

APPENDIX

A

CONTEXT REPORT

# Parking Scheme Review – Context Report

Belongil Beach

80021089



Prepared for  
Byron Shire Council

29 October 2021

---

## Contact Information

### Cardno (NSW/ACT) Pty Ltd

ABN 95 001 145 035

Level 9 - The Forum  
203 Pacific Highway  
St Leonards NSW 2065  
PO Box 19

www.cardno.com

Phone +61 2 9496 7700

## Document Information

Prepared for	Byron Shire Council
Project Name	Belongil
File Reference	211029 Belongil Parking Scheme Review - Context Report.docx
Job Reference	80021089
Date	29 October 2021
Version Number	1

## Document History

Version	Effective Date	Description of Revision	Prepared by	Reviewed by
1	9 September 2021	Final	Shobhan Baranwal	Elizabeth Muscat Chris Slenders
2	29 October 2021	Future projects status updates	Shobhan Baranwal	Ivo Pais

© Cardno. Copyright in the whole and every part of this document belongs to Cardno and may not be used, sold, transferred, copied or reproduced in whole or in part in any manner or form or in or on any media to any person other than by agreement with Cardno.

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

Our report is based on information made available by the client. The validity and comprehensiveness of supplied information has not been independently verified and, for the purposes of this report, it is assumed that the information provided to Cardno is both complete and accurate. Whilst, to the best of our knowledge, the information contained in this report is accurate at the date of issue, changes may occur to the site conditions, the site context or the applicable planning framework. This report should not be used after any such changes without consulting the provider of the report or a suitably qualified person.

---

## Table of Contents

---

1	Byron Bay	1
	1.1 Regional context	1
	1.2 Local context	1
2	Strategic context	3
	2.1 Local government	3
3	Land uses	6
	3.1 Belongil Beach	6
	3.2 Old Jetty Park	6
	3.3 Environmental conditions and coastal management	6
	3.4 Lot SP83141	6
4	Community inputs	8
5	Discussion	16
	5.1 Parking	16
	5.2 Active transport	21
	5.3 Public transport	22
	5.4 Environmental	22

## Tables

---

Table 1-1	Byron Shire overview	1
Table 2-2	Masterplan projects	4
Table 2-3	Byron Shire DCP 2014 parking rates	5
Table 2-4	Accessible parking requirements	5
Table 4-1	Community input summary	8
Table 5-1	Comparison of parking configurations	16

## Figures

---

Figure 1-1	Local context	2
Figure 3-1	Coastal Management SEPP 2018 areas	7
Figure 4-2	Belongil Residents' Group July suggestions plan 1 of 3	9
Figure 4-3	Belongil Residents' Group July suggestions plan 2 of 3	10
Figure 4-4	Belongil Residents' Group July suggestions plan 3 of 3	11
Figure 4-5	Belongil Residents' Group August suggestions plan 1 of 4	12
Figure 4-6	Belongil Residents' Group August suggestions plan 2 of 4	13
Figure 4-7	Belongil Residents' Group August suggestions plan 3 of 4	14
Figure 4-8	Belongil Residents' Group August suggestions plan 4 of 4	15
Figure 5-1	Edge line adjacent to moving lane	17

---

Figure 5-2	Road marking dots	17
Figure 5-3	Examples of accessible angled parking without kerb extensions	17
Figure 5-4	Examples of accessible angled parking with kerb extensions	17
Figure 5-5	Conversion of a car parking space to motorcycle spaces	18
Figure 5-6	Timber fencing as a protective device for parking	19
Figure 5-7	Sandstone as a protective device for parking	19
Figure 5-8	Geogrid pavement treatment for parking spaces	20
Figure 5-9	Pedestrian crossing facility with kerb extensions on Jonson Street, Byron Bay	22
Figure 5-10	Pedestrian crossing facility with kerb extensions in Glenorchy, Tasmania	22
Figure 5-11	Destination signage gateway treatment in Collector, NSW	22

---

# 1 Byron Bay

---

## 1.1 Regional context

Byron Shire Local Government Area (LGA) is located on the far north coast of NSW in the Northern Rivers region and is characterised by agricultural land uses, hinterland, beaches and villages. Most villages are small and contain rural properties, with the exception of the town centres of Mullumbimby, Byron Bay and Ocean Shores, and villages of Brunswick and Bangalow.

An overview of Byron Shire is provided in **Table 1-1**.

Table 1-1 Byron Shire overview

Population (ABS Estimated Residential Population 2020*)	Land area	Population density
35,773	567 km <sup>2</sup>	0.63 persons per hectare

Source: Profile.id, accessed 14/05/2021

\* Australian Bureau of Statistics Estimated Residential Population based on 2016 Census data

The region is close to the centres of Lismore, Tweed Heads and Ballina, and the various villages are well connected by roads. Locational advantages make Byron Shire an attractive place to live and visit, and it is regarded for its creativity, sustainability and relaxed lifestyle. Byron Shire's economy is supported strongly by tourism, agriculture, health and wellbeing, lifestyle, creative arts and small businesses.

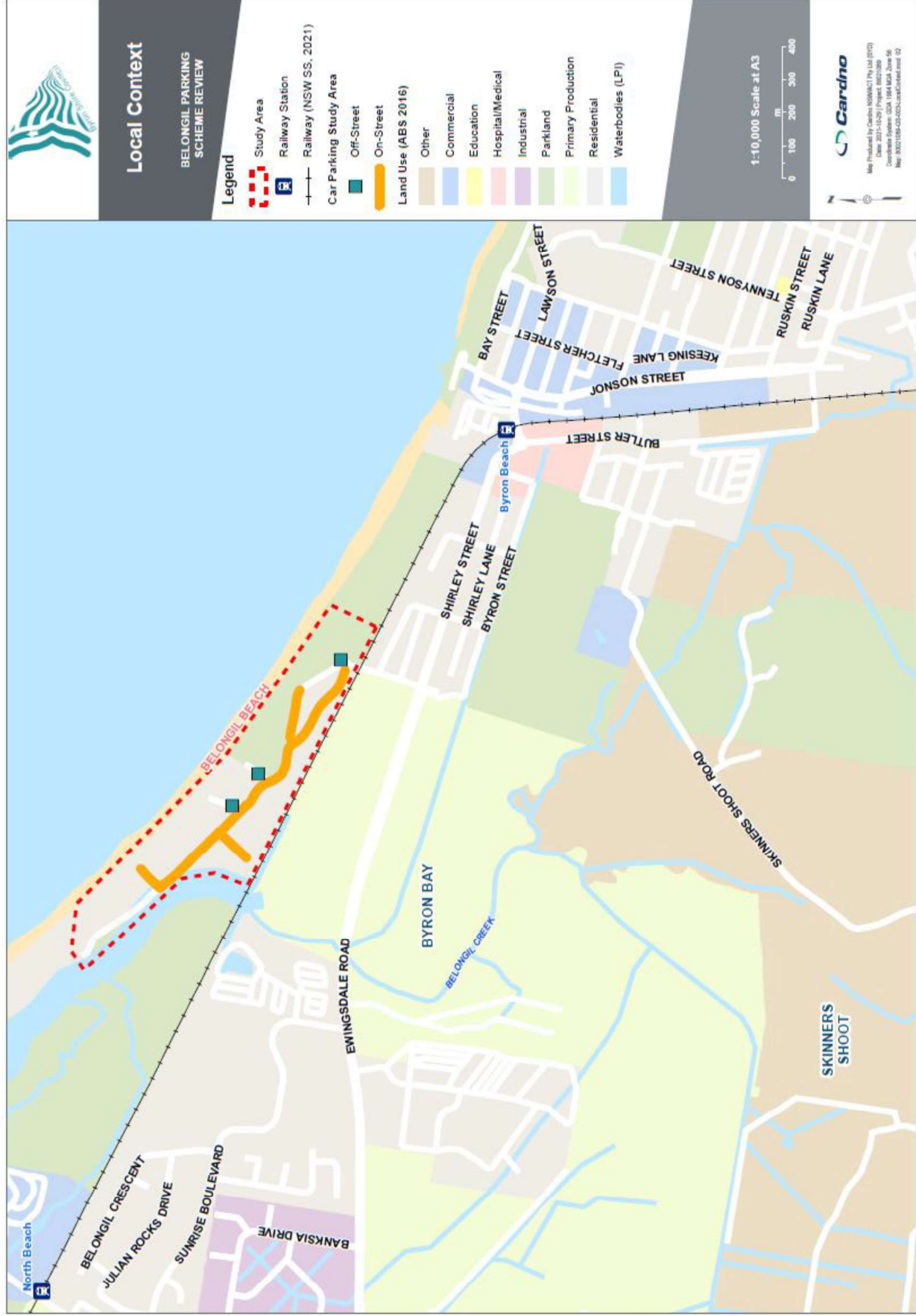
Byron Shire aims to empower their community to be creative and innovative whilst providing the services and infrastructure needed for a thriving yet sustainable future. There is a strong emphasis on the protection of the Shire's natural environment, lifestyle, diversity and community spirit. The arts, culture and respect are valued in the area.

## 1.2 Local context

Byron Bay is located approximately 165 kilometres south of Brisbane and 770 kilometres north of Sydney. It is home to approximately 6,500 permanent residents (Profile.id, 2020) and is an iconic tourist destination due to its natural beauty, creative and unique community, and alternative lifestyle. The beachside town is shown in **Figure 1-1** and attracted over 1.5 million international and domestic tourists each year prior to Covid-19. The number of dwellings being used for short-term rental accommodation has increased significantly in recent years to accommodate this demand.

The town centre provides a range of traffic-generating land uses including shops, cafés, restaurants and nightlife venues while the fringe areas, such as Belongil, primarily provide visitor accommodation. Peak visitation months experience considerable traffic congestion in the town centre and this is the community's biggest concern, as identified in the *Byron Bay Town Centre Masterplan*.

Figure 1-1 Local context



## 2 Strategic context

### 2.1 Local government

#### Byron Bay Town Centre Masterplan, Byron Shire Council, 2016

The *Byron Bay Town Centre Masterplan* (Masterplan) presents a vision and strategy to guide the future form of Byron Bay's town centre, identifying realistic actions and projects to achieve that vision. The vision of the Masterplan is to "connect the Centre of Byron Bay with the Spirit of its community" by implementing six town centre strategies developed through community consultation and engagement.

The Masterplan identifies that the community's main concerns were congestion, high parking demand, lack of public transport opportunities and lack of pedestrian only streets and cycle routes. It proposes to address the issues of traffic congestion and high parking demand through an Access and Movement Strategy which ultimately encourages a mode shift towards alternative transport modes such as active travel. The interrelated sub-strategies to achieve the Access and Movement Strategy are outlined in **Table 2-1**.

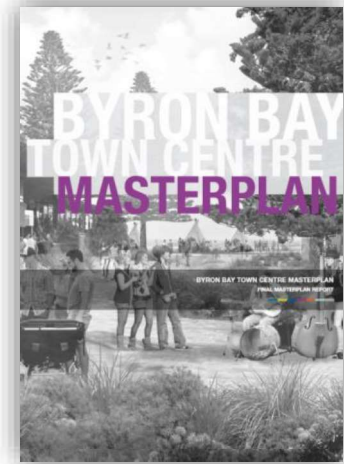


Table 2-1 Byron Bay Town Centre Masterplan: Access and Movement sub-strategies

No.	Sub-strategy	Aim
01	A Traffic Calmed Centre	Redirect traffic around the centre and introduce traffic calming measures in the centre.
02	Parking Out! People In!	Relocate some parking to the edge and limit parking in the town centre.
03	An Integrated Transport Hub	Relocate an integrated transport interchange to the western side of the rail line.
04	A People-Prioritised Centre	A pedestrian-prioritised centre that establishes a better place for walking and cycling.

Source: *Byron Bay Town Centre Masterplan*, Byron Shire Council, 2016

The Belongil Parking Scheme Review will play an important role in achieving Sub-strategy 02 by providing an understanding of existing parking conditions in the Belongil area and its suitability to support long-term parking demand from Byron Bay town centre. The key actions listed in the sub-strategy with relevant implications for car parking in Belongil are:

- > Long-stay, at grade car park at Butler Street Reserve;
- > Long-stay, multi-storey car park at Kendall Street;
- > Reduction in on-street car parking supply in Byron Bay town centre;
- > Short-stay and paid parking restrictions introduced in Byron Bay town centre; and
- > Increase in on-street parking along the south of Johnson Street.

These initiatives will support the relocation of on-street car parking to the edge of the centre with a desired relocation of 30 per cent of spaces in the short term and greater than 60 per cent of spaces in the long term.

The Masterplan identifies a schedule of priority projects for the future of Byron Bay town centre. The key future projects relevant to this study are shown in **Table 2-2**.



Table 2-2 Masterplan projects

Priority	Key project	Details	Status
Short term (2016 – 2021)	Butler Street Bypass and Car Park	Bypass to redirect traffic around town centre core. Butler Street Reserve to be utilised as a surface level car park for long stay car parking with access from Somerset Street.	Bypass completed 2021. Car park in progress.
	Railway Square	Relocation of car parking from Railway Square to Butler Street Reserve for activation as a public space.	Completed November 2019.
	Lawson Street Car Parks (North and South)	Both car parks to be redeveloped into a diverse array of uses that support local business and residential living within the centre.	South car park redeveloped July 2021. North car park not started as of June 2021.
Long term (2022 – 2035)	Butler Street Car Park Facility	Redevelopment of the surface level car park into a multi-functional car parking facility with studios and residential units.	Not applicable – this proposal was removed from consideration for the site.
	Light Rail Corridor	Conversion of heavy rail line to light rail to accommodate active transport movements across and along the rail corridor	
	Main Beach Extension	Reassessment of the allocation and scale of parking along the foreshore given new car parking sites around the township. Consider short stay parking and kiss and drop provisions.	

Source: *Byron Bay Town Centre Masterplan, Byron Shire Council, 2016*

The Masterplan also proposes a possible multi-storey car parking facility for long stay parking on vacant land west of Kendall Street. This would be a Park and Ride facility providing direct access to the rail corridor and active transport route to the town centre and Main Beach, and could be supported by local shuttle buses. The parcel of land is privately owned with a planning proposal being considered for this site which includes the provision of car parking as part of residential development.

### Byron Shire Local Strategic Planning Statement, Byron Shire Council, 2020

The *Byron Shire Local Strategic Planning Statement (LSPS)* presents a 2036 vision and framework for land use within Byron Shire. It outlines how growth and change will be accommodated across the LGA whilst providing high levels of environmental amenity, liveability and landscape quality.

The LSPS identifies that Byron Shire's population is projected to increase from around 24,000 in 2018 to approximately 37,500 people by 2036. Over a third of this growth will be driven by residential development in Byron Bay and the Sunrise Boulevard area (West Byron).

Relevant themes of the LSPS are providing a liveable and connected shire. Within these themes, the key priorities relevant to this project are:

- > LP2: Create great places that support and encourage an active, healthy and connected community;
- > CP1: Ensure infrastructure delivery is aligned with planned growth;
- > CP3: Support community wellbeing with appropriate community infrastructure; and
- > CP4: Provide essential services and reliable infrastructure which meet an acceptable community standard.



## Byron Shire Development Control Plan, Byron Shire Council, 2014

The *Byron Shire Development Control Plan* (DCP) specifies Council's requirements for quality development and sustainable environmental outcomes on land in Byron Shire LGA. It aims to provide controls and guidelines for development to ensure consistency with Council's vision, policies and strategies. This includes those relating to traffic planning, vehicle access, circulation and parking for developments.

Relevant on-site car parking rates outlined in the DCP are shown in **Table 2-3**. Parking rates consider gross floor area (GFA).

The DCP identifies that outdoor parking areas should provide suitable landscaping, in particular shade trees which can assist with cooling the car parking area and vehicles parked therein.

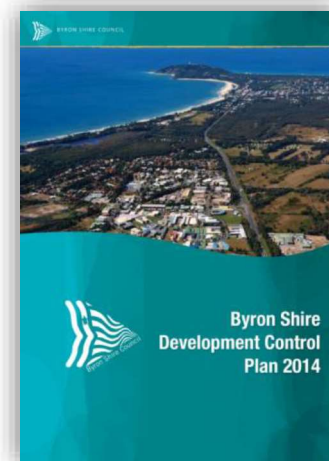


Table 2-3 Byron Shire DCP 2014 parking rates

Land use	Car parking provision	Bicycle parking provision
Backpackers accommodation	1 space per 8 beds	1 space per 5 beds
Bed and breakfast accommodation	1 space per guest bedroom plus 1 space per dwelling	-
Business premises	1 space per 20m <sup>2</sup> GFA	2 space per 100m <sup>2</sup> (or part thereof) up to a floor area of 200m <sup>2</sup> and 1 per 200m <sup>2</sup> thereafter
Dwelling house	2 spacer per dwelling	-
Educational establishment (tertiary)	1 space per 5 students plus 1 space per 2 staff members	1 space per 5 students
Food and drink premises	1 space per 7.5m <sup>2</sup> of GFA	1 per 25m <sup>2</sup> of GFA
Hotel or motel accommodation	1 space per unit plus 1 space per 2 employees (on site at any one time) plus 1 space for on-site manager). If public restaurant or function room included, as per food and drink premises.	2 spaces for accommodation units only. If public restaurant or function room included, add 1 space per 25m <sup>2</sup> of GFA.

Source: *Byron Shire Development Control Plan, Byron Shire Council 2014*

Given a typical car parking space may be approximately 12.5m<sup>2</sup>, some car parking rates are relatively high in comparison to the land use floor area. The high provision of car parking indicates there is an assumption of a high vehicle transport mode share in the region.

The DCP states that accessible parking should be provided in accordance with AS2890, the Building Code of Australia and Disability Discrimination Act 1992 (DDA) requirements. Minimum requirements for accessible parking in Byron Bay are summarised in **Table 2-4**.

Table 2-4 Accessible parking requirements

Standard	Minimum rate of provision
Australian Standard AS 2890 Part 5: On-Street Parking	Two per cent of regular spaces
Building Code of Australia	One space for every 50 spaces

Motorcycle parking provisions as per the DCP are as follows:

- > Large commercial developments with a GFA exceeding 1000 square metres shall provide motorcycle parking at the rate of two per cent of car spaces.

Motorcycle parking provisions will be considered on merit for smaller developments, provided a minimum of 90 per cent of parking is for cars, and four motorcycle spaces are provided for every vehicle space not provided.

---

## 3 Land uses

---

The study area is categorised as zone 7(f2) Urban Coastal Land in the Byron Shire Local Environmental Plan (LEP). Key land uses in the study area (contributing to parking demand) are:

- > Belongil Beach;
- > Old Jetty Park;
- > Various hotels and other short-term tourist accommodation;
- > Restaurants and cafes;
- > Envirotech Byron Bay (school); and
- > Residential properties.

### 3.1 Belongil Beach

Belongil Beach is a dog-friendly beach where dogs are allowed to roam off leash. Minimal infrastructure and amenity are provided for users of Belongil Beach. This is mainly due to environmental conditions and coastal management considerations. There is a lack of pathways, formalised parking, amenities such as toilets, fresh water and showering facilities.

### 3.2 Old Jetty Park

Old Jetty Park is located between Childe Street and Belongil Beach. It is a NSW Crown Land Reserve, owned by the State and managed by the Department of Planning Industry and Environment – Crown Lands. The reserve is degraded and amenity is poor. Council is not aware of any Crown Lands Plan of Management for the reserve.

The reserve adjacent to the east of Don Street is mapped by NSW Department of Planning Industry and Environment (DPIE) as a Littoral Rainforest as seen in **Figure 3-1**. As a result, a majority of the study area is designated as a Proximity Area for Littoral Rainforests. These areas are controlled by the Coastal Management State Environmental Planning Policy (SEPP) 2018, under the Coastal Management Act 2016. In addition, the whole study area falls under both the Coastal Environment Area and Coastal Use Area classifications within the Coastal Management SEPP.

### 3.3 Environmental conditions and coastal management

The area has issues with access, beach parking and sand ingress on roads. This is evident on Border Street, Childe Street and Manfred Street in particular. Council has attempted to prepare a certifiable coastal plan for this area of coastline over the preceding years, but all plans developed remain uncertified. There have been difficulties in finalising a certified plan for this area as coastal hazard risks are high. Development and infrastructure are within close proximity to the rear beach escarpment which is vulnerable to weathering. This has meant that most of the funding and resourcing for implementation of coastal projects including general repairs and maintenance has relied on internal funding which is limited and often applied on a reactive basis in response to access management during and after storms.

Council has commenced preparation of a Coastal Management Program (CMP) under the new NSW coastal management framework. This is currently in Stage 2 of the four-stage development process. A CMP for this area is a priority.

### 3.4 Lot SP83141

The triangular parcel of land between Border Street and Kendall Street has been subdivided and approved for individual houses. The northern verge of Kendall Street (south of this land) will have driveways constructed as development proceeds. This will reduce the availability of parallel on-street parking along this block in the long term and may also generate additional on-street parking demand.



Figure 3-1 Coastal Management SEPP 2018 areas



## 4 Community inputs

Council attended a meeting with local representatives of the Belongil Beach area on 1 June 2021 to discuss parking. Their concern was focused on the village area between Don Street and Giaour Street as this is what Byron Bay looked like over three decades ago. They wish to see improved parking provisions in this area while retaining the feel of the beachside village vibe. The main topics that were discussed are as follows.

- > According to the representatives, locals would like to see parking spaces in zones H, I and J formalised. This could be achieved through linemarking delineation in Zone H and Zone I. It is desired for Zone J to be sealed without excessive use of bitumen.
- > They would like to see traffic calming devices on the approach to the village area. Kerb blister islands and landscaping could be used to narrow the carriageway and facilitate pedestrian crossing movements. Business owners have also requested for a bin collection area in Zone J, to reduce conflict between car parking and bin collection on the south side of Childe Street.
- > It was stated that Childe Street Car Park is popular for dog beach access. This area has high parking demand and a high turnover as a result, indicating parking demand from locals. A permit system in this area may have a high impact.
- > Locals are very supportive of a pedestrian link from Belongil Beach to Shirley Street via Childe Street, Border Street and Kendall Street. Sections of footpath are provided along the route although connectivity is missing in multiple places.

There is concern about crowding caused by illegal camping. Locals are sympathetic to people staying in the area and want the behaviour controlled rather than eliminated. They would like to see no camping signs placed in key areas so achieve this. No Parking 1am – 6am restriction signage is already displayed in many beachside parking locations.

Additional community input was provided from Council on 30 July 2021 and 18 August 2021. The Belongil Residents' Group's suggestions are recorded in the plans shown in **Figure 4-2** to **Figure 4-8** and summarised in **Table 4-1**.

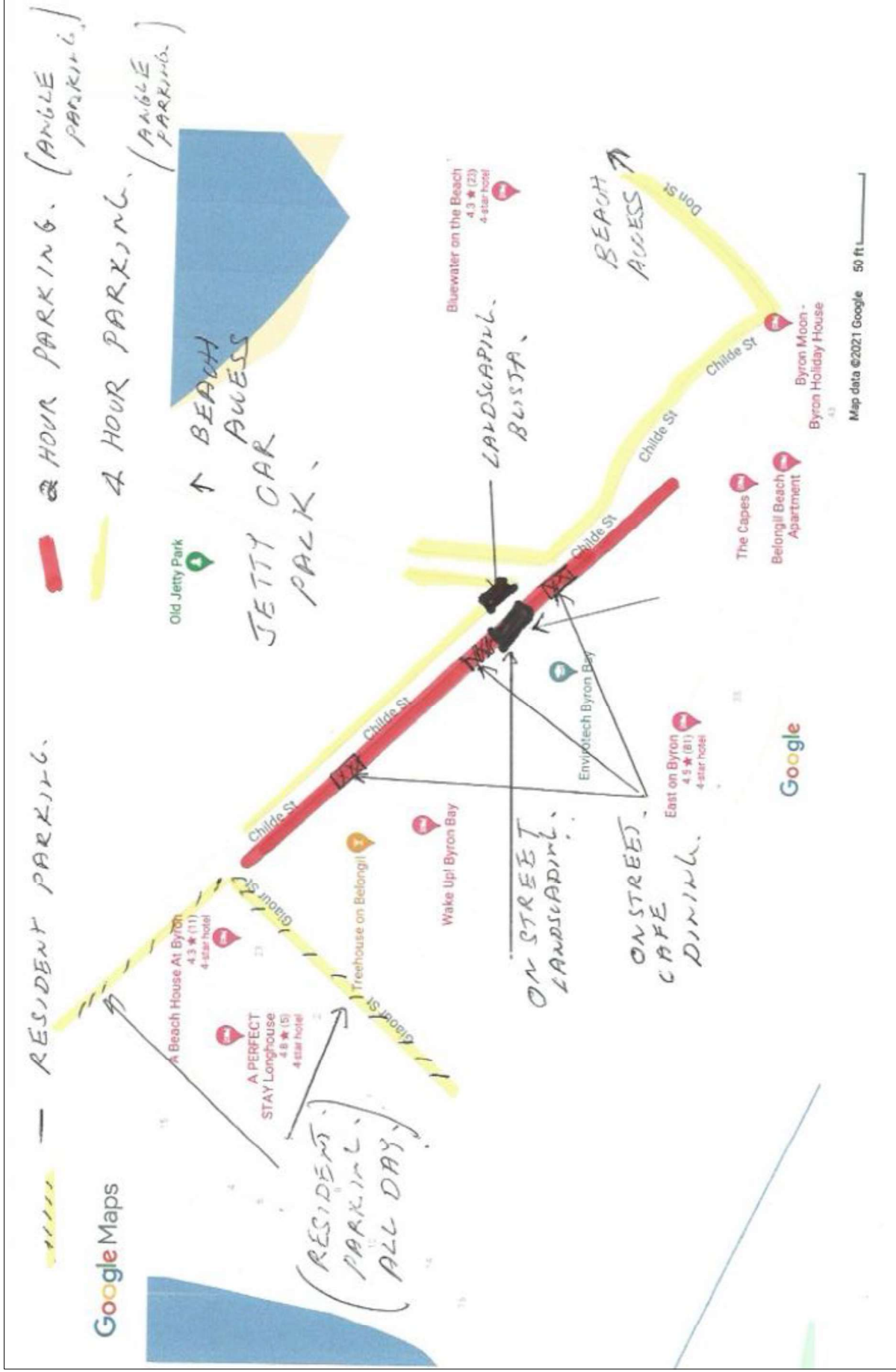
Table 4-1 Community input summary

Community recommendations	For Council's consideration
All day parking for residents	Resident parking schemes are challenging to manage and impose an administrative burden on Council, creating an expectation throughout the LGA. This would be difficult to remove later and go against a shared-use rationale of on-street parking.
2P and 4P parking restrictions	The introduction of 2P and 4P limits in the study area is appropriate in high demand areas to encourage turnover.
Gateway treatment (entry signage on Kendall Street)	Gateway treatment is effective for place-making and signifying a change in road environment.
Raised pedestrian crossing	A raised pedestrian crossing should be provided to facilitate movements between land uses on either side of Childe Street and to support car parking. The location of the crossing will need to serve pedestrian desire lines, be safe and minimise the loss of car parking.
Removal of car parking for on-street dining (parklet-style)	On-street dining will require the removal of multiple angled parking spaces in high demand areas and may require development approval. This may also result in safety issues without the implementation of a median.
Kerb build-outs with landscaping	Kerb build-outs are effective measures for traffic calming. Landscaping may require maintenance which may be minimised with the use of native plants or water-sensitive urban design (WSUD).



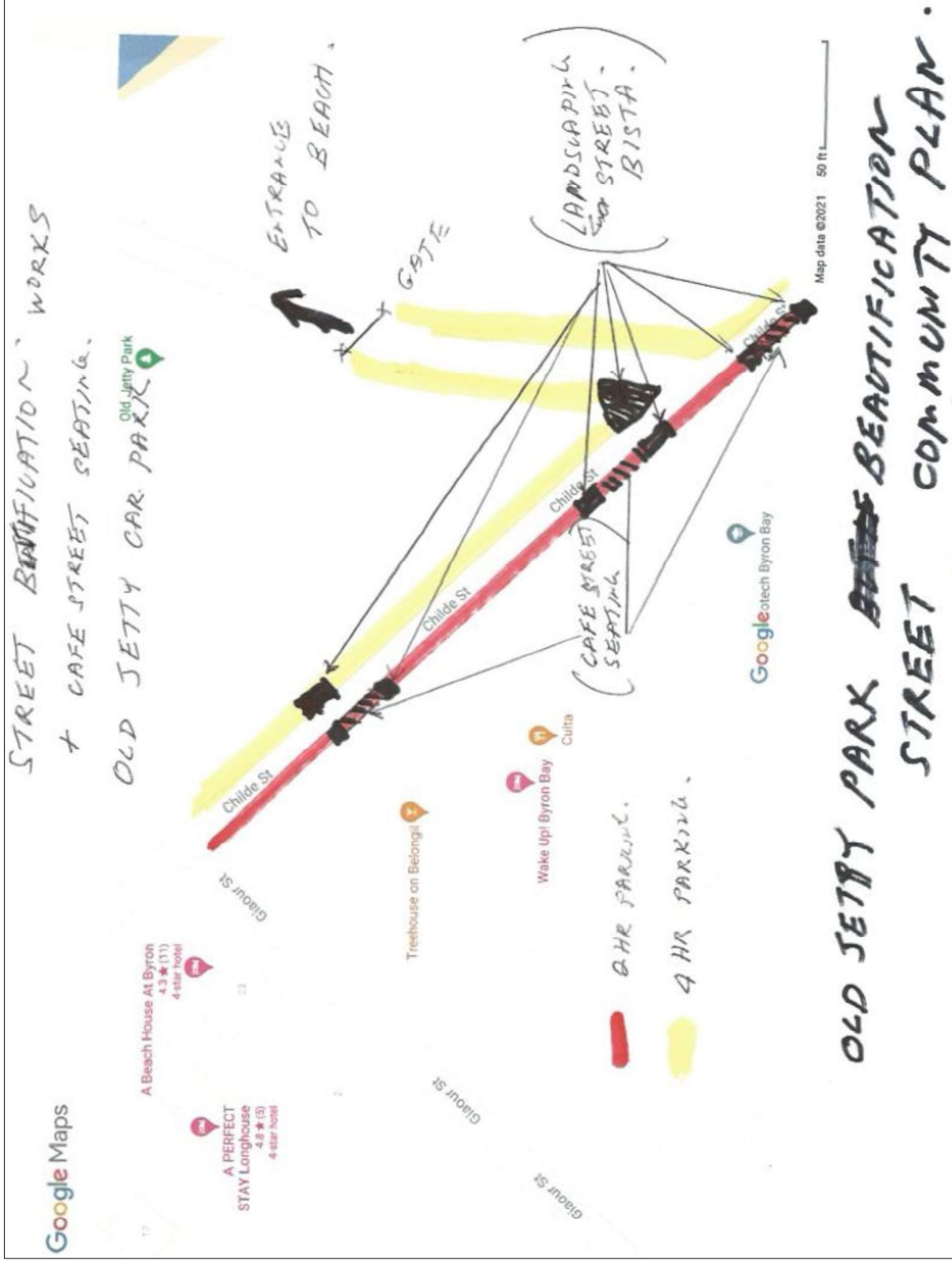


Figure 4-3 Belongil Residents' Group July suggestions plan 2 of 3



Source: Provided by Byron Shire Council, 30 July 2021

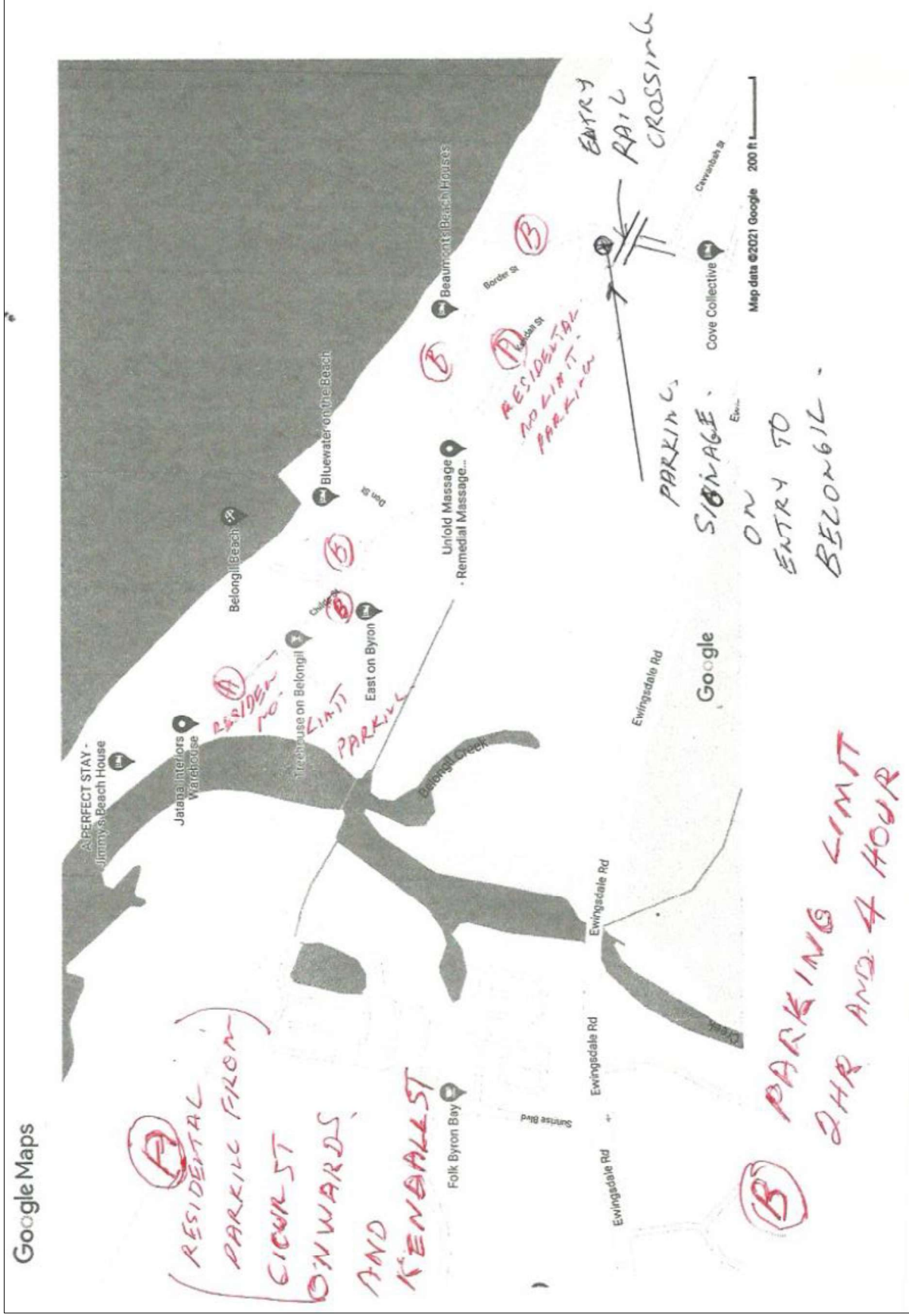
Figure 4-4 Belongil Residents' Group July suggestions plan 3 of 3



Source: Provided by Byron Shire Council, 30 July 2021

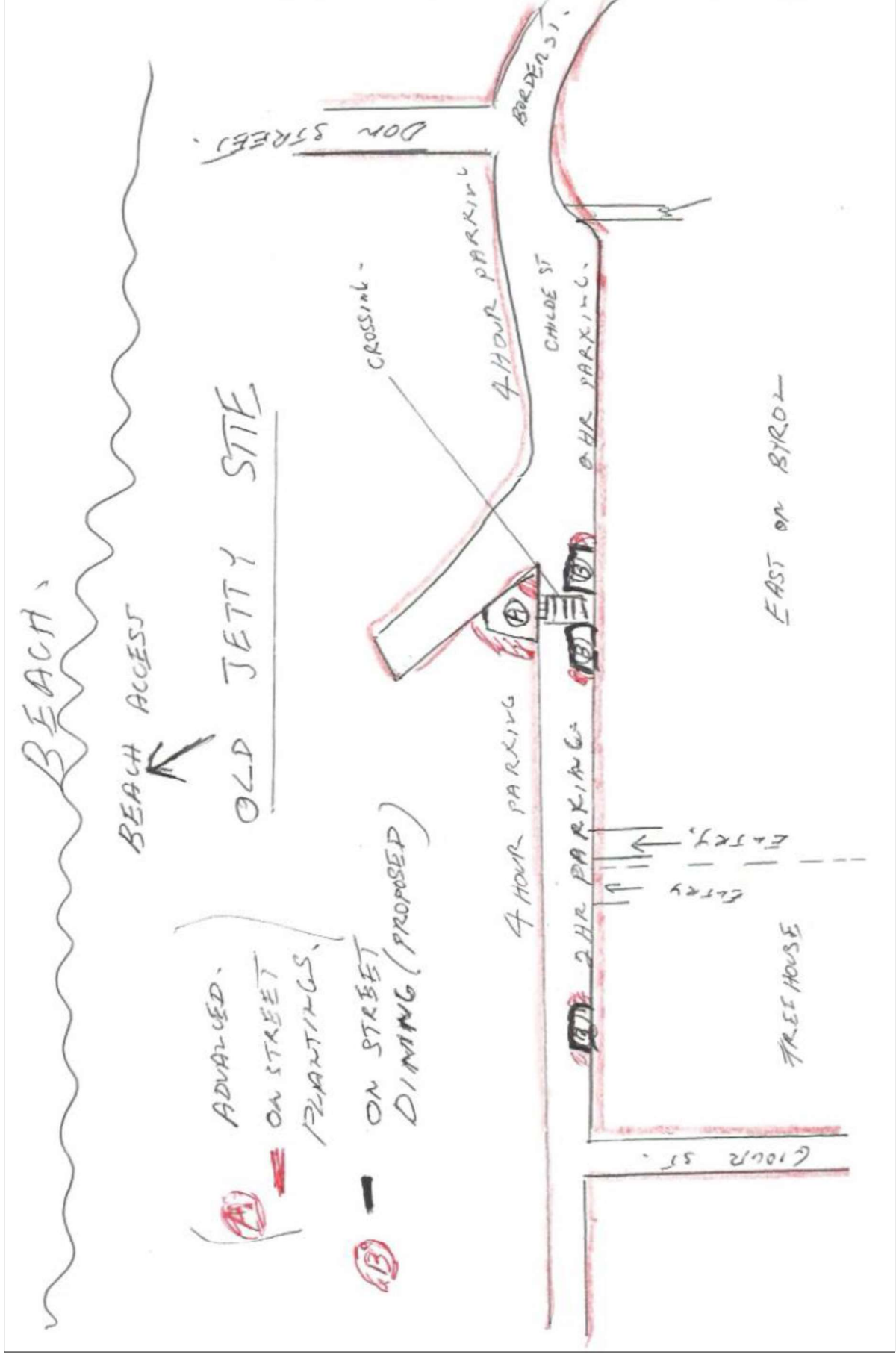


Figure 4-5 Belongil Residents' Group August suggestions plan 1 of 4



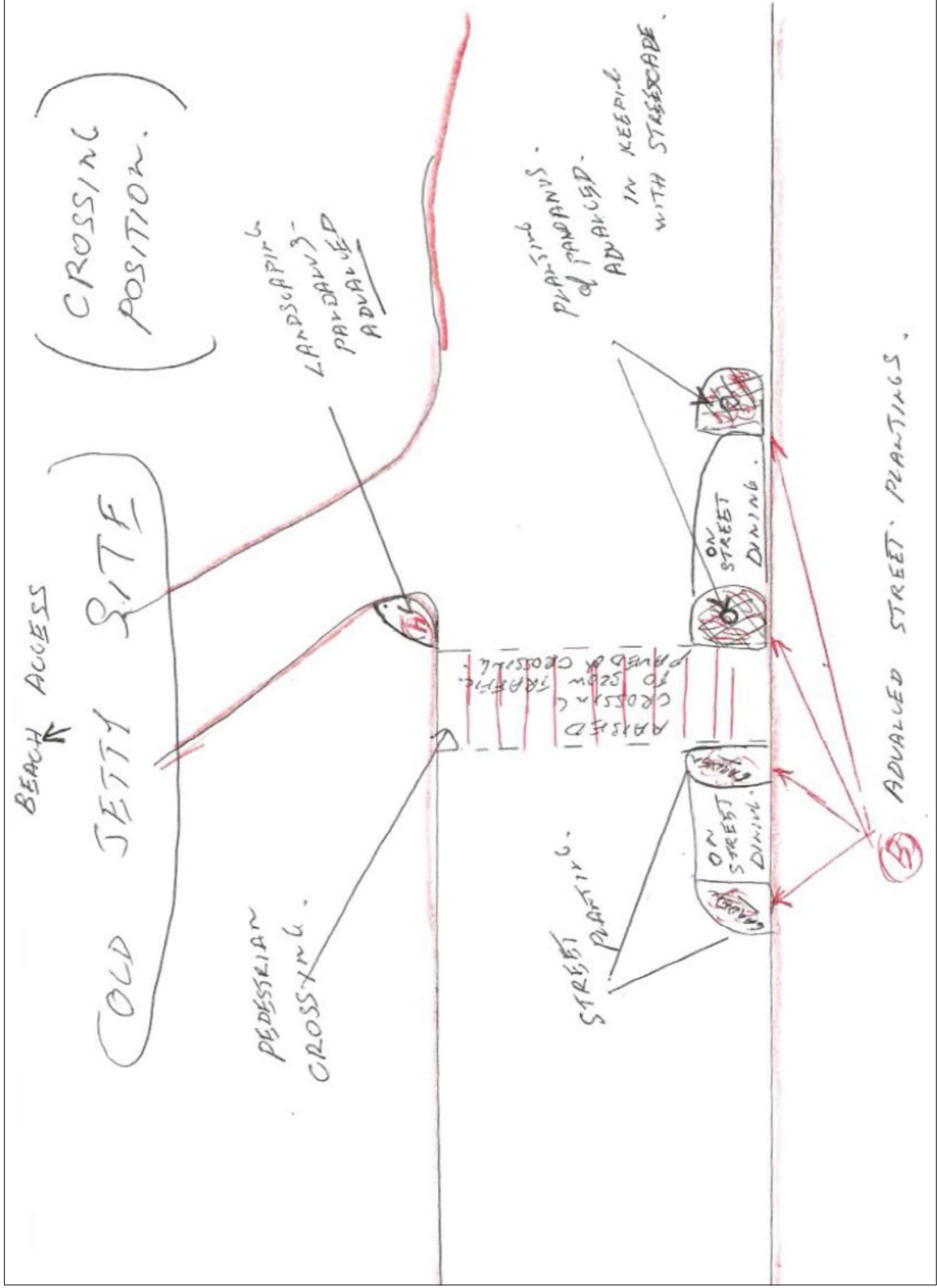
Source: Provided by Byron Shire Council, 18 August 2021

Figure 4-6 Belongil Residents' Group August suggestions plan 2 of 4



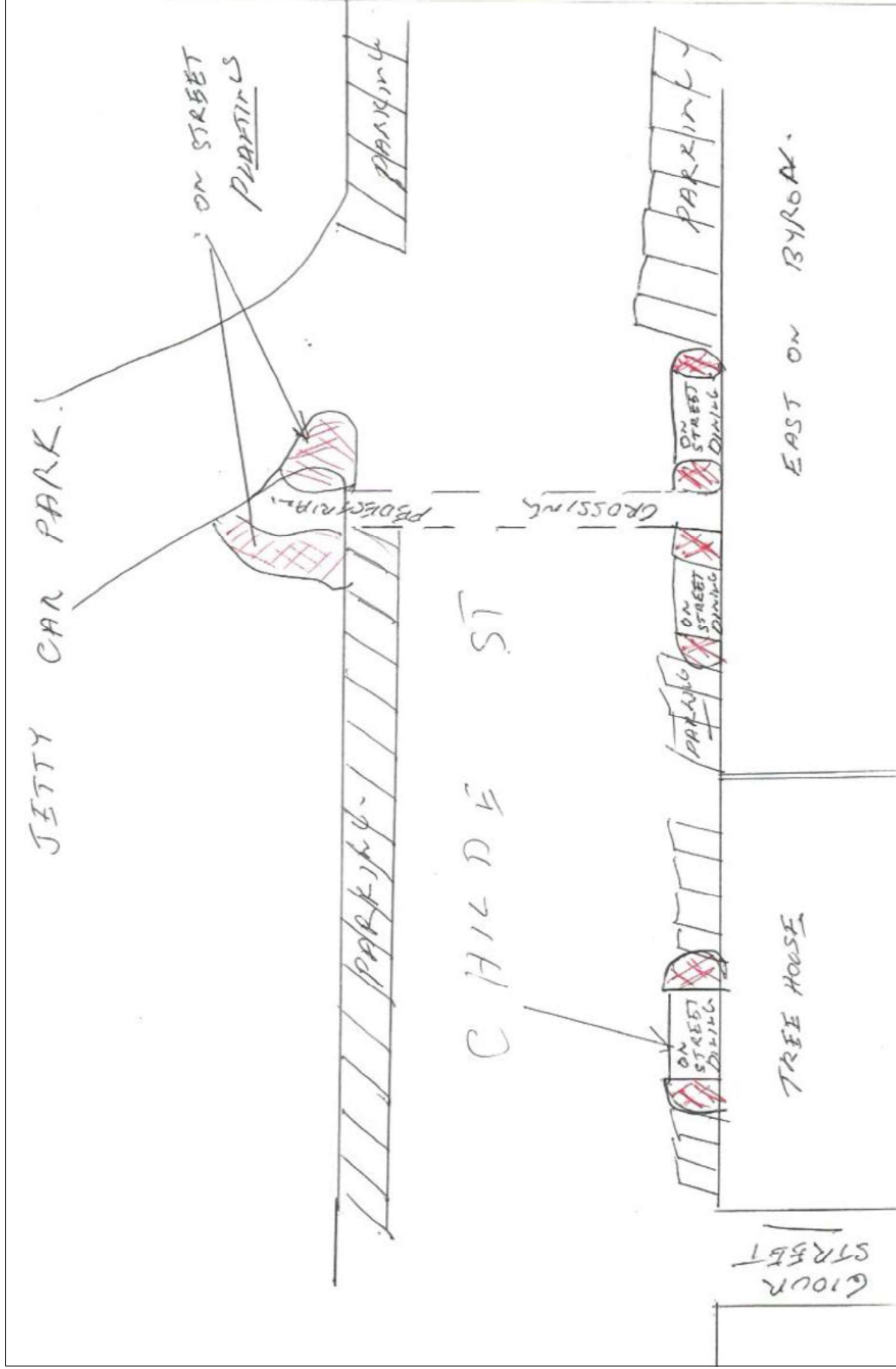
Source: Provided by Byron Shire Council, 18 August 2021

Figure 4-7 Belongil Residents' Group August suggestions plan 3 of 4



Source: Provided by Byron Shire Council, 18 August 2021

Figure 4-8 Belongil Residents' Group August suggestions plan 4 of 4



Source: Provided by Byron Shire Council, 18 August 2021

## 5 Discussion

This section discusses relevant theory from the reference documents and desktop research, and their application in relation to the Parking Scheme Review. The evaluation of potential mitigation measures has been utilised to develop a list of feasible recommendations for the Belongil Beach area. Items discussed within this section are presented from a parking perspective and are subject to assessment of environmental impacts to determine their suitability for the Belongil area.

### 5.1 Parking

Parking forms a necessary component of the transport system, especially in a regional context, and an interface between the road network and other land uses. Demand is dynamic and generates a need for pedestrian facilities. In the study area, the most effective ways to reduce demand are sustainable alternative to car use (active travel) and time restrictions on parking spaces. Public transport and paid parking structures are also effective although not yet practical in this context.

#### Configurations

Off-street parking is the preferred option for the mass storage of vehicles. Car parking entrances and exits should be located away from main roads and intersections where possible, taking advantage of existing side streets. Off-street car park access should be identifiable from the arterial road.

On-street parking should be prioritised to support road users with needs for high levels of access (customers, service vehicles and people with disabilities). Parking bays should be delineated in areas of high demand and turnover to maintain efficiency. Parking arrangement is dependent on the width of the roadway, traffic volumes and speed environment. Front-to-kerb parking is the preferred parking configuration in most angled parking situations. The advantages and disadvantages of parallel and angled parking configurations is summarised in **Table 5-1**.

Table 5-1 Comparison of parking configurations

Parking configuration	Advantages	Disadvantages
Parallel	<ul style="list-style-type: none"> <li>Road crashes are minimised</li> <li>Requires less carriageway width</li> <li>Can assist with traffic calming due to disruption of traffic</li> </ul>	<ul style="list-style-type: none"> <li>Supply is less than angled parking</li> <li>Manoeuvring into and out of spaces can cause disruption to traffic</li> </ul>
Angled / perpendicular	<ul style="list-style-type: none"> <li>Can accommodate up to twice as many vehicles per unit length of kerb</li> <li>Parking manoeuvring is easier</li> </ul>	<ul style="list-style-type: none"> <li>More roadway width is required</li> <li>Always requires reversing which causes disruption to traffic</li> <li>Sight / visibility issues</li> <li>Increased conflict with pedestrians crossing midblock</li> </ul>

Source: Austroads Guide to Traffic Management Part 11: Parking, 2020

The study area contains a mix of parallel, perpendicular and front-to-kerb angled parking. Front-to-kerb configurations are used in the main village area between Don Street and Giaour Street and require vehicles to protrude into the carriageway before the driver can see oncoming vehicles, which can be dangerous for cyclists and other vulnerable road users. Cyclist numbers are low in the study area so cyclist safety can be managed through the provision of lane edge lines and encouraging cyclists to ride within the lane away from parked vehicles. Traffic volumes and speeds are low in the study area and loading / unloading of front-to-kerb parked vehicles is safe where an edge line is provided to delineate a buffer zone. Motorists are required to perform a U-turn when leaving parking spaces to travel eastbound and exit Belongil. Perpendicular parking may provide a safer and more efficient configuration in this area.

#### Parking space delineation

Edge line markings are used to delineate the road shoulder from the travel lane. They also act as a guide to avoid objects which are close enough to the edge of the pavement to constitute a hazard, such as to define the boundaries between travel lanes and parking lanes as shown in **Figure 5-1**. This is effective at separating angled parking areas from travel lanes to provide a defined area for parking manoeuvres and



loading/unloading vehicles. They provide safety benefits in both front-to-kerb and rear-to-kerb configurations. Any bicycle stencils must be painted on the right side of the edge line and at least one metre from the edge of any parked vehicle.

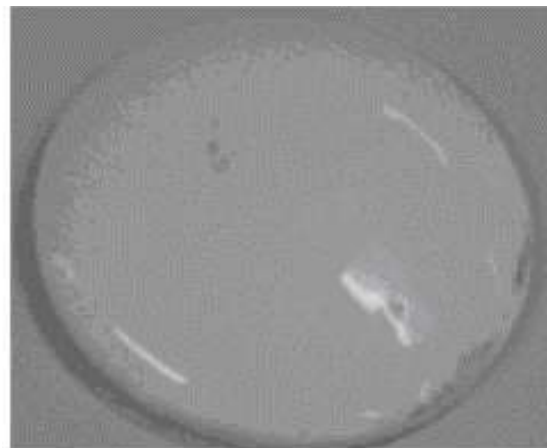
There is no parking delineation linemarking present in the study area. While it may be effective to paint these, the use of raised pavement markers provides an alternative solution to dividing lines in gravel areas and areas where sand may cover linemarking. **Figure 5-2** shows road marking dots, a form of raised pavement marker, which are a suitable solution for car parking areas where gravel or sand surfaces do not allow for painted line markings.

Figure 5-1 Edge line adjacent to moving lane



Source: RTA Delineation Manual, 2008

Figure 5-2 Road marking dots

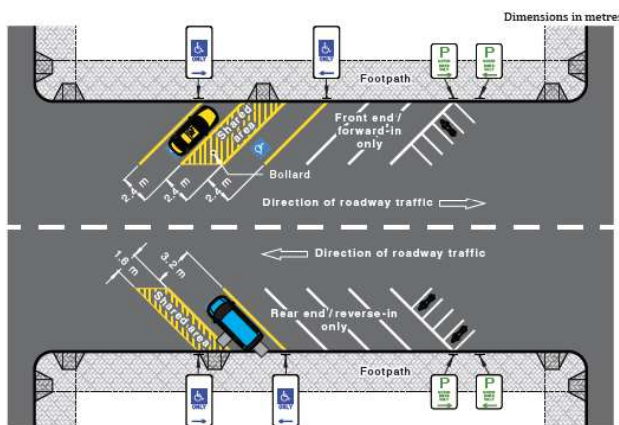


Source: RTA Delineation Manual, 2008

### Accessible parking

Parking for people with disabilities should be provided in close proximity to any particular establishments which people with disabilities are likely to use. Within Belongil, this is like to be on the southern side of Childe Street near Treehouse on Belongil and Envirotech Byron Bay. Examples of accessible angled parking provided by Australian Standards are shown in **Figure 5-3** and **Figure 5-4**.

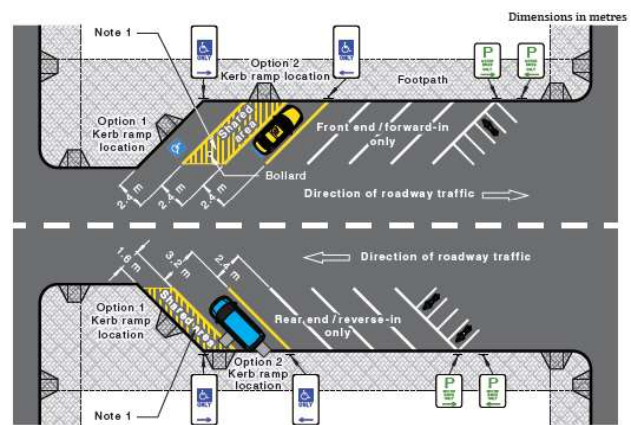
Figure 5-3 Examples of accessible angled parking without kerb extensions



NOTE:  
 1. Shared area markup required.  
 2. All kerb ramps shall conform to AS 1428.1.  
 3. Motor bike parking is not recommended adjacent to shared areas due to potential for encroachment.

Source: AS2890 Part 5, 2020

Figure 5-4 Examples of accessible angled parking with kerb extensions



NOTE:  
 1. Shared area markup required.  
 2. All kerb ramps shall conform to AS 1428.1.

Source: AS2890 Part 5, 2020

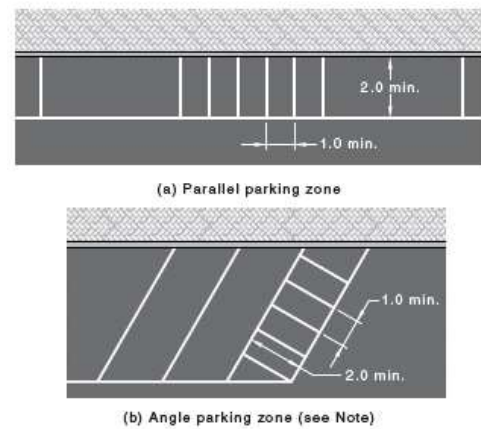
Minimum requirements for accessible parking provision are shown in **Table 2-4**. There are 71 spaces provided in the Childe Street East precinct (**Figure 3-19 of the main report**), indicating two spaces are the minimum acceptable provision.

## Motorcycle parking

Motorcycle parking demand was observed in zones C, D, K, J and Childe Street Car Park. Providing motorcycle parking reduces the need for motorcycles to park in car spaces, improving the efficient use of available space. Motorcycle spaces should be at least one metre wide by two metres in length where provided as shown in **Figure 5-5**. It may be more efficient if individual spaces are not marked although marking can provide clear encouragement for use of the spaces.

In angled parking zones, only car spaces at the ends can be converted, and then only if roadway cross fall is not too steep. Where possible, areas that are inadequate for other road users but adequate for motorcycles should be designated and marked for motorcycle parking. The Byron Shire DCP indicates a provision of four motorcycle spaces is appropriate. This would require the conversion of one car space to motorcycle parking.

Figure 5-5 Conversion of a car parking space to motorcycle spaces



Source: AS2890.5, 2020

## Parking controls

The distinction of short-stay and long-stay parking is important to stop high turnover beach, restaurant and café spaces being used by campers and tourists staying in nearby accommodation. This is facilitated by time restrictions and designated spaces. Long-stay parking assumes users are prepared to accept smaller parking spaces and narrower aisles while easy access is desired for short-stay parking. Zones A, B, E, F, G, K, L, M and N are well placed to provide long-stay parking due to their close proximity to residences, accommodation and the main village area of Belongil. Zones C, D, H, I, J, O, P and the car parks at Border Street and Childe Street are well placed to provide short-stay parking due to easy access to the beach, café and restaurant.

Where demand for parking exceeds supply, time limits can be imposed to prioritise shorter-term parking and increase turnover. In business districts, it is common to apply parking limits with the duration increasing with distance from the centre of the district. The following time limits may be appropriate for consideration in the study area:

- > **1P (60 minute) parking** is appropriate outside parks, cafés and in other locations where there is a demand for exclusively high turnover parking and the activity is likely to take longer than half an hour (for example walking a dog on the beach).
- > **2P (120 minute) parking** is appropriate outside restaurants and near beaches to encourage moderate turnover of parking in prime location parking spaces. It is also likely to be applicable in areas with developments containing professional and personal services.
- > **3P (180 minute) parking** is appropriate in recreational areas. This allows for enough time to enjoy coastal environments while discouraging long-stay parking which reduces the availability of prime location parking spaces. It is Council policy not to use 3P time limits to rationalise the number of restrictions.
- > **4P (240 minute) parking** is appropriate where it is desired to stop all day (camper or commuter) parking, but allow parking by other local people. This allows for enough time to visit restaurants / cafés and the beach in a single trip and can also be used to divert long-stay parking away from prime location parking spaces.
- > **Parking with no time limit (all day parking)** is usually generated by employees or residents and will occur across all types of development. It does not require signs to be used to indicate that parking is permitted, where there is no time limit or no user limitation. However, a 'Parking' sign may be necessary where the method of parking (for example angle parking) or the method of payment (for example voucher) has to be indicated on a sign. Also, a 'Parking' sign will be necessary where the parking area is available only for certain classes of users (for example 'Motorcycles Only'). Edgelines or linemarking may be used to indicate unrestricted parking spaces where no signage is provided.
- > **No Parking** is used in areas where parking is not desirable. This may be due to road geometry such as carriageway width or sightlines. It is appropriate in on-street locations where neighbouring land uses

provide driveways and garages. It still allows for stopping when required, such as picking up passengers or for deliveries. Time restrictions may be utilised to allow parking during the day and prevent parking during the night, such as 1AM – 6AM to prevent overnight camping.

Enforcement is essential to the success of parking policies such as time limits and time restrictions. Without effective enforcement, illegal parking will occur. The four main methods of enforcement are parking infringement notices, wheel clamping, towing and physical methods.

### Wheel stops

Wheel stops are a physical control that may be used in both on-street and off-street parking spaces. They may be provided where it is considered necessary to limit the travel of a vehicle. Typical uses include:

- > Control of kerb overhang where obstructive or hazardous for pedestrians;
- > Inhibiting contact with an end barrier or high kerb; and
- > Inhibiting encroachment into opposing parking spaces

Concrete, rubber and plastic are common materials used. Wheel stops should be 90-100 millimetres in height and 1,600-1,700 millimetres in length where provided off-street or two metres in length where provided on-street. The distance from wheel stop to kerb should be 0.6 metres for front-to-kerb parking and 0.9 metres for rear-to-kerb parking. These should be installed perpendicular to the direction of parking.

Note that wheel stops may present a trip hazard for pedestrians moving to or from parked vehicles and should primarily be considered for spaces at the edge of off-street parking areas or for perpendicular/ angled parking along a kerb and gutter.

### Bollards

Bollards are a physical control that may be used in both on-street and off-street parking spaces. They may be provided to limit vehicle travel, prevent vehicles from entering an area and to guide vehicles into parking spaces. They come in fixed and removable variants.

Bollards are available in a range of materials including steel, concrete and timber. Timber bollards are popular for use in areas adjacent to parks and beaches due to their natural aesthetic. Fencing (**Figure 5-6**) and stone blocks (**Figure 5-7**) may also be used to perform a similar function, as utilised on Ocean Road in Palm Beach, NSW.

Figure 5-6 Timber fencing as a protective device for parking



Source: Google Street View, accessed 21 June 2021

Figure 5-7 Sandstone as a protective device for parking



Source: Google Street View, accessed 21 June 2021

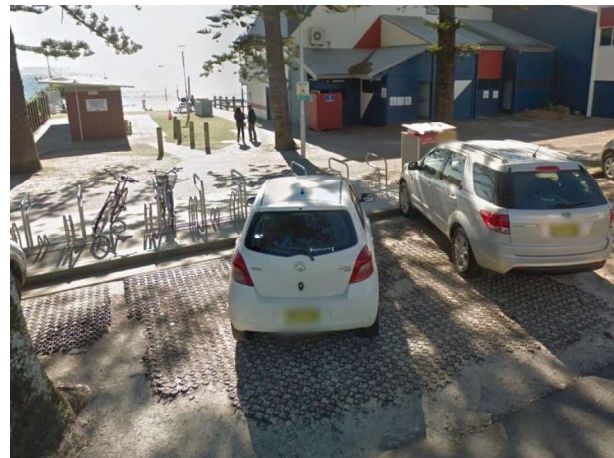


## Pavement treatment

Road pavements serve two basic functions. They perform as an engineering structure while meeting functional requirements such as comfort, drainage, skid resistance and line markings. Pavements are classified as either flexible (containing unbound granular and/or stabilised materials and/or asphalt) or rigid (concrete pavement with joints and/or steel reinforcement).

The study area generally contains sealed road surfaces and unsealed road shoulders that support parking. Some parking areas adjacent to the beach are unsealed and contain gravel, such as Zone J. These areas may be sealed using paving, geogrid or Grasscrete-style products to provide comfortable parking areas for cars while retaining a beachside village feel. Similar pavement treatment (**Figure 5-8**) has been utilised on Bay Street, Byron Bay, outside Apex Park Playground.

Figure 5-8 Geogrid pavement treatment for parking spaces



Source: Google Street View, accessed 21 June 2021

## Overnight camping

Byron Shire is a popular location for overnight campers who live out of vans and cars. Campgrounds and caravan parks are available throughout the region, yet some overnight campers search for free overnight parking to avoid paying accommodation fees. This can result in social, environmental and economic issues.

Overnight camping is common near beaches and residential areas where high demand beach parking spaces may be occupied by overnight campers throughout the day and residents are affected by noise and littering throughout the night. There is also a risk of disease outbreak from human waste in areas where public toilets are not provided. Provision of designated spaces may control some issues of overnight camping; however, land is expensive and tourism businesses would be negatively impacted if free Council campgrounds were provided.

Illegal parking by overnight campers occurs in the Belongil area. Parking signs displaying “No Parking 1am – 6am” are erected throughout the study area in addition to Council signs stating “NO CAMPING AT ANY TIME” upon entry from Kendall Street and along Childe Street. As discussed with parking controls, enforcement is necessary to prevent illegal parking and overnight camping.

## Off-street car parks

### *Border Street*

Border Street is in an immediate coastal risk area. Informal beach access along the road is triggering further erosion. Kendall Street was extended to bypass Border Street in a plan to move the roadway south from the beach for erosion protection. Vegetation has grown over the bitumen on Border Street, disconnecting it and resulting in two separate parking areas as Border Street has become a No Through Road from both ends, forming Border Street Car Park at the eastern side. Reconnection of Border Street is an opportunity in the long term however, maintenance would be required. In the short term, fencing and a pedestrian path may encourage beach users to only access the beach from the formal access at Border Street Car Park.

### *Don Street*

Parking at Don Street Car Park is limited and unrestricted. Aerial imagery indicates that landscaping from private property may be encroaching on the carriageway and reducing parking capacity and manoeuvring space. Time limits in this area may encourage higher turnover which may not be desirable due to access constraints.

Access to Don Street Car Park is narrow due to the provision of a green space to the west of the carriageway. Surrounding residential structures are designed to be able to be relocated within eight hours due to coastal risks. Truck access is to be considered and maintained to facilitate this in the event of an emergency. There is an opportunity to remove the green space and expand the carriageway to provide additional perpendicular parking in the long term. There are several trees and tree stumps in this location and environmental assessment is required to determine if this is necessary.

---

## Childe Street

Childe Street Car Park experiences sand ingress issues. Parking surveys identified that many spaces were unutilised at the northern end, indicating that sand ingress had reduced the capacity by approximately half. This car park also provides limited space for manoeuvring.

There is an opportunity to activate this area by moving the beach fence line south and replacing the off-street car park with perpendicular on-street parking. This will result in minimal loss to the useable capacity. A gate and clearway must be provided for vehicle access to the beach for emergency and maintenance use. The clearway could be integrated with a pedestrian crossing facility to minimise the loss of car parking capacity.

### Manoeuvring

There is an uneven distribution of parking demand across the study area. Zone B was observed to be significantly underutilised, indicating there may be difficulty in changing direction to utilise these spaces when entering the area from Kendall Street. Since Border Street has been closed, accessing these spaces requires negotiating a three-point turn which may be difficult where on-street parking reduces manoeuvrability.

Roundabouts assist in accessing parking areas which require turning movements by providing a safe facility to do so. They are an effective form of intersection control for four-leg and three-leg intersections and act as physical traffic calming devices. A roundabout at the intersection of Kendall Street and Border Street will assist with accessing parking spaces in Zone B. This intersection provides sufficient space for a roundabout with an inscribed circle diameter of approximately 18 metres. A mountable centre island diameter of approximately six metres may be suitable. Further investigation including sight distance and swept path assessment will be required as part of detailed roundabout design.

## 5.2 Active transport

The active transport network in the study area is limited. Motorists aim to park as close to their destination as possible as footpaths are not always provided to support parking spaces in the study area. Due to the low vehicle speed environments, the provision of footpaths for network connectivity is not critical but desired. Pedestrians utilise the verge where footpaths are not available and these can often become muddy in wet weather. Footpaths would increase the attractiveness of parking areas further away from key destinations and walking more generally. Many parking areas to the east of the main village area are underutilised as there is a missing footpath link between Zone H and Zone E. The lack of footpath connectivity may be contributing to the concentrated parking demand. An even distribution throughout the study area may be achieved with improved pedestrian infrastructure.

There is a large reliance on private vehicle use to access Belongil Beach due to poor active transport connectivity to Byron Bay town centre. Improved active transport connectivity to the town centre may ease parking demand. The following options are appropriate:

- > Rail trail;
- > Foreshore shared path; and
- > Kendall Street.

Pedestrian crossing facilities are also limited. A pair of kerb ramps is provided between the footpaths on Kendall Street near the Border Street intersection. No other pedestrian crossing opportunities are provided in the study area. A pedestrian desire line is visible from Segment I1 to Belongil Beach via an off-road path through Old Jetty Park, although no pedestrian crossing facility is provided. There is an opportunity to provide a pedestrian crossing in the form of a raised zebra crossing and kerb ramp although this may result in a reduction in parking capacity. Integration of the pedestrian crossing with accessible parking and/ or a beach access gate may minimise the reduction in parking capacity in this area.

### Traffic calming measures

Kerb extensions are horizontal deflection devices that narrow the trafficable carriageway to reduce speeds, improve delineation and to minimise pedestrian crossing distances. They generally involve extending kerbs inwards and present an opportunity for landscaping. Their effectiveness is increased when used in combination with roundabouts. When integrated with pedestrian crossings, they provide a shorter crossing distance, may improve sight distances, reduce vehicle speeds and delineate and protect parking spaces. The size of kerb extensions depends on the carriageway width, but is usually 2-2.3 metres in width and 6-10 metres in length. Examples of pedestrian crossing facilities utilising kerb extensions are shown in **Figure 5-9** and **Figure 5-10**.

Figure 5-9 Pedestrian crossing facility with kerb extensions on Jonson Street, Byron Bay



Source: MetroMap aerial imagery, 21 April 2021

Figure 5-10 Pedestrian crossing facility with kerb extensions in Glenorchy, Tasmania



Source: Austroads Guide to Traffic Management Part 8: Local Area Traffic Management, 2016

## Gateway treatment

Gateway treatments provide an effective form of traffic calming by signifying entry to a change in urban environment. In a regional context, preferred methods include destination signage (**Figure 5-11**), entry portals or horizontal treatments such as lane narrowing through medians, traffic islands or kerb extensions. Speed tables and raised crossings are applicable, however, vertical treatments are not suitable for roads with heavy vehicle freight functions.

High Pedestrian Activity Area (HPAA) zones are appropriate in areas with high volumes of pedestrians and low traffic speeds. They utilise gateway treatment to designate an area with a speed limit of 40 kilometres per hour or less. A HPAA may be appropriate in Belongil once connected to Byron Bay town centre via active transport links, subject to further investigation.

Figure 5-11 Destination signage gateway treatment in Collector, NSW



## 5.3 Public transport

No public transport is available in the study area. Belongil Beach has a heavy reliance on private vehicle use due to a lack of sustainable transport options to access the area from Byron Bay town centre. There is an opportunity to create a new station for the Byron Solar Train so that it can service Belongil Beach as the rail line is in close proximity to the area. Possible platform locations include the intersection of Kendall Street and the southern end of Giaour Street. Public transport services in the Belongil Beach area may contribute to a reduction in parking demand in the area by tourists or it may distribute demand from Byron Bay town centre to Belongil Beach. Any impacts would need to be assessed in broader study scope.

## 5.4 Environmental

### Sand fences

Parking areas near the beach are sealed in bitumen but have been covered by sand ingress. Sand is carried inland by the wind and can cover linemarking and parking spaces, reducing parking efficiency and capacity. Sand fences and sandbreaks provide options to stop sand ingress, but may not be appropriate to use in this area without environmental assessment. Regular maintenance may reduce the need for restoration works.