T1	All MCs	694	7.4	694	7.4	* 0.722	44.5	LOS D	18.8	140.2	0.97	0.85	0.99	34.8
6	R2	All MCs	114	5.1	114	5.1	0.246	43.6	LOS D	5.3	38.6	0.83	0.77	0.83	25.0
Approach			959	6.5	959	6.5	0.722	38.5	LOS D	18.8	140.2	0.84	0.80	0.85	34.8
North: Lakeside Dr (N)															
8	T1	All MCs	329	2.1	329	2.1	* 0.673	8.8	LOS A	15.4	109.6	0.48	0.57	0.48	20.0
9	R2	All MCs	858	1.9	858	1.9	0.673	9.2	LOS A	15.4	109.6	0.27	0.60	0.27	45.8
Approach			1186	2.0	1186	2.0	0.673	9.1	LOS A	15.4	109.6	0.32	0.59	0.32	42.7
All Vehicles			2623	3.7	2623	3.7	0.804	27.2	LOS C	18.8	140.2	0.61	0.72	0.64	33.3

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance (CCG)

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
Site: 101 [Racecourse_Lakeside_Design_2029_PM (WEST)]											
West: Racecourse Dr (W)											
P4	Full	23	54.2	LOS E	0.1	0.1	0.95	0.95	208.0	200.0	0.96
All Pedestrians		23	54.2	LOS E	0.1	0.1	0.95	0.95	208.0	200.0	0.96
Site: 101 [Racecourse_Lakeside_Lakeside Extended_Design_2029_PM]											
West: Racecourse Dr (W)											
P4	Full	23	54.2	LOS E	0.1	0.1	0.95	0.95	208.0	200.0	0.96
All Pedestrians		23	54.2	LOS E	0.1	0.1	0.95	0.95	208.0	200.0	0.96

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

MOVEMENT SUMMARY

Site: 303 [Precinct 1 & 2_Precinct 3_Design_2029_Weekend (Site Folder: Final Design 1)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Racecourse_Lakeside_Townsville Turf Club Access_Design_2029_Weekend (Network Folder: Design)]

2029 DesignTraffic Volumes
Site Category: Proposed Design 1
Roundabout
Design Life Analysis (Final Year): Results for 5 years

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lakeside Dr Extended (S)															
1	L2	All MCs	24	0.0	24	0.0	0.187	6.8	LOS A	1.2	8.6	0.62	0.63	0.62	43.2
2	T1	All MCs	92	3.8	92	3.8	0.187	7.2	LOS A	1.2	8.6	0.62	0.63	0.62	35.4
3	R2	All MCs	55	0.0	55	0.0	0.187	11.2	LOS B	1.2	8.6	0.62	0.63	0.62	42.5
Approach			171	2.0	171	2.0	0.187	8.5	LOS A	1.2	8.6	0.62	0.63	0.62	39.8
East: Precinct 1 & 2 Access (E)															
4	L2	All MCs	55	0.0	55	0.0	0.325	6.2	LOS A	2.4	16.6	0.58	0.63	0.58	37.9
5	T1	All MCs	1	0.0	1	0.0	0.325	6.5	LOS A	2.4	16.6	0.58	0.63	0.58	44.2
6	R2	All MCs	284	0.7	284	0.7	0.325	10.7	LOS B	2.4	16.6	0.58	0.63	0.58	37.9
Approach			340	0.6	340	0.6	0.325	10.0	LOS A	2.4	16.6	0.58	0.63	0.58	37.9
North: Lakeside Dr Extended (N)															
7	L2	All MCs	280	0.0	280	0.0	0.390	4.6	LOS A	3.0	21.2	0.31	0.51	0.31	46.0
8	T1	All MCs	144	0.8	144	0.8	0.390	4.9	LOS A	3.0	21.2	0.31	0.51	0.31	39.4
9	R2	All MCs	120	0.0	120	0.0	0.390	9.1	LOS A	3.0	21.2	0.31	0.51	0.31	45.2
Approach			544	0.2	544	0.2	0.390	5.7	LOS A	3.0	21.2	0.31	0.51	0.31	44.7
West: Precinct 3 Access (W)															
10	L2	All MCs	93	0.0	93	0.0	0.125	6.8	LOS A	0.8	5.3	0.61	0.63	0.61	40.8
11	T1	All MCs	1	0.0	1	0.0	0.125	7.1	LOS A	0.8	5.3	0.61	0.63	0.61	46.5
12	R2	All MCs	19	0.0	19	0.0	0.125	11.3	LOS B	0.8	5.3	0.61	0.63	0.61	40.8
Approach			113	0.0	113	0.0	0.125	7.6	LOS A	0.8	5.3	0.61	0.63	0.61	40.9
All Vehicles			1168	0.6	1168	0.6	0.390	7.5	LOS A	3.0	21.2	0.46	0.57	0.46	41.8

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

MOVEMENT SUMMARY

Site: 101 [Stuart_Edison_Design_2029_Weekend (Site Folder: Final Design 1)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Racecourse_Lakeside_Townsville Turf Club Access_Design_2029_Weekend (Network Folder: Design)]

2029 Design Traffic Volumes
Site Category: Proposed Design 1
Roundabout
Design Life Analysis (Final Year): Results for 5 years

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Stuart Dr (S)															
1	L2	All MCs	25	8.7	25	8.7	0.265	6.0	LOS A	1.6	11.7	0.38	0.49	0.38	55.3
2	T1	All MCs	565	4.5	565	4.5	0.265	6.7	LOS A	1.6	11.7	0.39	0.52	0.39	57.9
3	R2	All MCs	95	2.4	95	2.4	0.265	11.0	LOS B	1.6	11.4	0.40	0.55	0.40	53.2
3u	U	All MCs	1	0.0	1	0.0	0.265	13.3	LOS B	1.6	11.4	0.40	0.55	0.40	57.3
Approach			687	4.4	687	4.4	0.265	7.3	LOS A	1.6	11.7	0.39	0.52	0.39	57.4
East: Lakeside Dr Extended (E)															
4	L2	All MCs	139	0.8	139	0.8	0.271	7.4	LOS A	1.2	8.1	0.59	0.73	0.59	52.4
5	T1	All MCs	28	0.0	28	0.0	0.271	6.9	LOS A	1.2	8.1	0.59	0.73	0.59	49.4
6	R2	All MCs	50	0.0	50	0.0	0.271	11.5	LOS B	1.2	8.1	0.59	0.73	0.59	51.8
Approach			217	0.5	217	0.5	0.271	8.3	LOS A	1.2	8.1	0.59	0.73	0.59	51.8
North: Stuart Dr (N)															
7	L2	All MCs	46	0.0	46	0.0	0.292	5.7	LOS A	1.8	13.1	0.35	0.48	0.35	55.3
8	T1	All MCs	643	2.8	643	2.8	0.292	6.5	LOS A	1.8	13.1	0.36	0.50	0.36	58.5
9	R2	All MCs	100	2.2	100	2.2	0.292	10.8	LOS B	1.8	12.9	0.37	0.54	0.37	54.5
9u	U	All MCs	2	0.0	2	0.0	0.292	13.1	LOS B	1.8	12.9	0.37	0.54	0.37	57.5
Approach			791	2.6	791	2.6	0.292	7.0	LOS A	1.8	13.1	0.36	0.51	0.36	57.8
West: Edison St (W)															
10	L2	All MCs	137	0.8	137	0.8	0.255	7.6	LOS A	1.1	7.6	0.59	0.72	0.59	54.8
11	T1	All MCs	28	4.1	28	4.1	0.255	7.3	LOS A	1.1	7.6	0.59	0.72	0.59	48.4
12	R2	All MCs	18	12.5	18	12.5	0.255	12.4	LOS B	1.1	7.6	0.59	0.72	0.59	51.5
12u	U	All MCs	1	0.0	1	0.0	0.255	13.8	LOS B	1.1	7.6	0.59	0.72	0.59	51.7
Approach			184	2.4	184	2.4	0.255	8.0	LOS A	1.1	7.6	0.59	0.72	0.59	53.8
All Vehicles			1879	3.0	1879	3.0	0.292	7.4	LOS A	1.8	13.1	0.42	0.56	0.42	56.7

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

CCG MOVEMENT SUMMARY

Common Control Group: CCG1 [Racecourse Dr]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Racecourse_Lakeside_Townsville Turf Club Access_Design_2029_Weekend (Network Folder: Design)]

EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (CCG User-Given Phase Times)
Design Life Analysis (Final Year): Results for 5 years

Vehicle Movement Performance (CCG)

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
Site: 101 [Racecourse_Lakeside_Design_2029_Weekend (WEST)]															
South: Lakeside Dr (S)															
2	T1	All MCs	392	1.2	392	1.2	0.140	5.2	LOS A	4.6	32.7	0.32	0.24	0.32	47.6
3	R2	All MCs	151	3.8	151	3.8	0.717	41.6	LOS D	7.6	55.0	0.87	0.79	0.89	6.8
Approach			543	1.9	543	1.9	0.717	15.3	LOS B	7.6	55.0	0.47	0.39	0.48	30.5
North: Lakeside Dr (N)															
7	L2	All MCs	223	5.2	223	5.2	0.220	20.7	LOS C	6.3	46.4	0.53	0.72	0.53	26.7
8	T1	All MCs	1120	0.5	1120	0.5	0.520	17.6	LOS B	20.3	142.6	0.66	0.59	0.66	28.6
Approach			1343	1.3	1343	1.3	0.520	18.1	LOS B	20.3	142.6	0.64	0.62	0.64	27.5
West: Racecourse Dr (W)															
10	L2	All MCs	388	1.8	388	1.8	0.587	5.9	LOS A	9.1	65.0	0.49	0.65	0.49	48.0
11	T1	All MCs	439	4.5	439	4.5	* 0.587	38.1	LOS D	10.7	77.6	0.80	0.73	0.80	28.2
12	R2	All MCs	113	0.0	113	0.0	0.533	55.9	LOS E	6.2	43.7	0.96	0.80	0.96	21.4
Approach			940	2.8	940	2.8	0.587	26.9	LOS C	10.7	77.6	0.69	0.70	0.69	34.3
All Vehicles			2826	1.9	2826	1.9	0.717	20.5	LOS C	20.3	142.6	0.63	0.60	0.63	31.3
Site: 101 [Racecourse_Lakeside_Lakeside Extended_Design_2029_Weekend]															
South: Lakeside Dr Extended (S)															
1	L2	All MCs	110	2.1	110	2.1	0.189	9.1	LOS A	1.6	11.5	0.32	0.64	0.32	47.2
2	T1	All MCs	359	1.0	359	1.0	* 0.793	60.8	LOS E[11]	11.0	77.9	1.00	0.92	1.16	9.7
Approach			469	1.2	469	1.2	0.793	48.7	LOS D	11.0	77.9	0.84	0.86	0.97	16.7
East: Racecourse Dr (E)															
4	L2	All MCs	138	0.8	138	0.8	0.117	6.9	LOS A	1.1	8.1	0.21	0.61	0.21	49.0
5	T1	All MCs	476	2.9	476	2.9	0.711	52.1	LOS D	13.6	97.7	1.00	0.86	1.04	32.5
6	R2	All MCs	155	5.3	155	5.3	0.494	54.6	LOS D	8.3	60.9	0.95	0.80	0.95	21.7
Approach			769	3.0	769	3.0	0.711	44.6	LOS D	13.6	97.7	0.85	0.80	0.87	31.7
North: Lakeside Dr (N)															
8	T1	All MCs	406	0.3	406	0.3	* 0.576	8.2	LOS A	14.8	104.0	0.44	0.52	0.44	21.3
9	R2	All MCs	822	0.7	822	0.7	0.576	8.3	LOS A	14.8	104.0	0.21	0.58	0.21	46.8
Approach			1228	0.6	1228	0.6	0.576	8.3	LOS A	14.8	104.0	0.29	0.56	0.29	43.1
All Vehicles			2465	1.5	2465	1.5	0.793	27.3	LOS C	14.8	104.0	0.57	0.69	0.60	31.8

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
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.

11 Level of Service is worse than the Level of Service Target specified in the Parameter Settings dialog.
* Critical Movement (Signal Timing)

Pedestrian Movement Performance (CCG)

Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE [Ped	Dist]	Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		ped	m			sec	m	m/sec
Site: 101 [Racecourse_Lakeside_Design_2029_Weekend (WEST)]											
West: Racecourse Dr (W)											
P4	Full	6	54.2	LOS E	0.0	0.0	0.95	0.95	208.0	200.0	0.96
All Pedestrians		6	54.2	LOS E	0.0	0.0	0.95	0.95	208.0	200.0	0.96
Site: 101 [Racecourse_Lakeside_Lakeside Extended_Design_2029_Weekend]											
West: Racecourse Dr (W)											
P4	Full	58	54.3	LOS E	0.2	0.2	0.95	0.95	208.1	200.0	0.96
All Pedestrians		58	54.3	LOS E	0.2	0.2	0.95	0.95	208.1	200.0	0.96

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

MOVEMENT SUMMARY

Site: 404 [Precinct 1 & 2_Precinct 3_Design_2039_AM (Site Folder: Final Design 1)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Racecourse_Lakeside_Townsville Turf Club Access_Design_2039_AM (Network Folder: Design)]

2039 Design Traffic Volumes
Site Category: Proposed Design 2
Roundabout
Design Life Analysis (Final Year): Results for 15 years

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lakeside Dr Extended (S)															
1	L2	All MCs	37	0.0	37	0.0	0.253	6.4	LOS A	1.7	12.6	0.59	0.58	0.59	44.0
2	T1	All MCs	164	6.9	164	6.9	0.253	6.9	LOS A	1.7	12.6	0.59	0.58	0.59	36.4
3	R2	All MCs	45	0.0	45	0.0	0.253	10.8	LOS B	1.7	12.6	0.59	0.58	0.59	43.2
Approach			246	4.6	246	4.6	0.253	7.6	LOS A	1.7	12.6	0.59	0.58	0.59	39.8
East: Precinct 1 & 2 Access (E)															
4	L2	All MCs	57	0.0	57	0.0	0.251	6.2	LOS A	1.8	12.9	0.57	0.62	0.57	38.3
5	T1	All MCs	1	0.0	1	0.0	0.251	6.6	LOS A	1.8	12.9	0.57	0.62	0.57	44.5
6	R2	All MCs	201	3.1	201	3.1	0.251	10.8	LOS B	1.8	12.9	0.57	0.62	0.57	38.3
Approach			259	2.4	259	2.4	0.251	9.8	LOS A	1.8	12.9	0.57	0.62	0.57	38.4
North: Lakeside Dr Extended (N)															
7	L2	All MCs	169	2.5	169	2.5	0.326	4.5	LOS A	2.2	15.9	0.25	0.51	0.25	45.5
8	T1	All MCs	157	9.0	157	9.0	0.326	5.0	LOS A	2.2	15.9	0.25	0.51	0.25	39.5
9	R2	All MCs	122	0.0	122	0.0	0.326	9.0	LOS A	2.2	15.9	0.25	0.51	0.25	45.2
Approach			449	4.1	449	4.1	0.326	5.9	LOS A	2.2	15.9	0.25	0.51	0.25	44.1
West: Precinct 3 Access (W)															
10	L2	All MCs	73	0.0	73	0.0	0.103	6.7	LOS A	0.6	4.3	0.59	0.63	0.59	40.7
11	T1	All MCs	1	0.0	1	0.0	0.103	7.0	LOS A	0.6	4.3	0.59	0.63	0.59	46.4
12	R2	All MCs	21	0.0	21	0.0	0.103	11.1	LOS B	0.6	4.3	0.59	0.63	0.59	40.7
Approach			95	0.0	95	0.0	0.103	7.6	LOS A	0.6	4.3	0.59	0.63	0.59	40.8
All Vehicles			1049	3.4	1049	3.4	0.326	7.4	LOS A	2.2	15.9	0.44	0.57	0.44	41.5

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

MOVEMENT SUMMARY

Site: 505 [Stuart_Edison_Design_2039_AM (Site Folder: Final Design 1)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Racecourse_Lakeside_Townsville Turf Club Access_Design_2039_AM (Network Folder: Design)]

2039 Design Traffic Volumes
Site Category: Proposed Design 1
Roundabout
Design Life Analysis (Final Year): Results for 15 years

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Stuart Dr (S)															
1	L2	All MCs	50	14.6	50	14.6	0.475	6.5	LOS A	3.6	27.3	0.50	0.52	0.50	54.6
2	T1	All MCs	989	8.5	989	8.5	0.475	8.6	LOS A	3.6	27.3	0.51	0.54	0.51	56.4
3	R2	All MCs	151	5.6	151	5.6	0.475	11.5	LOS B	3.5	26.3	0.53	0.57	0.53	52.4
3u	U	All MCs	2	0.0	2	0.0	0.475	13.7	LOS B	3.5	26.3	0.53	0.57	0.53	56.8
Approach			1191	8.4	1191	8.4	0.475	8.9	LOS A	3.6	27.3	0.51	0.54	0.51	56.0
East: Lakeside Dr Extended (E)															
4	L2	All MCs	144	6.9	144	6.9	0.359	9.7	LOS A	1.7	12.3	0.69	0.82	0.74	49.3
5	T1	All MCs	30	9.3	30	9.3	0.359	8.4	LOS A	1.7	12.3	0.69	0.82	0.74	47.9
6	R2	All MCs	61	2.3	61	2.3	0.359	12.6	LOS B	1.7	12.3	0.69	0.82	0.74	49.8
Approach			235	6.0	235	6.0	0.359	10.3	LOS B	1.7	12.3	0.69	0.82	0.74	49.2
North: Stuart Dr (N)															
7	L2	All MCs	46	3.0	46	3.0	0.408	6.3	LOS A	2.9	21.8	0.51	0.53	0.51	53.8
8	T1	All MCs	825	10.3	825	10.3	0.408	7.9	LOS A	2.9	21.8	0.52	0.55	0.52	56.0
9	R2	All MCs	89	2.7	89	2.7	0.408	11.5	LOS B	2.8	21.0	0.53	0.58	0.53	53.8
9u	U	All MCs	16	0.0	16	0.0	0.408	13.8	LOS B	2.8	21.0	0.53	0.58	0.53	56.8
Approach			977	9.1	977	9.1	0.408	8.3	LOS A	2.9	21.8	0.52	0.55	0.52	55.7
West: Edison St (W)															
10	L2	All MCs	199	1.2	199	1.2	0.525	14.1	LOS B	2.8	20.2	0.79	0.95	1.00	51.6
11	T1	All MCs	49	5.7	49	5.7	0.525	11.6	LOS B	2.8	20.2	0.79	0.95	1.00	43.9
12	R2	All MCs	28	0.0	28	0.0	0.525	15.8	LOS B	2.8	20.2	0.79	0.95	1.00	51.3
12u	U	All MCs	1	0.0	1	0.0	0.525	17.9	LOS B	2.8	20.2	0.79	0.95	1.00	48.9
Approach			278	1.9	278	1.9	0.525	13.8	LOS B	2.8	20.2	0.79	0.95	1.00	50.7
All Vehicles			2681	7.8	2681	7.8	0.525	9.3	LOS A	3.6	27.3	0.56	0.61	0.59	54.8

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

CCG MOVEMENT SUMMARY

Common Control Group: CCG1 [Racecourse Dr]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Racecourse_Lakeside_Townsville Turf Club Access_Design_2039_AM (Network Folder: Design)]

EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (CCG User-Given Phase Times)
Design Life Analysis (Final Year): Results for 15 years

Vehicle Movement Performance (CCG)

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
Site: 202 [Racecourse_Lakeside_Design_2039_AM (WEST)]															
South: Lakeside Dr (S)															
2	T1	All MCs	356	2.8	356	2.8	0.183	11.7	LOS B	5.6	40.4	0.41	0.34	0.41	37.8
3	R2	All MCs	150	12.3	150	12.3	* 0.878	54.9	LOS D	9.0	69.9	1.00	0.85	1.12	5.3
Approach			506	5.6	506	5.6	0.878	24.5	LOS C	9.0	69.9	0.59	0.49	0.62	23.3
North: Lakeside Dr (N)															
7	L2	All MCs	115	11.1	115	11.1	0.186	42.6	LOS D	4.6	35.1	0.73	0.75	0.73	18.7
8	T1	All MCs	960	3.9	960	3.9	0.731	40.1	LOS D	25.2	183.0	0.93	0.82	0.93	18.0
Approach			1075	4.7	1075	4.7	0.731	40.4	LOS D	25.2	183.0	0.91	0.81	0.91	16.6
West: Racecourse Dr (W)															
10	L2	All MCs	895	2.1	895	2.1	0.853	12.2	LOS B	36.8	266.6	0.83	0.88	0.84	44.5
11	T1	All MCs	582	14.6	582	14.6	* 0.853	33.2	LOS C	36.8	266.6	0.76	0.69	0.76	34.6
12	R2	All MCs	143	9.9	143	9.9	0.404	34.6	LOS C	6.2	47.0	0.77	0.78	0.77	28.4
Approach			1621	7.3	1621	7.3	0.853	21.7	LOS C	36.8	266.6	0.80	0.80	0.81	37.8
All Vehicles			3203	6.1	3203	6.1	0.878	28.4	LOS C	36.8	266.6	0.80	0.76	0.81	29.2
Site: 303 [Racecourse_Lakeside_Lakeside Extended_Design_2039_AM]															
South: Lakeside Dr Extended (S)															
1	L2	All MCs	119	4.7	119	4.7	0.206	13.3	LOS B	2.6	19.0	0.45	0.68	0.45	43.7
2	T1	All MCs	322	4.4	322	4.4	0.850	65.7	LOS E[11]	10.4	75.2	1.00	0.97	1.27	9.1
Approach			442	4.5	442	4.5	0.850	51.5	LOS D	10.4	75.2	0.85	0.89	1.05	16.6
East: Racecourse Dr (E)															
4	L2	All MCs	131	7.6	131	7.6	0.104	7.7	LOS A	1.4	10.4	0.24	0.61	0.24	48.2
5	T1	All MCs	630	13.9	630	13.9	0.450	28.8	LOS C	13.5	106.1	0.79	0.68	0.79	40.9
6	R2	All MCs	194	8.8	194	8.8	0.284	32.3	LOS C	7.7	58.0	0.73	0.77	0.73	29.4
Approach			955	12.0	955	12.0	0.450	26.6	LOS C	13.5	106.1	0.70	0.69	0.70	39.5
North: Lakeside Dr (N)															
8	T1	All MCs	323	3.1	323	3.1	* 0.846	15.3	LOS B	16.9	122.4	0.74	0.74	0.76	14.4
9	R2	All MCs	783	5.1	783	5.1	0.846	14.4	LOS B	16.9	122.4	0.55	0.73	0.58	41.0
Approach			1107	4.5	1107	4.5	0.846	14.7	LOS B	16.9	122.4	0.61	0.73	0.63	37.0
All Vehicles			2504	7.4	2504	7.4	0.850	25.7	LOS C	16.9	122.4	0.69	0.74	0.73	34.0

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
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.

11 Level of Service is worse than the Level of Service Target specified in the Parameter Settings dialog.
* Critical Movement (Signal Timing)

Pedestrian Movement Performance (CCG)

Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE [Ped	Dist]	Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		ped	m			sec	m	m/sec
Site: 202 [Racecourse_Lakeside_Design_2039_AM (WEST)]											
West: Racecourse Dr (W)											
P4	Full	28	54.2	LOS E	0.1	0.1	0.95	0.95	208.1	200.0	0.96
All Pedestrians		28	54.2	LOS E	0.1	0.1	0.95	0.95	208.1	200.0	0.96
Site: 303 [Racecourse_Lakeside_Lakeside Extended_Design_2039_AM]											
West: Racecourse Dr (W)											
P4	Full	28	54.2	LOS E	0.1	0.1	0.95	0.95	208.1	200.0	0.96
All Pedestrians		28	54.2	LOS E	0.1	0.1	0.95	0.95	208.1	200.0	0.96

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

MOVEMENT SUMMARY

Site: 303 [Precinct 1 & 2_Precinct 3_Design_2039_PM (Site Folder: Final Design 1)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Racecourse_Lakeside_Townsville Turf Club Access_Design_2039_PM (Network Folder: Design)]

2039 Design Traffic Volumes
Site Category: Proposed Design 2
Roundabout
Design Life Analysis (Final Year): Results for 15 years

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lakeside Dr Extended (S)															
1	L2	All MCs	17	0.0	17	0.0	0.202	6.2	LOS A	1.3	9.5	0.58	0.59	0.58	43.8
2	T1	All MCs	125	4.5	125	4.5	0.202	6.7	LOS A	1.3	9.5	0.58	0.59	0.58	36.1
3	R2	All MCs	55	0.0	55	0.0	0.202	10.7	LOS B	1.3	9.5	0.58	0.59	0.58	43.0
Approach			196	2.9	196	2.9	0.202	7.8	LOS A	1.3	9.5	0.58	0.59	0.58	39.7
East: Precinct 1 & 2 Access (E)															
4	L2	All MCs	56	0.0	56	0.0	0.301	6.4	LOS A	2.2	15.4	0.60	0.63	0.60	37.9
5	T1	All MCs	1	0.0	1	0.0	0.301	6.7	LOS A	2.2	15.4	0.60	0.63	0.60	44.2
6	R2	All MCs	247	2.1	247	2.1	0.301	11.0	LOS B	2.2	15.4	0.60	0.63	0.60	37.9
Approach			304	1.7	304	1.7	0.301	10.1	LOS B	2.2	15.4	0.60	0.63	0.60	38.0
North: Lakeside Dr Extended (N)															
7	L2	All MCs	237	0.9	237	0.9	0.383	4.7	LOS A	2.8	19.8	0.31	0.50	0.31	46.1
8	T1	All MCs	210	4.7	210	4.7	0.383	5.1	LOS A	2.8	19.8	0.31	0.50	0.31	39.8
9	R2	All MCs	71	0.0	71	0.0	0.383	9.2	LOS A	2.8	19.8	0.31	0.50	0.31	45.4
Approach			517	2.3	517	2.3	0.383	5.5	LOS A	2.8	19.8	0.31	0.50	0.31	44.3
West: Precinct 3 Access (W)															
10	L2	All MCs	133	0.0	133	0.0	0.183	6.9	LOS A	1.1	8.0	0.63	0.64	0.63	40.4
11	T1	All MCs	1	0.0	1	0.0	0.183	7.3	LOS A	1.1	8.0	0.63	0.64	0.63	46.3
12	R2	All MCs	32	0.0	32	0.0	0.183	11.4	LOS B	1.1	8.0	0.63	0.64	0.63	40.4
Approach			165	0.0	165	0.0	0.183	7.8	LOS A	1.1	8.0	0.63	0.64	0.63	40.5
All Vehicles			1183	1.9	1183	1.9	0.383	7.4	LOS A	2.8	19.8	0.48	0.57	0.48	41.5

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

MOVEMENT SUMMARY

Site: 101 [Stuart_Edison_Design_2039_PM (Site Folder: Final Design 1)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Racecourse_Lakeside_Townsville Turf Club Access_Design_2039_PM (Network Folder: Design)]

2039 Design Traffic Volumes
Site Category: Proposed Design 1
Roundabout
Design Life Analysis (Final Year): Results for 15 years

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Stuart Dr (S)															
1	L2	All MCs	51	0.0	51	0.0	0.510	7.0	LOS A	4.0	28.5	0.63	0.59	0.63	54.5
2	T1	All MCs	1005	3.9	1005	3.9	0.510	9.0	LOS A	4.0	28.5	0.64	0.60	0.64	56.8
3	R2	All MCs	118	3.6	118	3.6	0.510	12.4	LOS B	3.8	27.5	0.66	0.63	0.66	51.5
3u	U	All MCs	2	0.0	2	0.0	0.510	14.6	LOS B	3.8	27.5	0.66	0.63	0.66	56.2
Approach			1176	3.7	1176	3.7	0.510	9.3	LOS A	4.0	28.5	0.64	0.61	0.64	56.4
East: Lakeside Dr Extended (E)															
4	L2	All MCs	178	3.2	178	3.2	0.499	12.3	LOS B	2.7	19.4	0.78	0.93	0.96	48.6
5	T1	All MCs	54	2.6	54	2.6	0.499	10.1	LOS B	2.7	19.4	0.78	0.93	0.96	46.6
6	R2	All MCs	63	2.2	63	2.2	0.499	14.8	LOS B	2.7	19.4	0.78	0.93	0.96	48.2
Approach			296	2.9	296	2.9	0.499	12.4	LOS B	2.7	19.4	0.78	0.93	0.96	48.1
North: Stuart Dr (N)															
7	L2	All MCs	43	0.0	43	0.0	0.484	6.1	LOS A	3.9	28.0	0.50	0.51	0.50	53.9
8	T1	All MCs	1017	4.0	1017	4.0	0.484	8.0	LOS A	3.9	28.0	0.51	0.53	0.51	57.4
9	R2	All MCs	191	0.6	191	0.6	0.484	11.3	LOS B	3.8	27.1	0.52	0.57	0.52	53.7
9u	U	All MCs	15	0.0	15	0.0	0.484	13.6	LOS B	3.8	27.1	0.52	0.57	0.52	56.6
Approach			1265	3.3	1265	3.3	0.484	8.5	LOS A	3.9	28.0	0.51	0.54	0.51	56.7
West: Edison St (W)															
10	L2	All MCs	112	6.5	112	6.5	0.348	11.9	LOS B	1.6	11.7	0.74	0.87	0.81	51.7
11	T1	All MCs	36	4.0	36	4.0	0.348	9.4	LOS A	1.6	11.7	0.74	0.87	0.81	45.6
12	R2	All MCs	24	0.0	24	0.0	0.348	13.8	LOS B	1.6	11.7	0.74	0.87	0.81	52.5
12u	U	All MCs	1	0.0	1	0.0	0.348	15.9	LOS B	1.6	11.7	0.74	0.87	0.81	50.0
Approach			174	5.0	174	5.0	0.348	11.7	LOS B	1.6	11.7	0.74	0.87	0.81	51.0
All Vehicles			2911	3.5	2911	3.5	0.510	9.4	LOS A	4.0	28.5	0.60	0.62	0.63	55.5

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

CCG MOVEMENT SUMMARY

Common Control Group: CCG1 [Racecourse Dr]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Racecourse_Lakeside_Townsville Turf Club Access_Design_2039_PM (Network Folder: Design)]

EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (CCG User-Given Phase Times)
Design Life Analysis (Final Year): Results for 15 years

Vehicle Movement Performance (CCG)

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
Site: 101 [Racecourse_Lakeside_Design_2039_PM (WEST)]															
South: Lakeside Dr (S)															
2	T1	All MCs	386	1.5	386	1.5	0.156	6.2	LOS A	4.4	31.5	0.30	0.25	0.30	45.7
3	R2	All MCs	167	8.5	167	8.5	0.819	43.5	LOS D	9.2	68.7	0.93	0.82	0.99	6.5
Approach			553	3.6	553	3.6	0.819	17.5	LOS B	9.2	68.7	0.49	0.43	0.51	28.2
North: Lakeside Dr (N)															
7	L2	All MCs	276	4.6	276	4.6	0.323	35.0	LOS D	9.9	72.0	0.66	0.76	0.66	22.1
8	T1	All MCs	1291	1.7	1291	1.7	0.768	31.7	LOS C	33.7	239.5	0.89	0.81	0.89	21.4
Approach			1568	2.2	1568	2.2	0.768	32.3	LOS C	33.7	239.5	0.85	0.80	0.85	19.4
West: Racecourse Dr (W)															
10	L2	All MCs	595	1.0	595	1.0	0.658	5.8	LOS A	11.4	82.0	0.39	0.62	0.39	50.3
11	T1	All MCs	458	9.3	458	9.3	0.658	29.6	LOS C	12.6	95.6	0.72	0.70	0.72	31.2
12	R2	All MCs	98	13.0	98	13.0	0.447	47.5	LOS D	5.0	38.9	0.88	0.79	0.88	23.8
Approach			1151	5.3	1151	5.3	0.658	18.8	LOS B	12.6	95.6	0.56	0.67	0.56	39.5
All Vehicles			3272	3.5	3272	3.5	0.819	25.1	LOS C	33.7	239.5	0.69	0.69	0.69	28.9
Site: 101 [Racecourse_Lakeside_Lakeside Extended_Design_2039_PM]															
South: Lakeside Dr Extended (S)															
1	L2	All MCs	118	6.0	118	6.0	0.283	18.3	LOS B	3.6	26.6	0.59	0.73	0.59	40.2
2	T1	All MCs	385	1.5	385	1.5	* 0.853	64.4	LOS E	12.3	87.3	1.00	0.98	1.25	9.3
Approach			502	2.5	502	2.5	0.853	53.6	LOS D	12.3	87.3	0.90	0.92	1.10	15.5
East: Racecourse Dr (E)															
4	L2	All MCs	169	4.2	169	4.2	0.139	7.6	LOS A	1.6	11.9	0.23	0.62	0.23	48.6
5	T1	All MCs	846	7.4	846	7.4	* 0.881	56.5	LOS E	27.1	201.9	1.00	1.04	1.19	31.3
6	R2	All MCs	139	5.1	139	5.1	0.300	44.2	LOS D	6.6	47.9	0.85	0.78	0.85	24.8
Approach			1153	6.6	1153	6.6	0.881	47.9	LOS D	27.1	201.9	0.87	0.95	1.01	31.6
North: Lakeside Dr (N)															
8	T1	All MCs	351	2.4	351	2.4	* 0.793	8.9	LOS A	17.2	122.4	0.57	0.65	0.57	19.6
9	R2	All MCs	1046	1.9	1046	1.9	0.793	9.6	LOS A	17.2	122.4	0.35	0.65	0.36	45.4
Approach			1397	2.0	1397	2.0	0.793	9.4	LOS A	17.2	122.4	0.41	0.65	0.41	42.6
All Vehicles			3052	3.9	3052	3.9	0.881	31.2	LOS C	27.1	201.9	0.66	0.80	0.75	31.7

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance (CCG)

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
Site: 101 [Racecourse_Lakeside_Design_2039_PM (WEST)]											
West: Racecourse Dr (W)											
P4	Full	28	54.2	LOS E	0.1	0.1	0.95	0.95	208.1	200.0	0.96
All Pedestrians		28	54.2	LOS E	0.1	0.1	0.95	0.95	208.1	200.0	0.96
Site: 101 [Racecourse_Lakeside_Lakeside Extended_Design_2039_PM]											
West: Racecourse Dr (W)											
P4	Full	28	54.2	LOS E	0.1	0.1	0.95	0.95	208.1	200.0	0.96
All Pedestrians		28	54.2	LOS E	0.1	0.1	0.95	0.95	208.1	200.0	0.96

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

MOVEMENT SUMMARY

Site: 303 [Precinct 1 & 2_Precinct 3_Design_2039_Weekend (Site Folder: Final Design 1)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Racecourse_Lakeside_Townsville Turf Club Access_Design_2039_Weekend (Network Folder: Design)]

2039 Design Traffic Volumes
Site Category: Proposed Design 2
Roundabout
Design Life Analysis (Final Year): Results for 15 years

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lakeside Dr Extended (S)															
1	L2	All MCs	24	0.0	24	0.0	0.210	6.8	LOS A	1.4	9.9	0.64	0.62	0.64	43.3
2	T1	All MCs	112	3.8	112	3.8	0.210	7.3	LOS A	1.4	9.9	0.64	0.62	0.64	35.4
3	R2	All MCs	55	0.0	55	0.0	0.210	11.3	LOS B	1.4	9.9	0.64	0.62	0.64	42.6
Approach			191	2.2	191	2.2	0.210	8.4	LOS A	1.4	9.9	0.64	0.62	0.64	39.5
East: Precinct 1 & 2 Access (E)															
4	L2	All MCs	55	0.0	55	0.0	0.334	6.5	LOS A	2.5	17.3	0.61	0.64	0.61	37.7
5	T1	All MCs	1	0.0	1	0.0	0.334	6.8	LOS A	2.5	17.3	0.61	0.64	0.61	44.1
6	R2	All MCs	284	0.7	284	0.7	0.334	11.0	LOS B	2.5	17.3	0.61	0.64	0.61	37.7
Approach			340	0.6	340	0.6	0.334	10.2	LOS B	2.5	17.3	0.61	0.64	0.61	37.8
North: Lakeside Dr Extended (N)															
7	L2	All MCs	280	0.0	280	0.0	0.411	4.6	LOS A	3.2	22.8	0.31	0.51	0.31	46.0
8	T1	All MCs	176	0.8	176	0.8	0.411	5.0	LOS A	3.2	22.8	0.31	0.51	0.31	39.4
9	R2	All MCs	120	0.0	120	0.0	0.411	9.1	LOS A	3.2	22.8	0.31	0.51	0.31	45.2
Approach			576	0.2	576	0.2	0.411	5.6	LOS A	3.2	22.8	0.31	0.51	0.31	44.6
West: Precinct 3 Access (W)															
10	L2	All MCs	93	0.0	93	0.0	0.127	7.0	LOS A	0.8	5.5	0.63	0.64	0.63	40.6
11	T1	All MCs	1	0.0	1	0.0	0.127	7.3	LOS A	0.8	5.5	0.63	0.64	0.63	46.3
12	R2	All MCs	19	0.0	19	0.0	0.127	11.4	LOS B	0.8	5.5	0.63	0.64	0.63	40.6
Approach			113	0.0	113	0.0	0.127	7.7	LOS A	0.8	5.5	0.63	0.64	0.63	40.6
All Vehicles			1219	0.6	1219	0.6	0.411	7.5	LOS A	3.2	22.8	0.48	0.57	0.48	41.7

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

MOVEMENT SUMMARY

Site: 101 [Stuart_Edison_Design_2039_Weekend (Site Folder: Final Design 1)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Racecourse_Lakeside_Townsville Turf Club Access_Design_2039_Weekend (Network Folder: Design)]

2039 Design Traffic Volumes
Site Category: Proposed Design 1
Roundabout
Design Life Analysis (Final Year): Results for 15 years

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Stuart Dr (S)															
1	L2	All MCs	28	8.7	28	8.7	0.352	6.2	LOS A	2.3	17.0	0.44	0.51	0.44	55.1
2	T1	All MCs	759	4.5	759	4.5	0.352	7.3	LOS A	2.3	17.0	0.45	0.53	0.45	57.6
3	R2	All MCs	109	2.6	109	2.6	0.352	11.2	LOS B	2.3	16.6	0.46	0.56	0.46	53.0
3u	U	All MCs	2	0.0	2	0.0	0.352	13.5	LOS B	2.3	16.6	0.46	0.56	0.46	57.1
Approach			899	4.4	899	4.4	0.352	7.7	LOS A	2.3	17.0	0.45	0.53	0.45	57.2
East: Lakeside Dr Extended (E)															
4	L2	All MCs	162	0.9	162	0.9	0.351	9.2	LOS A	1.6	11.4	0.68	0.81	0.72	51.5
5	T1	All MCs	33	0.0	33	0.0	0.351	7.8	LOS A	1.6	11.4	0.68	0.81	0.72	48.6
6	R2	All MCs	53	0.0	53	0.0	0.351	12.5	LOS B	1.6	11.4	0.68	0.81	0.72	50.9
Approach			248	0.6	248	0.6	0.351	9.7	LOS A	1.6	11.4	0.68	0.81	0.72	51.0
North: Stuart Dr (N)															
7	L2	All MCs	48	0.0	48	0.0	0.384	5.9	LOS A	2.7	19.2	0.41	0.49	0.41	54.7
8	T1	All MCs	864	2.8	864	2.8	0.384	7.2	LOS A	2.7	19.2	0.42	0.51	0.42	58.2
9	R2	All MCs	110	2.2	110	2.2	0.384	11.0	LOS B	2.6	18.8	0.44	0.54	0.44	54.3
9u	U	All MCs	3	0.0	3	0.0	0.384	13.3	LOS B	2.6	18.8	0.44	0.54	0.44	57.3
Approach			1026	2.6	1026	2.6	0.384	7.6	LOS A	2.7	19.2	0.42	0.51	0.42	57.6
West: Edison St (W)															
10	L2	All MCs	152	0.8	152	0.8	0.322	9.1	LOS A	1.4	10.0	0.66	0.79	0.68	54.1
11	T1	All MCs	32	4.4	32	4.4	0.322	8.2	LOS A	1.4	10.0	0.66	0.79	0.68	47.4
12	R2	All MCs	20	12.5	20	12.5	0.322	13.4	LOS B	1.4	10.0	0.66	0.79	0.68	50.9
12u	U	All MCs	1	0.0	1	0.0	0.322	14.7	LOS B	1.4	10.0	0.66	0.79	0.68	51.1
Approach			204	2.5	204	2.5	0.322	9.4	LOS A	1.4	10.0	0.66	0.79	0.68	53.1
All Vehicles			2377	3.1	2377	3.1	0.384	8.0	LOS A	2.7	19.2	0.48	0.57	0.49	56.5

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

CCG MOVEMENT SUMMARY

Common Control Group: CCG1 [Racecourse Dr]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Racecourse_Lakeside_Townsville Turf Club Access_Design_2039_Weekend (Network Folder: Design)]

EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (CCG User-Given Phase Times)
Design Life Analysis (Final Year): Results for 15 years

Vehicle Movement Performance (CCG)

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
Site: 101 [Racecourse_Lakeside_Design_2039_Weekend (WEST)]															
South: Lakeside Dr (S)															
2	T1	All MCs	438	1.3	438	1.3	0.156	5.7	LOS A	5.7	40.1	0.35	0.25	0.35	46.5
3	R2	All MCs	167	4.2	167	4.2	0.795	46.5	LOS D	9.2	66.6	0.94	0.82	0.99	6.2
Approach			605	2.1	605	2.1	0.795	17.0	LOS B	9.2	66.6	0.52	0.41	0.53	29.0
North: Lakeside Dr (N)															
7	L2	All MCs	272	5.2	272	5.2	0.268	23.9	LOS C	8.0	58.4	0.55	0.73	0.55	26.4
8	T1	All MCs	1321	0.5	1321	0.5	0.639	20.7	LOS C	27.5	193.6	0.73	0.67	0.73	27.1
Approach			1593	1.3	1593	1.3	0.639	21.2	LOS C	27.5	193.6	0.70	0.68	0.70	25.2
West: Racecourse Dr (W)															
10	L2	All MCs	473	1.8	473	1.8	0.716	5.9	LOS A	10.2	72.6	0.56	0.69	0.56	48.2
11	T1	All MCs	536	4.5	536	4.5	*0.716	39.1	LOS D	13.6	98.9	0.84	0.78	0.86	27.7
12	R2	All MCs	113	0.0	113	0.0	0.698	60.9	LOS E	6.8	47.7	0.99	0.87	1.11	20.3
Approach			1122	2.9	1122	2.9	0.716	27.3	LOS C	13.6	98.9	0.74	0.75	0.76	34.2
All Vehicles			3320	2.0	3320	2.0	0.795	22.5	LOS C	27.5	193.6	0.68	0.65	0.69	30.1
Site: 101 [Racecourse_Lakeside_Lakeside Extended_Design_2039_Weekend]															
South: Lakeside Dr Extended (S)															
1	L2	All MCs	112	2.5	112	2.5	0.233	11.3	LOS B	2.2	16.0	0.41	0.67	0.41	45.2
2	T1	All MCs	380	1.1	380	1.1	*0.841	63.5	LOS E[11]	12.0	85.1	1.00	0.97	1.23	9.4
Approach			491	1.4	491	1.4	0.841	51.6	LOS D	12.0	85.1	0.87	0.90	1.05	15.8
East: Racecourse Dr (E)															
4	L2	All MCs	149	0.9	149	0.9	0.130	7.1	LOS A	1.4	9.6	0.22	0.61	0.22	48.8
5	T1	All MCs	581	2.9	581	2.9	0.867	61.0	LOS E[11]	18.6	133.4	1.00	1.01	1.22	30.1
6	R2	All MCs	188	5.3	188	5.3	0.602	55.8	LOS E[11]	10.4	76.0	0.97	0.82	0.97	21.5
Approach			919	3.1	919	3.1	0.867	51.2	LOS D	18.6	133.4	0.87	0.91	1.01	29.8
North: Lakeside Dr (N)															
8	T1	All MCs	427	0.3	427	0.3	*0.672	7.9	LOS A	17.4	122.4	0.48	0.56	0.48	21.4
9	R2	All MCs	1002	0.7	1002	0.7	0.672	8.4	LOS A	17.4	122.4	0.25	0.60	0.25	46.7
Approach			1429	0.6	1429	0.6	0.672	8.2	LOS A	17.4	122.4	0.32	0.59	0.32	43.5
All Vehicles			2839	1.5	2839	1.5	0.867	29.6	LOS C	18.6	133.4	0.59	0.75	0.67	31.1

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
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.

11 Level of Service is worse than the Level of Service Target specified in the Parameter Settings dialog.
* Critical Movement (Signal Timing)

Pedestrian Movement Performance (CCG)

Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE [Ped	Dist]	Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		ped	m			sec	m	m/sec
Site: 101 [Racecourse_Lakeside_Design_2039_Weekend (WEST)]											
West: Racecourse Dr (W)											
P4	Full	7	54.2	LOS E	0.0	0.0	0.95	0.95	208.0	200.0	0.96
All Pedestrians		7	54.2	LOS E	0.0	0.0	0.95	0.95	208.0	200.0	0.96
Site: 101 [Racecourse_Lakeside_Lakeside Extended_Design_2039_Weekend]											
West: Racecourse Dr (W)											
P4	Full	71	54.3	LOS E	0.2	0.2	0.95	0.95	208.2	200.0	0.96
All Pedestrians		71	54.3	LOS E	0.2	0.2	0.95	0.95	208.2	200.0	0.96

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

Appendix H Development code responses

State code 1: Development in a state-controlled road environment

Table 1.2 Vehicular access, road layout and local roads

Performance outcomes	Acceptable outcomes	Response
Vehicular access to a state-controlled road or within 100 metres of a state-controlled road intersection		
PO15 The location, design and operation of a **new or changed access** to a **state-controlled road** does not compromise the safety of users of the **state-controlled road**.	No acceptable outcome is prescribed.	Not applicable. No access is proposed to a state-controlled road. As part of the proposed transport infrastructure upgrades a new four-leg single lane roundabout will be provided at the midpoint between Racecourse Road and Stuart Drive. Direct property access to the new Lakeside Drive extended will not be permitted with all development traffic to flow through the eastbound and westbound approaches to this roundabout.
PO16 The location, design and operation of a **new or changed access** does not adversely impact the **functional requirements** of the **state-controlled road**.	No acceptable outcome is prescribed.	**COMPLIES WITH PO16** As part of the proposed transport infrastructure upgrades a new four-leg single lane roundabout will be provided at the midpoint between Racecourse Road and Stuart Drive. Direct property access to the new Lakeside Drive extended will not be permitted with all development traffic to flow through the eastbound and westbound approaches to this roundabout.
PO17 The location, design and operation of a **new or changed access** is consistent with the **future intent** of the **state-controlled road**.	No acceptable outcome is prescribed.	Not applicable. No access is proposed to a state-controlled road.
PO18 New or changed access is consistent with the access for the relevant **limited access road policy**: 1. **LAR 1** where direct access is prohibited; or	No acceptable outcome is prescribed.	Not applicable.

Performance outcomes	Acceptable outcomes	Response
2. **LAR 2** where access may be permitted, subject to assessment.		
PO19 New or changed access to a **local road** within 100 metres of an intersection with a **state-controlled road** does not compromise the safety of users of the **state-controlled road**.	No acceptable outcome is prescribed.	As part of the proposed transport infrastructure upgrades a new four-leg single lane roundabout will be provided at the midpoint between Racecourse Road and Stuart Drive. Direct property access to the new Lakeside Drive extended will not be permitted with all development traffic to flow through the eastbound and westbound approaches to this roundabout. Refer to **Geleon Traffic Impact Report 50890-RP02-B** which presents the findings of a Traffic Impact Assessment on the external road network
PO20 New or changed access to a **local road** within 100 metres of an intersection with a **state-controlled road** does not adversely impact on the operating performance of the intersection.	No acceptable outcome is prescribed.	As part of the proposed transport infrastructure upgrades a new four-leg single lane roundabout will be provided at the midpoint between Racecourse Road and Stuart Drive. Direct property access to the new Lakeside Drive extended will not be permitted with all development traffic to flow through the eastbound and westbound approaches to this roundabout. Refer to **Geleon Traffic Impact Report 50890-RP02-B** which presents the findings of a Traffic Impact Assessment on the external road network
Public passenger transport and active transport		
PO21 Development does not compromise the safety of users of **public passenger transport infrastructure**, **public passenger services** and **active transport infrastructure**.	No acceptable outcome is prescribed.	**COMPLIES WITH PO21.** The normal operation of public passenger transport infrastructure or public passenger services will not be interrupted during construction of the development.
PO22 Development maintains the ability for people to access **public passenger transport infrastructure, public passenger services** and **active transport infrastructure**.	No acceptable outcome is prescribed.	**COMPLIES WITH PO22.** The normal operation of public passenger transport infrastructure or public passenger services will not be interrupted during construction of the development.

Performance outcomes	Acceptable outcomes	Response
PO23 Development does not adversely impact the operating performance of **public passenger transport infrastructure, public passenger services** and **active transport infrastructure**.	No acceptable outcome is prescribed.	**COMPLIES WITH PO23.** The normal operation of public passenger transport infrastructure or public passenger services will not be interrupted during construction of the development.
PO24 Development does not adversely impact the **structural integrity** or physical condition of **public passenger transport infrastructure** and **active transport infrastructure**.	No acceptable outcome is prescribed.	**COMPLIES WITH PO24.** The normal operation of public passenger transport infrastructure or public passenger services will not be interrupted during construction of the development.

Table 1.3 Network impacts

Performance outcomes	Acceptable outcomes	Response
PO25 Development does not compromise the safety of users of the **state-controlled road** network.	No acceptable outcome is prescribed.	**COMPLIES WITH PO25.** The anticipated peak hour traffic generated by the development is 660 trips in the AM peak hour, 780 trips in the PM peak hour, 862 trips in the weekend peak and 7,351 daily trips. Refer to **Geleon Traffic Impact Assessment Report 50890-RP02-B** which presents the findings of a Traffic Impact Assessment on the external road network.
PO26 Development ensures **no net worsening** of the operating performance of the **state-controlled road** network.	No acceptable outcome is prescribed.	**COMPLIES WITH PO26.** The anticipated peak hour traffic generated by the development is 660 trips in the AM peak hour, 780 trips in the PM peak hour, 862 trips in the weekend peak and 7,351 daily trips. Refer to **Geleon Traffic Impact Assessment Report 50890-RP02-B** which presents the findings of a Traffic Impact Assessment on the external road network.
PO27 Traffic movements are not directed onto a **state-controlled road** where they can be accommodated on the **local road** network.	No acceptable outcome is prescribed.	**COMPLIES WITH PO27.** Given the geographical location of the development, most traffic entering and exiting the

Performance outcomes	Acceptable outcomes	Response
		development will travel through the Racecourse Road / Lakeside Drive intersections. An assessment of aggregate-intersection-delay impact 'with development' and road safety assessment has been undertaken which confirmed the following mitigation measures are required: – apply a common control group (CCG) phasing sequence to the existing Racecourse Road eastbound / Lakeside Drive and Racecourse Road westbound / Lakeside Drive / Townsville Turf Club Access signalised intersections and modify the phasing sequence and timing to cater for existing and development generated traffic, as well as a new road connection to Stuart Drive – provide a new road connection between Racecourse Road and Stuart Drive connecting to the Stuart Drive / Edison Street roundabout in the south and Racecourse Road / Lakeside Drive signalised intersection in the north. The road connection will be to a two-lane, two-way road configuration in accordance with Council Standard Drawing SD-002 – Typical Cross Sections, Major Collector Roads and direct property access will be prohibited – provide a new four-leg single lane roundabout at the midpoint between Racecourse Road and Stuart Drive. The eastbound and westbound approaches to this roundabout will facilitate access to the proposed development, and – upgrade the existing Stuart Drive / Edison Street three-leg roundabout to a four-leg double lane roundabout in the north-south

Performance outcomes	Acceptable outcomes	Response
		direction. A four-lane, two-way carriageway on both Stuart Drive approaches will be required for 130m on the approach and 170m on the departure side of the roundabout. SIDRA analysis for the proposed infrastructure upgrades confirm that the development's impact has been mitigated to an acceptable level consistent with TMR's GTIA. Refer to **Geleon Traffic Impact Assessment Report 50890-RP02-B** which presents the findings of a Traffic Impact Assessment and a Road Safety Assessment on the external road network.
PO28 Development involving haulage exceeding 10,000 tonnes per year does not adversely impact the pavement of a **state-controlled road**.	No acceptable outcome is prescribed.	Not applicable.
PO29 Development does not impede delivery of **planned upgrades** of **state-controlled roads**.	No acceptable outcome is prescribed.	Not applicable.
PO30 Development does not impede delivery of **corridor improvements** located entirely within the **state-controlled road corridor**.	No acceptable outcome is prescribed.	Not applicable.

State code 6: Protection of state transport networks

Table 6.2 Development in general

Performance outcomes	Acceptable outcomes	Response
Network impacts		
PO1 Development does not compromise the safety of users of the **state-controlled road** network.	No acceptable outcome is prescribed.	**COMPLIES WITH PO1** No access is proposed to a state-controlled road. As part of the proposed transport infrastructure upgrades a new four-leg single lane roundabout will be provided at the midpoint between Racecourse Road and Stuart Drive. Direct property access to the new Lakeside Drive extended will not be permitted with all development traffic to flow through the eastbound and westbound approaches to this roundabout. Refer to Geleon Traffic Impact Assessment Report **50890-RP02-B** which presents the findings of a traffic impact assessment on the external road network.
PO2 Development does not adversely impact the structural integrity or physical condition of a **state-controlled road** or **road transport infrastructure**.	No acceptable outcome is prescribed.	**COMPLIES WITH PO2.** The development does not result in a worsening of the infrastructure condition of the state-controlled road as a result of implementing the proposed infrastructure upgrades. For further details in relation to the proposed development details, refer plans of development and Geleon Traffic Impact Assessment Report **50890-RP02-B**.
PO3 Development ensures **no net worsening** of the operating performance the **state-controlled road** network.	No acceptable outcome is prescribed.	**COMPLIES WITH PO3.** The development does not result in a worsening of the infrastructure condition of the state-controlled road as a result of implementing the proposed infrastructure upgrades. For further details in relation to the proposed development details, refer plans of development and Geleon Traffic Impact Assessment Report **50890-RP02-B**.

Performance outcomes	Acceptable outcomes	Response
PO4 Traffic movements are not directed onto a **state-controlled road** where they can be accommodated on the **local road** network.	No acceptable outcome is prescribed.	**COMPLIES WITH PO4.** Given the geographical location of the development, most traffic entering and exiting the development will travel through the Racecourse Road / Lakeside Drive intersections. An assessment of aggregate-intersection-delay impact 'with development' and road safety assessment has been undertaken which confirmed the following mitigation measures are required: – apply a common control group (CCG) phasing sequence to the existing Racecourse Road eastbound / Lakeside Drive and Racecourse Road westbound / Lakeside Drive / Townsville Turf Club Access signalised intersections and modify the phasing sequence and timing to cater for existing and development generated traffic, as well as a new road connection to Stuart Drive – provide a new road connection between Racecourse Road and Stuart Drive connecting to the Stuart Drive / Edison Street roundabout in the south and Racecourse Road / Lakeside Drive signalised intersection in the north. The road connection will be to a two-lane, two-way road configuration in accordance with Council Standard Drawing SD-002 – Typical Cross Sections, Major Collector Roads and direct property access will be prohibited – provide a new four-leg single lane roundabout at the midpoint between Racecourse Road and Stuart Drive. The eastbound and westbound approaches to this roundabout will facilitate access to the proposed development, and – upgrade the existing Stuart Drive / Edison Street three-leg roundabout to a four-leg

Performance outcomes	Acceptable outcomes	Response
		double lane roundabout in the north-south direction. A four-lane, two-way carriageway on both Stuart Drive approaches will be required for 130m on the approach and 170m on the departure side of the roundabout. SIDRA analysis for the proposed infrastructure upgrades confirm that the development's impact has been mitigated to an acceptable level consistent with TMR's GTIA. Refer to **Geleon Traffic Impact Assessment Report 50890-RP02-B** which presents the findings of a Traffic Impact Assessment and a Road Safety Assessment on the external road network.
PO5 Development involving haulage exceeding 10,000 tonnes per year does not damage the pavement of a **state-controlled road**.	No acceptable outcome is prescribed.	Not applicable.
PO6 Development does not require a new **railway** level crossing.	No acceptable outcome is prescribed.	Not applicable.
PO7 Development does not adversely impact the operating performance of an existing **railway crossing**.	No acceptable outcome is prescribed.	Not applicable.
PO8 Development does not adversely impact on the safety of an existing **railway crossing**.	No acceptable outcome is prescribed.	Not applicable.
PO9 Development is designed and constructed to allow for on-site circulation to ensure vehicles do not queue in a **railway crossing**.	No acceptable outcome is prescribed.	Not applicable.
PO10 Development does not create a safety hazard within the **railway corridor**.	No acceptable outcome is prescribed.	Not applicable.
PO11 Development does not adversely impact the operating performance of the **railway corridor**.	No acceptable outcome is prescribed.	Not applicable.
PO12 Development does not interfere with or obstruct the **railway transport infrastructure** or **other rail infrastructure**.	No acceptable outcome is prescribed.	Not applicable.
PO13 Development does not adversely impact the structural integrity or physical condition of a	No acceptable outcome is prescribed.	Not applicable.

Performance outcomes	Acceptable outcomes	Response
railway corridor or **rail transport infrastructure**.		
Planned upgrades		
PO21 Development does not impede delivery of **planned upgrades** of **state transport infrastructure**.	No acceptable outcome is prescribed.	**COMPLIES WITH PO21.** The proposed development does not impede delivery of planned upgrades of state transport infrastructure.

Table 6.3 Public passenger transport infrastructure and active transport

Performance outcomes	Acceptable outcomes	Response
PO22 Development does not damage or interfere with **public passenger transport infrastructure**, **active transport infrastructure** or **public passenger services**.	No acceptable outcome is prescribed.	**COMPLIES WITH PO22.** The proposed development does not impact existing public passenger transport infrastructure.
PO23 Development does not compromise the safety of **public passenger transport infrastructure**, **public passenger services** and **active transport infrastructure**.	No acceptable outcome is prescribed.	**COMPLIES WITH PO23.** The proposed development does not compromise the safety of public passenger transport infrastructure, public passenger services and active transport infrastructure.
PO24 Development does not adversely impact the operating performance of **public passenger transport infrastructure, public passenger services** and **active transport infrastructure**.	No acceptable outcome is prescribed.	**COMPLIES WITH PO24.** The normal operation of public passenger transport infrastructure or public passenger services will not be interrupted during construction of the development.
PO25 Development does not adversely impact the structural integrity or physical condition of **public passenger transport infrastructure** and **active transport infrastructure**.	No acceptable outcome is prescribed.	**COMPLIES WITH PO25.** The proposed development does not adversely impact the structural integrity or physical condition of public passenger transport infrastructure and active transport infrastructure.
PO26 Upgraded or new **public passenger transport infrastructure** and **active transport infrastructure** is provided to accommodate the demand for **public passenger transport** and **active transport** generated by the development.	No acceptable outcome is prescribed.	Not applicable.

Performance outcomes	Acceptable outcomes	Response
PO27 Development is designed to ensure the location of **public passenger transport infrastructure** prioritises and enables efficient **public passenger services**.	No acceptable outcome is prescribed.	Not applicable.
PO28 Development enables the provision or extension of **public passenger services**, **public passenger transport infrastructure** and **active transport infrastructure** to the development and avoids creating indirect or inefficient routes for **public passenger services**.	No acceptable outcome is prescribed.	Not applicable.
PO29 New or modified road networks are designed to enable development to be serviced by **public passenger services**.	**AO29.1** Roads catering for buses are arterial or **sub-arterial roads**, collector or their equivalent. AND **AO29.2** Roads intended to accommodate buses are designed and constructed in accordance with: 1. Road Planning and Design Manual, 2nd Edition, Volume 3 – Guide to Road Design; Department of Transport and Main Roads; 2. Supplement to Austroads Guide to Road Design (Parts 3, 4-4C and 6), Department of Transport and Main Roads; 3. Austroads Guide to Road Design (Parts 3, 4-4C and 6); 4. Austroads Design Vehicles and Turning Path Templates; 5. Queensland Manual of Uniform Traffic Control Devices, Part 13: Local Area Traffic Management and AS 1742.13-2009 Manual of Uniform Traffic Control Devices – Local Area Traffic Management; AND **AO29.3** Traffic calming devices are not installed on roads used for buses in accordance with section 2.3.2 Bus Route Infrastructure, Public	Not applicable.

Performance outcomes	Acceptable outcomes	Response
	Transport Infrastructure Manual, Department of Transport and Main Roads, 2015.	
PO30 Development provides safe, direct and convenient access to existing and future **public passenger transport infrastructure** and **active transport infrastructure**.	No acceptable outcome is prescribed.	**COMPLIES WITH PO30.** The development will provide connections to existing footpaths. Refer to plans of development.
PO31 On-site vehicular circulation ensures the safety of both **public passenger transport services** and pedestrians.	No acceptable outcome is prescribed.	Not applicable.
PO32 Taxi facilities are provided to accommodate the demand generated by the development.	No acceptable outcome is prescribed.	Not applicable.
PO33 Facilities are provided to accommodate the demand generated by the development for community transport services, courtesy transport services, and **booked hire services** other than taxis.	No acceptable outcome is prescribed.	Not applicable.
PO34 Taxi facilities are located and designed to provide convenient, safe and equitable access for passengers.	**AO34.1** A **taxi facility** is provided parallel to the kerb and adjacent to the main entrance. AND **AO34.2 Taxi facilities** are designed in accordance with: 1. AS2890.5–1993 Parking facilities – on-street parking and AS1428.1–2009 Design for access and mobility – general requirements for access – new building work; 2. AS1742.11–1999 Parking controls – manual of uniform traffic control devices 3. AS/NZS 2890.6–2009 Parking facilities –off street parking for people with disabilities; 4. Disability standards for accessible public	Not applicable.

Performance outcomes	Acceptable outcomes	Response
	5. transport 2002 made under section 31(1) of the Disability Discrimination Act 1992; 6. AS/NZS 1158.3.1 – Lighting for roads and public spaces, Part 3.1: Pedestrian area (category P) lighting – Performance and design requirements; 7. Chapter 7 Taxi Facilities, Public Transport Infrastructure Manual, Department of Transport and Main Roads, 2015.	
PO35 Educational establishments are designed to ensure the safe and efficient operation of **public passenger services**, pedestrian and cyclist access and **active transport infrastructure**.	**AO35.1** Educational establishments are designed in accordance with the provisions of the Planning for Safe Transport Infrastructure at Schools, Department of Transport and Main Roads, 2011.	Not applicable.

9.3.5 Transport Impact, Access and Parking Code

Performance outcomes	Acceptable outcomes	Comment
Transport impact		
PO1 The development is located on roads that are appropriate for the nature of traffic generated, having regard to the safety and efficiency of the transport network, and the functions and characteristics identified of the road hierarchy.	**AO1** No acceptable outcome is nominated.	**COMPLIES WITH PO1.** Refer to Geleon Traffic Impact Assessment report **50890-RP02-B** which presents the findings of a traffic impact assessment on the external road network.
PO2 Development does not compromise the orderly provision or upgrading of the transport network.	**AO2** No acceptable outcome is nominated.	**COMPLIES WITH PO2.** Refer to Geleon Traffic Impact Assessment Report **50890-RP02-B** which presents the findings of a traffic impact assessment on the external road network.
PO3 On-site transport network infrastructure (including roads, parking, access and public transport, pedestrian and cyclist facilities) appropriately integrates and connects with surrounding networks.	**AO3** No acceptable outcome is nominated.	**COMPLIES WITH PO3.** Refer to the plans of development.
Site access		
PO4 As far as practicable, development is designed to encourage travel by public transport, walking and cycling.	**AO4** No acceptable outcome is nominated.	**COMPLIES WITH PO4.** Footpath connections will be provided to the external road network. For further details in this regard, refer to the plans of development.
PO5 Access arrangements are appropriate for: (a) the capacity of the parking area; (b) the volume, frequency and type of vehicle usage; (c) the function and characteristics of the access road and adjoining road network; and (d) the safety and efficiency of the road network.	**AO5** Access is provided in accordance with the standards identified in the Development manual planning scheme policy SC6.4 — SC6.4.5.5 Driveways, SC6.4.5.3 Public Transport Facilities and SC6.4.5.4 Car Parking.	**COMPLIES WITH AO5.** As part of the proposed transport infrastructure upgrades a new four-leg single lane roundabout will be provided at the midpoint between Racecourse Road and Stuart Drive. Direct property access to the new Lakeside Drive extended will not be permitted with all development traffic to flow through the eastbound and westbound approaches to this roundabout. For further details in relation to the location of the access, refer to **Section 5.0** of Geleon Traffic Impact Assessment Report **50890-RP02-B.**

PO6 Where practical, access for cyclists and pedestrians is clearly distinguished from vehicle access.	**AO6** No acceptable outcome is nominated.	**COMPLIES WITH PO6.** Provision for cyclists and pedestrians will be detailed at the next stage of the development.
PO7 Access is located and designed to provide safe and easy access to the site, having regard to its position, width and gradient.	**AO7** Access is provided in accordance with the standards identified in the Development manual planning scheme policy no. SC6.4 — SC6.4.5.5 Driveways and SC6.4.3 Standard Drawings	**COMPLIES WITH AO7.** Access into the proposed development will be provided in accordance with the Development manual planning scheme policy no. SC6.4 — SC6.4.5.5 Driveways and SC6.4.3 Standard Drawings. Access details will be provided at the next stage of the development.
PO8 All vehicles reasonably expected to use the site are able to travel the length of the driveway or driveway access without damage to vehicle or the driveway surface.	**AO8** Access is provided in accordance with the standards identified in the Development manual planning scheme policy no. SC6.4 — SC6.4.5.5 Driveways, SC6.4.5.3 Public Transport Facilities and SC6.4.5.4 Car Parking.	**COMPLIES WITH AO8.** Access into the proposed development will be provided in accordance with the Development manual planning scheme policy no. SC6.4 — SC6.4.5.5 Driveways, SC6.4.5.3 Public Transport Facilities and SC6.4.5.4 Car Parking. Access details will be provided at the next stage of the development.
PO9 A driveway does not cause change in the level of a footpath that is unsafe or inaccessible for people with mobility difficulties.	**AO9** Access is provided in accordance with the standards identified in the Development manual planning scheme policy no. SC6.4 — SC6.4.5.5 Driveways and SC6.4.3 Standard Drawings.	**COMPLIES WITH AO9.** Access into the proposed development will be provided in accordance with the Development manual planning scheme policy no. SC6.4 — SC6.4.5.5 Driveways and SC6.4.3 Standard Drawings. Access details will be provided at the next stage of the development.
PO10 Driveways are designed to withstand loadings from all vehicles reasonably expected to use the site.	**AO10** Access is provided in accordance with the standards identified in the Development manual planning scheme policy no. SC6.4 — SC6.4.5.5 Driveways.	**COMPLIES WITH AO10.** Access into the proposed development will be provided in accordance with the Development manual planning scheme policy no. SC6.4 — SC6.4.5.5 Driveways. Access details will be provided at the next stage of the development.
PO11 A driveway does not allow water to pond on adjacent properties or adjacent buildings and does not allow water to enter a building or property.	**AO11** Access is provided in accordance with the standards identified in the Development manual planning scheme policy no. SC6.4 — SC6.4.5.5 Driveways.	**COMPLIES WITH AO11.** Access into the proposed development will be provided in accordance with the Development manual planning scheme policy no. SC6.4 — SC6.4.5.5 Driveways. Access details will be provided at the next stage of the development.
PO12 Construction of a driveway does not damage or interfere with the location, function of or access to any services and infrastructure.	**AO12** Access is provided in accordance with the standards identified in the Development manual planning scheme policy no. SC6.4 — SC6.4.5.5	**COMPLIES WITH AO12.** Access into the proposed development will be provided in accordance with the Development manual planning scheme policy no. SC6.4 — SC6.4.5.5 Driveways, SC6.4.5.3 Public Transport Facilities, SC6.4.5.4

	Driveways, SC6.4.5.3 Public Transport Facilities, SC6.4.5.4 Car Parking and SC6.4.3 Standard Drawings.	Car Parking and SC6.4.3 Standard Drawings. Access details will be provided at the next stage of the development.
PO13 All vehicles reasonably expected to access the site can safely manoeuvre to allow vehicles to exit and enter in a forward motion.	**AO13** Access is provided in accordance with the standards identified in Development manual planning scheme policy no. SC6.4 - SC6.4.5.5 Driveways, SC6.4.5.3 Public Transport Facilities, SC6.4.5.4 Car Parking and SC6.4.3 Standard Drawings such that all vehicles reasonably expected to access the site, can exit and enter in a forward motion with no more than a three-point turn.	**COMPLIES WITH AO13.** Access into the proposed development will be provided in accordance with the Development manual planning scheme policy no. SC6.4 — SC6.4.5.5 Driveways, SC6.4.5.3 Public Transport Facilities, SC6.4.5.4 Car Parking and SC6.4.3 Standard Drawings. Access and service vehicle details will be provided at the next stage of the development.
Pedestrian and cyclist facilities		
PO14 Provision is made for the safe and convenient movement of pedestrians on-site and connecting to the external network, having regard to desire lines, legibility, safety, topographical constraints, shading and other weather protection and equitable access arrangements.	**AO14** No acceptable outcome is nominated.	**COMPLIES WITH PO14.** Provision for pedestrians will be detailed at the next stage of the development.
PO15 Provision is made for safe and convenient cycle movement to the site and within the site and connecting to the external network having regard to desire lines, users' needs, safety, topographical constraints and legibility.	**AO15** No acceptable outcome is nominated.	**COMPLIES WITH PO15.** Provision for cyclists will be detailed at the next stage of the development.
PO16 Parking areas, pathways and other elements of transport network infrastructure are designed to enhance public safety by discouraging crime and antisocial behaviour, having regard to: (a) provision of opportunities for casual surveillance; (b) provision of lighting; (c) the use of fencing to define public and private spaces, whilst allowing for appropriate sight lines; (d) minimising potential concealment points and assault locations; (e) minimising opportunities for graffiti and other vandalism; and (f) restricting unlawful access to buildings and between buildings.	**AO16** No acceptable outcome is nominated.	**COMPLIES WITH PO16.** The development will be designed at the detailed design stage to comply with these requirements.

Parking		
PO17 **Provision is made for on-site vehicle parking to:** (a) meet the demand likely to be generated by the development; and (b) avoid on street parking that would adversely impact on the safety or capacity of the road network or unduly impact on local amenity.	**AO17** Parking is provided in accordance with the standards identified in Parking rates planning scheme policy no. SC6.10.	**COMPLIES WITH AO17.** Car parking will be provided in accordance with the Parking rates planning scheme policy no. SC6.10.
PO18 Parking ensures access is provided for people with disabilities.	**AO18** Parking areas are designed in accordance with the standards identified in the Development manual planning scheme policy no. SC6.4 — SC6.4.5.4 Car Parking.	**COMPLIES WITH AO18.** Parking areas will be designed in accordance with the standards identified in the Development manual planning scheme policy no. SC6.4 — SC6.4.5.4 Car Parking.
PO19 Where the nature of the proposed development creates a demand, provision is made for set-down and pick-up facilities by bus, taxis or private vehicle, which: (a) are safe for pedestrians and vehicles; (b) are conveniently connected to the main component of the development by pedestrian pathway; and (c) provide for pedestrian priority and clear sight lines.	**AO19** No acceptable outcome is nominated.	**COMPLIES WITH PO19.** Provision will be made for set-down and pick-up facilities by bus, taxis or private vehicle.
PO20 Parking and servicing areas are designed to: (a) be clearly defined, marked and signed; (b) be convenient and accessible; (c) minimise large unbroken areas of hardstand to the extent practicable; (d) be safe for vehicles, pedestrians and cyclists; (e) provide shading;	**AO20** No acceptable outcome is nominated.	**COMPLIES WITH PO20.** Car parking design for the proposed development will be undertaken in accordance with Australian Standard *AS2890.1 – Parking Facilities* and *AS2890.6 – Off-street parking for people with disabilities.*

(f) be located to encourage multi-purpose trip ends and minimise vehicle movements within the site; and (g) minimise any adverse impacts on the amenity of surrounding land.		
PO21 Vehicle spaces have adequate dimensions to meet user requirements.	**AO21** Parking areas are designed in accordance with the standards identified in the Development manual planning scheme policy no. SC6.4 — SC6.4.5.3 Public Transport Facilities and SC6.4.5.4 Car Parking.	**COMPLIES WITH AO21.** Car parking design for the proposed development will be undertaken in accordance with Australian Standard *AS2890.1 – Parking Facilities* and *AS2890.6 – Off-street parking for people with disabilities.*
PO22 Pavement is constructed to an appropriate standard.	**AO22** No acceptable outcome is nominated.	**COMPLIES WITH PO22.** The development will be designed at the detailed design stage to comply with this requirement.
PO23 Parking and servicing areas are kept accessible and available for use as a parking area at all times during the normal business hours of the activity.	**AO23** No acceptable outcome is nominated	**COMPLIES WITH PO23.** The development will comply with this requirement.
PO24 Visitor parking for accommodation activities remains accessible and useable to visitors at all times.	**AO24** No acceptable outcome is nominated	**COMPLIES WITH PO24.** The development will comply with this requirement.
PO25 Multi-level parking areas are designed, articulated and finished to make a positive contribution to the local external streetscape character, as well as the internal user experience of the facility ensuring way finding technologies and aesthetic treatments are provided.	**AO25** No acceptable outcome is nominated	**Not applicable.**
Servicing		
PO26 Provision is made for the on-site loading, unloading, manoeuvring and access by service vehicles that: (a) are adequate to meet the demands generated by the development;	**AO26** Servicing areas are provided and designed in accordance with the standards identified in the Development manual planning scheme policy no. SC6.4 – SC6.4.5.3 Public Transport Facilities and SC6.4.5.4 Car Parking.	**COMPLIES WITH AO26.** Servicing areas will be provided and designed in accordance with the standards identified in the Development manual planning scheme policy no. SC6.4 – SC6.4.5.3 Public Transport Facilities and SC6.4.5.4 Car Parking.

(b) are able to accommodate the design service vehicle requirements; and (c) does not unduly impede vehicular, cyclist and pedestrian safety and convenience both within the site and external to the site.		
PO27 Refuse collection vehicles are able to safely access on-site refuse collection facilities.	**AO27** Refuse collection areas are provided and designed in accordance with the standards identified in the Development manual planning scheme policy no. SC6.4 – SC6.4.22 Waste Management, SC6.4.5.3 Public Transport Facilities and SC6.4.5.4 Car Parking.	**COMPLIES WITH AO27.** Refuse collection areas will be provided and designed in accordance with the standards identified in the Development manual planning scheme policy no. SC6.4 – SC6.4.22 Waste Management, SC6.4.5.3 Public Transport Facilities and SC6.4.5.4 Car Parking.
PO28 Servicing arrangements minimise any adverse impact on the amenity of premises in the vicinity, having regard to operating hours, noise generation, proximity to sensitive uses, odour generation and dust.	**AO28** No acceptable outcome is nominated	**COMPLIES WITH PO28.** The development will comply with this requirement.

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