



MOUNT GEORGE BIKE TRAIL
GEORGE TOWN

**TRAFFIC IMPACT
ASSESSMENT**

Hubble Traffic

January 2021

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1. Introduction

Peter Rickards, Project Manager for the George Town Council, has engaged Hubble Traffic to prepare an independent Traffic Impact Assessment, to consider the traffic impacts of creating a mountain bike trail head (development) off Mount George Road, Georgetown. This development will be supported with a new car park that will require access off Mount George Road.

This report has considered the amount of traffic currently using Mount George Road, and how the expected increase in traffic movements generated by this use will integrate into the current road network.

Although the development will be located on Crown Land, George Town Council has an appropriate lease for use of the land for the proposed purpose.

This report has been prepared to satisfy the requirements of Austroads, Guide to Traffic Management Part 12: Traffic Impacts of Developments, 2019. This assessment has referred to the following information and resources:

- George Town Council Planning Scheme (planning scheme)
- Road Traffic Authority NSW (RTA) Guide to Traffic Generating Developments
- Australian Standards 2890
- Austroads series of Traffic Management and Road Design
 - Part 4: Intersection and crossings, General
 - Part 4a: Unsignalised and Signalised Intersections
 - Part 8: Local street management
 - Part 12: Traffic Impacts of Development
- Department of State Growth crash database
- Google Earth imagery

2. Site Description

The development site is located within Crown Land, situated south east of George Town.



2.0 Map – Extract from Google

3. Development proposal

The creation of various mountain bike trails and a purpose built car park.

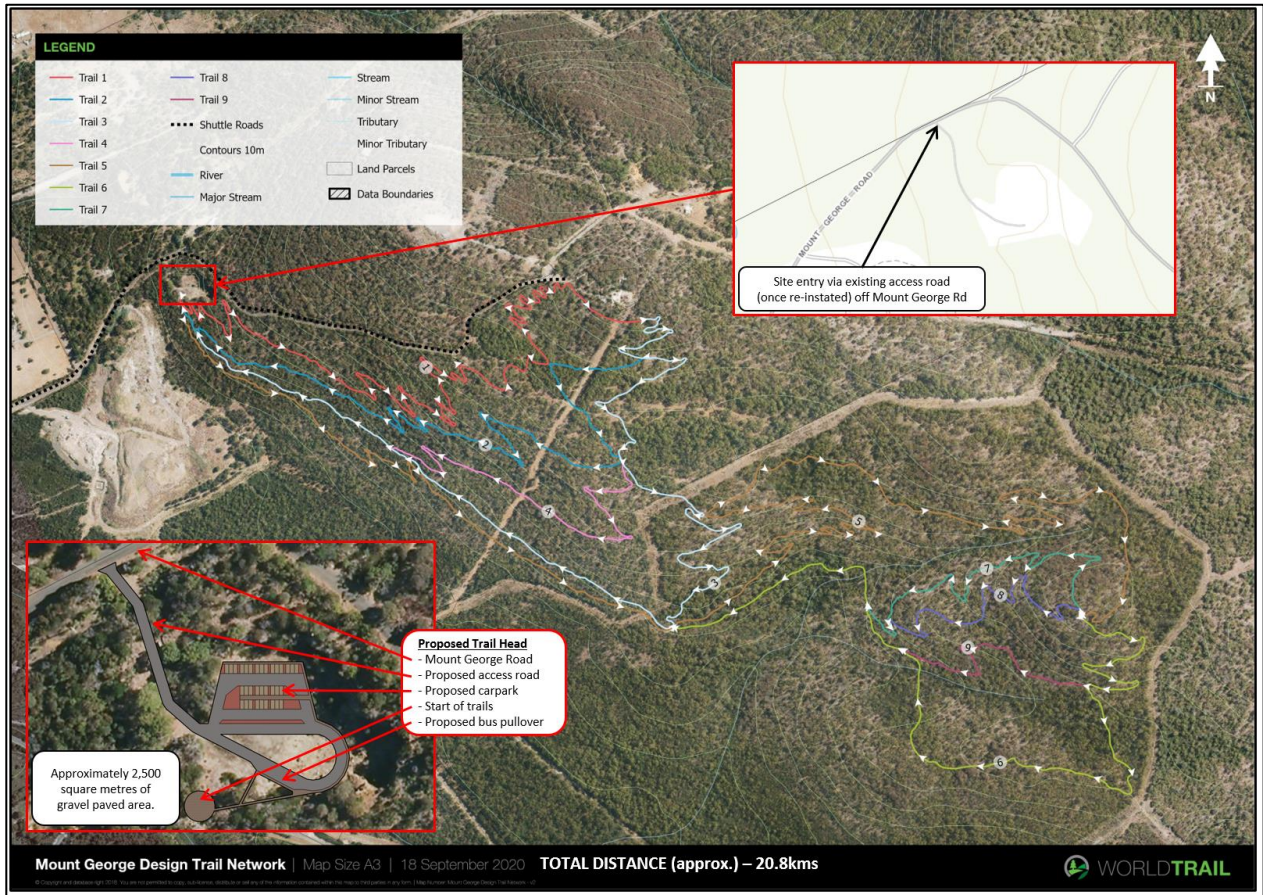


Diagram 3.0A – Layout of development site

4. Trip generation by this development

A trip in this report is defined as a one way vehicular movement from one point to another, excluding the return journey. Therefore, a return trip to and from a land use is counted as two trips.

To determine the number of trips likely to be generated by this development, reference has been taken from the RTA Guide to Traffic Generating Developments, section 3.8 Recreation Use.

4.1. Expected trips generated by the mountain bike trails

Section 3.8 of the RTA guide indicates that the daily vehicle trips for recreational facilities is largely dependent on, site location, type of use, and seasonal variations. It recommends analysis of proposed developments be based on survey data of similar developments.

A traffic survey was undertaken on Sunday 17 January 2021, at the Meehan Range Nature Reserve main trailhead carpark, located at Flagstaff Gully Road Mornington, Hobart to determine the number of vehicles the use generated.

The Mornington facility is located in close proximity to Hobart. When comparing the population of Hobart with George Town, it has been estimated the Mornington facility is likely to generate four times higher usage, than the proposed George Town facility.

Table 4.0 – Traffic demand at the Mornington site

Time	Vehicles in	Vehicles Out	Total trips	Number of Vehicles parked
Before 8am				6
8.00 to 8.15am	3	1	4	8
8.15 to 8.30am	5	4	9	9
8.30 to 9.00am	11	2	9	18
9.00 to 9.15am	2	2	4	18
9.15 to 9.30am	7	2	9	23
9.30 to 9.45am	5	2	7	26
9.45 to 10.00am	10	4	14	32
Total	43	17	56	
Time	Vehicles in	Vehicles Out	Total trips	Number of Vehicles parked
Before 2.30pm				14
2.30 to 2.45pm	7	7	14	14
2.45 to 3.00pm	0	2	2	12
3.00 to 3.15pm	1	0	1	13
3.15 to 3.30pm	2	2	4	13
Total	10	11	21	

Having consideration that the proposed George Town use will represent 25 percent of the Meehan Range usage, the following trips and parking demand will be used for this assessment:

- Peak hour vehicle trips – 10 per hour (two-way traffic trips).
- Number of vehicles parked at any one time is 8.
- Total average daily trips of 80 (based on 8 hours of operation).

5. Existing traffic Conditions

All traffic accessing this development will need to travel along Mount George Road from the East Tamar Highway (Main Street). This section of the report will examine the current traffic flow and conditions.

5.1. Mount George Road characteristics and function

Mount George Road is managed by the George Town Council; the road extends off the Main Street of George Town and extends for approximately two kilometres, terminating at a communication tower and scenic lookout.

In the surrounding road network, this road functions as a rural minor access road, with no through traffic, providing access to some 12 residential properties, a waste transfer station, and a scenic lookout.

It is not uncommon for minor access roads to be narrow; but can still function safely with low traffic usage. The roadway is sealed at 4.8 metres wide; there are open drains, and the route traverses across undeveloped land set aside as a nature reserve.

This road width can support two-way traffic movements operating at low travel speeds.

5.1 Photograph of the typical road standard



5.2. Operating speed

There is a 60 km/h speed limit sign posted along the route, that faces traffic turning off the Main Street, and therefore this speed limit applies to the entire route.

While this speed limit sign sets the maximum speed permitted, drivers are required to drive according to the prevailing traffic, road, and weather conditions, and in some cases a lower operating speed may be necessary.

With the road operating within a rural environment, the 60 km/h speed limit reflects the limited road standard and signifies to motorists that a high operating speed is not suitable.

With the new use generating an increase in traffic usage, it would be prudent for the road manager to arrange for additional 60 km/h speed limit signs. Additional signs should be installed along the route in both directions at 600 metre intervals, to reinforce unfamiliar motorists that a low operating speed is warranted.

Photograph 5.2 – Existing speed limit sign



5.3. Traffic activity along Mount George Road

To understand the current traffic usage along the route in absence of any traffic data, an estimate of traffic movements has been based on first principles; where a residential dwelling is likely to generate 7.4 daily trips, the waste transfer station is likely to generate 40 daily trips, and the scenic lookout is likely to generate 6 daily trips.

It has been concluded that the existing number of daily trips using Mount George Road, is estimated at 135.

The proposed car park access will be located about half way along the route, and beyond this access point there is only two residential properties and the scenic lookout. This means the majority of the 135 daily trips is expected to occur west of the new car park access, with only 20 daily trips expected to pass the new access.

5.4. Traffic safety along the route

The Department of State Growth maintains a database of reported road crashes. A check of this database found one reported crash in the area; this was a single vehicle driving off-road, collided with a large boulder and no injuries recorded.

No reported crashes along Mount George Road signifies that the road is fit for purpose, and motorists are not encountering any difficulties while negotiating the route.

5.5. Horizontal and vertical alignment

Generally, the horizontal alignment of the route is reasonably straight, except for a tight curve located 1.1 kilometres from the Main Street, and this is located just beyond the proposed access to the new car park.

The route gradually climbs from Main Street to the scenic lookout, and at the proposed car park access the road gradient is around 17 percent.

6. Impact from traffic generated by this development

As determined in section 4 of this assessment, this development has the potential to generate up to 80 daily traffic movements, with 10 trips occurring within an hour.

The recent Meehan Range traffic survey found that even with the site located in close proximity to residential development, most of the users travelled by a private vehicle, rather than by bicycle or other transport modes.

6.1. Additional traffic movements operating on Mount George Road

It is expected that trips generated from this development will be new trips given the location.

In the hierarchy of low-volume rural roads, Mount George Road operates as a local minor access road, with its function to serve the surrounding land-uses. It would not be unreasonable to expect this type of road to carry 400 vehicle trips per day.

With the existing traffic usage estimated at 14 vehicle trips per hour, the expected additional 10 trips per hour represent a significant percentage increase. However, the total number of hourly trips is extremely low at 24 two-way trips and represents one vehicle trip every two and a half minutes.

The road is expected to absorb these additional vehicle trips without adversely effecting safety, traffic efficiency or amenity issues.

6.2. New internal access to the car park

A new internal access road will be constructed to provide access to a car park supporting the Mountain Bike Trails. The internal access road will reactivate an old access, located approximately one kilometre from the Main Street.

Photograph 6.2 – Proposed access location



6.3. Available sight distance

The access to the new car park will be located prior to a tight horizontal curve in the road, on a vertical downgrade, which limits the available sight distance between a vehicle leaving the access and a vehicle approaching in an easterly direction. On-site measurements found that the available sight distance is likely to be 55 metres, as shown in photograph 6.3A.

Photograph 6.3A – View looking eastbound from the proposed access



The Georgetown Council has agreed to remove vegetation and undertake minor sight benching on the inside of this horizontal curve, but the available sight distance will remain limited.

The available sight distance for vehicles approaching from the west exceeds 115 metres and is shown in photograph 6.3B. Georgetown Council has agreed to remove vegetation along the road edge to ensure this sight distance is easily achieved for motorists leaving the access.

Photograph 6.3B – View looking westbound from the proposed access



6.4. Safe Intersection Sight Distance

It is important that motorists leaving the car park access have suitable sight distance to enter and leave Mount George Road in a safe manner, without impacting other motorists.

The planning scheme table E4.7.4 prescribes the Safe Intersection Sight Distance (SISD), and for a speed limit of 60 km/h the required SISD is 115 metres.

The SISD can be influenced by vertical grades of the approaching roadway, as a vehicle travelling on a downhill grade will need longer distance to stop, due to the weight and momentum of the vehicle, while the opposite occurs for a vehicle travelling uphill.

Austrroads Guide to Road Design provides guidance on grade correction for steep grade. For downhill grade of 17 percent, an additional 11 metres sight distance is required, and seven metres less on the uphill approach.

The revised SISD with grade correction is 126 metres for vehicles approaching from an easterly direction and 108 metres in a westerly direction.

6.5. Traffic calming

To mitigate against the limited available sight distance in an easterly direction, it will be necessary to implement traffic calming to reduce the speed of vehicles approaching the new car park access from this direction. The most appropriate method having consideration to this location, is to implement vertical deflection devices in the form of road humps.

Road humps used in the right context can be very-successful in achieving significant reduction in vehicle speeds.

The provision of road humps located on the eastern side of the access would be appropriate; the route provides for no through traffic; the traffic usage is low as it has been estimated that only 20 vehicles pass the site on a daily basis; the speed limit and operating speed is already low; and the potential to adversely affect emergency vehicles response times will be negligible.

6.6. Suitability of road humps

When selecting any traffic management device, it is important to ensure the device is suitable for the road function, traffic composition, and abutting land-use, as devices can have negative impacts, and these must be considered thoughtfully. Austroads Guide to Traffic Management Part 8: Local Street Management has been used to identify likely impacts and table 6.6 considers these.

Table 6.6 – Consideration of impacts of road humps

Possible impacts	Consideration
Excessive acceleration and deceleration and associated noise.	The volume of traffic travelling over the road humps on a daily basis is low, estimated at 20 vehicles per day. The abutting land-use is a rural reserve with only one residential property located within 200 metres of the road humps, and the surrounding trees and vegetation is expected to dampen any excessive noise cause by vehicles travelling across the road humps. Excessive noise impact is considered a low risk.
Possible discomfort for bus passengers.	Buses are not expected to travel over the road humps.
Increase in travel time for drivers and frustration for property owners.	The road humps only impact one residential property that is located at the end of the road.
Effect of parking supply.	Not applicable for rural road.
Possible increase response time for emergency and service vehicles.	Emergency response times are primarily determined by the adequacy of main roads, and not the short length in which the road humps are located.
Transfer traffic from one street to another.	Transfer of traffic will not occur.
Additional cost burdens in terms of maintenance and enforcement.	Additional maintenance costs will be outweighed by the benefits delivered to the community through developing this project.
Mobility and service functionality.	With the road terminating within 1 kilometre of the devices, there is no impact to mobility or level of service to road users.

With the road terminating at the scenic lookout there is no through traffic; the expected volume of traffic travelling across the road humps is low, so the potential impact to traffic efficiency and road function appears to be minor. With the current speed limit at 60 km/h, the speed differential to negotiate the humps is moderate, and should not create any adverse impacts.

The no through road status means traffic must negotiate the road humps in the first instance while travelling uphill, and then return negotiating the road humps on a downhill slope, so motorists are aware of the devices and the downhill grade is not expected to be problematic.

6.7. Design aspect of the road humps

For a public road, a typical car park hump is not appropriate. The most effective road hump profile is the Watts profile and are usually constructed on-site using bitumen.

There are preformed rubber alternatives such as speed cushions, that are simply bolted to the existing road pavement and these might be suitable for this location.

The humps must be clearly visible to approaching motorists and therefore the following must be installed to supplement the devices:

- illuminated by adequate street lighting
- enhance by the use of appropriate traffic signage, including 25 km/h advisory speed plates
- pavement markings on the road humps, and
- minimum of four guide-posts at close interval at each road hump.

6.8. Regulatory approval of road humps

The approval of road humps on a public street is covered in section 49a of the Traffic Act 1925, and this section was amended in June 2019, to allow a road authority to approve and implement road humps, on roads under their jurisdiction.

6.9. Mount George Road and East Tamar Highway junction

The increase in traffic trips generated by this new use will intensify the amount of traffic using the Mount George Road and East Tamar Highway junction. This junction currently operates with an 80 speed limit environment and available sight distance exceeds 200 metres in both directions, due to the highway's straight alignment. The available sight distance exceeds the planning scheme SISD requirement of 175 metres.

The highway includes a Basic Auxiliary Right (BAR) turning treatment, where the roadway is widened so that a vehicle turning right into Mount George Road can be passed to the left, by a vehicle at a reduced travel speed. The junction is controlled by a Give Way sign operating on Mount George Road.

The current junction layout is considered appropriate to cater for additional traffic movements without causing any adverse safety or traffic efficiency issues.

Photograph 6.9A – View for driver looking left



Photograph 6.9B – View for drivers looking right



Photograph 6.9C – BAR turn treatment on the East Tamar Highway

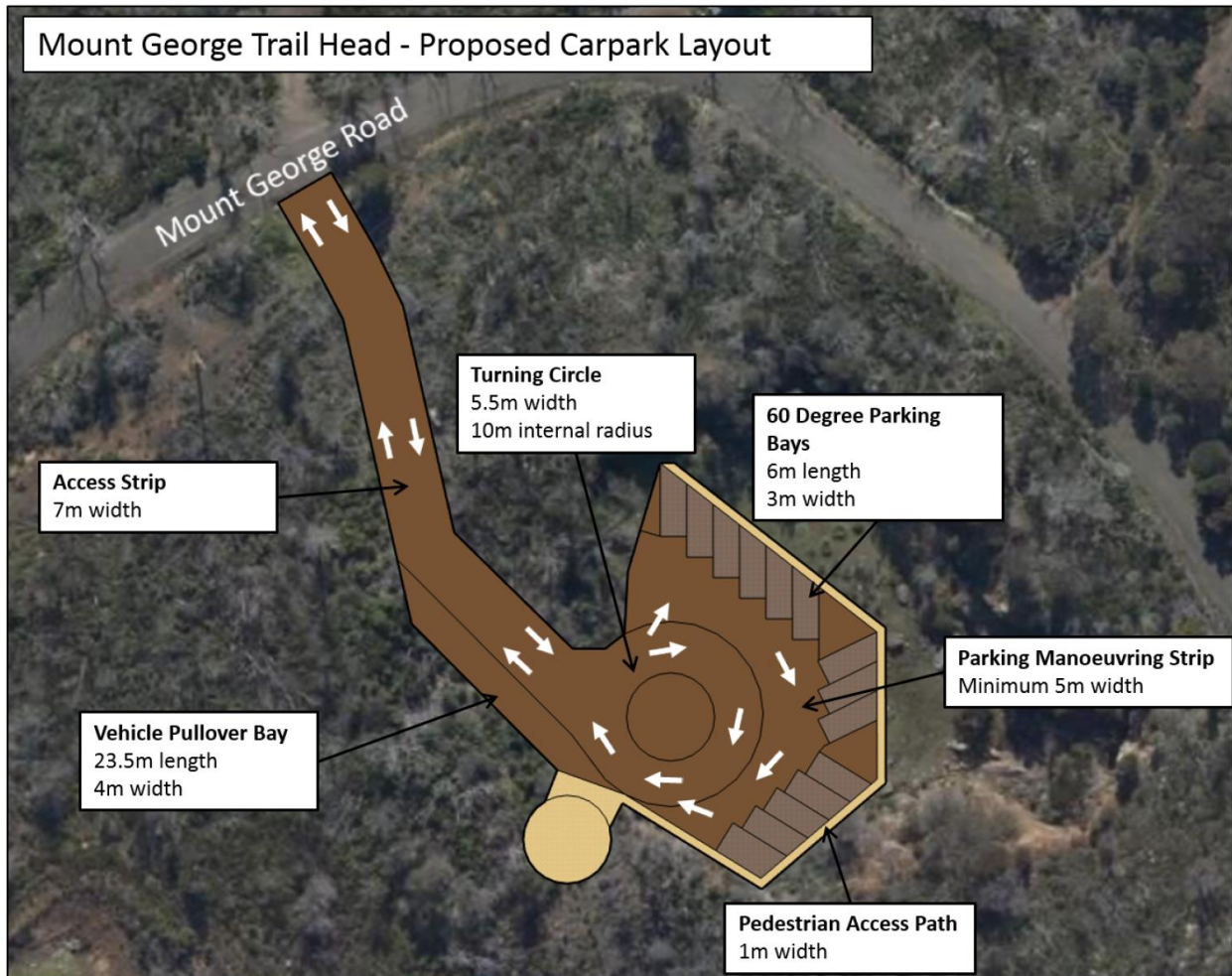


7. Mountain George Trail Head – Car park layout

As determined in section 4 of this assessment, based on available assumptions from a similar activity, eight parking spaces is expected to meet the reasonable demand.

Council has determined an old quarry site would be appropriate for the car park, and a proposed layout is shown in the diagram below.

Diagram 7.0 – Proposed car park layout



The parking facility will be considered as a greenfield site, and will be designed to comply with the Australian Standards 2890 Part 1: Off-street car parking and will consist of the following attributes:

- User class 3A, short term, high turnover parking spaces.
- 60 degree angle parking spaces to be 3 metres wide and 6 metres long.
- 5 metre manoeuvring area behind each parking space.
- Allowance for efficient one-way traffic circulation.
- Gradient of the parking area to be less than 5 percent.
- The surface to be a minimum of 100mm gravel pavement.

- Concrete wheel stops will be used to delineate the parking spaces.
- Pathways will be provided to connect the parking area to the various bike trails.
- A drainage system will be considered to ensure that surface water is allowed for, including a piped culvert under the crossover for service continuation of the table drain on Mount George Road.
- The access road between the car park and Mount George Road will be a gravel surface, and a minimum of 5.5 metres wide.
- A minimum of 14 car parking spaces and a bus pullover bay.

This proposed design is expected to meet the reasonable parking demand caused by this new use.

8. Access off Mount George Road to car park access

To access the new car park an existing unused access will be reactivated. This access is located prior to a horizontal curve in the road alignment, which limits available sight distance to vehicles approaching in a westerly direction to 55 metres.

Road humps located east of this access will be implemented as part of the development, the road humps are expected to reduce the operating speed of approaching vehicles, and table 8.0 demonstrates the speed affect by using various type of humps.

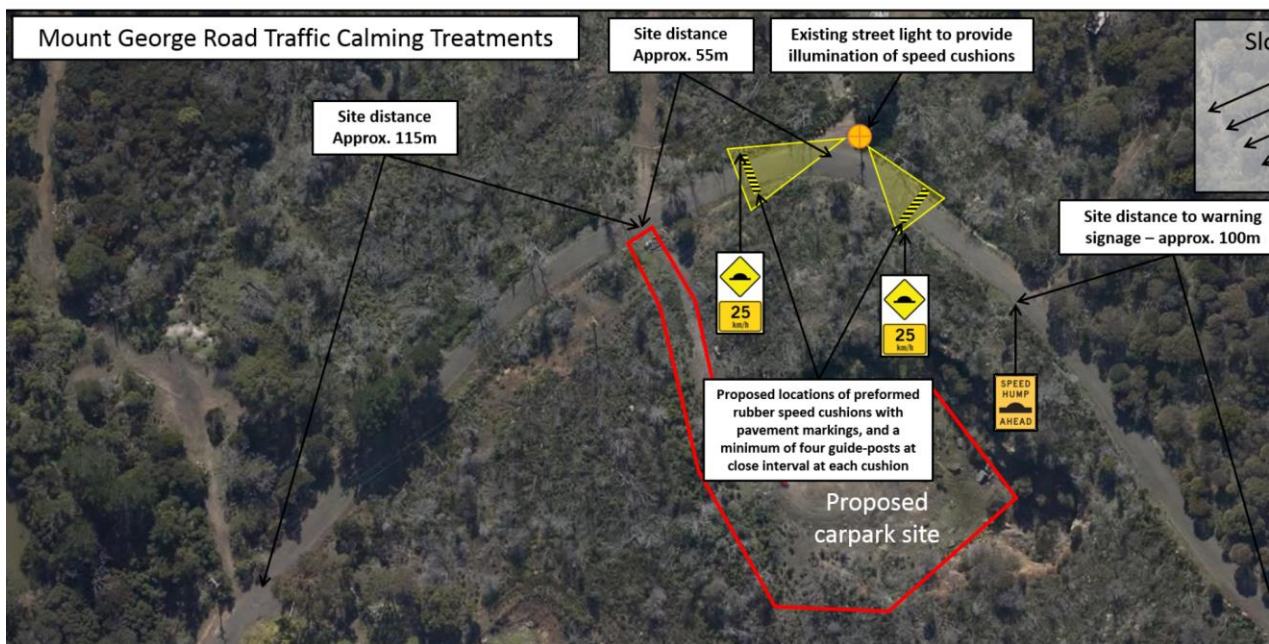
Table 8.0 – Calculated SISD for hump profile and grade correction

Hump profile	Speed environment	Expected reduction in operating speed	Modified operating speed	Calculated SISD	Calculated SISD with grade correction
Watts profile	60 km/h	45%	33 km/h	30metres	35 metres
Speed cushions	60 km/h	27%	44km/h	25metres	49 metres

Based on available information, implementing road humps on approach to the access is expected to reduce the speed of approaching vehicles. Both the Watts profile and speed cushions are expected to reduce the operating speed to within the SISD tolerance, and this means traffic can enter and leave the access in a safe manner.

The access will be designed to allow for two-way traffic movement to enter and leave simultaneously.

The expected reduction in operating speed due to the presence of the road humps has been obtained from Austroads Guide to Traffic Management part 8: table C21, and the calculated SISD based on Austroads Guide to Road Design Part 4a: Unsignalised and Signalised intersection section 3 and includes two seconds reaction time for the driver.



9. Planning scheme

9.1. E4.6 Road and Railway Assets Code

E4.6.1 Existing road accesses and junction

This development will intensify traffic movements along Mount George Road by more than 40 movements per day and therefore must be considered under the performance criteria P2, as the speed limit is 60 km/h.

Performance criteria	Assessment
To ensure that the safety and efficiency of road and rail infrastructure is not reduced by the creation of new accesses and junctions or increased use of existing accesses and junctions.	
a) The level of use and number;	It is estimated that the existing volume of daily traffic movements along Mount George Road is 135, with most of these generated by the land-use west of the proposed mountain bike trail head. This new use is expected to generate some 80 additional daily vehicle movements and there is sufficient capacity to absorb these movements without creating any adverse safety, traffic efficiency or amenity issues.
b) Location;	The surrounding land-use is a Crown reserve and considered suitable for this type of development. The trail head is located within one kilometre off the East Tamar Highway (Main Street) so the journey for users will be primarily on a State Highway, with minimal use of the local road network. There are very few residential properties in the surrounding area, limiting any adverse amenity impacts. The operating speed along Mount George Road is restricted to 60 km/h, the roadway is sealed and provides adequate access for road users.
c) Layout and design of accesses and junction must maintain an acceptable level of safety for all road users, including pedestrians and bicycles;	The access to the internal car park off Mount George Road will be designed to provide an acceptable level of safety. Through implementing traffic calming measures east of the access to ensure the approach speeds of vehicles is reduced, so the available sight distance will satisfy the Safe Intersection Sight Distance requirements. The access will be designed to accommodate two-way movements to occur simultaneously.

E4.7.2 – Management of Road Accesses and Junctions

It will be necessary to reactivate an old quarry site access, to enable the provision of a car parking area to support the new development. The access will be located within a 60 km/h speed environment, will be a single access catering for both traffic entering and leaving the car park, and will meet the acceptable solution A1.

E4.7.4 Sight distance at accesses, junctions, and level crossings

The available sight distance at the access to the car park will meet the Safe Intersection Sight Distance as prescribed in the planning scheme table E4.7.4 based on the 85th percentile approach speed.

Traffic approaching in a westerly direction:

- For vehicles approaching the access from a westerly direction, the 85th percentile speed is estimated at 60 km/h, and at this approach speed the prescribed SISD is 115 metres. However, with the approach being on an uphill grade of 17 percent, grade correction reduces the SISD to 107 metres.
- The available sight distance for a driver viewing left (west) is 115 metres and meets the planning scheme requirement.

Traffic approaching in an easterly direction:

- The horizontal alignment limits available sight line, road humps will be implemented as part of the development, to reduce the 85th percentile speed of approaching drivers to less than 44 km/h.
- For a 44 km/h approach speed, the necessary SISD with grade corrected for downhill gradient, is calculated at 49 metres.
- The available sight distance for a driver viewing right (east) is 55 metres.

As available sight distance in both directions will meet the SISD based on the 85th percentile approach speeds, the development meets the acceptable solution.

9.2. E6.0 Parking and Sustainable Transport Code

E6.6.1 Car parking numbers

The planning scheme specifies that any new use must provide parking spaces that meet the reasonable demand, to prevent overflow of parking on the local road network. Table E6.1 provides parking requirements for various development use, unfortunately the table does not provide any information on mountain bike trails, and the closest use is Sports and Recreation which is not considered applicable.

A usage and parking survey was conducted on a mountain bike facility at the Meehan Range Nature reserve located in Mornington, Hobart. This Mornington facility is more accessible to a larger population than the proposed development, and is expected to generate a significantly higher usage. For the purpose of this assessment, the new development is estimated at 25 percent of the Mornington facility, and from the survey data, it is estimated the parking demand for the proposed development is eight parking spaces.

The car park provided as part of this development is expected to provide a minimum of 14 car parking spaces, and a bus parking area. This level of parking is expected to meet the reasonable demand, and meets the acceptable solution for car parking.

E6.6.2 Bicycle Parking Numbers

This type of development is not expected to create a parking demand from cyclists.

E6.6.3 Taxi Drop-off and Pickup

Although a separate drop-off or pick-up facility is considered unnecessary, the car park layout provides suitable one-way traffic circulation and facilitates adequate pick-up and drop-off locations.

E6.6.4 Motorbike parking provisions

This type of development is not expected to create a parking demand from motorcyclists.

E6.7 Development standards

Development standards	Comment
6.7.1 Construction of car parking spaces and access strips.	The proposed car park layout is expected to conform with the Australian Standards 2890 part 1: Off-street parking. The one-way circulating flow and adequate parking and manoeuvring aisles will introduce efficient and safe traffic flow. The car park surface will be an all-weather hard wearing gravel surface with appropriate drainage.
6.7.2 Design and layout of car parking.	The parking spaces will be class 3A for high turnover, ensuring easy manoeuvrability into and out of the spaces. The width of the aisles will be in accordance with the Australian Standard. The gradient of the parking area will be designed for 5 percent or less. The access road will be a minimum of 5.5 metres in width, to accommodate two-way traffic movements. The layout provides for a turning circle and ensures all vehicles move in a forward direction when entering and leaving.
6.7.3 Car parking access, safety, and security.	The development is for day use, with no night time activity expected. No vehicles are expected to park overnight and the need for security lighting is not considered necessary given the use and location.
6.7.4 Parking for persons with a disability.	This type of use is not expected to create a demand by disable persons.
6.7.5 No standard	
6.7.6 Loading and unloading of vehicles, drop-off and pickup.	This development will not create a demand for deliveries, and special loading and unloading facilities is considered unwarranted.

9.3. E6.8 Provision for sustainable Transport

This development does not include employees and therefore end of trip bicycle facilities are not required.

E6.8.5 Pedestrian walkways

The car park incorporates one-metre-wide pedestrian walkways, separated from the parking spaces, and designed to meet the expected to use the facilities.

10. Conclusion

From a traffic engineering and road safety perspective, additional traffic generated from this development site is not expected to create any adverse safety, amenity, or traffic efficiency problems, as:

- the amount of traffic generated is considered low, and there is sufficient capacity within the Mount George Road to absorb the extra traffic movements,
- the development will be supported by a new car park that is expected to meet the reasonable demand, and no overflow of parked vehicles is expected on the public road network,
- the new access to the car park will be supplemented with road humps located to the east of the access; the road humps are expected to reduce the operating speed of approaching vehicles to less than 44 km/h; the corresponding Safe Intersection Sight Distance for 44 km/h is 49 metres with grade correction, and the available sight distance will satisfy the planning scheme sight distance requirements, and
- the layout of the new car park will be designed to satisfy the Australian Standards 2890 part 1 and is expected to operate safely and efficiently.

This Traffic Impact Assessment found no reasons for this development not to proceed.