NOTICE OF MEETING



LOCAL TRAFFIC COMMITTEE MEETING

A Local Traffic Committee Meeting of Byron Shire Council will be held as follows:

Venue Cavanbah Centre, Ewingsdale Road, Byron Bay

Date Tuesday, 16 January 2018

Time **10.00am**

Committee Alan Eichmann – Roads and Maritime Services Members Snr Constable David Brigg – Police Cr Basil Cameron Tamara Smith MP

LOCAL TRAFFIC COMMITTEE MEETING

BUSINESS OF MEETING

1. APOLOGIES

2. DECLARATIONS OF INTEREST – PECUNIARY AND NON-PECUNIARY

3. ADOPTION OF MINUTES FROM PREVIOUS MEETINGS

- 3.1 Local Traffic Committee Meeting held on 31 October 2017
- 3.2 Extraordinary Local Traffic Committee Meeting held on 13 December 2017

4. MATTERS ARISING

5. OUTSTANDING ISSUES/RESOLUTIONS

6. REGULATORY MATTERS

6.1	Council resolutions and recommendation processes	3
6.2	Ewingsdale Road Roundabouts - Signs and Linemarking	4
6.3	Byron Bay Pay Parking Time Limit Review - Endorsement of Council Resolved	
	Changes to Time Limits in Byron Bay	10
6.4	Traffic - The Esplanade 13 - Regulatory Signs - Formalise parking in cul-de-sac	15
6.5	Traffic - Cowper St 34 - Regulatory Signage - No Parking 1am - 6am	19
6.6	Traffic Compliants on Clays Road and Coral Ave	22

7. DEVELOPMENT APPLICATIONS

7.1	DA 10.2017.510.1 - Mixed Use development, Jonson and browning Streets, Byron	
	Bay2	6

LOCAL TRAFFIC COMMITTEE MEETING

REGULATORY MATTERS

Report No. 6.1Council resolutions and recommendation processesFile No:12017/2008

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The purpose of this report is to request the Committee review and provide advice and comments in relation to the legislative requirements and procedural processes that need to be followed to enable the committee to fulfil its roles and obligations and associated interactions with Council through recommendations and associated resolutions.

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As a consequence of recent queries raised by Council in relation to procedural processes around LTC advice, recommendations and Council adoption of those recommendations, advice and comments are sought regarding the procedural processes pertaining to, but not limited to;

- 15 1. Situations where Council has resolved to take certain actions pending future advice or recommendations from LTC and or;
 - 2. Situations where Council has made a resolution that is not in accordance with LTC recommendations.
- 20 In preparing such advice, committee members are asked to review meeting procedures including attendance and apologies notifications and provision of comments for agenda items.

RECOMMENDATION:

That the advice and comments of the Local Traffic Committee in relation to the procedural processes required to execute its roles and responsibilities be provided to the Council.

LOCAL TRAFFIC COMMITTEE MEETING

Report No. 6.2Ewingsdale Road Roundabouts - Signs and LinemarkingFile No:12017/2009

Detailed pavement marking and signage plans have been attached for both roundabouts.

RECOMMENDATION:

That the Local Traffic Committee endorse the Pavement Marking and Signage Plans for the Ewingsdale Road roundabouts as detailed below:

- a) Sunrise Boulevard roundabout as per Attachment 1 (E2017/115555)
- b) Bayshore Drive roundabout as per Attachment 2 (E2017/115586)

10 Attachments:

- 1 24.2016.57.1 Sunrise RAB 2016-0037 Pavement Marking and Signage Plan, E2017/115555, page 51
- 2 24.2015.48.1 Bayshore RAB 2017-0014 Pavement Marking and Signage Plan, E2017/115586, page 7

REGULATORY MATTERS

6.2 - ATTACHMENT 1



COMMENT

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REGULATORY MATTERS

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E01-004 E7-66 E01-005 R4-10

E01-009 R8-2

E01-000 H8-2 E01-000 G11-4 E01-011 H8-2 E01-011 H8-2 E01-012 H1-1 E01-013 G5-1 E01-014 D4-4 E01-075 R2-3 E01-04 G6-7

E01-014 05-7 E01-017 R8-2

E01-018 81-1

E01-001

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800-103

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N8-2

6.2 - ATTACHMENT 1



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\$01-002	\$11-6	TOURIST CYCLE PATH	1 046	TO BE RELOCATED FROM ED1-010
501-003	R8-2	SHARED PAIN		TO BE RELOCATED FROM EDI-011
\$01-004	04-1-2	UNDRECTURAL CHEVRONS	-	ERECT NEW SIGN ON CUARDRAIL SERMINIC
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501-006	83-1	ACONDABOUT	1 046	ERECT NEW SIGN
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DIRECTIONAL

OUDE - CAMPING GROUNDS SPEED RESTRICTION - SOMM/A AREA

DISCOVERY HOLDAY PARKS

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SHARED PATH - PREPARE TO STOP TOUREST CYCLE PATH SHARED PATH

STOP SIGN

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REGULATORY MATTERS





REGULATORY MATTERS

6.2 - ATTACHMENT 2



REGULATORY MATTERS

6.2 - ATTACHMENT 2

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LOCAL TRAFFIC COMMITTEE MEETING

Report No. 6.3	Byron Bay Pay Parking Time Limit Review - Endorsement of Council Resolved Changes to Time Limits in Byron Bay
File No:	12017/2071

- 5 Council resolved on 21 September 2017 under Resolution 17-425 to undertake investigation and community consultation regarding possible revisions to the time limits in various areas of the pay parking area in Byron Bay.
- Council staff undertook community consultation regarding the proposed changes. Based on the survey and consultation feedback, it was proposed that the majority of the community were in favour of the changes as detailed.

Council subsequently resolved 17-697 as follows;

- 15 1. That the changes to the parking time limits in the Byron Bay pay parking area as outlined below be endorsed:
 - a) Wordsworth Street modify 2P zone to OP (no limit) zone.
 - b) Shirley Street modify 4P zone to OP (no limit) zone.
 - c) Lawson Street North and South Car Parks modify from OP (no limit) to 4P.
 - d) Somerset Street and Butler Street Reserve modify to free parking zone.
 - e) Butler Street modify 4P zone to OP (no limit) zone.
 - f) Byron Street modify 2P zone to 1P zone.
 - g) Fletcher Street modify eastern side from 4P to 2P.
- 25 h) Jonson Street modify Carlyle to Kingsley zone from 1P to 2P.
 - 2. That a budget of \$15,000 be approved from Pay Parking Operations in Byron Bay to modify the signage.
- 30 3. That a report be prepared for the Local Traffic Committee for concurrence prior to actioning for items 1a), 1b), 1c), 1e), 1f), 1g) and 1h).
 - 4. That the modification in item 1d) for Somerset Street and Butler Street Reserve be implemented as soon as possible.
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5. That staff provide a report with an analysis of resident and non-resident usage for the different paid parking time zones.

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The following pages detail the endorsed changes and the likely result of each.

LOCAL TRAFFIC COMMITTEE MEETING

Wordsworth Street

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Issue Identified – There is currently a 2P that was most likely implemented when the Byron Hospital was still in operation.

Proposed Change – Modify the 2P section to a OP section (no limit).

Likely Result – Encourage longer term parking outside the town centre and maintain consistency throughout Wordsworth Street.



Shirley Street

15 *Issue Identified* – There is currently a 4P that was most likely implemented when the Byron Hospital was still in operation.

Proposed Change – Modify the 4P section to a OP section (no limit).

20 *Likely Result* – Encourage longer term parking outside the town centre and maintain consistency throughout the Shirley Street & Wordsworth Street area.



LOCAL TRAFFIC COMMITTEE MEETING

Lawson Street North and South Car Parks

Issue Identified – The Lawson Street north and south car parks currently have OP (no limit) for pay parking. This does not promote long term parking outside the town centre.

Proposed Change – Modify the OP (no limit) area to a 4P area.

Likely Result – Encourage long term parking outside the town centre.



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Butler Street

Issue Identified – There is currently a 4P pay parking area that is not consistent with Butler Street and the Master Plan intention to promote long term parking outside the town centre.

Proposed Change – Modify the 4P area to a OP (no limit) area.

Likely Result – Encourage longer term parking outside the town centre and maintain consistency throughout Butler Street.



LOCAL TRAFFIC COMMITTEE MEETING

Byron Street

5 *Issue Identified* – Byron Street currently has a 2P zone from Jonson Street to Fletcher Street. *Proposed Change* – Modify the 2P area to a 1P area.

Likely Result - Consistently encourage shorter term parking in the town centre.



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Fletcher Street

Issue Identified – There is currently 4P parking along the full length of Fletcher Street on the
 eastern side. This does not promote longer term parking outside the town centre and provides an opportunity for employees to utilise this area for parking.

Proposed Change – Modify the 4P area to a 2P area.

20 *Likely Result* – Encourage long term parking outside the town centre.



LOCAL TRAFFIC COMMITTEE MEETING

Jonson Street

Issue Identified – There is currently 1P parking zone on Jonson Street from Carlyle Street to Kingsley Street. This is not consistent with the gradual increase of time zones from the town centre.

Proposed Change – Modify the 1P area to a 2P area.

10 Likely Result – Gradually increase time zones as the distance from the town centre increases.



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RECOMMENDATION:

That the Local Traffic Committee endorse Council Resolution 17-697, clause 3, providing concurrence for the changes to the time limits as detailed below:

- a) Wordsworth Street modify 2P zone to OP (no limit) zone.
- b) Shirley Street modify 4P zone to OP (no limit) zone.
- c) Lawson Street North and South Car Parks modify from OP (no limit) to 4P.
- e) Butler Street modify 4P zone to OP (no limit) zone.
- f) Byron Street modify 2P zone to 1P zone.
- g) Fletcher Street modify eastern side from 4P to 2P.
- h) Jonson Street modify Carlyle to Kingsley zone from 1P to 2P.

BYRON SHIRE COUNCIL LOCAL TRAFFIC COMMITTEE MEETING

Report No. 6.4	Traffic - The Esplanade 13 - Regulatory Signs - Formalise parking in cul-de-sac
File No:	12017/2081

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SUMMARY

On the 6 December 2017, Evan Elford met with concerned residents of The Esplanade, New Brighton to discuss parking, access and vehicle movement issues. The residents offered support for signage to regulate parking and to assist with vehicular movement management.



LOCAL TRAFFIC COMMITTEE MEETING

OFFICER RECOMMENDATION

That Council regulate parking in the Southern cul-de-sac end of The Esplanade, New Brighton.

5 LINKAGE TO OUR COMMUNITY STRATEGIC PLAN

Theme	Community Infrastructure	Services and infrastructure that sustains, connects and integrates our communities and environment.
Objective	CI2	Provision of essential services
Strategy	CI2.3	Provide roads and drainage infrastructure within the Shire
Measures	CI2.G	Provide road, drainage and transport infrastructure within the Shire

BACKGROUND

On the 6 December 2017, Evan Elford met with concerned residents of The Esplanade, New
 Brighton to discuss parking, access and vehicle movement issues. There is currently no regulatory parking signage in this section of the road reserve.

The concept design provided has been developed in consideration of the discussions held on site and identified site constraints providing No Parking on the Eastern side of the Esplanade and the
Parallel Parking Areas along the Western edge of the Esplanade. Additional advisory signage at the intersection with Orana Road will be required to advise the road is not suitable larger RV type vehicles and caravans, noting that garbage collection trucks will still be required to access the street.

20 Regulating the parking could reduce the current supply to between sixteen and twenty two Parallel Parks for vehicles less than six meters long however it will also assist to maintain clear access for residents and service vehicles..

25 KEY ISSUES

- 1. Vehicles are being parked across driveways.
- 2. Service vehicle access is being restricted.
- 3. There is a lack of regulatory parking signage to be able to enforce.

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COUNCIL IMPLICATIONS

Budget/Financial

Estimate of \$3,960 for twenty two signs at \$180 per sign. Vacuum excavation is recommended to avoid services in this area.

A further estimate of \$20,000 would be required to complete a full survey, geotechnical investigation and design to formalise the road and parking.

40 • Asset Management

Estimate of \$2,200 for 10 signs at \$10.00 per sign/year for an expected life of 10 years. Council will need to maintain signage ongoing, including cleaning and replacement (if necessary).

Policy or Regulation

Delegated to council for authorisation in conjunction with:

- Prescribed traffic control devices division 1 of Part 4 (Sections 50 to 55) of the Road Transport (Safety and Traffic Management) Act, 1999.
- R5-41 No Parking NSW Road Rules 168, \$108 fine.

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LOCAL TRAFFIC COMMITTEE MEETING

- No Camping by order Local Government Act 1993 – Section 632, \$80 fine.

Consultation

Consultation with residents to be completed once the concept design is finalised.

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Legal and Risk Management

Travellers and visitors are drawn to the car park adjacent to the beach due to its discreet location. The residents seek to deter over parking in this area so they can access their homes safely and provide safe access for refuse services.

RECOMMENDATION:

That, subject to available funds, Council regulate parking in the Southern cul-de-sac end of The Esplanade, New Brighton through the installation of "No Parking" and "Parallel Parking" and other relevant and appropriate signage to improve access for residents and service vehicles.

15 Attachments:

1 Signs Plan, E2017/116041 , page 18

REGULATORY MATTERS



LOCAL TRAFFIC COMMITTEE MEETING

Report No. 6.5	Traffic - Cowper St 34 - Regulatory Signage - No Parking 1am - 6am
File No:	I2018/11

SUMMARY

Community Enforcement has requested assistance to resolve illegal camping within the road reserve around the Byron Recreation Ground in Carlyle, Cowper and Tennyson Streets, Byron Bay. They have proposed that regulated parking be installed with signs stating 'No Parking 1am to 6am'.

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OFFICER RECOMMENDATION

15 That Council regulate parking around the Byron Recreational Ground by installing 'No Parking 1am to 6am' signage to deter illegal camping.

LOCAL TRAFFIC COMMITTEE MEETING

LINKAGE TO OUR COMMUNITY STRATEGIC PLAN

Theme	Community Infrastructure	Services and infrastructure that sustains, connects and integrates our communities and environment.
Objective	CI2	Provision of essential services
Strategy	CI2.3	Provide roads and drainage infrastructure within the Shire
Measures	CI2.G	Provide road, drainage and transport infrastructure within the Shire

BACKGROUND

5 Councils Team Leader Community Enforcement has advised that illegal camping is being carried out around the reserve due to a lack of regulatory parking signage. Community Enforcement would like to close the gravel road section of Cowper Street to deny access to illegal campers.

KEY ISSUES 10

- 1. Anti social behaviour is occurring with people camping illegally.
- 2. There is a lack of regulatory parking signage to be able to enforce illegal camping.

15 **COUNCIL IMPLICATIONS**

Budget/Financial

Estimate of \$3,080 includes fourteen new signs.

20 **Asset Management** .

Estimate of \$980 for 14 signs at \$10.00 per sign/year for an expected life of 7 years. Council will need to maintain signage ongoing, including cleaning and replacement (if necessary).

Policy or Regulation

Delegated to council for authorisation in conjunction with:

- Prescribed traffic control devices division 1 of Part 4 (Sections 50 to 55) of the Road Transport (Safety and Traffic Management) Act, 1999.
- R5-41 No Parking (specified times) NSW Road Rules 168, \$108 fine.
- No Camping by order Local Government Act 1993 Section 632, \$80 fine.

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Consultation

Consultation to be completed once the design is finalised with the Byron Recreational Grounds and the Feros Care management of the Byron Bay Village.

35 Legal and Risk Management

Travellers and visitors are drawn to the car park adjacent to the Byron Recreational Ground due to its discreet location and the proximity to water, toilets and undercover facilities. Community Enforcement seek to deter this activity as it has resulted in antisocial behaviour occurring after dark. Limited no camping signs are visible in this area however it is difficult to enforce compliance.

BYRON SHIRE COUNCIL LOCAL TRAFFIC COMMITTEE MEETING

RECOMMENDATION:

That Council regulate parking around the Byron Recreation Ground including Tennyson, Carlyle and Cowper Streets by installing 'No Parking 1am to 6am' signage when funds become available.

LOCAL TRAFFIC COMMITTEE MEETING

Report No. 6.6Traffic Compliants on Clays Road and Coral AveFile No:12018/13

The purpose of this report is to seek the advice of the Local Traffic Committee (LTC) on the intersection treatment of Plover Parkway and Clays Road.

Council has received two complaints about vehicles speeding, dust, safety, and amenity on Clays Road and Coral Avenue since the opening of Plover Parkway. A copy of the complaints is provided in the attachments (E2018/1889 and E2018/2033). The subject length of road is shown in the aerial image below.

10 in the aerial image below.



The original development application for the subdivision DA 10.2009.314.1 was approved by the NSW Land and Environment Court.

This DA was for the first stage of 29 lots and set out the concept plan for the estate as part of a staged development consent.

20 This consent did not require the upgrade of Coral Avenue or Clays Road.

A subsequent development consent DA 10.2009.151.1 approved the sports field on Plover Parkway. At the time of the original approvals, due to the proposed staging of the subdivision works, the sports fields were likely to be constructed prior to the construction of the culvert over the

25 creek on Plover Parkway. This meant that the only access to the sports field would be via Clays Road. Condition 11 of the sports field DA required upgrade works for these access roads. The developer's responsibility to seal these sections arose from the need to provide access to the

<u>6.6</u>

LOCAL TRAFFIC COMMITTEE MEETING

sports field and not because of the traffic generated by the subdivision. This is why the requirement to seal is in the sports field consent and not in the subdivision consent.

11 Consent required for works within the road reserve –Clays Road and Coral Avenue.

Consent from Council, and the Crown where applicable, must be obtained for works within the road reserve pursuant to Section 138 of the Roads Act 1993. Three (3) copies of Engineering construction plans must accompany the application for consent for works within the formed road reserves of Clays Road and Coral Avenue.

- 10 Such plans are to be in accordance with Council's "<u>Northern Rivers Development</u> <u>Design & Construction Manuals and Standard Drawings."</u>
 - Reconstruct the gravel sections of Coral Avenue and Clays Road from the northern site boundary through to the vicinity of Lomandra Lane with a bitumen seal having a nominal width of 6m. with gravel/grassed shoulders and drainage.
- 15

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This development consent was subsequently amended when the staging of the main subdivision consent was altered and there was potential for the culvert to be built and access provided from the estate rather than via Clays Road. Condition 11 was modified as follows:

20 **11 Consent required for works within the road reserve –Clays Road and Coral** Avenue.

The Consent was changed with the addition of the following clause.

This condition does not need to be complied with if the road access to Tuckeroo Ave is completed and dedicated as public road prior to the dedication of the reserves as required by condition 37.

Traffic calming devices (speed bumps) have been installed on Plover Parkway to discourage through traffic. It is not the developers responsibility to upgrade this section of road at this point in time.

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Despite the traffic calming on Plover Parkway there is anecdotal evidence of an increase in vehicles using Clays Road. The travel time and distance for the two routes into town is very similar when taken from the western end of the new estate (refer to google maps extract below).

LOCAL TRAFFIC COMMITTEE MEETING



Council will place traffic counters out on the northern end of Plover Parkway and the Southern end of Tuckeroo Ave to determine the traffic volumes using the two routes. Dependant on the volumes

5 the option to temporarily close Plover Parkway may be further investigated and subsequently reported back to LTC.

In the interim Council is seeking advice from LTC on the appropriate regulatory signage and treatment of the intersection of Plover Parkway and Clays Road. Clays Road is gravel and up until recently was an elbow bend as shown on the aerial image below.

BYRON SHIRE COUNCIL LOCAL TRAFFIC COMMITTEE MEETING



With the opening of Plover Parkway it has now become a T-junction with the predominant movement being a north south through movement.

5

Options to regulate this intersection are to:

- 1. Place a Give Way sign on western approach to the T-junction on Clays Road; or
- 2. Place a Stop sign and line marking on the sealed southern approach of Plover Parkway.
- 10

RECOMMENDATION:

- 1. That a Give Way sign be placed on western approach to the T-junction on Clays Road; and
- 2. That this matter be reported back to LTC once traffic counts on Plover Parkway and the Southern end of Tuckeroo Ave have been completed should Council wish to close access via Plover Parkway.

LOCAL TRAFFIC COMMITTEE MEETING

DEVELOPMENT APPLICATIONS

Report No. 7.1 DA 10.2017.510.1 - Mixed Use development, Jonson and browning Streets, Byron Bay

File No: 12017/1906

The Committee considered a report on this matter at the meeting of 31 October 2017 and provided the following comments:

10

5

The Committee does not have a concept drawing to refer to and does not have enough information to assess the impacts on the surrounding road network with particular regard to links with the Byron Bay bypass and planning for cycleway and pedestrian access linkages in the Bangalow Rd corridor. The committee also requires documentation for trucks swept paths, and where the drop off for the preschool area will be located.

15 off for the preschool area will be located.

The LTC requests a briefing by both planning and the proponent to provide more documentation in early December 2017.

20 Council staff and the proponent's traffic consultant will attend the LTC meeting to provide the required briefing.

The report from the meeting of 31 October is reproduced below.

25 SUMMARY

Council has received a Development Application (DA 10.2017.510.1) from Mr M Scott, on behalf of JGD Developments Pty Ltd for a mixed use development comprising commercial premises, café, child care centre, shop top housing and serviced apartments. The development is located on the south-west corner of the Jonson Street/ Browning Street intersection in Byron Bay.

30

OFFICER RECOMMENDATION

That the LTC review the proposed changes to Ruskin Lane and potential Byron Bay Bypass conflicts and provided comments for the consideration of the Planning Team.

35 BACKGROUND

Ruskin Lane

The site which is subject to development application 10.2017.510.1 is located at the corner of Jonson and Browning Streets, Byron Bay, adjacent to the proposed Byron Bypass roundabout. Ruskin Lane, which is currently a sealed two-way lane, adjoins the eastern boundary of the site.

LOCAL TRAFFIC COMMITTEE MEETING



Fig. 1 - Proposed Site Pre Byron Bay Bypass Roundabout

The application proposes to construct a mixed use development involving:

- Two shops and a café at ground level, fronting Jonson Street;
 - A child care centre at ground level fronting Browning Street;
 - 24 residential apartments in three levels above the shops and café;
 - 26 serviced apartments (tourist accommodation) in three levels above the child care centre; and
- Two basement levels of car parking containing a total of 122 car parking spaces as well as bicycle and motorcycle parking, with access off Ruskin Lane.

The Traffic Impact Study that accompanies the Development Application (see Attachment 1) estimates total traffic generation to be approximately 349.7 – 375.7 DVT's and 86.54 – 89.04 PHT's and proposes the following changes to Ruskin Lane:

- Widen Ruskin Lane and Browning St intersection for approximately 35m from Browning Street to cater for two-way traffic and MRV manoeuvring (see Fig. 2);
- MRV loading bay off Ruskin Lane adjacent to basement ramp;
- The remainder of Ruskin Lane (approximately 135m) is proposed to be converted to one-way with entry only from Tennyson Street;
- Ruskin Lane to be restricted to left in / out movements only;
- A convex mirror installed at the Ruskin Lane / Browning St intersection to provide pedestrians with improved sight lines.

5

15

BYRON SHIRE COUNCIL LOCAL TRAFFIC COMMITTEE MEETING



Fig. 2 - Works proposed at Ruskin Lane / Browning St intersection





North from Browning St Intersection

Fig 3 – Ruskin Lane

5

Bypass Roundabout

The development has absolute frontage onto the proposed Bypass Roundabout at the intersection of Jonson St / Browning St. Council is in the process of acquiring the SW portion of the subject site for road widening for the roundabout. To compensate a strip of land will be added to the subject property along Browning St (see Fig. 4).

10 subject property along Browning St (see Fig. 4).

The proposed development introduces challenges relating to construction timing and sequencing. The first plan within Attachment 2 illustrates the current roundabout design that assumes the subject site remains unchanged. The second plan illustrates the proposed ground floor and

15 landscape design. The third plan illustrates the extent of road and drainage works proposed in the road reserve. Together these plans illustrate driveway access to Lots 5 and 6 and footpath alignment are redundant post construction of the development. The third plan illustrates works across the width and length of Browning St.

LOCAL TRAFFIC COMMITTEE MEETING



Fig 4. – Boundary changes

KEY ISSUES

5 Ruskin Lane

1. The Council must refer all traffic related matters to the Local Traffic Committee (LTC) prior to exercising its delegated functions for the Regulation of Traffic.

Byron Bay Bypass

- 10 2. How to manage the sequence of construction if:
 - (i) the proposed DA is constructed first , or
 - (ii) the Bypass Roundabout is constructed first.
 - 3. How the proposed development may impact the Bypass Roundabout design.

15 COUNCIL IMPLICATIONS

Budget/Financial

Unknown

Asset Management

Council will need to maintain signage for Ruskin Lane and maintain road and drainage assets within both Ruskin Lane and Browning St.

Policy or Regulation

Delegated to council for authorisation in conjunction with prescribed traffic control devices division 1 of Part 4 (Sections 50 to 55) of the Road Transport (Safety and Traffic Management) Act, 1999.

Consultation

The application has been referred to the RMS for comment.

30

20

LOCAL TRAFFIC COMMITTEE MEETING

• Legal and Risk Management

The development will result in increased pedestrian and vehicular activity at the Ruskin Lane / Browning St intersection and the Bypass Roundabout.

5

RECOMMENDATION:

That the Local Traffic Committee's comments relating to DA 10.2017.510.1 be provided to the Council Planning Team.

10 Attachments:

- 1 Attachment 1 Traffic Impact Study, E2017/96782 , page 31
- 2 Attachment 2 Bypass Roundabout Conflicts, E2017/97532 , page 72





Traffic Impact Study 137-139 Jonson St & 3 Browning St, Byron Bay

JGD Developments

Planit August 2017 Document No: J170-TIA01

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DEVELOPMENT APPLICATIONS



Traffic Impact Study for Jonson Street ~ Browning Street, Byron Bay

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Planit Engineering

Page 1

J170-T/S01



Traffic Impact Study for Jonson Street -- Browning Street, Byron Bay

CONTENTS

Table of Figures	3
Table of Tables	3
Executive Summary	4
1. Introduction	6
1.1. Project Background	6
1.2. Scope and Structure of Report	6
1.3. Standards, Policies and Guidelines	6
1.4. Butler Street Bypass	6
1.5. Definitions	6
2. Development description	9
3. Existing Infrastructure	
3.1. Parking Provisions	
3.2. Public Transport	
3.3. Road Network	
3.4. Peak Hour Traffic Survey	13
3.4.1. Turning Movement Survey	
3.4.2. Traffic Survey	
3.4.3. Adopted Peak Hour Traffic Volumes	
3.5. Daily Traffic Survey	14
3.6. Peak Period Traffic Characteristics	
3.6.1. 8:00 to 9:00 AM Peak Observations	
3.6.2. 15:10 to 16:10 PM Peak Observations	
3.7. Traffic Volume Trends	
4. Car parking	
4.1. Car Parking Numbers	19
4.1.1. Overall Car Parking	
4.1.2. Accessible Car Parking	19
4.1.3. Bicycle Parking	20
4.1.4. Motorbike Parking	20
4.1.5. Staff Parking	20
4.1.6. Loading Bays	20
4.1.7. Summary of Parking Requirements	21
4.2. Geometric Requirements	21
4.3. Suitability of Current Design	22
5. Trip Generation	23
5.1. Trip Generation Rates	23
5.2. Daily Trip Calculations	26
6. Internal Manoeuvring	
7. Impact on Surrounding Road Network	
7.1. Impact on Road Capacity	28
7.2. Impact on the Ruskin Lane Intersections	29
7.2.1. Modelling Scenarios	29
7.2.2. General Modelling Information	29
7.2.3. Modelling Results	
8. Safety Considerations	35
8.1. Site Access	35
Planit Engineering Page 2	J170-TIS01

DEVELOPMENT APPLICATIONS

PLAN

Traffic impact Study for Jonson Street ~ Browning Street, Byron Bay

under under onde her seuter an en under en ende hour set				
8.	2. Road Safety	35		
9.	Cycling Provisions	37		
10.	Strategic Environment	38		
11.	Conclusions and Recommendations	39		
References				

TABLE OF FIGURES

Figure 1	Subject Site, Source of aerial image: SIX Maps
Figure 2	Excerpt of Site Plan
Figure 3	Paid Parking Scheme
Figure 4	Byron Bay Bypass Overall Layout Plan
Figure 5	Browning Street & Ruskin Lane Intersection
Figure 6	Ruskin Lane & Ramp Intersection
Figure 7	Sight Line to the Right from Ruskin Lane
Figure 8	Sight Line to the Left from Ruskin Lane

TABLE OF TABLES

Table 1 Level of Service
Table 2 Turning Movement Survey
Table 3 Browning Street Peak Hour Volumes
Table 4 Turning Movements
Table 5 AADT Calculations
Table 6 Speed Data
Table 7 BSC Traffic Survey Data Summary17
Table 8 Ewingsdale Road Traffic Growth for Site 054
Table 9 Overall Car Parking Calculation Table
Table 10 Accessible Parking Requirements
Table 11 Bicycle Space Calculations20
Table 12 Loading Bay Calculations21
Table 13 Summary of Parking Spaces21
Table 14 Geometric Requirements21
Table 15 Trip Generation, data sources23
Table 16 Peak Hour Trip Generation, adopted rates25
Table 17 Development Daily Trip Generation, adopted rates
Table 18 Peak Hour Vehicle Trips on Surrounding Road Network
Table 19 Pre-development SIDRA Input Browning Street/Ruskin Lane Intersection
Table 20 Post-development SIDRA Input Browning Street/Ruskin Lane Intersection
Table 21 Post-development SIDRA Input Ruskin Lane/Ramp Intersection
Table 22 Level of Service for Pre-development Scenario's
Table 23 95 th %ile Queue Length (m) for Pre-development Scenario's
Table 24 Control Delay (s) for Pre-development Scenario's
Table 25 Level of Service for Post-development Scenario's
Table 26 95th%ile Queue Length (m) for Post-development Scenarios
Table 27 Control Delay (s) for Post-development Scenarios
Table 28 Section 94 Contribution Costs

Planit Engineering

/170-T/S01

PLANIT

Traffic Impact Study for Jonson Street ~ Browning Street, Byron Bay

EXECUTIVE SUMMARY

This Traffic Impact Study has been prepared to provide an assessment on the potential traffic impact the proposed development has on the surrounding road network. The proposed development is located at 137-139 Jonson Street and 3 Browning Street on Lots 5 and 6 on DP758207 and Lot 21 on DP247289. Planit was engaged by JGD Developments Pty Ltd to prepare a Traffic Impact Study to support the development application (DA) for the proposed development.

The subject site currently contains three lots. Two lots contain a single residence and one lot is approved as a dual occupancy. The proposed site layout consists of approximately 3309m² of residential GFA and 1151m² of commercial GFA. There is a proposed two-level basement carpark on the subject site that is accessed from Ruskin Lane. Above ground, the proposal includes four levels of development, comprising of retail, a cafe, a childcare centre and 42 apartments (shop top housing and serviced apartments, some of which are dual key). The purpose of this report is to inform both the developer and Byron Shire Council (BSC) on opportunities and constraints regarding the proposed Jonson/ Browning Street mixed-use development. In particular, this report aims to address:

- Existing traffic conditions.
- Access and parking for cars, service vehicles, mobility impaired, bicycles and pedestrians.
- Safety associated with the entrance and internal manoeuvring.
- Impact on the surrounding road network.

It is proposed to construct a two-level basement carpark that will service the entire parking capacity of the development. The underground carpark access shall be via a vehicular crossover ramp that is accessed from a public road. The access to the site will be via Ruskin Lane. Site access will be primarily from the Ruskin Lane / Browning Street intersection. Site access from Tennyson Street is discouraged. It is proposed to widen Ruskin Lane from Browning Street to the MRV loading bay to cater for two-way traffic and the simultaneous entering and existing of cars. The Ruskin Lane splays have been designed for MRV swept paths. The arrangement is similar to the approved and adopted arrangements in Bay Lane for the recently renovated backpackers hostel.

A traffic survey was undertaken on the roads adjacent to the subject between 26 June and 3 July 2017, and average annual daily traffic and peak hour traffic volumes were derived from this survey. This data is used as the base traffic volumes for analysis of the road network and the Ruskin Lane and Browning Street intersection. A site inspection was also undertaken to monitor the traffic trends around the subject site and it was found that the general traffic conditions were normal and uninterrupted. It was found that cyclists and pedestrians utilise the existing road network around the site without any noticeable difficultly.

Item	Minimum required
Regular parking spaces (inclusive of small car spaces and electric car charging bays)	100
Dedicated child car parking spaces	17
Accessible parking spaces	3
Bicycle spaces	12
Motorbike spaces	8
Staff parking spaces	0
SRV loading bays	2
MRV loading bays	1

Car parking requirements are summarised in the table below:

It is proposed that the bicycle spaces will be located on the ground floor on the development in a secure location. Based on Table B4.2 of Chapter B4 of the 2014 DCP, a total of 2 SRV loading bays and one MRV loading bay would be required. It is proposed to locate one SRV loading bay at the Jonson Street frontage, that would only be used between 7pm and 7am and one MRV loading bay on the Ruskin Lane frontage beside the basement carparking ramp. The site manager would manage timing deliveries and pickups to ensure there is never a shortage of loading

Planit Engineering

J170-T/S01

DEVELOPMENT APPLICATIONS

Traffic Impact Study for Jonson Street ~ Browning Street, Byron Bay



bays. Closure of the two existing driveway cross overs on Jonson Street will likely result in the potential of an extra on-street car park in Jonson Street, which would offset the loss of one car park for the SRV loading bay.

Trip generation rates have been retrieved from multiple sources including the RTA's *Guide to Generating Traffic Development* and ITE's *Trip Generation Manual*. This report adopts a merit based assessment for trip generation to ensure that an accurate representation of the proposed site is shown. Based on the architectural layout provided, the proposed development will generate 213 AM peak hour trips, 167 PM peak hour trips, and 1361 daily trips.

Internal manoeuvring has been assessed for the design vehicles for the site, using Civil3D based swept path analysis software. The following design vehicles have been adopted:

- B99 for access ramp (2-way) and basement car park (one-way) manoeuvring.
- MRV for Ruskin Lane.
- MRV for MRV loading bay.

It was found that safe and efficient manoeuvring is achievable.

In order to improve safe manoeuvring of both vehicles and pedestrians in the basement car park, the following safety enhancing measures have been incorporated into the design:

- Speed humps.
- Signage.
- Separate pedestrian path along the perimeter of the dedicated child care spaces. This path leads to the lift and stairs.

The proposed Byron Bay Bypass (BBB) will begin at the corner of Jonson Street and Browning Street and connect into the end of Butler Street and continue to the existing roundabout adjacent to the Police Station. It is proposed that a new roundabout will be located at the corner of Jonson Street and Browning Street, changing the dynamics of traffic around the subject site. The BBB will aim to improve the traffic flow along Jonson Street by diverting through traffic around the Byron Bay CBD.

There is currently vehicular access to 137-139 Jonson Street and 3 Browning Street via the Jonson Street frontage. Additionally, there is a second vehicular access point to 3 Browning Street at the Browning Street frontage and a second vehicular access point to 137 Jonson Street at the Ruskin Lane frontage. It is proposed that all vehicular entry and exits to the subject site will be via Ruskin Lane. The sight lines at the Browning Street intersection are uninterrupted to the intersections with Jonson Street and Bangalow Road. From the proposed site access point in Ruskin Lane, uninterrupted sight lines exist and will be maintained towards Browning Street and the corner in Ruskin Lane. Thus, adequate sight lines are achieved.

SIDRA Intersection modelling shows excellent performance of the Ruskin Lane intersections, under the conditions specified in this report.

Planit Engineering

Page 5

J170-T/S01
PLANIT

Traffic impact Study for Jonson Street ~ Browning Street, Byron Bay

1. INTRODUCTION

1.1. PROJECT BACKGROUND

This Traffic Impact Study has been prepared to provide an assessment on the potential impact the proposed development has on the surrounding road network. The proposed development located at 137-139 Jonson Street and 3 Browning Street on Lots 5 and 6 on DP758207 and Lot 21 on DP247289. Planit was engaged by JGD Developments to prepare a Traffic Impact Study to support the development application (DA) for the proposed development.

The subject site currently contains three lots, of which one is approved as a dual occupancy lot. The proposed site layout consists of approximately 3309m² of residential GFA and 1113m² of commercial GFA. There is a proposed two-level basement carpark on the subject site with 108 car parking spaces, 3 PWD spaces, 8 motorcycle spaces and 11 bicycle spaces. Above ground, the proposal includes three levels of development, comprising of retail, a cafe, a childcare centre, shop top housing and serviced apartments.

1.2. SCOPE AND STRUCTURE OF REPORT

The purpose of this report is to inform both the developer and Byron Shire Council (BSC) on opportunities and constraints regarding the proposed Jonson/ Browning Street mixed-use development. In particular, this report aims to address:

- Existing traffic conditions.
- Access and parking for cars, service vehicles, mobility impaired, bicycles and pedestrians.
- Safety associated with the entrance and internal manoeuvring.
- Impact on the surrounding road network.

In order to achieve the above, the report has been structured such that Chapters 2 and 3 summarise the existing conditions of the subject site. Chapters 4, 5 and 6 identify the parking requirements, trip generation and internal manoeuvring of the proposed development. Chapter 7 assesses the impact the proposed development has on the surrounding road network. Chapter 8 focuses on safety considerations associated with the development. Cycling provisions are addressed in Chapter 9 and tie in to Council's strategic plans is addressed in Chapter 10. Conclusions and recommendations are provided in Chapter 11.

1.3. STANDARDS, POLICIES AND GUIDELINES

This assessment is based on requirements from the following standards, policies and guidelines:

- Byron Shire Development Control Plan 2014 Chapter B4 Traffic Planning, Vehicle.
- 2002 RTA Guide to Traffic Generating Developments.
- Australian/New Zealand Standard 2890 series.
- Austroads Guide to Road Design.
- Austroads Guide to Traffic Management.
- ITE Trip Generation Manual.
- National construction code Building Code of Australia Class 2 to Class 9 Buildings.

1.4. BUTLER STREET BYPASS

The subject site is located on the corner of Browning Street and Jonson Street. As part of the construction of the proposed Byron Bay Bypass (BBB), this intersection shall be upgraded and a roundabout shall be provided. Planit understands that works for the BBB are likely to commence in the 2017/2018 financial year. A boundary adjustment of 3 Browning Street has taken place to accommodate the proposed new roundabout on the junction of Browning Street, Jonson Street and the Butler Street Bypass. Existing and new boundaries are indicated on the Engineering Plans (Appendix A).

1.5. DEFINITIONS

- Annual Average Daily Traffic (AADT) is the total volume of vehicle traffic for a year divided by 365 days. Sometimes also referred to as "Average Annual Daily Traffic" it provides a rudimentary traffic volume number.
- Carriageway is the portion of the road assigned to the use of vehicles, inclusive of shoulder and auxiliary lanes.

Planit Engineering	Page 6	J170-TIS01



Traffic Impact Study for Jonson Street ~ Browning Street, Byron Bay

- SRV, Small rigid vehicle as defined in AS 2890.2-2004.
- MRV, Medium rigid vehicle as defined in AS 2890.2-2004.
- HRV, Heavy rigid vehicle as defined in AS 2890.2-2004.
- AV, Articulated vehicle as defined in AS 2890.2-2004.
- Design year, standard practise in traffic engineering is to determine the impact of a development 10 years
 after the date of the assessment. For a 2017 assessment, the design year is AD 2027.
- Classification of buildings, the classification of a building or part of a building is determined designed, constructed or adapted to be used.
- Level of Service, (in accordance with the Austroads definition), is a qualitative measure describing
 operational conditions within a traffic stream, and their perception by motorists and/or passengers. A level
 of service definition generally describes these conditions in terms of factors such as speed and travel time,
 delay, density, freedom to manoeuvre, traffic interruptions, comfort and convenience, and delay. Levels of
 service can be described for interrupted and uninterrupted flow facilities. Descriptions are provided in
 Table 1.

Table 1 | Level of Service

Level of Service	Uninterrupted flow facility definition (HCM 2010)	Interrupted flow facility definition (AGTTM3)
A	A condition of free-flow in which individual drivers are virtually unaffected by the presence of others in the traffic stream. Freedom to select desired speeds and to manoeuvre within the traffic stream is extremely high, and the general level of comfort and convenience provided is excellent.	Describes primarily free-flow operation. Vehicles are completely unimpeded in their ability to manoeuvre within the traffic stream. Control delay at the boundary intersections is minimal. The travel speed exceeds 85% of the base free-flow speed.
В	In the zone of stable flow where drivers still have reasonable freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience is a little less than with level of service A.	Describes reasonably unimpeded operation. The ability to manoeuvre within the traffic stream is only slightly restricted and control delay at the boundary intersections is not significant. The travel speed is between 67% and 85% of the base free-flow speed.
c	Also in the zone of stable flow, but most drivers are restricted to some extent in their freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience declines noticeably at this level.	Describes stable operation. The ability to manoeuvre and change lanes at mid segment locations may be more restricted than at LOS B. Longer queues at the boundary intersections may contribute to lower travel speeds. The travel speed is between 50% and 67% of the base free-flow speed.
D	Close to the limit of stable flow and approaching unstable flow. All drivers are severely restricted in their freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience is poor, and small increases in traffic flow will generally cause operational problems.	Indicates a less stable condition in which small increases in flow may cause substantial increases in delay and decreases in travel speed. This operation may be due to adverse signal progression, high volume, or inappropriate signal timing at the boundary intersections. The travel speed is between 40% and 50% of the base free-flow speed.
E	Traffic volumes are at or close to capacity, and there is virtually no freedom to select desired speeds or to manoeuvre within the traffic stream. Flow is unstable and minor disturbances within the traffic stream will cause breakdown.	Characterised by unstable operation and significant delay. Such operations may be due to some combination of adverse progression, high volume, and inappropriate signal timing at the boundary intersections. The travel speed is between 30% and 40% of the base free-flow speed.

Planit Engineering

Page 7

DEVELOPMENT APPLICATIONS



upact 54	udy for Jonson Street Browning Street, Byron Bay	
F	In the zone of forced flow, where the amount of traffic approaching the point under consideration exceeds that which can pass it. Flow breakdown occurs, and queuing and delays result.	Characterised by a flow at extremely low speed. Congestion is likely occurring at the boundary intersections, as indicated by high delay and extensive queueing. The travel speed is 30% or less of the base free-flow speed. LOS F is assigned to the subject direction of travel i the through movement at one or more boundary intersections has a volume-to capacity ratio greater than 1.0.

Planit Engineering

Page 8

PLANIT

Traffic Impact Study for Jonson Street ~ Browning Street, Byron Bay

2. DEVELOPMENT DESCRIPTION

The subject site is approximately 2835m² in plan and is currently made up of three (3) residential lots, of which one is approved as a dual occupancy lot. The proposal comprises of the construction of a mixed-use development with residential and commercial areas and a child care centre. The site has a high point at approximately RL 8.4m in the northwestern extremity of the site and low points of approximately RL 4.1m at the Jonson St and Browning St boundaries. Proposed access to the subject site is from Ruskin Lane, in the southeastern corner of the site.

It is proposed to construct a two-level basement car park with sufficient capacity to service the number of car parks required by Council. The underground carpark access shall be via a vehicular crossover ramp that is accessed from a public road. The access to the site will be via Ruskin Lane. Ruskin Lane is primarily assessed from the Ruskin Lane / Browning Street intersection, an arrangement that will be encouraged by site management.

One MRV loading area is proposed on the site via Ruskin Lane, immediately north of the vehicular access ramp to the underground carpark. A second loading area (bin collection) is proposed on Browning Street, west of the Ruskin Lane access point. A 7pm to 7am SRV loading bay will be signposted on Jonson Street.

The proposed carpark is sized such that it can accommodate all of the residents, workers and visitors of the subject site. A site manager will be on site to schedule service vehicle arrivals to ensure smooth operation of service vehicles and avoid site servicing during peak periods.

It is proposed to widen Ruskin Lane from Browning Street to the access road to cater for two-way traffic and the simultaneous entering and existing of cars. The Ruskin Lane splays have been designed for MRV swept paths. The arrangement is similar to the approved and adopted arrangements in Bay Lane for the recently renovated backpackers hostel.

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Page 9

DEVELOPMENT APPLICATIONS



Figure 1 | Subject Site, Source of aerial image: SIX Maps

Planit Engineering

Page 10

/170-T/S01

DEVELOPMENT APPLICATIONS

7.1 - ATTACHMENT 1



Figure 2 | Excerpt of Site Plan

Planit Engineering Page 11 J170-TIS01



Traffic Impact Study for Jonson Street ~ Browning Street, Byron Bay

3. EXISTING INFRASTRUCTURE

3.1. PARKING PROVISIONS

Byron Shire Council introduced a paid parking scheme in December 2015 that extends throughout the Byron Bay CBD, including the entire length of Jonson Street and capturing the majority of side streets (Figure 3). There is available parking that exists for users of 137-139 Jonson Street and 3 Browning Street along the Jonson Street and Browning Street frontages. There are no signalised parking restrictions along the Ruskin Lane frontage as laneways are unsuitable for parking.



Figure 3 | Paid Parking Scheme

The parking available along the Jonson Street frontage is a part of the paid parking scheme employed by Byron Shire Council (Figure 3). The parking along Browning Street is un-metered and currently free to use, however with the introduction of the Byron Bay Bypass and the installation of a major roundabout on the corner of Jonson Street and Browning Street, it is anticipated that the majority of this parking will be removed.

Free parking exists adjacent to Mitre 10, a short walk from the subject site. On-site basement parking is provided for the site's shop and café patrons, as well as residents and the child care centre.

Planit Engineering

Page 12

DEVELOPMENT APPLICATIONS



Traffic Impact Study for Jonson Street ~ Browning Street, Byron Bay

3.2. PUBLIC TRANSPORT

Bus services are the only public transport facility available in close proximity to the site and several bus routes pass the proposed development. Northern Rivers Buslines Group (Routes 610 and 635), Blanch's Bus Company (Routes 637, 640 and 641) and Greyhound (Routes Red and Green) are the main providers of bus services in the Byron Shire. The scheduled routes to and from Byron Bay operate 7 days a week. Byron Bay bus origins/destinations include, but are not limited to, Bangalow, Ballina, Mullumbimby, Lismore, Gold Coast and Brisbane.

Although no official bus stops are shown on the official routes along Browning Street or Jonson Street, Blanch's Bus Company operates these routes on a "hail and ride" policy: the users can be catching Blanch's buses from anywhere along the route as long as the driver considers it safe and legal. Blanch's timetables show that bus routes are passing the subject site on weekdays and weekends, providing opportunity for future users of the proposed development to utilise public transport. These routes connect the site with the Byron Bay bus station, located 600m north of the site on Jonson Street.

3.3. ROAD NETWORK

The stretches of Jonson Street and Browning Street adjacent to the subject site are RMS roads. The roads are classified as 'Main Road' and the route is identified as MR545. The total carriageway is approximately 16metres wide, this includes two 5metre wide traffic lanes and two 3metre wide kerbside parking shoulders.

Ruskin Lane is a laneway that is owned and operated by Byron Shire Council. The road is approximately 3metres wide adjacent to the subject site. The road reserve width is approximately 6 metres. It is proposed to widen and reseal the section of Ruskin Lane adjacent to the subject site to improve accessibility and safety to and from the site.

Table D.1.5 of the Northern Rivers Development Design Specification – *Geometric Road Design* states that the maximum traffic volume for distributor roads is 3000+ (vpd). This value has no explicit vehicle limit and does not give a valuable representation of the maximum allowable vehicles on the road network adjacent to the subject site. For the road network adjacent the subject site, network capacity is likely driven by the capacity and traffic volumes on individual intersections.

The SIDRA modelling of the Ruskin Lane and Browning Street intersection will give a more realistic representation of the performance of the road network. Modelling results will be provided in chapter 7 of this report. Additionally, site inspections during peak hour periods will give a good representation of the current operation of the road network.

3.4. PEAK HOUR TRAFFIC SURVEY

3.4.1. Turning Movement Survey

Staff from our office carried out an AM peak turning movement survey between 8am and 8:30am on Thursday the 4th of May 2017. This turning movement survey was carried out at the intersection of Ruskin Lane and Browning Street. The survey results are provided below:

Approach	Turning movement	Vehicles surveyed in 30 minutes	Adopted AM peak hour volume
Browning Street	Left	2	4
(eastbound)	Straight	172	344
Browning Street	Straight	269	538
(westbound)	Right	0	0
Bueble Loss	Left	0	0
Ruskin Lane	Right	0	0

Table 2 | Turning Movement Survey

The total volume for the AM peak hour would be 886 vehicles per hour on Browning Street.

Planit Engineering

Page 13



Traffic Impact Study for Jonson Street ~ Browning Street, Byron Bay

3.4.2. Traffic Survey

Greg Alderson and Associates (GAA) undertook a traffic survey between 26th June 2017 and 3rd July 2017 using a classified vehicle counter. Traffic counters were placed along Jonson Street, Browning Street and Ruskin Lane to capture the daily traffic and peak hour traffic surrounding the subject site.

The results obtained were used to determine the AADT on the surrounding road network. Results obtained on July 3-5 were disregarded from the average daily traffic (ADT) calculations as they were the beginning of the school holidays period. Results recorded from June 26 to July 2 were used to determine the average daily traffic (Monday to Sunday) across the period. The ADT was converted into AADT using a seasonal fluctuation factor of 1.05 based on the Austroads Guide to Traffic Management Part 3: Traffic Studies and Analysis.

Peak hour traffic flows for the AM and PM across the weekend period were disregarded for the purpose of this report and the proposed development will have its greatest impact on the surrounding road network on weekdays when the child care centre is open. The AM peak period with the largest traffic volumes was 8:00-9:00 and this time period is used for the average AM peak hour. The PM peak period with the largest traffic volumes was 16:30-17:30 and this time period is used to calculate the average PM peak hour volume (Table 3).

Table 3 | Browning Street Peak Hour Volumes

Approach	AM Peak Hour Volume	PM Peak Hour Volume
Browning Street (westbound)	624	467
Browning street (eastbound)	393	556

3.4.3. Adopted Peak Hour Traffic Volumes

The following traffic volumes have been adopted from the turning movement survey undertaken by Planit and traffic survey undertaken by GAA. The traffic data recorded by GAA will be used for the straight movements as this data set is recorded across the entire week and gives the best representation of the greatest peak hour periods across the entire week. Additionally, the turning movement survey undertaken by Planit was for 30 minutes and requires interpolation for the hourly volume. The movements in to and out of Ruskin Lane recorded during the turning movement survey will be used for modelling as they give the best representation of turning movements.

The results obtained from the turning movement survey and traffic data is multiplied by a seasonality factor of 1.05 to give a better representation of the average peak hour volumes across the entire year. The values obtained from multiplying the results by the seasonality factor will be used as the design year 2017 volumes. The 2027 design year will also be modelled to give an understanding of how the intersection will operate in the future. Based on experience with other developments in this region, an annual compound growth rate of 2.5% is adopted for 10 years leading to the 2027 design year. The volumes used for modelling purposes can be seen in Table 4.

Table 4 | Turning Movements

Approach	Turning movement	2017 AM Peak	2017 PM Peak	2027 AM Peak	2027 PM Peak
Browning Street	Left	4	0	0	5
(eastbound)	Straight	412	583	527	747
Browning Street	Right	0	0	0	0
(westbound)	Straight	655	490	838	627
Puckin Lann	Left	0	0	0	0
KUSKIII LANE	Right	0	0	0	0

3.5. DAILY TRAFFIC SURVEY

The above mentioned GAA traffic survey provides daily traffic volumes. The daily traffic from Tuesday 27 June to Monday 3 July was averaged at each location to give a 7-day ADT that is inclusive of weekend traffic. However, an

Planit Engineering



Traffic Impact Study for Jonson Street ~ Browning Street, Byron Bay

error occurred with the Browning Street counter on Wednesday 28 June, so the results obtained on this day were replaced with the results obtained on Wednesday 5 July.

The average annual daily traffic (AADT) is a parameter discussed more commonly than ADT in traffic engineering. The AADT gives a better representation of the average traffic on a road network as it accounts for the high and low volume times of the year. For this reason, the results obtained from the GAA survey will be converted to AADT using a seasonality factor to account for the variations in daily traffic throughout the year. A factor of 1.05 (derived from Austroads) will be used to determine the 2017 AADT. An annual compound traffic growth factor of 2.5% will be adopted to calculate traffic volumes up to the 2027 design year. Table 5 shows the AADT calculations.

Table 5 | AADT Calculations

	Jonson Street	Browning Street	Ruskin Lane
7-day ADT	11890	11609	10
Seasonal adjustment factor	1.05	1.05	1.05
2017 AADT	12485	12189	10
Annual compound traffic growth factor	2.50%	2.50%	2.50%
2027 AADT	15981	15603	13
% HV	6.10%	4.90%	0%

The traffic data that was recorded from the GAA survey also recorded the speed at which vehicles crossed the pneumatic tubes. Table 6 shows the statistics relating to the speed of vehicles on each road.

Table 6 | Speed Data

and a second second	Jonson Street	Browning Street	Ruskin Lane
Mean (km/h)	40.3	39.4	17.7
85%-ile (km/h)	46.1	44.3	22
95%-ile (km/h)	49.7	47.5	24.5
Median (km/h)	40.3	39.6	17.3

3.6. PEAK PERIOD TRAFFIC CHARACTERISTICS

Two traffic site inspections have been carried out, on Wednesday 28/06/2017, in the surroundings of the subject site. This section aims to discuss their main findings.

3.6.1. 8:00 to 9:00 AM Peak Observations

This section aims to discuss general observations that refer to the AM peak (8:00-9:00 am).

Tennyson/Browning Roundabout:

- The traffic streams are only slightly restricted and control delays at the boundary intersections are not significant. Minor congestion and queues are observed.
- Cars travelling north on Tennyson Street can enter the "Green Garage" grocery store without queuing.
- The School Zone sign 20m north of the Roundabout is flashing (speed limit lowered to 40km/h).

Corner of Jonson St & Browning St/Mitre 10 Intersection:

- Trucks are observed to be able to accelerate coming out of the Mitre 10 parking area and entering Jonson Street northbound in a safe manner.
- Cars and trucks can enter the "Mitre 10" area from Jonson Street, queueing along the through lane, without difficulties.
- Customers of the petrol station can safely re-enter the main road infrastructure via a dedicated manoeuvring area to the west of the pumps.
- Two users are observed carrying out illegal U-turn manoeuvres to change their directions of travel while transiting northbound on Browning Street. To do so, they drove through the opening in the traffic island

Planit Engineering

Page 15

DEVELOPMENT APPLICATIONS

PLANIT

Traffic Impact Study for Jonson Street ~ Browning Street, Byron Bay

that allows vehicles travelling southbound to access the Mitre 10 parking area and vehicles travelling northbound to leave the Mitre 10 parking area. This issue will likely be resolved once the new roundabout is constructed.

Ruskin Intersection

 Only one user is observed coming out of Ruskin Lane. The user had to wait for approximately 15 seconds before being able to turn right.

On-Street Parking

Cars are parked on both sides of Browning Street. The carpark strips are both at approximately 40% capacity.

Public Transport

 Blanch's School Bus Stopped by at 08:01 to pick up students gathered nearby the shop "Spell" on the northern side of the Browning Street/Tennyson Street roundabout.

Pedestrians

- Pedestrians can generally walk safely and efficiently around the subject site. They share the footpaths with
 cyclists.
- Pedestrians walking from Bangalow Road to Tennyson Street face difficulties crossing the roundabout due to vehicles having the right of way onto the roundabout.
- Pedestrians walking across the "Mitre 10" intersection/parking area towards the proposed development face the risk of getting hit by vehicles. The main risk for pedestrians is vehicles trying to enter the Mitre 10 carpark when travelling westbound along Browning Street. It appears that drivers wishing to enter the carpark are rushed by tail-gating vehicles as there is no dedicated turning lane.

Cyclists

- Cyclist can generally ride safely and efficiently around the subject site.
- Cyclists travelling northbound (north side of Browning Street) tend to ride on the traffic lane and not to use the Cyclist path.
- Cyclists travelling on the footpaths from Bangalow Road to Tennyson Street face difficulties during roundabout crossing, just like pedestrians.

3.6.2. 15:10 to 16:10 PM Peak Observations

The Tennyson/Browning Roundabout:

- The traffic streams are more restricted than those observed during the AM session. Control delays and
 minor queues at the boundary intersections are noticed, this may contribute to lower travel speeds.
- Cars travelling north on Tennyson can enter the "Green Garage" grocery store without queuing.
- The School Zone sign 20m north of the roundabout was flashing.

Jonson-Browning Intersection

- · Cars and trucks entering from Jonson Street can safely queue on the turning lane.
- Cars and medium articulated vehicles can use the intersection in all directions, in conditions of stable flow and without significative queueing events.

Ruskin Intersection

No vehicles used the intersection.

On-Street Parking

- Cars are parked on both sides of Browning Street.
- The southern carpark strip is at 80% capacity.
- The southern carpark strip is at full capacity.

Public Transport

Planit Engineering

Page 16

/170-T/S01

DEVELOPMENT APPLICATIONS

PLANE

Traffic Impact Study for Jonson Street ~ Browning Street, Byron Bay

- Blanch's School Bus stopped by at 16:03 to drop off students on the northern side of Browning Street.
- Blanch's School Bus stopped by at 16:10 to drop off students on the southern Side of Browning Street.

Pedestrians

- Similar observations to AM.
- Pedestrians have to wait approximately 20 seconds to cross Browning Street in proximity of the Ruskin Lane
 intersection due to the passing traffic.

Cyclists

- 80% of the cyclists riding southbound use the cycling path on the southern side of Browning Street.
- Cyclists travelling northbound (north side of Browning Street) tended to use the traffic lane and not to use the Cyclist path.

Others

Cars and vans coming out, in reverse, of the near guest houses driveway (7 Browning Street) face collision
risks due to parked cars on the northern side of Browning Street that act as obstacles to visibility.

3.7. TRAFFIC VOLUME TRENDS

Byron Shire Council have provided us with traffic survey data obtained at locations in the vicinity of the subject site. A summary of these surveys is provided in Table 7. In this Table, we include the average weekday peak hour volume, measured between 8am and 9am. Although in these streets, the actual AM peak hour sometimes occurs later, the likely trip generation peak by the proposed development and in particular the child care facility would be between 8am and 9am. Therefore, the 8am to 9am timeslot has been selected to represent AM peak impact.

Table 7 | BSC Traffic Survey Data Summary

Survey code	Location	Survey period	Weekday average daily traffic (exc). public holidays)	7-day average daily traffic (excl. public holidays)	Weekday AM peak hour volume, 8am – 9am	Percentage heavy vehicles
SP0420	Browning Street, 50m west of Tennyson Street	21 December 2009 – 4 January 2010	12,180	12,692	788	3.2%
SP0365	Browning Street, 120m east of Tennyson Street	4 February 2009 – 12 February 2009	441	425	30	3.5%
SP0107	Intersection Browning and Jonson Streets	24 September 2003 – 1 October 2003	12,362	11,857	850	2.5%

The SP0420 survey is located near the Ruskin Lane intersection with Browning Street, which is relevant for this project. It is the most recent data set (2010), however the survey was undertaken over the Christmas holiday period. In calculation of the averages we have excluded the public holidays (Christmas Day, Boxing Day and New Year's Day).

SP036 was undertaken outside school holidays, however this survey was undertaken on a relatively quiet section of Browning Street, to the east of the Bangalow Road intersection, and is therefore not suitable to be used for the purposes of this report.

The SP0107 survey was taken just outside the subject property, on the intersection of Browning Street and Jonson Street. This survey location may be more highly trafficked than SP0420 due to traffic associated with the Mitre10

Planit Engineering

Page 17

DEVELOPMENT APPLICATIONS



Traffic Impact Study for Jonson Street ~ Browning Street, Byron Bay

precinct, which would explain why this survey from 2003 shows roughly the same average daily traffic volumes as the Christmas holiday survey from 2010 in Browning Street.

Council have also provided us with traffic survey data on Ewingsdale Road near the new Byron Hospital. At this location (100 metres east of the batching plant) Council carries out regular traffic surveys (every 2 years). This data would assist in gaining an understanding of annual traffic growth in Byron Bay.

Table 8 | Ewingsdale Road Traffic Growth for Site 054

Survey period	5-day average daily traffic	7-day average daily traffic	% heavy vehicles
22 September 2010 – 30 September 2010	17,126	16,159	5.6%
16 October 2012 - 24 October 2012	17,102	16,480	5.7%
29 September 2016 - 6 October 2016	20,069	19,642	6.0%

Unfortunately, the 2008 survey set provided was unsuitable for use due to the number of data omissions in the set. The data provided above shows a 3.3% annual compound traffic growth between 2010 and 2016, and a 4.5% annual compound traffic growth between 2012 and 2016. Generally, in this region, a 2.5% annual compound traffic growth value is adopted when detail surveys and traffic forecasts are not available. Although the survey data provided shows annual compound traffic growth rates in excess of 2.5%, these surveys are snapshots over a relatively short period. The amount of data provided is not sufficient to carry out accurate forecast calculations. Therefore, we will adopt a generally accepted 2.5% annual compound traffic growth rate percentage as a basis for the analyses in this report.

Planit Engineering

Page 18



Traffic Impact Study for Jonson Street ~ Browning Street, Byron Bay

CAR PARKING

It is proposed to provide sufficient onsite parking space to allow all car parking and drop off to occur in the basement car park. All service vehicles, however, will remain at ground level, as described above. Requirements for car parking numbers and geometric requirements are described in this chapter.

4.1. CAR PARKING NUMBERS

4.1.1. Overall Car Parking

Overall car parking calculations are carried out in Table 9.

Table 9 | Overall Car Parking Calculation Table

Item	Relevant DCP land use definition	Calculation rate	Amount	Number of parking spaces
		1 space per 1 or 2 bed unit, 2	24x one or two bed units	24
Serviced	Medium density	spaces per 3 or more bed unit,	2x three bed units	4
apartments	housing	1 visitor space per 4 dwellings or part thereof	Visitor spaces, based on 26 dwellings	6.5
		1 space per 1 or 2 bed unit, 2	22x one or two bed units	22
Shop top	Shop top Medium density housing housing	spaces per 3 or more bed unit, 1 visitor space per 4 dwellings or part thereof	2x three bed units	4
housing			Visitor spaces, based on 24 dwellings	6
Manager's office	Business premises	1 space per 20m ² GFA	18	0.9
Child care	Child care centre	1 space per 4 children plus drop off/pick up area	65	16.25
Shops	Business premises	1 space per 20m ² GFA	617	30.85
Retail (café)	Food and drink premises	1 space per 20m ² GFA	149 (including end of trip and retail WC)	7.45
		Total		122

A minimum of 122 car spaces is required for this development, including 17 car parking spaces dedicated to the child care centre. A breakdown of these 122 spaces is provided in the following sections.

4.1.2. Accessible Car Parking

Accessible car parking requirements are specified in Volume 1 of the 2015 National Construction Code and Building Code of Australia. These codes provide several rates for various building classes. The accessible parking calculations are carried out in Table 10.

Table 10	Accessible	Parking	Requirements
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Building class	Calculation rate	Number of parking spaces	Number of accessible spaces
2	Nil required		0
2	Nil required		0
5	1 space for every 100 carparking spaces or part thereof	1	1
9b	1 space for every 100 carparking spaces or part thereof	65	1
6	1 space for every 50 carparking	30	
6	spaces or part thereof	30	
	Total		
	Building class 2 2 5 9b 6 6	Building class Calculation rate 2 Nil required 2 Nil required 2 Nil required 5 1 space for every 100 carparking spaces or part thereof 9b 1 space for every 100 carparking spaces or part thereof 6 1 space for every 50 carparking spaces or part thereof 6 spaces or part thereof	Building class Calculation rate Number of parking spaces 2 Nil required 1 2 Nil required 1 5 1 space for every 100 carparking spaces or part thereof 1 9b 1 space for every 100 carparking spaces or part thereof 65 6 1 space for every 50 carparking spaces or part thereof 38

Planit Engineering Page 19 J170-TiS01

DEVELOPMENT APPLICATIONS

PLANIT

Traffic Impact Study for Jonson Street ~ Browning Street, Byron Bay

We recommend that of the 122 parking spaces, at least 3 be configured as a disabled parking space.

4.1.3. Bicycle Parking

Bicycle spaces are calculated in accordance with the requirements of Chapter B4 of the 2014 Byron Shire DCP. A calculation summary is provided in Table 11.

Table 11 | Bicycle Space Calculations

• Item)	Relevant DCP land use definition	Calculation rate	Amount	Number of bicycle spaces
Serviced apartments	Bed and breakfast accommodation	Nil	-	0
Apartments	1 or 2 bed unit (medium density housing)	Nil		0
Apartments	3 bed unit (medium density housing)	Nil	8	0
Apartments	Visitor spaces	Nil	2	0
Manager's office	Business premises	2 per 100m ² or part thereof	18	0
Child care	Child care centre	Nil	65	0
Shops	Business premises	2 per 100m ² (or part thereof) up to a floor area of 200m ² and 1 per 200m ² thereafter	617	6
Cafe	Food and drink premises	1 per 25m ² of GFA	149	6
		Total		112

We recommend at least 12 bicycle spaces are provided on site.

4.1.4. Motorbike Parking

Chapter B4 of the 2014 Byron Shire DCP requires that for commercial developments with a GFA exceeding 1000m², two percent of car parking spaces shall be converted to motorbike spaces at a rate of 4 motor cycle spaces for every space converted.

The commercial component of the development comprises of more than 1000m², therefore the above requirement applies. The commercial component, comprising of the serviced apartments, child care, shops and café, generates the need for 89 parking spaces. We recommend that two of these spaces be converted to a total of 8 motor cycle spaces.

4.1.5. Staff Parking

Staff spaces are calculated in accordance with the requirements of Chapter B4 of the 2014 Byron Shire DCP. For the use definitions in this proposal, no staff parking rates apply.

4.1.6. Loading Bays

Loading bay calculations are carried out in accordance with Chapter B4 of the 2014 Byron Shire DCP and the GTTG, based on development types. The calculations are provided in Table 12.

Planit Engineering

Page 20

Traffic Impact Study for Jonson Street ~ Browning Street, Byron Bay

Table 12 | Loading Bay Calculations



Relevant DCP Table B4.2 development type	Items included	GFA, m ^a	Number of loading bays required by vehicle class
Business premises/office premises	Manager's office	18	1 x SRV
Retail premises, tourist and visitor accommodation (except bed and breakfast accommodation and farmstay accommodation)	Café and shop	766	1 x SRV 1 x MRV
Industry			

Based on Table B4.2 of Chapter B4 of the 2014 DCP, a total of two SRV loading bays and one MRV loading bay would be required. The proposed development includes one SRV loading and one MRV loading bay, the use of which is managed by the site manager.

4.1.7. Summary of Parking Requirements

A summary of the required number of parking spaces and types is provided in Table 13.

Table 13 | Summary of Parking Spaces

Item	Minimum required
Regular parking spaces (inclusive of small car spaces and electric car charging bays)	100
Dedicated child car parking spaces	17
Accessible parking spaces	3
Bicycle spaces	12
Motorbike spaces	8
Staff parking spaces	0
SRV loading bays	2
MRV loading bays	1

4.2. GEOMETRIC REQUIREMENTS

Geometric requirements for the parking spaces and loading bays are determined in accordance with Australian / New Zealand Standard 2890. An overview of the geometric requirements is provided in Table 14.

Table 14 | Geometric Requirements

Item	Minimum amount	Relevant user classes	Dimensions
Regular parking spaces	100	1A, 2, 3	5.4 x 2.6m spaces with 5.8m aisle
Child care spaces	17	3A	5.4 x 2.7m spaces with 6.2m aisle
Accessible parking spaces	2	4	5.4 x 2.5m spaces with 2.4m shared area between 2 spaces
Bicycle spaces	12	22	
Motorbike spaces	8	÷	
Staff parking spaces	0	+	4
SRV loading bays	2	*	3.5 x 6.4m bay with 3.5m vertical clearance
MRV loading bays	1	÷	3.5 x 8.8m bay with 4.5m vertical clearance

Planit Engineering

Page 21

Traffic Impact Study for Jonson Street ~ Browning Street, Byron Bay



4.3. SUITABILITY OF CURRENT DESIGN

The proposed architectural design complies with the parking requirements and geometric design requirements outlined in this chapter of the report. The design has been modified to ensure that the required PWD parking spaces, carparking spaces, motorcycle spaces and bicycle spaces are provided. As part of the parking spaces, three small vehicle car parking spaces are provided as well as 2 electrical car charging bays.

Safety measures including pedestrian zones and pedestrian crossings have been provided to ensure that children can be escorted to the lift and staircase with sufficient safety.

Although a minimum of 2 SRV loading bays is recommended based on the DCP, the requirement for one of these spaces, an 18m² manager's office is negligible for the area range (0-999m²) that requires such a bay. Deliveries can to be managed such, by the site manager, to ensure that there are never two SRV's on site simultaneously.

Planit Engineering

Page 22



Traffic Impact Study for Jonson Street ~ Browning Street, Byron Bay

5. TRIP GENERATION

This section of the report focuses on the traffic generated by the proposed development.

5.1. TRIP GENERATION RATES

Trip generation rates have been obtained from multiple sources including the RTA's *Guide to Generating Traffic Development* (GTTGD) and ITE's *Trip Generation Manual*. This report will adopt a merit based assessment for trip generation to ensure that an accurate representation of the proposed site is shown. Based on local knowledge of the local area, the rates that best represent the proposed development will be adopted for this assessment. Table 15 shows a summary of relevant rates provided in the GTTGD and the ITE Trip Generation Manual. The rates provided in this table will be assessed in order to establish rates that will be adopted for this assessment. The adopted rates are provided in Table 16 and Table 17.

item	Trip generation parameter	Source	Daily trip generation rate	Peak hour trip generation rate
Shop top housing (apartments) (1 or 2 bedroom)	Number of dwellings	RTA Guide to Generating Traffic Developments	5 per dwelling	0.4-0.5 per dwelling
Shop top housing (apartments) (3 bedroom)	Number of dwellings	RTA Guide to Generating Traffic Developments	6.5 per dwelling	0.5-0.65 per dwelling
Apartments	Number of dwellings	ITE Trip Generation Manual	*	0.35 per dwelling (AM) 0.44 per dwelling (PM)
Serviced Apartments	Number of dwelling units	ITE Trip Generation Manual	6.65 per unit	0.51 (AM) 0.62 (PM)
Manager's Office	m² GFA	RTA Guide to Generating Traffic Developments	10 per 100m² GFA	2 per 100m² GFA
Manager's Office	m² GFA	ITE Trip Generation Manual	12.4 per 100m ² GFA	1.68 per 100m ² GFA (AM) 1.60 per 100m ² GFA (PM)
Child care	Children	RTA Guide to Generating Traffic Developments		0.8 per child (AM) 0.7 per child (PM)
Child care	Children	ITE Trip Generation Manual	4.38 per child	0.8 per child (AM) 0.81 per child (PM)
Shop – Shopping Centre	m² GFA	RTA Guide to Generating Traffic Developments	121 per 100m ² GFA (0 – 10,000m ² GFA)	12.5 per 100m ² GFA
Shop – Variety Store	m² GFA	ITE Trip Generation Manual	64.03 per 100m ³ GFA	3.81 per 100m ² GFA (AM)

Table 15 | Trip Generation, data sources

Planit Engineering

Page 23

DEVELOPMENT APPLICATIONS

PLA	NIT

Traffic Impact Study for Jonson Street -- Browning Street, Byron Bay

				6.99 per 100m ² GFA (PM)
Shop – Shopping Centre	m² GFA	ITE Trip Generation Manual	42.70 per 100m² GFA	0.96 per 100m ² GFA (AM) 3.71 per 100m ² GFA (PM)
Shop – Specialty Retail Store	m² GFA	ITE Trip Generation Manual	44.32 per 100m ² GFA	6.84 per 100m ² GFA (AM) 5.02 per 100m ² GFA (PM)
Shop – Home Improvement Store	m ² GFA	ITE Trip Generation Manual	30.74 per 100m² GFA	1.49 per 100m ² GFA (AM) 2.33 per 100m ² GFA (PM)
Shop – Apparel Store	m² GFA	ITE Trip Generation Manual	-	3.83 per 100m ² GFA (PM)
Shop – Pharmacy	m² GFA	ITE Trip Generation Manual	90 per 100m² GFA	2.94 per 100m ² GFA (AM) 8.40 per 100m ² GFA (PM)
Shop – Furniture Store	m² GFA	ITE Trip Generation Manual	5.06 per 100m ² GFA	0.17 per 100m ² GFA (AM) 0.45 per 100m ² GFA (PM)
Shop – Hair Salon	m² GFA	ITE Trip Generation Manual		1.21 per 100m ² GFA (AM) 1.93 per 100m ² GFA (PM)
Restaurant	m² GFA	RTA Guide to Generating Traffic Developments	60 per 100m² GFA	5 per 100m² GFA
Coffee/Donut Shop without drive-through window	m² GFA	ITE Trip Generation Manual	180 per 100m ² GFA [{AM + PM}*2]	64.21 per 100m ² GFA (AM) 25.81 per 100m ² GFA (PM)

The proposed shop on the ground floor level of the development has a significant GFA footprint and will constitute a large percentage of trip generation to the development. The GTTGD provides daily trip and peak hour rates for shopping centres, however does not provide data of shop uses that would likely reflect the proposed development. For this reason, data from the ITE Trip Generation Manual has been sourced to provide a better understanding of the trip generation at the development.

Clause 3.6.1 of the GTTGD suggests that a 25% discount rate can be applied to the shopping centre rates for new shops in existing shopping centres (<10,000m² GFA). This reduces the daily trip generation to 91 trips per 100m² GFA, and the peak hour trip generation to 9.3 trips per 100m² GFA. When comparing this data to the ITE data, it can be seen that the adopted rates are in the same order of magnitude of rates provided for several shop types, but generally the calculated rate is on the high side. The adopted rates are similar to the rates provided for a pharmacy, and it is assumed that this is a potential shop for the development. For modelling purposes, the discounted GTTGD rates will be used as they are conservative trip generation rates for the potential development use. This can be adjusted in the future if more information regarding the use of the shop is known.

Planit Engineering

Page 24

DEVELOPMENT APPLICATIONS

Traffic Impact Study for Jonson Street ~ Browning Street, Byron Bay

The adopted peak hour trip generation rates are summarised in Table 16.



Item :	Trip Generation Parameter	Source	AM Peak Hour Trip Generation Rate	PM Peak Hour Trip Generation Rate	Number of items	AM peak hour trip generation	PM peak hour trip generation
Shop top housing (1 or 2 bedroom)	Number of dwellings	RTA Guide to Generating Traffic Developments	0.5 per dwelling	0.5 per dwelling	22	11	11
Shop top housing (3 bedroom)	Number of dwellings	RTA Guide to Generating Traffic Developments	0.65 per dwelling	0.65 per dwelling	4	2.6	2.6
Serviced apartment	Number of dwellings	ITE Trip Generation Manual	0.51 per dwelling	0.62 per dwelling	28	14.28	17.36
Manager's office	m² GFA	RTA Guide to Generating Traffic Developments	2 per 100m ² GFA	2 per 100m ² GFA	18	0.36	0.36
Child care	Children	RTA Guide to Generating Traffic Developments & ITE Trip Generation Manual	0.81 per child	0.76 per child (averaged)	65	52.65	49.4
Shops	m² GFA	RTA Guide to Generating Traffic Developments	9.3 per 100m ² GFA	9.3 per 100m ² GFA	617	57.38	57.38
Café (incl end of trip and WC)	m ² GFA	RTA Guide to Generating Traffic Developments	64.21 per 100m ² GFA	25.81 per 100m ² GFA	149	95.67	38.46
		TOTAL				233.94	176.56

Table 16 | Peak Hour Trip Generation, adopted rates

The existing site comprises of 3 low density residential lots, of which one is an approved dual occupancy lot. The existing trip generation can be calculated based on the 2013 RMS supplement to the GTTGD. It provides a weekday average morning peak hour trip of 0.71 per dwelling and a weekday average evening peak hour trip of 0.78 per dwelling. Based on 4 existing dwellings, the existing trip generation would be:

- 2.84 trips per hour (AM peak).
- 3.12 trips per hour (PM peak).

The net trip generation of the proposed development would be:

- 231 trips per hour (AM peak).
- 174 trips per hour (PM peak).

Planit Engineering

Page 25



Traffic Impact Study for Jonson Street ~ Browning Street, Byron Bay

5.2. DAILY TRIP CALCULATIONS

The existing site comprises of 3 low density residential lots, of which one is an approved dual occupancy lot. The existing trip generation can be calculated based on the 2013 RMS supplement to the GTTGD. It provides an average trip generation rate of 7.4 trips per day per dwelling in regional areas. Based on 4 existing dwellings, the existing site trip generation would be 29.6 trips per day.

Adopted daily development trip generation calculations are provided in Table 17.

Item	Trip generation parameter	Daily trip generation rate	Amount	Trip generation
Shop top housing (1 or 2 bedroom)	Number of dwellings	5 per dwelling	22	110
Shop top housing (2 bedroom)	Number of dwellings	6.5 per dwelling	4	26
Serviced Apartments	Number of units	6.65 per apartment	28	186.2
Manager's office	m ² GFA	10 per 100m ² GFA	18	1.8
Child care	Children	4.38 per child	65	284.7
Shops	m ² GFA	91 per 100m ² GFA	617	561.5
Cafe	m ² GFA	180 trips per 100m ² GFA (assumed, based on peak trip generation rates)	149	268.2
		TOTAL		1438:4

Table 17 | Development Daily Trip Generation, adopted rates

Based on the parameters above, the development will generate 1438 daily trips. This results in a net daily trip generation of **1408** vehicle trips per day.

Planit Engineering

Page 26

LANI

6. INTERNAL MANOEUVRING

Traffic Impact Study for Jonson Street ~ Browning Street, Byron Bay

Internal manoeuvring has been assessed for the design vehicles for the site, using Civil3D based swept path analysis software. The following design vehicles have been adopted:

- B99 for access ramp (2-way) and basement car park (one-way) manoeuvring.
- MRV for Ruskin Lane.
- MRV for MRV loading bay.

The swept path analysis outcomes have been recorded in the civil drawings. It shows that safe and efficient manoeuvring is feasible based on the current architectural design.

SIDRA modelling shows minimal delays for vehicles exiting the site and turning left from Ruskin Lane onto Browning Street. Thus, it has been shown that the intersections will not result in queues for traffic exiting the site.

The basement car park has been design complies with the parameters set out in AS2890.1 and summarised in section 4.2 of this report.

In order to improve safe manoeuvring of both vehicles and pedestrians in the basement car park, the following safety enhancing measures have been incorporated into the design:

- Speed humps.
- Signage.
- Separate pedestrian path along the perimeter of the dedicated child care spaces. This path leads to the lift and stairs.

Planit Engineering

Page 27

Traffic Impact Study for Jonson Street ~ Browning Street, Byron Bay

7. IMPACT ON SURROUNDING ROAD NETWORK

7.1. IMPACT ON ROAD CAPACITY

The sections of Jonson Street and Browning Street adjacent to the subject site is currently used to enter and exit the Byron Bay CBD from the Suffolk Park direction.

The proposed Byron Bay Bypass will begin at the corner of Jonson Street and Browning Street and connect into the end of Butler Street and continue to the existing roundabout adjacent to the Police Station. The proposed overall layout can be seen in Figure 4. It is proposed that a new roundabout will be located at the corner of Jonson Street and Browning Street, changing the dynamics of traffic around the subject site.



Figure 4 | Byron Bay Bypass Overall Layout Plan

The Byron Bay Bypass will aim to improve the traffic flow along Jonson Street by diverting through traffic around the Byron Bay CBD. It is anticipated that the traffic volumes along Jonson Street will decrease and the traffic volumes along Browning Street will remain the same as a result of the bypass. Although traffic volumes along Browning Street will remain the same, the dynamic of the road will change as the flow of traffic will no longer be constant due to the installation of a roundabout at the Jonson Street and Browning Street intersection. The true dynamics of the road network will not be understood until the roundabout is installed, and this is not within the scope of this report.

Planit Engineering

Page 28

DEVELOPMENT APPLICATIONS

Traffic Impact Study for Jonson Street ~ Browning Street, Byron Bay



Table 5.1 of the Guide to Traffic Management Part 3: Traffic Studies and Analysis shows that the peak hour capacity of an urban road with interrupted flow is 900 veh/h.

The average peak hour traffic volumes for Jonson and Browning Street can be seen in Table 18 below (please refer to next section for calculation methodology). These values are inclusive of the 1.05 seasonality factor. From this table, it can be seen that the peak hour capacity of the street remains within the 900 veh/h limit (allowing for some flexibility in calculating the 901 veh/h value for Browning Street westbound). These numbers do not take into account changes in traffic volumes due to the Byron Bay Bypass. The percentage increase in traffic volume varies between 4.3% and 7.5%, depending on street and direction. This increase would be noticeable, but together with the roadways remaining within capacity, no road upgrades are required to support the predicted traffic volume increase on the surrounding roads.

Table 18	Peak Hour Vehicle Tr	ips on Surrounding	Road Network

		Jonson Southbound	Browning Eastbound	Browning Westbound
2017 and development	AM Peak (veh/h)	430	416	656
2017 pre-development	PM Peak (veh/h)	584	584	491
2027 pre-development	AM Peak (veh/h)	550	532	839
	PM Peak (veh/h)	748	748	632
2022 and development	AM Peak (veh/h)	591	573	907
2027 post-development	PM Peak (veh/h)	782	782	679
Percentage increase (between 2027 pre- and	AM Peak (veh/h)	7.49%	7.74%	8.14%
post-development)	PM Peak (veh/h)	4.52%	4.52%	7.47%

7.2. IMPACT ON THE RUSKIN LANE INTERSECTIONS

7.2.1. Modelling Scenarios

Establishment of the relevant modelling scenario's is based on the following questions:

- How does the intersection perform now and in the 2027 design year, adopting an assumed 2.5% annual compound traffic growth rate, with no development traffic included?
- How does the intersection perform in 2027 when development traffic is added?
- Are any intersection upgrades required?

Eight intersection modelling scenarios have been setup to capture the content of the above questions. The predevelopment modelling scenarios will be based on the Browning Street/Ruskin Lane intersection. For the postdevelopment scenarios, two intersections are connected and modelled simultaneously as a network. The two intersections modelled are the Browning Street/Ruskin Lane intersection and the Ruskin Lane/Proposed development (ramp) intersection. The modelled scenarios are as follows:

- Current conditions 2017 AM Peak.
- Current conditions 2017 PM Peak.
- Pre-development 2027 AM Peak.
- Pre-development 2027 PM Peak.
- Post-development 2017 AM Peak.
- Post-development 2017 PM Peak.
- Post-development 2027 AM Peak.
- Post-development 2027 PM Peak.

7.2.2. General Modelling Information

SIDRA Intersection 7.0 PLUS is used to carry out intersection modelling. Although general site-specific modelling input is described in the corresponding sections, detailed SIDRA modelling data can be provided upon request.

Planit Engineering

Page 29



Traffic Impact Study for Jonson Street ~ Browning Street, Byron Bay

For traffic on Browning Street, an approach speed limit of 50km/h is used. At the Ruskin Lane intersection, an approach operating speed of 40km/h will be assumed and used in modelling. In the post-development scenarios, a vehicle movement speed of 5km/h will be used for movements into and out of the ramp.

The following generic key performance indicators are adopted when deciding whether a modelling scenario is a pass or a fail:

- · Worst Level of Service on an intersection or roundabout: LOS C.
- Worst Level of Service on a through road: LOS D.

The geometry of the SIDRA models are depicted in Figure 5 and Figure 6.



Figure 5 | Browning Street & Ruskin Lane Intersection

Planit Engineering

Page 30

DEVELOPMENT APPLICATIONS



Traffic Impact Study for Jonson Street ~ Browning Street, Byron Bay

NETWORK CONFIGURATION



Figure 6 | Ruskin Lane & Ramp Intersection

The pre-development turning movements were obtained from the GAA survey and Planit survey. The GAA survey data is used for straight movements along Jonson and Browning Street, and the Planit survey is used for the movements into and out of Ruskin Lane.

The following assumptions were made for determining the traffic volumes:

- 2.5% per annum compound traffic growth on background traffic.
- Development traffic trip distribution proportional with existing directional distribution on Browning Street traffic lanes.
- No Ruskin Lane residents don't turn right into Ruskin Lane for post-development scenario's, due to the
 proposed one-way treatment of the majority of Ruskin Lane.
- · Ruskin Lane left turn out only for post-development scenario's.

Table 19 shows the traffic data used for the SIDRA inputs for the pre-development modelling scenarios.

Approach	Turning movement	2017 AM Peak	2017 PM Peak	2027 AM Peak	2027 PM Peak
Browning Street	Left	4	1	5	1
(eastbound)	Straight	412	583	527	747
Browning Street	Right	1	4	1	5
(westbound)	Straight	655	490	838	627
Puckie Lone	Left	4	1	5	1
Ruskin Lane	Right	1	1	1	1

Table 19 | Pre-development SIDRA Input Browning Street/Ruskin Lane Intersection

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Traffic impact Study for Jonson Street ~ Browning Street, Byron Bay

Table 20 | Post-development SIDRA Input Browning Street/Ruskin Lane Intersection

Approach	Turning movement	2017 AM Peak	2017 PM Peak	2027 AM Peak	2027 PM Peak
	Left	46	35	46	35
Browning Street (eastbound)	Straight	412	583	527	747
	Right	69	52	69	52
Browning Street (westbound)	Straight	655	490	838	627
	Left	120	88	121	88
Ruskin Lane	Right	1	1	1	1
TOTAL	M	1303	1249	1602	1550

Table 21 | Post-development SIDRA Input Ruskin Lane/Ramp Intersection

Approach	Turning movement	2017 AM Peak	2017 PM Peak	2027 AM Peak	2027 PM Peak
	Left	115.5	87	115.5	87
Ruskin In					
	Right	115.5	87	115.5	87
Development Out					
	Straight	4	1	5	1
Ruskin South	Right	1	1	1	1
TOTAL	Trueses.	236	176	237	176

7.2.3. Modelling Results

Modelling results for Level of Service, 95th%-ile queue length (m) and controlled delay (s) are depicted in Table 22 through Table 27. The modelling shows that the intersections are currently operating at Level of Service A for every movement. It is expected that if right turn movements out of Ruskin Lane are allowed post-development, the intersection would perform significantly worse. For this reason, it is proposed that Ruskin Lane will become left out only onto Browning Street. Northbound traffic can use the nearby Tennyson Street roundabout to adjust their direction of travel. Additionally, with the construction of a roundabout at the corner or Jonson Street and Browning Street, it is expected that queueing would occur along Browning Street leading into the roundabout. This queueing would create issues with vehicles making a right turn out of Ruskin Lane.

The modelling results show excellent performance of both intersections for pre- and post-development scenario's. It is unlikely that there is any queuing of traffic leaving the site, which in turn ensures that development traffic can travel into the basement car park unimpeded.

	2017 Pre AM	2017 Pre PM	2027 Pre AM	2027 Pre PM
Straight (eastbound)	A	A	A	A
Left in (eastbound)	A	A	A	A
Straight (westbound)	A	A	A	A
Right in (westbound)	A	A	A	A
Left out	A	A	A	A
Right out	Δ	Δ	Δ	Δ

Table 22 | Level of Service for Pre-development Scenario's

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Page 32

LANIT

Traffic Impact Study for Jonson Street ~ Browning Street, Byron Bay

Table 23 | 95th%ile Queue Length (m) for Pre-development Scenario's

	2017 Pre AM	2017 Pre PM	2027 Pre AM	2027 Pre PM
Straight (eastbound)	0	0	0	0
Left in (eastbound)	0	0	0	0
Straight (westbound)	0	1	0	1
Right in (westbound)	0	1	0	1
Left out	0	0	0	0
Right out	0	0	0	0

Table 24 | Control Delay (s) for Pre-development Scenario's

	2017 Pre AM	2017 Pre PM	2027 Pre AM	2027 Pre PM
Straight (eastbound)	0	0	0	0
Left in (eastbound)	4.3	4.3	4.3	4.3
Straight (westbound)	6.3	0.1	0	0.1
Right in (westbound)	7.2	8.5	9	11.4
Left out	3.4	4.1	3.9	5.1
Right out	8.4	8.2	14	13.2

Table 25 | Level of Service for Post-development Scenario's

	2017 Post AM	2017 Post PM	2027 Post AM	2027 Post PM
	Browning Stree	t/Ruskin Lane Int	ersection	
Straight (eastbound Browning)	A	A	A	A
Left in (eastbound Browning)	A	A	A	A
Straight (westbound Browning)	A	A	A	A
Right in (westbound Browning)	A	A	A	A
Left Out (Ruskin)	A	A	A	A
Right out (Ruskin)	A	A	A	A
	Ruskin Lane/Pr	oposed Ramp Int	ersection	
Left in to ramp	A	A	A	A
Right out of ramp	A	A	A	A
Straight (southbound Ruskin)	A	A	A	A
Right in (southbound Ruskin)	A	A	A	A

Planit Engineering

Page 33

DEVELOPMENT APPLICATIONS

PLANIT

Traffic Impact Study for Jonson Street ~ Browning Street, Byron Bay

Table 26 | 95th%ile Queue Length (m) for Post-development Scenarios

9	2017 Post AM	2017 Post PM	2027 Post AM	2027 Post PM
	Browning Stree	t/Ruskin Lane Int	tersection	
Straight (eastbound Browning)	0	0	0	0
Left in (eastbound Browning)	0	0	0	0
Straight (westbound Browning)	0	0	0	0
Right in (westbound Browning)	0	0	0	0
Left Out (Ruskin)	3	2	3	3
Right out (Ruskin)	3	2	3	3
	Ruskin Lane/Pr	oposed Ramp Int	ersection	0
Left in to ramp	0	0	0	0
Right out of ramp	3	2	3	2
Straight (southbound Ruskin)	0	0	0	0
Right in (southbound Ruskin)	0	0	0	0

Table 27 | Control Delay (s) for Post-development Scenarios

	2017 Post AM	2017 Post PM	2027 Post AM	2027 Post PM
	Browning Stree	t/Ruskin Lane Int	ersection	
Straight (eastbound Browning)	0	0	0	0
Left in (eastbound Browning)	4.3	4.3	4.3	4.3
Straight (westbound Browning)	0.7	0.9	0.9	1.7
Right in (westbound Browning)	7.9	9.1	10.2	12.6
Left Out (Ruskin)	3.6	4.4	4.1	5.5
Right out (Ruskin)	10.9	9.9	19	16.4
- 02 18 - 10	Ruskin Lane/Pr	oposed Ramp Int	ersection	
Left in to ramp	4.2	4.2	4.2	4.2
Right out of ramp	0.3	0.2	0.3	0.2
Straight (southbound Ruskin)	0.7	2.5	0.5	2.5
Right in (southbound Ruskin)	10.8	9.2	10.9	9.2

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Page 34



Traffic Impact Study for Jonson Street ~ Browning Street, Byron Bay

8. SAFETY CONSIDERATIONS

8.1. SITE ACCESS

There is currently vehicular access to 137-139 Jonson Street and 3 Browning Street via the Jonson Street frontage. Additionally, there is a second vehicular access point to 3 Browning Street at the Browning Street frontage and a second vehicular access point to 137 Jonson Street at the Ruskin Lane frontage. It is proposed that all vehicular entry and exits to the subject site will be via Ruskin Lane.

The sight lines at the Browning Street intersection are uninterrupted to the intersections with Jonson Street and Bangalow Road. From the proposed site access point in Ruskin Lane, uninterrupted sight lines exist and will be maintained towards Browning Street and the corner in Ruskin Lane. Thus, adequate sight lines are achieved. Sight lines from Ruskin Lane to the right and to the left are depicted in Figure 7 and Figure 8.



Figure 7 | Sight Line to the Right from Ruskin Lane



Figure 8 | Sight Line to the Left from Ruskin Lane

8.2. ROAD SAFETY

A pedestrian safety issue currently exists along the Ruskin Lane and Browning Street intersection when vehicles are exiting Ruskin Lane. When exiting Ruskin Lane, there is a pedestrian footpath along the road where pedestrians have right of way over vehicles. There is poor visibility towards the left and the right, with a timber fence inhibiting

Planit Engineering Page 35 /170-TIS01

DEVELOPMENT APPLICATIONS

7.1 - ATTACHMENT 1

PLANIT

Traffic Impact Study for Jonson Street ~ Browning Street, Byron Bay

vision to the left and a tall hedge inhibiting vision to the right. The proposed development will improve vision to the right by removing the hedge and including an area free of structures or shrubs, however the vision to the left will not be altered. It is proposed that right of way arrangements will be altered in such a way that vehicular traffic will have right of way over pedestrians. We recommend a convex mirror is installed to improve the sight lines for the pedestrians with respect to vehicles exiting Ruskin Lane.

In addition to the aforementioned pedestrian safety issues, it was noticed during a site inspection on 28/06/2017 that pedestrians face difficulties at the roundabout crossing when walking from Bangalow Road to Tennyson Street. This is due to vehicles having right of way. It was also noticed that Pedestrians walking across the "Mitre 10" intersection/parking area towards the proposed development face the risk of getting hit by vehicles. The main risk for pedestrians is vehicles trying to enter the Mitre 10 carpark when travelling westbound along Browning Street. It appears that drivers wishing to enter the carpark are rushed by tail-gating vehicles as there is no dedicated turning lane. It is assumed that his situation will be improved due to the Byron Bay Bypass works.

The trip generation calculations show that the proposed development would not result in a significant change in road conditions, and that the laneway capacity is not exceeded on the surrounding road network.

Planit Engineering

Page 36

PLANIT

Traffic Impact Study for Jonson Street ~ Browning Street, Byron Bay

9. CYCLING PROVISIONS

There is currently a cycle way that exists throughout the Byron Bay CBD to promote the use of bicycles in the area. According to the Byron Bay Town Centre Bypass Environmental Impact Statement, there will be a 2m wide shoulder/bicycle lane in each direction along the bypass. Butler Street currently has a designated cycle way and it is anticipated that the bypass will tie into cycle way.

The Byron Shire Bike Strategy and Action Plan promotes the transitioning of the Byron Shire into a cycle friendly road space. It is proposed that 11 bicycle parks are provided at the development to promote the use of bicycles as a means of transport to and from the site. The bicycle storage will be provided on the ground level of the building and will be within a designated enclosed room. This ensures that the bicycles are not within vision of the general public and are free from environmental conditions such as rain and UV degradation. The storage area will include two showers for bicycle users to ensure that they can manage their hygiene after a lengthy trip to site.

Thus, the development adequately addresses the requirements of the Byron Shire Bike Strategy and Action Plan.

Planit Engineering

Page 37

LAN

Traffic Impact Study for Jonson Street ~ Browning Street, Byron Bay

10. STRATEGIC ENVIRONMENT

Byron Shire Council published a *Strategic Transport Statement (Transport Policy)* that aims to integrate a shire-wide transport network and network approach that improves mobility, accessibility and choice for all road users. The Shire aims to reduce the use of non-renewable energy and improve sustainability, amenity and opportunities for environmental health. Council have many mechanisms to implement these actions and they can be identified as either supply or demand.

Council's supply techniques that are currently in place are:

- Council adopted bike plan: This identifies the needs for off-road paths, on-road bicycle lanes, bicycle parking
 and end of trip facilities.
- Proposed Pedestrian Access and Mobility Plan (PAMP) and car parking studies: This will be influenced by development of a transport strategy to ensure an integrated and coordinated approach is adopted for future road network. The first step of this process is assessing the existing infrastructure and transport supply.
- Disability and Inclusion Action Plan: This was developed for people with a disability through a stakeholder
 engagement process and a whole-of-council process. This action plan was Council's commitment to
 reducing the barrier for people with disabilities by improving the access for disabled people. The plan
 facilitated an inclusion and participation process across the Byron Shire.

The Byron Shire Bike Strategy and Action Plan 2008 provides an assessment of existing conditions in each town within the Byron Shire by reviewing the pedestrian and cyclists needs of the different user groups. Byron Shire Council currently accommodates for bicycle users and pedestrians by providing cycle ways and pedestrian footpaths combined with the road system. This offers opportunity for locals, workers and visitors to utilise these facilities for recreation access. The plan facilitates the expansion of the existing network of bicycles facilities within the Byron Shire. The plan analyses the current bike needs and demands within the Shire and aims to predict the future demand on the bicycle network.

Provision of pedestrian and bicycle facilities such as signage, bicycle storage racks and special kerb crossings will be undertaken as part of the road network improvements. The purpose of these proposed pedestrian and cycle facilities will be for commuter access as well as for recreational purposes.

Section 94 plans and contributions

Shire Wide Bikeways & Footpaths: \$75.20 per SDU. Bikeways and Footpaths: \$1280.71 per SDU.

- 3 bedroom unit = 1 SDU.
- 2 bedroom unit = 0.75 SDU.
- 1 bedroom unit = 0.5 SDU.

Table 28 | Section 94 Contribution Costs

Dweiling type	Number of SDU	Number of dwellings	Cost per SDU	Contribution
Single bedroom	0.5	22	\$1,281	\$14,091
Double bedroom	0.75	24	\$1,281	\$23,058
Triple bedroom	1	4	\$1,281	\$5,124
	\$42,273			

Planit Engineering

Page 38

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Traffic Impact Study for Jonson Street ~ Browning Street, Byron Bay

11. CONCLUSIONS AND RECOMMENDATIONS

Based on the findings in this report, the following conclusions are made:

- The proposed development will increase 2027 traffic volumes on the surrounding road network by up to 12%, but this does not result in exceedance of roadway capacity. Intersection modelling shows excellent intersection performance for the Ruskin Lane intersections.
- The development adequately incorporates the recommendations of the Byron Shire Bike Strategy and Action Plan.
- · The proposed development as described in this report is unlikely to create safety hazards to road users.

Based on the findings in this report, the following recommendations are proposed:

- Ruskin Lane is restricted to left out movements only.
- Ruskin Lane to the north of the site to be one-way only (entry only from Tennyson Street, no exit from Tennison Street).
- A convex mirror is installed at the Ruskin Lane exit to provide pedestrians with sight lines to vehicles along Ruskin Lane.

Planit Engineering

Page 39

PLAN

Traffic Impact Study for Jonson Street ~ Browning Street, Byron Bay

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Planit Engineering

Page 40


BYRON SHIRE COUNCIL



DEVELOPMENT APPLICATIONS

7.1 - ATTACHMENT 2

Planting beds at back of kerb, species to maintain vehicle site lines and views through to building.

- Deep planting with feature tree
- Trellis to boundary acoustic fence
- Feature planting to boundary acoustic fence
- Rainforest courtyard refer page 13 for details
- 0-3 year old outdoor playspace
- 3-5 year old outdoor playspace refer page 14 for details
 - 4m wide pedestrian pavement. Wave pattern to council
- 2m wide pedestrian pavement. Wave pattern to council colour specifications

 - Hardstand for rubbish bin collection
 - 215m² total planting within boundary 71m² deep planting within boundary (15% of total site
 - Note these quantities may alter with detailed design.

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7.1 - ATTACHMENT 2