

JMG

203 & 205 Old Beach Road Traffic Impact Statement

August 2023





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1. Introduction

1.1 Background

Midson Traffic were engaged by JMG to prepare a traffic impact statement for a proposed rezoning proposal for future residential subdivision at 203 & 205 Old Beach Road, Old Beach.

1.2 Traffic Impact Assessment/ Traffic Impact Statement

A traffic impact assessment (TIA) is a process of compiling and analysing information on the impacts that a specific development proposal is likely to have on the operation of roads and transport networks. A TIA should not only include general impacts relating to traffic management but should also consider specific impacts on all road users, including on-road public transport, pedestrians, cyclists and heavy vehicles.

A traffic impact statement (TIS) is a reduced form of a TIA, where only specific traffic and/or parking matters are required to be investigated. A TIS is often undertaken when the full traffic and transport impacts associated with a development are not considered necessary.

This TIS has generally been prepared in accordance with the Department of State Growth (DSG) publication, *A Framework for Undertaking Traffic Impact Assessments*, 2007. This TIS has also been prepared with reference to the Austroads publication, *Guide to Traffic Management*, Part 12: *Traffic Impacts of Developments*, 2019.

This TIS also addresses the relevant clauses of Code C3.0, *Road and Railway Assets Code,* of the Tasmanian Planning Scheme - Brighton, 2021.

1.3 Statement of Qualification and Experience

This TIA has been prepared by an experienced and qualified traffic engineer in accordance with the requirements of Council's Planning Scheme and The Department of State Growth's, *Traffic Impact Assessment Guidelines*, August 2020, as well as Council's requirements.

The TIA was prepared by Keith Midson. Keith's experience and qualifications are briefly outlined as follows:

- 27 years professional experience in traffic engineering and transport planning.
- Master of Transport, Monash University, 2006
- Master of Traffic, Monash University, 2004
- Bachelor of Civil Engineering, University of Tasmania, 1995
- Engineers Australia: Fellow (FIEAust); Chartered Professional Engineer (CPEng); Engineering Executive (EngExec); National Engineers Register (NER)





1.4 Project Scope

The project scope of this TIA is outlined as follows:

- Review of the existing road environment in the vicinity of the site and the traffic conditions on the road network.
- Provision of information on the proposed development with regards to traffic movements and activity.
- Identification of the traffic generation potential of the proposal with respect to the surrounding road network in terms of road network capacity.
- Review of the parking requirements of the proposed development. Assessment of this parking supply with Planning Scheme requirements.
- Traffic implications of the proposal with respect to the external road network in terms of traffic efficiency and road safety.

1.5 Subject Site & Study Area

The subject site is located at 203 & 205 Old Beach Road, Old Beach. The site is currently a vacant lot.

The study area includes all land potentially accessed by Riviera Drive, between East Derwent Highway and Old Beach Road. The subject site, study area and surrounding road network is shown in Figure 1.





Figure 1 Subject Site & Surrounding Road Network

Image Source: LIST Map, DPIPWE

1.6 Development Proposal

The proposed development involves rezoning of the subject site to general residential. The proposed rezoning of the site from 'Future Urban' to 'General Residential' and 'Low Density Residential'. No subdivision is proposed at this stage of development. The rezoning is shown in Figure 2.





Figure 2 Rezoning Plan

1.7 Reference Resources

The following references were used in the preparation of this TIA:

- Tasmanian Planning Scheme Brighton, 2021 (Planning Scheme)
- Austroads, Guide to Traffic Management, Part 12: Traffic Impacts of Developments, 2019
- Austroads, Guide to Road Design, Part 4A: Unsignalised and Signalised Intersections, 2021
- Department of State Growth, *Traffic Impact Assessment Guidelines*, 2020
- Roads and Maritime Services NSW, *Guide to Traffic Generating Developments*, 2002 (RMS Guide)
- Roads and Maritime Services NSW, *Updated Traffic Surveys*, 2013 (Updated RMS Guide)
- Australian Standards, AS2890.1, *Off-Street Parking*, 2004 (AS2890.1)



2. Existing Conditions

2.1 Transport Network

For the purpose of this report, the transport network consists of East Derwent Highway, Old Beach Road, Lottie Way and Riviera Drive.

2.1.1 East Derwent Highway

East Derwent Highway is a Category 3 'Regional Access Road' under State Growth's Tasmanian State Road Hierarchy. Regional Access Roads are of strategic importance to regional and local communities and economies. They link towns and regions to Category 1 and 2 roads and provide an important freight task role (although to a lesser extent to Category 1 and 2 roads). It carries approximately 11,500 vehicles per day (State Growth traffic data).

The posted speed limit of East Derwent Highway is 80-km/h. East Derwent Highway carries approximately 8,750 vehicles per day¹. Peak flows are 618 and 911 vehicles per hour for the AM and PM peak periods respectively. Peak directional flows are:

- AM Peak Northbound 280 vph; Southbound 522 vph
- PM Peak
 Northbound 645 vph; Southbound 390 vph

Peak hourly flow is shown in Figure 3. Peak hourly directional traffic flow of the East Derwent Highway is shown in Figure 4. The East Derwent Highway at the Riviera Drive junction is shown in Figure 5.

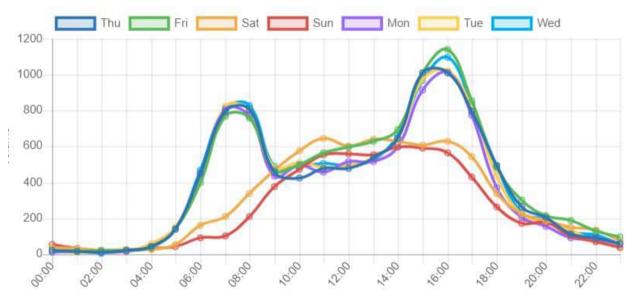


Figure 3 East Derwent Highway Hourly Traffic Flow

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 $^{^{\}rm 1}$ Department of State Growth, 2022 traffic data, north of Old Beach Road junction.



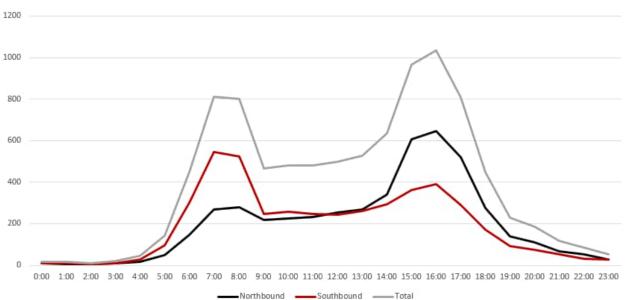


Figure 4 East Derwent Highway Peak Directional Flow





2.1.2 Old Beach Road

Old Beach Road connects between East Derwent Highway at its southern end, and Briggs Road/ Gage Road at its northern end. Old Beach Road provides a rural collector road function that services a residential catchment east of East Derwent Highway.

Old Beach Road extends across the eastern boundary of the subject site, but does not provide direct vehicular connectivity to the site.



2.1.3 Lottie Mews

Lottie Mews is a local residential road that services the existing subdivision within the study area. It currently connects between Riviera Drive and Arbie Lane. The northern end of Lottie Mews connects to the subject site.

The sealed pavement width of Lottie Mews is 7.9 metres. The general urban speed limit of 50-km/h is applicable to Lottie Mews.

2.1.4 Riviera Drive

Riviera Drive is a residential collector road that connects between East Derwent Highway and Littie Mews. The road reservation of Riviera Drive extends to Old Beach Road, however the road has not been constructed to provide connectivity.

The sealed pavement width of Riviera Drive is approximately 8 metres. The general urban speed limit of 50-km/h is applicable to Riviera Drive.

Riviera Drive connects to the East Derwent Highway at a T-junction with channelised right turn lane. The East Derwent Highway/ Riviera Drive junction is shown in Figure 5.

2.2 Road Safety Performance

Crash data can provide valuable information on the road safety performance of a road network. Existing road safety deficiencies can be highlighted through the examination of crash data, which can assist in determining whether traffic generation from the proposed development may exacerbate any identified issues.

Crash data was obtained from the Department of State Growth for a 5+ year period between 1st January 2018 and 31st July 2023 for Riviera Drive, Lottie Mews and Old Beach Road.

The findings of the crash data is summarised as follows:

- 1 crash was reported in Riviera Drive the single vehicle crash was reported at 3:44pm, 24th May 2023 at the intersection of Rachel Crescent and Riviera Drive involving property damage only.
- No crashes were reported in Lottie Mews.
- 4 crashes were reported in Old Beach Road. These are detailed as follows:
 - → 12:30am, 26th December 2020, 'other-straight' crash at a midblock location resulting in property damage only.
 - → 11:15am, 29th January 2021, 'right-through' collision at the intersection of Mollineaux Drive and Old Beach Road resulting in property damage only.
 - $\rightarrow~$ 12:30pm, 14th March 2022, 'leaving-parking' crash at a midblock location resulting in property damage only.
 - → 5:55am, 6th March 2023, 'other-straight' collision at the intersection of East Derwent Highway resulting in property damage only.



The crash rate does not provide any indication that there are pre-existing road safety deficiencies in the transport network near the subject site. It is noted that much of the study area is under construction, and the full traffic generation associated with approved subdivisions has not yet been realised.

Importantly no crashes have been reported at the East Derwent Highway/ Riviera Drive junction.



3. Traffic Impacts

3.1 Traffic Generation Rates

Traffic generation rates were sourced from the RMS Guide. The RMS Guide states the following traffic generation rates for residential dwellings:

- Daily vehicle trips
 7.4 trips pe
- Weekday peak hour vehicle trips
- 7.4 trips per dwelling per day
- 0.78 trips per dwelling per hour

3.2 Subject Site Traffic Generation

The following assumptions have been applied to the proposed rezoned land in order to determine the likely number of lots that may be applicable to the rezoned lane:

- Assuming an average lot size of 500 m² (consistent with typical lot sizes in adjacent subdivision within the subject site, generally ranging from 500m² to 1,500m² and assuming a 'worst-case' scenario of only small lot sizes).
- Road infrastructure will utilise approximately 20% of the site area. This is consistent with adjacent subdivision areas (typically with road infrastructure utilising 20-30% of available land).
- The total area of the site is 6.4 hectares, however some of this land is constrained due to the creek and required setbacks. The subdividable area of the subject site is approximately 6.2 hectares. This equates to a maximum lot yield of 101 lots.

Based on the trip generation rates in Section 3.1, the traffic generation from future subdivision of the rezoned land within the subject site is 747 vehicles per day, with a peak of 79 vehicles per hour.

3.3 Subject Site and Existing Subdivision Traffic Generation

It is important to consider the potential traffic generation associated with the subject site in addition to the approved subdivision in the study area (including constructed and approved subdivision). This excludes vacant land within the subject site that has not yet been considered for subdivision.

The traffic generation associated with the existing subdivision area in addition to the potential subdivision associated with the subject site includes:

- 90 recently approved lots accessed via the eastern end of Riviera Drive (including subdivision within new roads such as Lottie Mews, Maritimo Way, Arbie Lane, etc).
- 130 established lots accessed via the full length of Riviera Drive (including Rachel Crescent, Lewis Court, Jye Court, Hannah Court, Amelia Court, etc).
- 101 potential lots associated with the subject site.



This equates to a total of 321 lots associated with this scenario. The traffic generation associated with this scenario is 2,375 vehicles per day with a peak of 250 vehicles per hour. This has been modelled as 'Scenario 1' to determine the potential impacts associated with future subdivision of the subject site.

3.4 Study Area Maximum Traffic Generation

The study area is in various stages of development, with established residential subdivision areas, areas of subdivision under construction, and vacant land.

The number of lots (actual and estimated) within the study area, including the subject site, is summarised as follows:

- 90 recently approved lots accessed via the eastern end of Riviera Drive (including new roads such as Lottie Mews, Maritimo Way, Arbie Lane, etc).
- 130 established lots accessed via the full length of Riviera Drive (including Rachel Crescent, Lewis Court, Jye Court, Hannah Court, Amelia Court, etc).
- 101 potential lots associated with the subject site.
- Approximately 150 potential lots associated with Lot 4 Lewis Court (using the same methodology as Section 3.2 and noting constraints associated with setbacks from the highway).

The total number of potential lots within the study area, excluding the subject site, is therefore 471 lots.

The traffic generation associated with the subject site is therefore 3,485 vehicles per day, with a peak of 367 vehicles per hour. This has been modelled as 'Scenario 2' to determine the potential impacts associated with future subdivision of the subject site.

3.5 Trip Assignment

The transport network utilises Riviera Drive as a minor collector road for the study area. All traffic generated by future subdivision of the subject site will utilise Riviera Drive to connect to the East Derwent Highway.

Two scenarios have been considered in the assessment of trip assignment:

- <u>Scenario 1</u>. All existing approved subdivision within the study area including the subject site's potential traffic generation associated with future subdivision. Peak hour traffic flow on the highway has been factored for 10-year growth, using a compound growth rate of 1.5% per annum.
- <u>Scenario 2</u>. All potential traffic generation within the study area, including existing approved subdivision, potential traffic generation associated with the subject site, and future subdivision of the remaining land in the study area. Peak hour traffic flow on the highway has been factored for 10-year growth, using a compound growth rate of 1.5% per annum.



The future turning movements associated with the East Derwent Highway/ Riviera Road junction are summarised in Table 1.

Scenario/ Peak	Left-In	Right-In	Left-Out	Right-Out	Northbound	Southbound
AM Scenario 1	49 vph	26 vph	114 vph	61 vph	325 vph	606 vph
PM Scenario 1	57 vph	93 vph	88 vph	12 vph	749 vph	453 vph
AM Scenario 2	72 vph	38 vph	167 vph	90 vph	325 vph	606 vph
PM Scenario 2	83 vph	137 vph	131 vph	15 vph	749 vph	453 vph

 Table 1
 East Derwent Highway/ Riviera Turning Movements

3.6 East Derwent Highway/ Riviera Drive Analysis

The subject site will connect to Riviera Drive via Lottie Mews. Riviera Drive provides the sole access to the external network, at its junction with the East Derwent Highway. The operational performance of the intersection of East Derwent Highway and Riviera Drive was therefore assessed using SIDRA Intersection traffic modelling software. SIDRA uses complex analytical traffic models coupled with iterative approximation technique to provide estimates of capacity and performance of intersections. SIDRA is endorsed as a modelling tool by Austroads.

3.6.1 SIDRA Modelling

One of the key SIDRA outputs is an indication of level of service (LOS) at intersections. The LOS concept describes the quality of traffic service in terms of 6 levels, with level of service A (LOS A) representing the best operating condition (ie. at or close to free flow) and level of service F (LOS F) representing the worst (i.e. forced flow). Other key outputs of SIDRA include average movement delay and 95th percentile queue lengths².

The level of service method used in the modelling is the Delay method, where level of service is based solely on average movement delay, including geometric delay, as summarised in Table 2.

 $^{^{\}rm 2}$ This is the queue length not exceeded 95% of the time.



Level of Service	Signals and Roundabouts	Sign Control (Give Way & Stop)
Α	$d \leq 10$	$d \le 10$
В	$10 < d \le 20$	$10 < d \le 15$
С	$20 < d \le 35$	$15 < d \le 25$
D	$35 < d \leq 55$	$25 < d \le 35$
E	$55 < d \le 80$	$35 < d \le 50$
F	80 < <i>d</i>	50 < <i>d</i>

Table 2 SIDRA LOS Performance standards

The lowest target level of service considered acceptable for an urban environment is LOS D, which corresponds to a maximum delay of 35 seconds for give-way control. LOS E and F represent the junction operating at capacity, with forced flow conditions.

3.6.2 Junction Modelling Results

Scenarios 1 and 2 were modelled during the AM and PM peak periods. The SIDRA modelling indicates that the junction performs at a satisfactory LOS D for Scenario 1 during both peak periods.

For Scenario 2. the modelling indicates that the junction performance deteriorates to LOS E during the PM peak period for the Riviera Drive approach. This demonstrates that the junction cannot cater for full development of the study area as the only junction to the external road network.

The modelling indicates that the junction can accommodate approximately 450 lots before the junction deteriorates below LOS D in 10 years.

For full development to occur, the following options are considered appropriate:

- The conversion of the junction to a large diameter roundabout.
- The construction of a new T-Junction connecting to Old Beach Road. It is noted that a road reservation currently extends between the eastern termination of Riviera Drive and Old Beach Road. Careful road design could result in a road junction that would cater for traffic generated from the study area (broader than the subject site).



Table 3 AM Scenario 1 SIDRA Modelling Summary

Performance	- Vehicles						
Turn	Demand Flow veb/b	HV «	Deg. Satn	Average Delay	Level of Service	Vehicles	Queue Distance m
erwent Hwy	VCIDI	20	w.c	300		Ven	
Т	342	10.5	0.187	0.0	LOS A	0.0	0.0
R	27	5.0	0.042	12.5	LOS B	0.2	1.1
	369	10.1	0.187	0.9	NA	0.2	1.1
Drive							
L	120	5.0	0.230	14.1	LOS B	0.9	6.3
R	64	5.0	0.337	28.8	LOS D	1.1	8.4
	184	5.0	0.337	19.2	LOS C	1.1	8.4
erwent Hwy							
L	52	5.0	0.029	8.4	LOS A	0.0	0.0
т	638	10.5	0.349	0.0	LOS A	0.0	0.0
	689	10.1	0.349	0.6	NA	0.0	0.0
	1243	9.3	0.349	3.5	NA	1.1	8.4
	Turn Derwent Hwy T R Drive L R R Verwent Hwy L	Turn Flow veh/h Derwent Hwy 7 T 342 R 27 369 369 Drive 120 L 120 R 64 184 verwent Hwy 52 T 638 689	Tum Demand Flow veh/h HV Derwent Hwy	Tum Demand Flow veh/h HV % Deg. Sath v/c Derwent Hwy	Tum Demand Flow veh/h HV % Deg. Satn v/c Average Delay Sec Derwent Hwy	Tum Demand Flow veh/h HV % Deg. Satn v/c Average Delay Sec Level of Service Derwent Hwy	Turn Demand Flow veh/h HV % Deg. Satn v/c Average Delay sec Level of Service 95% Back of C Vehicles veh Derwent Hwy

Level of Service (LOS) Method: Delay (HCM 2000). Vehicle movement LOS values are based on average delay per movement Minor Road Approach LOS values are based on average delay for all vehicle movements.

Table 4 PM Scenario 1 SIDRA Modelling Summary

Performance	- Vehicles						
Tum	Demand Flow	HV ∞	Deg. Satn	Average Delay	Level of Service	Vehicles	Distance
Derwent Hwy	Ven/m	20	V/C			ven	m
т	342	10.5	0.187	0.0	LOS A	0.0	0.0
R	40	5.0	0.063	12.8	LOS B	0.2	1.7
	382	9.9	0.187	1.3	NA	0.2	1.7
Drive							
L	194	5.0	0.377	15.6	LOS C	1.7	12.7
R	72	5.0	0.391	30.9	LOS D	1.4	10.0
	265	5.0	0.391	19.8	LOS C	1.7	12.7
erwent Hwy							
L	74	5.0	0.041	8.4	LOS A	0.0	0.0
Т	638	10.5	0.349	0.0	LOS A	0.0	0.0
	712	9.9	0.349	0.9	NA	0.0	0.0
	1359	9.0	0.391	4.7	NA	1.7	12.7
	Turn Derwent Hwy T R Drive L R Derwent Hwy L	Turm Flow veh/h Derwent Hwy 7 T 342 R 40 382 Drive 194 L 194 R 72 265 Derwent Hwy 265 Derwent Hwy 74 T 638 712	Turn Demand Flow veh/h HV Oerwent Hwy	Turn Demand Flow veh/h HV % Deg. Satn v/c Derwent Hwy	Turn Demand Flow veh/h HV % Deg. Satn v/c Average Delay Sec Derwent Hwy	Turn Demand Flow veh/h HV % Deg. Satn v/c Average Delay Sec Level of Service Derwent Hwy	Turn Demand Flow veh/h HV % Deg. Satn v/c Average Delay sec Level of Service 95% Back of 0 Vehicles veh Derwent Hwy

Level of Service (LOS) Method: Delay (HCM 2000). Vehicle movement LOS values are based on average delay per movement Minor Road Approach LOS values are based on average delay for all vehicle movements.



Table 5 AM Scenario 2 SIDRA Modelling Summary

		Demand		Deg.	Average	Level of	95% Back of (Queue
Mov ID	Turn	Flow	HV	Satn	Delay	Service	Vehicles	Distance
		veh/h	%	v/c	sec		veh	m
South: East I	Derwent Hwy							
2	т	342	10.5	0.187	0.0	LOS A	0.0	0.0
3	R	40	5.0	0.064	12.8	LOS B	0.2	1.7
Approach		382	9.9	0.187	1.3	NA	0.2	1.7
East: Riviera	Drive							
4	L	176	5.0	0.343	15.3	LOS C	1.5	11.1
6	R	95	5.0	0.519	34.2	LOS D	2.0	14.5
Approach		271	5.0	0.519	21.9	LOS C	2.0	14.5
North: East D	Derwent Hwy							
7	L	76	5.0	0.042	8.4	LOS A	0.0	0.0
8	т	638	10.5	0.349	0.0	LOS A	0.0	0.0
Approach		714	9.9	0.349	0.9	NA	0.0	0.0
All Vehicles		1366	8.9	0.519	5.2	NA	2.0	14.5

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement

Minor Road Approach LOS values are based on average delay for all vehicle movements.

Table 6 PM Scenario 2 SIDRA Modelling Summary

Movement	Performance	e - Vehicles						
Mov ID	Turn	Demand Flow veh/h	H∨ %	D e g. Satn v/c	Average Delay sec	Level of Service	95% Back of 0 Vehicles veh	Queue Distance m
South: East Derivent Hwy								
2	т	788	10.5	0.432	0.0	LOS A	0.0	0.0
3	R	144	5.0	0.187	11.8	LOS B	0.8	5.5
Approach		933	9.6	0.432	1.8	NA	0.8	5.5
East: Riviera	Drive							
4	L	138	5.0	0.215	12.2	LOS B	0.8	5.9
6	R	16	5.0	0.146	37.8	LOS E	0.4	2.8
Approach		154	5.0	0.215	14.9	LOS B	0.8	5.9
North: East D	Derwent Hwy							
7	L	87	5.0	0.049	8.4	LOS A	0.0	0.0
8	Т	477	10.5	0.261	0.0	LOS A	0.0	0.0
Approach		564	9.6	0.261	1.3	NA	0.0	0.0
All Vehicles		1651	9.2	0.432	2.9	NA	0.8	5.9

Level of Service (LOS) Method: Delay (HCM 2000).

Vehicle movement LOS values are based on average delay per movement

Minor Road Approach LOS values are based on average delay for all vehicle movements.

3.7 Local Road Capacity

The subject site will rely upon the existing road network to absorb the traffic generation associated with future subdivision. The subject site connects directly to Lottie Mews. The design of any future subdivision will need to include a road that connects to Lottie Mews and/or Arbie Lane.

The traffic volumes on Lottie Mews will be approximately 1,000 vehicles per day when considering approved development and future subdivision of the subject site (when fully developed). This traffic volume is well below the capacity of Lottie Mews as a minor collector road. The peak traffic flow will be



in the order of 100 to 120 vehicles per hour, which will result in a high level of service for a residential collector road.

Lottie Mews feeds into Riviera Drive. Riviera Drive is the main collector road that provides access to the study area from East Derwent Highway. Riviera Drive will carry approximately 2,375 vehicles per day when considering approved development and future subdivision of the subject site (when fully developed).

The traffic capacity of Riviera Drive is limited by the junction at East Derwent Highway, which has been demonstrated to have a capacity of 3,330 vehicles per day/ peak of 350 vehicles per hour with the existing junction configuration. The traffic generation associated with the proposed development can be absorbed by the existing junction layout and general construction of Riviera Drive.



4. Conclusions

This traffic impact statement (TIS) provides a high-level traffic assessment of proposed rezoning of land at 203 Old Beach Road, Old Beach.

The key findings of the TIA are summarised as follows:

- The rezoning of the land will result in a potential future subdivision of 101 residential lots.
- The traffic generation associated with future subdivision of the subject site is likely to be 750 vehicles per day with a peak of 80 vehicles per hour.
- When considering the approved subdivision within the study area, including the potential future subdivision of the subject site, the traffic volume of Riviera Drive near East Derwent Highway will be approximately 2,375 vehicles per day with a peak of 321 vehicles per hour. This volume is assuming that Riviera Drive provides the only access to the study area.
- Traffic modelling demonstrates that the existing junction of Riviera Drive and East Derwent Highway can accommodate the traffic volume within the study area, including the potential future subdivision of the subject site. The level of service of the junction results in an acceptable LOS D during peak periods.
- Future subdivision within the area is limited beyond the subject site. The intersection performance of East Derwent Highway/ Riviera Drive will deteriorate to an unacceptable LOS E at approximately 450 dwellings.
- The proposed rezoning can therefore be accommodated with the existing road network, however further development within the study area will be limited.
- There are several options to facilitate further development within the study area. These are summarised as follows:
 - \rightarrow Conversion of the East Derwent Highway/ Riviera Drive junction to a large diameter roundabout.
 - → Extension of Riviera Drive to Old Beach Road. The existing road reservation appears to extend to Old Beach Road.

Based on the findings of this report the proposed rezoning is supported on traffic grounds.



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Document Status

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0	Keith Midson	Zara Kacic-Midson	17 August 2023

