

Sinclair Planning Pty Ltd
ABN 17 639 191 503

Our Ref: SP20011.L07.001.docx
SARA Ref: 2008-18279 SRA
Council Ref: A005505645
Contact: Leisa Sinclair

1 December 2020

Queensland Treasury
State Assessment and Referral Agency
Brisbane Regional Office
Level 13, 1 William Street
GPO Box 611
BRISBANE QLD 4001

Attention: Tyler Josephson, Planning Officer

Delivery via email: BrisbaneSARA@DSDMIP.qld.gov.au

Dear Tyler,

DEVELOPMENT APPLICATION SEEKING A DEVELOPMENT PERMIT FOR A MATERIAL CHANGE OF USE – CENTRE ACTIVITIES (SHOP) OVER LAND AT 63 – 69 MACGREGOR TERRACE, BARDON QLD 4065 PROPERLY DESCRIBED AS LOT 92 ON RP213399, LOT 1 ON RP42301 LOT 96 ON RP20444 AND LOT 98 ON RP20444 – S50 AND S51 PLANNING ACT 2016

RESPONSE TO ADVICE NOTICE ISSUED UNDER SECTION 35 OF THE DEVELOPMENT ASSESSMENT RULES V1.3

ASSESSMENT MANAGER APPLICATION REFERENCE: A005505645

SARA REFERENCE: 2008-18279 SRA

Sinclair Planning Pty Ltd acts for CB (Qld) Pty Ltd ACN 639 514 060 (**Applicant**) in relation to the abovementioned development application (**application**). Reference is made to the State Assessment and Referral Agency (**SARA**) Advice Notice for the application, dated 9 November 2020.

Please accept this correspondence on behalf of the Applicant, as a response to the Advice Notice. The response includes **Attachment A – Traffic Assessment Response**, which provides a detailed response to each of the matters raised.

In summary, the proposed development offers significant improvements to the safety and efficiency of the road network in this location by:

- retaining only one of the two existing crossovers, which will improve road safety for pedestrians, cyclists and drivers;
- relocating the eastbound bus stop further west of the site access, which will improve driver sight distance at the site access;
- widening the eastern crossover / site access, which will improve manoeuvrability at the access;
- restricting the right turn movement out of the site, which will reduce potential vehicle conflicts;
- reducing the gross floor area (GFA) on the site, which will reduce traffic generating impacts on the road network, and which will provide a net benefit for network operations.

The Applicant's responses to SARA's Information Request and Advice Notices about the development application appropriately respond to State Code 1. Accordingly, the proposed development warrants Referral Agency support subject to reasonable and relevant conditions.

The Applicant requests that SARA now finalise the assessment of the development application on this basis.

Please contact the undersigned if you have any queries in relation to the application.

Yours sincerely,

A handwritten signature in blue ink, appearing to read 'L Sinclair', with a small mark to the right.

Leisa Sinclair
Director and Principal Planner
Sinclair Planning Pty Ltd

Mail: PO Box 130, Lutwyche Q 4030
Mobile: +61 413 626 694
Email: leisa.sinclair@sinclairplanning.com.au

enc: Attachment A – Traffic Assessment Response

cc Dominic Hudson, BCC Assessment Manager, via edacitywest@brisbane.qld.gov.au
Adrian Spencer, Applicant's Representative via email A.Spencer@pradella.com.au

ATTACHMENT A

Traffic Assessment Response

Our Ref: QTT20017
Contact: Alice Shi

30 November 2020

CB (QLD) Pty Ltd
Level 1, 409 Montague Road
West End QLD 4101

Cardno (Qld) Pty Ltd
ABN 57 051 074 992

Level 11
515 St Paul's Terrace
Fortitude Valley QLD 4006
Australia

Phone +61 7 3369 9822
Fax +61 7 3369 9722

www.cardno.com

63 MACGREGOR TCE BARDON QLD 4065 TRAFFIC ENGINEERING RESPONSE TO SARA INFORMATION REQUEST

Cardno (Qld) Pty Ltd (Cardno) has been engaged by CB (QLD) Pty Ltd to provide traffic and transport engineering advice regarding the proposed retail development located at 63 MacGregor Terrace Bardon QLD, 4065.

Following their review of the application (Ref: 2008-18279 SRA), SARA issued an Information Request (IR) dated 24 August 2020 and an Advice Notice dated 2 September 2020. Cardno responded to the information request with the response dated 23rd October 2020. Following the response, SARA issued a Further Advice Notice which included six (6) items. These items have been reproduced below for ease of reference with a corresponding Cardno response. A copy of the Advice Notice is enclosed at **Appendix 1**.

The proposed development offers significant improvements to the existing situation in the following aspects:

- > Removal of the western crossover on MacGregor Terrace, improving road safety for pedestrians, cyclists and drivers
- > Relocating the eastbound bus stop which improves sight distance for drivers at the site access
- > Widening the eastern crossover, improving manoeuvrability at the access
- > Restricting the right turn out of the site, reducing potential vehicle conflicts
- > Reducing the scale of the existing development gross floor area (GFA) which reduces the traffic generating impact on the road network, providing a net benefit for network operations.

Item 1

Issue:

The response to information request stated that the proposed driveway has been widened to a 9m wide (hybrid type B1/B2) standard driveway to allow for simultaneous traffic movements through the access. The submitted swept path diagrams, prepared by Cardno, do not demonstrate that a Heavy Reticulated Vehicle (HRV) can safely manoeuvre through the access whilst facilitating simultaneous traffic movements within the access. Furthermore, the swept path diagrams show that an HRV turning left out of the site to Macgregor Terrace would utilise the entire width of the 9m driveway, as well as crossing over the road centre line.

It is required that the access driveway be redesigned to a suitable standard which provides safe, efficient and simultaneous traffic movements for all design vehicles, so as to comply with Performance Outcome (PO) 16 of State Code 1: Development in a State-controlled road environment (State Code 1) of SDAP.

Action:

To demonstrate compliance with PO16 of State Code 1, the following information should be provided:

- revised plans detailing a redesign of the proposed driveway that is suitable in providing simultaneous traffic movements for all expected vehicles (previous information request suggested a 12m wide Type C2 driveway be investigated).*
- revised swept path diagrams detailing that an HRV can safely manoeuvre and exit the access when a vehicle is queued at the access waiting to exit (ensuing no hazard impact)*

Response for Item 1:

Following the advice by the Department of Transport and Main Roads (DTMR) the design team has updated the development plans to provide a 10.8 metre wide driveway crossover. A copy of the revised development plans is enclosed at Appendix 2.

Brisbane City Council (BCC) Transport, Access, Parking and Servicing (TAPS) indicates that for a supermarket with less than 2,000m² of GFA, the required service vehicle is an MRV. The swept paths on drawings QTT2007-SK22-SK24-B identifies that the driveway can accommodate this design vehicle (and an RCV) entering and exiting while a B99 passes it in the driveway. A copy of the swept paths is enclosed at Appendix 3.

The operator (Coles) has informed us that occasional use by an HRV design vehicle may occur outside of peak times, and that these events would be scheduled by the operator (as are all loading and servicing activities). Standard practice for delivery to site involves co-ordination between distribution centre truck drivers and the store to ensure all reasonable safety measures are taken including HRV delivery outside of operating hours to avoid any conflict with customer vehicles.

The increased driveway width allows for heavy vehicles to safely pass any queued vehicles on both entry and exit. The revised swept path assessment indicates a vehicle is able to store without impacting the through traffic on MacGregor Terrace while the HRV leaves the site. This is indicated on drawing QTT20017-SK18-D, which also outlines that the HRV exit manoeuvre sits within the provided lane width of MacGregor Terrace and provides sufficient clearance (500mm) to vehicles travelling on the opposite side of MacGregor Terrace (westbound).

This arrangement demonstrates that while the HRV is exiting the site, a B99 is able to store across the access, while remaining outside of the through traffic lane. While the vehicle is shown propping across the verge, traffic on MacGregor Terrace will not be blocked from continuing through, as it will only be positioned temporarily, until the HRV exits the site. Pedestrians will be able to clearly see the vehicle waiting and therefore, the risk of conflicts occurring is considered to be unlikely.

The redesigned access also provides a small central median on MacGregor Terrace, which blocks right turn manoeuvres out of the site and separates left turn manoeuvres out of the site from westbound traffic on MacGregor Terrace. The central median ensures HRV drivers would be able to perform the left turn exit manoeuvre within the eastbound lane width of MacGregor Terrace as the physical barrier provides a limit to the manoeuvring area.

Item 2

Issue:

It is proposed that the vehicle access on Macgregor Terrace would utilise line marking and signage to limit access to the subject site via left-in / right-in / left-out operations, with restriction of right turn exiting movements. Line marking and signage alone has a low compliance level and a physical barrier would be required on Macgregor Terrace to enforce any restrictions to right turns.

There is concern that due to the high vehicle frequency, historic and well documented crash history and limited sight distance along Macgregor Terrace, right turn movements into the subject site would be problematic for the safety and efficiency of the State-controlled road network. This is particularly the case when the proposed development for a shopping centre will intensify the use on the subject site with additional generated traffic.

To comply with PO16 of State Code 1, further justification is required to explain how the proposed arrangement is the most suitable option to managing safety and efficiency impacts on the State-controlled road network. SARA maintains a strong position that right turns into and out of the proposed access should be avoided. Furthermore, the proposal should propose other suitable alternatives, such as a left-in/left out access arrangement or by creating a signalised intersection.

Action:

To demonstrate compliance with PO16 of State Code 1, the following information should be provided:

- *Further justification how the proposed access arrangement for left-in / right-in / left-out with linemarking and signage will not result in queuing, delay and safety impacts on the State-controlled road (with consideration to expected traffic generated by the proposed shopping centre). The arrangement should be updated to include physical barriers to enforce restrictions to right exit turns; and*
- *Update plans detailing the linemarking, location and design of signage and physical barriers proposed to support the access arrangement; or*
- *Revaluate the access arrangement to either of the following, as recommended by SARA:*
 - *a signal-controlled vehicle access, which incorporates and replaces the existing mid-block pedestrian crossing facility; or*
 - *a left-in / left-out access (with physical measures to prevent right turns).*

Response for Item 2:

To ensure the development was providing a suitable access arrangement for the proposed development, the option to provide a signalised development access and restrict development access to left-in / left-out were investigated.

Providing a signalised access arrangement for the proposed development must incorporate the existing conditions on MacGregor Terrace. The development access point is located between a curve to the east and a signalised pedestrian crossing. To facilitate the signalisation of the development access, the existing pedestrian crossing would require removal due to the close proximity to the access.

The signalisation of the development access should also provide access to the commercial development opposite. However, this would be difficult to implement given the offset between the two access driveways. The proposal would also make it difficult to safely retain access to the adjacent residential dwelling to the east of the development access.

Furthermore, the east approach to the development access is after a bend which may influence sight distance for the back of the vehicle queue. Considering the signalisation of the development access would impact queuing along MacGregor Terrace, impacts existing commercial and residential accesses and raises safety concerns with vehicle sight distance, the signalisation of the development access has not been further investigated.

A left-in / left-out arrangement for the development access on MacGregor Terrace would mean that development traffic are required to reroute on the external road network. If right turn movements out of the site are banned, development traffic is able to access the MacGregor Terrace / Latrobe Terrace roundabout intersection to perform a u-turn and travel in their desired direction. However, there is no convenient location to turn around for right turn movements into the site. Development traffic coming from the east on MacGregor Terrace would be required to perform a wider divert on the external road network potentially rat-running to perform a left turn into the site. As a result, traffic could even make unsafe manoeuvres if they did not deem the diversion as a convenient route. Thus, due to the external road network not providing convenient access for diverted right turns and potential safety risks with development traffic diverting, a left-in left-out arrangement has not been investigated further. Hence, the development proposed to restrict right turn out of the site but retain right turns into the site.

The redesigned driveway allows for the right and left turn movements into the development and bans the right turn movement out of the development. This is illustrated on Figure 1-1.

Figure 1-1 Redesigned Access Driveway



The revised access provides a 0.2m wide central median on MacGregor Terrace and a painted median on the driveway crossover. The central median fits within the existing carriageway while providing a 3.5m wide kerbside lane and 3.3m wide central lane for the westbound direction.

The central median width is expected to be in line with existing examples of medians below 1m in width. Similar applications which utilise a skinnier median is outlined in Figure 1-2. The skinny central median also discourages pedestrians from using the island as a pedestrian refuge. Given MacGregor Terrace is a busy corridor, it is important that pedestrians utilise the midblock pedestrian crossing rather than trying to cross at their own avail.

Figure 1-2 Central Median Examples



The central median on MacGregor Terrace will allow for right turns into the site for cars and restrict right turns into the site by heavy vehicles. Heavy vehicles will be restricted to left-in left-out. For cars, the combination of the central median on Macgregor Terrace and painted median on the driveway crossover will result in the right turn exit manoeuvre from the site not being achievable. This is supplemented by line marking (left turn arrow) and signage (left turn only) as shown on Figure 1-1.

The banning of right turn movements will result in lower delays for vehicles leaving the site and will also reduce the potential conflict points at the access. Vehicles leaving the site via a left turn will only give way to eastbound traffic on MacGregor Terrace as opposed to two traffic streams when undertaking a right turn manoeuvre.

Further to improving safety for the development driveway, these arrangements will also reinforce the left out only restrictions for the driveway opposite the development. As a result, the safety and efficiency of MacGregor Terrace will be enhanced beyond the existing all movements arrangement. Further discussions on the delay are provided in the response to item 5.

Item 3

Issue:

To demonstrate that the development will comply with PO20 of State Code 1, all potential impacts to the State-controlled road network should be adequately identified.

The predicted traffic generation of the existing uses (as identified in the submitted Traffic Assessment Response, prepared by Cardno) is not accepted. The existing buildings comprise a series of separate tenancies ranging in size from 30m² GFA to 600m² Gross Floor Area (GFA). The tenancies accommodate a mix of uses including food and drink, shop, indoor sport and recreation, health care services and office uses, typical of the subject site's neighbourhood centre zoning. The existing use is not considered representative of a shopping centre. Therefore, the existing traffic conditions on site is not accurately represented.

Despite having a lower GFA, the proposed supermarket is expected to result in a significant intensification of turn movements at the site access on Macgregor Terrace. Accordingly, the traffic generation of the existing use should be estimated by either:

- undertaking weekday and weekend peak hour traffic surveys at the existing site accesses and adjusting the results for any un-tenanted use; and*
- applying industry standard trip rates to each of the occupied component uses.*

Action:

To demonstrate compliance with PO20 of State Code 1 the TIA prepared by Cardno should be revised to include a SIDRA intersection analysis. The SIDRA analysis should be undertaken for the weekday morning, weekday evening and weekend peak hours for the design year peak hour (10 years after opening year). The SIDRA analysis should also determine that the form and design of the proposed access to Macgregor Terrace will operate with sufficient capacity, to avoid impacting the safety and efficiency of the State- controlled road network.

Response for Item 3:

Cardno does not agree with the statement regarding the existing approved use of the centre. The existing use of the development site comprises three buildings totalling 2,664m² GFA, which have been approved and used for retail and associated land uses. The existing development operates similar to a strip centre in a neighbourhood shopping precinct. In the absence of the proposed development, the existing approved use of the premises would continue. The proposed development plans to provide a supermarket comprising 1,880m² GFA, which is less GFA than currently provided. As stated in our previous traffic response, the application of a shopping centre rate for the existing development on the site is in line with the Brisbane City Plan 2014 characterisation of the site, as this represents the potential generation of the site as it has been approved.

The shopping centre rate should be applied to existing development on the site for the following reasons:

- > The site is zoned as Neighbourhood Centre under the Brisbane City Plan 2014, which supports a mix of uses including shops, food and drink outlets, sport and recreation and health care uses in an integrated precinct.
- > The site forms part of a wider neighbourhood centre precinct in Bardon that extends to the west and south of MacGregor Terrace. Within this neighbourhood centre precinct, the existing site uses are considered to provide a degree of self-containment and cross-utilisation, which is supported by shared off-street parking spaces.
- > Applying the trip generation rates for the individual site land uses would not appropriately capture cross-utilisation expected within the site or the neighbourhood centre precinct and may well result in an overestimation of existing trips.

The application of the shopping centre traffic generation rate for existing uses is considered appropriate for the subject site, which forms part of the integrated neighbourhood centre.

Notwithstanding, a sensitivity test assessment of the trip generation for each individual tenancy for the existing site has been estimated to compare to the proposed development for information only. This assessment is outlined in Table 1-1.

Table 1-1 Individual Tenancy Traffic Generation

Tenant	Land Use	Yield	Weekday AM Trip Rate	Thursday Trip Rate	Saturday Trip Rate	Source	Weekday AM Peak Trips (vph)	Thursday Peak Trips (vph)	Saturday Peak Trips (vph)
Mundo Churrasco [#]	Assumed Shop	379 m ²	5 per 100sqm	12 per 100sqm	16 per 100sqm	RTA 2002	19	47	62
Recent Guarantee [#]	Assumed Shop	217 m ²	5 per 100sqm	12 per 100sqm	16 per 100sqm	RTA 2002	11	27	35
Anytime Fitness	Indoor sport and recreation	581 m ²	3 per 100sqm	7 per 100sqm	3 per 100sqm	Cardno surveys	16	38	15
Theirs Douglas Christine	Educational establishment	248 m ²	First principles*	First principles*	First principles*	-	70	70	70
YRD Aust Pty Ltd	Shop	80 m ²	5 per 100sqm	12 per 100sqm	16 per 100sqm	RTA 2002	4	10	13
Maddison's Hair Design Pty Ltd	Shop	63 m ²	5 per 100sqm	12 per 100sqm	16 per 100sqm	RTA 2002	3	8	10
Greendot Group Pty Ltd	Shop	42 m ²	5 per 100sqm	12 per 100sqm	16 per 100sqm	RTA 2002	2	5	7
The Persian [#]	Assumed Shop	184 m ²	5 per 100sqm	12 per 100sqm	16 per 100sqm	RTA 2002	9	23	30
Charm Health Pty Ltd	Office	444 m ²	2 per 100sqm	2 per 100sqm		RTA 2002	9	9	0
Matsuik Property Pty Ltd	Office	87 m ²	2 per 100sqm	2 per 100sqm		RTA 2002	2	2	0
Bic Australia Pty Ltd	Shop	31 m ²	5 per 100sqm	12 per 100sqm	16 per 100sqm	RTA 2002	2	4	5
Formzoo [#]	Assumed Shop	46 m ²	5 per 100sqm	12 per 100sqm	16 per 100sqm	RTA 2002	2	6	7
Koaben Pty Ltd	Health Care Service	71 m ²	8 per 100sqm	6 per 100sqm	3 per 100sqm	TMR	5	4	2
Access Art Inc	Community use	82 m ²	First principles*	First principles*	First principles*	-	23	23	23
Matthew Johnson (hairdresser)	Shop	34 m ²	5 per 100sqm	12 per 100sqm	16 per 100sqm	RTA 2002	2	4	6
Smoked Paprika Pty Ltd	Food and drink	75 m ²	12 per 100sqm	12 per 100sqm	15 per 100sqm	ITE	9	0	11
Total		2664 m²					187	279	297

*Traffic generation for educational uses estimated through first principles. Theirs Douglas Christine was assumed to have three classes and Access Art Inc is assumed to have one class. For both uses the room occupancy is assumed to be 75% for a 30 person class and the trips are associated with one class operating, one class overlapping and 3 staff. Additionally, 60% of the site is assumed to utilise private transport to access the site.

[#] Tenancies noted to be vacant and assumed shop

The results of Table 1-1 indicates that the use of individual tenancies generate 187vph in the weekday AM peak, 279vph in the Thursday PM peak and 297vph in the Saturday peak. The comparison to the proposed development trips is outlined in Table 1-2.

Table 1-2 Trip Generation Comparison

Scenario	Yield	Traffic Generation		
		Weekday AM	Weekday PM	Saturday
Existing	2,664m ² GFA	187 vph	279 vph	297 vph
Proposed	1,880m ² GFA	86 vph*	250 vph	286 vph
Difference	-784m² GFA	-101 vph	-29 vph	-11 vph

*Weekday AM Peak estimated as 30% of Saturday peak in accordance with Google analytics data for Coles supermarkets

As a result of the reduced GFA and change in land uses, it is anticipated that the proposed development generates 101 less trips in the weekday AM Peak, 29 less trips in the Thursday PM Peak and 11 vehicles less in the Saturday peak.

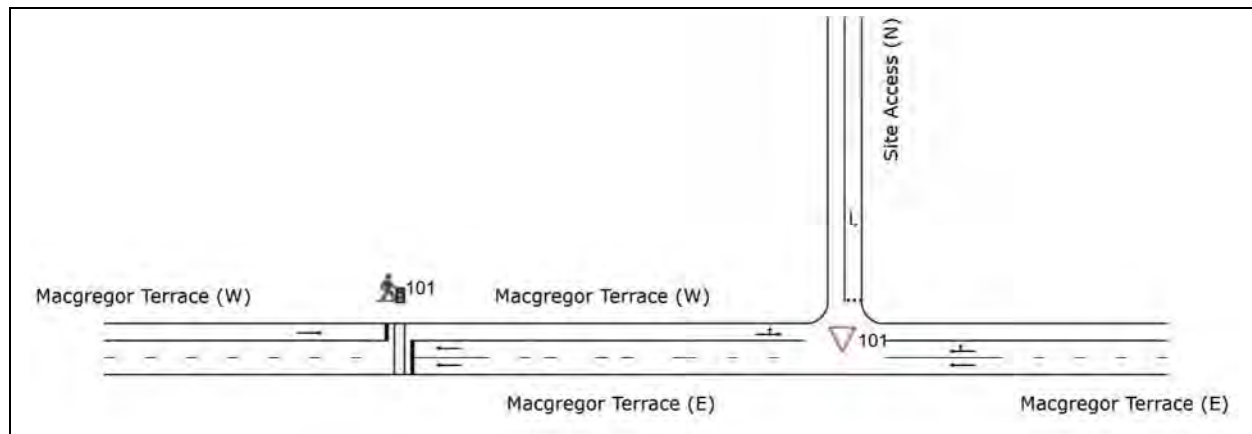
To further demonstrate the impact on the external road network, a SIDRA assessment has been undertaken of the development access point networked with the pedestrian signals to the west of the access point. Traffic assumptions and characteristics for this assessment are outlined in Appendix 4.

MacGregor Terrace / Site Access and MacGregor Terrace / Pedestrian Crossing

The configuration of the driveway crossover operates similar to a three-way unsignalised intersection. Due to the proximity of the signalised pedestrian crossing, this intersection has also been analysed. The SIDRA assessed layout is illustrated on Figure 1-3.

The proposed permitted movements have been assessed, with vehicles seeking to exit towards the west taking a left turn to re-route around the MacGregor Terrace / Latrobe Terrace intersection.

Figure 1-3 SIDRA Network Layout – MacGregor Terrace / Site Access and MacGregor Terrace / Pedestrian Crossing



Source: Nearmap, SIDRA 8.0

The results of the SIDRA network assessment are summarised in Table 1-3 and Table 1-4 for the network. Table 1-3 presents the SIDRA results for the MacGregor Terrace / Site Access intersection while Table 1-4 presents the SIDRA results for the MacGregor Terrace / Pedestrian Crossing.

Table 1-3 SIDRA Results – MacGregor Terrace / Site Access Intersection

Scenario	Weekday AM Peak			Thursday PM Peak			Saturday Peak		
	DOS	Critical Delay (sec)	95 th ile Queue (m)	DOS	Critical Delay (sec)	95 th ile Queue (m)	DOS	Critical Delay (sec)	95 th ile Queue (m)
Proposed Development									
2021 BG + Dev	0.625	21.9	23.5	0.604	21.5	35.1	0.652	25.1	32.0
2031 BG + Dev	0.687	28.7	29.9	0.661	27.4	43.7	0.714	22.2	39.9

The results indicate that the intersection is anticipated to operate within typical performance thresholds (DOS < 0.80 for priority controlled intersections, delays ≤ 42 seconds) in the 2021 and 2031 scenarios with the proposed development traffic.

Table 1-4 SIDRA Results – MacGregor Terrace / Pedestrian Crossing

Scenario	Weekday AM Peak			Thursday PM Peak			Saturday Peak		
	DOS	Critical Delay (sec)	95 th ile Queue (m)	DOS	Critical Delay (sec)	95 th ile Queue (m)	DOS	Critical Delay (sec)	95 th ile Queue (m)
Proposed Development									
2021 BG + Dev	0.702	2.9	165.3	0.688	3.3	150.5	0.726	2.9	184.6
2031 BG + Dev	0.770	3.4	216.5	0.754	3.6	192.8	0.795	3.4	245.0

The results indicate that the intersection is anticipated to operate within typical performance thresholds (DOS < 0.90 for signalised intersections) in the 2021 and 2031 scenarios with the proposed development traffic.

Item 4

Issue:

As explained in the previous information request, a Road Safety Assessment (RSA) in accordance with the Department of Transport and Main Roads' Guide to Traffic Impact Assessment (GTIA) is necessary. The RSA will facilitate an understanding of the safety and efficiency impacts the development could potentially impose on the State-controlled road network, so as to enable assessment of the application against PO20 of State Code 1.

It has not been effectively demonstrated that the proposed development would reduce traffic impacts on the State-controlled road network over existing conditions. Conversely, the development proposal has the potential to have a significant adverse impact on the safety of the state-controlled road given:

- the traffic volumes on this section of Macgregor Terrace, which are about 2,000vph during the network peak hours
- the expected traffic generation of the proposed development (i.e. approximately 250 vehicles per hour based on industry standard rates for supermarket use)
- the crash history on this section of Macgregor Terrace, with a significant number of crashes in close proximity to the subject site (with a number related to the operation of the existing access driveways)
- the currently proposed form and design of the site access
- the lack of any existing (or currently proposed) turn treatments at the site access, particularly for vehicles turning right into the subject site.

Action:

To demonstrate compliance with PO20 of State Code 1, the Traffic Impact Assessment (TIA), prepared by Cardno should be revised to include a safety impact assessment. The TIA, completed by a Registered Professional Engineer of Queensland (RPEQ) and in accordance with the GTIA. The safety impact assessment should consider:

- the design of the driveway and the ability to safely accommodate vehicles simultaneously entering and exiting the subject development
- the potential for angle and rear-end crashes associated with vehicles turning into and out of the subject development
- the requirement to ban any turn movements at the site access
- the need for any turn treatments on Macgregor Terrace at the site access.

Response for Item 4:

A review of the available crash data for the past five (5) years (2015-2019) for the road network approaching the site has been undertaken. Figure 1-4 illustrates the identified crash locations, with the details summarised in Table 1-5.

Figure 1-4 Historical Crash Locations (2015-2019)



Table 1-5 Historical Crash Description

Reference	Location	Date	DCA Code and Type	Severity
6841	Macgregor Tce / Rockbourne Tce	June, 2016	303 Veh'S Same Direction: Right Rear	Minor injury
15312	Macgregor Tce	December, 2015	301 Veh'S Same Direction: Rear End	Medical treatment
15705	Macgregor Tce	May, 2017	308 Veh'S Same Direction: Right Turn S/Swipe	Minor injury
15718	Macgregor Tce	May, 2017	309 Veh'S Same Direction: Left Turn S/Swipe	Minor injury
15808	Macgregor Tce	August, 2017	301 Veh'S Same Direction: Rear End	Medical treatment
15902	Macgregor Tce	December, 2017	303 Veh'S Same Direction: Right Rear	Medical treatment
320966	Macgregor Tce	March, 2018	1 Ped'N: Near Side Vehicle Hit From Right	Hospitalisation

Two crashes of the seven recorded on MacGregor Terrace (illustrated in orange in Figure 1-3) in the last five years appear to be attributed to the movements associated with the development access (these are shown as **bold** in Table 1-5).

One of these crashes (reference 15312) was a rear end crash which appears to have occurred at the development access location. This crash could be attributed to either a vehicle not slowing down fast enough for a vehicle in front undertaking the left turn movement into the site, or as a result of external traffic movements such as the driver not braking quickly enough when joining the end of a queueing occurring on MacGregor Terrace. Should the crash be attributed to site access related movements, it is acknowledged that only one rear end crash was recorded in the last five years which does not indicate a crash trend or significant safety issue with the site access.

The second crash (reference 15705) was a right turn sideswipe which is likely to have occurred when a westbound vehicle was passing another vehicle turning right into the site. There was only one crash recorded in the last five years, which does not indicate there is a trend.

There is no significant crash risk associated with the development access in the last five years. The proposed access arrangement would further increase safety and reduce crash risk with the restriction of right turn movements from heavy vehicles into the site and right turn movements for all vehicle types out of the site.

The proposed access design will limit the right turn movements out of the site. In addition, the proposed access form will introduce a central median on MacGregor Terrace which has been designed to extend across the access for the site opposite (60-62 MacGregor Terrace) which is designated as a no right exit driveway. The median will serve a dual purpose by limiting right turns from both accesses.

With respect to turn treatments at the access, provision of a right turn pocket would be inconsistent with other intersections in the area and cannot be provided in the existing road corridor. The adjacent intersection of MacGregor Terrace / Rockbourne Terrace serves a moderately sized residential catchment without the provision of a right turn lane on MacGregor Terrace. Furthermore, use of turn lanes in urban environments such as MacGregor Terrace are not considered to serve a significant benefit relative to the implementation costs, as drivers are alert and familiar with sharing the road space with other users.

As requested by DTMR, a safety impact assessment has been prepared. This is documented in the form of a safety risk assessment, in line with the guidelines set out in the GTIA.

This assessment has identified the potential risks associated with the existing arrangement and the residual risks associated with the proposed arrangement. For each of the identified issues, a risk rating has been determined. This has been based on the GTIA safety risk score matrix (Figure 9.3.2(a)), a copy of which is shown below on Figure 1-4.

The rating descriptors are defined as the following in Table 1-6:

Table 1-6 Risk Rating Descriptors

Rating Measure	Descriptor			
Potential Likelihood of Incident Occurring				
Almost Certain (5)	Very likely. The event is expected to occur in most circumstances			
Likely (4)	There is a strong possibility the event will occur			
Moderate (3)	The event might occur at some time			
Unlikely (2)	Not expected, but there's a slight possibility it may occur at some time			
Rare (1)	Highly unlikely, but it may occur in exceptional circumstances. It could happen, but probably never will.			
Potential Consequence of Incident Occurring				
Property Only (1)	Minor Injury (2)	Medical Treatment (3)	Hospitalisation (4)	Fatality (5)
Potential Risk of Incident Occurring				
High	Should be corrected or the risk significantly reduced, even if the treatment costs is high			
Medium	Should be corrected or the risk significantly reduced, if the treatment cost is moderate, but not high.			
Low	Should be corrected or the risk reduced, if the treatment cost is low			

Figure 1-5 Safety Risk Score Matrix

		Potential consequence				
		Property only (1)	Minor injury (2)	Medical treatment (3)	Hospitalisation (4)	Fatality (5)
Potential likelihood	Almost certain (5)	M	M	H	H	H
	Likely (4)	M	M	M	H	H
	Moderate (3)	L	M	M	M	H
	Unlikely (2)	L	L	M	M	M
	Rare (1)	L	L	L	M	M

L: Low risk
 M: Medium risk
 H: High risk

Source: TMR GTIA Figure 9.3.2(a)

Table 1-7 outlines the risk assessment for each of the identified items, and assigns the likelihood and consequence of each item to determine the risk level. Each of the risks are illustrated on Figure 1-6 for reference.

Figure 1-6 Identified Risks



Table 1-7 Safety Risk Assessment

Item	Existing Risk	Risk Level			Proposed Treatment	Residual Risk		
		Likelihood	Consequence	Risk		Likelihood	Consequence	Risk
1	Bus stop located close to the eastern access temporarily blocks sight lines for drivers at the access when a bus is at the bay. This introduces vehicle conflict risks for drivers entering the road	3	3	MEDIUM	The bus stop has been relocated to the west, away from the site access. Better sight lines will be achieved as there is greater separation between the temporary blockage with buses.	2	2	LOW
2	Two driveways introduce multiple conflict points between pedestrians and vehicles	2	3	MEDIUM	The development proposes to remove one driveway. This halves the potential number of conflict points between pedestrians and vehicles	1	3	LOW
3	Pedestrian sightlines at the eastern access are limited by the fence immediately adjacent to the driveway. This introduces pedestrian – vehicle conflict risks	3	2	MEDIUM	The proposed design does not change this existing arrangement, and thus does not worsen the risk. To mitigate the risk for pedestrians, it is recommended that landscaping could be added at the property boundary to push pedestrian paths outwards or the fence could be cut down to allow for clear sightlines. Crash analysis has indicated that no pedestrian – vehicles incidents have occurred at the access in the last five years	2	2	LOW
4	Multiple service vehicles access the site to serve the various tenancies. This introduces potential conflicts between heavy vehicles, private vehicles and pedestrians	2	2	LOW	The development will have service vehicles for only two tenants which allows for easier coordination of servicing times and reduction in the frequency of servicing in comparison to the existing arrangement. To deter pedestrians from walking through the driveway to access the site, it is recommended that pedestrian access to / from the basement parking is kept open 24 hours for safer pedestrian access through the site at all times.	1	2	LOW
5	The current site caters for servicing by MRV and RCV vehicles, due to the limited on-site turning space for larger vehicles.	2	3	MEDIUM	The development has been designed for HRV access to suit the tenant's needs. While this is a larger vehicle using the access, the driveway has been widened to suit HRV maneuvering. This also improves manoeuvring for MRVs and RCVs.	2	2	LOW
6	All movements for vehicles are permitted at the eastern access. This poses six potential vehicle conflict points at the access	3	2	MEDIUM	The proposed access will restrict right turn movements out of the site. This reduces the potential vehicle conflict points to three.	2	2	LOW
7	A right rear crash was recorded at the access for the site opposite (60-62 MacGregor Terrace) in the crash analysis. This could be associated with the right turn into the site or the right turn out of the site (which is not a permitted movement)	2	3	MEDIUM	The proposed access will introduce a central median which is designed to extend across the exit lane of the access for the site opposite. This will reduce the risk associated with right turns leaving the site, and could reduce the risk of right rear crashes in future	1	3	LOW
8	Pedestrians walking along the MacGregor Terrace frontage need to cross two accesses, with a combined crossing length of approximately 12m.	2	3	MEDIUM	The proposed design removes one access point however lengthens the crossing distance for the retained access, which will be approximately 10m in total. However, the painted median will act as a pedestrian refuge which will allow pedestrians to cross in two stages	1	3	LOW

As indicated in the table, the existing arrangement has a number of medium level risks. The proposed development reduces or maintains the risk level for all of the identified risks to a low level, presenting improvements in many cases and certainly does not worsen the safety. Therefore, the development is not considered to present an overall adverse impact to the safety of the transport network.

Item 5

Issue:

Further information is required to demonstrate compliance with PO20 of State Code 1 and to explain how the proposed development will not adversely impact the safety and efficiency of the State-controlled road network.

Whilst the development would generate a proportion of undiverted drop-in trips (i.e. trips that already form part of the existing flows on the road network), the new trips generated by the development would be expected to result in a significant (i.e. greater than 5%) number of additional turn volumes at other intersections on the State-controlled road network including the Macgregor Road / Simpsons Road signal-controlled intersection.

Action:

To demonstrate compliance with PO20 of State Code 1, the TIA prepared by Cardno should include the following information:

- An intersection delay assessment at all intersections where the development traffic exceeds 5% of base traffic movements in the weekday peak periods; and*
- Details of any mitigation measures proposed to address traffic impacts on the State-controlled road network by the proposed development. Any mitigation measures must be prepared in accordance with the Department of Transport and Main Roads' Road Planning and Design Manual.*

Response for Item 5:

In accordance with the GTIA requirements for no net worsening to baseline road network operations, this assessment has investigated the delay impact of the development traffic on the network. The assessment has reviewed whether the increase in average delay at the state controlled intersections (MacGregor Terrace / Site Access and MacGregor Terrace / Pedestrian Crossing) exceeds 5%.

The average delay has been calculated as per the guidance in the GTIA (shown below), taking the aggregate average delay across the intersections for both the baseline scenario (2021 and 2031 Background) and the With Development scenario (2021 and 2031 Background with Development).

$$ID = \sum_{i=1}^n WD - \sum_{i=1}^n BC$$

where:

ID	is aggregate intersection-delay impact vehicle-minutes.
WD	is 'with development' intersection vehicle-minutes for design peak periods. This is calculated by multiplying the 'with development' average delay by movement to the base case volume on each movement, thus not counting the impact as delays to development traffic, only to pre-existing traffic that is affected by these additional delays.
BC	is base case intersection vehicle-minutes for design peak periods
n	is the number of intersections in the impact assessment area
i	is each intersection within the impact assessment area.

Source: TMR GTIA

The results of the network impact assessment are summarised in Table 1-8 and Table 1-9. Table 1-8 outlines the delay impact when considering use of the shopping centre trip rates for the existing uses on site. Comparatively, Table 1-9 outlines the results when adopting the individual use rates for the existing uses. Detailed calculations are enclosed at **Appendix 5**.

The existing development traffic has been proportioned as follows:

- > Assumed 50% / 50% split at the two existing access points
- > All movements access permitted as per current arrangement

The proposed development traffic has been proportioned as follows:

- > 100% development traffic using the proposed access point
- > Right turn exit not permitted as per proposed arrangement

Table 1-8 Intersection Impact – MacGregor Terrace / Site Access and MacGregor Terrace / Pedestrian Crossing – Shopping Centre Rate applied for existing uses

Assessment Scenario	Aggregate Delay (veh-min)		
	Weekday AM Peak	Thursday PM Peak	Saturday Peak
2021 Background (Shopping Centre rate)	298	2,985	7,161
2021 Background with Development	146	234	264
Difference (Development Impact)	-152	-2,751	-6,897
Development Delay Impact (%)	-51%	-92%	-96%
Average 2021 Delay Impact (%)		-80%	
2031 Background (Shopping Centre rate)	757	6,728	16,329
2031 Background with Development	194	309	364
Difference (Development Impact)	-563	-6,419	-15,965
Development Delay Impact (%)	-74%	-95%	-98%
Average 2031 Delay Impact (%)		-89%	

As shown, the network average delay impact is -80% at 2021 and -89% at 2031, which does not exceed the 5% threshold and significantly improves the delays from the existing uses. This is due to the delays associated with the right turns out of the site access being delayed by through traffic. The development proposal will ban right turn movements, thus improving the network operations. Therefore, no mitigation works are considered to be required.

Table 1-9 Intersection Impact – MacGregor Terrace / Site Access and MacGregor Terrace / Pedestrian Crossing – Individual Use rates applied for existing uses

Assessment Scenario	Aggregate Delay (veh-min)		
	Weekday AM Peak	Thursday PM Peak	Saturday Peak
2021 Background (Individual use rates)	699	285	1,524
2021 Background with Development	146	234	264
Difference (Development Impact)	-552	-51	-1,260
Development Delay Impact (%)	-79%	-18%	-83%
Average 2021 Delay Impact (%)		-60%	
2031 Background (Individual use rates)	1,743	696	3,680
2031 Background with Development	194	309	364
Difference (Development Impact)	-1,549	-387	-3,316
Development Delay Impact (%)	-89%	-56%	-90%
Average 2031 Delay Impact (%)		-78%	

As shown, the network average delay impact is -60% at 2021 and -78% at 2031, which does not exceed the 5% threshold and improves the delays from the existing uses. This is due to the delays associated with the right turns out of the site access being delayed by through traffic. The development proposal will ban with movement, thus improving the network operations. Therefore, no mitigation works are considered to be required.

Item 6

Issue:

Further information is required to demonstrate compliance with Performance Outcome (PO) 18 of State Code 1 of SDAP, ensuring that Public Passenger Transport Services are not adversely impacted by the proposed development.

The TIA (prepared by Cardno in response to SARA's information request) does not adequately demonstrate that the relocated bus stop 'MacGregor Terrace at Bardon, stop 15, Bardon (Hastus ID: 001357) will:

- be adequately separated from the signalised pedestrian crossing in accordance with the Transport Operations (Road Use Management – Road Rules) Regulation 2009
- be designed in accordance with the Public Transport Infrastructure Manual and Brisbane City Council requirements
- avoid conflicts with constraints such as power poles, street trees, drainage, on-street car parking and the like conflict with the on-street car parking on a curve to the immediate west of the bus zone when buses queue and manoeuvre into the bus stop
- provide adequate sightlines for bus drivers to enter and exit the stop.

Action:

To demonstrate compliance with PO18 of State Code 1, provide the following information:

- An RPEQ certified safety assessment demonstrating that bus drivers will have adequate sightlines to safely enter and exit the relocated bus stop. If the sightlines are not adequate, the applicant will need to revise the location of the relocated bus stop to ensure it is safe or propose necessary changes or safety controls to the roadway to overcome the issues.
- A layout plan for the relocated bus stop clearly demonstrating the following:
- provision for the set down of a single unit rigid bus of 14.5m in length (27m bus bay and 10m departure length) in accordance with Section 5.6.3.1 – 'Bus stop length requirements' and 'Table 5.7: Minimum bus stop length requirements' of Chapter 5 – 'Bus stop infrastructure' of the Public Transport Infrastructure Manual 2015;
- the relocated bus bay setback a minimum of 10m from the stop line at the signalised pedestrian crossing in MacGregor Terrace in accordance with the Transport Operations (Road Use Management – Road Rules) Regulation 2009. In this instance, the 10m departure length of the bus zone could comprise the 10m separation;
- access and hardstand in accordance with 'Intermediate Stop – Site Layout
- Without Indented Bus Bay' - DRG 5-0021 in Appendix 5B of the Public Transport Infrastructure Manual 2015;
- all bus stop components shown (seats under awning, J-pole, blade sign, tactiles) for an Intermediate Stop in accordance with Section 5.7 – 'Bus stop components' of Chapter 5 – 'Bus stop infrastructure' of the Public Transport Infrastructure Manual 2015 and relevant Brisbane City Council standards;
- the rear and front doors of a parked bus in the bus zone will be clear of obstructions including landscaping, drainage, power poles, street furniture and the like. This should be demonstrated for single unit rigid buses of 12.5 m in length and 14.5m in length in accordance with 'Table 5.6: Estimated Door Positions' of Chapter 5 – 'Bus stop infrastructure' of the Public Transport Infrastructure Manual 2015; and
- remove the on-street carparking between the bus zone and the driveway at 81 Macgregor Terrace to ensure the safety and efficiency of the relocated bus stop. No standing line marking and signage should be provided.

Response for Item 6:

It is proposed to relocate bus stop "Bardon-15" (I.D. 001375) further to the west of MacGregor Terrace on the approach side of the signalised pedestrian crossing as illustrated in Figure 1-6 and **Appendix 6**.

Figure 1-7 Proposed Bus Stop Relocation



The new location provides 10m separation from the MacGregor Terrace stop line in accordance with Transport Operations Regulation 2009. The bus bay length has been increased to 27m to accommodate a 14.5m rigid bus. Additionally, the separation from the stop line doubles as the departure length for the bus zone. A review of the door opening locations has confirmed that the position of the doors will be unobstructed by existing poles or trees. The proposed landscape design will be amended to suit.

As requested on-street carparking between the bus zone and the driveway at 81 MacGregor Terrace will be removed to ensure the safety and efficiency of the relocated bus stop.

Further design of the bus stop will be completed in the detailed design stage.

Should there be any queries with regards to the above items, please contact the undersigned.

Yours sincerely,

Alice Shi
Senior Traffic Engineer, RPEQ 22028
for Cardno
Direct Line: +61 7 3310 2442
Email: yang.shi@cardno.com.au

Enc: Appendix 1: SARA Further Advice Notice
Appendix 2: Revised Development Plans
Appendix 3: Swept Path Drawings
Appendix 4: Traffic Assumptions and Characteristics
Appendix 5: Delay Assessment Calculations
Appendix 6: Bus Bay Concept Design

APPENDIX

1

SARA FURTHER ADVICE NOTICE –
2008-18279 SRA



Queensland Treasury

SARA reference: 2008-18279 SRA

Council reference: A005505645

9 November 2020

CB (Qld) Pty Ltd ACN 639 514 060
C/- Sinclair Planning Pty Ltd
PO Box 130
LUTWYCHE QLD 4030
leisa.sinclair@sinclairplanning.com.au

Attention: Ms Leisa Sinclair

Dear Ms Sinclair,

SARA advice notice – 63, 65a, 67 and 69 Macgregor Terrace, Bardon

(Advice notice given under section 35 of the Development Assessment Rules)

The State Assessment and Referral Agency (SARA) advises that your development application has not adequately demonstrated compliance with the State Development Assessment Provisions (SDAP).

SARA has reviewed the information you provided in your response of 23 October 2020 to SARA's information request. As discussed, the following issues with the proposed development application have been identified:

Performance Outcome 16 – Access to a State-controlled road

1.	<p><u>Issue:</u></p> <p>The response to information request stated that the proposed driveway has been widened to a 9m wide (hybrid type B1/B2) standard driveway to allow for simultaneous traffic movements through the access. The submitted swept path diagrams, prepared by Cardno, do not demonstrate that a Heavy Reticulated Vehicle (HRV) can safely manoeuvre through the access whilst facilitating simultaneous traffic movements within the access. Furthermore, the swept path diagrams show that an HRV turning left out of the site to Macgregor Terrace would utilise the entire width of the 9m driveway, as well as crossing over the road centre line.</p> <p>It is required that the access driveway be redesigned to a suitable standard which provides safe, efficient and simultaneous traffic movements for all design vehicles, so as to comply with Performance Outcome (PO) 16 of State Code 1: Development in a State-controlled road environment (State Code 1) of SDAP.</p>
----	---

	<p><u>Action:</u></p> <p>To demonstrate compliance with PO16 of State Code 1, the following information should be provided:</p> <ul style="list-style-type: none"> revised plans detailing a redesign of the proposed driveway that is suitable in providing simultaneous traffic movements for all expected vehicles (previous information request suggested a 12m wide Type C2 driveway be investigated). revised swept path diagrams detailing that an HRV can safely manoeuvre and exit the access when a vehicle is queued at the access waiting to exit (ensuing no hazard impact).
2.	<p><u>Issue:</u></p> <p>It is proposed that the vehicle access on Macgregor Terrace would utilise line marking and signage to limit access to the subject site via left-in / right-in / left-out operations, with restriction of right turn exiting movements. Line marking and signage alone has a low compliance level and a physical barrier would be required on Macgregor Terrace to enforce any restrictions to right turns.</p> <p>There is concern that due to the high vehicle frequency, historic and well documented crash history and limited sight distance along Macgregor Terrace, right turn movements into the subject site would be problematic for the safety and efficiency of the State-controlled road network. This is particularly the case when the proposed development for a shopping centre will intensify the use on the subject site with additional generated traffic.</p> <p>To comply with PO16 of State Code 1, further justification is required to explain how the proposed arrangement is the most suitable option to managing safety and efficiency impacts on the State-controlled road network. SARA maintains a strong position that right turns into and out of the proposed access should be avoided. Furthermore, the proposal should propose other suitable alternatives, such as a left-in/left out access arrangement or by creating a signalised intersection.</p> <p><u>Action:</u></p> <p>To demonstrate compliance with PO16 of State Code 1, the following information should be provided:</p> <ul style="list-style-type: none"> Further justification how the proposed access arrangement for left-in / right-in / left-out with linemarking and signage will not result in queuing, delay and safety impacts on the State-controlled road (with consideration to expected traffic generated by the proposed shopping centre). The arrangement should be updated to include physical barriers to enforce restrictions to right exit turns; and Update plans detailing the linemarking, location and design of signage and physical barriers proposed to support the access arrangement; or Revaluate the access arrangement to either of the following, as recommended by SARA: <ul style="list-style-type: none"> a signal-controlled vehicle access, which incorporates and replaces the existing mid-block pedestrian crossing facility; or a left-in / left-out access (with physical measures to prevent right turns).
Performance Outcome 20 – Safety and efficiency of the State-controlled road	

3.	<p><u>Issue:</u></p> <p>To demonstrate that the development will comply with PO20 of State Code 1, all potential impacts to the State-controlled road network should be adequately identified.</p> <p>The predicted traffic generation of the existing uses (as identified in the submitted Traffic Assessment Response, prepared by Cardno) is not accepted. The existing buildings comprise a series of separate tenancies ranging in size from 30m² GFA to 600m² Gross Floor Area (GFA). The tenancies accommodate a mix of uses including food and drink, shop, indoor sport and recreation, health care services and office uses, typical of the subject site's neighborhood centre zoning. The existing use is not considered representative of a shopping centre. Therefore, the existing traffic conditions on site is not accurately represented.</p> <p>Despite having a lower GFA, the proposed supermarket is expected to result in a significant intensification of turn movements at the site access on Macgregor Terrace. Accordingly, the traffic generation of the existing use should be estimated by either:</p> <ul style="list-style-type: none"> • undertaking weekday and weekend peak hour traffic surveys at the existing site accesses and adjusting the results for any un-tenanted use; and • applying industry standard trip rates to each of the occupied component uses. <p><u>Action:</u></p> <p>To demonstrate compliance with PO20 of State Code 1 the TIA prepared by Cardno should be revised to include a SIDRA intersection analysis. The SIDRA analysis should be undertaken for the weekday morning, weekday evening and weekend peak hours for the design year peak hour (10 years after opening year). The SIDRA analysis should also determine that the form and design of the proposed access to Macgregor Terrace will operate with sufficient capacity, to avoid impacting the safety and efficiency of the State-controlled road network.</p>
4.	<p><u>Issue:</u></p> <p>As explained in the previous information request, a Road Safety Assessment (RSA) in accordance with the Department of Transport and Main Roads' Guide to Traffic Impact Assessment (GTIA) is necessary. The RSA will facilitate an understanding of the safety and efficiency impacts the development could potentially impose on the State-controlled road network, so as to enable assessment of the application against PO20 of State Code 1.</p> <p>It has not been effectively demonstrated that the proposed development would reduce traffic impacts on the State-controlled road network over existing conditions. Conversely, the development proposal has the potential to have a significant adverse impact on the safety of the state-controlled road given:</p> <ul style="list-style-type: none"> • the traffic volumes on this section of Macgregor Terrace, which are about 2,000vph during the network peak hours • the expected traffic generation of the proposed development (i.e. approximately 250 vehicles per hour based on industry standard rates for supermarket use) • the crash history on this section of Macgregor Terrace, with a significant number of crashes in close proximity to the subject site (with a number related to the operation of the existing access driveways) • the currently proposed form and design of the site access • the lack of any existing (or currently proposed) turn treatments at the site access, particularly for vehicles turning right into the subject site.

	<p><u>Action:</u></p> <p>To demonstrate compliance with PO20 of State Code 1, the Traffic Impact Assessment (TIA), prepared by Cardno should be revised to include a safety impact assessment. The TIA, completed by a Registered Professional Engineer of Queensland (RPEQ) and in accordance with the GTIA. The safety impact assessment should consider:</p> <ul style="list-style-type: none"> the design of the driveway and the ability to safely accommodate vehicles simultaneously entering and exiting the subject development the potential for angle and rear-end crashes associated with vehicles turning into and out of the subject development the requirement to ban any turn movements at the site access the need for any turn treatments on Macgregor Terrace at the site access.
5.	<p><u>Issue:</u></p> <p>Further information is required to demonstrate compliance with PO20 of State Code 1 and to explain how the proposed development will not adversely impact the safety and efficiency of the State-controlled road network.</p> <p>Whilst the development would generate a proportion of undiverted drop-in trips (i.e. trips that already form part of the existing flows on the road network), the new trips generated by the development would be expected to result in a significant (i.e. greater than 5%) number of additional turn volumes at other intersections on the State-controlled road network including the Macgregor Road / Simpsons Road signal-controlled intersection.</p> <p><u>Action:</u></p> <p>To demonstrate compliance with PO20 of State Code 1, the TIA prepared by Cardno should include the following information:</p> <ul style="list-style-type: none"> An intersection delay assessment at all intersections where the development traffic exceeds 5% of base traffic movements in the weekday peak periods; and Details of any mitigation measures proposed to address traffic impacts on the State-controlled road network by the proposed development. Any mitigation measures must be prepared in accordance with the Department of Transport and Main Roads' Road Planning and Design Manual.

Performance Outcome 18 – Impacts to Public Passenger Transport

6.	<p><u>Issue:</u></p> <p>Further information is required to demonstrate compliance with Performance Outcome (PO) 18 of State Code 1 of SDAP, ensuring that Public Passenger Transport Services are not adversely impacted by the proposed development.</p> <p>The TIA (prepared by Cardno in response to SARA's information request) does not adequately demonstrate that the relocated bus stop 'MacGregor Terrace at Bardon, stop 15, Bardon (Hastus ID: 001357) will:</p> <ul style="list-style-type: none"> be adequately separated from the signalised pedestrian crossing in accordance with the <i>Transport Operations (Road Use Management – Road Rules) Regulation 2009</i> be designed in accordance with the Public Transport Infrastructure Manual and Brisbane City Council requirements avoid conflicts with constraints such as power poles, street trees, drainage, on-street car parking and the like conflict with the on-street car parking on a curve to the immediate west of the bus
----	---

	<ul style="list-style-type: none"> zone when buses queue and manoeuvre into the bus stop provide adequate sightlines for bus drivers to enter and exit the stop. <p>Action:</p> <p>To demonstrate compliance with PO18 of State Code 1, provide the following information:</p> <ul style="list-style-type: none"> An RPEQ certified safety assessment demonstrating that bus drivers will have adequate sightlines to safely enter and exit the relocated bus stop. If the sightlines are not adequate, the applicant will need to revise the location of the relocated bus stop to ensure it is safe or propose necessary changes or safety controls to the roadway to overcome the issues. A layout plan for the relocated bus stop clearly demonstrating the following: <ul style="list-style-type: none"> provision for the set down of a single unit rigid bus of 14.5m in length (27m bus bay and 10m departure length) in accordance with Section 5.6.3.1 – ‘Bus stop length requirements’ and ‘Table 5.7: Minimum bus stop length requirements’ of Chapter 5 – ‘Bus stop infrastructure’ of the <i>Public Transport Infrastructure Manual 2015</i>; the relocated bus bay setback a minimum of 10m from the stop line at the signalised pedestrian crossing in MacGregor Terrace in accordance with the <i>Transport Operations (Road Use Management – Road Rules) Regulation 2009</i>. In this instance, the 10m departure length of the bus zone could comprise the 10m separation; access and hardstand in accordance with ‘Intermediate Stop – Site Layout – Without Indented Bus Bay’ - DRG 5-0021 in Appendix 5B of the <i>Public Transport Infrastructure Manual 2015</i>; all bus stop components shown (seats under awning, J-pole, blade sign, tactiles) for an Intermediate Stop in accordance with Section 5.7 – ‘Bus stop components’ of Chapter 5 – ‘Bus stop infrastructure’ of the <i>Public Transport Infrastructure Manual 2015</i> and relevant Brisbane City Council standards; the rear and front doors of a parked bus in the bus zone will be clear of obstructions including landscaping, drainage, power poles, street furniture and the like. This should be demonstrated for single unit rigid buses of 12.5 m in length and 14.5m in length in accordance with ‘Table 5.6: Estimated Door Positions’ of Chapter 5 – ‘Bus stop infrastructure’ of the <i>Public Transport Infrastructure Manual 2015</i>; and remove the on-street carparking between the bus zone and the driveway at 81 Macgregor Terrace to ensure the safety and efficiency of the relocated bus stop. No standing line marking and signage should be provided. <p><i>Note:</i> The Department of Transport and Main Roads’ TransLink <i>Public Transport Infrastructure Manual 2015</i> is available at: http://translink.com.au/about-translink/reports-and-publications.</p>
--	---

Please note that unlike an information request, **assessment timeframes do not stop** when advice is provided by SARA.

How to respond

It is recommended that you address these issues promptly and provide a response to SARA. If you decide not to respond, your application will be assessed and decided based on the information provided to date.

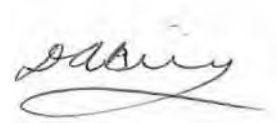
Under the [Development Assessment Rules](#) (DA Rules), the issuing of advice does not stop the assessment timeframes. If you intend to provide additional information, it should be provided in a timely manner to allow sufficient time for the information to be considered. As such, you are strongly encouraged to consider using the 'stop the clock' provisions under s32 of the DA rules, to allow sufficient time for you to consider and respond to SARA's advice; and for SARA to consider any new or changed material provided.

If you wish to utilise the 'stop the clock' provisions, you should give notice to the assessing authority (assessment manager or referral agency) whose current period you wish to stop. This can be done through MyDAS2 or via correspondence.

You are requested to upload your response and complete the relevant tasks in [MyDAS2](#).

If you require further information or have any questions about the above, please contact Tyler Josephson, Planning Officer, on (07) 3452 6814 or via email BrisbaneSARA@dndmip.qld.gov.au who will be pleased to assist.

Yours sincerely,



Darren Brewer
Planning Manager - SARA Brisbane Region

cc Brisbane City Council, dalodgement@brisbane.qld.gov.au

Development details	
Description:	Development permit Material Change of Use for centre activities (shopping centre)
SARA role:	referral agency
SARA trigger:	Schedule 10, Part 9, Division 4, Subdivision 2, Table 4, Item 1 (Planning Regulation 2017) Material Change of Use on premises within 25 metres of a State-controlled road.
SARA reference:	2008-18279 SRA
Assessment criteria:	State Code 1 of SDAP, version 2.6.

APPENDIX

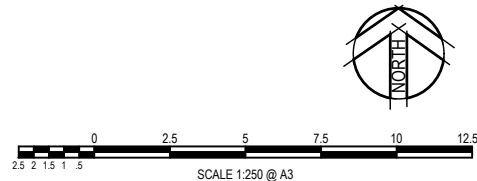
2

REVISED DEVELOPMENT PLANS



CAD File: G:\Q1720017 - Bardon Retail\6_ACA\Q1720017 - SK16_SK18 - K.dwg

Imagery supplied by nearmap, November 2020



© Cardno Limited
All Rights Reserved.
This document is produced by Cardno Limited solely for the benefit of and use by the client in accordance with the terms of the retainer. Cardno Limited does not and shall not assume any responsibility or liability whatsoever to any third party arising out of any use or reliance by third party on the content of this document.

Cardno
Cardno (Qld) Pty Ltd | ABN 57 051 074 992
Level 11, 515 St Paul's Terrace
Fortitude Valley, QLD 4006
Tel: 07 3369 9822 Fax: 07 3369 9722
Web: www.cardno.com.au

Supermarket Macgregor Terrace Access Review Driveway Concept			
Drawn T.Anang	Date 27/11/2020	Scale 1:250	Size A3
Drawing Number SK16			Revision B

APPENDIX

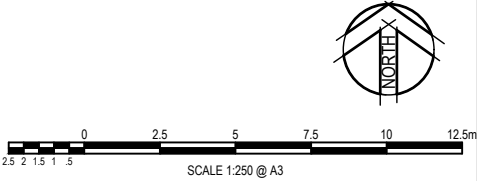
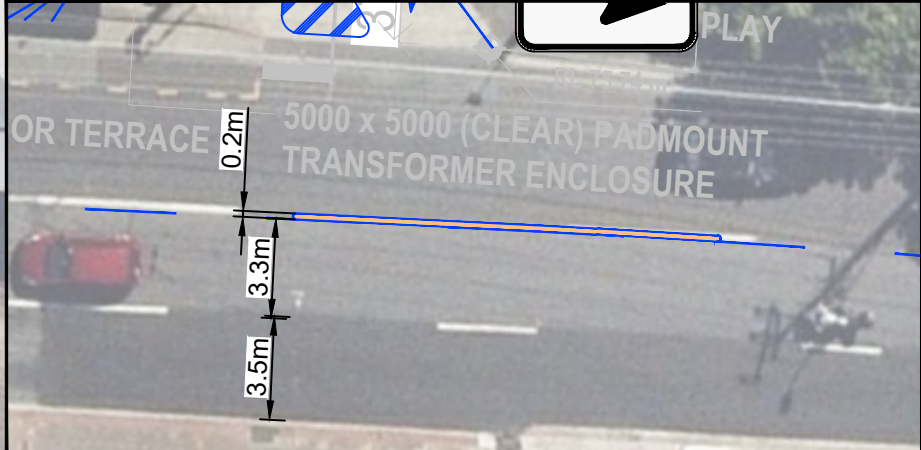
3

SWEPT PATHS DRAWINGS



Painted Median to discourage right turn manoeuvres.

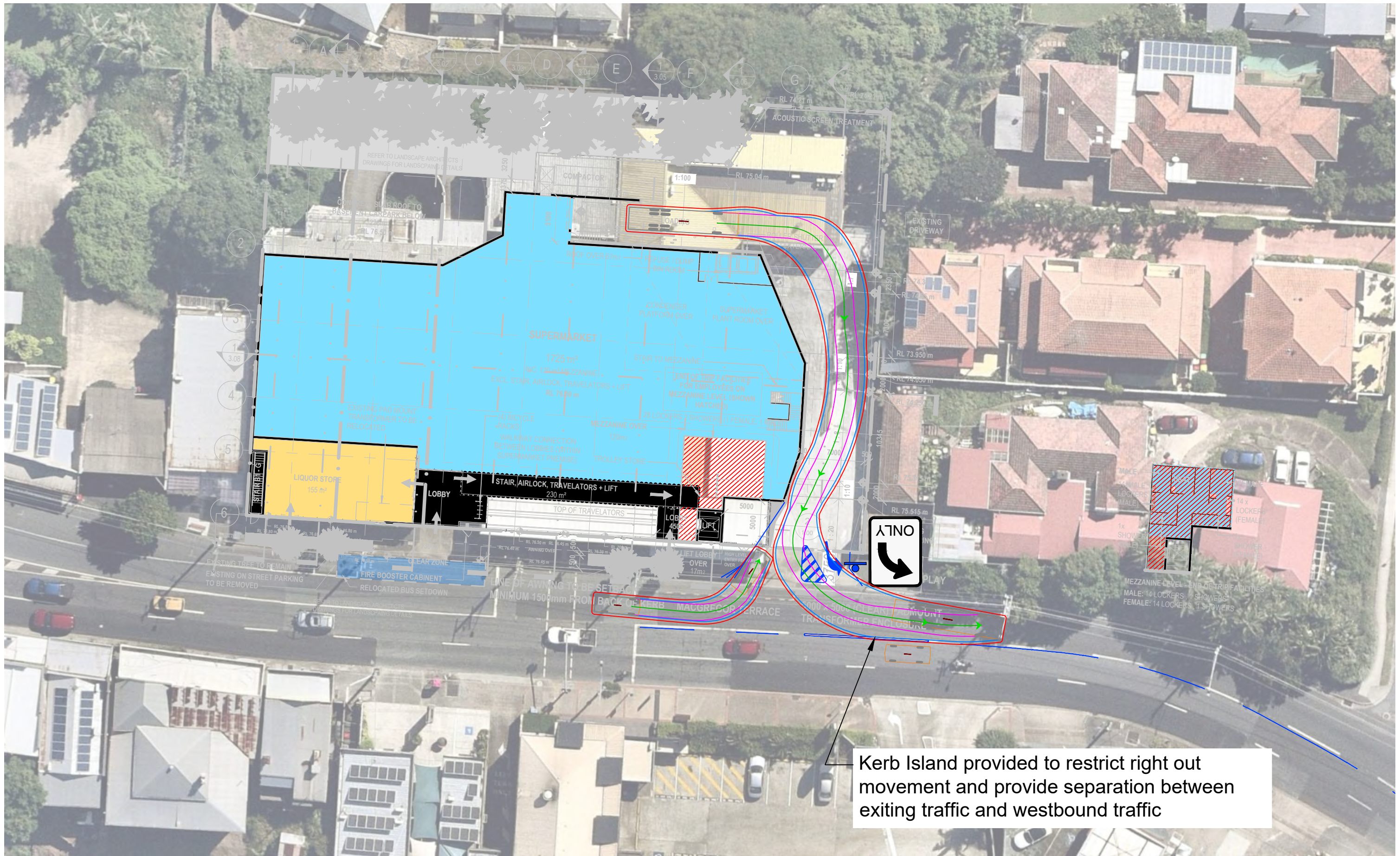
Provide 14m median island by reducing outside lane width to 3.3m (0.2m reduction)



© Cardno Limited
All Rights Reserved.
This document is produced by Cardno Limited solely for the benefit of and use by the client in accordance with the terms of the retainer. Cardno Limited does not and shall not assume any responsibility or liability whatsoever to any third party arising out of any use or reliance by third party on the content of this document.

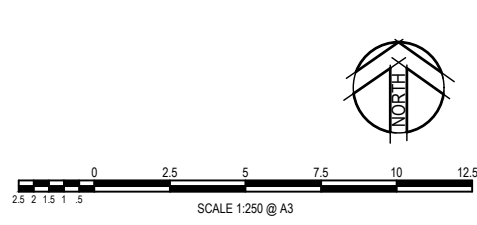
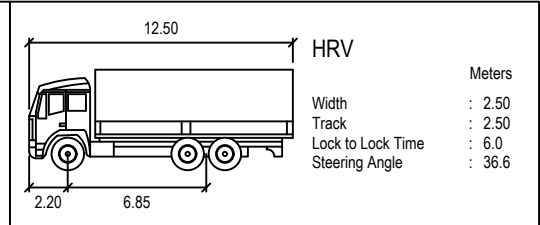
Cardno
Cardno (Qld) Pty Ltd | ABN 57 051 074 992
Level 11, 515 St Paul's Terrace
Fortitude Valley, QLD 4006
Tel: 07 3369 9822 Fax: 07 3369 9722
Web: www.cardno.com.au

Supermarket Macgregor Terrace Access Review Driveway Concept			
Drawn T.Anang	Date 30/11/2020	Scale 1:250	Size A3
Drawing Number SK16			Revision C



CAD File: G:\QTT2017 - Bardon Retail\6_ACAD\QTT2017 - SK18_SK18 - K.dwg
Imagery supplied by nearmap, November 2020

SWEEP PATH LEGEND	
	VEHICLE BODY
	FRONT TIRES
	VEHICLE PATH
	VEHICLE CLEARANCE (300mm)
	VEHICLE



© Cardno Limited
All Rights Reserved.
This document is produced by Cardno Limited solely for the benefit of and use by the client in accordance with the terms of the retainer. Cardno Limited does not and shall not assume any responsibility or liability whatsoever to any third party arising out of any use or reliance by third party on the content of this document.

Cardno (Qld) Pty Ltd | ABN 57 051 074 992
Level 11, 515 St Paul's Terrace
Fortitude Valley, QLD 4006
Tel: 07 3369 9822 Fax: 07 3369 9722
Web: www.cardno.com.au

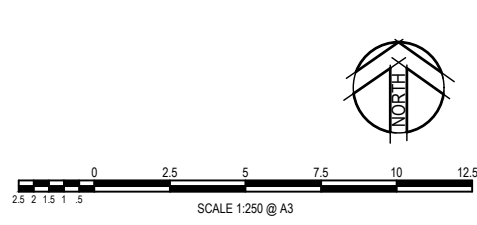
Supermarket Macgregor Terrace Swep path - HRV Concept Driveway - Exit			
Drawn T.Anang	Date 30/11/2020	Scale 1:250	Size A3
Drawing Number SK18			Revision E



CAD File: G:\QTT2017 - Barton Retail\ACAD\QTT2017 - SK01_SK02 - K.dwg
Imagery supplied by nearmap, November 2020

SWEEP PATH LEGEND	
	VEHICLE BODY
	FRONT TIRES
	VEHICLE PATH
	VEHICLE CLEARANCE (300mm)
	VEHICLE

	BCC Standard Rear Lift Meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 39.2
Clearance Height	: 3.4
Operating Height	: 3.4



© Cardno Limited
All Rights Reserved.
This document is produced by Cardno Limited solely for the benefit of and use by the client in accordance with the terms of the retainer.
Cardno Limited does not and shall not assume any responsibility or liability whatsoever to any third party arising out of any use or reliance by third party on the content of this document.

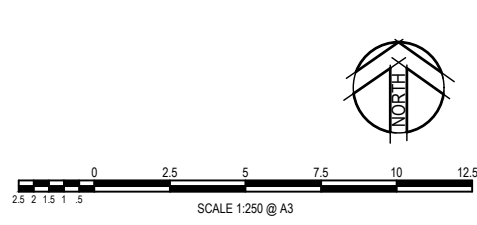
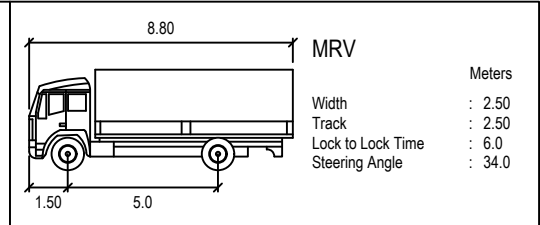
Cardno (Qld) Pty Ltd | ABN 57 051 074 992
Level 11, 515 St Paul's Terrace
Fortitude Valley, QLD 4006
Tel: 07 3369 9822 Fax: 07 3369 9722
Web: www.cardno.com.au

Supermarket Macgregor Terrace Sweep path - RCV Concept Driveway - Exit			
Drawn T.Anang	Date 30/11/2020	Scale 1:250	Size A3
Drawing Number SK24			Revision B



CAD File: G:\QTT2017 - Barton Retail\ACAD\QTT2017 - SK01_SK26 - K.dwg
Imagery supplied by nmapr, November 2020

SWEEP PATH LEGEND	
	VEHICLE BODY
	FRONT TIRES
	VEHICLE PATH
	VEHICLE CLEARANCE (300mm)
	VEHICLE



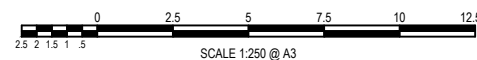
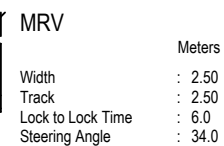
© Cardno Limited
All Rights Reserved.
This document is produced by Cardno Limited solely for the benefit of and use by the client in accordance with the terms of the retainer. Cardno Limited does not and shall not assume any responsibility or liability whatsoever to any third party arising out of any use or reliance by third party on the content of this document.

Cardno (Qld) Pty Ltd | ABN 57 051 074 992
Level 11, 515 St Paul's Terrace
Fortitude Valley, QLD 4006
Tel: 07 3369 9822 Fax: 07 3369 9722
Web: www.cardno.com.au

Supermarket Macgregor Terrace Sweep path - MRV Concept Driveway - Entry				
Drawn T.Anang	Date 30/11/2020	Scale 1:250	Size A3	Revision C
Drawing Number		SK26		



- VEHICLE BODY
- FRONT TIRES
- VEHICLE PATH
- VEHICLE CLEARANCE (300mm)
- VEHICLE



 **Cardno®**

Cardno (Qld) Pty Ltd | ABN 57 051 074 992
Level 11, 515 St Paul's Terrace
Fortitude Valley, QLD 4006
Tel: 07 3369 9822 Fax: 07 3369 9722
Web: www.cardno.com.au

Drawn T.Anang	Date 30/11/2020	Scale 1:250	Size A3
Drawing Number SK28			Revision C



APPENDIX

4

TRAFFIC ASSUMPTIONS AND CHARACTERISTICS

1 Proposed Development

1.1 Land Uses

1.1.1 Existing Land Uses

The development proposes to replace an existing mixed use development with retail uses. The existing uses include retail, fitness, food and drink and commercial office, providing up to 2,664 m² of gross floor area (GFA).

1.1.2 Proposed Land Uses

A summary of the proposed development uses and yields is provided in Table 1-1.

Table 1-1 Proposed Development Land Use

Land Use	Yield
Supermarket	1,725 m²
Liquor Store	155 m²
Total	1,880 m²

Figure 1-1 illustrates the development site located along Macgregor Terrace in Bardon.

Figure 1-1 Site Location



Source: Nearmap

1.2 Access

The site currently has two existing crossovers on the southern boundary of the site gaining direct access to Macgregor Terrace. It is proposed to remove the existing western crossover and retain the all movement access from the eastern crossover as illustrated in Figure 1-2.

Figure 1-3 Proposed Site Access



Source: Nearmap

2 Traffic Assumptions and Characteristics

2.1 Background Traffic Volumes

To understand the existing traffic conditions, loop count data was requested from Brisbane City Council for two weeks between 2nd February 2020 and 15th February 2020 at the following intersections.

- > Coopers Camp Road / Simpson Road / MacGregor Terrace
- > MacGregor Terrace / Midblock Pedestrian Crossing Between Simpsons Road and Rockbourne Terrace

The loop count data obtained for the intersections was utilised to obtain weekday AM, weekday PM (Thursday) and Saturday peak traffic volumes by averaging the volumes observed over the two-week period.

2.2 Traffic Growth

Traffic census data released by TMR from 2014 to 2019 was utilised to determine the traffic growth along the corridor. The growth along the corridor was inconsistent for the five years of growth as outlined in Table 2-1.

Table 2-1 MacGregor Terrace Traffic Growth

Year	AADT (vpd)	Growth
2014	22013	-
2015	21289	-3%
2016	21289*	0%*
2017	23382	5%
2018	23027	-2%
2019	22862	-1%
Average		-0.1%

*It is noted that the AADT did not change between 2015 and 2016 which may be an error in the data.

The traffic growth in Table 2-1 indicates in the last few years traffic volumes have been declining, nonetheless Cardno has adopted a linear growth of 1% p.a as a conservative assessment.

2.3 Directional Distribution

A summary of the in / out splits adopted for the proposed development uses are summarised in Table 2-2.

Table 2-2 Directional Distribution Splits

Land Use	IN	OUT
Supermarket	50%	50%

2.4 External Distribution

For the purpose of this assessment, the existing distribution at the MacGregor Terrace / Midblock Pedestrian Crossing (east/west split) was adopted for the external distribution as illustrated in Figure 2-1.

Figure 2-1 Proposed Development Distribution



It is noted that heavy vehicles will be restricted to left-in left-out. While it is not anticipated for heavy vehicle to access the site during peak hours,

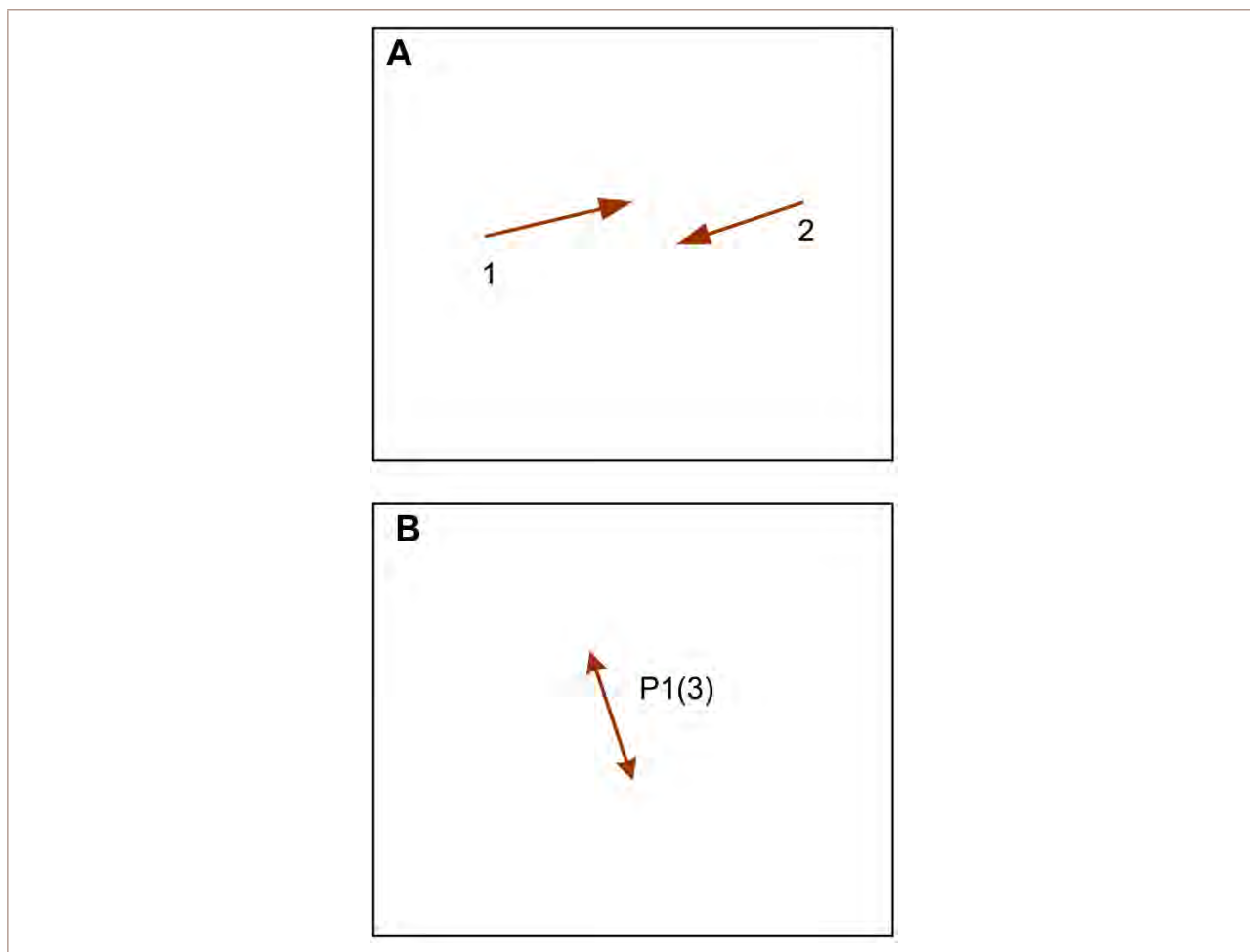
2.5 Heavy Vehicles

The provided loop count data from BCC did not include information on heavy vehicle volumes. As a result, the SIDRA assessment assumed 5% heavy vehicles for all movements. It is noted that the right turn movement into the development is banned for heavy vehicles for the proposed development but allowed in the existing configuration. While it is not completely accurate, the right turn movement into the site has been assigned a 5% HV proportion as a conservative assessment.

2.6 Pedestrian Crossing

SARA has also requested further information on the pedestrian crossing phases at the MacGregor Terrace / Midblock Pedestrian Crossing intersection. The BCC Phasing for the intersection is illustrated in Figure 2-2.

Figure 2-2 MacGregor Terrace / Midblock Pedestrian Crossing Intersection Phasing



The pedestrian crossing phase times based on the BCC loop count data is summarised for a weekday AM peak in Table 2-3, Thursday PM peak in Table 2-4 and Saturday peak in Table 2-5.

Table 2-3 MacGregor Terrace Midblock Pedestrian Crossing Phase Times – Weekday AM

Day	AM Peak		
	A Phase	B Phase	Cycle
Monday	172 sec	19 sec	191 sec
Tuesday	174 sec	19 sec	193 sec
Wednesday	158 sec	19 sec	177 sec
Thursday	305 sec	19 sec	325 sec
Friday	228 sec	19 sec	248 sec
Average	208 sec	19 sec	227 sec

The results of Table 2-3 indicate that for an average weekday AM peak, the cycle time is 227 seconds with pedestrian crossing time (Phase B) being 19 seconds of the total cycle time. Based on these results, the pedestrian phase is called 15 times in the peak hour.

Table 2-4 MacGregor Terrace Midblock Pedestrian Crossing Phase Times – Thursday PM

Day	PM Peak		
	A Phase	B Phase	Cycle
Thursday	180 sec	19 sec	199 sec

The results of Table 2-4 indicate that for the Thursday PM peak, the cycle time is 199 seconds with pedestrian crossing time (Phase B) being 19 seconds of the total cycle time. Based on these results, the pedestrian phase is called 18 times in the peak hour.

Table 2-5 MacGregor Terrace Midblock Pedestrian Crossing Phase Times – Saturday Peak

Day	Peak		
	A Phase	B Phase	Cycle
Saturday	221 sec	19 sec	240 sec

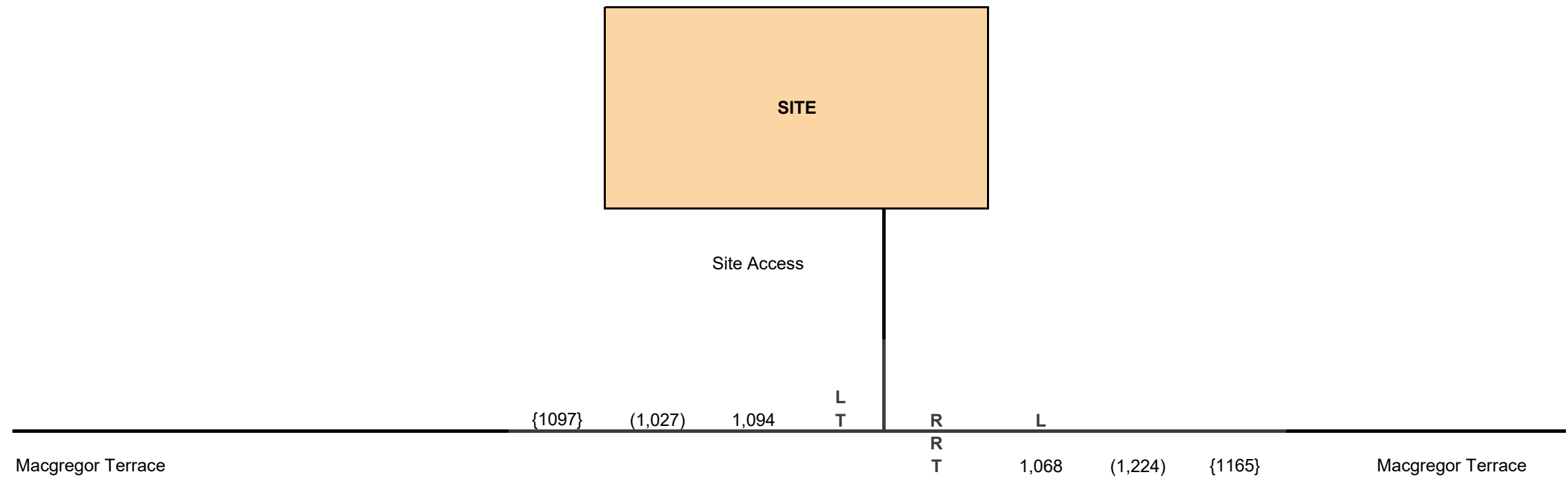
The results of Table 2-5 indicate that for the Saturday peak, the cycle time is 240 seconds with pedestrian crossing time (Phase B) being 19 seconds of the total cycle time. Based on these results, the pedestrian phase is called 15 times in the peak hour.

63 Macgregor Tce, Bardon

APPENDIX

A

NETWORK FLOW DIAGRAM



Figure

1

2020 Background Traffic

Project no. QTT20017
Prepared by Tariqul Islam

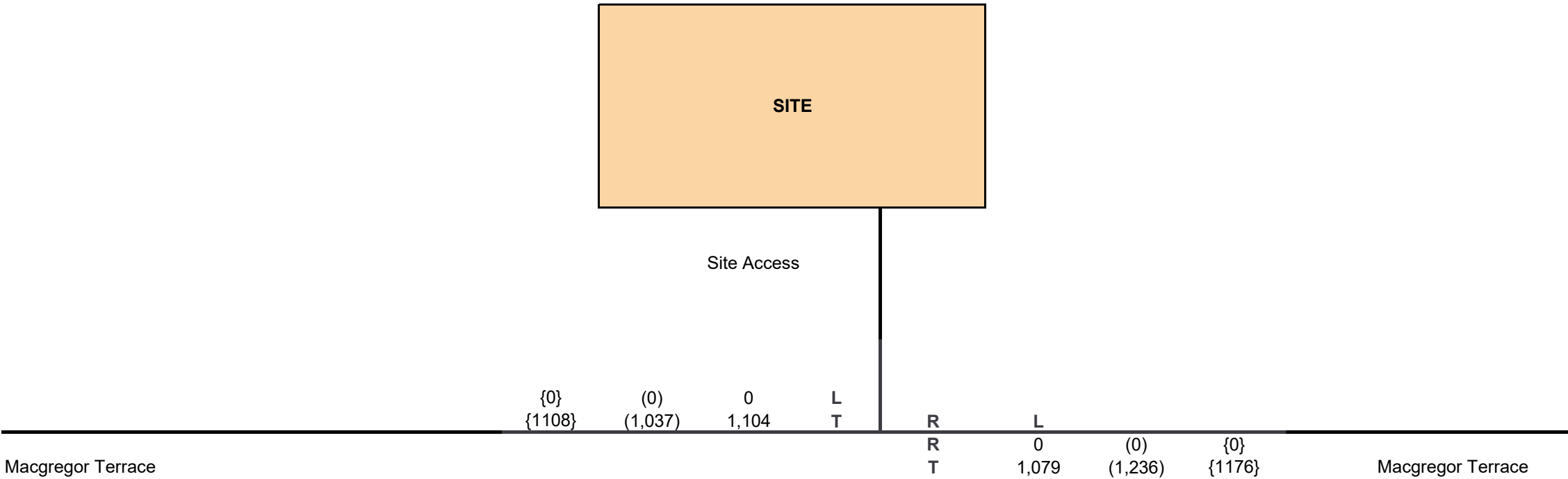
Project Bardon Retail
Reviewed by Tetteh Anang / Alice Shi

30/11/2020 G:\QTT20017 - Bardon Retail\5 PROJECT ANALYSIS\Analysis\NFD\QTT20017 - NFD v4 - Print.xlsx\BG2020

Legend

L	Left turn	00	AM Peak Volume
T	Through	(00)	PM Peak Volume
R	Right turn	{00}	Saturday Peak
U	U-turn		





Figure

2

Project no. QTT20017
Prepared by Tariqul Islam

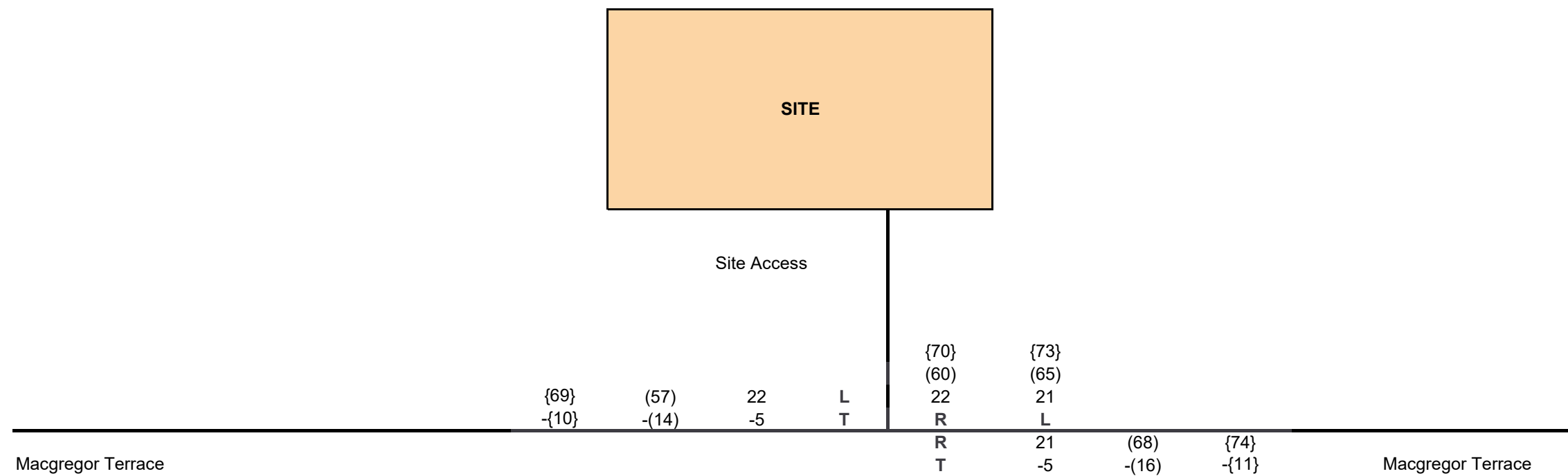
2021 Background Traffic

Project Bardon Retail
Reviewed by Tetteh Anang / Alice Shi

Legend

L	Left turn	00	AM Peak Volume
T	Through	{00}	PM Peak Volume
R	Right turn	{00}	Saturday Peak
U	U-turn		





Figure

3

Project no. QTT20017
Prepared by Tariqul Islam

Development Traffic

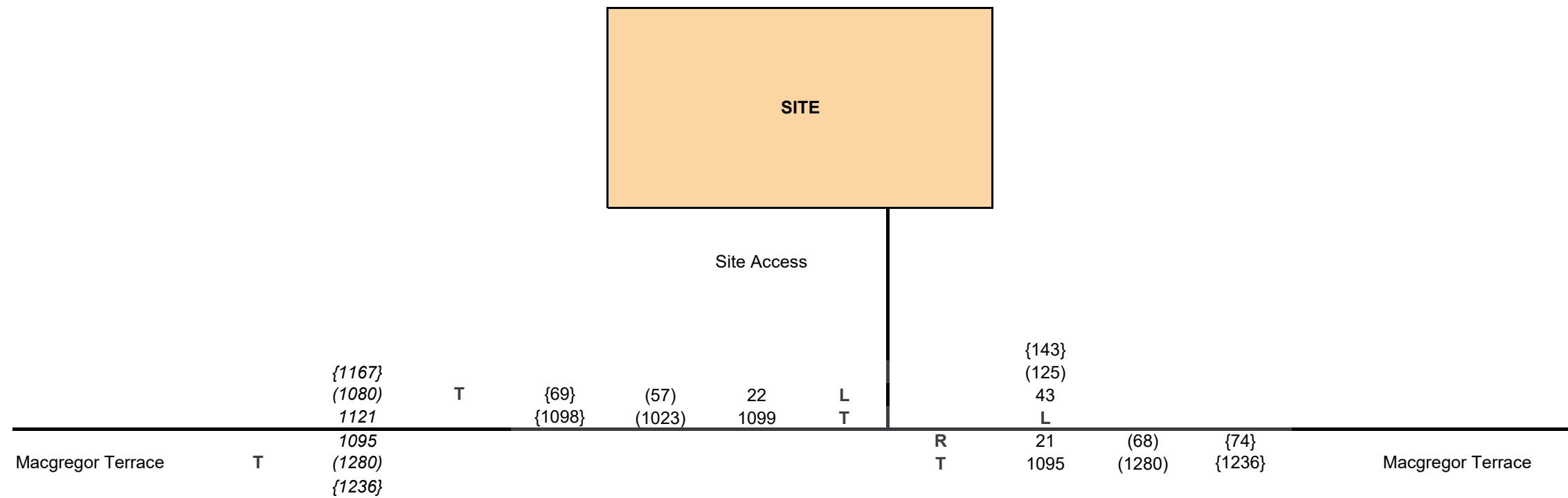
Project Bardon Retail
Reviewed by Tetteh Anang / Alice Shi

Legend

L	Left turn	00	AM Peak Volume
T	Through	(00)	PM Peak Volume
R	Right turn	{00}	Saturday Peak
U	U-turn		



30/11/2020 G:\QTT20017 - Bardon Retail\5_PROJECT ANALYSIS\Analysis\NFD\QTT20017 - NFD v4 - Print.xlsx\Dev



Figure

4

2021 Background + Development Traffic

Project no. QTT20017
Prepared by Tariqul Islam

Project Bardon Retail
Reviewed by Tetteh Anang / Alice Shi

Legend

L	Left turn	00	AM Peak Volume
T	Through	(00)	PM Peak Volume
R	Right turn	{00}	Saturday Peak
U	U-turn		

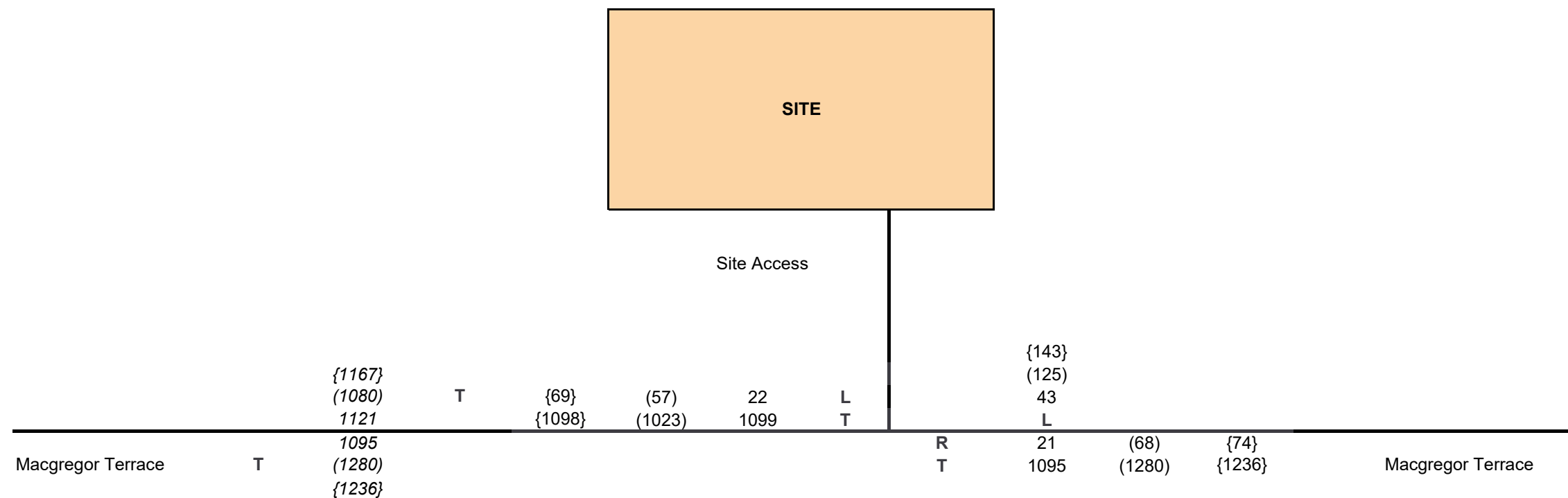


30/11/2020 G:\QTT20017 - Bardon Retail\5_PROJECT ANALYSIS\Analysis\NFD\QTT20017 - NFD v4 - Print.xlsx\2021+Dev

APPENDIX

5

DELAY ASSESSMENT
CALCULATIONS



Figure

1

2021 Background + Development Traffic

Project no. QTT20017
Prepared by Tariqul Islam

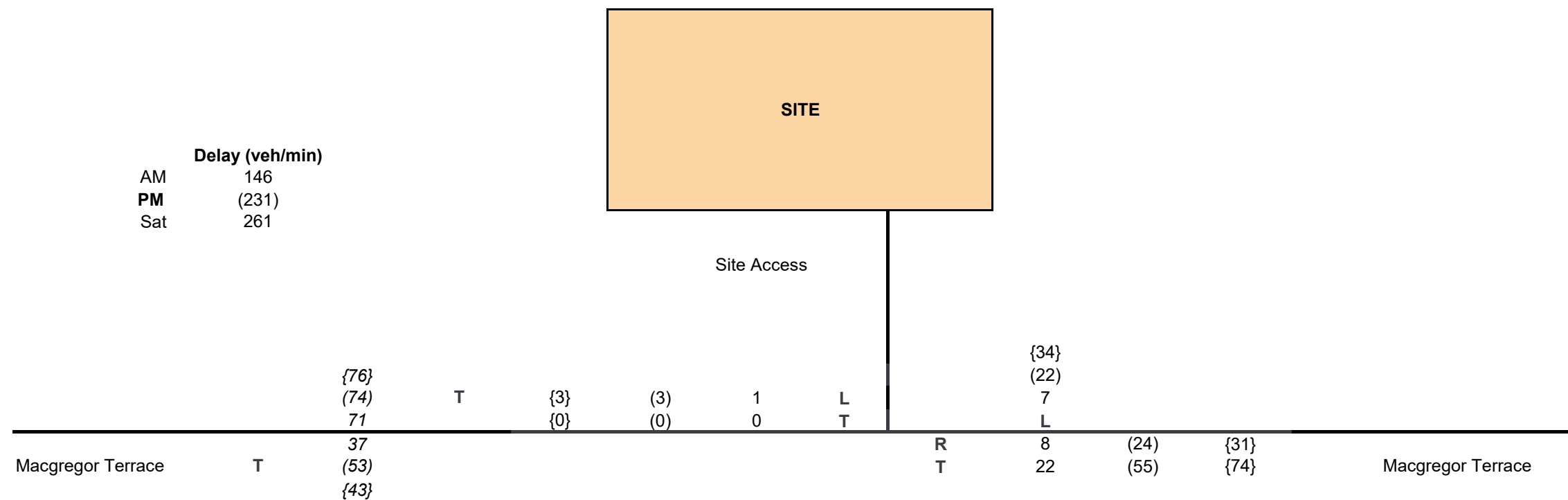
Project Bardon Retail
Reviewed by Tetteh Anang / Alice Shi

27/11/2020 G:\QTT20017 - Bardon Retail\5_PROJECT ANALYSIS\Analysis\NFD\QTT20017 - NFD v4 - Print.xlsx\2021+Dev

Legend

L	Left turn	00	AM Peak Volume
T	Through	(00)	PM Peak Volume
R	Right turn	{00}	Saturday Peak
U	U-turn		





Figure

2

2021 Background + Development Traffic Delay Calculations

Project no. QTT20017
Prepared by Tariqul Islam

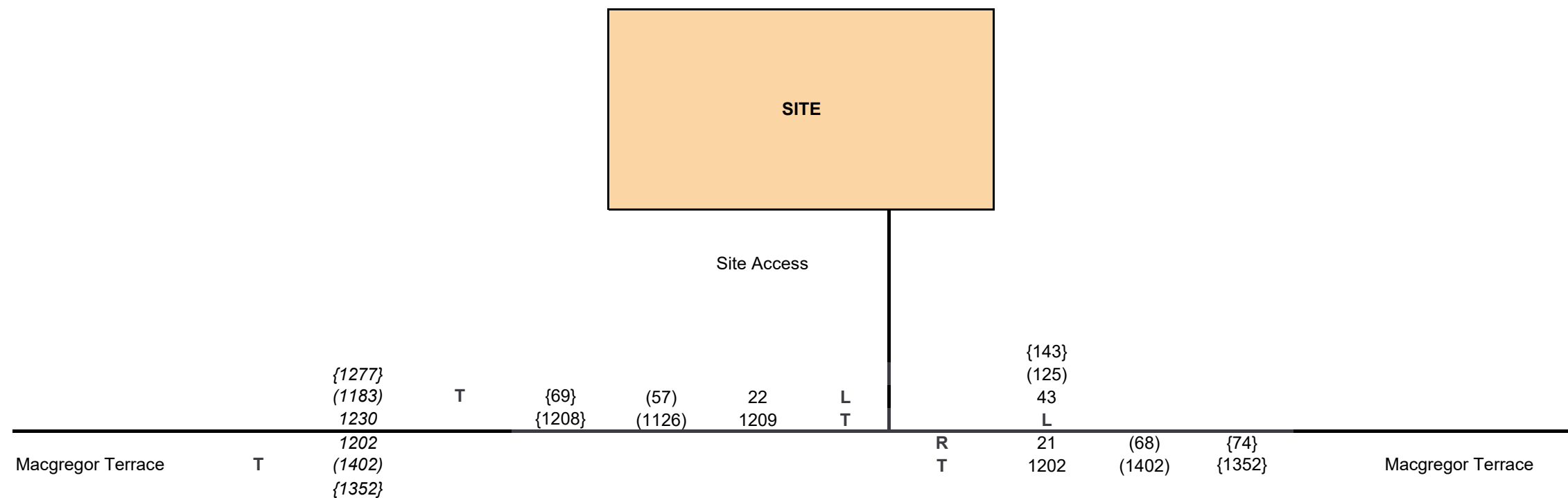
Project Bardon Retail
Reviewed by Tetteh Anang / Alice Shi

27/11/2020 G:\QTT20017 - Bardon Retail\5_PROJECT ANALYSIS\Analysis\NFD\QTT20017 - NFD v4 - Print.xlsx\2021+Dev (veh-delay)

Legend

L	Left turn	00	AM Peak Volume
T	Through	(00)	PM Peak Volume
R	Right turn	{00}	Saturday Peak
U	U-turn		





Figure

3

2031 Background + Development Traffic

Project no. QTT20017
Prepared by Tariqul Islam

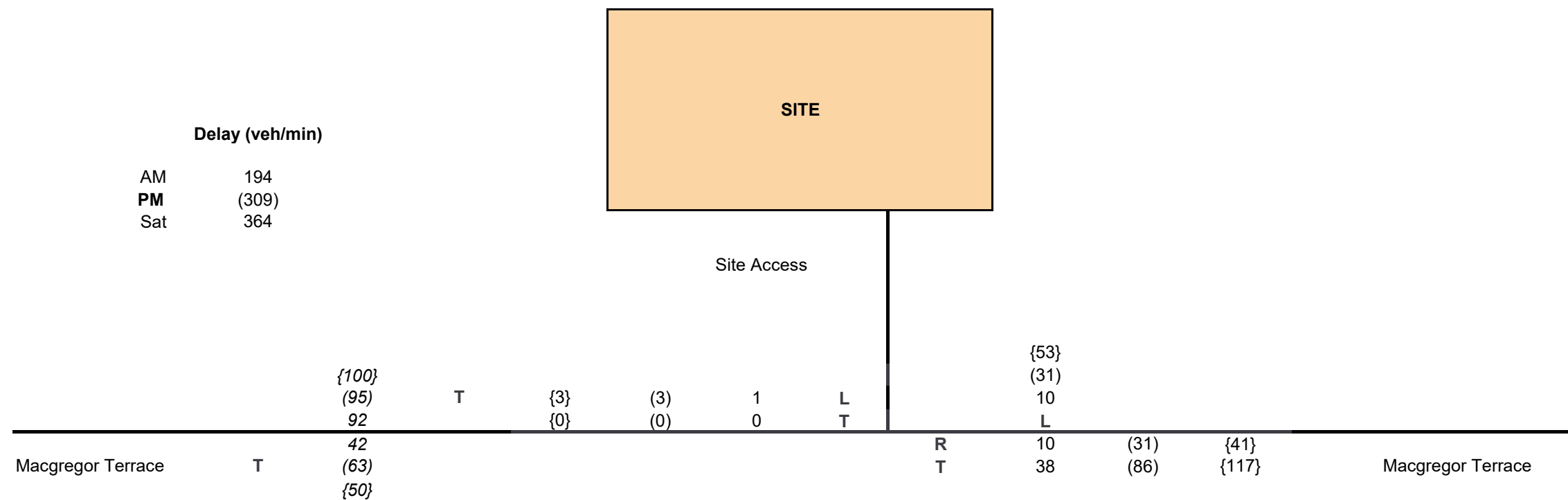
Project Bardon Retail
Reviewed by Tetteh Anang / Alice Shi

27/11/2020 G:\QTT20017 - Bardon Retail\5_PROJECT ANALYSIS\Analysis\NFD\QTT20017 - NFD v4 - Print.xlsx\2031+Dev

Legend

L	Left turn	00	AM Peak Volume
T	Through	(00)	PM Peak Volume
R	Right turn	{00}	Saturday Peak
U	U-turn		





Figure

4

2031 Background + Development Traffic Delay Calculations

Project no. QTT20017
Prepared by Tariqul Islam

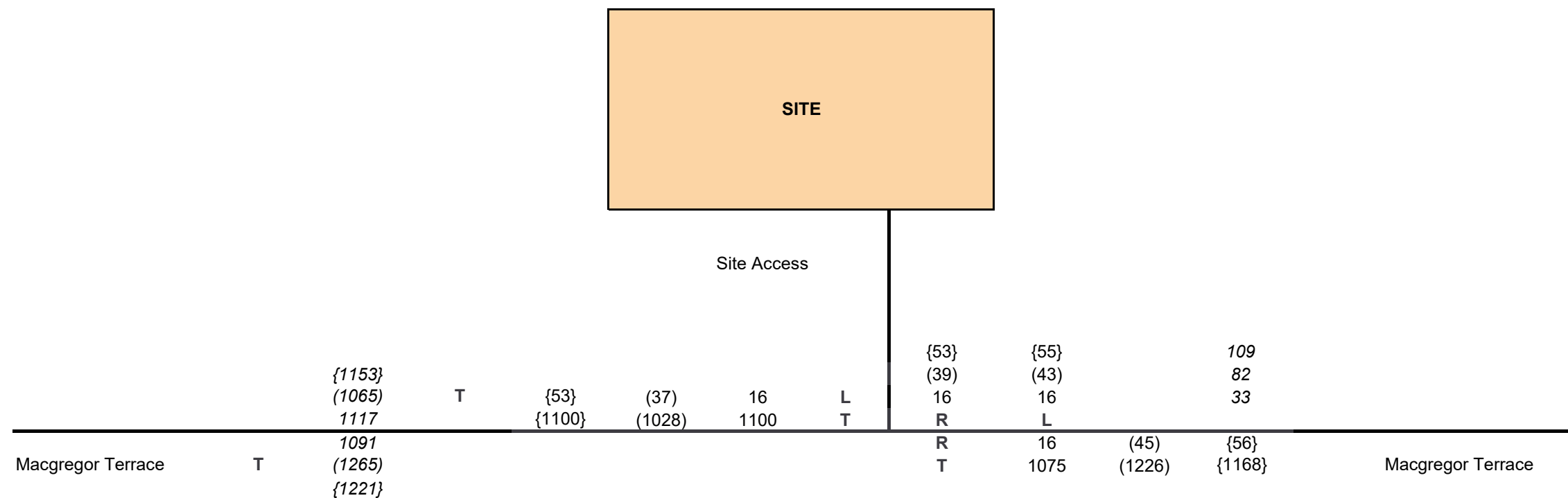
Project Bardon Retail
Reviewed by Tetteh Anang / Alice Shi

27/11/2020 G:\QTT20017 - Bardon Retail\5_PROJECT ANALYSIS\Analysis\NFD\QTT20017 - NFD v4 - Print.xlsx2031+Dev (veh-delay)

Legend

L	Left turn	00	AM Peak Volume
T	Through	(00)	PM Peak Volume
R	Right turn	{00}	Saturday Peak
U	U-turn		





Figure

5

2021 Background - Shopping Centre Rates

Project no. QTT20017
Prepared by Tariqul Islam

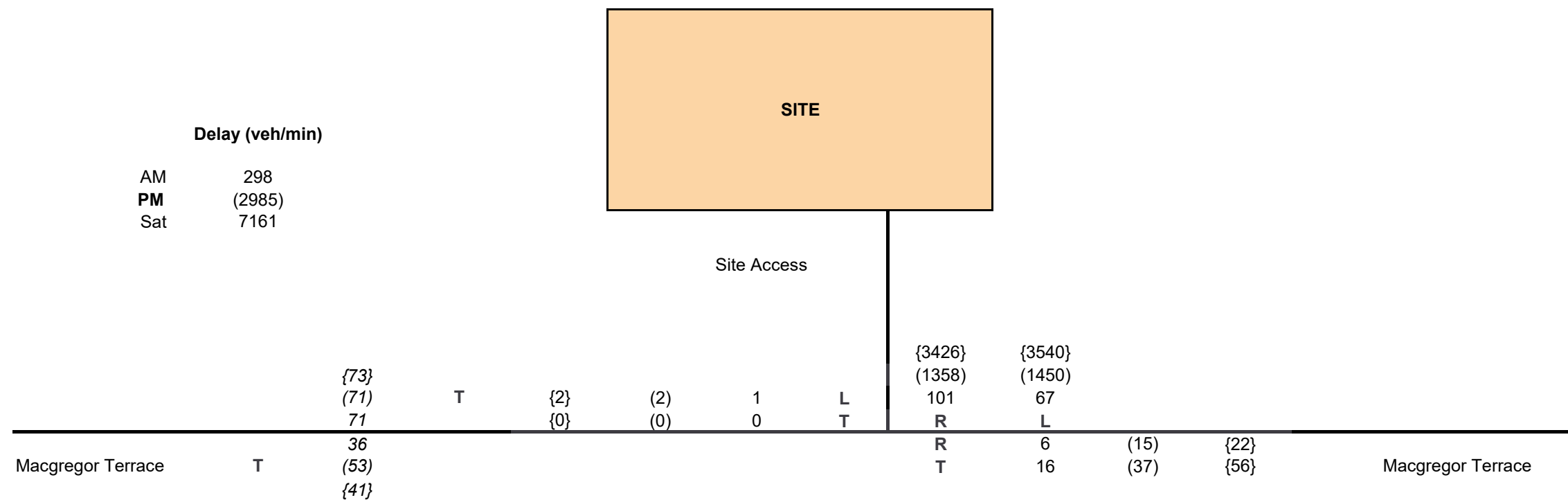
Project Bardon Retail
Reviewed by Tetteh Anang / Alice Shi

27/11/2020 G:\QTT20017 - Bardon Retail\5_PROJECT ANALYSIS\Analysis\NFD\QTT20017 - NFD v4 - Print.xlsx\2021+Existing Dev

Legend

L	Left turn	00	AM Peak Volume
T	Through	(00)	PM Peak Volume
R	Right turn	{00}	Saturday Peak
U	U-turn		





Figure

6

2021 Background - Shopping Centre Rates Delay Calculations

Project no. QTT20017
Prepared by Tariqul Islam

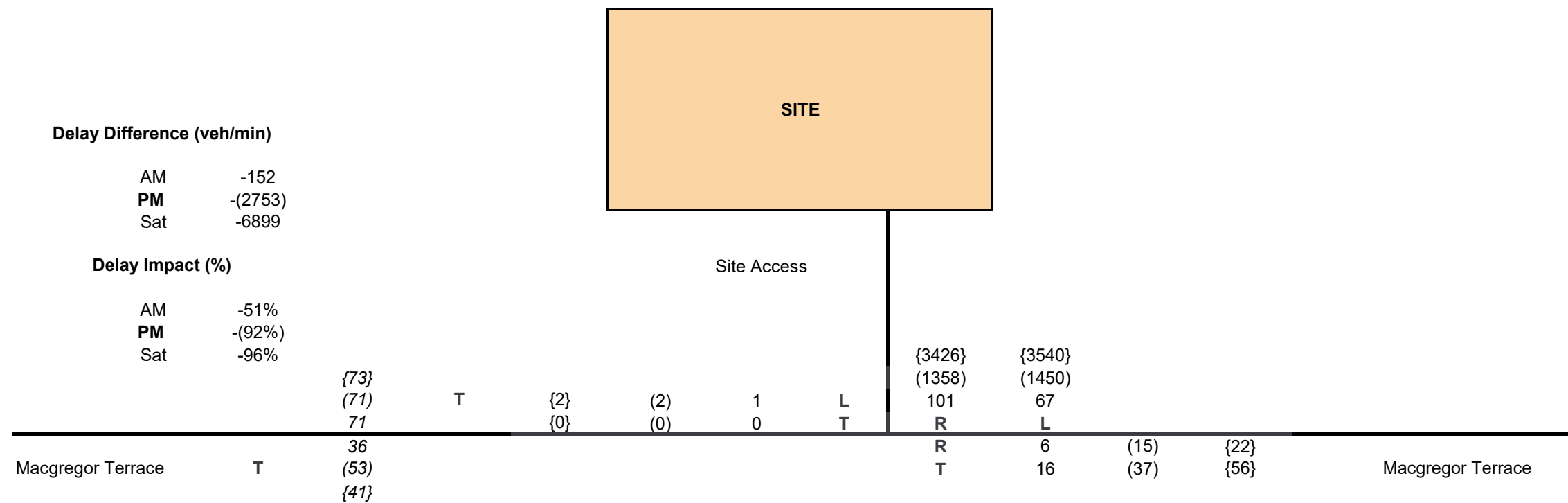
Project Bardon Retail
Reviewed by Tetteh Anang / Alice Shi

27/11/2020 G:\QTT20017 - Bardon Retail\5_PROJECT ANALYSIS\Analysis\NFD\QTT20017 - NFD v4 - Print.xlsx|2021+Existing Dev (veh-delay)

Legend

L	Left turn	00	AM Peak Volume
T	Through	(00)	PM Peak Volume
R	Right turn	{00}	Saturday Peak
U	U-turn		





Figure

7

2021 Development Delay Impact - Shopping Centre Rates

Project no. QTT20017
Prepared by Tariqul Islam

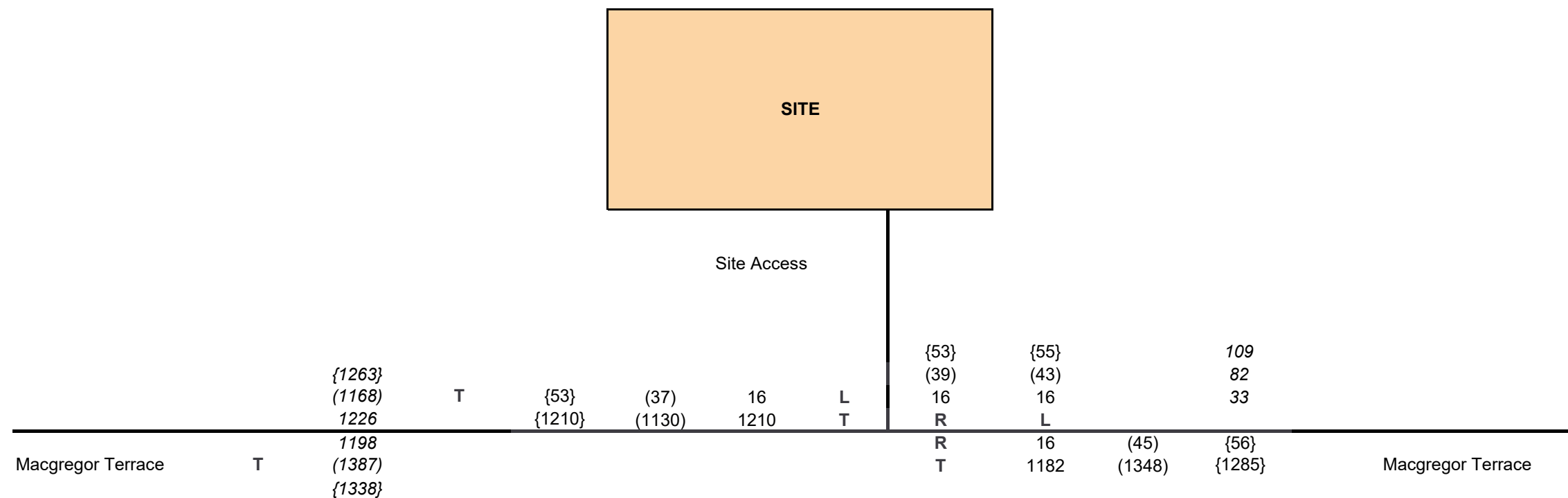
Project Bardon Retail
Reviewed by Tetteh Anang / Alice Shi

27/11/2020 G:\QTT20017 - Bardon Retail\5 PROJECT ANALYSIS\Analysis\NFD\QTT20017 - NFD v4 - Print.xlsx\2021 Delay Impact

Legend

L	Left turn	00	AM Peak Volume
T	Through	(00)	PM Peak Volume
R	Right turn	{00}	Saturday Peak
U	U-turn		





Figure

8

2031 Background - Shopping Centre Rates

Project no. QTT20017
Prepared by Tariqul Islam

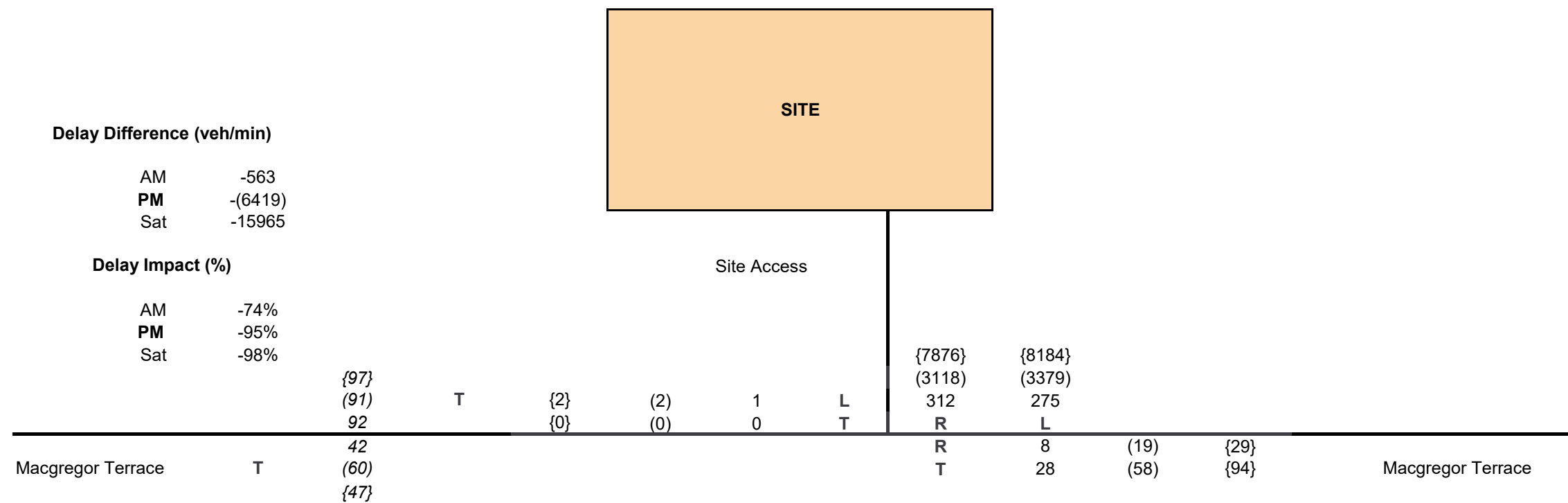
Project Bardon Retail
Reviewed by Tetteh Anang / Alice Shi

27/11/2020 G:\QTT20017 - Bardon Retail\5_PROJECT ANALYSIS\Analysis\NFD\QTT20017 - NFD v4 - Print.xlsx\2031+Existing Dev

Legend

L	Left turn	00	AM Peak Volume
T	Through	(00)	PM Peak Volume
R	Right turn	{00}	Saturday Peak
U	U-turn		





Figure

10

2031 Development Delay Impact - Shopping Centre Rates

Project no. QTT20017
Prepared by Tariqul Islam

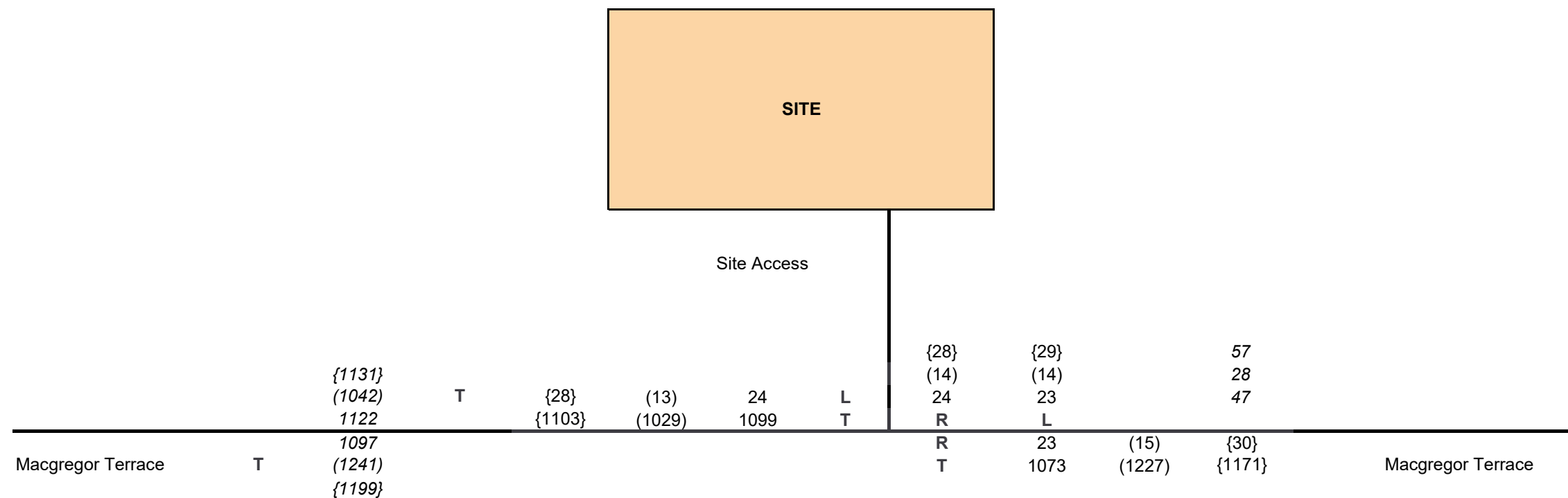
Project Bardon Retail
Reviewed by Tetteh Anang / Alice Shi

27/11/2020 G:\QTT20017 - Bardon Retail\5 PROJECT ANALYSIS\Analysis\NFD\QTT20017 - NFD v4 - Print.xlsx\2031 Delay Impact

Legend

L	Left turn	00	AM Peak Volume
T	Through	(00)	PM Peak Volume
R	Right turn	{00}	Saturday Peak
U	U-turn		





Figure

11

2021 Background - Individual Tenancies

Project no. QTT20017
Prepared by Tariqul Islam

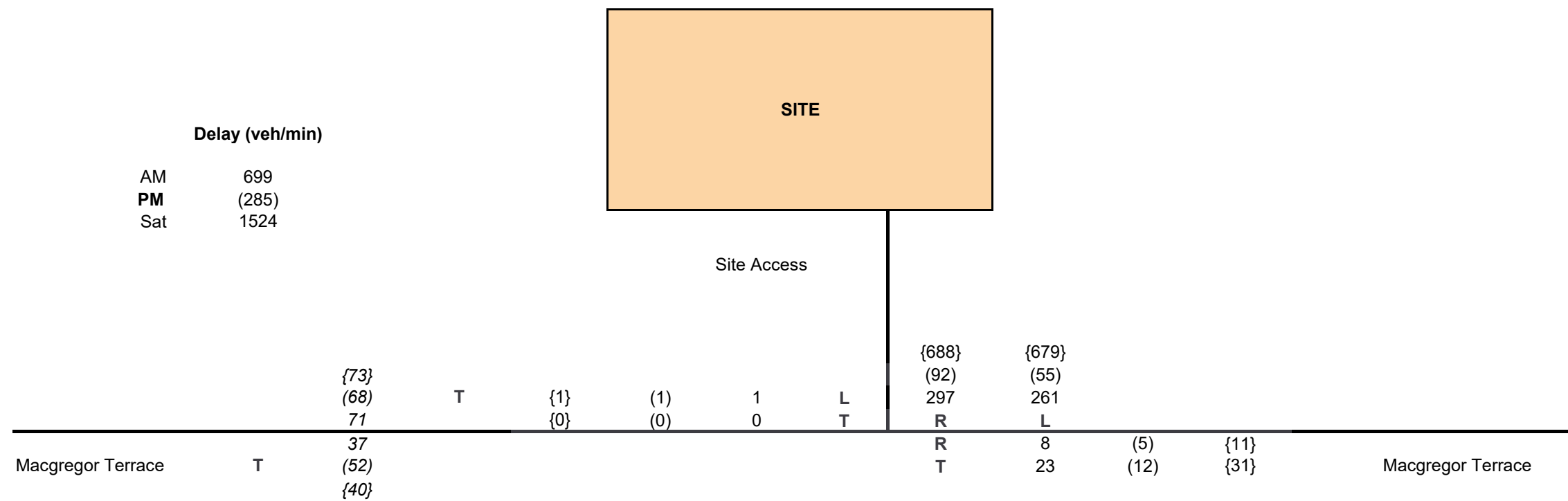
Project Bardon Retail
Reviewed by Tetteh Anang / Alice Shi

27/11/2020 G:\QTT20017 - Bardon Retail\5_PROJECT ANALYSIS\Analysis\NFD\QTT20017 - NFD v4 - Print.xlsx\Individual 2021+Existing Dev

Legend

L	Left turn	00	AM Peak Volume
T	Through	{00}	PM Peak Volume
R	Right turn	{00}	Saturday Peak
U	U-turn		





Figure

12

2021 Background - Individual Tenancies Delay Calculations

Project no. QTT20017
Prepared by Tariqul Islam

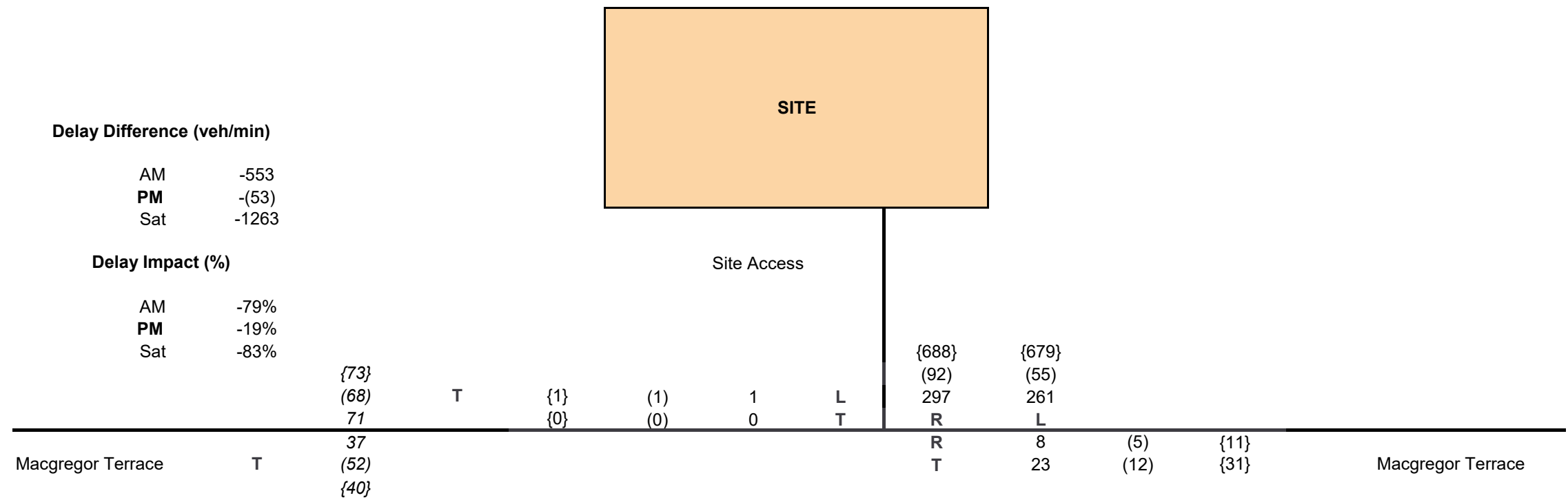
Project Bardon Retail
Reviewed by Tetteh Anang / Alice Shi

Legend

L	Left turn	00	AM Peak Volume
T	Through	(00)	PM Peak Volume
R	Right turn	{00}	Saturday Peak
U	U-turn		



27/11/2020 G:\QTT20017 - Bardon Retail\5_PROJECT ANALYSIS\Analysis\NFD\QTT20017 - NFD v4 - Print.xlsx\Individual 2021+Exist Dev(D-V)



Figure

13

2021 Development Delay Impact - Individual Tenancies

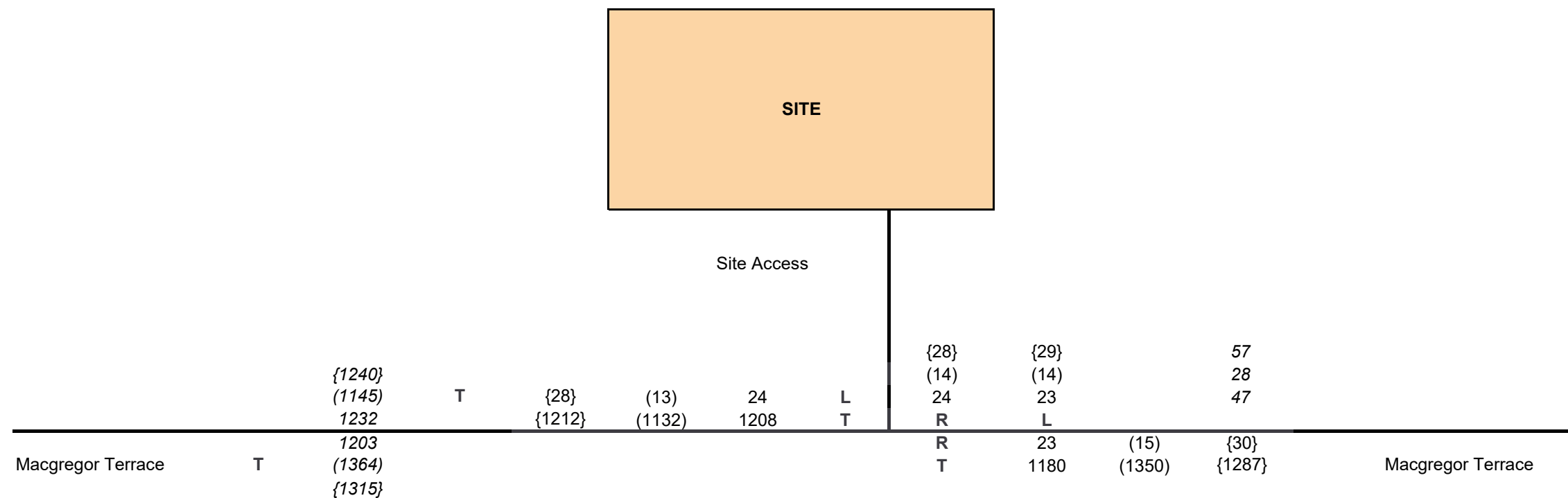
Project no. QTT20017
Prepared by Tariqul Islam

Project Bardon Retail
Reviewed by Tetteh Anang / Alice Shi

Legend

L	Left turn	00	AM Peak Volume
T	Through	(00)	PM Peak Volume
R	Right turn	{00}	Saturday Peak
U	U-turn		

27/11/2020 G:\QTT20017 - Bardon Retail\5 PROJECT ANALYSIS\Analysis\NFD\QTT20017 - NFD v4 - Print.xlsx2021 Individual Delay Impact



Figure

14

2031 Background - Individual Tenancies

Project no. QTT20017
Prepared by Tariqul Islam

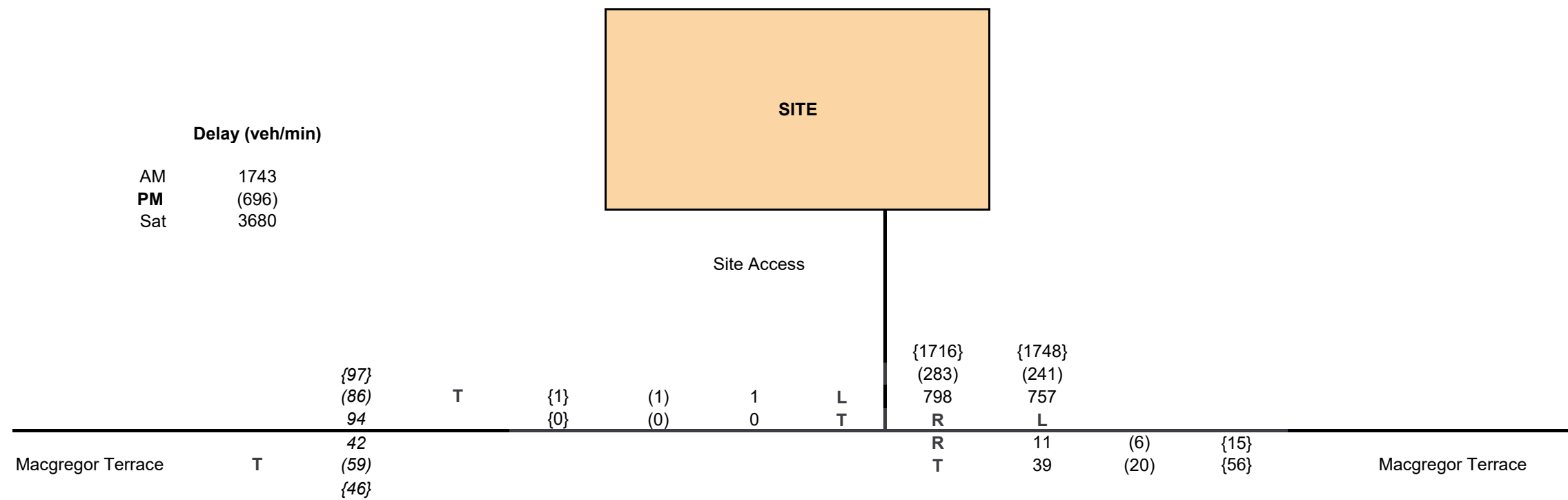
Project Bardon Retail
Reviewed by Tetteh Anang / Alice Shi

27/11/2020 G:\QTT20017 - Bardon Retail\5_PROJECT ANALYSIS\Analysis\NFD\QTT20017 - NFD v4 - Print.xlsx\Individual 2031+Existing Dev

Legend

L	Left turn	00	AM Peak Volume
T	Through	{00}	PM Peak Volume
R	Right turn	{00}	Saturday Peak
U	U-turn		





Figure

15

2031 Background - Individual Tenancies Delay Calculations

Project no. QTT20017
Prepared by Tariqul Islam

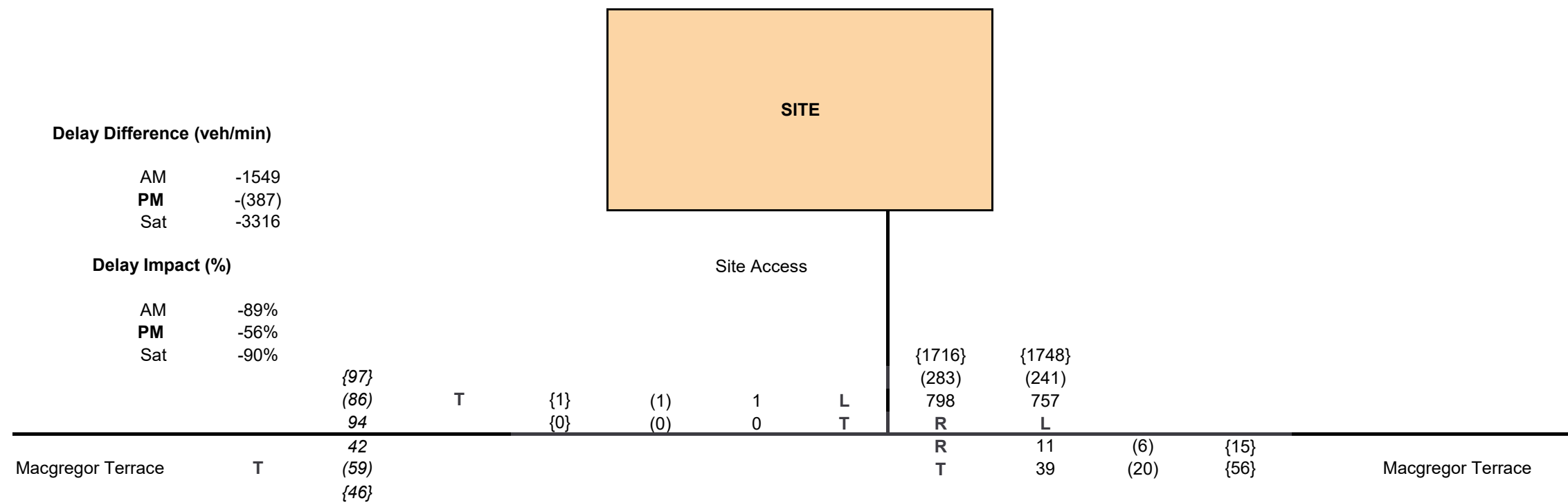
Project Bardon Retail
Reviewed by Tetteh Anang / Alice Shi

Legend

L	Left turn	00	AM Peak Volume
T	Through	(00)	PM Peak Volume
R	Right turn	{00}	Saturday Peak
U	U-turn		



27/11/2020 G:\QTT20017 - Bardon Retail\5_PROJECT ANALYSIS\Analysis\NFD\QTT20017 - NFD v4 - Print.xlsx\Individual 2031+Exist Dev(D-V)



Figure

16

2031 Development Delay Impact - Individual Tenancies

Project no. QTT20017
Prepared by Tariqul Islam

Project Bardon Retail
Reviewed by Tetteh Anang / Alice Shi

Legend

L	Left turn	00	AM Peak Volume
T	Through	(00)	PM Peak Volume
R	Right turn	{00}	Saturday Peak
U	U-turn		



27/11/2020 G:\QTT20017 - Bardon Retail\5 PROJECT ANALYSIS\Analysis\NFD\QTT20017 - NFD v4 - Print.xlsx\2031 Individual Delay Impact

APPENDIX

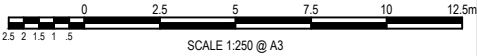
6

BUS BAY CONCEPT DESIGN



Existing on-street parking to be removed

Landscaping to be relocated to provide clear door zone



© Cardno Limited
All Rights Reserved.
This document is produced by Cardno Limited solely for the benefit of and use by the client in accordance with the terms of the retainer. Cardno Limited does not and shall not assume any responsibility or liability whatsoever to any third party arising out of any use or reliance by third party on the content of this document.


Cardno (Qld) Pty Ltd | ABN 57 051 074 992
Level 11, 515 St Paul's Terrace
Fortitude Valley, QLD 4006
Tel: 07 3369 9822 Fax: 07 3369 9722
Web: www.cardno.com.au

Supermarket				
Macgregor Terrace				
Bus Bay Concept				
Drawn	Date	Scale	Size	Revision
T.Anang	25/11/2020	1:250	A3	
Drawing Number				
SK12				B