



**Discovery Holiday Parks**  
Discovery Holiday Park Cradle Mtn RAA  
Transport Impact Assessment

February 2020

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# 1. Introduction

## 1.1 Background

GHD were engaged by Discovery Holidays Parks to undertake a Transport Impact Assessment in relation to the proposed redevelopment of Cradle Mountain Holiday Park.

## 1.2 Purpose of this report

The purpose of this report is to assess the traffic and parking conditions within and surrounding the subject site, and to recommend mitigation treatments for issues that may arise. The report will also address the relevant provisions of the *Kentish Interim Planning Scheme 2013*.

## 1.3 Scope and limitations

This report has been prepared by GHD for Discovery Holiday Parks and may only be used and relied on by Discovery Holiday Parks for the purpose agreed between GHD and the Discovery Holiday Parks as set out in this report.

GHD otherwise disclaims responsibility to any person other than Discovery Holiday Parks arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by Discovery Holiday Parks and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

## 1.4 Study Area

The subject site comprises of Discovery Parks - Cradle Mountain, located on Cradle Mountain Road. The site and its immediate surrounds are presented in Figure 1.



**Figure 1 Subject Site**

Base imagery obtained from TheList © State of Tasmania

## 1.5 Referenced Materials

Several documents and reference materials have been used to inform the preparation of this report including the following:

- *Kentish Interim Planning Scheme 2013* (the Planning Scheme)
- Austroads Guide to Road Design Part 4: Intersections and Crossings – General
- Austroads Guide to Traffic Management Part 2: Traffic Theory
- Australian/New Zealand Standard AS/NZS 2890.1, *Parking facilities – Part 1: Off-street car parking*, 2004 (AS2890.1)
- AADT traffic data for Cradle Mountain Road, Department of State Growth
- Design drawings, Green Hill Design, Dated 25 May 2018
- Crash data, Department of State Growth, 2014–2019
- *ITE Trip Generation Manual* (10<sup>th</sup> edition)

## 2. Existing Conditions

### 2.1 Transport Network

For the purpose of this assessment, the transport network comprises of Cradle Mountain Road.

#### 2.1.1 Cradle Mountain Road

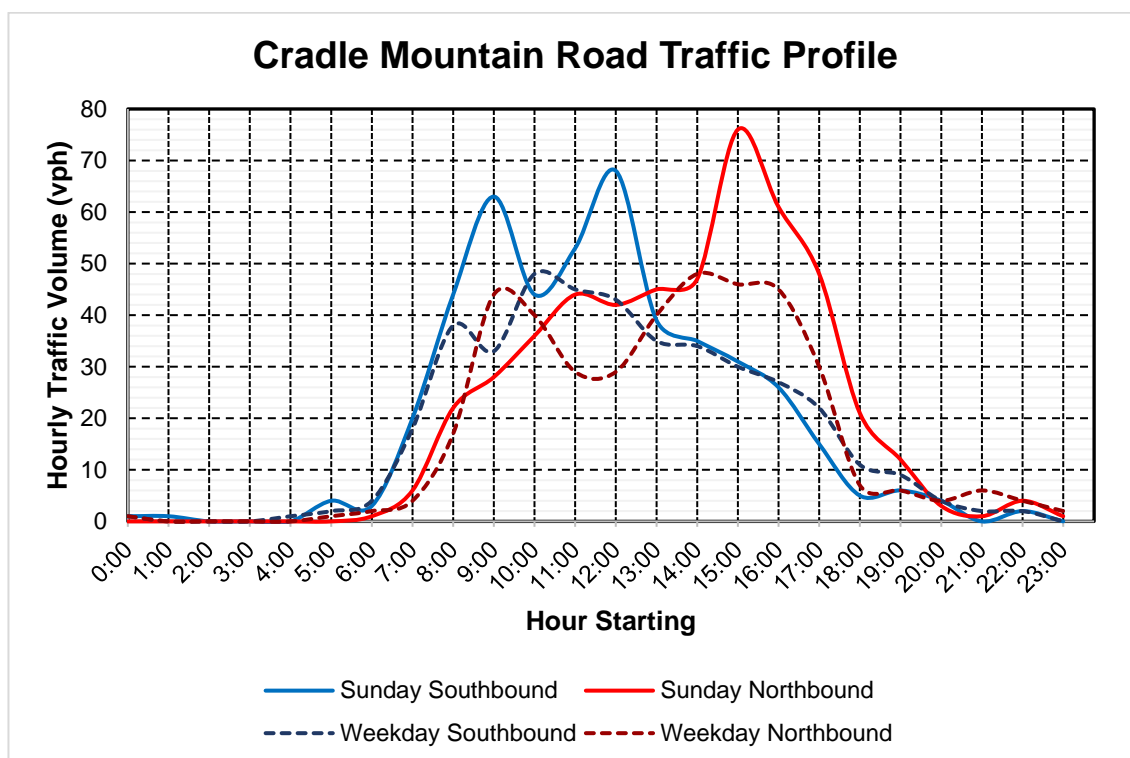
Cradle Mountain Road is a Category 4 road and part of the State Road Network owned and maintained by the Department of State Growth. It provides northern access to Cradle Mountain-Lake St Clair National Park which houses a number of lodgings, resorts and holiday parks including Cradle Mountain Holiday Park.

Cradle Mountain Road has one lane travelling in each direction for the majority of its length and has a posted speed limit of 60 km/hr within the Cradle Mountain Wildlife Zone.

Traffic data on Cradle Mountain Road was sourced from *RoadTas Traffic Stats* which is provided by the Department of State Growth. The traffic counts are dated March 2017. Key traffic statistics for Cradle Mountain Road are summarised as follows:

- Average daily traffic 756 vpd
- Weekday AM peak (10:00 – 11:00 am) 88 vph
- Weekday PM Peak (2:00 – 3:00 pm) 82 vph
- Weekend peak (12:00 – 1:00 pm) 110 vph

The daily traffic profile for Cradle Mountain Road is shown in Figure 2.



**Figure 2 Cradle Mountain Road Traffic Profile**

Data sourced from RoadTas Stats, March 2017

Peak traffic volumes are experienced on a typical Sunday during the holiday season with two-way traffic generally peaking around midday. The peaks are generally representative of day visitors to the Cradle Mountain-Lake St Clair National Park with southbound traffic volumes

peaking in the morning and around midday, and northbound traffic volumes peaking in the afternoon.

## 2.2 Road Safety Performance

Crash data was obtained from the Department of State Growth for the 5 year time period from 1 January 2014 to 1 January 2019 for the full length of Cradle Mountain Road. The crash history is summarised in Table 1.

**Table 1 Crash History on Cradle Mountain Road**

Location	Number of Crashes		Dominant Crash Types (s)
	Total	Casualty	
<b>Mid-block</b>			
Cradle Mountain Road	5	2	Off carriageway (3), Rear end (2)
<b>Intersection</b>			
Cradle Mountain Rd / Belvoir Rd	2	1	Cross traffic (2)
<b>Off Road</b>			
Off Road at Cradle Mountain	9	1	Manoeuvring (8), Reversing (1)
<b>Total</b>	<b>16</b>	<b>4</b>	

The crash rate on Cradle Mountain Road (excluding off-road crashes) is considered very low, with an average rate of 1.4 crashes per year over a distance of 10 km. Crashes are typically low severity with the majority resulting in property damage only and casualty crashes resulting in minor injury. No serious injuries have been recorded during the subject period.

The crash profile on Cradle Mountain Road, comprising single-vehicle and 'rear end' collisions is typical of a rural road through winding terrain. Crashes typically occur during daytime which is considered to be reflective of the higher traffic volumes during daylight hours. Only two crashes were associated with low light conditions.

No specific road safety deficiencies are evident in the data that might be exacerbated by the proposed development on Cradle Mountain Road.

## 3. Traffic Generation

### 3.1 The Proposal

A redevelopment and expansion is proposed for Cradle Mountain Holiday Park, located on Cradle Mountain Road, Cradle Mountain, Tasmania. The key features are as follows:

- An upgrade of the Holiday Park entry area including the existing turning circle,
- Removal of 10 existing camp sites,
- 51 new van sites (40 x powered, 11 x unpowered) and 71 new cabins, and
- Upgrades to the communal areas including a new amenities block and a new camp kitchen.

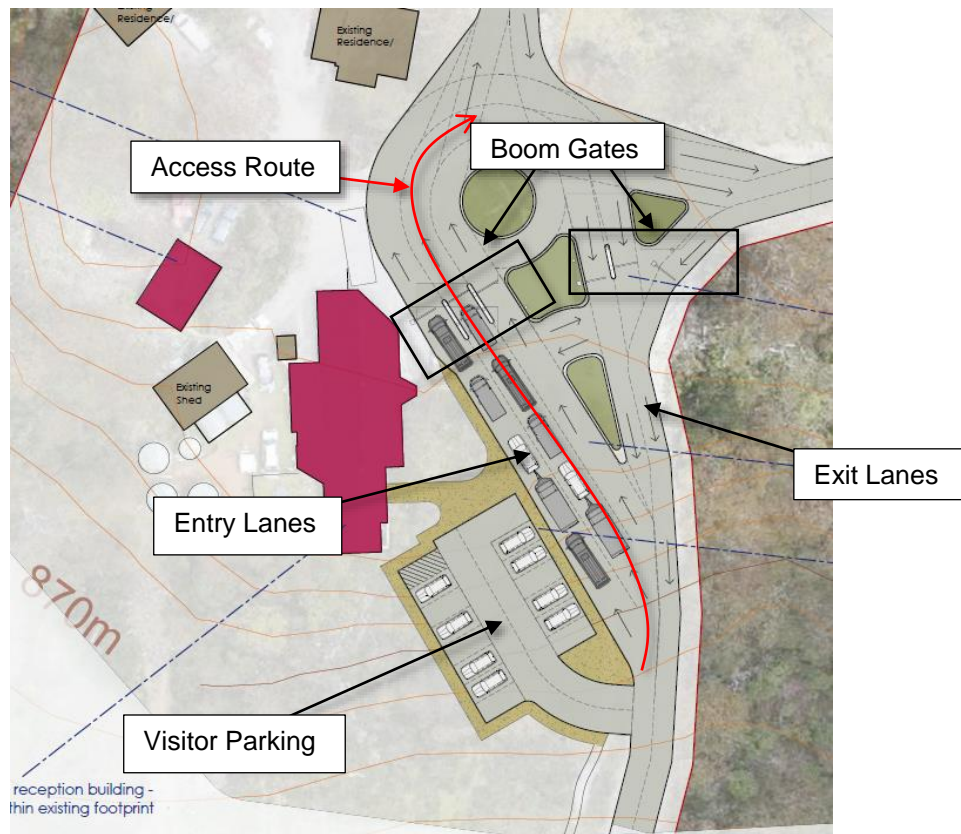
The area of the Holiday Park to be redeveloped has been split into six smaller areas, some of which already contain existing infrastructure. Proposed works within each area, as depicted in the masterplan drawings, are described and summarised below in Table 2.

**Table 2 Summary of Proposed Redevelopments**

Area	Area Description	Proposed Works
A	Revised entry area	Extension of reception building and other facilities. New entry roundabout and staging area. New visitor car parking (13 spaces).
B	Southern powered site area	Installation of 40 x powered sites and 11 x unpowered sites. New amenities.
C	Western cabin area	Installation of 4 x new cabins (including 1 x DDA cabin).
D	Western cabin boardwalk	11 x new cabins and 12 x car park spaces for guests.
E	Central cabin area	Installation of 21 x new cabins (including 1 x DDA cabin). Upgrades to existing trails and tracks
F	Northern cabin area	Installation of 35 x new cabins (including 2 x DDA cabins). Upgrades to existing trails and tracks New loop road to connect existing tracks Potential new communal facilities.
Overall		Loss of 10 existing sites

#### 3.1.1 Site Access

The existing roundabout located at the Holiday Park's entrance is to be upgraded as part of proposed works. Its revised design as provided in the Brief, consists of 3 entry lanes (2 x check-in, 1 x express) and 3 exit lanes. Access through these lanes are controlled by boom gates. A representation of the roundabout is shown below in Figure 3.



**Figure 3 Access Roundabout Design**

Green Hill Design, Discovery – Cradle Mountain, Tas, Proposed Site Plan, dwg no. 170901-3, dated 20 Jan 2020

### 3.2 Traffic Generation

According to the *ITE Trip Generation Manual (10<sup>th</sup> edition)*, the number of daily vehicle trips generated for land use categorised as ‘Caravan Parks’ is 3 vehicle trips per occupied site. This particular park attracts a visitation demographic that typically prefer to walk or use tour and shuttle buses to access the National Park. On this basis, the rate provided in the ITE Manual is likely overestimated and for this development, a rate of 2 vehicle trips per occupied site has been adopted.

A comparison between peak existing and future traffic generation is provided in Table 3.

**Table 3 Existing and Future Traffic Generation**

Case	No. of Sites	Daily Traffic Generation Rate	Daily Vehicle Trips
Existing	118	2 vehicle trips per occupied site	236
Future (redeveloped)	230	(assumed 100% occupied during peak)	460
<b>Difference</b>	<b>+112</b>		<b>+224</b>

Based on the above, proposed redevelopment of Cradle Mountain Holiday Park is expected to generate up to 460 vehicle trips per day typically which represents an increase of up to 224 trips per day compared to the existing situation.

Peak hourly traffic generation has been calculated based on application of existing traffic flow trends on Cradle Mountain Road with weekday and Sunday peak hourly volumes representing 11% and 15% of average daily traffic respectively.

A summary of traffic generation for the site is provided in Table 1.

**Table 4 Summary of Peak Traffic Generation**

Scenario	Daily Traffic Generation (vpd)	Peak Hour Traffic Generation (vph)	
		Weekday	Sunday
Existing	236	26	35
Proposed	460	51	69
<b>Difference</b>	<b>+224</b>	<b>+25</b>	<b>+34</b>

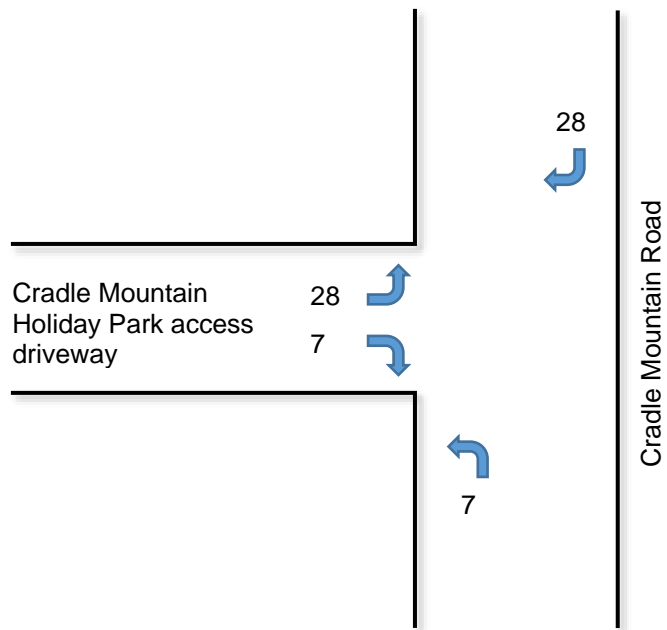
### 3.3 Traffic Access Distribution

Cradle Mountain Holiday Park is only accessible via Cradle Mountain Road from north and south directions. Movements to and from the south will typically be day-tripping guests accessing attractions at Cradle Mountain. The majority of movements are likely to be to and from the north. A directional split of 80/20 has been adopted as follows:

- North (Cradle Mountain Road) 80%
- South (Cradle Mountain Road) 20%

#### 3.3.1 Access Driveway Turning Movements

Based on the access distribution assumptions for northbound and southbound movements on Cradle Mountain Road and an overall peak hour volume of 69 vehicles (from Table 4), peak turning movement counts at the access point can be estimated. They are represented below in Figure 4.



**Figure 4 Turning Movements at Access Driveway**

## 4. Site Access

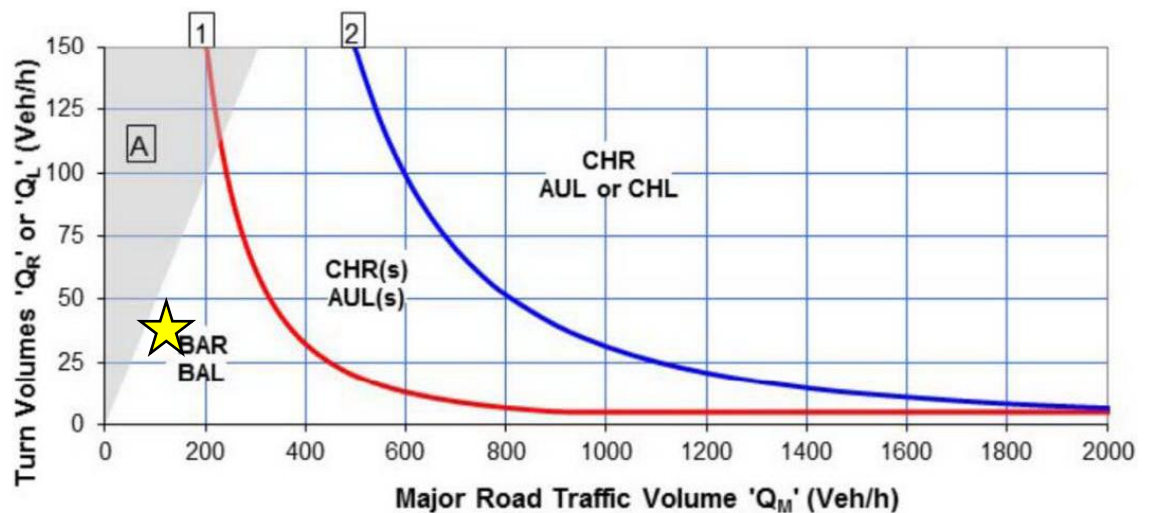
### 4.1 Access Arrangements

Access arrangements for the redeveloped Cradle Mountain Holiday Park are nominally as per the existing situation with a single, two-way access driveway on Cradle Mountain Road. A major redevelopment of the entrance and reception area (Area A) is proposed and will include a new roundabout and staging area located approximately 120 metres from Cradle Mountain Road within the site.

#### 4.1.1 Turning Lane Requirements

Given the increased right turn movements into the site, there is a need to review requirements for right turning facilities on Cradle Mountain Road. Based on Section 2.1.1 of this report, the existing, two-way peak traffic volume on the road is 110 vehicles per hour. This occurred at mid-day on a Sunday. Assuming a growth rate of around 2.0% p.a. over the next 10 years, background traffic volumes might increase to around 132 vehicles per hour. Left turns into the site add a further 7 vehicles per hour to the opposing flow for right turns.

Austrroads (2017) provides general warrants for right turn treatments based on traffic flows. The peak situation for the redeveloped Cradle Mountain Holiday Park is represented in Figure 5 with 28 right turn movements against a peak flow of 139 vehicles per hour.



**Figure 5 Warrants for Turn Treatments at Unsignalised Intersections**

Sourced from *Austrroads Guide to Traffic Management – Part 6: Intersections, Interchanges and Crossings, 2017*

Based on Figure 5, a right turn lane (CHR(S) or CHR) is not considered to be required, however the site access falls squarely within the area requiring a Rural Basic (BA) Right Turn Treatment. This features a widened shoulder on the major road and provides “sufficient trafficable width for the design through vehicle to pass on the left of the stationary turning vehicle”.

It is recommended that a Rural BAR treatment (refer Figure 6) be provided at the site access point generally in accordance with Austrroads and Department of State Growth requirements. This will involve shoulder widening to provide a northbound trafficable width of 6.5 metres over a minimum distance of 100 metres.



**Basic right turn (BAR)  
on the major road (two-lane, two-way road)**

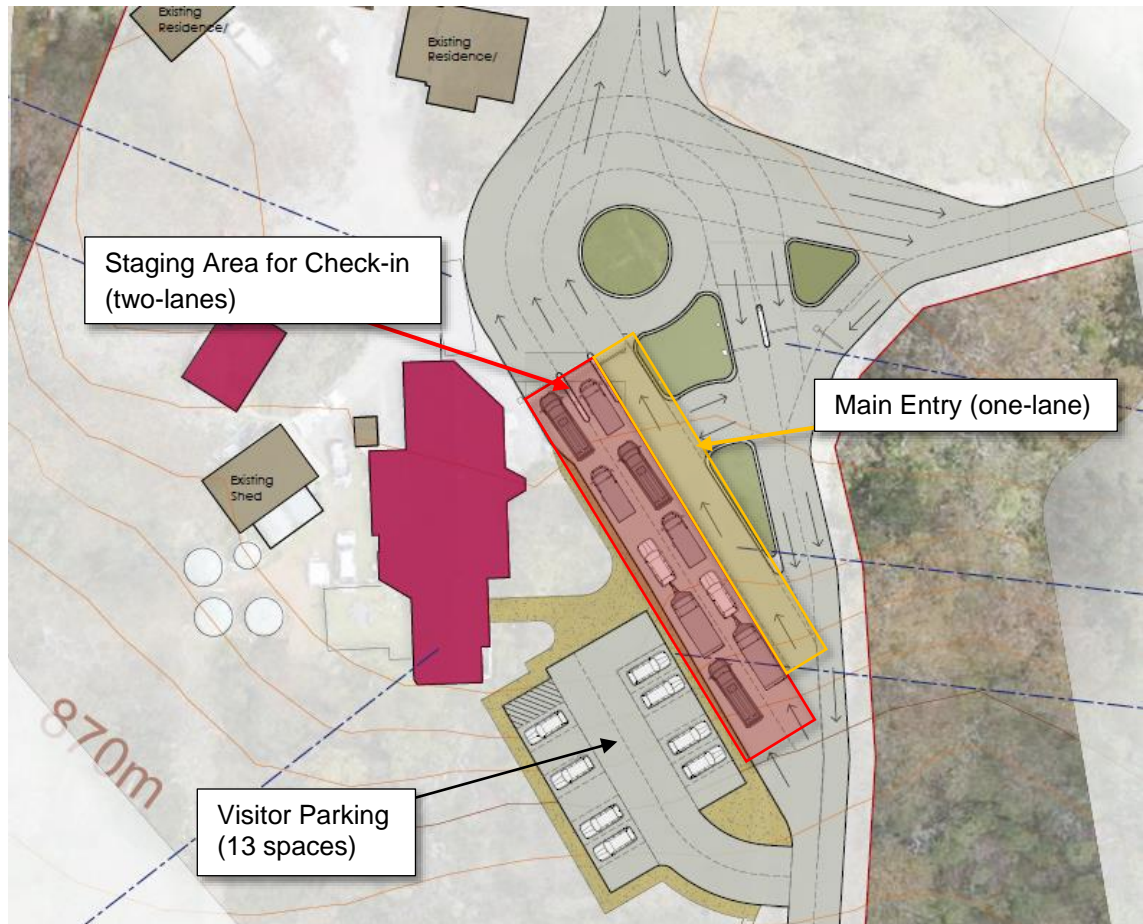
**Figure 6 Rural Basic Shouldering Widening BA Turn Treatment**

*Sourced from Austroads Guide to Road Design Part 4: Intersections and Crossings, Figure A2*

**4.1.2 Roundabout and Staging Area**

The staging area for guest entry to the Holiday Park is adjacent to Reception as shown in Figure 7. It has a three-lane configuration, with the two, left-most lanes being for vehicles checking in and the right-most lane being an express entry lane. Each check-in lane can accommodate 3-4 vehicles (depending on the vehicle type) resulting in storage for between 6 and 8 vehicles total.

With an estimated peak entry rate of up to 35 vehicles per hour (or around 1 vehicle per 2 minutes), no capacity issues are expected at the site entry. In the event there is overflow queuing, this will not impact on the operation of the public road (Cradle Mountain Road) given that the entry roundabout is located around 120 metres inside the site.



**Figure 7 Staging Area for Vehicle Entry**

*Green Hill Design, Discovery – Cradle Mountain, Tas, Proposed Site Plan, dwg no. 170901-3, dated 20 Jan 2020*

## 4.2 Sight Distance Assessment

### 4.2.1 Sight Distance Requirements

The access driveway to Cradle Mountain Holiday Park is required to allow for safe intersection sight distance for traffic on Cradle Mountain Road. In accordance with Figure 3.2 in AS/NZS 2890.1, and given a design speed of 60 km/h on Cradle Mountain Road, the sight distance requirements for the access driveway are summarised in Table 5.

**Table 5 Sight Distance Requirement for a Non-Domestic Driveway**

Sight Distance Measure	Distance Along Frontage Road
Desirable 5s gap	83 metres
Minimum SSD	65 metres

Sourced from Figure 3.2, AS/NZS 2890.01

### 4.2.2 Existing Sight Distances at the Access Driveway

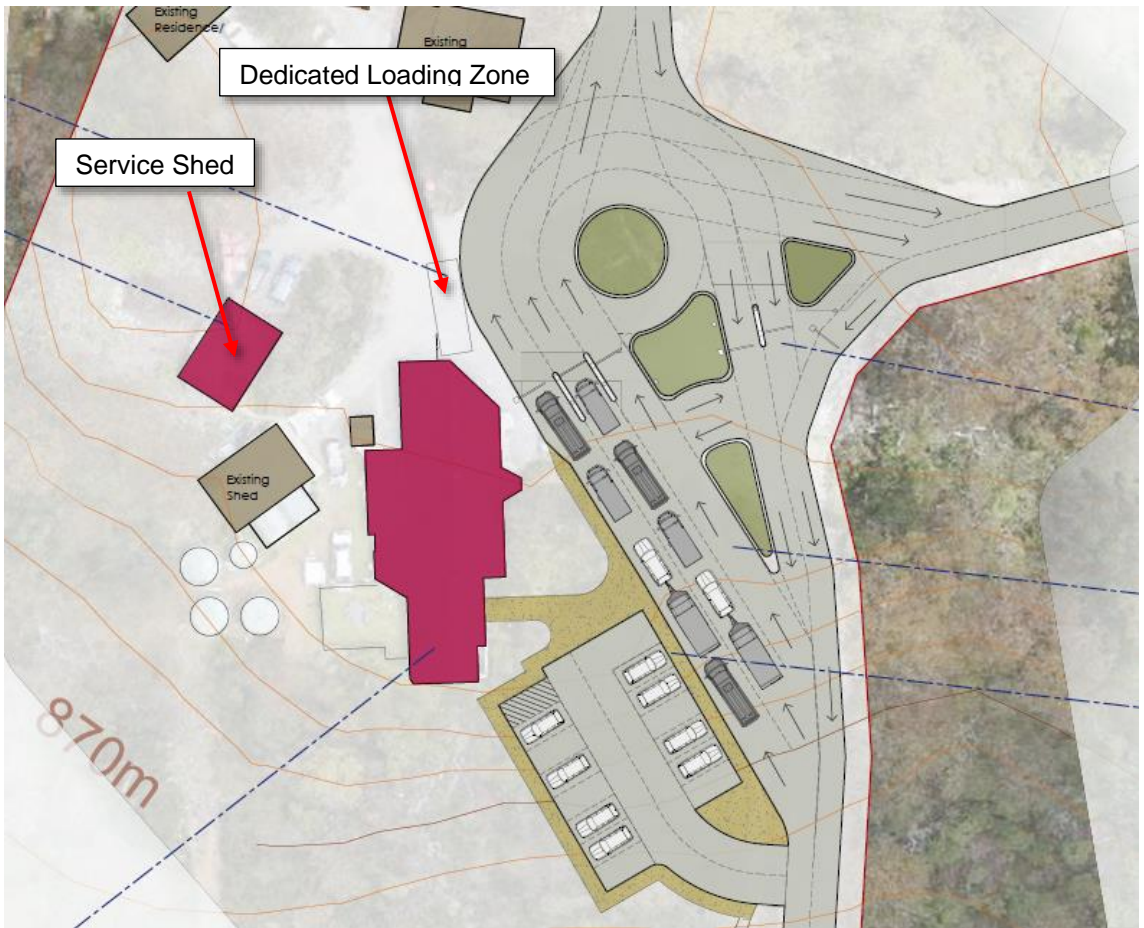
The frontage road is relatively straight with no obstructions near the access driveway intersection such as parking and large bushes/trees. The sight distances for the access driveway are greater than 200 metres from the northbound approach and greater than 300 metres from the southbound approach; both of which exceed the minimum requirements stated in Table 5 by a significant margin. This assessment of the access driveway shows that the sight distance requirements are met under AS/NZS 2890.01.

## 4.3 Waste Collection and Deliveries

Waste collection would occur via standard garbage trucks circulating through the site via the main roadways and emptying bins located at intervals throughout. There are not anticipated to be any specific issues associated with waste collection given that the waste collection vehicles would be smaller than caravans and larger motorhomes which would also access the site. The design of the internal road network is discussed in Section 5.3.

As per Table E9.1 of the Planning Scheme, the visitor accommodation land use requires loading area for "1 x small rigid truck."

There is a service shed proposed near the main entrance as indicated in Figure 8. The service shed is expected to include facilities for site servicing, waste collection and deliveries. Space will also be set aside adjacent to the main entry for a light rigid truck as shown. The loading zone can be entered and exited in a forward direction and reversing would not be required.



**Figure 8 Plan of Service Shed in Area A**

*Green Hill Design, Discovery – Cradle Mountain, Tas, Proposed Site Plan, dwg no. 170901-3, dated 20 Jan 2020*

# 5. Parking Assessment

## 5.1 Car Parking Supply

The proposed redevelopment includes new car parking spaces in select areas throughout the Holiday Park site. The parking supply is required to comply with Clause E9.5.1 under the Planning Scheme. The Acceptable Solution states:

*“The minimum number of on-site vehicle parking spaces must be in accordance with the applicable standard for the use class as shown in the Table to this Code.”*

The relevant table is Table E9.1. An extract from the visitor accommodation land use is provided below:

**Table 6 Parking Requirements**

Land Use	Parking Requirement
Caravan park and camping grounds	1 x space / caravan or tent site
Holiday cabins or units, or serviced apartments	1 x space /unit; and 1 x additional space / 3 units

*Sourced from Kentish Interim Planning Scheme 2013*

The parking supply for each area of the proposed Holiday Park redevelopment are assessed in Table 7.

**Table 7 Parking Provisions and Recommendations by Area**

Area	Use	Units	Parking Requirement	Parking Supply	Variance
A	N/A		N/A	13 spaces	13 spaces
B	Caravan site	51 sites	51 spaces	51 spaces	None
C	Holiday cabins	4 cabins	6 spaces	4 spaces	(2 spaces)
D	Holiday cabins	11 cabins	15 spaces	12 spaces	(3 spaces)
E	Holiday cabins	21 cabins	28 spaces	21 spaces	(7 spaces)
F	Holiday cabins	35 cabins	47 spaces	35 spaces	(12 spaces)

Based on Table 7, only Areas A and B currently satisfy the requirements of the acceptable solution and there is a combined deficit of 11 *visitor* car parking spaces across the site. The proposal relies on performance criteria which are addressed as follows:

*“Adequate and appropriate provision must be made for vehicle parking to meet –*  
*(i) anticipated requirement for the type, scale, and intensity of the use;*

(ii) likely needs and requirements of site users; and

(iii) likely type, number, frequency, and duration of vehicle parking demand.”

The proposal provides 1 space per cabin which is sufficient for guest parking. The deficiency is in regards to visitor parking only where 24 visitor spaces are required and 13 spaces supplied. In this case, the site is access controlled by boom gates and therefore there is no public access to the site. Furthermore, it is unlikely that there would be significant demand for visitor parking at the caravan park, as those users would typically be visiting other facilities in the wider area and would be more likely to park in public parking facilities.

A small supply of visitor parking (13 parking spaces) is provided in a publicly accessible location between the public road access point and the boom gates. This supply is considered sufficient to meet the low demand for visitor parking that might arise from the proposed development.

## 5.2 Car Park Layout

Clause E9.6.1 A1.2 of the Planning Scheme states that:

*“Other than for development for a single dwelling in the General Residential, Low Density Residential, Urban Mixed use and Village zones, the layout of vehicle parking area, loading area, circulation aisle and manoeuvring area must be in accordance with [the relevant Australian Standard].”*

For car parking, the relevant Australian Standard is AS/NZS 2890.1, *Parking facilities – Part 1: Off-street car parking*, 2004. All car park spaces within the Holiday Park site are 90 degree angled parking bays. The minimum required dimensions for each parking space are summarised in Table 8.

**Table 8 Minimum Parking Space Requirements for User Class II**

Variable	Dimension
Parking Bay Width	2.5 metres
Parking Bay Length	5.4 metres
Aisle Width	5.8 metres

Sourced from Figure 2.2, AS/NZS 2890.01

It is noted that the design of car parking areas are yet to be finalised, however the minimum dimension standards outlined above should be referred to as the site design progresses.

### 5.2.1 Car Park Circulation

Clause E9.6.1 A1.2(f) of the Planning Scheme requires: *“[Provision] for the forward movement and passing of all vehicles within the site other than if entering or leaving a loading or parking space.”*

Each car park area within the Holiday Park site connects to an internal road loop leading to and from the main entrance such that reversing manoeuvres (other than entering or leaving a parking space or caravan site) should generally not be required for access within the site proper.

The visitor car park near the main entrance provides a turning facility at the end of the aisle to allow vehicles to exit in a forward direction if required.

### **5.3 Internal Road Layout**

The internal road network consists of a number of one-way loops generally running in a clockwise direction, and accessed via short, two-way sections of roadway. The proposed arrangements are considered suitable provided that clear wayfinding and traffic management signage are provided to reduce circulation and ensure drivers do not travel the wrong way.

The design of internal roads must be sufficient to accommodate the following vehicles:

- Car and caravan combinations
- Larger motor homes
- Garbage trucks

The ability for each of the above vehicles to navigate the internal road network will need to be confirmed as the design progresses.

## **6. Traffic Impacts**

### **6.1 Traffic Efficiency**

The proposed development is likely to result in increased traffic on Cradle Mountain Road, particularly during holiday seasons. This increase is estimated to be around 20 to 30 extra vehicles per hour (two-way) during peak times. Given existing peak hour volumes on Cradle Mountain Road of around 110 vehicles per hour, increasing to around 132 vehicles per hour over the next 10 years, there is ample spare capacity in the road to accommodate this increase in traffic.

Based on the above, and subject to the provision of a BAR treatment at the site access point (refer Section 4.1.1), the impacts of this proposal on traffic efficiency are considered negligible.

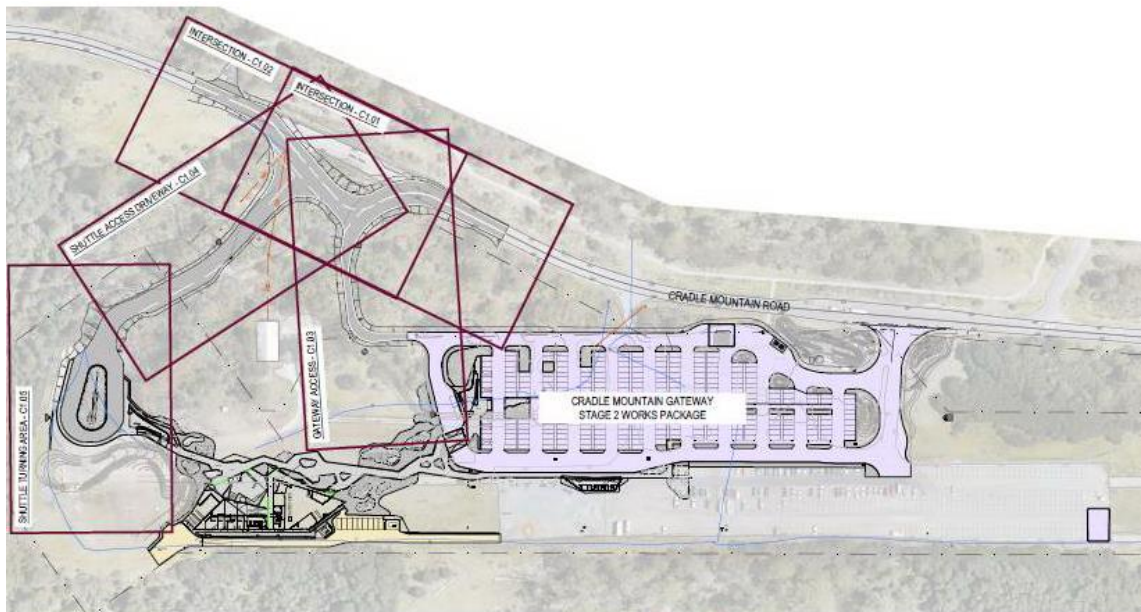
### **6.2 Road Safety**

The proposed redevelopment is not expected to result in significant detrimental impacts to road safety on Cradle Mountain Road. This is based on the following:

- The increase in peak traffic generated on Cradle Mountain Road is not substantial and there is sufficient capacity to accommodate this increase.
- The crash history does not indicate any specific road safety deficiencies on the frontage road that might be exacerbated by the additional traffic generated by the proposal.
- This site contains an existing caravan park operation, which has been demonstrated to not hinder safe vehicular movements through the area.
- A BAR turning lane upgrade from Cradle Mountain Road has been recommended which will allow for some separation between through movements and turning movements.
- The sight distance at the access driveway, as assessed in Section 4.2.2, is more than adequate.

### **6.3 Visitor Centre Development**

The Cradle Mountain Visitor Centre (Cradle Mountain Gateway) is currently undergoing a major redevelopment which will include several changes to road and access arrangements, including improved access and circulation for shuttle buses and tour buses, as well as an increase in the parking supply. The visitor centre is located opposite Cradle Mountain Road and south of the Discovery Park access point as shown in Figure 9.



**Figure 9 Visitor Centre Redevelopment**

Source: Aldanmark Consulting Engineers, Dwg No. 17E54-1 C0.01, Overall Plan, Index and Notes, Rev 4, dated 10/12/2018

The Visitor Centre redevelopment and proposed Discovery Park expansion are not expected to have interactions causing detrimental impact to traffic and safety based on the following:

- The visitor centre is located south of (downstream) of the Discovery Park access point.
- While the parking supply for the visitor centre has increased, there will not be a large step change in traffic access. This report has assumed a 2.0% p.a. traffic growth rate over the next 10 years and identified no issues with capacity.

## 7. Conclusion

This report investigated the potential traffic and parking impacts related to the proposed redevelopment of Cradle Mountain Holiday Park. The key findings are as follows:

- The proposed development is anticipated to effectively double the total number of vehicle trips into and out of the site, increasing from around 35 vehicles per hour (existing peak) to 69 vehicles per hour (proposed peak).
- Cradle Mountain Road is expected to experience an additional 27 vehicles/hr (two-way) north of the site access point. This is based on an assumption that trips will be split 80/20 between north and south on Cradle Mountain Road.
- With reference to Austroads standards, it is recommended that a basic shoulder widening (BAR) treatment be provided on Cradle Mountain Road at the Access Driveway to accommodate the increase in right turn movements.
- In order to comply with requirements of the *Kentish Interim Planning Scheme 2013*, the following design changes are recommended for the site:
  - Car park designs to be generally in accordance with AS/NZS 2890.1, *Parking facilities – Part 1: Off-street car parking*, 2004.
  - Internal road network to be provided with wayfinding signage and traffic management signage to limit vehicle circulation and ensure drivers do not travel the wrong way down one-way roads.
  - The design of the internal road network to be suitable for the design vehicles listed in Section 5.3.
- The proposed redevelopment is unlikely to result in significant adverse impacts to traffic efficiency or road safety in the road network.

Based on the findings of this report, and subject to the recommendation outlined above, the proposed development is supported on traffic and parking grounds.

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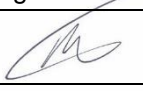
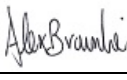
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