

**Report Prepared for**  
Briody Drive Projects Pty Ltd

12 October 2022

**Briody Drive, Torquay**  
Briody Drive West Development Plan

**traffic:report**

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Version	Date	Issue	Prepared By	Checked By
1.0	2/10/19	DRAFT	S NAIK	A WALLEY
1.0	25/10/19	FINAL	S NAIK	A WALLEY
1.0	12/11/19	FINAL	S NAIK	A WALLEY
2.0	7/02/20	FINAL	S NAIK	A WALLEY
3.0	19/09/21	FINAL	S NAIK	A WALLEY
4.0	08/04/21	FINAL	S NAIK	A WALLEY
5.0	17/06/22	FINAL	N MAHARAJ	A WALLEY
5.0	05/08/2022	FINAL	N MAHARAJ	A WALLEY
6.0	12/10/2022	FINAL	N MAHARAJ	A WALLEY

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Appendices:

**Appendix A      SIDRA Results**

# 1 Introduction:

Ratio Consultants have been engaged by Briody Drive Projects Pty Ltd to prepare a Traffic Impact Assessment for the Briody West Development Plan (Revision 46, 11 October 2022) that includes a retirement village and a residential aged care (including assisted living apartments) in addition to the residential lots.

In the preparation of this assessment, the following documents have been referenced in the preparation of this report:

- Approved Briody Drive West Development Plan, dated 30<sup>th</sup> November 2017;
- Briody Drive West Upgrade – Development Contributions Plan, dated October 2012;
- Road Network Plan – Briody Drive West Torquay, dated 5<sup>th</sup> December 2017.

In the course of preparing this assessment, the subject site and its surrounds have been inspected, plans of the development have been reviewed and relevant traffic data has been collected and analysed.

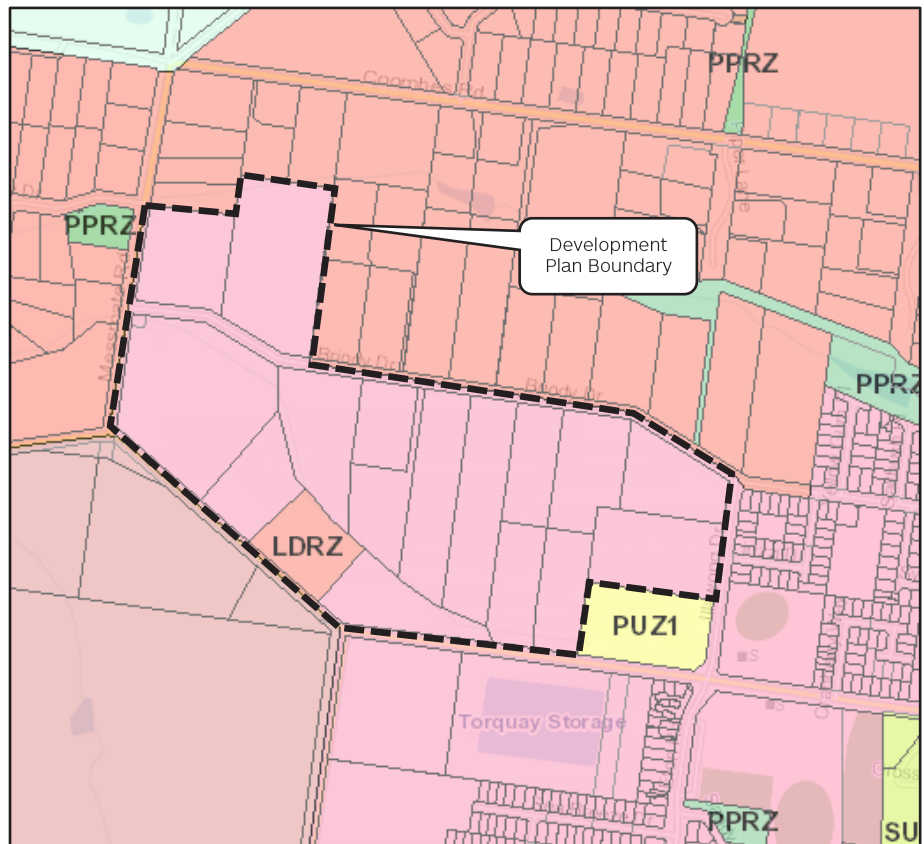
## 2.1 Site Location

The area identified as the Briody Drive West Development Plan in the municipality of Surf Coast Shire comprises a total of 24 properties located to the south of Briody Drive and north of Grossmans Road between Messmate Road and Illawong Drive, in Torquay.

Majority of the site falls within a General Residential Zone (GRZ) with land use to the east being medium density residential, while land use to the south and west of the site being a mix of low density residential and vacant land. The site also includes a parcel of land categorized as Low Density Residential Zone (LDRZ).

The Briody Drive West Development Plan boundary is presented in Figure 2.1 below:

**Figure 2.1: Subject Site Context**



Source: <https://mapshare.vic.gov.au/vicplan>

## 2.2 Road Network

**Briody Drive** is a Local Road that runs in a 'L shaped' alignment between Messmate Road to the west and Grossmans Road to the south.

West of its intersection with Illawong Drive, and through the Development Plan area, Briody Drive has an approximate unsealed carriageway width of 7.2 metres. Briody Drive has a posted speed limit of 50km/hr, and constructed 2.0 metre wide shared path is provided along the northern side within this section of the of the road.

East of its intersection with Illawong Drive, Briody Drive is a sealed road and has an approximate carriageway width of 7.0 metres. Through this section, Briody Drive has a default speed limit of 50km/hr and constructed

footpaths are provided on both sides within this section of the of the road. Kerbside parallel parking is permitted along both sides within this section of the road.

**Illawong Drive** is a Local Road that runs between Briody Drive to the north and Grossmans Road to the south. Further south Illawong Drive continues as Eton Road.

Illawong Drive has sealed carriageway of approximately 11.0 metres that includes two, 3.2 metre wide traffic plus a 2.3 metre wide parking lane along both sides. Kerb outstands are included within the parking lane.

The street has a posted speed limit of 40km/hr. A constructed 2.0 metre wide shared path is provided along the eastern side of the road, with a section of 1.5 metre footpath along the west side of the road south of Briody Drive.

**Messmate Road** is a Local Road that essentially runs in a north-south alignment between Coombes Road and Grossmans Road. North of Coombes Road, Messmate Road continues in a north-east direction to provide a connection to the Surf Coast Highway.

Between Coombes Road and Grossmans Road, Messmate Road has a sealed carriageway, 6.0 metres in width accommodating one lane of traffic in each direction. Messmate Road has a posted speed limit of 50km/hr.

**Grossmans Road** is a Collector Road that runs in an east-west alignment between Surf Coast Highway and Messmate Road. Further west, Grossmans Road provides connection to Anglesea Road.

Between Surf Coast Highway and Illawong Drive, the road has an approximate carriageway width of 11.0 metres with kerbside parallel parking permitted along the northern side. Along the southern side of Grossmans Road, kerbside parallel parking is permitted between Surf Coast Highway and Pimelea Way, while 60-degree angled parking is permitted between Pimelea Way and Illawong Drive.

Grossmans Road has a default speed limit of 50km/hr within this section which is reduced to 40km/hr on school days.

West of Illawong Drive, Grossmans Road has a carriageway width of approximately 7.0 metres and has a posted speed limit of 60km/hr, transitioning to 80 km/hr towards Duffields Road.

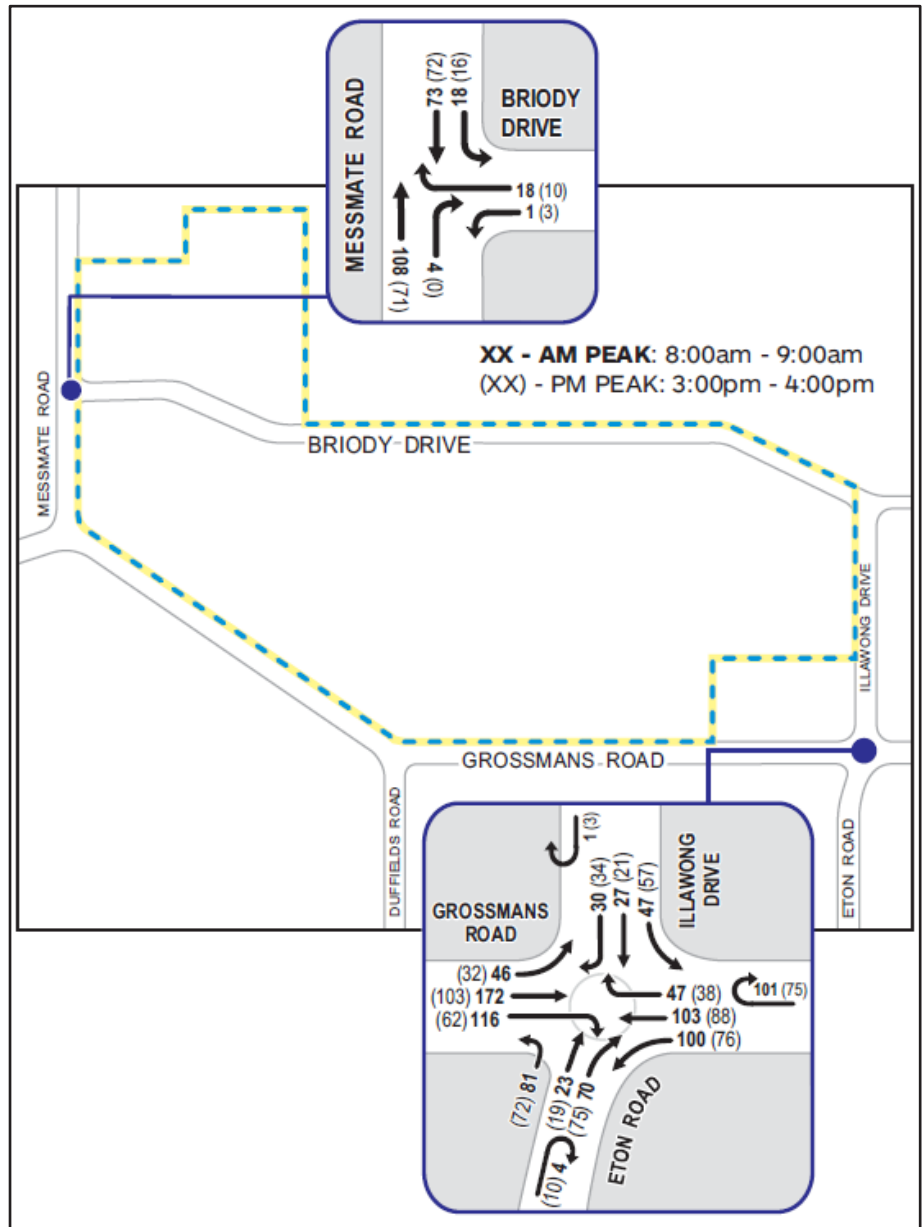
## 2.3 Existing Traffic Conditions

In order to determine the traffic conditions in the immediate vicinity of the site, Ratio Consultants commissioned traffic movement surveys at the following intersections:

- Briody Drive / Messmate Road; and
- Illawong Drive / Messmate Road.

The surveys were undertaken for a 12-hour period on Thursday 15<sup>th</sup> August 2019, between 7:00am & 7:00pm. The network AM peak hour occurred between 8:00am & 9:00am while the network PM peak hour occurred between 3:00pm & 4:00pm. The network peak hour volumes along with the 12-hour volumes both intersections are presented in Figure 2.2 below.

**Figure 2.2: Turning Movement Count Summary**



Daily traffic volumes on local roads are shown in Table 2.1.

These volumes are based on count data sourced from SCSC 7-day tube count. Where this data is not available, volumes are estimated from the turning movement counts undertaken by Ratio and presented in the February 2020 TIA report.

**Table 2.1 External Road Network Traffic Volumes (Existing and Post Development)**

Road	Section	Volumes (vpd)	
		Existing (weekday)	Source
Briody Drive	West	239	SCSC
	East		
Illawong Drive		2100*	Ratio
Messmate Road	North of Briody Drive	2322	SCSC
	South of Briody Drive		
Grossmans Road	West of Illawong Drive	4700*	Ratio
	East of Illawong Drive	5223	SCSC
Duffields Road		3072	SCSC

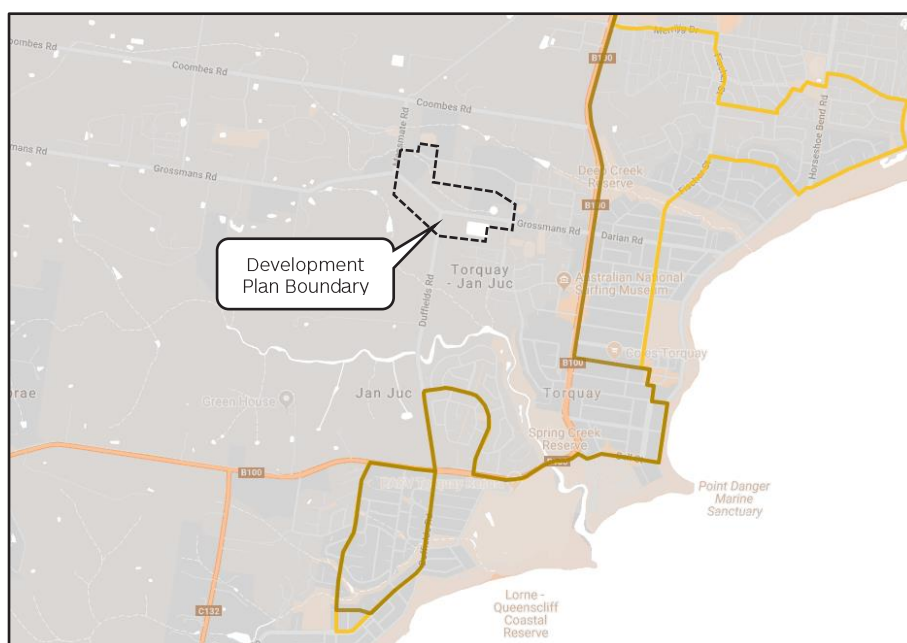
\*estimated from peak hour turning movement counts

## 2.4 Public Transport

The subject site currently has limited access to public transport. The closest bus stop is approximately 1 km east of the site serviced by two bus services operating along the Surf Coast Highway.

The existing public transport services in the vicinity of the subject site are presented in Figure 2.3 below:

**Figure 2.3: Public Transport Services - Buses**



Source: <https://mcharrys.com.au/route-maps>



## 2.5 Active Transport

The provision of pedestrian and cycle infrastructure in the immediacy of the site is ad-hoc, with no separate provision for either typical in historic development areas but with pedestrian paths and some shared paths provided in newer subdivisions and along strategic connections.

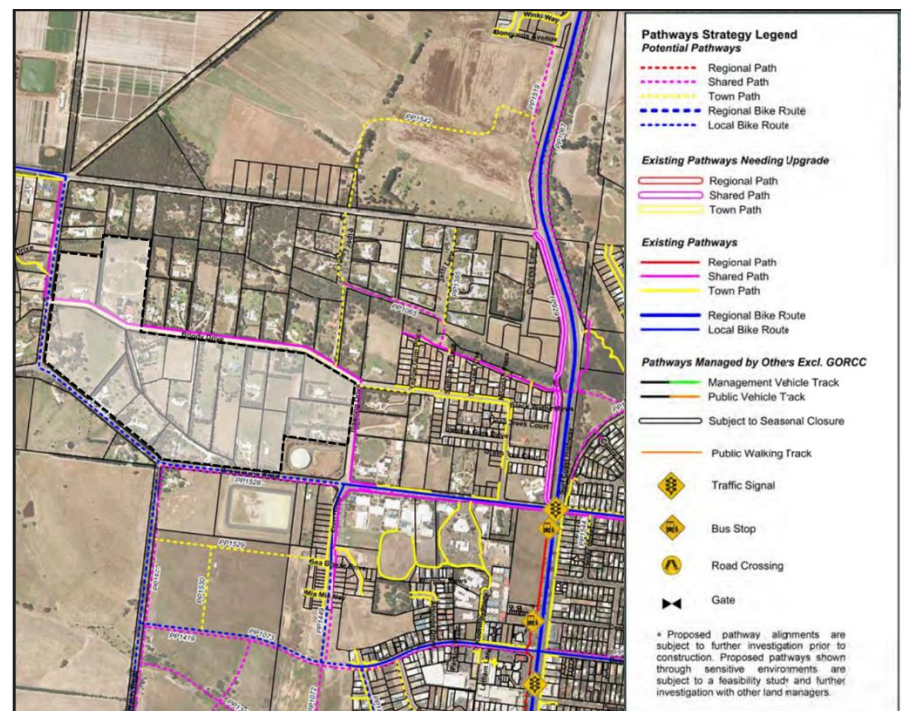
The 2012 Surf Coast Pathway Strategy identifies the path extending along Illawong Drive, Briody Drive west of Illawong Drive, and Messmate Road north of Briody Drive as a shared path.

Surf Coast Highway, Grossmans Road between Surf Coast Highway and Eton Road, south from Grossmans Road are identified as on-road cycle routes.

The Pathway Strategy also identifies the future provision and on-road cycle and off-road shared paths along Grossmans Road west of Illawong Drive and future on-road cycle infrastructure along Messmate Road linking to Coombes Road.

Existing and proposed pedestrian and cycle paths as per the 2012 Surf Coast Pathway Strategy are shown in Figure 2.4.

**Figure 2.4 Cycle and Pedestrian Paths**



Source: *Surf Coast Pathways Strategy*

## 2.6 Road Network Speed Limit Review

Surf Coast Shire is currently seeking a review of posted speed limits along local roads in proximity to the Development Plan area to better align post speeds with the balance of the local road network and community expectations.

This review proposes to:

- Introduce a 60km/h speed limit on Grossmans Road east of Messmate Road, a 70 km/h speed limit between Messmate Road and Ghazeepore Road, and an 80km/h limit west of Ghazeepore Road;

- Introduce a 70km/h speed limit on Coomes Road between Messmate Road and Ghazeeopore Road; and
- Introduce a 70km/h speed limit on Ghazeeopore Road between Coomes Road and Grossmans Road.

This review is currently out for community consultation.

**Figure 2.5: Proposed Local Road Network Speed Limit Changes**



Source: Surf Coast Shire Community information letter, 23 August 2021

## 3.1 Schedule 10 to the Development Plan Overlay

Schedule 10 to Clause 43.04 of the Surf Coast Planning Scheme outlines the objectives and requirements for the preparation of the Development Plan for the subject land.

### Objectives

- To co-ordinate the actions of land owners to ensure a comprehensively planned residential subdivision generally in accordance with the Briody Estate West Concept Plan 2012 contained in this schedule.
- To facilitate an attractive and high amenity residential area that:
  - integrates well with existing and future adjoining residential development and the existing character of Torquay;
  - responds in a sensitive way to the protection of remnant vegetation and the abutting Deep Creek environs; and
  - provides a variety of lot sizes.

### Requirements for the Development Plan

Development Plan requirements at 1.0 of Schedule 10 to Clause 43.04 are listed as follows. Items relevant to movement and access issues are italicised.

The Development Plan must include:

- The location of all proposed land uses including, but not restricted to, roads, public open space (including a local park that is approximately 1 hectare in area), drainage reserves, and other known authority reserves (including sewerage and gas).
- *An internal road network that:*
  - *Provides a high level of permeability through and within the site for pedestrians, cyclists and vehicles, providing direct and safe access to public transport connections, the Deep Creek environs, community facilities and local schools. The network must have regard to future development of 70–140 Briody Drive.*
  - *Considers the need for up to two new vehicle accesses to Grossmans Road between Illawong Drive and Messmate Road to assist in distributing traffic more evenly through the precinct and reducing reliance on Briody Drive as a sole access provided any new intersection can be accommodated by minimising impacts on significant roadside vegetation*
  - *Provides for the upgrading of Briody Drive as an Access Street Level 2.*
- The general subdivision layout, including location and distribution of lots showing a variety of lot sizes and densities to encourage a range of housing types. The layout should maximise solar efficiency to as many lots as possible. Higher residential densities should be focussed around public open space areas.
- Identification of the Deep Creek waterway as a linear open space between Messmate Road and the existing open space reserve generally in accordance with the Concept Plan.
- *Provision of a shared sealed pathway (walking/cycling track) along the waterway and linking to the pathway in the Frog Hollow Estate, to be sited above the 1 in 100 year flood level.*
- Maximising surveillance of public areas through provision of street frontages to areas of public open space.

- *At the interface of Messmate Road and Grossmans Road and the remnant native vegetation the following must be provided:*
  - Retention of the remnant vegetation in a linear reserve to a width to the satisfaction of the responsible authority.
  - *An access street immediately adjacent to the vegetation reserve that will separate private land from the remnant vegetation. The access street road reserve width should be 11.5 metres.*
  - A rural post and rail fence (or similar) between the remnant vegetation and the Grossmans and Messmate Road reserves designed to inhibit uncontrolled pedestrian access to the external road network.
- *Pedestrian and/or bicycle links, including a link from the corner of Grossmans and Messmate Roads to the nearby schools.*
- Designation of areas to be subject to building restrictions and fencing provisions.
- Identification of land aggregation opportunities over the land that will facilitate integrated development and recommended staging of development that provides for the sequential delivery of infrastructure. These opportunities must have regard to ownership pattern, servicing and accessibility and the orderly release of land for residential development.

In addition to the above requirements, Schedule 10 to Clause 43.04 requires that the Development Plan must be supported by a Road Network and Traffic Management Plan that includes:

- An assessment of the traffic generated by the residential development of the land.
- Classification of streets according to standards contained in Clause 56 of the Surf Coast Planning Scheme.
- Pedestrian links from Messmate Road and Grossmans Road to the nearby areas and facilities.
- Identification of all off-site traffic infrastructure requirements associated with the site, including at the intersections of Grossmans Road and Messmate Road, and Messmate Road and Briody Drive and Grossmans Road and Duffields Road, including and land required in order to accommodate a roundabout at the intersection of Grossmans Road and Duffields Road.
- Definition of the cross-sections, including where relevant, verge widths, nature strips, kerb and channel, drainage, pavement widths and pathways for all identified roads within and abutting the development.

# 4 Proposal:

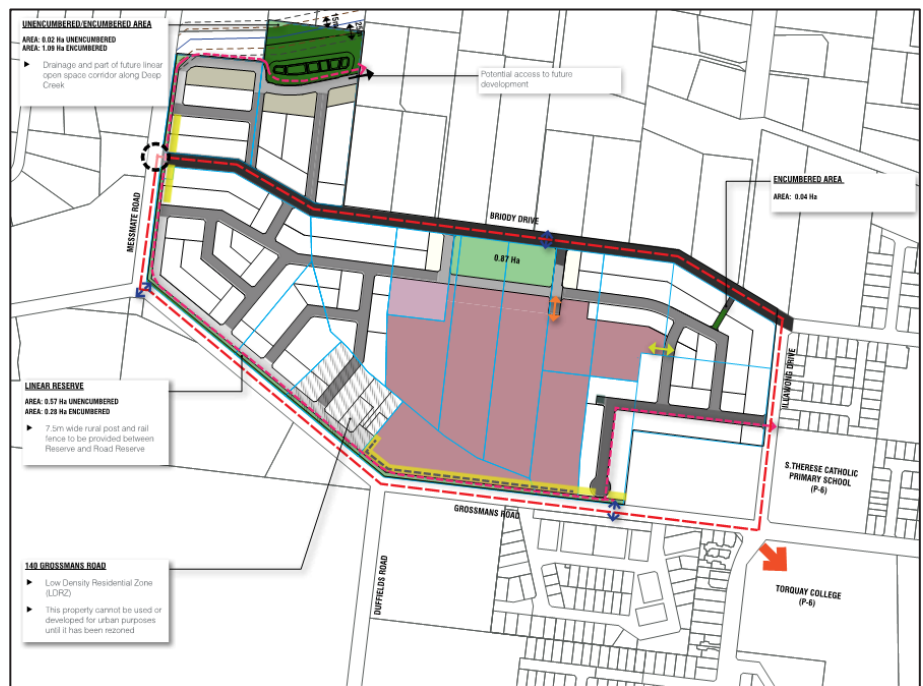
It is proposed to amend the existing Development Plan for Briody Drive West to include a Retirement Village and Residential Aged Care (including assisted living apartments) in addition to the residential lots.

The development plan will include:

- Retirement Village and Residential Aged Care Facility, comprising:
  - 231 x retirement village units;
  - 80 x aged care beds
  - 60 x independent and assisted living apartments
- 335 x residential lots;
- One x multi-unit residential lot (equalling 11 residential lots); and
- One existing low density residential zone (equalling 7 residential lots).

The proposed Development Plan is presented in Figure 4.1 below:

**Figure 4.1: Proposed Development Plan**



## 4.1 Road Network and Hierarchy

### Road Network

The Development Plan road network relies on Briody Drive as the key Development Plan access, with all new access streets linking to Briody Drive with the exception of the proposed local street connection to Illawong Drive in the south-east corner of the land.

This access response has been developed in consultation with Surf Coast Shire as the preferred response, acknowledging a preference to limit impact on the significant vegetation that extends along the Grossmans Road and Messmate Road frontages of the Development Plan area.

The effect of the above on the Development Plan street network is that that future generated traffic will seek to filter to Briody Drive before distributing across the wider road network and that the lack of vehicle access to Grossmans Road and Messmate Road will discourage the desire and need for external vehicle traffic to filter through the Development Plan street network.

The operational impacts of the above have been considered as part of the traffic impact assessment, discussed in Section 5.

The Torquay West Development Plan road network proposes:

- An internal road network as a series of access streets, single loaded frontage streets and a limited number of 'Mews' streets linking to Briody Drive and Illawong Drive;
- A staged approach to Briody Drive West as:
  - An interim connector street with an 8.7m carriageway as two traffic lanes plus shoulders; and
  - An ultimate connector street with an 11.0m carriageway as two traffic lanes plus parking lane plus shoulders (to be delivered by Council in the future as traffic volumes necessitate).

The Development Plan also makes provision for a future roundabout at the Messmate Road / Briody Drive intersection that would be delivered by Council in the future as traffic volumes necessitate.

Street characteristics are consistent with the road and neighbourhood street guidance in Table C1 at Clause 52.06-8 of the Surf Coast Planning Scheme and as per the requirements of the Infrastructure Design Manual (IDM).

Court bowls will be provided with a 28.0 metre reserve diameter, consistent with the requirements of the Infrastructure Design Manual and equivalent to such turning treatments as delivered within the Torquay North development area and elsewhere across Torquay.

Roads within the Retirement Village and Residential Aged Care site will be delivered as a private road network, with the arrangement and configuration to be resolved as part of a future development application.

Proposed street design characteristics are outlined in Table 4-1.

The proposed interim and ultimate Development Plan road hierarchies are illustrated in Figure 4.2 and Figure 4.2.

**Table 4-1 Internal Street Design Characteristics**

Street	Reserve	Carriageway	Notes
Access Street Level 1	16.25m	7.3m	With shared path
Access Street Level 1	16.0m	7.3m	
Access Street Level 1	14.5m	7.3m	Open space interface
Access Street Level 1	12.5m	5.5m	Single loaded, Grossmans Road and Messmate Road interfaces
Mews – Limited Access	12.0m	3.5-4.0m	Limited lot access only. Shared area
Briody Drive (Interim)	20.0m	8.7m	Carriageway configured as 2 x 3.5m traffic lanes plus narrow sealed shoulders (1.0m south, 0.7m north)
Briody Drive (Ultimate)	20.0m	11.0m	Carriageway configured as 2 x 3.5m traffic lanes plus narrow sealed shoulders (1.0m south, 0.7m north) plus 1 x 2.3m parking lanes (as indented lanes)

### Path Network

Standard 1.5 metre wide footpaths will be provided along all both sides internal roads within the Development Plan area with the following exceptions:

2.0 metre wide paths will be provided along Briody Drive (existing north side, proposed on the south side)

A 2.5 metre shared path will extend along the Messmate Road and Grossmans Road interface

Paths will be provided on both sides of the road where lots are along both sides.

A shared path will be provided along the Grossmans Road and Messmate Road frontages and extend through to Illawong Drive via the internal street network and through the open space / wetland interface in the north-west corner of the Development Plan area.

Figure 4.2: Development Plan Movement Network - Interim



Figure 4.3: Development Plan Movement Network - Ultimate





## 5.1 Traffic Generation

### Retirement Village and Aged Care

The Transport Road and Maritime Services (previously RTA) Guide to Traffic Generating Developments (Update August 2013) recommends daily traffic generation of 2.1 vehicle movements per day per dwelling for housing for seniors, with a weekday peak hour rate of 0.4 vehicle movements per dwelling which typically occurs outside of commuter peak hours.

The RMS data also identifies that traffic generation rates for housing with seniors typically has an inverse relationship to the level of support offered. That is, the higher the level of support offered by the accommodation type, the lesser the level of traffic generation is experienced.

The above is confirmed by traffic generation surveys conducted by Ratio Consultants at various aged care facilities, which demonstrate that the aged care facilities generate a relatively low traffic, particularly during the AM and PM peak periods.

Noting the above, the RMS rates above have been applied to the 231 units in the retirement village units, with reduced rates equivalent to 80 percent of the RMS rates applied across the ILU's and aged care beds.

The above equates to 720 movements per day with 143 peak hour movements. We expect movements during peak hours to be evenly split between inbound and outbound.

### Residential Lots

A traffic generation rate of 10 daily vehicle trips per lot was adopted for assessing the traffic impacts on the surrounding road network, with 10% of the daily vehicle movements in the AM and PM peak hours (one per lot).

For the purposes of this assessment a similar rate has been adopted for the following:

- Residential Lots (335 Lots);
- Multi-Unit Residential Lot (11 Lots); and
- Low-Density Residential Lot (7 Lots) – This yield has been calculated based on the minimum 0.2 Ha lot size permitted under the Surf Coast Planning Scheme for the LDRZ.

## Summary

Application of the above rates results in the AM, PM & daily traffic generation as outlined in Table 5-1 below:

**Table 5-1: Traffic Generation Summary**

Land Use	Number	Daily Trips	AM Peak Hour		PM Peak Hour	
			IN	OUT	IN	OUT
Retirement Village	231 Units	485	49	49	49	49
Residential ILU's	60 Units	94	9	9	9	9
Residential Aged Care	80 beds	141	13	14	14	13
Residential Lots	335 Lots	3350	67	268	235	101
Multi-Unit Residential Lot	11 Lots	110	2	9	8	3
Low-Density Residential Lot	7 Lots	70	1	6	5	2
	<b>TOTAL</b>	<b>4250 Trips</b>	<b>141</b>	<b>355</b>	<b>320</b>	<b>177</b>

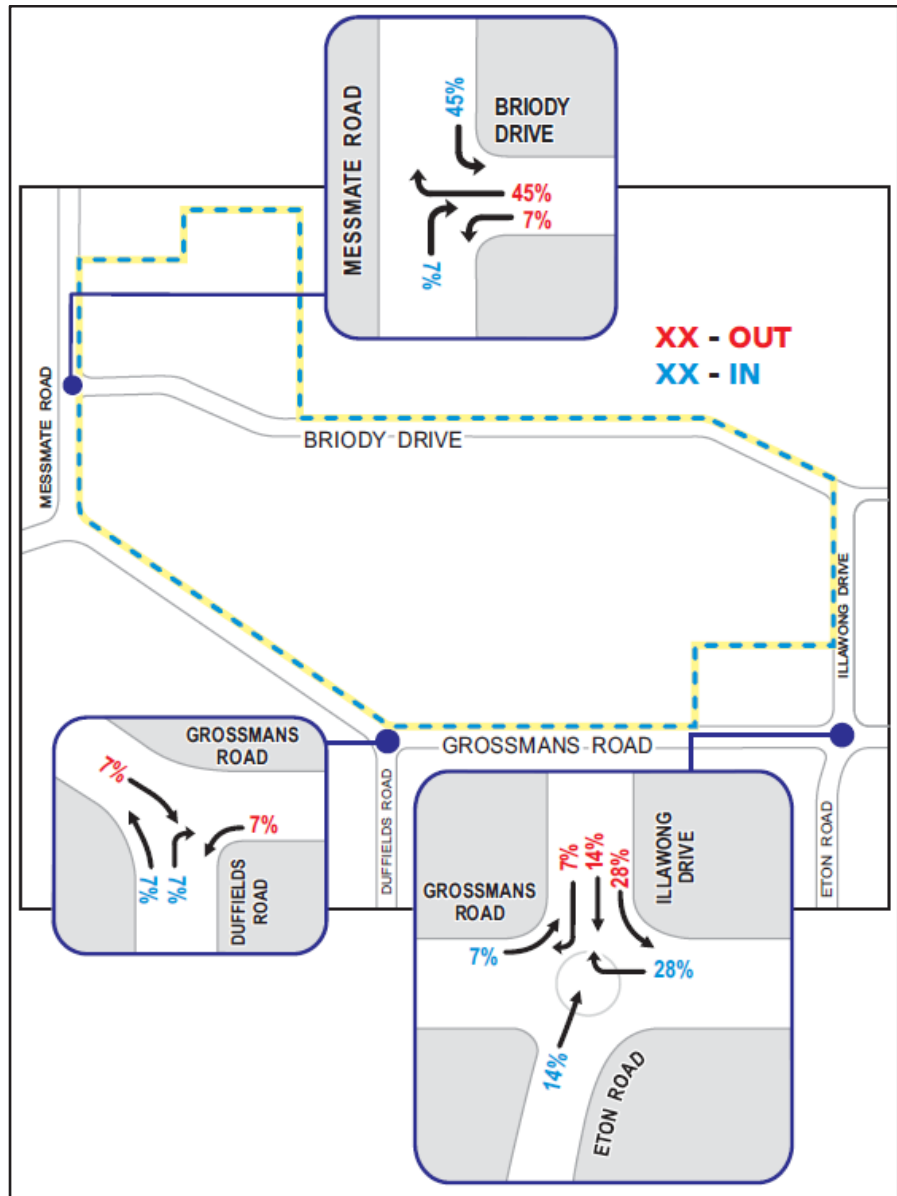
## 5.2 Traffic Distribution

The traffic distribution assumptions adopted for the Briody Drive West Development Plan are as follows:

- 45% to/from the west via Messmate Road towards Coombes Road;
- 28% to/from the south via Illawong Drive and Grossmans Road;
- 14% to/from the south via Illawong Road and Eton Road; and
- 13% to/from the south via Duffields Road, distributed as:
  - 6.5% via Illawong Drive & Grossmans Road; and
  - 6.5% via Messmate Road & Grossmans Road.

Based on our review of the surrounding road network, we consider that the above traffic distribution assumptions are satisfactory. Therefore, the traffic generated by subject site has been distributed having regard to the adopted assumptions for traffic distribution, as outlined above. The traffic distribution is presented in Figure 5.1 below:

Figure 5.1: Traffic Distribution



### 5.3 Post Development Road Network Traffic Volumes

Adopting the above traffic distribution, the amended BDDP is expected to generate the following traffic to Briody Drive and surrounding roads.

- Briody Drive West: +2170 vpd
- Briody Drive East: + 650 vpd
- Illawong Drive: + 2040 vpd
- Messmate Road North: + 1895 vpd
- Messmate Road South (Briody Dve to Grossmans): + 270 vpd
- Grossmans Road (Messmate to Illawong Drive): +270 vpd
- Grossmans Road (east of Illawong Drive): +1170 vpd
- Duffields Road: + 550 vpd

Adding BDDP area traffic to existing volumes, post development volumes are also presented in Table 5.2.

**Table 5.2 External Road Network Traffic Volumes (Existing and Post Development)**

Road	Section	Volumes (vpd)		
		Existing (weekday)	Source	Post Development
Briody Drive	West	239	SCSC	2409
	East			889
Illawong Drive		2100*	Ratio	4140
Messmate Road	North of Briody Drive	2322	SCSC	4217
	South of Briody Drive			2592
Grossmans Road	West of Illawong Drive	4700*	Ratio	4970
	East of Illawong Drive	5223	SCSC	6393
Duffields Road		3072	SCSC	3622

\*estimated from peak hour turning movement counts

Relevant to road function and issues raised regarding streets and street cross sections:

- Traffic volumes in Briody Drive will remain below 2,500 vehicles per day at Messmate Road, reducing to approximately 890 vehicles per day at Illawong Drive. These volumes compare with the preferred upper limit of 2500 vehicles per day for an Access Street as identified within the IDM and 3000 vehicles per day for an Access Street identified with street network guidelines at Clause 56 of the SCSC Planning Scheme;
- Traffic volumes on Illawong Drive near Grossmans Road will approach 4140 vehicles per day;
- Traffic volumes on Messmate Road north of Briody Drive will approach 4320 vehicles per day. South of Briody Drive, volumes will remain close to current levels. We note that the Messmate Road / Coombes Road intersection is proposed as a roundabout within the Torquay / Jan Juc DCP (with the BDDP area subject to this DCP)
- Traffic increases on Grossmans Road and Duffields Road remain consistent with the current road function of both roads.

We note that traffic volumes on Briody Drive will remain below the level of a connector street, albeit that Briody Drive will be delivered as a connector street as negotiated with Council.

Relevant to external roads we note that:

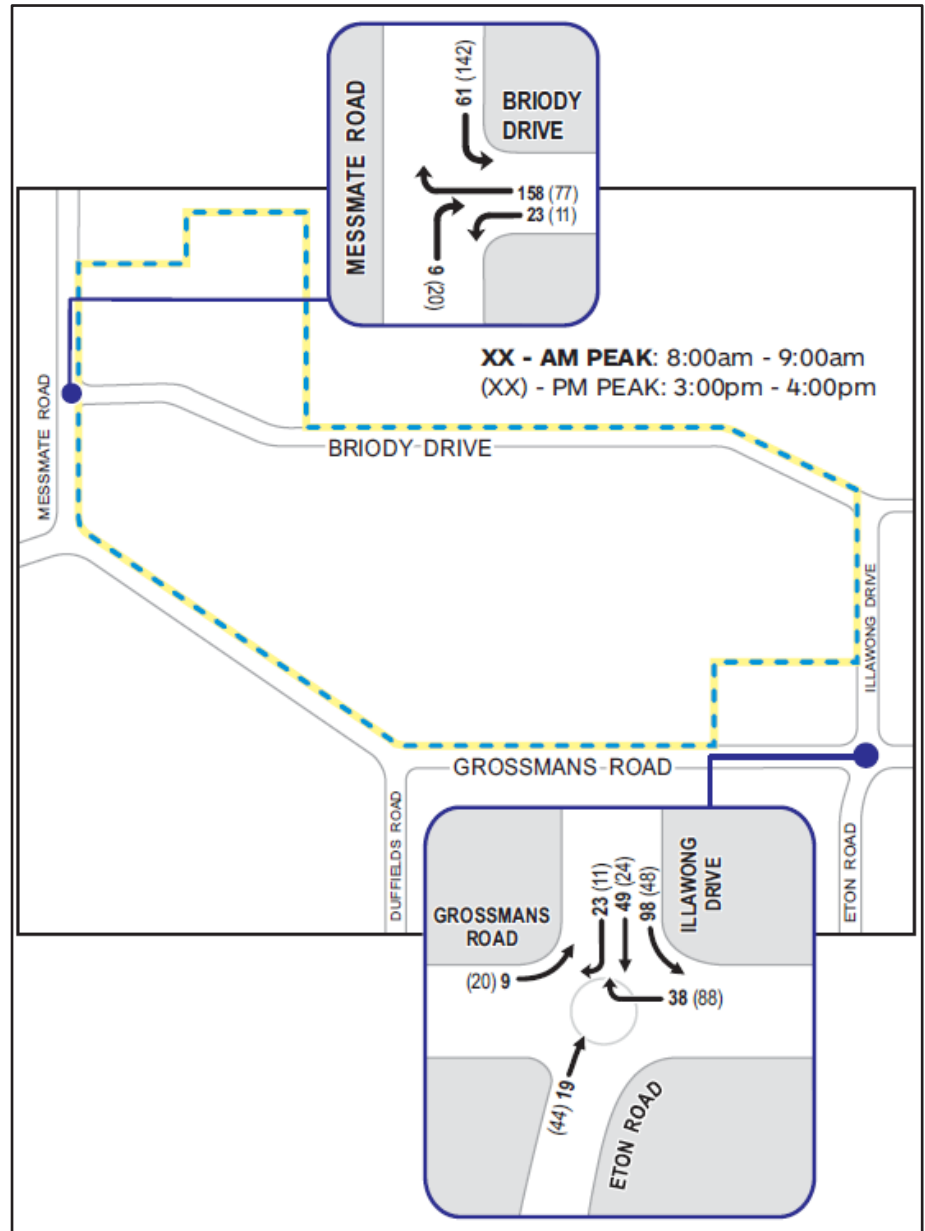
- A significant proportion of the traffic activity near the intersection of Grossmans Road with Illawong Drive is generated by activity associated with Torquay College and Saint Therese Catholic Primary School; and

- The Torquay and Jan Juc Structure Plan and DCP assume the development of the subject land in identifying future infrastructure needs and road/intersection upgrades.

### 5.4 Intersection Operation

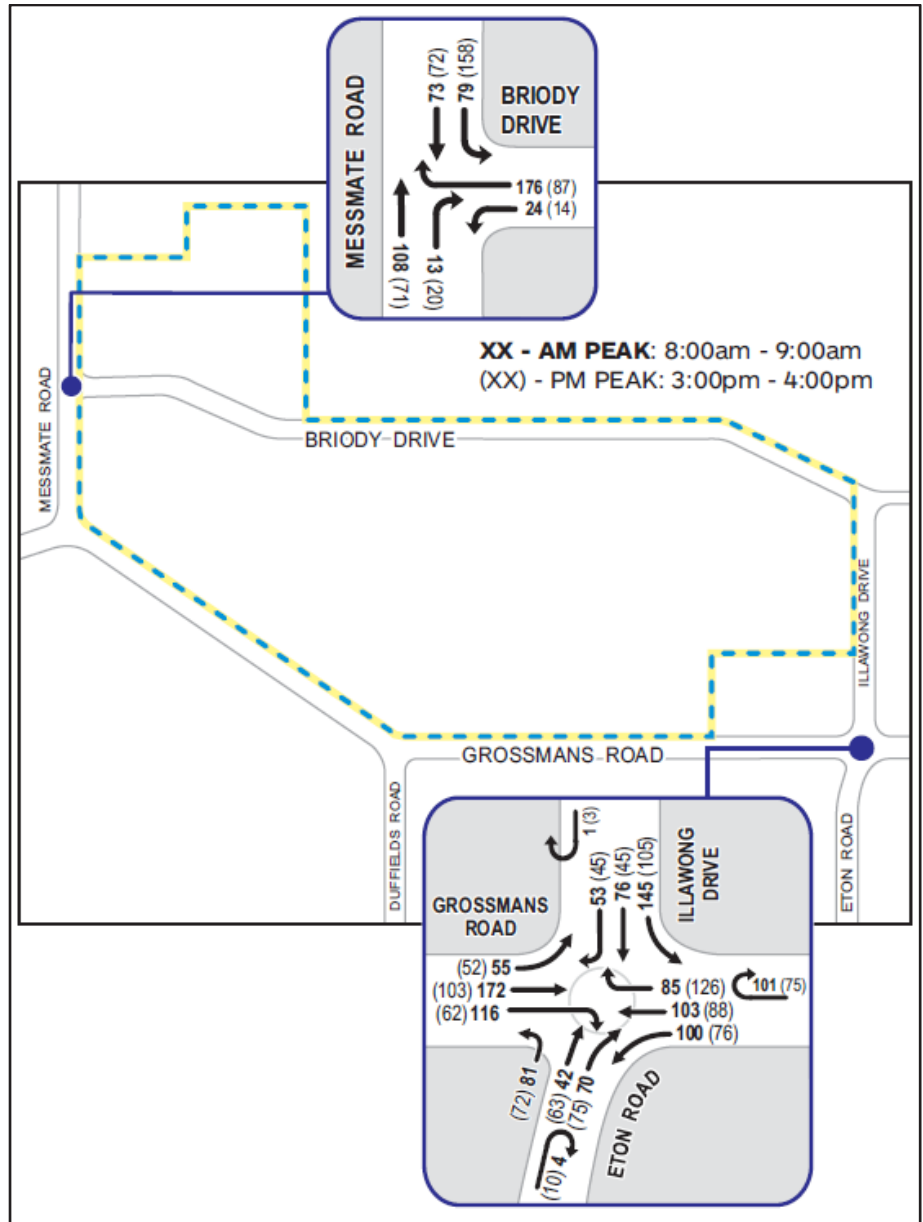
Based on the conservative traffic generation and the traffic distribution discussed above, the estimated traffic volumes generated by the Briody Drive West Development Plan (including the subject site) are presented below in Figure 5.2:

**Figure 5.2: Site Generated Traffic Volumes**



The traffic volumes for the after the complete development of the Briody Drive West Development Plan, are presented below in Figure 5.3:

**Figure 5.3: Post Development Traffic Volumes**



## SIDRA Analysis

As discussed in Section 2.3, Ratio Consultants commissioned turning movement count surveys at the following intersections on 15<sup>th</sup> August 2019 between 7:00am to 7:00pm:

- Briody Drive / Messmate Road; and
- Illawong Drive / Grossmans Road.

The operation of the surveyed intersections was analysed for AM and PM peak hours, using the intersection analysis program SIDRA, in order to assess the future operational characteristics of each intersection.

This computer package, originally developed by the Australian Road Research Board, provides information about the capacity of an intersection in terms of a range of parameters, as described below:

**Degree of Saturation (D.O.S.)** is the ratio of the volume of traffic observed making a particular movement compared to the maximum capacity for that movement. Various values of degree of saturation and their rating are shown in Table 5-3 below:

**Table 5-3: Degree of Saturation Ratings**

Rating	Degree of Saturation (D.O.S.)	
	Unsignalised Intersection / Roundabouts	Signalised Intersection
Excellent	Up to 0.6	Up to 0.6
Very Good	0.60 – 0.70	0.60 – 0.70
Good	0.70 – 0.80	0.70 – 0.90
Acceptable	0.80 – 0.90	0.90 – 0.95
Poor	0.90 – 1.00	0.95 – 1.00
Very poor	Greater than 1.00	Greater than 1.00

The **95th Percentile (95%ile) Queue** represents the maximum queue length, in metres, that can be expected in 95% of observed queue lengths in the peak hour.

**Average Delay** is the delay time, in seconds, which can be expected over all vehicles making a particular movement in the peak hour.

### Weekday AM Peak Hour Conditions

A comparison of the performance of both intersections in the existing and post development scenario for the weekday AM peak hour is presented in Table 5-4 and Table 5-5.

This analysis shows that:

- Both intersections currently operate well below capacity with minimal vehicles queues and with vehicle delays largely attributable to intersection geometry rather than congestion.
- There is negligible change expected to the operation of the Briody Drive / Messmate Road intersection, with all movements remaining well below capacity; and
- There is a minimal change to the DoS on the Illawong Drive approach at the Illawong Drive / Grossmans Road roundabout. DoS remain in

the 'excellent' range and there is no material impact on intersection delays or queues.

**Table 5-4: SIDRA Results - Briody Drive/Messmate Road Intersection**

Approach	Movement	Existing AM Peak			Post Development AM Peak		
		D.O.S.	95%ile Queue (m)	Avg Delay (s)	D.O.S.	95%ile Queue (m)	Avg Delay (s)
South: Messmate Road	Through	0.063	0.2	0.0	0.069	0.6	0.1
	Right	0.063	0.2	5.9	0.069	0.6	6.1
East: Briody Drive	Left	0.018	0.4	5.7	0.195	5.1	5.8
	Right	0.018	0.4	6.3	0.195	5.1	6.6
North: Messmate Road	Left	0.051	0.0	5.5	0.086	0.0	5.5
	Through	0.051	0.0	0.0	0.086	0.0	0.0

**Table 5-5: SIDRA Results - Illawong Drive/Grossmans Road/Eton Road Roundabout**

Approach	Movement	Existing AM Peak			Post Development AM Peak		
		D.O.S.	95%ile Queue (m)	Avg Delay (s)	D.O.S.	95%ile Queue (m)	Avg Delay (s)
South: Eton Road	Left	0.184	7.3	6.2	0.173	6.7	5.9
	Through	0.184	7.3	6.4	0.173	6.7	6.1
	Right	0.184	7.3	9.8	0.173	6.7	9.5
	U-Turn	0.184	7.3	11.5	0.173	6.7	11.2
East: Grossmans Road	Left	0.320	14.3	5.7	0.239	9.7	5.3
	Through	0.320	14.3	5.9	0.239	9.7	5.5
	Right	0.320	14.3	9.3	0.239	9.7	8.9
	U-Turn	0.320	14.3	11.0	0.239	9.7	10.6
North: Illawong Drive	Left	0.126	4.9	7.2	0.121	4.5	6.3
	Through	0.126	4.9	7.5	0.121	4.5	6.6
	Right	0.126	4.9	10.8	0.121	4.5	9.9
	U-Turn	0.126	4.9	12.6	0.121	4.5	11.7



West: Grossmans Road	Left	0.330	14.4	6.2	0.191	7.3	5.8
	Through	0.330	14.4	6.4	0.191	7.3	6.1
	Right	0.330	14.4	9.8	0.191	7.3	9.4

### Weekday PM Peak Hour Conditions

A comparison of the performance of both intersections in the existing and post development scenario for the weekday PM peak hour is presented in Table 5-6 and Table 5-7.

Similar to the results of the AM analysis, this analysis shows that both intersections currently operate well below capacity with minimal vehicles queues and with vehicle delays largely attributable to intersection geometry rather than congestion.

Adding traffic from the Development Plan area, post conditions show:

- There is negligible change expected to the operation of the Briody Drive / Messmate Road intersection, with all movements remaining well below capacity; and
- There are minor increases to DoS on all approaches at the Illawong Drive / Grossmans Road roundabout. DoS remain in the 'excellent' range and there is no material impact on intersection delays or queues.

Based on the above SIDRA results, it is considered that the traffic generated by the proposed development is expected to be satisfactorily accommodated by the surrounding road network, with both intersections still operating in the 'excellent' categories during the AM and PM peak hours.

Detailed SIDRA results are presented in Appendix A.

**Table 5-6: SIDRA Results - Briody Drive/Messmate Road Intersection**

Approach	Movement	Existing PM Peak			Post Development PM Peak		
		D.O.S.	95%ile Queue (m)	Avg Delay (s)	D.O.S.	95%ile Queue (m)	Avg Delay (s)
South: Messmate Road	Through	0.040	0.0	0.0	0.054	1.0	0.3
	Right	0.040	0.0	5.9	0.054	1.0	6.4
East: Briody Drive	Left	0.011	0.3	5.7	0.098	2.4	5.8
	Right	0.011	0.3	6.1	0.098	2.4	6.6
North: Messmate Road	Left	0.049	0.0	5.5	0.132	0.0	5.6
	Through	0.049	0.0	0.0	0.132	0.0	0.0

**Table 5-7: SIDRA Results - Illawong Drive/Grossmans Road/Eton Road Roundabout**

Approach	Movement	Existing PM Peak			Post Development PM Peak		
		D.O.S.	95%ile Queue (m)	Avg Delay (s)	D.O.S.	95%ile Queue (m)	Avg Delay (s)
South: Eton Road	Left	0.216	8.9	6.6	0.238	9.8	6.6
	Through	0.216	8.9	6.9	0.238	9.8	6.9
	Right	0.216	8.9	10.2	0.238	9.8	10.2
	U-Turn	0.216	8.9	11.9	0.238	9.8	12.0
East: Grossmans Road	Left	0.385	18.0	6.3	0.326	14.6	5.6
	Through	0.385	18.0	6.6	0.326	14.6	5.8
	Right	0.385	18.0	9.9	0.326	14.6	9.2
	U-Turn	0.385	18.0	11.6	0.326	14.6	10.9
North: Illawong Drive	Left	0.332	14.8	7.8	0.211	8.4	6.5
	Through	0.332	14.8	8.0	0.211	8.4	6.7
	Right	0.332	14.8	11.4	0.211	8.4	10.1
	U-Turn	0.332	14.8	13.1	0.211	8.4	11.8
West: Grossmans Road	Left	0.360	16.2	6.7	0.235	9.5	6.7
	Through	0.360	16.2	6.9	0.235	9.5	7.0
	Right	0.360	16.2	10.3	0.235	9.5	10.3

## 6.1 Response to Schedule 10 to the Development Overlay – Traffic Matters

Responses to the access and movement requirements of Schedule 10 to the Development Plan are provided in the tables below.

**Table 6-1 Development Plan Requirements – Access and Movement**

Requirement	Response
<p>An internal road network that:</p> <ul style="list-style-type: none"> <li>– Provides a high level of permeability through and within the site for pedestrians, cyclists and vehicles, providing direct and safe access to public transport connections, the Deep Creek environs, community facilities and local schools. The network must have regard to future development of 70–140 Briody Drive.</li> <li>– Considers the need for up to two new vehicle accesses to Grossmans Road between Illawong Drive and Messmate Road to assist in distributing traffic more evenly through the precinct and reducing reliance on Briody Drive as a sole access provided any new intersection can be accommodated by minimising impacts on significant roadside vegetation</li> <li>– Provides for the upgrading of Briody Drive as an Access Street Level 2.</li> </ul>	<p>Acknowledging the shared path link along Grossmans Road and Messmate Road, and the future service road within the Retirement Village and the Residential Aged Care site, the Development Plan road and path network provides a high level of local permeability for active transport modes.</p> <p>As resolved with Surf Coast Council vehicle access to Grossmans Road and Messmate Road is not proposed to maximize vegetation retention. As such, vehicle traffic is focused towards Briody Drive to then distribute to the external road network.</p> <p>As resolved with Surf Coast Council, no direct vehicle access is proposed to Messmate Road and Grossmans Road. The traffic analysis undertaken demonstrates that additional access to the existing road network is not required for matters of traffic capacity.</p> <p>Briody Drive will be upgrade to a Connector Street, a level above Access Street Level 2.</p>
<p>Provision of a shared sealed pathway (walking/cycling track) along the waterway and linking to the pathway in the Frog Hollow Estate, to be sited above the 1 in 100 year flood level.</p>	<p>Provided.</p>
<ul style="list-style-type: none"> <li>– At the interface of Messmate Road and Grossmans Road and the remnant native vegetation the following must be provided: <ul style="list-style-type: none"> <li>• immediately adjacent to the vegetation reserve that will separate private land from the remnant vegetation. The access street road reserve width should be 11.5 metres.</li> </ul> </li> </ul>	<p>The access street along the Messmate Road / Grossmans Road interface is proposed at 12.5 metres wide.</p>
<p>Pedestrian and/or bicycle links, including a link from the corner of Grossmans and Messmate Roads to the nearby schools.</p>	<p>Achieved by way of the shared path provided along the Messmate Road / Grossmans Road frontage.</p>

**Table 6-2 Development Plan – Road Network and Traffic Management Plan Requirements**

Requirement	Response
An assessment of the traffic generated by the residential development of the land.	Refer to Section 5.
Classification of streets according to standards contained in Clause 56 of the Surf Coast Planning Scheme.	Streets within the Development Plan road network allow for roads to be delivered in accordance with the requirements of Clause 56 of the SCPS and IDM - Refer to Section 4.1.
Pedestrian links from Messmate Road and Grossmans Road to the nearby areas and facilities.	All roads will include footpaths. A shared path will be provided along the Messmate Rd and Grossmans Rd interfaces linking to Illawong Drive – Refer to Section 4.2
Identification of all off-site traffic infrastructure requirements associated with the site, including at the intersections of Grossmans Road and Messmate Road, and Messmate Road and Briody Drive and Grossmans Road and Duffields Road, including and land required in order to accommodate a roundabout at the intersection of Grossmans Road and Duffields Road.	No off-site infrastructure is required to cater for additional Development Plan traffic.  A roundabout is proposed at the intersection of Messmate Road and Briody Drive which will be provided by Council when traffic volumes necessitate.
Definition of the cross-sections, including where relevant, verge widths, nature strips, kerb and channel, drainage, pavement widths and pathways for all identified roads within and abutting the development.	The Development Plan road network characteristics are discussed in Section 4.1.  External road characteristics are discussed in Section 2.1.

## 7 Conclusion:

The proposed Briody Drive West Development Plan in Torquay is to include:

- Retirement Village and Residential Aged Care Facility, comprising
  - 231 x retirement village units;
  - 80 x aged care beds
  - 60 x independent and assisted living apartments
- 335 x residential lots;
- One x multi-unit residential lot (equalling 11 residential lots); and
- One existing low density residential zone.

Based on the preceding discussion, and analysis following conclusions have been reached:

- The road network within the Development Plan area is consistent with the design principles of the Surf Coast Planning Scheme and Infrastructure Design Manual.
- The road network has been designed to facilitate convenient access through the proposed subdivision, as well as connections to abutting neighbourhoods;
- Good pedestrian and bicycle connectivity will be provided throughout the subject site and to the broader network;
- Traffic generated by the Development Plan area can be satisfactorily accommodated by the surrounding road network, while both intersections still operating in the 'excellent' categories during the AM and PM peak hours; and
- In our view, the proposed Development Plan suitably responds to the relevant movement and access requirements at Schedule 10 to the Development Plan of the Surf Coast Planning Scheme.

# Appendix A SIDRA Results



# MOVEMENT SUMMARY

▽ Site: 101 [BrioMess\_ExAM]

Briody Drive / Messmate Road  
 Existing AM Peak Hour Conditions  
 Site Category: (None)  
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Messmate Road												
2	T1	114	0.0	0.063	0.0	LOS A	0.0	0.2	0.02	0.02	0.02	59.7
3	R2	4	0.0	0.063	5.9	LOS A	0.0	0.2	0.02	0.02	0.02	57.3
Approach		118	0.0	0.063	0.2	NA	0.0	0.2	0.02	0.02	0.02	59.6
East: Briody Drive												
4	L2	1	0.0	0.018	5.7	LOS A	0.1	0.4	0.24	0.59	0.24	52.9
6	R2	19	0.0	0.018	6.3	LOS A	0.1	0.4	0.24	0.59	0.24	52.3
Approach		20	0.0	0.018	6.2	LOS A	0.1	0.4	0.24	0.59	0.24	52.3
North: Messmate Road												
7	L2	19	0.0	0.051	5.5	LOS A	0.0	0.0	0.00	0.12	0.00	57.3
8	T1	77	0.0	0.051	0.0	LOS A	0.0	0.0	0.00	0.12	0.00	58.9
Approach		96	0.0	0.051	1.1	NA	0.0	0.0	0.00	0.12	0.00	58.6
All Vehicles		234	0.0	0.063	1.1	NA	0.1	0.4	0.03	0.11	0.03	58.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

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.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

Site: 101 [BrioMess\_PDAM]

Briody Drive / Messmate Road  
 Post Development AM Peak Hour Conditions  
 Site Category: (None)  
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Messmate Road												
2	T1	114	0.0	0.069	0.1	LOS A	0.1	0.6	0.07	0.07	0.07	59.1
3	R2	14	0.0	0.069	6.1	LOS A	0.1	0.6	0.07	0.07	0.07	56.8
Approach		127	0.0	0.069	0.7	NA	0.1	0.6	0.07	0.07	0.07	58.9
East: Briody Drive												
4	L2	25	0.0	0.195	5.8	LOS A	0.7	5.1	0.28	0.63	0.28	52.8
6	R2	185	0.0	0.195	6.6	LOS A	0.7	5.1	0.28	0.63	0.28	52.2
Approach		211	0.0	0.195	6.5	LOS A	0.7	5.1	0.28	0.63	0.28	52.2
North: Messmate Road												
7	L2	83	0.0	0.086	5.5	LOS A	0.0	0.0	0.00	0.31	0.00	55.8
8	T1	77	0.0	0.086	0.0	LOS A	0.0	0.0	0.00	0.31	0.00	57.3
Approach		160	0.0	0.086	2.9	NA	0.0	0.0	0.00	0.31	0.00	56.5
All Vehicles		498	0.0	0.195	3.9	NA	0.7	5.1	0.14	0.38	0.14	55.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

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.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.



# MOVEMENT SUMMARY

Site: 101 [BrioMess\_ExPM]

Briody Drive / Messmate Road  
 Existing PM Peak Hour Conditions  
 Site Category: (None)  
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Messmate Road												
2	T1	75	0.0	0.040	0.0	LOS A	0.0	0.0	0.01	0.01	0.01	59.9
3	R2	1	0.0	0.040	5.9	LOS A	0.0	0.0	0.01	0.01	0.01	57.5
Approach		76	0.0	0.040	0.1	NA	0.0	0.0	0.01	0.01	0.01	59.9
East: Briody Drive												
4	L2	3	0.0	0.011	5.7	LOS A	0.0	0.3	0.19	0.57	0.19	53.0
6	R2	11	0.0	0.011	6.1	LOS A	0.0	0.3	0.19	0.57	0.19	52.4
Approach		14	0.0	0.011	6.0	LOS A	0.0	0.3	0.19	0.57	0.19	52.5
North: Messmate Road												
7	L2	17	0.0	0.049	5.5	LOS A	0.0	0.0	0.00	0.11	0.00	57.4
8	T1	76	0.0	0.049	0.0	LOS A	0.0	0.0	0.00	0.11	0.00	59.0
Approach		93	0.0	0.049	1.0	NA	0.0	0.0	0.00	0.11	0.00	58.7
All Vehicles		182	0.0	0.049	1.0	NA	0.0	0.3	0.02	0.10	0.02	58.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

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.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

▽ Site: 101 [BrioMess\_PDPM]

Briody Drive / Messmate Road  
 Post Development PM Peak Hour Conditions  
 Site Category: (None)  
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Messmate Road												
2	T1	75	0.0	0.054	0.3	LOS A	0.1	1.0	0.17	0.14	0.17	58.2
3	R2	21	0.0	0.054	6.4	LOS A	0.1	1.0	0.17	0.14	0.17	55.9
Approach		96	0.0	0.054	1.6	NA	0.1	1.0	0.17	0.14	0.17	57.6
East: Briody Drive												
4	L2	15	0.0	0.098	5.8	LOS A	0.3	2.4	0.26	0.62	0.26	52.9
6	R2	92	0.0	0.098	6.6	LOS A	0.3	2.4	0.26	0.62	0.26	52.2
Approach		106	0.0	0.098	6.5	LOS A	0.3	2.4	0.26	0.62	0.26	52.3
North: Messmate Road												
7	L2	166	0.0	0.132	5.6	LOS A	0.0	0.0	0.00	0.40	0.00	55.0
8	T1	76	0.0	0.132	0.0	LOS A	0.0	0.0	0.00	0.40	0.00	56.4
Approach		242	0.0	0.132	3.8	NA	0.0	0.0	0.00	0.40	0.00	55.4
All Vehicles		444	0.0	0.132	4.0	NA	0.3	2.4	0.10	0.40	0.10	55.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

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.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

 Site: 101 [GroIIIeto\_ExAM]

Grossmans Road / Illawong Drive / Eton Road  
Existing AM Peak Hour Conditions  
Site Category: (None)  
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Eton Road												
1	L2	85	0.0	0.184	6.2	LOS A	1.0	7.3	0.50	0.65	0.50	51.8
2	T1	24	0.0	0.184	6.4	LOS A	1.0	7.3	0.50	0.65	0.50	52.8
3	R2	74	0.0	0.184	9.8	LOS A	1.0	7.3	0.50	0.65	0.50	52.5
3u	U	4	0.0	0.184	11.5	LOS B	1.0	7.3	0.50	0.65	0.50	53.1
Approach		187	0.0	0.184	7.7	LOS A	1.0	7.3	0.50	0.65	0.50	52.3
East: Grossmans Road												
4	L2	105	0.0	0.320	5.7	LOS A	2.0	14.3	0.44	0.63	0.44	51.6
5	T1	108	0.0	0.320	5.9	LOS A	2.0	14.3	0.44	0.63	0.44	52.6
6	R2	49	0.0	0.320	9.3	LOS A	2.0	14.3	0.44	0.63	0.44	52.3
6u	U	106	0.0	0.320	11.0	LOS B	2.0	14.3	0.44	0.63	0.44	52.9
Approach		369	0.0	0.320	7.8	LOS A	2.0	14.3	0.44	0.63	0.44	52.4
North: Illawong Drive												
7	L2	49	0.0	0.126	7.2	LOS A	0.7	4.9	0.59	0.69	0.59	51.5
8	T1	28	0.0	0.126	7.5	LOS A	0.7	4.9	0.59	0.69	0.59	52.4
9	R2	32	0.0	0.126	10.8	LOS B	0.7	4.9	0.59	0.69	0.59	52.1
9u	U	1	0.0	0.126	12.6	LOS B	0.7	4.9	0.59	0.69	0.59	52.7
Approach		111	0.0	0.126	8.4	LOS A	0.7	4.9	0.59	0.69	0.59	51.9
West: Grossmans Road												
10	L2	48	0.0	0.330	6.2	LOS A	2.1	14.4	0.51	0.65	0.51	51.8
11	T1	181	0.0	0.330	6.4	LOS A	2.1	14.4	0.51	0.65	0.51	52.8
12	R2	122	0.0	0.330	9.8	LOS A	2.1	14.4	0.51	0.65	0.51	52.4
Approach		352	0.0	0.330	7.6	LOS A	2.1	14.4	0.51	0.65	0.51	52.5
All Vehicles		1019	0.0	0.330	7.8	LOS A	2.1	14.4	0.49	0.65	0.49	52.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

 Site: 101 [GroIIIeto\_PDAM]

Grossmans Road / Illawong Drive / Eton Road  
 Post Development AM Peak Hour Conditions  
 Site Category: (None)  
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Eton Road												
1	L2	85	0.0	0.216	6.6	LOS A	1.3	8.9	0.56	0.69	0.56	51.6
2	T1	44	0.0	0.216	6.9	LOS A	1.3	8.9	0.56	0.69	0.56	52.6
3	R2	74	0.0	0.216	10.2	LOS B	1.3	8.9	0.56	0.69	0.56	52.3
3u	U	4	0.0	0.216	11.9	LOS B	1.3	8.9	0.56	0.69	0.56	52.9
Approach		207	0.0	0.216	8.1	LOS A	1.3	8.9	0.56	0.69	0.56	52.1
East: Grossmans Road												
4	L2	105	0.0	0.385	6.3	LOS A	2.6	18.0	0.55	0.68	0.55	51.2
5	T1	108	0.0	0.385	6.6	LOS A	2.6	18.0	0.55	0.68	0.55	52.2
6	R2	89	0.0	0.385	9.9	LOS A	2.6	18.0	0.55	0.68	0.55	51.8
6u	U	106	0.0	0.385	11.6	LOS B	2.6	18.0	0.55	0.68	0.55	52.4
Approach		409	0.0	0.385	8.5	LOS A	2.6	18.0	0.55	0.68	0.55	51.9
North: Illawong Drive												
7	L2	153	0.0	0.332	7.8	LOS A	2.1	14.8	0.67	0.76	0.67	51.3
8	T1	80	0.0	0.332	8.0	LOS A	2.1	14.8	0.67	0.76	0.67	52.3
9	R2	56	0.0	0.332	11.4	LOS B	2.1	14.8	0.67	0.76	0.67	52.0
9u	U	1	0.0	0.332	13.1	LOS B	2.1	14.8	0.67	0.76	0.67	52.6
Approach		289	0.0	0.332	8.6	LOS A	2.1	14.8	0.67	0.76	0.67	51.7
West: Grossmans Road												
10	L2	58	0.0	0.360	6.7	LOS A	2.3	16.2	0.58	0.69	0.58	51.5
11	T1	181	0.0	0.360	6.9	LOS A	2.3	16.2	0.58	0.69	0.58	52.5
12	R2	122	0.0	0.360	10.3	LOS B	2.3	16.2	0.58	0.69	0.58	52.1
Approach		361	0.0	0.360	8.0	LOS A	2.3	16.2	0.58	0.69	0.58	52.2
All Vehicles		1267	0.0	0.385	8.3	LOS A	2.6	18.0	0.59	0.70	0.59	52.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

 Site: 101 [GroIIIeto\_ExPM]

Grossmans Road / Illawong Drive / Eton Road  
Existing PM Peak Hour Conditions  
Site Category: (None)  
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Eton Road												
1	L2	76	0.0	0.173	5.9	LOS A	1.0	6.7	0.44	0.64	0.44	51.8
2	T1	20	0.0	0.173	6.1	LOS A	1.0	6.7	0.44	0.64	0.44	52.8
3	R2	79	0.0	0.173	9.5	LOS A	1.0	6.7	0.44	0.64	0.44	52.5
3u	U	11	0.0	0.173	11.2	LOS B	1.0	6.7	0.44	0.64	0.44	53.1
Approach		185	0.0	0.173	7.8	LOS A	1.0	6.7	0.44	0.64	0.44	52.3
East: Grossmans Road												
4	L2	80	0.0	0.239	5.3	LOS A	1.4	9.7	0.34	0.59	0.34	52.0
5	T1	93	0.0	0.239	5.5	LOS A	1.4	9.7	0.34	0.59	0.34	53.0
6	R2	40	0.0	0.239	8.9	LOS A	1.4	9.7	0.34	0.59	0.34	52.6
6u	U	79	0.0	0.239	10.6	LOS B	1.4	9.7	0.34	0.59	0.34	53.2
Approach		292	0.0	0.239	7.3	LOS A	1.4	9.7	0.34	0.59	0.34	52.7
North: Illawong Drive												
7	L2	60	0.0	0.121	6.3	LOS A	0.6	4.5	0.49	0.64	0.49	52.0
8	T1	22	0.0	0.121	6.6	LOS A	0.6	4.5	0.49	0.64	0.49	53.0
9	R2	36	0.0	0.121	9.9	LOS A	0.6	4.5	0.49	0.64	0.49	52.7
9u	U	3	0.0	0.121	11.7	LOS B	0.6	4.5	0.49	0.64	0.49	53.3
Approach		121	0.0	0.121	7.6	LOS A	0.6	4.5	0.49	0.64	0.49	52.4
West: Grossmans Road												
10	L2	34	0.0	0.191	5.8	LOS A	1.0	7.3	0.43	0.61	0.43	52.1
11	T1	108	0.0	0.191	6.1	LOS A	1.0	7.3	0.43	0.61	0.43	53.1
12	R2	65	0.0	0.191	9.4	LOS A	1.0	7.3	0.43	0.61	0.43	52.8
Approach		207	0.0	0.191	7.1	LOS A	1.0	7.3	0.43	0.61	0.43	52.8
All Vehicles		805	0.0	0.239	7.4	LOS A	1.4	9.7	0.41	0.61	0.41	52.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Organisation: RATIO CONSULTANTS PTY LTD | Processed: Wednesday, 5 February 2020 3:31:51 PM

Project: Y:\16000-16500\16437T - Briody Drive, Torquay\Work\SIDRA\16437T-SID02.sip8

# MOVEMENT SUMMARY

 Site: 101 [GrollIeto\_PDPM]

Grossmans Road / Illawong Drive / Eton Road  
 Post Development PM Peak Hour Conditions  
 Site Category: (None)  
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Eton Road												
1	L2	76	0.0	0.238	6.6	LOS A	1.4	9.8	0.55	0.69	0.55	51.5
2	T1	66	0.0	0.238	6.9	LOS A	1.4	9.8	0.55	0.69	0.55	52.5
3	R2	79	0.0	0.238	10.2	LOS B	1.4	9.8	0.55	0.69	0.55	52.2
3u	U	11	0.0	0.238	12.0	LOS B	1.4	9.8	0.55	0.69	0.55	52.8
Approach		232	0.0	0.238	8.2	LOS A	1.4	9.8	0.55	0.69	0.55	52.1
East: Grossmans Road												
4	L2	80	0.0	0.326	5.6	LOS A	2.1	14.6	0.42	0.63	0.42	51.5
5	T1	93	0.0	0.326	5.8	LOS A	2.1	14.6	0.42	0.63	0.42	52.5
6	R2	133	0.0	0.326	9.2	LOS A	2.1	14.6	0.42	0.63	0.42	52.1
6u	U	79	0.0	0.326	10.9	LOS B	2.1	14.6	0.42	0.63	0.42	52.7
Approach		384	0.0	0.326	8.0	LOS A	2.1	14.6	0.42	0.63	0.42	52.2
North: Illawong Drive												
7	L2	111	0.0	0.211	6.5	LOS A	1.2	8.4	0.53	0.66	0.53	52.1
8	T1	47	0.0	0.211	6.7	LOS A	1.2	8.4	0.53	0.66	0.53	53.1
9	R2	47	0.0	0.211	10.1	LOS B	1.2	8.4	0.53	0.66	0.53	52.7
9u	U	3	0.0	0.211	11.8	LOS B	1.2	8.4	0.53	0.66	0.53	53.3
Approach		208	0.0	0.211	7.5	LOS A	1.2	8.4	0.53	0.66	0.53	52.5
West: Grossmans Road												
10	L2	55	0.0	0.235	6.7	LOS A	1.4	9.5	0.55	0.68	0.55	51.7
11	T1	108	0.0	0.235	7.0	LOS A	1.4	9.5	0.55	0.68	0.55	52.7
12	R2	65	0.0	0.235	10.3	LOS B	1.4	9.5	0.55	0.68	0.55	52.3
Approach		228	0.0	0.235	7.9	LOS A	1.4	9.5	0.55	0.68	0.55	52.3
All Vehicles		1053	0.0	0.326	7.9	LOS A	2.1	14.6	0.50	0.66	0.50	52.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.