Traffic Engineers and Transport Planners

Traffix Group Pty Ltd
ABN 32 100 481 570

Address
Suite 8, 431 Burke Road
Glen Iris Victoria 3146

Contact
Telephone 03 9822 2888
Facsimile 03 9822 7444
admin@traffixgroup.com.au
www.traffixgroup.com.au

TRAFFIC IMPACT ASSESSMENT

OF

PROPOSED REZONING & RESIDENTIAL SUBDIVISION JUMBUNNA ROAD, KORUMBURRA (CELLANTE & WINTERHALTER PROPERTIES)

Prepared for

A.M. & J.H. Winterhalter and Kufner Textiles (Australia) Pty Ltd

Traffic Impact Assessment

for

Proposed Rezoning & Residential Subdivision
at

Jumbunna Road, Korumburra

(Cellante & Winterhalter Properties)

Our Reference: GRP13858R-01A.doc

DOCUMENT CONTROL

Issue No.	Type	Date	Prepared By	Approved By
A	Final Report	16/5/2012	L. Procter	W. de Waard

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APPENDICES

1. INTRODUCTION

Traffix Group has been engaged by A.M. & J.H. Winterhalter and Kufner Textiles (Australia) Pty Ltd to undertake a traffic impact assessment of the proposed rezoning of land at Jumbunna Road, Korumburra, known as the 'Winterhalter' and 'Cellante' properties, for development as a residential subdivision.

The proposal is to rezone and develop land currently zoned as Farm Zone for residential development (subdivision), with a yield in the order of 189 standard residential lots. Primary vehicular access to the subject site is to be via Sommers Crescent with secondary access to the Winterhalter property proposed via Prudence Close.

This report provides a detailed traffic engineering assessment of the proposed rezoning and subdivision of the subject site, including the internal access arrangements as well as the likely impacts on the surrounding road network of the proposed development. In particular, this report provides an assessment of the likely traffic generation and distribution and recommends an appropriate intersection treatment for the intersection of Sommers Crescent and Jumbunna Road.

2. EXISTING CONDITIONS

2.1. SUBJECT SITE

The subject site comprises two existing properties, including:

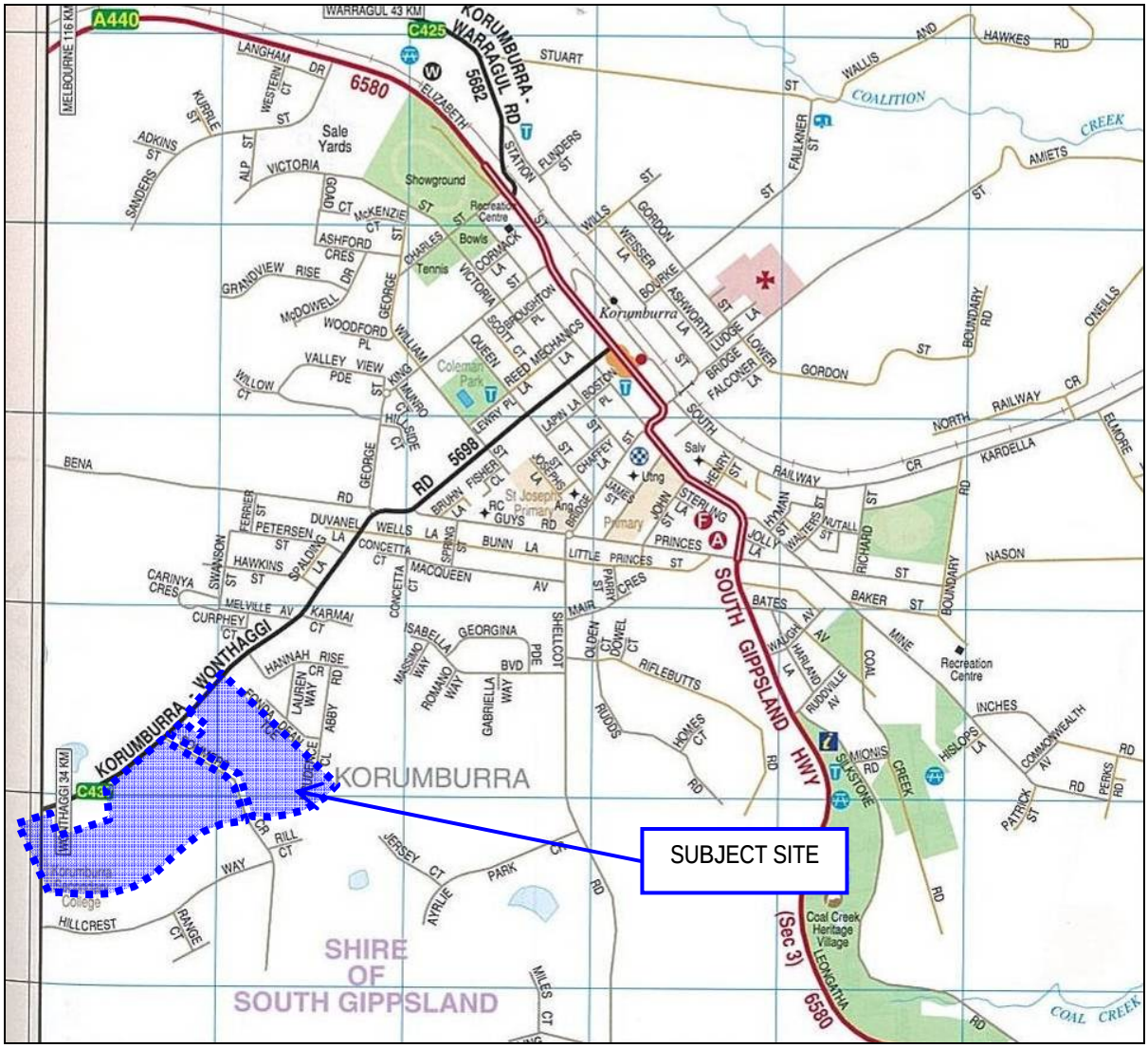
- 'Winterhalter' made up of Crown Allotment 90 (part), Lot 2 LP139825 of the Parish of Korumburra, and
- 'Cellante' made up of Lot 2 LP139824, Lot 4 LP135303, and Lot 2 LP139823 of the Parish of Korumburra.

Both of these properties are located to the south-east side of Jumbunna Road (Korumburra-Wonthaggi Road), and are separated by Sommers Cresent, with 'Winterhalter' to the north-east and 'Cellante' to the south-west of Sommers Crescent.

A locality plan and aerial photograph of the subject site are provided at Figure 1 and Figure 2.

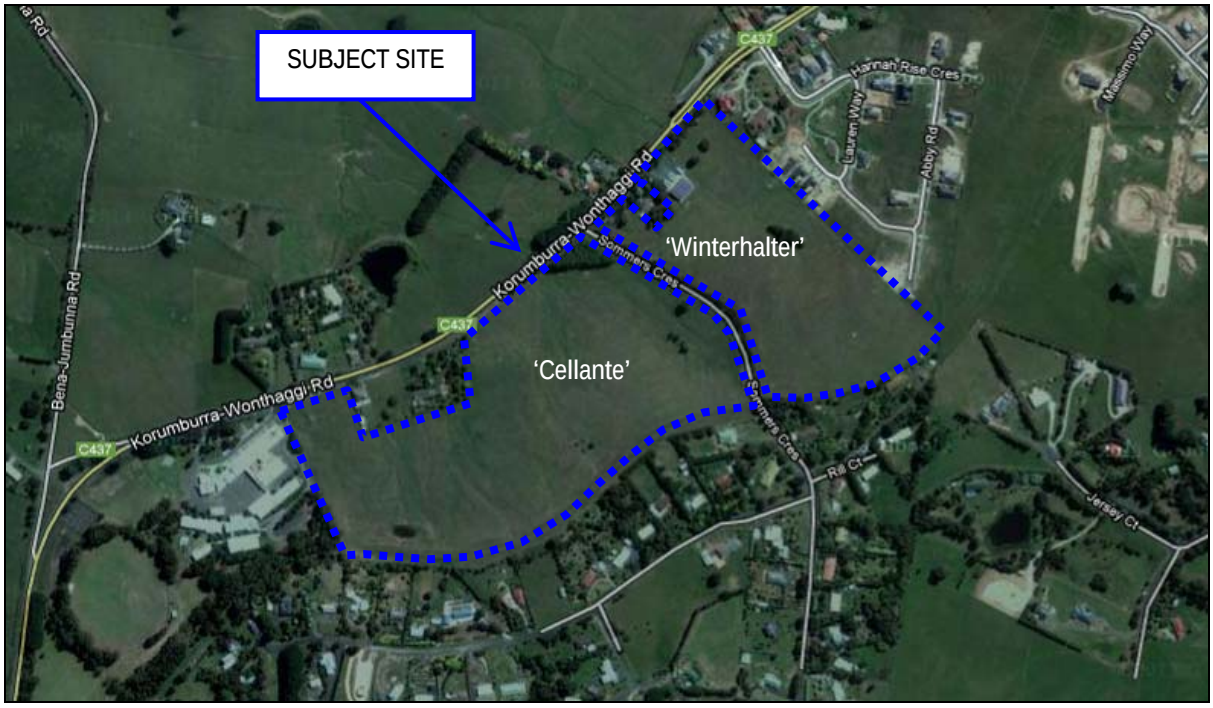
The subject site is currently zoned 'Farm Zone' under the South Gippsland Planning Scheme. A land use zoning map is provided at Figure 3. Land use surrounding the subject site includes:

- residential properties to the north-east and south of the subject site (including further south along Sommers Crescent),
- Korumburra Secondary College directly abutting the western property boundary of 'Cellante', to the south-west of the subject site, and
- the main township of Korumburra to the north-east of the subject site, accessed via Jumbunna Road.



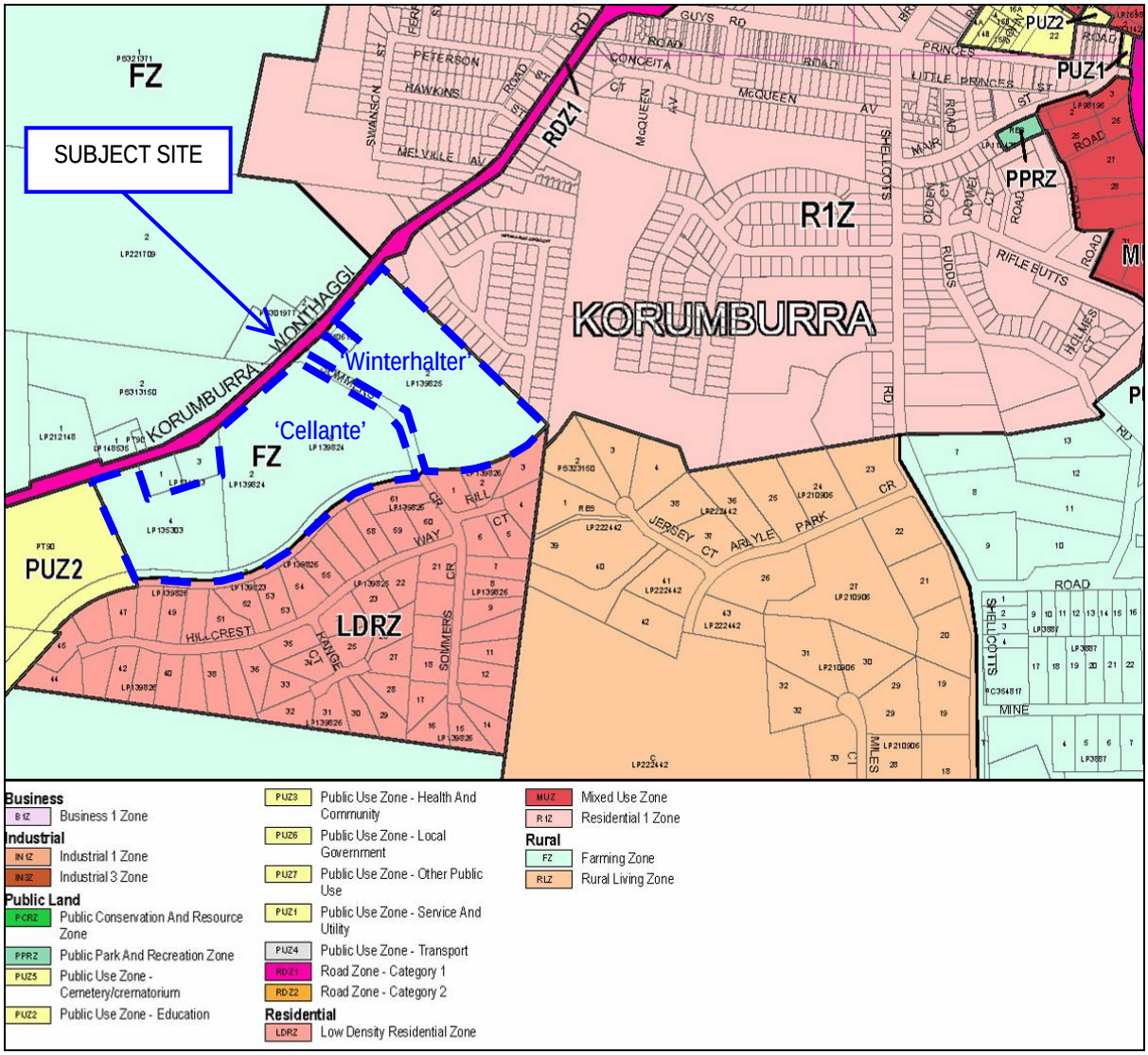
Source: Vicroads Country Street Directory of Victoria, Edition 8

Figure 1: Locality Plan



Source: www.maps.google.com

Figure 2: Aerial Photo



Source: www.services.land.vic.gov.au

Figure 3: South Gippsland Land Use Zoning Map

2.2. ROAD NETWORK

Jumbunna Road (Korumburra – Wonthaggi Road) is a VicRoads Arterial Road which extends from the South Gippsland Highway (Korumburra) in the north-east and the Bass Highway in the south-west (Wonthaggi). In the vicinity of the subject site, Jumbunna Road has a road reservation in the order of 20m, and provides for a two-lane, two-way carriageway. The carriageway has a trafficable pavement width in the order of 7.5m.

Jumbunna Road has an 80km/h speed limit in the vicinity of the subject site.

Sommers Crescent is a rural local road which extends in a north-west to south-east direction between Jumbunna Road in the north-west and a dead-end in the south-east, providing access to low density residential properties to the south of the subject site. In the vicinity of the subject site Sommers Crescent is approximately 6.0m wide within a road reserve of approximately 20.0m. The intersection of Sommers Crescent with Jumbunna Road is controlled with a 'Give Way' sign.

Prudence Close is a local road which extends in a north-south direction within the existing residential subdivision located to the north-east of the subject site, with access via Hannah Rise Crescent to Jumbunna Road. In the vicinity of the subject site Prudence Close is approximately 15.4m wide within a road reserve of approximately 16.0m.

Photographs of the road network surrounding the subject site are provided in Figure 4 to Figure 15.

Figure 4: Jumbunna Road South-West of Sommers Crescent – View South-West

Figure 5: Jumbunna Road North-East of Sommers Crescent – View North-East

Figure 6: Jumbunna Road – Road Reserve Along North Side of Road at Sommers Crescent

Figure 7: Jumbunna Road & Sommers Crescent Intersection – View North-East

Figure 8: Jumbunna Road & Sommers Crescent Intersection – View South-West

Figure 9: Jumbunna Road – Road Reserve Along South Side of Road at Sommers Crescent

Figure 10: Jumbunna Road & Sommers Crescent Intersection – View South-East

Figure 11: Sommers Crescent View South-East

Figure 12: Prudence Close at South End – View North

Figure 13: Jumbunna Road & Sommers Crescent Intersection – View North-West

Figure 14: Sommers Crescent View North-West to Jumbunna Road

Figure 15: Prudence Close at South End – View South

2.3. TRAFFIC VOLUMES

A turning movement count was undertaken at the intersection of Jumbunna Road and Sommers Crescent on Wednesday, 22nd February, 2012, between 3pm an 6pm, and on Thursday, 23rd February, 2012 between 7:30am and 9:30am.

The recorded peak hours were 8am-9am and 3:15pm-4:15pm. Detailed survey results are provided at Appendix A, with a summary of the turning movement volumes during the identified peak hours provided in Figure 16 and Figure 17 below.

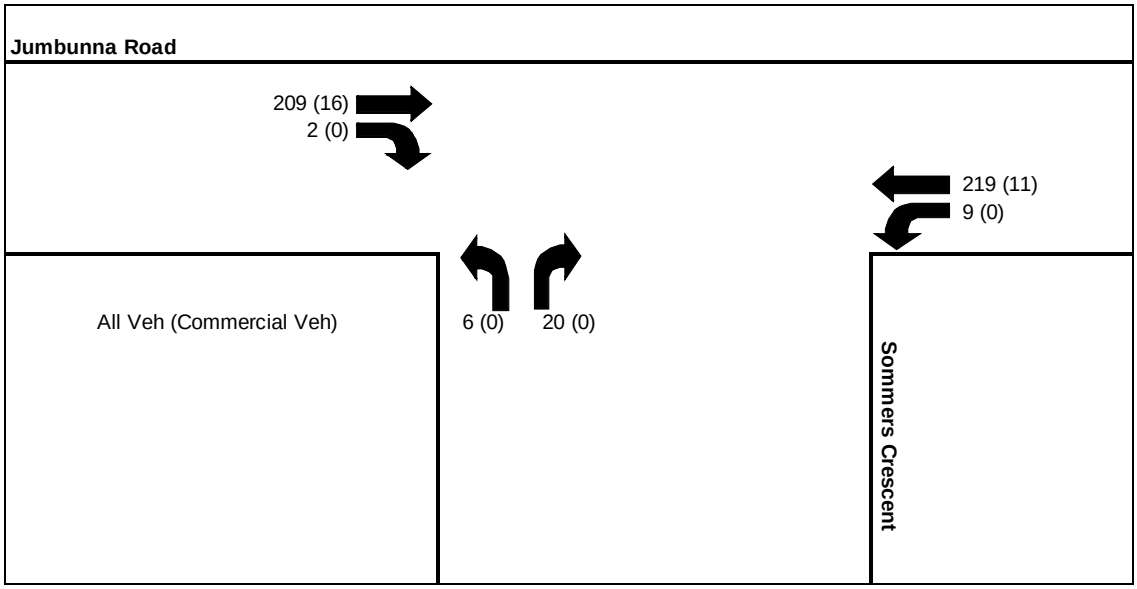


Figure 16: Jumbunna Road & Sommers Crescent
– AM Peak Period Volumes (8:00am-9:00am)

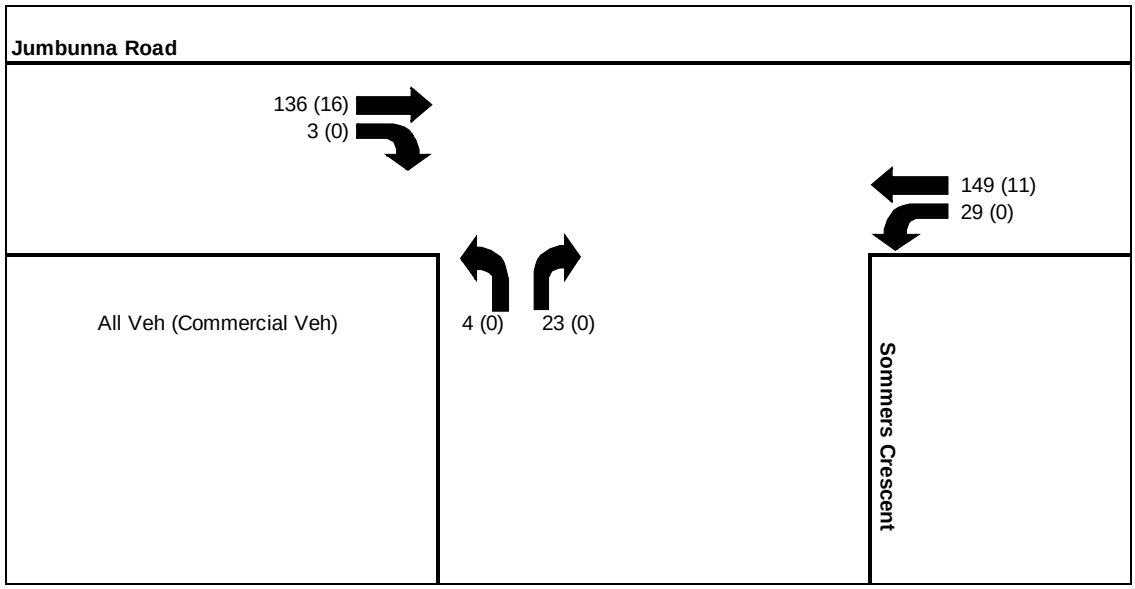


Figure 17: Jumbunna Road & Sommers Crescent
– PM Peak Period Volumes (3:15pm-4:15pm)

3. PROPOSAL

The proposal is to rezone and develop the 'Cellante' and 'Winterhalter' properties at Jumbunna Road, Korumburra for the purposes of residential subdivision, with an indicative yield in the order of 189 lots, as follows:

- Winterhalter Property:
  - 51 properties accessed via an internal local road connecting to Sommers Crescent,
  - 5 properties with direct access to Sommers Crescent, and
  - 3 properties with direct access to Jumbunna Road.
- Cellante Property:
  - 130 properties accessed via internal local roads connecting to Sommers Crescent.

Primary vehicle access to the subject site is proposed via Sommers Crescent, with a secondary access to the Winterhalter property via Prudence Close. Access onto Sommers Crescent for both plans of subdivision is to be at the same location to enable a common access treatment to service both sides of Sommers Crescent.

It is noted that there is also the potential for in the order of an additional 5 properties to access Sommers Crescent via the proposed Cellante subdivision. This would occur if existing properties known as 'Fava' and 'Scollo' (at 111 and 113 Jumbunna Road) were also developed and required to provide access via internal local streets to Sommers Crescent, rather than direct to Jumbunna Road.

To cater for the anticipated future traffic volumes, it is proposed to upgrade the intersection of Sommers Crescent and Jumbunna Road to include a CHR(S) right turn lane and a BAL left turn lane.

A preliminary concept plan has been developed for the Sommers Crescent and Jumbunna Road intersection to include appropriate turn lane treatments to service the increase in traffic volumes associated with the development. It is noted that Sommers Crescent also caters for an existing low density residential subdivision at its south end, which has in the order of 61 lots, of which 55 are currently developed and occupied.

The proposed intersection treatment required to service the development of the subject site is further discussed in Section 5.1 of this report.

It is noted that Council has requested the setting aside of a 2.5 metre wide reservation along Jumbunna Road for pedestrian access between Sommers Crescent and Lot LP 135303. This reservation widens to 5.0 metres between Lot 1 LP 134693 and the south western boundary to provide future widening for school buses entering Korumburra Secondary College.

A copy of the proposed residential subdivision plans prepared by Beveridge Williams are attached at Appendix B.

4. TRAFFIC ENGINEERING ASSESSMENT

4.1. TRAFFIC GENERATION

It is generally accepted that a conservative estimate of daily traffic generation of residential subdivisions is in the order of 10 trips per household per day, and one (1) vehicle trip per household per day in each of the AM and PM peak hours.

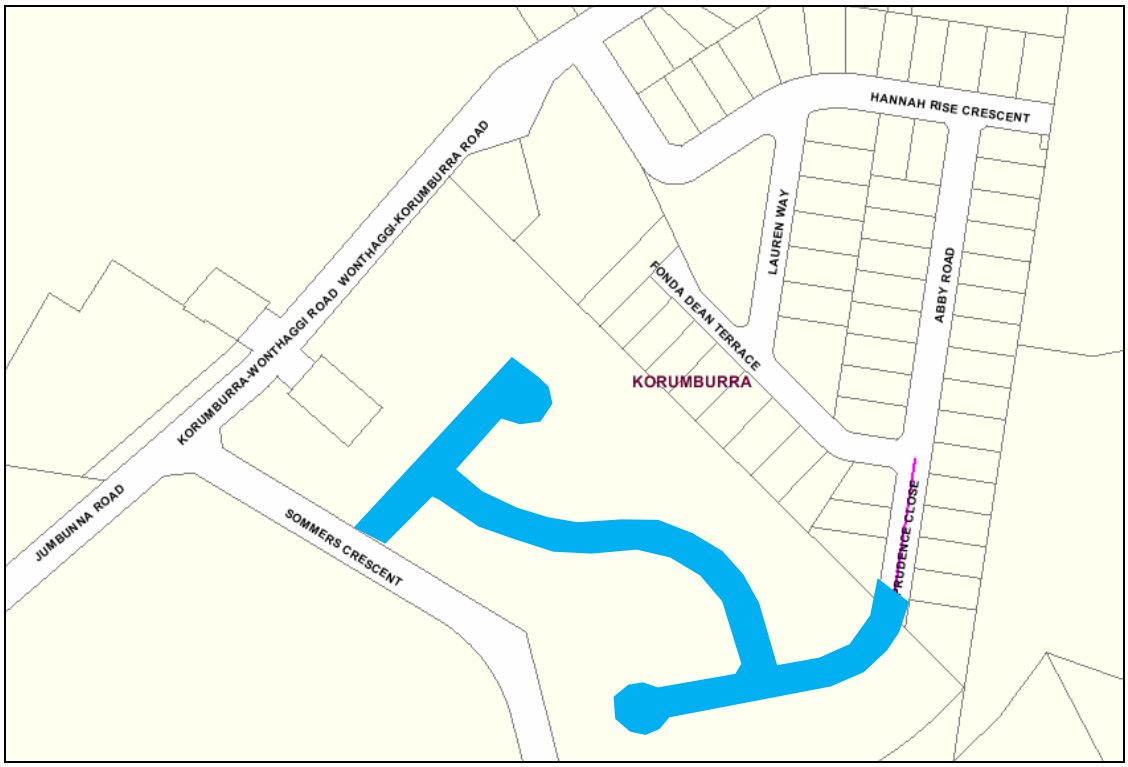
Based on the proposal to develop 189 standard lots, this represents a daily traffic generation of 1,890 trips, with no more than around 189 trips in each of the AM and PM peak hour periods.

4.1.1. ACCESS FROM ABUTTING PROPERTIES

As part of the development of the Winterhalter property there is a proposed secondary access connection to Prudence Close. Given the alignment of the existing local road network between Prudence Close and Jumbunna Road, it is believed that some level of Prudence Close and Abby Road traffic may use the proposed road network through Winterhalter to access Somers Crescent head south along Jumbunna Road. This could be in the order of 10 properties using this route to head south along Jumbunna Road in preference to using the existing local road network.

Figure 18 shows the existing local road network to the north of the subject site, and an indicative proposed road alignment through the Winterhalter property.

We believe that it is less likely that traffic from the Winterhalter subject site will use Prudence Close and the existing local road network to head north along Jumbunna Road. As such, we have conservatively assumed that all northbound traffic from the subject site will access Jumbunna Road via Sommers Crescent.



Source: www.services.land.vic.gov.au

Figure 18: Indicative Road Network through Winterhalter

4.2. TRAFFIC GROWTH

For the purposes of this assessment, the following assumptions have been made with regards to traffic growth and future traffic volumes:

- Jumbunna Road Traffic: a compound growth rate of 2.5% over 10 years, and
- Sommers Crescent Traffic: the remaining low density residential lots be occupied within the subdivision to the south of the subject site i.e. a growth factor of 10% applied to existing traffic volumes.

4.3. TRAFFIC DISTRIBUTION

For the purposes of this assessment, we have assumed the following lot yields and access arrangements to the subject site:

- Cellante Property:
  - access via internal subdivision roads to Sommers Crescent = 130 lots
- PLUS development of the Fava and Scollo properties with access through Cellante = 5 lots.
- Winterhalter Property:
  - access via internal subdivision roads to Sommers Crescent access = 51 lots,
  - access direct to Sommers Crescent = 5 lots, and
  - access direct to Jumbunna Road = 3 lots.
- TOTAL = 194 lots

Based on the existing distribution of turning traffic at the Sommers Crescent and Jumbunna Road intersection (determined by the Turning Movement Count surveys detailed in Section 2.3), traffic to and from the site has been assumed as follows:

- Northbound along Jumbunna Road – 80% of trips (to Korumburra, Warragul, Drouin, Melbourne etc), and
- Southbound along Jumbunna Road – 20% of trips (to Inverloch, Wonthaggi etc).

In addition, the following distribution of traffic heading into and out of the subject site during each of the peak hour periods has been adopted:

- AM Peak – 80% of trips out, 20% of trips in, and
- PM Peak Trips – 40% of trips out, 60% of trips in.

Based on the traffic generation rates as outlined in Section 4.1 and the abovementioned assumptions in relation to access arrangements and traffic distribution, the resultant peak period turning movement volumes of the subject site traffic have been determined. The turning volumes at the intersection of the subject site with Sommers Crescent and at the intersection of Sommers Crescent and Jumbunna Road are provided in Table 1. It is noted that the traffic volumes represent the predicted upper limit peak hour traffic movements, when the subject site is fully developed (including allowance for traffic from Prudence Close and for the development of the Favia and Scollo properties). It is noted that the turning movement volumes do not include the existing turning movement volumes at the intersection of Sommers Crescent and Jumbunna Road generated by the low density residential development located at the south end of Sommers Crescent.

Table 1: Expected Peak Hour Turning Movements

Direction	AM Peak	PM Peak
Subject Site Access and Sommers Crescent		
Right Turn Out	42	21
Left Turn In	11	32
Left Turn Out	108	54
Right Turn In	27	81
TOTAL	188	188
Sommers Crescent and Jumbunna Road Intersection		
Right Turn Out	122	61
Left Turn In	31	92
Left Turn Out	32	16
Right Turn In	8	24
TOTAL	193	193

The expected post development AM and PM peak hour turning movement volumes at the subject site access intersection with Sommers Crescent and the intersection of Sommers Crescent with Jumbunna Road are presented at Figure 19 and Figure 20. These include the anticipated future traffic volumes along Sommers Crescent and Jumbunna Road as per Section 4.2.

The full traffic generation and distribution model is provided at Appendix C.

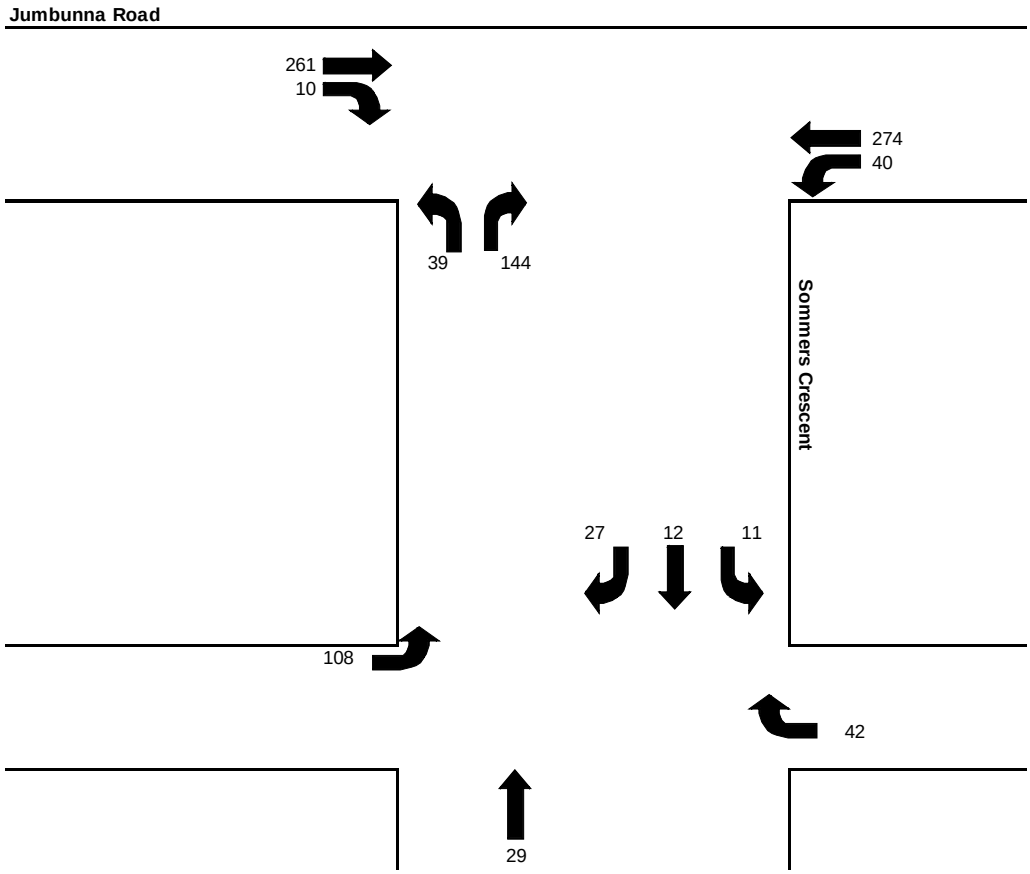


Figure 19: AM Peak Hour Turning Movement Volumes

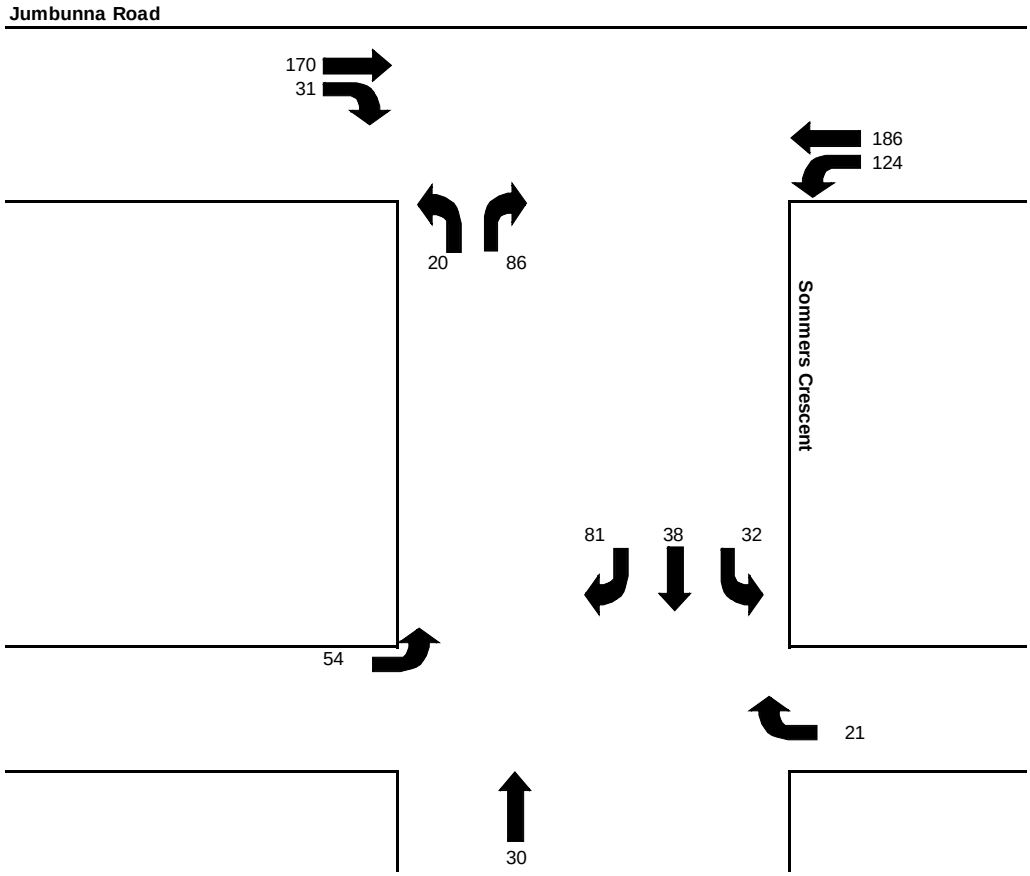


Figure 20: PM Peak Hour Turning Movement Volumes

5. TRAFFIC IMPACTS

The following sections of the report discuss the proposed intersection treatment at Sommers Crescent and Jumbunna Road.

5.1. SOMMERS CRESCENT & JUMBUNNA ROAD INTERSECTION

The proposed mitigating works at the intersection are based on the anticipated ultimate peak hour traffic volumes for the full development of the subject site, as well as growth in traffic volumes along Sommers Crescent and Jumbunna Road, as outlined in Section 4.2.

The requirement for turn lanes has been assessed with regard for the Austroads Guide to Road Design: Part 4A – Unsignalised and Signalised Intersections.

The 'ultimate' turning movement volumes result in the following treatments being recommended to be provided in accordance with AustRoads Guidelines:

- Jumbunna Road: Short Channelised Right Turn CHR(S) into Sommers Crescent, and
- Jumbunna Road: Short Auxiliary Left Turn AUL(S) into Sommers Crescent.

A concept plan of the intersection of Jumbunna Road and Sommers Crescent is presented at Appendix D.

5.1.1. CAPACITY ANALYSIS

The intersection of Sommers Crescent and Jumbunna Road has been analysed using SIDRA Intersection 5.1 for both the AM and PM peak hour using volumes presented in Figure 19 and Figure 20.

The intersection layout used in the model is presented at Figure 21 below

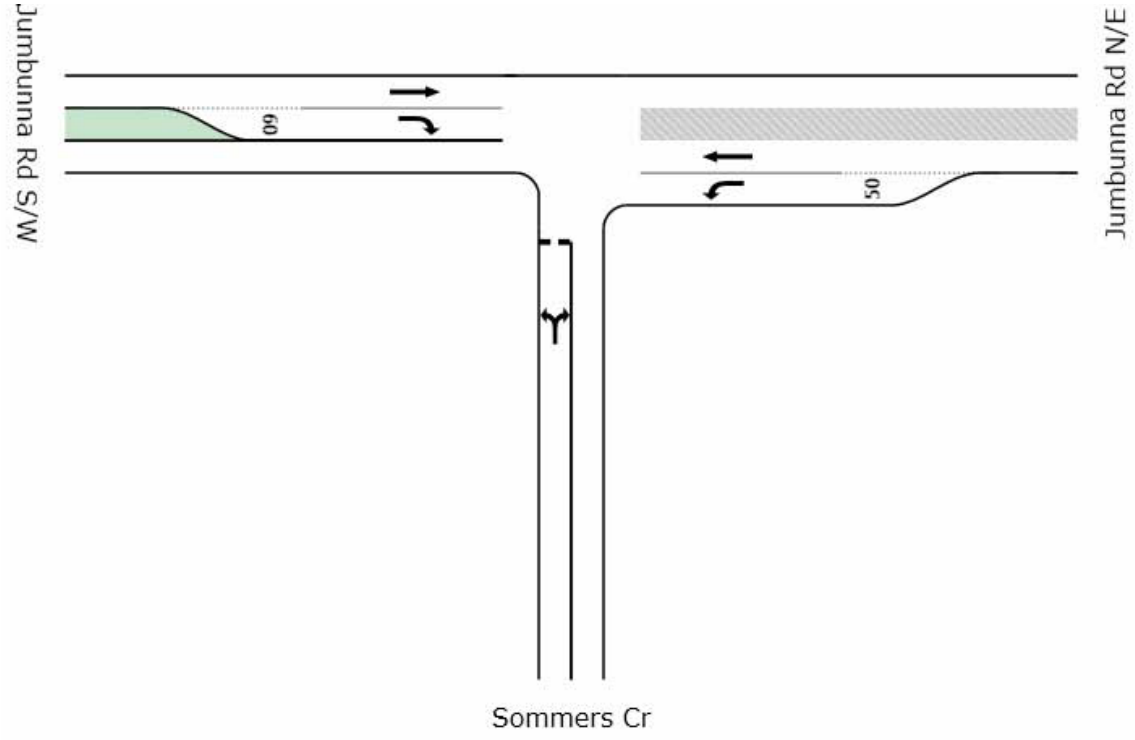


Figure 21: Sommers Crescent & Jumbunna Road – SIDRA Intersection Layout

The gap acceptance values have been adopted from Table 3.4 in the Austroads Guide to Road Design: Part 4A – Unsignalised and Signalised Intersections as follows:

- Right Turn From Major Road (across one lane) – t_a = 4 sec, t_f = 2 sec,
- Right Turn From Minor Road (two lane/two way) – t_a = 5 sec, t_f = 3 sec,
- Left Turn From Minor Road – t_a = 5 sec, t_f = 3 sec, and

As discussed previously, these traffic volumes include growth in traffic volumes along Sommers Crescent and Jumbunna Road and as such, represent future peak traffic volumes.

A summary of the analysis at the Sommers Crescent and Jumbunna Road intersection, during the AM and PM peak hour, is presented in Table 2.

A full summary of the SIDRA analysis is provided at Appendix E.

The results in Table 2 indicate that the intersection of Sommers Crescent and Jumbunna Road will provide good operating conditions with minimal delays and queuing following the development of the subject site and into the future. We are satisfied that the traffic volumes generated from the proposed development will not cause any significant impacts on the operation of Sommers Crescent or Jumbunna Road.

Table 2: Intersection Capacity Analysis – Sommers Crescent & Jumbunna Road Intersection

Scenario	Sommers Crescent South Approach		Jumbunna Road North-East Approach		Jumbunna Road South-West Approach	
	Left	Right	Left	Through	Through	Right
Future (10 years) – AM Peak Hour						
Degree of Saturation (DoS)	0.282	0.282	0.023	0.154	0.146	0.008
Average Delay (seconds)	13.3	13.3	8.2	0.0	2.6	11.2
95th %ile Queue Length (m)	8.4	8.4	0.0	0.0	0.0	0.2
Future (10 years) – PM Peak Hour						
Degree of Saturation (DoS)	0.145	0.145	0.069	0.104	0.095	0.023
Average Delay (seconds)	11.8	11.8	8.2	0.0	2.6	11.2
95th %ile Queue Length (m)	3.8	3.8	0.0	0.0	0.0	0.7

6. CONCLUSIONS

Having completed a traffic impact assessment associated with the proposed rezoning for residential subdivision at Jumbunna Road, Korumburra, we are of the opinion that:-

a) The development is likely to generate up to 1,890 trip ends per day,

b) The majority of these trips will use Sommers Crescent and then Jumbunna Road to access the road network, with a nominal number of trips direct to Jumbunna Road (3 lots),

c) Based on the Austroads Guide to Road Design: Part 4A, the intersection of Jumbunna Road and Sommers Crescent requires an AUL(S) short left turn treatment for left turns into Sommers Crescent, and a CHR(S) short right turn treatment for right turns into Sommers Crescent,

d) Capacity analysis of the intersection of Sommers Crescent and Jumbunna Road indicates that the intersection will perform well, with limited delays and queuing expected post development and into the future,

e) There are no traffic engineering reasons why a permit for the proposed rezoning for residential subdivision should not be granted, subject to appropriate conditions.

Appendix A

Traffic Count Results

TURNING MOVEMENT COUNT SUMMARY

Intersection: Sommers Cr & Jumbunna Rd, Korumburra

Day: Wednesday

Date: 22 February 2012

Weather: Fine

Map Ref.: VR 709M10

Survey Periods

Period 1: 07:30 to 09:30

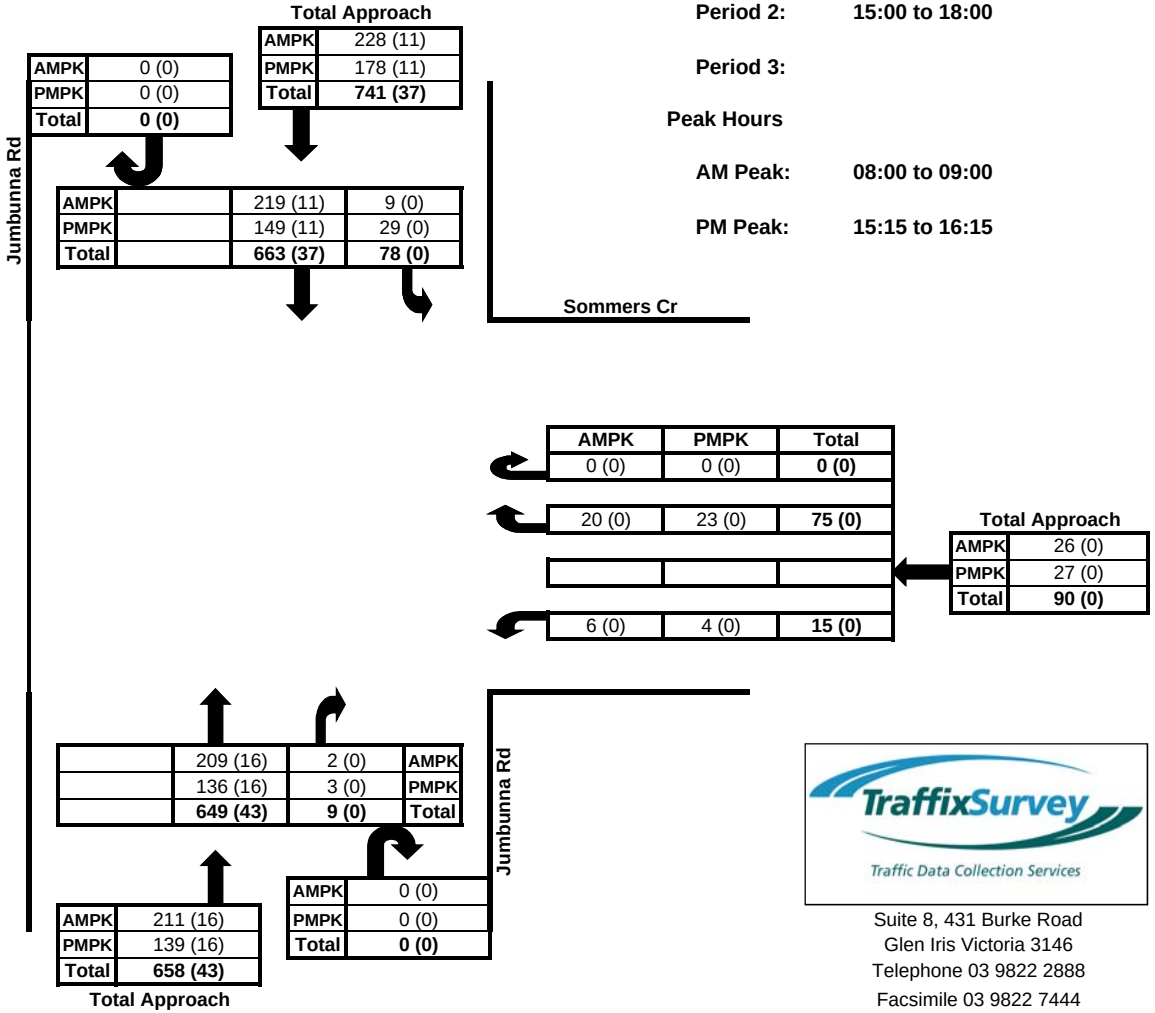
Period 2: 15:00 to 18:00

Period 3:

Peak Hours

AM Peak: 08:00 to 09:00

PM Peak: 15:15 to 16:15



Legend:

Vehicle Movements

Total Vehicles (Commercial Vehicles)

N

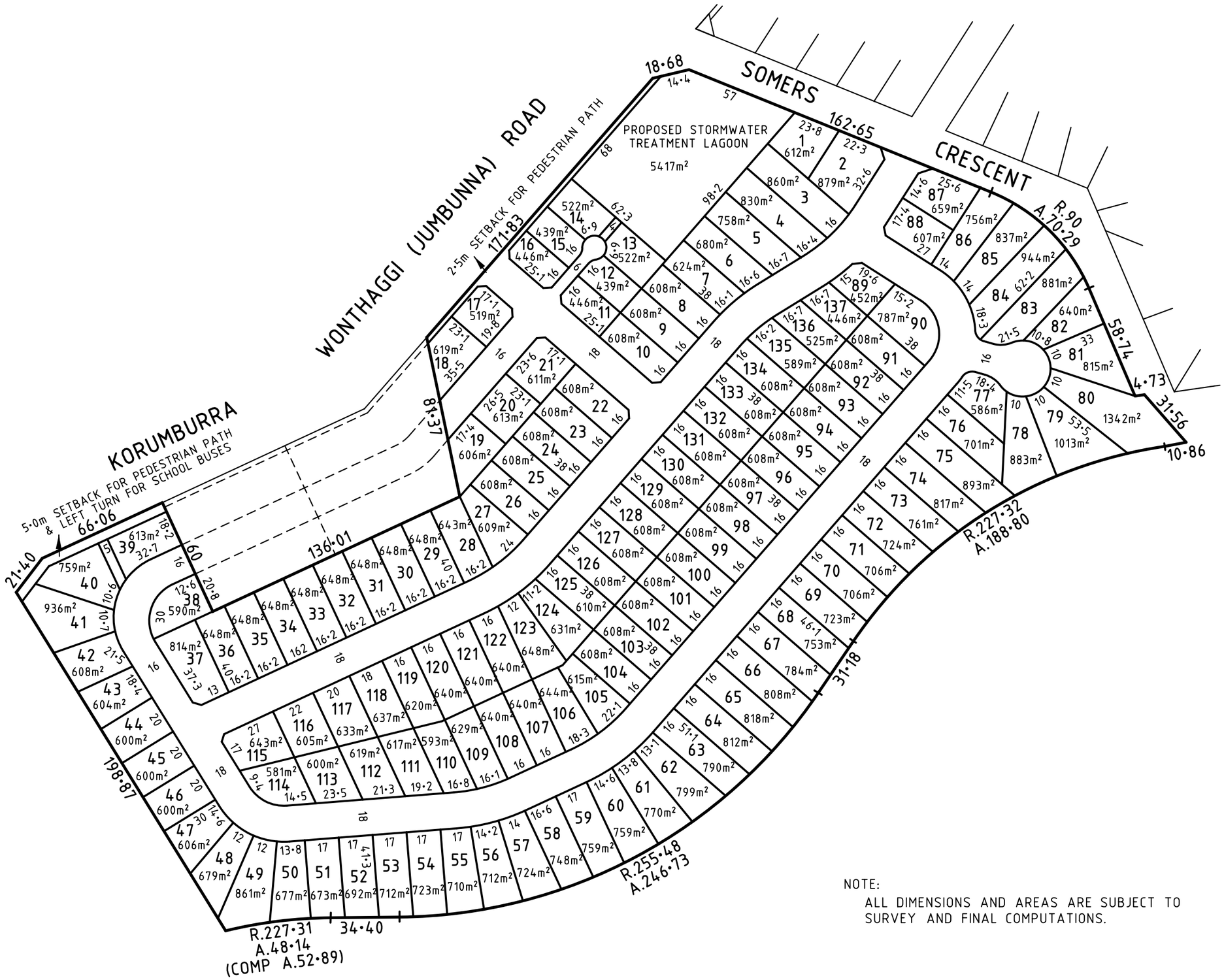
TraffixSurvey
Traffic Data Collection Services

Suite 8, 431 Burke Road
Glen Iris Victoria 3146
Telephone 03 9822 2888
Facsimile 03 9822 7444
Email: survey@traffixgroup.com.au
Web: www.traffixgroup.com.au

Reference: GRP13858

Appendix B

Plans of Proposed Subdivision



NOTE:
ALL DIMENSIONS AND AREAS ARE SUBJECT TO SURVEY AND FINAL COMPUTATIONS.

Beveridge Williams
development & environment consultants
Leongatha ph : 03 5662 2630
www.beveridgewilliams.com.au

ORIGINAL

Scale	Sheet Size
1:2000	A3

Dwg No CELLANTE TENT DGN
Sheet 1 of 1

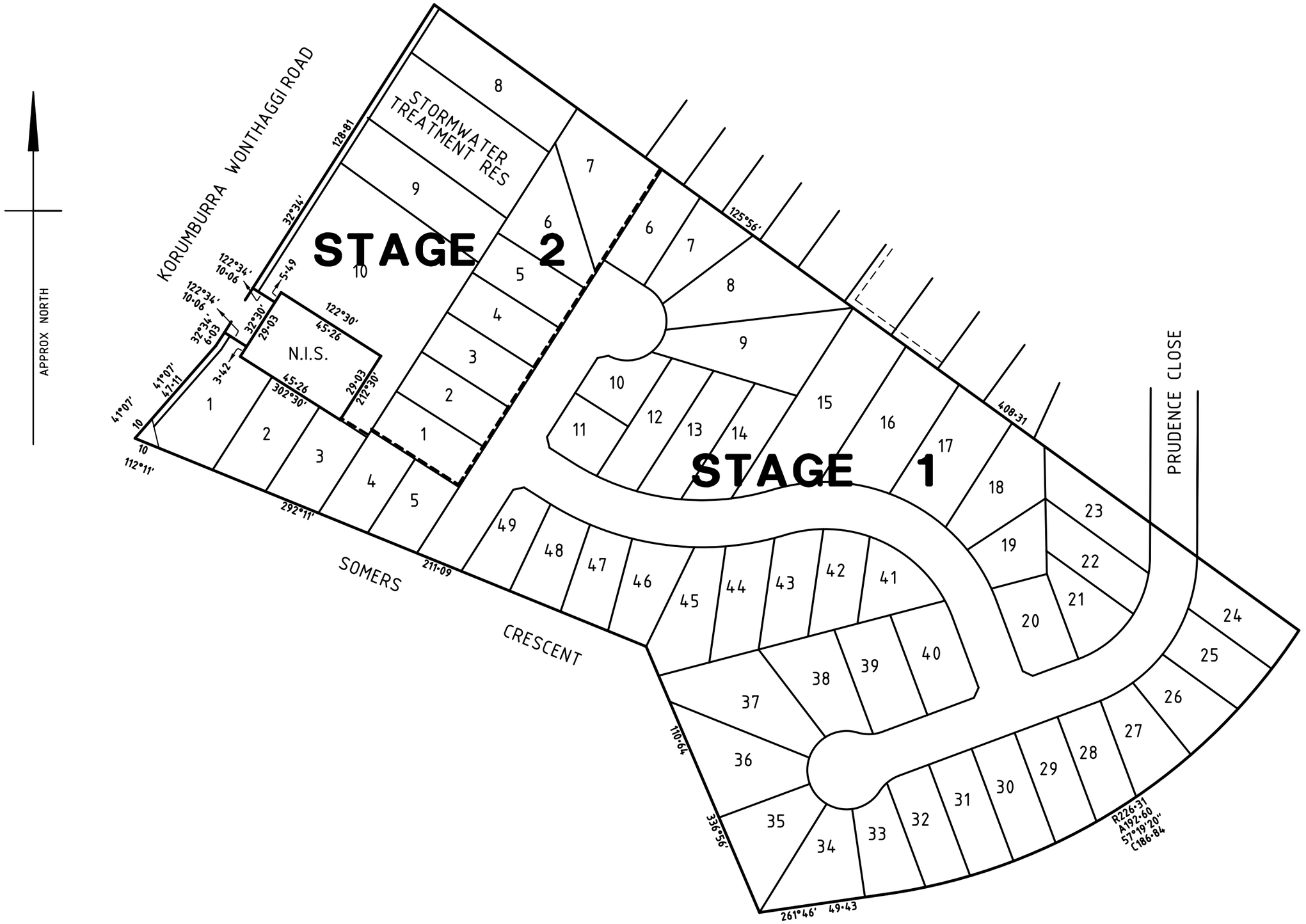
PLAN OF PROPOSED SUBDIVISION VERSION 2

PREPARED R.J. WEBSTER
SURVEY
CHECKED N.BREEDEN
DATE 31/10/2011
AUTHORISED FOR ISSUE
Proj No L7074

CELLANTE PROPERTY

JUMBUNNA ROAD, KORUBURRA
LOT 2 LP139824, LOT 4 LP135303 & LOT 2 LP139823

SOUTH GIPPSLAND SHIRE COUNCIL



Beveridge Williams development & environment consultants Leongatha ph : 03 5662 2630 www.beveridgewilliams.com.au	ORIGINAL Scale 1:1500 / Sheet Size A3 Dwg No WINTERHALTER TENT DGN Sheet 1 of 1	**PLAN OF PROPOSED SUBDIVISION** COUNTY OF MORNINGTON PARISH OF KORUMBURRA CROWN ALLOTMENT 90 (PART)	PREPARED R.J. WEBSTER SURVEY CHECKED N.BREEDEN DATE 10/08/2011 AUTHORISED FOR ISSUE Proj No L7074	WINTERHALTER JUMBUNA ROAD, KORUMBURRA LOT 2 LP SOUTH GIPPSLAND SHIRE COUNCIL

Appendix C

Traffic Generation & Distribution Model

Jumbunna Road, Korumburra
Proposed Residential Subdivision
Traffic Generation and Distribution
Our Ref: GRP13858

TraffixGroup
Traffic Engineers and Transport Planners

Use	No. of Lots	Trip Generation (veh/day)	Peak Hour %	Peak Hour Volumes (v/h)	Daily Trip Generation (v/d)
Cellante - Access via internal to Sommers	130	10	10%	130	1,300
Fava & Scollo - Additional Lots access via internal to Sommers	5	10	10%	5	50
Winterhalter - Access via internal to Sommers	51	10	10%	51	510
Prudence Close Southbound Traffic - Access via internal to Sommers	10	10	10%	10	100
Winterhalter - Access via Sommers to Jumbunna	5	10	10%	5	50
Winterhalter - Access direct to Jumbunna	3	10	10%	3	30
TOTAL	204	-	-	204	2040
TOTAL VIA SOMMERS CRESCENT (sthbnd Prudence Cl Traffic Only)	193	-	-	193	1930

Peak Period Splits	AM	PM
In	20%	60%
Out	80%	40%

General Traffic Direction:	Percentage
To North (Korumburra, Warragul, Melbourne etc)	80%
To South (Wonthaggi etc)	20%

Winterhalter:	AM Peak	PM Peak
Right Turn Out	42	21
Left Turn In	11	32
Cellante:	AM Peak	PM Peak
Left Turn Out	108	54
Right Turn In	27	81
TOTAL:	188	188

Subject Site Traffic At Jumbunna Road	AM Peak	PM Peak
Right Turn Out	122	61
Left Turn In	31	92
Left Turn Out	32	16
Right Turn In	8	24
TOTAL:	193	193

Jumbunna Road Growth Factor:	2.5%	compound over 10 years
Residential Area to South on Sommers Crescent Anticipated Growth:	10%	based on number of vacant lots

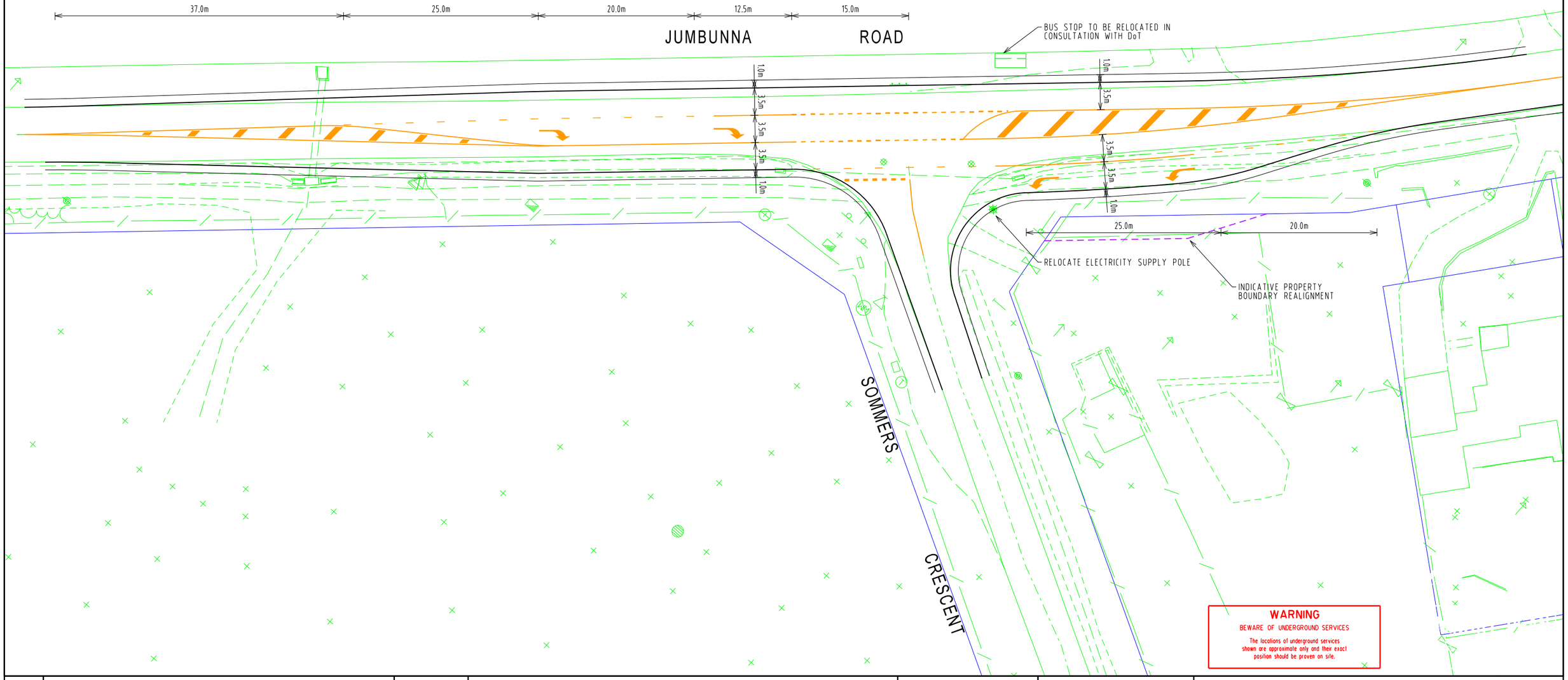
Sommers Road & Jumbunna Road Existing TMC	2012		2022	
	AM	PM	AM	PM
Right Turn Out	20	23	22	25
Left Turn Out	6	4	7	4
Right Turn In	2	6	2	7
Left Turn In	9	29	10	32
Northbound	209	136	261	170
Southbound	219	149	274	186
TOTAL	465	347	575	424

Sommers Road & Jumbunna Road Post-Development TMC	2012		2022	
	AM	PM	AM	PM
Right Turn Out	142	84	144	86
Left Turn Out	37	96	39	20
Right Turn In	34	22	10	31
Left Turn In	17	53	40	124
Northbound	209	136	261	170
Southbound	219	149	274	186
TOTAL	658	540	768	617

Turn Lane Requirements	2012		2022	
Qm Calculation	AM	PM	AM	PM
Right Turn Lane	445	338	575	479
Left Turn Lane	219	149	274	186

Appendix D

Sommers Crescent and Jumbunna Road Intersection – Concept Plan



ISSUE	ISSUE NOTES	REVISION DATE
A	DRAFT CONCEPT LAYOUT PLAN	16 MAY 2012

GENERAL NOTES:
1. BASE INFORMATION FROM AERIAL PHOTOGRAPHY AND BEVERIDGE WILLIAMS SURVEY FILE: L7074.DWG
2. MAIN ROAD - JUMBUNNA ROAD (SPEED ZONE 80km/h).

DESIGNED: A. BACKMAN 16 MAY 2012
CHECKED: W. de WAARD 16 MAY 2012
FILE NAME: G13858.DGN
ISSUE: B

TraffixDesign
Traffic Engineering Design and Survey
Suite 8/431 Burke Road GLEN IRIS, VICTORIA 3146
TEL : (03) 9822-2888 FAX : (03) 9822-7444
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JUMBUNNA ROAD, KORUMBURRA

SOMMERS CRESCENT

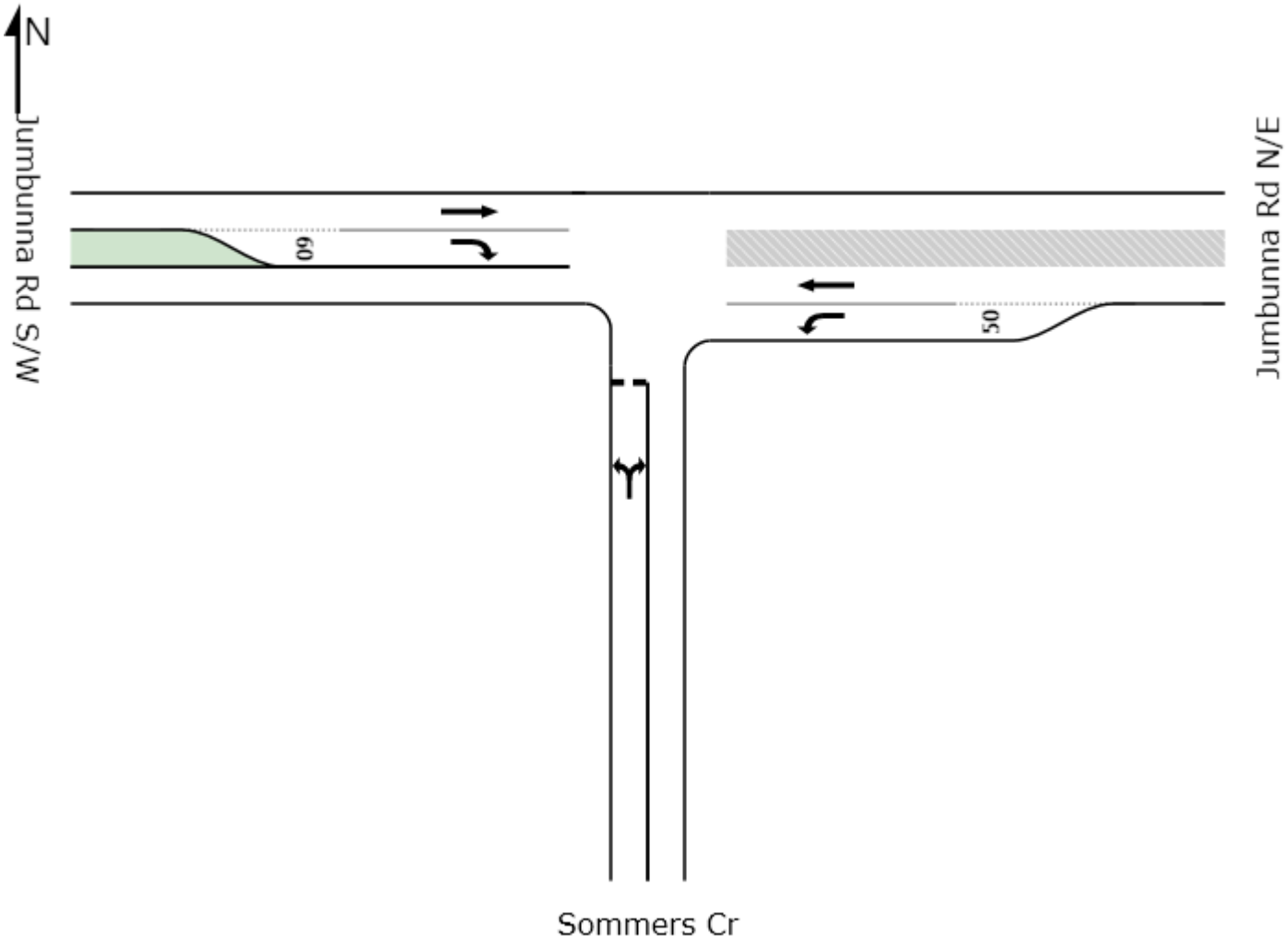
SOUTH GIPPSLAND SHIRE COUNCIL

CONCEPT LAYOUT PLAN

SCALE 0 5.0 10
SHEET No.
DWG No. G13858-01

Appendix E

SIDRA Analysis


N
Jumbunna Rd S/W
Jumbunna Rd N/E
60
50
Sommers Cr

MOVEMENT SUMMARY

Site: AM Peak Hour

Jumbunna Road & Sommers Crescent
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Sommers Cr											
1	L	38	0.0	0.282	13.3	LOS B	1.2	8.4	0.55	0.78	47.0
3	R	148	0.0	0.282	13.3	LOS B	1.2	8.4	0.55	0.88	47.0
Approach		186	0.0	0.282	13.3	LOS B	1.2	8.4	0.55	0.86	47.0
East: Jumbunna Rd N/E											
4	L	42	0.0	0.023	8.2	LOS A	0.0	0.0	0.00	0.67	49.0
5	T	288	6.0	0.154	0.0	LOS A	0.0	0.0	0.00	0.00	80.0
Approach		331	5.2	0.154	1.0	NA	0.0	0.0	0.00	0.09	74.6
West: Jumbunna Rd S/W											
11	T	275	6.0	0.146	2.6	LOS A	0.0	0.0	0.00	0.23	71.0
12	R	11	0.0	0.008	11.2	LOS B	0.0	0.2	0.39	0.65	54.9
Approach		285	5.8	0.146	2.9	NA	0.0	0.2	0.01	0.24	70.2
All Vehicles		802	4.2	0.282	4.6	NA	1.2	8.4	0.13	0.32	64.2

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.

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 used.

SIDRA INTERSECTION

MOVEMENT SUMMARY

Site: PM Peak Hour

Jumbunna Road & Sommers Crescent
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Sommers Cr											
1	L	20	0.0	0.145	11.8	LOS B	0.5	3.8	0.46	0.70	48.4
3	R	89	0.0	0.145	11.8	LOS B	0.5	3.8	0.46	0.79	48.5
Approach		109	0.0	0.145	11.8	LOS B	0.5	3.8	0.46	0.77	48.4
East: Jumbunna Rd N/E											
4	L	127	0.0	0.069	8.2	LOS A	0.0	0.0	0.00	0.67	49.0
5	T	196	6.0	0.104	0.0	LOS A	0.0	0.0	0.00	0.00	80.0
Approach		323	3.6	0.104	3.2	NA	0.0	0.0	0.00	0.26	65.1
West: Jumbunna Rd S/W											
11	T	179	6.0	0.095	2.6	LOS A	0.0	0.0	0.00	0.23	71.0
12	R	31	0.0	0.023	11.2	LOS B	0.1	0.7	0.38	0.67	54.9
Approach		209	5.1	0.095	3.9	NA	0.1	0.7	0.06	0.29	68.1
All Vehicles		642	3.5	0.145	4.9	NA	0.5	3.8	0.10	0.36	62.1

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.
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 used.