



PROPOSED TORRENS TITLE LAND SUBDIVISION - 1 LOT INTO 3 LOTS

337 LOWER PLATEAU ROAD, BILGOLA PLATEAU

TRAFFIC ASSESSMENT REPORT

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REF 22070

Prepared by

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1. INTRODUCTION

This report has been prepared to accompany a Development Application to Northern Beaches Council for a proposed Torrens Title land subdivision at 337 Lower Plateau Road, Bilgola Plateau (Figures 1 and 2).

The development site is located on the western side of Lower Plateau Road between Yarrabee Place and Bilwara Avenue. It has a total site area of 3,410m² with a frontage of 4.57m to Lower Plateau Road. The existing site development comprises a single residential dwelling that gains vehicular access to Lower Plateau Road via a 38m long single lane accessway. The accessway has an average grade of approximately 24% (1 in 4.2) from Lower Plateau Road (RL91.0) down to the existing dwelling (RL82.0).

An extract from the site survey is reproduced in the following pages.

Development Proposal

The proposed development comprises the following:

- Retention of the existing 3.0m wide driveway and accessway
- Demolition of the existing dwelling and outbuildings
- The creation of three (3) new lots:
 - Lot $1 1,222m^2$
 - Lot $2 1,073 \text{m}^2$
 - Lot $3 1,115m^2$

A plan of the proposed subdivision and Indicative Building Plans prepared by Gartner Trovato Architects are reproduced in Appendix A. The Indicative Building Plans show single dwellings on each lot that are served by at least 2 off-street parking spaces per dwelling.

A convex mirror has been positioned at the base of the accessway to enhance sight lines to oncoming vehicles.



Public Transport Connectivity

The development site is located in close proximity to bus stops serving Route 191 which is a "loop service" operating between Avalon Beach and Taylors Point via Bilgola and Clareville. The nearest bus stop is a 150m walk to the north of the site on Lower Plateau Road.

The purpose of this report is to assess the traffic implications of the proposed development.















Extract of the Site Survey



2. TRAFFIC IMPLICATIONS

Road Hierarchy

Lower Plateau Road is an unclassified local road performing a collector road function through Bilgola Plateau. It forms part of the collector road system that includes Plateau Road – Lower Plateau Road – Wandeen Road – Hudson Parade – Central Road. Both Plateau Road and Central Road connect onto Barrenjoey Road.

The section of Lower Plateau Road in the vicinity of the site has a pavement width of approximately 8.0m and is restricted to a speed limit of 50km/h. The relatively narrow width of the roadway and double white linemarking precludes kerbside parking along this section of Lower Plateau Road.

Projected Traffic Generation

An indication of the traffic generation potential of the proposed development is provided by reference to the Roads and Maritime Services (RMS) Guide to Traffic Generating Developments – Technical Direction TDT 2013-04a (August 2013). The traffic generation rates specified in the updated Guidelines are based on extensive surveys of a wide range of land uses throughout Sydney and regional NSW and nominate the following traffic generation rates for low density residential dwellings:

AM Peak (1 hour) vehicle trips per dwelling	0.95
PM Peak (1 hour) vehicle trips per dwelling	0.99

Application of this traffic generation rate to the proposed subdivision yields a traffic generation potential of 3 vehicle trips per hour (vtph) during the peak periods as follows:

AM Peak Period 3 x dwellings @ 0.95vtph per dwelling PM Peak Period

3 x dwellings @ 0.99vtph per dwelling 3vtph (3 in / 0 out)



The traffic generation of the proposed development should be discounted by the traffic generation of the existing dwelling on the site. Based on the RMS's traffic generation rate of 1 vehicle trip per dwelling, the existing site development would generate in the order of 1vtph during the peak periods. To that end, the proposed subdivision will only generate 2 additional vehicle trips during the peak periods as follows:

Proposed development	3vtph
Existing development	1vtph
Additional traffic	2vtph

Traffic Impacts of Proposed Development

It will be readily appreciated that the additional traffic generated by the proposed development is relatively minor (2vtph) which will not have any noticeable or unacceptable effect on the road network serving the site in terms of road network capacity or traffic-related environmental effect.

Compliance with Design Standards – Access Driveway

As noted above, vehicular access to the site is off Lower Plateau Road via a 4.57m wide ROW. The driveway between the kerb and boundary has a width of 3.0m while the accessway has varying widths from 3.0m at the site boundary to 4.3m at the base of the accessway.



Photograph of the existing accessway and driveway





The width of the driveway complies with the following criteria for a "*Category 1*" driveway as described Tables 3.1 and 3.2 of AS/NZS2890.1:2004 – "*Off-street car parking*":

- 1. The parking facilities are classified "Class 1A" for resident parking (refer to Table 1.1)
- 2. The development has less than 25 spaces
- 3. The development site is located on a Local Road

Class of parking		Access facility category Number of parking spaces (Note 1)				
facility	Frontage road type					
(see Table 1.1)	. one type	<25	25 to 100	101 to 300	301 to 600	>600
1,1A	Arterial	1	19015 2 0000	3	4	5
a set at the second	Local	1	1	2	3	4
2	Arterial	2	2	3	4	5
	Local	1	2	3	4	4
3,3A	Arterial	2	3	4	4	5
for research	Local	· 1	2	3	4	4

TABLE 3.1 SELECTION OF ACCESS FACILITY CATEGORY

NOTES:

1 When a car park has multiple access points, each access should be designed for the number of parking spaces effectively served by that access.

2 This Table does not imply that certain types of development are necessarily suitable for location on any particular frontage road type. In particular, access to arterial roads should be limited as far as practicable, and in some circumstances it may be preferable to allow left-turn-only movements into and out of the access driveway.

TABLE 3.2ACCESS DRIVEWAY WIDTHS

Category	Entry width	Exit width	Separation of driveways
1	3.0 to 5.5	(Combined) (see Note)	· N/A
2	6.0 to 9.0	(Combined) (see Note)	N/A
3	6.0	4.0 to 6.0	1 to 3
4	6.0 to 8.0	6.0 to 8.0	1 to 3
5	To be provided	l as an intersection, not an	access driveway, see

NOTE: Driveways are normally combined, but if separate, both entry and exit widths should be 3.0 m min.

As can be seen, reference to Table 3.2 reveals that "*Category 1*" access driveways can have a combined entry and exit width of between 3.0m and 5.5m. With a minimum width of 3.0m, the existing access driveway satisfies the requirements of the Standard.

In order to determine if the driveway needs to be widened to facilitate passing, it should be determined if there is an actual demand for a widened driveway.



Clause 3.4 of AS2890.1:2004 outlines the requirements for queuing areas at entry points to parking areas. The size of a queuing area is determined from considering the anticipated traffic flows on the accessway and the rate of entry and exit.

The following assessment has been carried out using Basic Queuing Theory to determine the length of queue on entry to the site. The 2 main factors in determining the queue is the "Arrival Rate" (how many vehicles are entering the site in an hour) and the "Service Rate" (how many vehicles can access the rear lots in an hour).

As noted above, this assessment has calculated that the ROW will carry 3 vehicles an hour during peak periods. While it is expected that these vehicles will depart in the morning and return in the evening, this assessment will assume that 2 vehicles will enter the site and 1 vehicle will exit during the PM peak period. The maximum <u>Arrival Rate</u> is therefore 2 vehicles.

The Service Rate can be calculated by adopting the travel speeds of a typical car travelling along an accessway. Based on a travel speed of say 15km/h, it would take a vehicle approximately 10 seconds to travel the 40m from the naturestrip/driveway on Lower Plateau Road to the passing area at the base of the accessway (and vice-versa). Assuming the entering vehicle waits a further 10 seconds to check if a car is approaching, the overall time for the car to enter the passing area at the base of the ROW is 20 seconds.

In order to provide a conservative approach, this assessment will assume a travel time of 30 seconds for a car to pull into the driveway, observe if a car is approaching and then travel down the ROW to the passing area.

Based on this timing, the ROW can transport approximately 120 vehicles per hour calculated as follows:

3,600 seconds per hour / 30 second trip = 120vph

The maximum Service Rate is therefore 120 vehicles per hour.



Based on these factors, the queuing theory assessment predicts that there will be less than a 0.03% chance that the queue will exceed 1 vehicle as follows:

- 1. Arrival Rate (r) is 2 vehicles per hour
- 2. Service Rate (s) is 120 vehicles per hour
- 3. The Utilisation Factor (p) = r / s

```
(p) = 2 / 120
(p) = 0.017
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4. The expected (mean) number of vehicles in the queue is calculated as follows:

$$\begin{split} E(n) &= r / (s - r) \\ E(n) &= 2 / (120\text{-}2) \\ E(n) &= 2 / 118 = 0.017 \text{ vehicles in queue} \end{split}$$

5. The probability that the queue will extend further than 1 vehicle can be calculated as follows:

$$P(n>1) = p^{1+1}$$

 $P(n>1) = 0.017^2 = 0.0003$

Based on this analysis, there will be a 0.03% chance of there being more than 1 vehicle in the queue. Therefore, it can be determined that the 99.9th percentile queue will not exceed 1 vehicle on the access driveway.

When taking this queuing analysis into account, it can be determined that the proposal will not result in any undue or unacceptable delays to through traffic on Lower Plateau Road and that the existing access driveway is fit for purpose.



Compliance with Design Standards – Accessway

Clause B6.2 of the Pittwater DCP 2021 outlines the following requirements for internal driveways:

Driveway width for dual occupancies, dwellings, secondary dwellings, exhibition homes, rural works dwellings and tourist and visitor accommodation.

The Internal Driveway shall be contained within the driveway corridor. The minimum width of the driveway corridor (i.e. impervious pavements together with grassed shoulder area) shall be as follows:

- Single Dwelling: 3.0 metres minimum.
- Dual Occupancy: 3.0 metres minimum.
- Combined driveway for more than 2 dwellings: 3.0 metres minimum except where the driveway length exceeds 40 metres, a passing bay to an overall minimum width of 5.0 metres for a length of 10 metres with suitable transitions to the adjacent narrow driveway.

As noted above, the proposal seeks to retain the existing 4.57m driveway corridor (ie impervious pavement together with grassed shoulder).

Clause 1.3.13 of the Australian Standard AS/NZS2890.1:2004 defines "domestic properties" as a property containing three or less dwellings. The subject subdivision therefore satisfies this definition.

Clause 2.6.1 specifies a minimum width of 3.0m for driveways and accessway serving domestic properties. The width is to be increased on curves and at turns into garages or parking spaces. Clause 2.6.2 of the Standard also nominates a maximum grade of 25% (1 in 4) for domestic driveways and accessways.

The existing accessway therefore satisfies the width and grade requirements of Council's DCP and the Australian Standard.



Swept Path Analysis

The ability of the Australian Standard AS/NZS2890.1:2004 B99 Vehicle (Ford Transitvan) to pass a B85 Vehicle (Ford Falcon) at the base of the accessway was tested using the Autodesk Vehicle Tracking Software. In addition, the software was used to ensure that the B85 vehicle can adequately access the off-street parking spaces serving the indicative dwellings on each Lot. These swept paths are reproduced in Appendix B and confirm that parking and passing can be adequately achieved.

Sight Lines

Sight lines along the ROW are also deemed acceptable as the roadway is straight and has a relatively constant grade. A convex mirror is proposed at the base of the accessway and is shown on the subdivision plan and swept path illustrations in Appendix B.



Photograph of a car exiting the site

In the circumstances, it can be concluded that the proposed development has no unacceptable traffic implications.



APPENDIX A

PROPOSED SUBDIVISION AND INDICATIVE BUILDING FOOTPRINT PLANS





APPENDIX B

SWEPT PATH ANALYSIS















