PROPOSED RESIDENTIAL SUBDIVISION

460 GROSSMANS ROAD, BELLBRAE

TRAFFIC IMPACT ASSESSMENT REPORT

Prepared for

ST. QUENTIN CONSULTING

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OUR REFERENCE: 16948R9678, REV A
PROPOSED RESIDENTIAL SUBDIVISION

460 GROSSMANS ROAD, BELLBRAE

TRAFFIC IMPACT ASSESSMENT REPORT

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Our Reference: 16948R9678, Rev A

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1 INTRODUCTION

Traffix Group has been engaged by St. Quentin Consulting to undertake a traffic impact assessment and to prepare a report for the proposed residential subdivision located at 460 Grossmans Road, Bellbrae.

This report provides a detailed traffic engineering assessment of the internal road layout and access arrangements of the proposed development and the likely resulting impacts on the surrounding road network, noting that we prepared our initial version of this report for an almost identical development scenario on 25th.

2 EXISTING CONDITIONS

2.1 The Site

The subject site is located on the north side of Grossmans Road in Bellbrae, as shown in Figure 1.

![Subject Site Map]

Figure 1: Locality Plan

The subject site is irregular in shape and has a frontage to Grossmans Road. The site forms part of a larger parcel of land which extends to Anglesea Road to the west and Coombes Road to the north. The part of the overall site that is the subject of this assessment is subject to DPO11 of the Surf Coast Planning Scheme.

The site currently comprises rural land and includes a dam in the centre. An aerial view of the site is shown in Figure 2.
Figure 2: Subject Site – Aerial View

The subject site is situated within a Low Density Residential Zone (LDRZ) under the Surf Coast Planning Scheme, as shown in Figure 3.

Surrounding land uses are rural/farming to the north, south and west. Land abutting the site to the east is zoned Low Density Residential Zone (LDRZ) and is currently being developed for the purpose of a retirement village (Kithbrooke Park).
2.2 Road Network

**Grossmans Road** forms an east-west collector road link through Torquay between Surf Coast Highway and Anglesea Road. The road continues to the east of Surf Coast Highway changing name to Darian Road.

In the vicinity of the site, Grossmans Road is constructed as a rural road with a 6.1 metre wide sealed carriageway within a 20 metre road reservation.

At the time of our most recent inspection the speed limit past the site was 100km/h, dropping to 80km/h towards Ghazeepore Road a short distance to the east.

Grossmans Road is shown in Photographs 1 and 2.
Anglesea Road is in the Road Zone Category 1 (RDZ1) under the Surf Coast Planning Scheme and is under the control of VicRoads. Anglesea Road has an undivided carriageway which provides a single lane of through traffic with a sealed shoulder in each direction of travel.

The intersection of Anglesea Road and Grossmans Road is currently operated under standard ‘Stop’ conditions and provides for all turning movements. Anglesea Road is shown in Photographs 3 and 4.

2.3 Public Transport

Public transport services currently operating in Bellbrae consist entirely of buses. These bus services include school buses, local bus services and a V/Line service which connects townships along the Great Ocean Road.

The nearest bus stop to the subject site is located at the Surf Coast Highway/Grossmans Road intersection, approximately 4km east of the subject site.

2.4 Existing Traffic Volumes

Traffix Survey Pty Ltd undertook a 7-day tube count on Grossmans Road between Anglesea Road and Ghazepore Road in the vicinity of the subject site as part of Traffix
Group’s involvement with a previous rezoning proposal for the site. The counts were undertaken from 14th to 20th January, 2010.

The results of these traffic counts are set out in Table 1.

**Table 1: Traffic Count Results – Grossmans Road**

<table>
<thead>
<tr>
<th></th>
<th>Eastbound</th>
<th>Westbound</th>
<th>Combined</th>
</tr>
</thead>
<tbody>
<tr>
<td>24-hour weekday average</td>
<td>359 vpd*</td>
<td>337 vpd</td>
<td>696 vpd</td>
</tr>
<tr>
<td>24-hour 7-day average</td>
<td>340 vpd</td>
<td>332 vpd</td>
<td>672 vpd</td>
</tr>
<tr>
<td>AM peak hour volume</td>
<td>40 vph**</td>
<td>36 vph</td>
<td>70 vph</td>
</tr>
<tr>
<td>AM peak hour</td>
<td>11am-12noon</td>
<td>10am-11am</td>
<td>10am-11am</td>
</tr>
<tr>
<td>PM peak hour volume</td>
<td>48 vph</td>
<td>38 vph</td>
<td>85 vph</td>
</tr>
<tr>
<td>PM peak hour</td>
<td>4pm-5pm</td>
<td>3pm-4pm</td>
<td>4pm-5pm</td>
</tr>
</tbody>
</table>

* vpd = vehicles per day    ** vph = vehicles per hour

In order to estimate current traffic volumes along Grossmans Road, an annual traffic growth rate of 4% has been adopted and added to the recorded traffic volumes shown in Table 1 (i.e. an overall growth rate of 20% from 2010-2015).

The adjusted traffic volumes for Grossmans Road are shown in Table 2.

**Table 2: Adjusted Traffic Counts – Grossmans Road**

<table>
<thead>
<tr>
<th></th>
<th>Eastbound</th>
<th>Westbound</th>
<th>Combined</th>
</tr>
</thead>
<tbody>
<tr>
<td>24-hour weekday average</td>
<td>431 vpd</td>
<td>404 vpd</td>
<td>835 vpd</td>
</tr>
<tr>
<td>24-hour 7-day average</td>
<td>408 vpd</td>
<td>398 vpd</td>
<td>806 vpd</td>
</tr>
<tr>
<td>AM peak hour volume</td>
<td>48 vph</td>
<td>43 vph</td>
<td>84 vph</td>
</tr>
<tr>
<td>AM peak hour</td>
<td>11am-12noon</td>
<td>10am-11am</td>
<td>10am-11am</td>
</tr>
<tr>
<td>PM peak hour volume</td>
<td>58 vph</td>
<td>46 vph</td>
<td>102 vph</td>
</tr>
<tr>
<td>PM peak hour</td>
<td>4pm-5pm</td>
<td>3pm-4pm</td>
<td>4pm-5pm</td>
</tr>
</tbody>
</table>

3 THE PROPOSAL

It is proposed to subdivide the subject site into a total of 68 residential allotments.

Vehicle access to and from the main part of the site will be available via a new access point to Grossmans Road, with two of the 68 allotments to have exclusive access via the short continuation of Dillwynia Lane towards the northeast corner of the site.
4 TRAFFIC CONSIDERATIONS

4.1 Traffic Generation

Standard residential dwellings within suburban areas typically generate in the order of 8 – 10 vehicle trip-ends per day, with approximately 10% occurring in the peak hours.

Traffic generation rates for residential developments within Torquay may differ from standard residential development in metropolitan suburban areas due to a number of factors including age structure of residents (e.g. retirees typically make fewer daily trips than families), and also not all dwellings may be occupied during the “off-peak” season due to the tourist nature of Torquay.

A survey of the Rocklea Avenue precinct (in Torquay) undertaken in November 2004 revealed a traffic generation rate of 7.2 vehicle trip-ends per dwelling per day, with 0.71 vehicle trip-ends per dwelling during the peak hour.

A survey of the Delview Drive precinct (in Jan Juc) undertaken in June 2005 revealed a traffic generation rate of 10.1 vehicle trip-ends per day (the date of this count is not known but is likely to have been during the mid-year school holidays having regard to the high traffic generation rate).

For the purposes of this assessment, a daily traffic generation rate of 10 vehicle trip-ends per dwelling per day will be conservatively adopted for the proposed development.

Based on this rate, the proposed development is predicted to generate in the order of 680 vehicle movements per day. It is expected that peak hour traffic generation will be up to 10% of the daily traffic generation, i.e. 68 vehicles movements per hour.

This volume of traffic will be generated to/from Grossmans Road.

4.2 Traffic Distribution

The following traffic distribution assumptions have been adopted based on the Journey to Work statistics (VicRoads 2006), the locality of the site and the layout of the surrounding road network:

- During the AM peak hour period, all traffic associated with the subject site will be split as 20% arrivals and 80% departures.
- During the PM peak hour period, all traffic associated with the subject site will be split as 60% arrivals and 40% departures.
- 70% of all traffic entering and exiting the subject site will be distributed to/from the east, while 30% will be distributed to/from the west, along Grossmans Road.

Based on the above assumptions, the projected AM and PM peak hour traffic movements to and from the main part of the subject site are illustrated in Figure 4, noting that this is conservative because two of the allotments will instead be exclusively accessed via the extension of Dillwynia Lane and subsequently Ghazeepore Road further to the east. The

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1 The 1996 ABS Census indicated a dwelling occupancy rate of 90% for Victoria as a whole, compared with an occupancy rate of 71% for Torquay West. The ABS Census is undertaken in August i.e. off-peak.
total conservative post-development AM and PM peak hour traffic volumes are illustrated in Figure 5\(^2\).

![Figure 4: Anticipated AM (PM) Peak Hour Traffic Volumes](image)

![Figure 5: Total Anticipated AM (PM) Post-Development Peak Hour Volumes](image)

\(^2\) An additional annual growth rate of 4% over a 10 year period has been added to predicted 2015 through movements along Grossmans Road (see Table 2), in order to account for future traffic that will be generated along Grossmans Road as a result if future development in the region, including the abutting Kithbrooke Park development. This is considered to be very conservative and is in addition to the traffic the site is conservatively predicted to generate.
4.3 Traffic Impacts

Based on the predicted peak hour traffic volumes presented in Figure 5, it is evident that motorists would be able to easily enter and exit the subject site without unreasonable delays.

However, it is also important to undertake an assessment of the required treatments at the proposed site access.

Austroads Guide to Road Design – Part 4A: Unsignalised and Signalled Intersections specifies appropriate turn treatments on major roads and is the appropriate standard to use when undertaking an assessment for the subject site. Specifically, Figure 4.9 of that standard shows the warrants for turn treatments on a major road with a design speed limit equal to or greater than 100 km/h (such as in this case).

Based on the post-development peak hour traffic volumes at the intersection of Grossmans Road and the site’s access point (as shown in Figure 5), Figure 4.9 of the Austroads Guide clearly shows that nothing more than a Basic Left-turn Treatment (BAL) and a Basic Right-turn Treatment (BAR) are required for the intersection. This is illustrated in Figure 6.

![Figure 6: Warrants for Turn Treatments](image)

Diagrams of the relevant BAR and BAL turn treatments as presented in the Austroads Guide are shown in Figures 7 and 8.

The provision of a BAR treatment will require the westbound traffic lane on Grossmans Road to be widened to the south. The Austroads Guide suggests that it would be desirable for an overall width of 6.5m to be provided between the centreline and the southern edge of the westbound lane (i.e. dimension C in Figure 7).
However, our site inspection suggests that there could be insufficient width within the southern verge of Grossmans Road to adequately accommodate the desirable 6.5m width without removing existing trees.

Accordingly, we are of the opinion that a reduced width of no less than 5.5m could be provided for an adequate outcome given that the Grossmans' Road horizontal alignment is straight and excellent sight lines (see Section 5) are available in this location. A Functional Layout Plan (FLP) showing the relevant treatments could be required as a condition of any permit that is issued for the site in our opinion.

![Diagram of BAR Treatment (Typical – Rural)](image)

**Figure 7: BAR Treatment (Typical – Rural)**

![Diagram of BAL Treatment (Typical – Rural)](image)

**Figure 8: BAL Treatment (Typical – Rural)**
Based on the forgoing, we are satisfied that subject to the provision of appropriate BAR and BAL treatments at the intersection of Grossmans Road and the site’s access point, the level of traffic likely to be generated by the proposed development will not have any detrimental impacts on the safety, capacity and operation of Grossmans Road and other nearby roads and intersections.

5 SIGHT DISTANCE ASSESSMENT

Traffix Group has undertaken a sight distance assessment at the proposed location of the site’s access point with Grossmans Road. Adjacent to the site, Grossmans Road has a posted speed limit of 100 km/h.

Sight distances were measured as per the Safe Intersection Sight Distance (SISD) method outlined under the Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections.

To the east and west along Grossmans Road, a SISD in excess of 690m was measured.

Table 3.2 in the Austroads Guide Part 4A outlines the following SISD(s) for a road with a design speed of 100 km/h:

<table>
<thead>
<tr>
<th>Desired Minimum Sight Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reaction Time = 1.5 seconds</td>
</tr>
<tr>
<td>Reaction Time = 2.0 seconds</td>
</tr>
<tr>
<td>Reaction Time = 2.5 seconds</td>
</tr>
<tr>
<td>234m</td>
</tr>
<tr>
<td>248m</td>
</tr>
<tr>
<td>262m</td>
</tr>
</tbody>
</table>

The measured SISDs in this instance are well in excess of the required sight distances and, accordingly, we are satisfied that vehicles will be able to enter and exit the site in a safe and efficient manner, subject to the provision of appropriate turn lanes as discussed in Section 4.

6 INTERNAL TRAFFIC MATTERS

6.1 Road Cross Sections

Statutory requirements for road cross-sections are set out at Clause 56.06-8 of the Surf Coast Planning Scheme as shown in Table 3.

All internal roads within the development will carry fewer than 1,000 vehicles per day and will operate as an ‘Access Place’. The roads are shown to have a 20m wide road reservation, with a 5.5m wide carriageway proposed for each.

An ‘extended driveway’ is proposed with a 14m wide road reservation towards the southeast corner of the site. This extended driveway will serve no more than three properties and is an appropriate outcome.

The proposed road reservation and carriageway widths either meet or exceed the requirements of Clause 56 for an ‘Access Place’ and will adequately accommodate necessary services and other characteristics as required.
The only exception is likely to be near the site’s connection with Grossmans Road where a wider carriageway is likely to be necessary for a short distance in order to simultaneously accommodate relevant entering and exiting vehicles.

6.2 Parking Provision

The proposed 5.5 metre wide carriageways are sufficient to accommodate parking on one side only. This provision of on-street parking is consistent with the Planning Scheme and current practice.

It is noted that all proposed lots are to be at least 2,000m². Accordingly, the likelihood of on-street parking occurring is very low, given that there will be ample space within each of the lots to provide for off-street parking for residents and their visitors.

Furthermore, each allotment will have ample abuttal to an internal street to accommodate multiple on-street spaces and not requiring on-street parking on both sides of the street.

Table 3: Clause 56 – Road Design Requirements

<table>
<thead>
<tr>
<th>Design Requirement</th>
<th>Access Place</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traffic Volume</td>
<td>300 – 1,000 vpd</td>
</tr>
<tr>
<td>Carriageway Width &amp; Parking Provision within Street Reservation</td>
<td>5.5m with 1 hard standing verge parking space per 2 lots, or 5.5m with parking on carriageway (one side, appropriately signed)</td>
</tr>
<tr>
<td>Verge Width</td>
<td>7.5m minimum total width (for services, min. 3.5m one side, min. 2.5m other side)</td>
</tr>
<tr>
<td>Road Reservation</td>
<td>minimum 13m</td>
</tr>
<tr>
<td>Footpath Provision</td>
<td>Not required for 5 dwellings or less, otherwise 1.5m (on one side only), offset minimum 1m from kerb</td>
</tr>
</tbody>
</table>

6.3 Pedestrian Access

Except for the single ‘extended driveway’ all internal roads are to typically have a 5.5m wide carriageway, within 20m wide road reserves. This results in an average 7.25m of verge on both sides of all roads. Whilst this is sufficient to accommodate a pedestrian footpath on one side of each road as suggested in Table 3, it is noted that there is no specific need or desire to do so given the extremely low traffic volumes that will be generate along each road. The lack of footpaths within the site is also consistent with other nearby developments.

However, we understand that the proposal is to provide a pedestrian link with the adjacent Kithbrooke Park development which we believe provides for good integration and a sensible outcome.

6.4 Access for Service and Emergency Vehicles

The minimum 5.5m wide carriageway suggested at Section 6.1 of this report will adequately facilitate relevant service and emergency vehicles and are consistent with the typical CFA requirements.

It is noted that CFA requires turning provisions at the end of dead-ends for roads which are longer than 60 metres. All dead-end roads (including the ‘extended driveway’) within
the development are to be no longer than 60m and, accordingly, are not required to provide turn-around areas.

With respect to refuse collection, it is considered appropriate for future residents of dwellings in a ‘dead-end’ road to wheel their bins to the nearest through road for collection, given that the dead-end roads (including the ‘extended driveway’) are no longer than 60 metres in length.

It is also noted that the short dead-end road located towards the northwest corner of the site allows for potential future access to the land to the north if desired.

6.5 Traffic Control

We are satisfied that the proposed internal road layout will meet the speed objectives of Clause 56 subject to the provision of some basic traffic control treatments which in some instances will predominately identify the priority route rather than provide speed control.

These treatments are identified in Figure 9 and consist of three reverse priority T-intersections. The relevant design requirements for these treatments can be addressed at the detailed design stage for the development.

Figure 9: Suggested Traffic Control Devices

All other roads within the subject site are to intersect via standard T-intersections which are appropriately staggered, i.e. at least 20m (centre to centre) apart.
7 CONCLUSIONS

Having visited the site, perused relevant documents and plans, predicted traffic generation and distribution, and undertaken other traffic engineering assessments, we are of the opinion that:

a) Subject to the provision of appropriate BAR and BAL treatments at the intersection of Grossmans Road and the site's access point that have consideration for existing trees, the level of traffic likely to be generated by the proposed development will not have any detrimental impacts on the safety, capacity and operation of Grossmans Road and any other nearby roads and intersections.

b) Sight distances at the proposed site's access points are appropriate and will enable vehicles to enter and exit the site in a safe and efficient manner.

c) The proposed road reservations are greater than what is required to accommodate appropriate carriageways, services and other characteristics, and appropriately facilitate all relevant user groups in accordance with relevant standards and current practice.

d) All relevant service and emergency vehicles will be able to adequately access and circulate through the site.

e) Traffic control devices similar to those presented at Figure 9 of this report should be considered on the internal road network to control speed in a fashion consistent with current practice.

f) There are no traffic engineering reasons why a permit should not be granted for the proposed residential subdivision at 460 Grossmans Road, Bellbrae.