1 Introduction

1.1 Background

JMT Consulting has prepared this document to provide an overview of the traffic and transport implications of the proposed site development of 4 Forest Road, Warriewood. The proposal envisages the development of 13 residential lots on the site.

1.2 Site location

The site location is presented in Figure 1 below and is located within the Warriewood Valley Release Area. Existing residential development adjoins the northern and eastern boundaries of the site with bushland directly to the west. The existing Mater Maria Catholic College is south of the site. Vehicle access will be obtained via Forest Road to the south of the site through an existing roundabout.

Figure 1 Site location

2 Transport Assessment

2.1 Proposed vehicle site access

The primary site access for vehicles would be via the southern end of the site through Forest Road as presented in Figure 2 below. A road connection would be provided between Forest Road to the south and ultimately continue north to provide a link to the adjacent 8 Forest Road site and linking with Jubilee Avenue. A secondary road will also be provided within the site to provide local access to the development lots. Based on the requirements of the Warriewood Valley Roads Masterplan document the roads within the site have been designated as an 'access street' which require a minimum carriageway width of 7.5m and a road reserve width of 12.5m. This street classification aligns with that approved as part of the 8 Forest Road development.

Figure 2 Proposed vehicle site access arrangements

2.2 Internal access arrangements

Each development lot will be provided with individual access points as indicated in Figure 3 below. The access points for all lots are located within the internal road and not on the connecting roadway through to 8 Forest Road (MC-01) to minimise conflicts with general traffic travelling to or from Forest Road. A footpath is provided directly adjacent to the kerb.

All streets within the site have been designed to accommodate two-way traffic flow with provision for on-street car parking – consistent with the recommendations contained in the Warriewood Valley Roads Masterplan document.

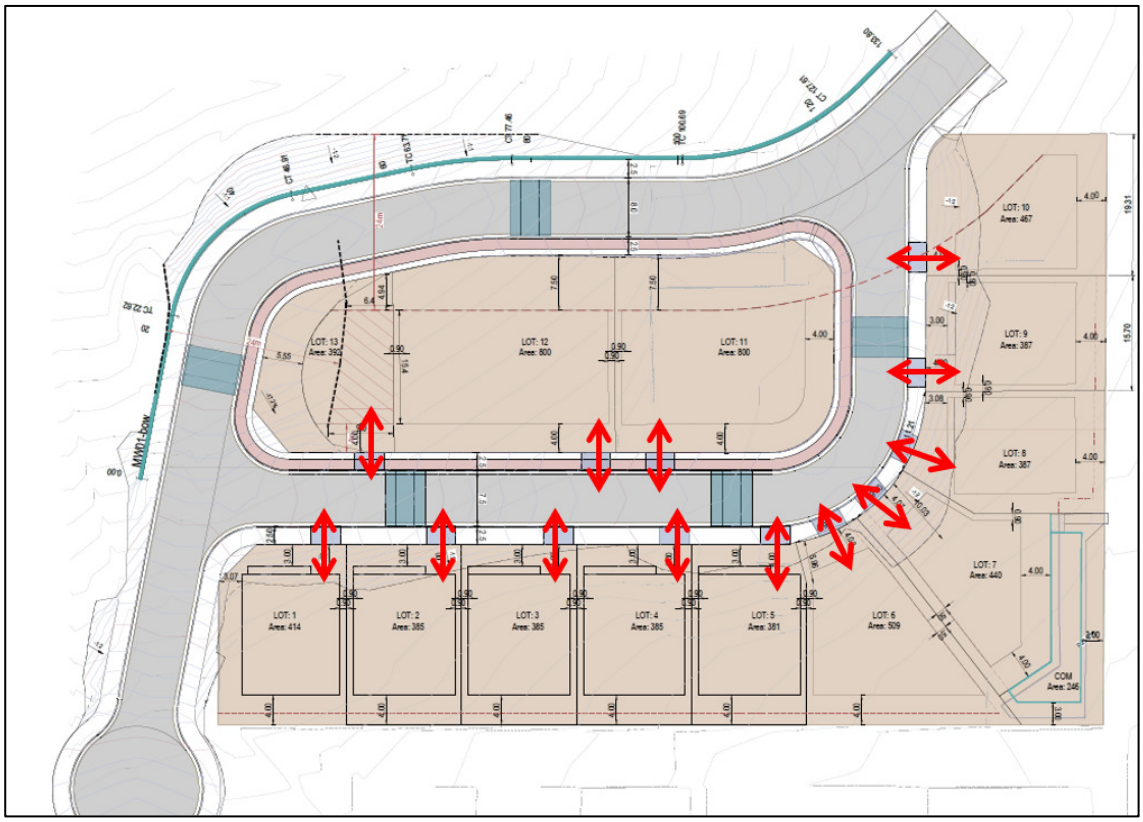

Figure 3 Proposed internal access arrangements

2.3 Road design

All roads have been designed with a 12.5m wide cross section including a 8.0m wide road carriageway to reflect requirements of the Rural Fire Service (RFS) for a perimeter road. This 8.0m wide carriageway exceeds the minimum 7.5m width as outlined in the Warriewood Valley Roads Masterplan document for a local street. All streets within the site have been designed to accommodate two-way traffic flow with provision for on-street car parking – consistent with the recommendations contained in the Warriewood Valley Roads Masterplan document.

The adoption of the main road (MC01) as a local street is considered suitable given:

- The Warriewood Valley Roads Masterplan does not nominate the extension of Forest Road as a Collector Street
- The approval for the adjacent 8 Forest Road development under N0440/15 (as modified 9 April 2018) requires the construction of a local road through the site rather than a collector road.
- The volume of traffic predicted to use MC01 will be in the order of 1,000-1,500 vehicles per day – well within the thresholds of a local street as defined in the Warriewood Valley Roads Masterplan document. This is based on the predicted traffic movements from the approved 8 Forest Road development, proposed 4 Forest Road development and other nearby sites. Traffic counts undertaken in support of the 8 Forest Road development showed that less than 25 vehicles per hour or approximately 250 vehicles per day currently use the section of Jubilee Avenue near 8 Forest Road.

Despite the challenging topography all roads within the site will generally have a gradient of 16% or less as detailed in the engineering plans developed by ACOR. An exception to this is for a short section of roadway of approximately 25m in the area highlighted in Figure 4.

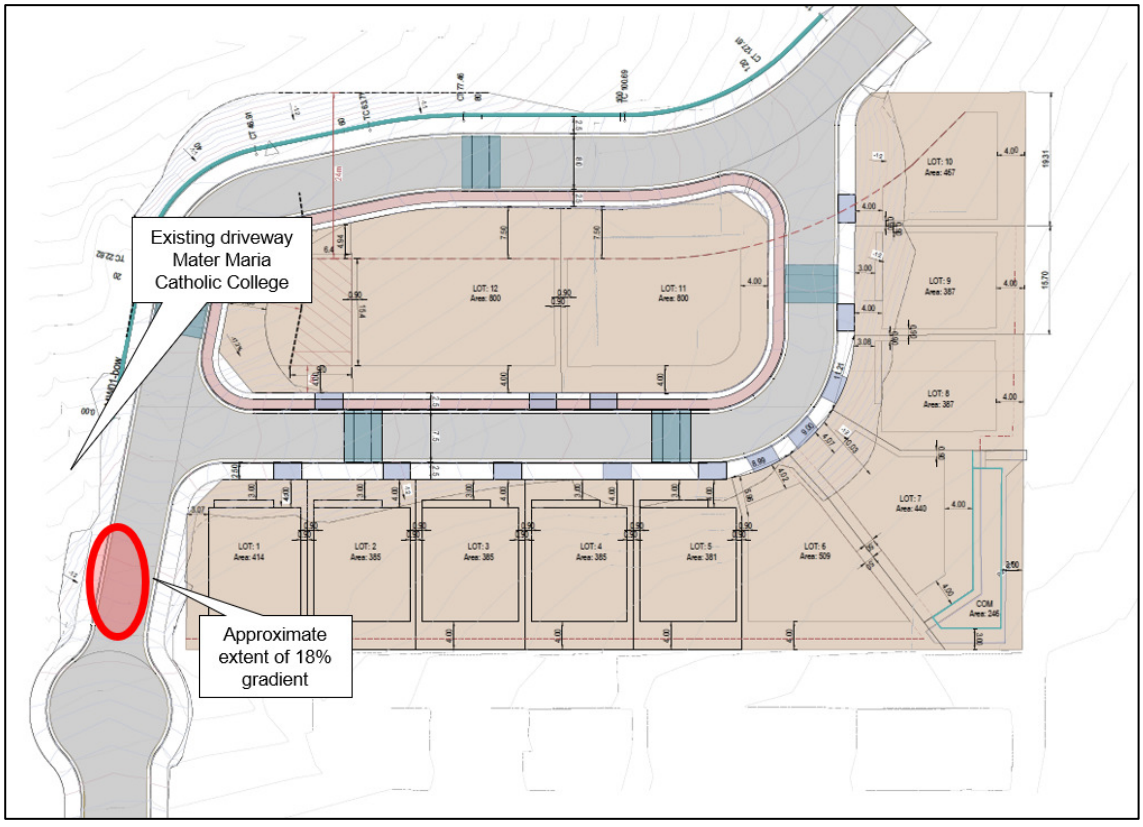

Figure 4 Extent of roadway with 18% gradient

Although Council recommends a maximum gradient for new roadways of 16%, the proposed road design is considered acceptable given:

- The 18% gradient covers a very short distance of approximately 25m, with the majority of the roadway having a gradient of 15% or less;
- The higher road gradient does not occur at an intersection within the site;
- The 18% gradient is required to allow the new roadway to match the level of the existing driveway into the adjoining Mater Maria Catholic College;
- Austroads guidelines[1] notes the following with respect to general maximum gradients "Higher values may be warranted to suit local conditions" and that grades of 15% to 33% are acceptable in some cases and over short lengths;
- All vehicle access points into the future residential lots are on gradients of 6% or less;
- Austroads guidelines notes that "*grades steeper than the general maximum may be justified in the following situations*" including the following applicable criteria:
    - comparatively short sections of steeper grade which can lead to significant cost savings
    - where absolute numbers of heavy vehicles are generally low
    - less important local roads where the costs or impact of achieving higher standards are difficult to justify
- Should the road be relocated to achieve a lesser gradient driver sight lines would be impacted as it would sit below the future housing lot - therefore the option put forward by the applicant is considered to provide a suitable balance in relation to vehicle access and driver safety.

Since the initial lodgement of the DA a revised road alignment has been prepared in discussions with Northern Beach Council. The revised road alignment is considered to provide for an improved outcome when compared to that presented in the traffic report as lodged with the DA, notably:

- The revised alignment provides a more suitable interface with the existing cul-de-sac on Forest Road – offering some level of horizontal deflection.
- A series of tactile pavement treatments is to be provided to act as traffic calming devices
- The revised alignments allows for the retention of a number of additional trees and less cut and fill in lots 11-13
- The steep section of Road MC01 is slightly shorter and slightly less steep when compared to that lodged with the original DA. The steepest part is now 18% (not 18.5%)

[1] Part 3: Geometric Design

The traffic assessment has taken into consideration the expected traffic flows generated by the adjacent (approved) development at 8 Forest Road, both in terms of the traffic modelling of surrounding intersections as well as with respect to the forecast level of traffic activity on the internal road MC-01. The analysis demonstrates that the intersections in the vicinity of the site, along with the internal roads, can function adequately when considering the additional traffic movements from both the subject site as well as 8 Forest Road.

2.4 Vehicle sight lines

Vehicle sight lines have been addressed by amending the road geometry to:

- Allow for improved sight lines for vehicles travelling around the bend in the road MC01 to sight vehicles leaving road MC02. This has been achieved by setting back the building line of Lot 13.
- Provide lines of sight for vehicles approaching the existing roundabout at the school adjoining the site. The vertical curve for road MC01 has been adjusted such that there is a constant downward slope from the bend in the road MC01 all the way through to the roundabout – providing for suitable lines of sight to nearby vehicles.

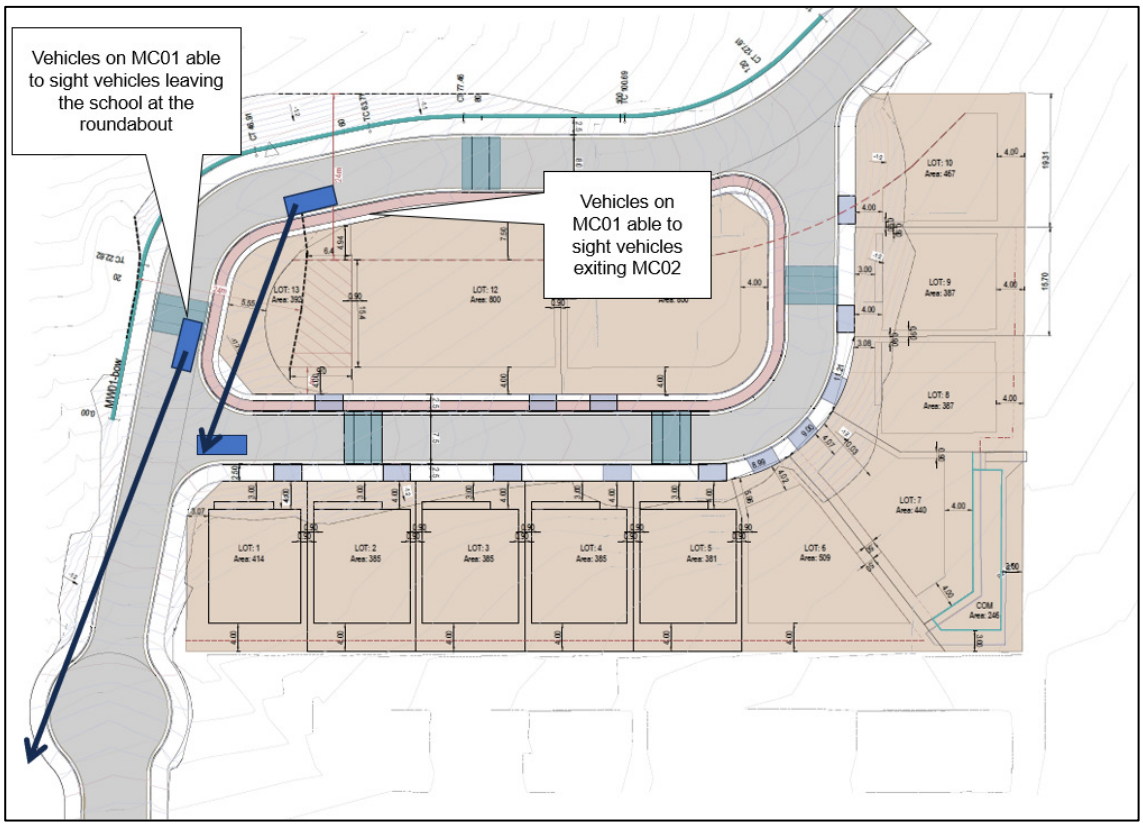

Figure 5 Vehicle sight lines

2.5 Car parking provision

Detached dwellings

The plans indicate that each dwelling will be provided with a garage with storage for 2 cars, with additional parking possible in the driveway of each property. This parking provision exceeds the minimum requirement of 2 spaces per dwelling outlined in the Pittwater DCP.

Visitor car parking

Car parking for visitors to the site can be provided on the local street network, with a minimum 7.5m carriageway width to be provided on all roads within the site. As per the guidance provided in the Warriewood Valley Roads Masterplan document this carriageway width is sufficient to provide for two way traffic movements as well as on-street parking on one side of the road.

2.6 Traffic generation

Detached dwellings

The forecast level of traffic generated from the detached dwellings has been based off the rates outlined in the *RMS Guide to Traffic Generating Developments* (2013 update) document. The rates applicable to low density residential dwellings are as follows:

- AM peak hour (8am – 9am): 0.99 vehicles / dwelling
- PM peak hour (5pm – 6pm): 0.95 vehicles / dwelling

The expected directions of travel for vehicles, based again off guidance within the *RMS Guide to Traffic Generating Developments* document, is as follows:

- AM peak hour: 80% departing, 20% arriving
- PM peak hour: 20% departing, 80% arriving

Total Traffic Generation

The peak hour traffic generation arising from the development of the residential lots on the site is summarised in Table 1 below. Based on Council's feedback a highly conservative assumption has been taken which allows for two residential dwellings to be located on each development lot.

Table 1 Forecast traffic generation

Use	Use	No.	Generation Rate	Number of vehicle trips		
				Into site	Out of site	Total
AM Peak Hour	Residential Lots	26	0.95	4	24	24
PM Peak Hour			0.99	20	6	26

2.7 Road network impacts

Notwithstanding the relatively small increase in traffic as a result of the proposal, traffic modelling has been undertaken at the nearby Forest Road / Macpherson Street roundabout. As a conservative assumption all traffic entering and exiting the proposed development has been assumed to travel through this intersection – therefore representing a worst case scenario. A more likely scenario is that traffic will be dispersed both to the north and south which will reduce the extent of traffic movements through this intersection.

The traffic modelling takes into consideration development from surrounding areas and the future extension of Forest Road. The modelling was based on traffic counts undertaken to support the 8 Forest Road development in October 2016. It is not anticipated traffic conditions have changed significantly since this time, however again as a conservative estimate a 1.5% per annum growth rate has been applied to this October 2016 traffic.

The performance of intersections in an urban environment is measured in terms of its Level of Service (LoS). Level of service ranges from A (very good) to F (over capacity with significant delays). This is described in the *RTA Guide to Traffic Generating Developments* as summarised in Table 2. In peak hours at intersections controlled by traffic signals on key regional and arterial routes, a LoS D is generally acceptable.

Table 2 Intersection level of service

Level of Service	Average Vehicle Delay (seconds)	Traffic Signals and Roundabouts	Priority Intersections ('Stop' and "Give Way')
A	< 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity and accident study required
E	57 to 70	At capacity. At signals, incidents will cause excessive delay. Roundabouts require other control mode	At capacity, requires other control mode
F	> 71	Unsatisfactory with excessive queuing	Unsatisfactory with excessive queuing;

Another common measure of intersection performance is the degree of saturation (DOS), which provides an overall measure of the capability of the intersection to accommodate additional traffic. A DOS of 1.0 indicates that an intersection is operating at capacity.

The findings of the traffic modelling are summarised in Table 3. Detailed traffic modelling outputs are provided in Appendix A of this report.

Table 3 Traffic modelling results - Forest Road / Macpherson Street

Peak Hour	Existing Conditions			Existing Conditions + Proposed Development		
	AVD (sec)	DOS	LOS	AVD (sec)	DOS	LOS
AM Peak Hour	8.2	0.50	A	8.4	0.53	A
PM Peak Hour	7.4	0.42	A	7.5	0.44	A

AVD – Average vehicle delay (seconds) DOS – Degree of Saturation LOS – Level of Service

The traffic modelling demonstrates that the minor increase in traffic flows associated with the proposal will not result in adverse impacts on the surrounding road network – taking into consideration development from surrounding areas and the future extension of Forest Road. The Forest Road / Macpherson Street retains it's strong existing level of service A and average vehicle delay increases by less than one second across both peak hour periods. This confirms the traffic impacts will be acceptable with no additional measures required to accommodate future traffic demands.

2.8 Walking and cycling network

The site will benefit from being located in close proximity to a number of existing and future walking and cycling paths to be provided within the Warriewood Valley Release Area. These pathways are shown in Figure 6 and include a shared pathway along the southern bank of Narrabeen Creek which will provide connections through to Warriewood. This network of walking and cycling facilities will support access to the site via sustainable transport modes.

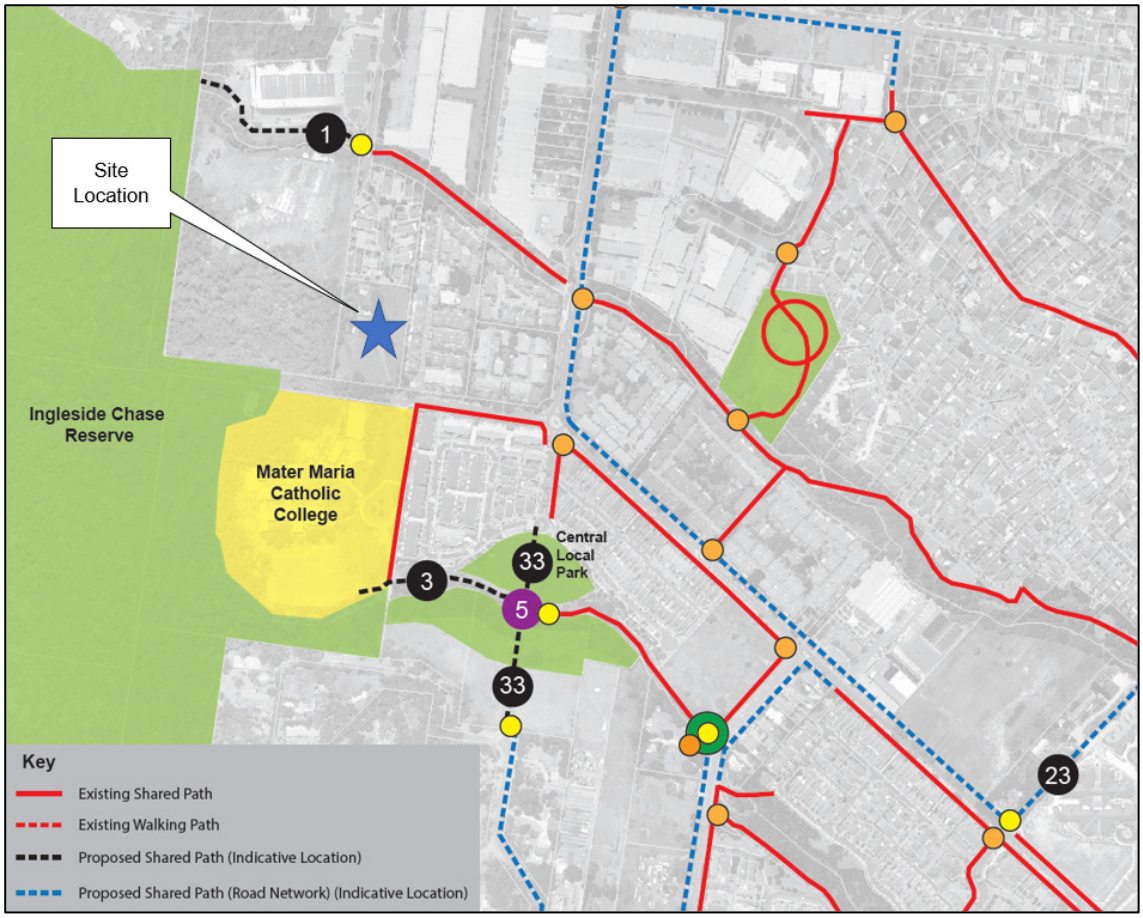

Figure 6 Future walking and cycling network

2.9 Public transport

Public transport access to the site is provided via two bus routes within viable walking distance which are as follows:

- Route 182 which runs between Mona Vale and Narrabeen via Forest Road and Macpherson Street
- Route 185 which runs between Mona Vale and Narrabeen via Garden Street and Macpherson Street

Bus stops for the 182 bus route are located within a five minute walk of the site as illustrated in Figure 7.

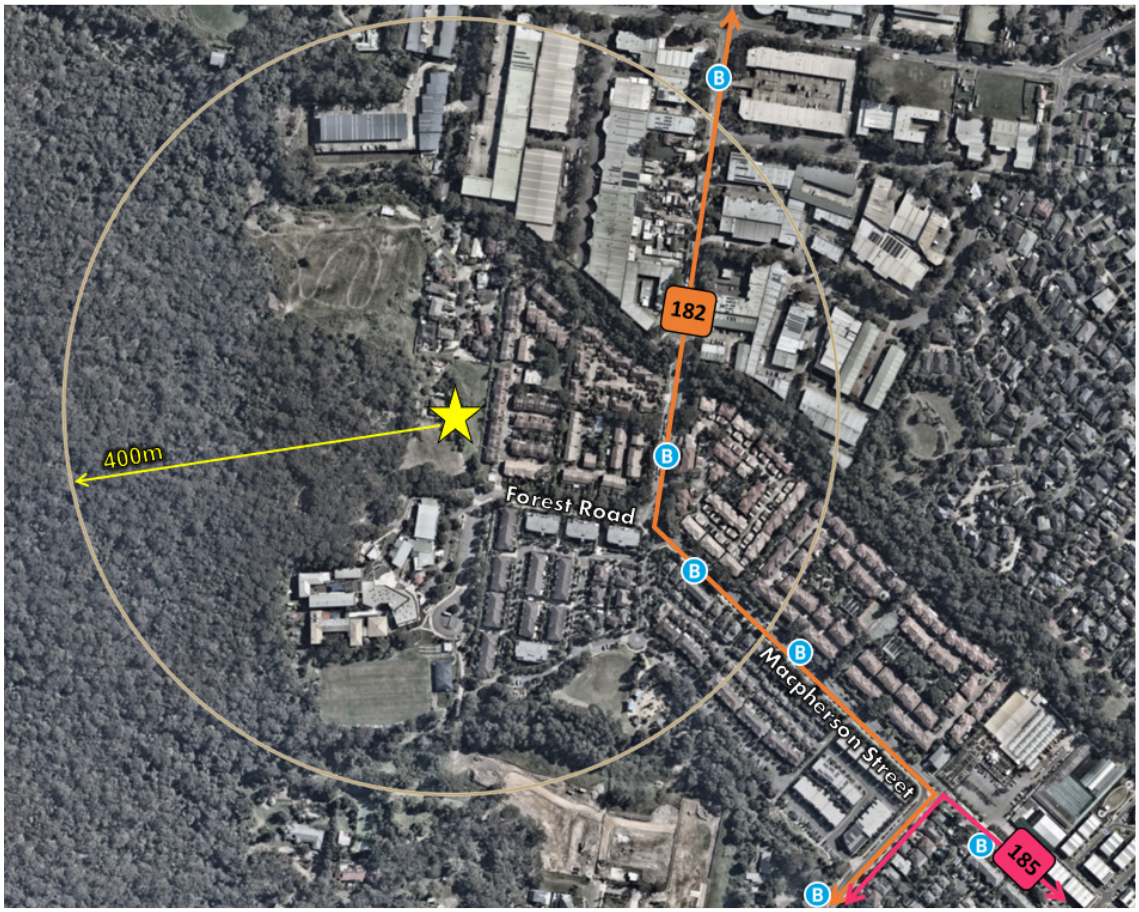

Figure 7 Public transport access

3 Summary

This transport assessment has been developed by JMT Consulting for the proposed site development at 4 Forest Road, Warriewood. The proposal envisages the development of 13 residential lots. Key findings of the assessment are as follows:

- Access from the surrounding road network will be provided in a manner that is consistent with the Warriewood Valley Roads Masterplan document.
- All vehicle driveways are located well away from intersections to minimise conflicts and queuing onto public roadways.
- Car parking for all site uses will be provided in accordance with the recommendations of the Pittwater DCP.
- Traffic modelling indicates that the operation of the road network would not be impacted by the relatively small increase in traffic associated with the proposal.
- The site benefits from a range of alternate transport options such as public transport as well as walking and cycling paths.

Based on the above key findings, it is considered that the proposal's impact on the transport network will be acceptable.

Appendix A: Traffic Modelling Outputs

MOVEMENT SUMMARY

Site: 101 [AM Peak Hour (Existing + Dev) (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Casuarina Drive (S)														
1	L2	2	3.0	2	3.0	0.171	9.4	LOS A	1.1	7.8	0.78	0.80	0.78	50.1
2	T1	72	3.0	76	3.0	0.171	9.7	LOS A	1.1	7.8	0.78	0.80	0.78	51.1
3	R2	34	3.0	36	3.0	0.171	13.8	LOS A	1.1	7.8	0.78	0.80	0.78	50.9
Approach		108	3.0	114	3.0	0.171	11.0	LOS A	1.1	7.8	0.78	0.80	0.78	51.0
East: Macpherson Street (E)														
4	L2	21	3.0	22	3.0	0.528	4.0	LOS A	4.3	30.9	0.58	0.68	0.58	51.2
5	T1	137	3.0	144	3.0	0.528	6.4	LOS A	4.3	30.9	0.58	0.68	0.58	52.1
6	R2	397	3.0	418	3.0	0.528	10.5	LOS A	4.3	30.9	0.58	0.68	0.58	51.9
Approach		555	3.0	584	3.0	0.528	9.3	LOS A	4.3	30.9	0.58	0.68	0.58	51.9
North: Macpherson Street (N)														
7	L2	327	3.0	344	3.0	0.510	5.6	LOS A	4.2	30.3	0.58	0.63	0.58	52.2
8	T1	35	3.0	37	3.0	0.510	5.9	LOS A	4.2	30.3	0.58	0.63	0.58	53.3
9	R2	205	3.0	216	3.0	0.510	10.0	LOS A	4.2	30.3	0.58	0.63	0.58	53.1
Approach		567	3.0	597	3.0	0.510	7.2	LOS A	4.2	30.3	0.58	0.63	0.58	52.6
West: Forest Road (W)														
10	L2	159	3.0	167	3.0	0.392	7.9	LOS A	2.7	19.0	0.74	0.78	0.74	51.9
11	T1	151	3.0	159	3.0	0.392	8.1	LOS A	2.7	19.0	0.74	0.78	0.74	53.1
12	R2	2	3.0	2	3.0	0.392	12.3	LOS A	2.7	19.0	0.74	0.78	0.74	52.9
Approach		312	3.0	328	3.0	0.392	8.0	LOS A	2.7	19.0	0.74	0.78	0.74	52.5
All Vehicles		1542	3.0	1623	3.0	0.528	8.4	LOS A	4.3	30.9	0.62	0.69	0.62	52.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
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 [PM Peak Hour (Existing + Dev) (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Casuarina Drive (S)														
1	L2	2	3.0	2	3.0	0.126	7.6	LOS A	0.7	5.2	0.66	0.73	0.66	50.9
2	T1	53	3.0	56	3.0	0.126	7.9	LOS A	0.7	5.2	0.66	0.73	0.66	52.0
3	R2	41	3.0	43	3.0	0.126	12.0	LOS A	0.7	5.2	0.66	0.73	0.66	51.8
Approach		96	3.0	101	3.0	0.126	9.7	LOS A	0.7	5.2	0.66	0.73	0.66	51.9
East: Macpherson Street (E)														
4	L2	25	3.0	26	3.0	0.430	4.1	LOS A	3.3	23.4	0.40	0.61	0.40	51.4
5	T1	62	3.0	65	3.0	0.430	5.3	LOS A	3.3	23.4	0.40	0.61	0.40	52.3
6	R2	440	3.0	463	3.0	0.430	9.4	LOS A	3.3	23.4	0.40	0.61	0.40	52.1
Approach		527	3.0	555	3.0	0.430	8.7	LOS A	3.3	23.4	0.40	0.61	0.40	52.1
North: Macpherson Street (N)														
7	L2	396	3.0	417	3.0	0.431	5.1	LOS A	3.3	23.4	0.45	0.56	0.45	53.2
8	T1	52	3.0	55	3.0	0.431	5.4	LOS A	3.3	23.4	0.45	0.56	0.45	54.4
9	R2	66	3.0	69	3.0	0.431	9.5	LOS A	3.3	23.4	0.45	0.56	0.45	54.2
Approach		514	3.0	541	3.0	0.431	5.7	LOS A	3.3	23.4	0.45	0.56	0.45	53.4
West: Forest Road (W)														
10	L2	74	3.0	78	3.0	0.212	7.6	LOS A	1.3	9.1	0.67	0.72	0.67	52.1
11	T1	92	3.0	97	3.0	0.212	7.9	LOS A	1.3	9.1	0.67	0.72	0.67	53.3
12	R2	2	3.0	2	3.0	0.212	12.0	LOS A	1.3	9.1	0.67	0.72	0.67	53.1
Approach		168	3.0	177	3.0	0.212	7.8	LOS A	1.3	9.1	0.67	0.72	0.67	52.8
All Vehicles		1305	3.0	1374	3.0	0.431	7.5	LOS A	3.3	23.4	0.47	0.61	0.47	52.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
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 [PM Peak Hour (Existing) (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Casuarina Drive (S)														
1	L2	2	3.0	2	3.0	0.123	7.5	LOS A	0.7	5.1	0.65	0.72	0.65	51.0
2	T1	53	3.0	56	3.0	0.123	7.8	LOS A	0.7	5.1	0.65	0.72	0.65	52.1
3	R2	41	3.0	43	3.0	0.123	11.9	LOS A	0.7	5.1	0.65	0.72	0.65	51.9
Approach		96	3.0	101	3.0	0.123	9.5	LOS A	0.7	5.1	0.65	0.72	0.65	52.0
East: Macpherson Street (E)														
4	L2	25	3.0	26	3.0	0.418	4.1	LOS A	3.1	22.4	0.38	0.61	0.38	51.4
5	T1	53	3.0	56	3.0	0.418	5.2	LOS A	3.1	22.4	0.38	0.61	0.38	52.3
6	R2	440	3.0	463	3.0	0.418	9.3	LOS A	3.1	22.4	0.38	0.61	0.38	52.1
Approach		518	3.0	545	3.0	0.418	8.6	LOS A	3.1	22.4	0.38	0.61	0.38	52.1
North: Macpherson Street (N)														
7	L2	396	3.0	417	3.0	0.420	5.0	LOS A	3.1	22.5	0.43	0.55	0.43	53.3
8	T1	52	3.0	55	3.0	0.420	5.3	LOS A	3.1	22.5	0.43	0.55	0.43	54.5
9	R2	57	3.0	60	3.0	0.420	9.4	LOS A	3.1	22.5	0.43	0.55	0.43	54.3
Approach		505	3.0	532	3.0	0.420	5.6	LOS A	3.1	22.5	0.43	0.55	0.43	53.5
West: Forest Road (W)														
10	L2	67	3.0	71	3.0	0.194	7.6	LOS A	1.1	8.2	0.66	0.71	0.66	52.2
11	T1	85	3.0	89	3.0	0.194	7.8	LOS A	1.1	8.2	0.66	0.71	0.66	53.3
12	R2	2	3.0	2	3.0	0.194	12.0	LOS A	1.1	8.2	0.66	0.71	0.66	53.1
Approach		154	3.0	162	3.0	0.194	7.8	LOS A	1.1	8.2	0.66	0.71	0.66	52.8
All Vehicles		1273	3.0	1340	3.0	0.420	7.4	LOS A	3.1	22.5	0.45	0.60	0.45	52.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
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 [AM Peak Hour (Existing) (Site Folder: General)]

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Casuarina Drive (S)														
1	L2	2	3.0	2	3.0	0.163	9.0	LOS A	1.0	7.2	0.75	0.78	0.75	50.4
2	T1	72	3.0	76	3.0	0.163	9.2	LOS A	1.0	7.2	0.75	0.78	0.75	51.5
3	R2	34	3.0	36	3.0	0.163	13.4	LOS A	1.0	7.2	0.75	0.78	0.75	51.3
Approach		108	3.0	114	3.0	0.163	10.5	LOS A	1.0	7.2	0.75	0.78	0.75	51.4
East: Macpherson Street (E)														
4	L2	21	3.0	22	3.0	0.498	4.0	LOS A	3.9	28.3	0.54	0.67	0.54	51.2
5	T1	121	3.0	127	3.0	0.498	6.1	LOS A	3.9	28.3	0.54	0.67	0.54	52.2
6	R2	397	3.0	418	3.0	0.498	10.3	LOS A	3.9	28.3	0.54	0.67	0.54	52.0
Approach		539	3.0	567	3.0	0.498	9.1	LOS A	3.9	28.3	0.54	0.67	0.54	52.0
North: Macpherson Street (N)														
7	L2	327	3.0	344	3.0	0.479	5.5	LOS A	3.8	27.5	0.54	0.61	0.54	52.4
8	T1	35	3.0	37	3.0	0.479	5.7	LOS A	3.8	27.5	0.54	0.61	0.54	53.5
9	R2	180	3.0	189	3.0	0.479	9.9	LOS A	3.8	27.5	0.54	0.61	0.54	53.3
Approach		542	3.0	571	3.0	0.479	6.9	LOS A	3.8	27.5	0.54	0.61	0.54	52.7
West: Forest Road (W)														
10	L2	144	3.0	152	3.0	0.352	7.7	LOS A	2.3	16.6	0.72	0.76	0.72	52.0
11	T1	136	3.0	143	3.0	0.352	8.0	LOS A	2.3	16.6	0.72	0.76	0.72	53.2
12	R2	2	3.0	2	3.0	0.352	12.1	LOS A	2.3	16.6	0.72	0.76	0.72	53.0
Approach		282	3.0	297	3.0	0.352	7.9	LOS A	2.3	16.6	0.72	0.76	0.72	52.6
All Vehicles		1471	3.0	1548	3.0	0.498	8.2	LOS A	3.9	28.3	0.59	0.67	0.59	52.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.