TRAFFIC

ASSESSMENT

REPORT

FOR

PROPOSED

RETIREMENT VILLAGE

MANOR ROAD

HARRINGTON

26 JUNE 2018

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1.0 INTRODUCTION

The purpose of this Traffic Assessment Report is to examine potential traffic impacts of a proposed Retirement Village development at Harrington.

The proposed development involves the demolition / removal of three existing residential dwellings to provide a Retirement Village on Manor Road, Harrington.

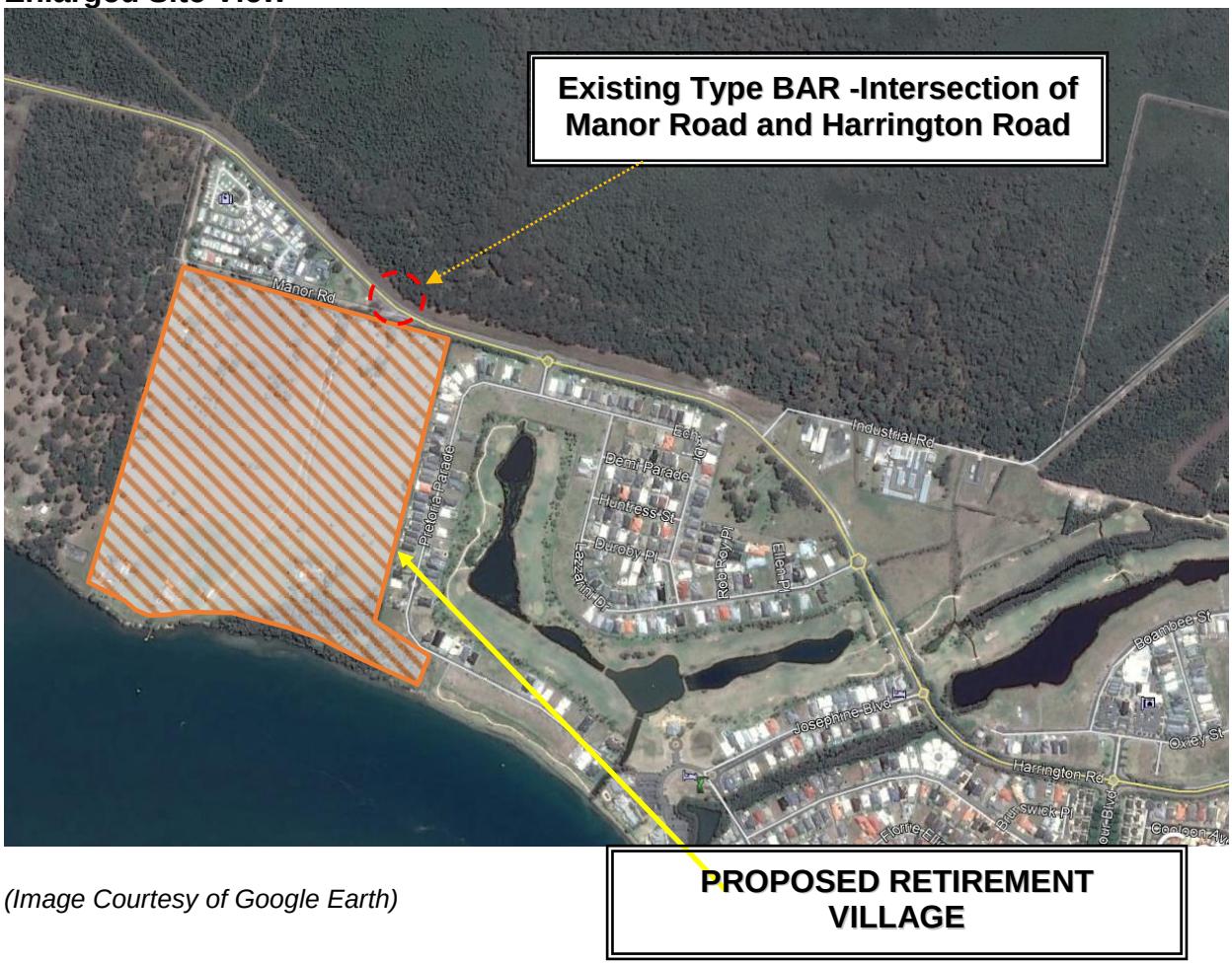
The proposed Retirement Village will be constructed in stages, the timing of which will be dependent on market demands.

However, for the purposes of this report, it is assumed that the Retirement Village may be approximately 20% occupied within 3 years and fully occupied within 8 years based on observed demand for other Retirement Villages.

2.0 LOCALITY DIAGRAM

(Image Courtesy of Google Earth)

Enlarged Site View



(Image Courtesy of Google Earth)

3.0 EXISTING USE OF SITE

The existing site contains three residential dwellings and other structures and facilities.

The site is relatively flat and has grassed areas with several trees and shrubs.

4.0 TRAFFIC ENVIRONMENT ON MANOR ROAD

Manor Road is a short local road approximately 200 metres long, under the control of Mid Coast Council.

Manor Road is located along the northern boundary of the site and oriented generally east-west past the site.

Manor Road has relatively level gradients and connects Harrington Road at its eastern end and Longworths Road at its western end.

There is a caravan parking on the northern side of Manor Road and the southern side of Harrington Road.

5.0 TRAFFIC ENVIRONMENT ON HARRINGTON ROAD

Harrington Road is a local road aligned generally east-west connecting with Beach Road at its eastern end at Harrington and with the Pacific Highway at its western end.

There is no kerb and gutter along either side of Harrington Road near Manor Road.

The existing speed zone on Harrington Road is 60km/h past Manor Road and east towards the Harrington retail / commercial area. The speed zone on Harrington increases to 90 km/h approximately 550 metres west of Manor Road continuing to the intersection with the Pacific Highway.

Harrington Road has a variable carriageway width near Manor Road with widenings at the access to the adjacent caravan park and also at Manor Road.

Harrington Road provides access for residential, retail, and commercial properties at various locations along its length.

There are no paved footpaths along either side of Harrington Road near Manor Road.

There are centerline and edgeline markings along Harrington Road with BAR lane marking on the eastbound lanes at Manor Road.

6.0 TRAFFIC VOLUMES ON MANOR ROAD AND HARRINGTON ROAD

Traffic volume data on Harrington Road was previously supplied by Council near Tappin Creek bridge, approximately 4.5 km west of the site. Little development has occurred between the Pacific Highway and Manor Road since 2011 and the traffic volumes would not have altered sufficiently since that survey period.

Traffic volume data supplied by Council for years 2009 and 2011 were:

2009	2,570 vpd
2011	2,680 vpd

The average annual rate of traffic growth between 2009 and 2011 based on the above data was 2.1%

Assuming the previous rate of growth was sustained, based on developments in Harrington being similar to 2011, the estimated 2018 traffic volume would be:

2018	3,110 vpd

The RTA Guide to Traffic Generating Developments equates peak hourly volumes to be approximately 10% of daily traffic volumes.

Estimated 2018 weekday peak hour volumes ➔ 311 vph

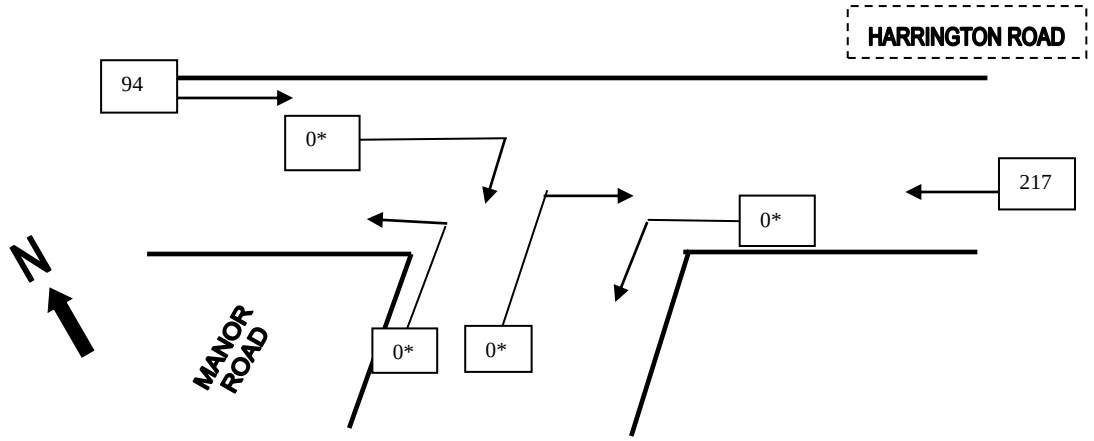
It is likely that most residents of the proposed Retirement Village would not be employees and attractions for driver trips leaving the Retirement Village are more likely to be for minor shopping and recreational needs, essentially oriented towards Harrington.

Traffic volumes on Harrington Road from Harrington and Crowdy Head may be oriented to employment centres in Coopernook, Cundletown and Taree. It is assumed that approximately 70% of morning peak hour traffic along Harrington Road would be towards the Pacific Highway, generally west of this development.

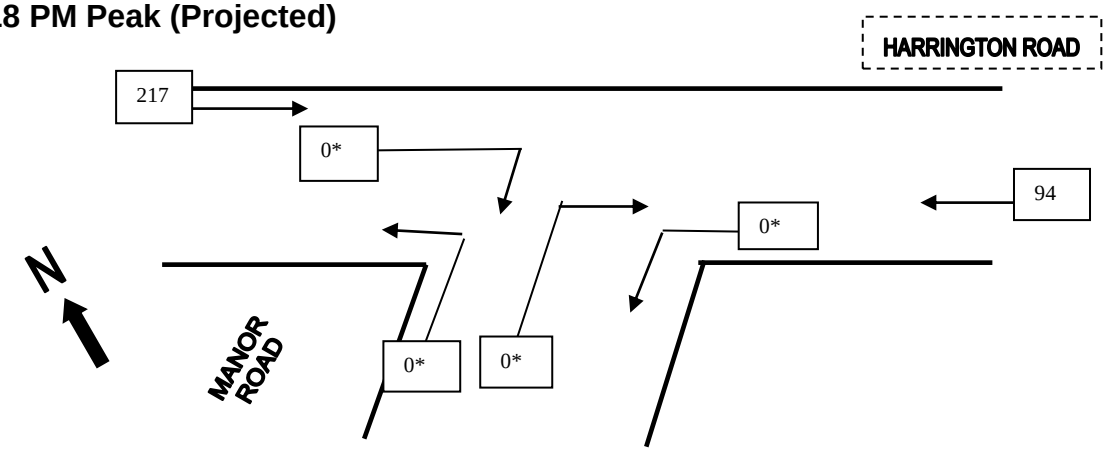
The reverse is likely in the evening peak hour.

The estimated 2018 peak hourly volumes on Manor Road / Harrington Road during the peak periods are shown diagrammatically below:

Manor Road / Harrington Road
2018 AM Peak (Projected)

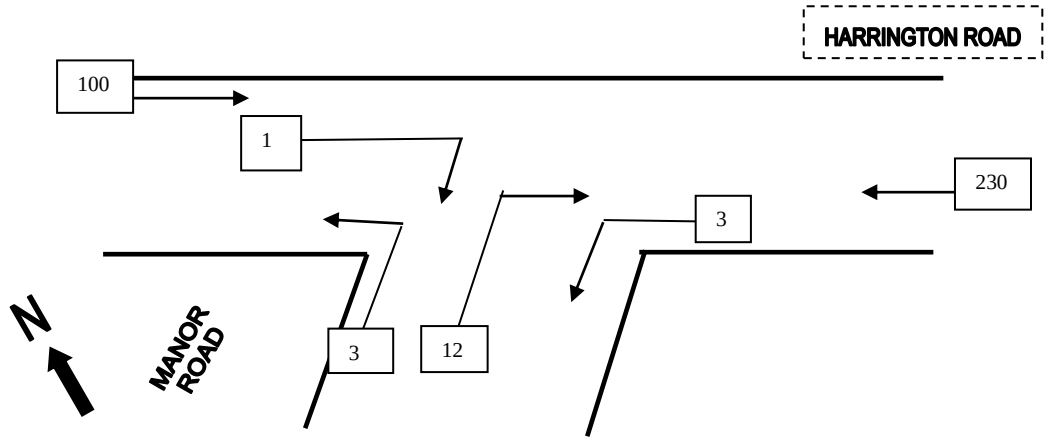


2018 PM Peak (Projected)

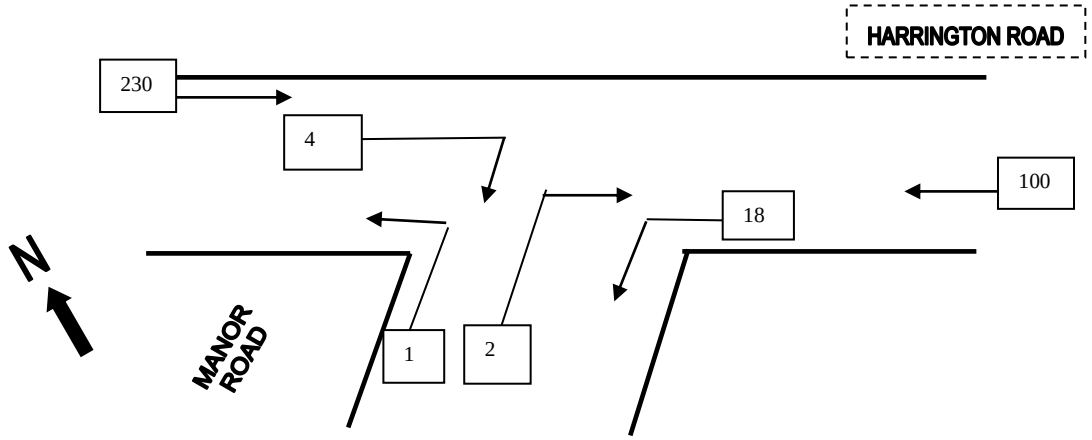


NOTE* : The existing three residential dwellings that currently access Manor Road to construct the new Retirement Village and hence traffic volumes will initially be zero until construction commences

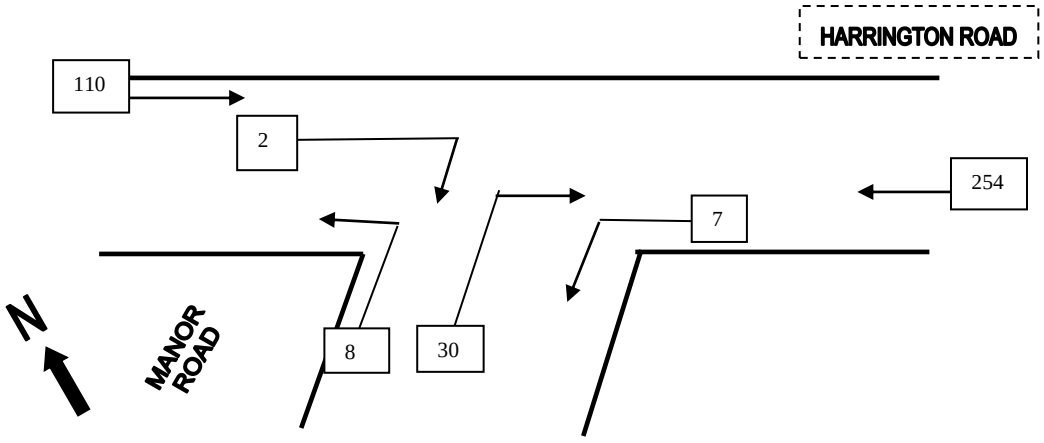
AM (2021 Project Stage 1 occupied – 20%)



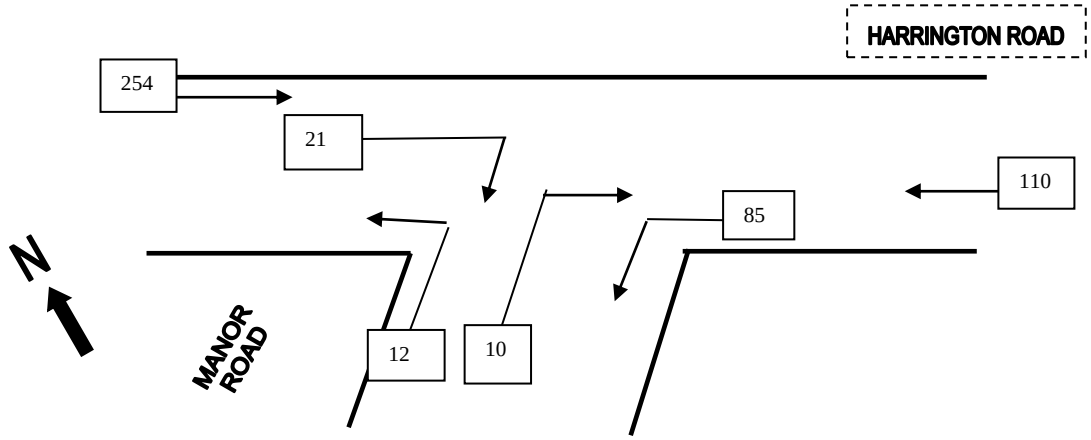
PM (2021 Project Stage 1 occupied – 20%)



AM (2026 Project – 100% occupied)



PM (2026 Project – 100% occupied)



7.0 PROPOSED DEVELOPMENT

The proposed development will remove the three existing residential dwellings and other improvements to provide 293 residential dwellings, a commercial centre, recreation centre, bowling green, tennis courts, maintenance shed, clubhouse, several recreational park areas plus a parking area for caravans.

The commercial centre may provide spaces for service activities such as hairdressers, medical practice, pharmacy needs, minor food and drink supplies etc that will minimise the need for residents to travel outside the retirement village for such services. Some services may operate on a part-time basis only.

The proposed Retirement Village will be appropriately landscaped.

Internal access roads will provide a loop road which will be partially dedicated as public road and partly private road, together other internal access roads to provide convenient access to all dwellings and facilities.

The civil drawings indicate that internal access road widths are nominated as follows:

Road Number	Carriageway Width (m)	Comments
2	8	Public Road - Chainages 60 to 300; 405 to 799.6
2	6	Private Road - Chainages 799.6 to 1220
3-14	6	

Cross-section details vary along Roads 2 and 3.

Cross-sections will be identical for Roads 4 to 12 inclusive (refer to Civil Drawings)

The carriageway widths comply with Council's DCP 2010 – Part G – Car Parking and Access.

8.0 SERVICING REQUIREMENTS

The proposed Retirement Village development will require negligible servicing.

The occasional servicing requirements would consist of:

- Building maintenance;
- Lawn and garden maintenance;
- Garbage removal.

Residential garbage will be collected at the kerbsides throughout the estate. Management may provide assistance for residents if necessary.

Other amenities such as the commercial centre, rec centre and club house will utilize central bins.

9.0 PARKING PROVISION

Mid Coast Council's Council's DCP 2010 Part G - Car Parking and Access doesn't include a category for Retirement Villages. In such situations, it is usual to apply SEPP Seniors Living car parking requirements for accommodation for people aged over 55 or people with disabilities.

The parking requirements as per the SEPP Seniors Living are:
Parking

(i) 0.5 spaces for each bedroom where the development application is made by a person other than the Department of Housing or a local government or community housing provider, or

(ii) 1 space for each 5 dwellings where the development application is made by, or is made jointly with, the Department of Housing or a local government or community housing provider

There are no specific parking requirements for recreation centres at SEPP Seniors Living development as they are a component of the overall development.

The proposed development will provide 293 residential units, each to contain 3 bedrooms. The parking requirement is therefore:

Residential Dwellings

293 x 3 bedrooms @ 0.5 spaces per bedroom ➔ 440 car spaces

Visitors

The current SEPP Seniors Living legislation does not require visitor parking.

However, visitor parking will be provided.

Total SEPP Seniors Living Car Parking Requirement ➔ 440 Spaces

Proposed Parking

It is proposed that each dwelling will have a double garage ➔ = **586 spaces**

Fifty (50) caravan spaces will be provided along the western boundary of the site, south of the maintenance shed.

Twelve (12) car spaces will be provided between the Tennis Courts and Club House.

Twelve (12) car spaces will be provided between the Bowling Green and the Maintenance Shed.

Fifty (50) spaces will be provided near the Commercial Centre and Rec Centre

Sixteen (16) spaces will be provided near the south-eastern corner of the site.

The proposed development will provide a total of **six-hundred and seventy-six (676) car spaces** plus a further **fifty (50) spaces for caravans**.

The car parking provision will considerably exceed the SEPP Seniors Living requirement.

10.0 PUBLIC TRANSPORT ACCESSIBILITY

Eggins Comfort Coaches currently operate Route 320 between Taree to Harrington via Coopernook and Cundletown.

Services are relatively infrequent with four (4) services Monday to Friday with an additional service Thursdays.

Bus services are not available on weekends.

However, the proposed Retirement Village will operate its own community bus for the convenience of resident to access shopping centres, commercial facilities, medical facilities as well as social and recreational facilities.

11.0 TRAFFIC GENERATION FROM PROPOSED DEVELOPMENT

The RMS Technical Direction TDT 2013/04a published August 2013 suggests traffic generation rates for seniors housing to be:

Daily vehicle trips = 2.1 per dwelling
Weekday peak hour vehicle trips = 0.4 trips per dwelling.

(Note: morning site peak hour does not generally coincide with the network peak hour)

The access to the proposed Retirement Village will be off Manor Road via two new access points, each being combined entry / exit driveways.

The traffic generation for the proposed Retirement Village in the evening peak hour based on the suggested RTA generation rates is therefore estimated to be:

293 dwellings @ 0.4 trips per dwelling = 117.2 trips

Say 118 trips

As noted, the morning peak traffic generation generally does not coincide with the network peak hour.

It is assumed for the purposes of this report, considering the location of the development relative to external attractions, that the morning peak generation in this instance may be 40% of the network peak hour, that is, 48 trips.

12.0 TRAFFIC DISTRIBUTION

The location of the proposed Retirement Village suggests that most traffic will be oriented towards the east along Manor Road to Harrington via Harrington Road, for minor shopping requirements, and particularly recreational activities such as walking, beach swimming and boating.

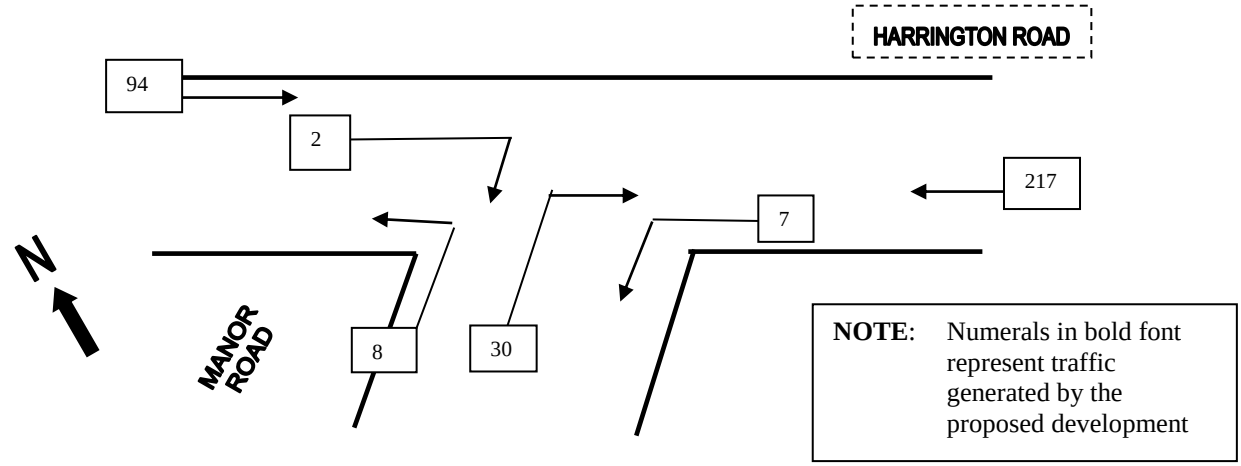
It is therefore assumed that approximately 80% of trips associated with the proposed development will therefore be to and from the east along Manor Road and Harrington Road towards Harrington.

It is also assumed that approximately 60% of trips in the morning peak will be outward trips and 40% inward, with the reverse in the evening peak.

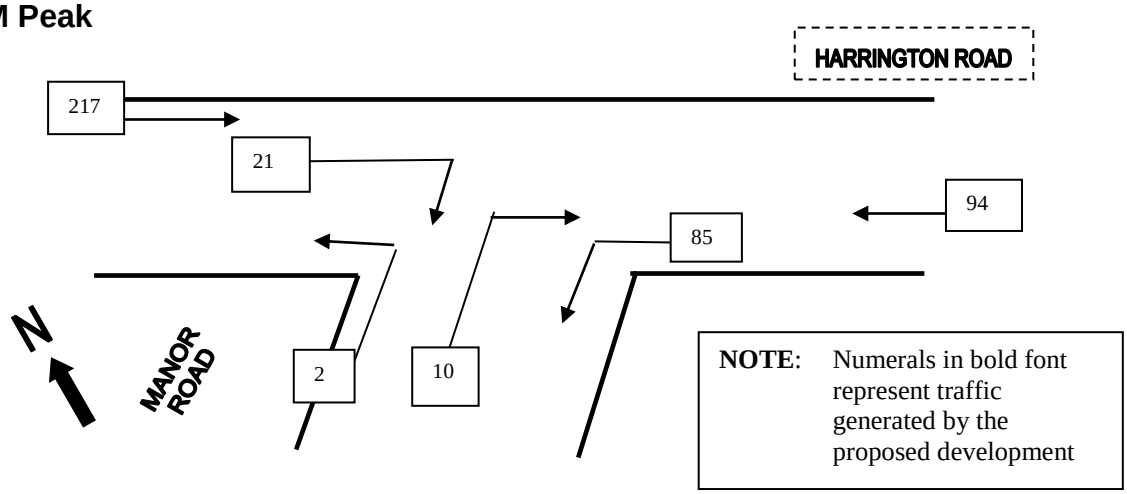
Traffic generated by the existing residential areas at Harrington and Crowdy Head is more likely to oriented to the Pacific Highway in the morning peak hour with the reverse in the evening peak.

It is estimated that approximately 70% of destinations for the existing residential areas in the Harrington area will be for major shopping and commercial purposes and employment in the Taree area.

AM Peak



PM Peak



13.0 ACCESS ON MANOR ROAD

It is proposed that the proposed Retirement Village will provide two (2) new combined entry / exit driveways onto Manor Road. The site currently contains 3 separate driveways for the residential dwellings. The three existing driveways will be removed.

The Manor Road access will service the total 676 car spaces within the facility.

The car parking areas will operate as a Class 1A parking facility for residents.

The AS/NZS 2890.1 – 2004 requirement for a Class 1 or 1A car parking facility on a local road servicing between 101 parking spaces and 300 spaces is for a Category 2 driveway for each location.

That is, a combined driveway 6.0 to 9.0 metres wide would comply with AS/NZS 2890.1 – 2004 given the low traffic generation of the subject Retirement Village.

Manor Road will be upgraded as required by Mid Coast Council's requirements.

14.0 SIGHT DISTANCES AT THE PROPOSED ACCESS

Sight distances at the existing intersection of Manor Road and Harrington Road are as follows:

Towards the left (generally west) along Harrington Road > 450 metres

Towards the right (generally east) along Harrington Road > 290 metres*
(* - *to roundabout at Pretoria Parade*)

The existing sight distances along Harrington Road at the intersection with Manor Road considerably exceed the Safe Intersection Sight Distance indicated in Table 3.2 of the Austroads publication "Guide to Road Design – Part 4A: Unsignalised and Signalised Intersections" which recommends 143 metres for a road design speed of 60km/h and a 2.0 second reaction time.

15.0 SIDRA SIMULATIONS

SIDRA simulations have been undertaken on Manor Road at the intersection with Harrington Road to assess the potential impacts of the proposed development on the operation of the intersection.

SIDRA simulations have been undertaken for the existing BAR intersection geometry and also for a roundabout having similar geometry to that existing at Pretoria Parade, approximately 290 metres east along Harrington Road.

The SIDRA program was developed in conjunction with ARRB Transport Research Ltd to analyse the operation of intersections controlled by traffic signals, Give Way signs, Stop signs, conventional roundabouts and signal controlled roundabouts. It is widely used by consulting traffic engineers and is recognised and used by the Roads and Traffic Authority of NSW. SIDRA is now owned and developed by Akcelik & Associates Pty Ltd.

The parameters used in the SIDRA program are measured against the following performance standards developed by the Roads and Traffic Authority of NSW and the American Transportation Research Board.

Table 15.1 - Level of Service for Unsignalised Intersections Controlled by Stop or Give Way Signs.

Average Delay per vehicle (secs)	Level of Service	Operational Conditions
0 to 14	A	Good
15 to 28	B	Acceptable delays and spare capacity
29 to 42	C	Satisfactory but accident study required
43 to 56	D	Near capacity and accident study required
57 to 70	E	At capacity and requires other control mode
> 70	F	Unsatisfactory and requires other control mode

Table 15.2 – Average Delays for Movements at Harrington Road and Manor Road (20% Occupation) – BAR Intersection

Movement	Average Delay for Movement – 2021 Traffic + Development – AM Peak (secs / veh)	Level of Service	Average Delay for Movement – 2021 Traffic + Development – PM Peak (secs / veh)	Level of Service
Northbound on Manor Road left into Harrington Road	6.4	A	5.9	A
Northbound on Manor Road right into Harrington Road	7.9	A	7.8	A
Harrington Road left into Manor Road	5.5	A	5.5	A
Harrington Road westbound through	0	A	0	A
Harrington Road eastbound through	0	A	0	A
Harrington Road eastbound right into Manor Road	6.5	A	6.0	A
Overall Average Delays	0.4	NA	0.4	NA

The SIDRA simulations indicate that average delays for all movements at the intersection of Harrington Road on Manor Road would be very low, with Level of Service A for all movements in both the 2021 morning and afternoon peak periods, with the retirement village 20% occupied.

Delays to through-movements on Harrington Road will be zero.

The 95% back of queue lengths will be negligible for all movements in both peak periods (refer Appendix A).

Table 15.3 – Average Delays for Movements Harrington Road and Manor Road (100% Occupation) – BAR Intersection

Movement	Average Delay for Movement – 2026 Traffic + Development – AM Peak (secs / veh)	Level of Service	Average Delay for Movement – 2016 Traffic + Development – PM Peak (secs / veh)	Level of Service
Northbound on Manor Road left into Harrington Road	6.6	A	5.9	A
Northbound on Manor Road right into Harrington Road	8.3	A	8.8	A
Harrington Road left into Manor Road	5.5	A	5.5	A
Harrington Road westbound through	0	A	0	A
Harrington Road eastbound through	0	A	0.1	A
Harrington Road eastbound right into Manor Road	6.6	A	6.4	A
Overall Average Delays	0.9	NA	1.9	NA

The SIDRA simulations indicate that average delays for all movements at the intersection of Harrington Road on Manor Road would be very low, with Level of Service A for all movements in both the 2026 morning and afternoon peak periods, with the retirement village 100% occupied.

Delays to through-movements on Harrington Road will be negligible

The 95% back of queue lengths will be negligible for all movements in both peak periods (refer Appendix A).

Table 15.4 – Level of Service for Roundabouts.

Average Delay per vehicle (secs)	Level of Service	Operational Conditions
0 to 14	A	Good
15 to 28	B	Acceptable delays and spare capacity
29 to 42	C	Satisfactory
43 to 56	D	Near capacity
57 to 70	E	At capacity and requires other control mode
> 70	F	Unsatisfactory and requires other control mode

Table 15.5 – Average Delays for Movements at Harrington Road and Manor Road (20% Occupation) – Roundabout

Movement	Average Delay for Movement – 2021 Traffic + Development – AM Peak (secs / veh)	Level of Service	Average Delay for Movement – 2021 Traffic + Development – PM Peak (secs / veh)	Level of Service
Northbound on Manor Road left into Harrington Road	5.1	A	4.5	A
Northbound on Manor Road right into Harrington Road	9.4	A	8.8	A
Harrington Road left into Manor Road	4.1	A	4.1	A
Harrington Road westbound through	4.4	A	4.4	A
Harrington Road eastbound through	4.4	A	4.4	A
Harrington Road eastbound right into Manor Road	8.4	A	8.4	A
Overall Average Delays	4.6	A	4.4	A

The SIDRA simulations indicate that average delays for all movements at the intersection of Harrington Road on Manor Road would be very low, with Level of Service A for all movements in both the 2021 morning and afternoon peak periods, with the retirement village 20% occupied.

Delays to through-movements on Harrington Road will be geometric delays.

The 95% back of queue lengths will be higher than for the BAR geometry for Harrington Road movements in both peak periods (refer Appendix A).

Table 15.6 – Average Delays for Movements at Harrington Road and Manor Road (100% Occupation) – Roundabout

Movement	Average Delay for Movement – 2026 Traffic + Development – AM Peak (secs / veh)	Level of Service	Average Delay for Movement – 2026 Traffic + Development – PM Peak (secs / veh)	Level of Service
Northbound on Manor Road left into Harrington Road	5.3	A	4.6	A
Northbound on Manor Road right into Harrington Road	9.6	A	8.9	A
Harrington Road left into Manor Road	4.1	A	4.1	A
Harrington Road westbound through	4.4	A	4.4	A
Harrington Road eastbound through	4.5	A	4.4	A
Harrington Road eastbound right into Manor Road	8.5	A	8.4	A
Overall Average Delays	4.8	A	4.5	A

The SIDRA simulations indicate that average delays for all movements at the intersection of Harrington Road on Manor Road would be very low, with Level of Service A for all movements in both the 2026 morning and afternoon peak periods, with the retirement village 100% occupied.

Delays to through-movements on Harrington Road will be geometric delays.

The 95% back of queue lengths will be higher than for the BAR geometry for Harrington Road movements in both peak periods (refer Appendix A).

16.0 POTENTIAL TRAFFIC IMPACTS

The proposed Retirement Village will not generate a significant volume of additional traffic onto Manor Road or Harrington Road.

There is unlikely to be any pedestrian activity generated with the development as there are no close attractions for pedestrians and no pedestrian facilities existing along Harrington Road near Manor Road.

The existing carriageway widths on Harrington Road do not cater for safe pedestrian activity east of Manor Road.

The low traffic generation likely to be generated by the proposed Retirement Village, particularly as a community bus will be operated for residents, suggests that the proposed Retirement Village will not adversely impact on the Level of Service or Safety at the intersection of Harrington Road or other intersections along Harrington Road.

17.0 SUMMARY

- The proposal development is for a Retirement Village that will incorporate various facilities and recreational and service amenities on the site.

- The proposed Retirement Village is estimated to generate approximately 48 trips in the morning weekday peak period and 118 trips in the evening weekday peak periods based on RMS Technical Direction TDT 2013/04a published August 2013.

- The proposed Retirement Village will provide a total of six-hundred and seventy-six (676) car spaces plus a further fifty (50) spaces for caravans, which is considerably greater than the requirement of the SEPP Seniors Living requirements.

- Sight distances along Harrington Road from Manor Road are satisfactory for the 60km/h speed zone on Harrington Road based on the Austroads publication “Guide to Road Design Part 4A – Unsignalised and Signalised Intersections”.

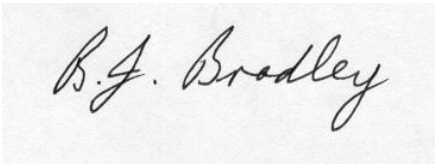
- Public buses provide services along Harrington Road near the proposed Retirement Village to provide convenient transportation for residents to local and regional facilities such as shopping centres, transport hubs, recreational facilities, and health facilities (refer to Appendix B).

- The proposed Retirement Village will also operate its own courtesy bus for the convenience of resident to access major shopping centres, commercial facilities, medical facilities as well as social and additional recreational facilities, minimising the need for private car trips.

18.0 RECOMMENDATIONS

1. I recommend the proposed Retirement Village as a suitable development on the site as it will not generate a significant volume of additional traffic and the development will not adversely affect the level of service, level of safety or capacity of Manor Road or Harrington Road, Harrington.

2. I recommend retaining the existing rural type BAR intersection at Manor Road and Harrington Road based on the SIDRA simulations for the existing intersection compared with the performance of a roundabout, which provides no operational benefits to traffic utilising Harrington Road when the Retirement Village is eventually fully occupied and would result in higher average geometric delays and lower average travel speeds for through-traffic on Harrington Road.



B J Bradley BE Grad Dip Man MIE Aust

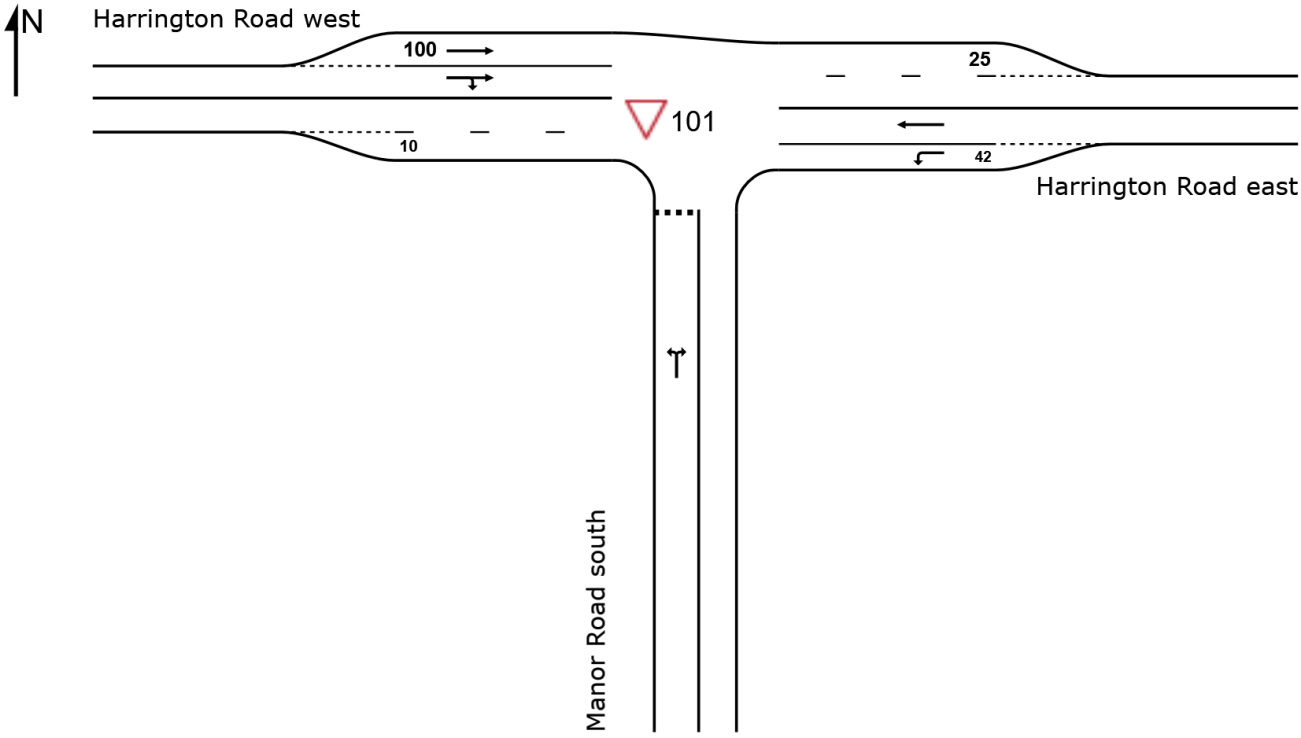
APPENDIX A

SIDRA DATA

SITE LAYOUT

Site: 101 [Harrington Road_Manor Road_2021 AM Peak_BAR]

Existing BAR Geometry
Subdivision 20% occupied
Site Category: (None)
Giveway / Yield (Two-Way)



MOVEMENT SUMMARY

Site: 101 [Harrington Road_Manor Road_2021 AM Peak_BAR]

Existing BAR Geometry
Subdivision 20% occupied
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	v/c	sec		veh	m				km/h
South: Manor Road south												
1	L2	3	0.0	0.020	6.4	LOS A	0.1	0.5	0.41	0.61	0.41	52.1
3	R2	12	0.0	0.020	7.9	LOS A	0.1	0.5	0.41	0.61	0.41	51.9
Approach		15	0.0	0.020	7.6	LOS A	0.1	0.5	0.41	0.61	0.41	52.0
East: Harrington Road east												
4	L2	3	0.0	0.002	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	53.6
5	T1	230	2.0	0.116	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		233	2.0	0.116	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.9
West: Harrington Road west												
11	T1	100	2.0	0.043	0.0	LOS A	0.0	0.1	0.01	0.01	0.01	59.9
12	R2	1	0.0	0.043	6.5	LOS A	0.0	0.1	0.01	0.01	0.01	58.1
Approach		101	2.0	0.043	0.1	NA	0.0	0.1	0.01	0.01	0.01	59.9
All Vehicles		349	1.9	0.116	0.4	NA	0.1	0.5	0.02	0.03	0.02	59.5

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.

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 [Harrington Road_Manor Road_2021 PM Peak_BAR]

Existing BAR Geometry
Subdivision 20% occupied
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Manor Road south												
1	L2	1	0.0	0.004	5.9	LOS A	0.0	0.1	0.30	0.56	0.30	52.4
3	R2	2	0.0	0.004	7.8	LOS A	0.0	0.1	0.30	0.56	0.30	52.2
Approach		3	0.0	0.004	7.2	LOS A	0.0	0.1	0.30	0.56	0.30	52.3
East: Harrington Road east												
4	L2	18	0.0	0.010	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	53.6
5	T1	100	2.0	0.051	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		118	1.7	0.051	0.8	NA	0.0	0.0	0.00	0.09	0.00	58.9
West: Harrington Road west												
11	T1	230	2.0	0.100	0.0	LOS A	0.0	0.2	0.01	0.01	0.01	59.9
12	R2	4	0.0	0.100	6.0	LOS A	0.0	0.2	0.01	0.01	0.01	58.0
Approach		234	2.0	0.100	0.1	NA	0.0	0.2	0.01	0.01	0.01	59.8
All Vehicles		355	1.9	0.100	0.4	NA	0.0	0.2	0.01	0.04	0.01	59.5

MOVEMENT SUMMARY

▽Site: 101 [Harrington Road_Manor Road_2026 AM Peak_BAR]

Existing BAR Geometry
Subdivision 100% occupied
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Manor Road south												
1	L2	8	0.0	0.052	6.6	LOS A	0.2	1.4	0.44	0.65	0.44	51.8
3	R2	30	0.0	0.052	8.3	LOS A	0.2	1.4	0.44	0.65	0.44	51.6
Approach		38	0.0	0.052	8.0	LOS A	0.2	1.4	0.44	0.65	0.44	51.7
East: Harrington Road east												
4	L2	7	0.0	0.004	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	53.6
5	T1	254	2.0	0.129	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		261	1.9	0.129	0.2	NA	0.0	0.0	0.00	0.02	0.00	59.8
West: Harrington Road west												
11	T1	110	2.0	0.048	0.0	LOS A	0.0	0.1	0.02	0.01	0.02	59.8
12	R2	2	0.0	0.048	6.6	LOS A	0.0	0.1	0.02	0.01	0.02	58.0
Approach		112	2.0	0.048	0.1	NA	0.0	0.1	0.02	0.01	0.02	59.8
All Vehicles		411	1.8	0.129	0.9	NA	0.2	1.4	0.05	0.07	0.05	58.9

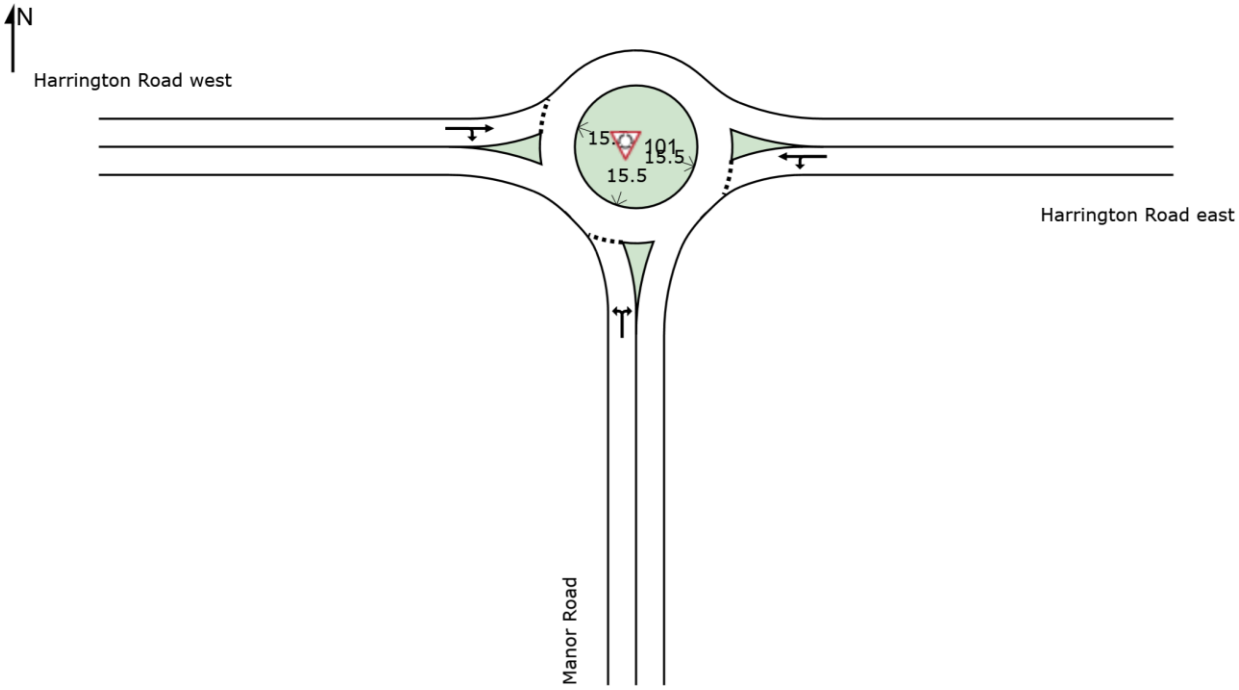
MOVEMENT SUMMARY

Site: 101 [Harrington Road_Manor Road_2026 PM Peak_BAR]

Existing BAR Geometry
Subdivision 100% occupied
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	v/c	sec		veh	m				km/h
South: Manor Road south												
1	L2	12	0.0	0.026	5.9	LOS A	0.1	0.7	0.27	0.58	0.27	52.3
3	R2	10	0.0	0.026	8.8	LOS A	0.1	0.7	0.27	0.58	0.27	52.2
Approach		22	0.0	0.026	7.2	LOS A	0.1	0.7	0.27	0.58	0.27	52.3
East: Harrington Road east												
4	L2	85	0.0	0.047	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	53.6
5	T1	110	2.0	0.056	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		195	1.1	0.056	2.4	NA	0.0	0.0	0.00	0.25	0.00	57.0
West: Harrington Road west												
11	T1	254	2.0	0.122	0.1	LOS A	0.2	1.3	0.06	0.05	0.06	59.3
12	R2	21	0.0	0.122	6.4	LOS A	0.2	1.3	0.07	0.06	0.07	57.4
Approach		275	1.8	0.122	0.6	NA	0.2	1.3	0.06	0.05	0.06	59.2
All Vehicles		492	1.5	0.122	1.6	NA	0.2	1.3	0.04	0.15	0.04	58.0


N
Harrington Road west
15.5
101
15.5
15.5
Harrington Road east
Manor Road

MOVEMENT SUMMARY

Site: 101 [Harrington Road and Manor Road_2021 AM Peak_Roundabout]

Roundabout at Harrington Rd_Manor Rd_2021 AM Peak
Subdivision 20% Occupied
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Manor Road												
1	L2	3	0.0	0.013	5.1	LOS A	0.1	0.4	0.36	0.60	0.36	51.6
3	R2	12	0.0	0.013	9.4	LOS A	0.1	0.4	0.36	0.60	0.36	52.4
Approach		15	0.0	0.013	8.6	LOS A	0.1	0.4	0.36	0.60	0.36	52.2
East: Harrington Road east												
4	L2	3	0.0	0.138	4.1	LOS A	0.7	5.0	0.02	0.43	0.02	54.8
5	T1	230	2.0	0.138	4.4	LOS A	0.7	5.0	0.02	0.43	0.02	56.0
Approach		233	2.0	0.138	4.4	LOS A	0.7	5.0	0.02	0.43	0.02	56.0
West: Harrington Road west												
11	T1	100	2.0	0.069	4.4	LOS A	0.4	2.6	0.08	0.43	0.08	55.7
12	R2	1	0.0	0.069	8.4	LOS A	0.4	2.6	0.08	0.43	0.08	55.5
Approach		101	2.0	0.069	4.4	LOS A	0.4	2.6	0.08	0.43	0.08	55.7
All Vehicles		349	1.9	0.138	4.6	LOS A	0.7	5.0	0.05	0.44	0.05	55.8

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.
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 [Harrington Road and Manor Road_2021 PM Peak_Roundabout]

Roundabout at Harrington Rd_Manor Rd_2021 PM Peak
Subdivision 20% Occupied
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Manor Road												
1	L2	1	0.0	0.002	4.5	LOS A	0.0	0.1	0.23	0.56	0.23	52.3
3	R2	2	0.0	0.002	8.8	LOS A	0.0	0.1	0.23	0.56	0.23	53.2
Approach		3	0.0	0.002	7.4	LOS A	0.0	0.1	0.23	0.56	0.23	52.9
East: Harrington Road east												
4	L2	18	0.0	0.074	4.1	LOS A	0.4	2.8	0.04	0.44	0.04	54.8
5	T1	100	2.0	0.074	4.4	LOS A	0.4	2.8	0.04	0.44	0.04	56.0
Approach		118	1.7	0.074	4.4	LOS A	0.4	2.8	0.04	0.44	0.04	55.8
West: Harrington Road east												
11	T1	230	2.0	0.140	4.4	LOS A	0.8	5.4	0.02	0.44	0.02	55.9
12	R2	4	0.0	0.140	8.4	LOS A	0.8	5.4	0.02	0.44	0.02	55.7
Approach		234	2.0	0.140	4.4	LOS A	0.8	5.4	0.02	0.44	0.02	55.9
All Vehicles		355	1.9	0.140	4.4	LOS A	0.8	5.4	0.03	0.44	0.03	55.8

MOVEMENT SUMMARY

Site: 101 [Harrington Road and Manor Road_2026 AM Peak_Roundabout]

Roundabout at Harrington Rd_Manor Rd_2026 AM Peak
Subdivision 100% Occupied
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Manor Road												
1	L2	8	0.0	0.034	5.3	LOS A	0.2	1.1	0.38	0.62	0.38	51.5
3	R2	30	0.0	0.034	9.6	LOS A	0.2	1.1	0.38	0.62	0.38	52.4
Approach		38	0.0	0.034	8.7	LOS A	0.2	1.1	0.38	0.62	0.38	52.2
East: Harrington Road east												
4	L2	7	0.0	0.156	4.1	LOS A	0.8	5.9	0.02	0.43	0.02	54.8
5	T1	254	2.0	0.156	4.4	LOS A	0.8	5.9	0.02	0.43	0.02	56.0
Approach		261	1.9	0.156	4.4	LOS A	0.8	5.9	0.02	0.43	0.02	56.0
West: Harrington Road west												
11	T1	110	2.0	0.081	4.5	LOS A	0.4	3.1	0.13	0.42	0.13	55.4
12	R2	2	0.0	0.081	8.5	LOS A	0.4	3.1	0.13	0.42	0.13	55.2
Approach		112	2.0	0.081	4.6	LOS A	0.4	3.1	0.13	0.42	0.13	55.4
All Vehicles		411	1.8	0.156	4.8	LOS A	0.8	5.9	0.09	0.45	0.09	55.4

MOVEMENT SUMMARY

Site: 101 [Harrington Road and Manor Road_2026 PM Peak_Roundabout]

Roundabout at Harrington Rd_Manor Rd_2026 PM Peak
Subdivision 100% Occupied
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Manor Road												
1	L2	12	0.0	0.018	4.6	LOS A	0.1	0.6	0.24	0.55	0.24	52.9
3	R2	10	0.0	0.018	8.9	LOS A	0.1	0.6	0.24	0.55	0.24	53.8
Approach		22	0.0	0.018	6.5	LOS A	0.1	0.6	0.24	0.55	0.24	53.3
East: Harrington Road east												
4	L2	85	0.0	0.114	4.1	LOS A	0.6	4.0	0.01	0.47	0.01	54.9
5	T1	110	0.0	0.114	4.4	LOS A	0.6	4.0	0.01	0.47	0.01	56.2
Approach		195	0.0	0.114	4.3	LOS A	0.6	4.0	0.01	0.47	0.01	55.6
West: Harrington Road west												
11	T1	1	0.0	0.002	4.4	LOS A	0.0	0.0	0.06	0.56	0.06	54.3
12	R2	1	0.0	0.002	8.4	LOS A	0.0	0.0	0.06	0.56	0.06	54.1
Approach		2	0.0	0.002	6.4	LOS A	0.0	0.0	0.06	0.56	0.06	54.2
All Vehicles		219	0.0	0.114	4.5	LOS A	0.6	4.0	0.04	0.48	0.04	55.4

PROJECT SUMMARY FOR SITES

Project: Harrington Road_Manor Road

Project Summary for selected Sites.

Site Performance - Hourly Values

Site ID	Site Name	Demand Flow (Total) veh/h	Capacity (Total Effective) veh/h	Degree of Saturation	Delay (Worst Movement) sec	Delay (Control) sec	Level of Service	Back of Queue veh	Stop Rate	Travel Speed km/h	Cost (Total) $/h
Site Category: (None)											
101	Harrington Road and Manor Road_2021 AM Peak_Roundabout	349	2535	0.138	9.4	4.6	LOS A	0.7	0.44	55.8	180.96
101	Harrington Road and Manor Road_2021 PM Peak_Roundabout	355	2539	0.140	8.8	4.4	LOS A	0.8	0.44	55.8	182.71
101	Harrington Road and Manor Road_2026 AM Peak_Roundabout	411	2642	0.156	9.6	4.8	LOS A	0.8	0.45	55.4	215.45
101	Harrington Road and Manor Road_2026 PM Peak_Roundabout	219	1916	0.114	8.9	4.5	LOS A	0.6	0.48	55.4	110.62
101	Harrington Road_Manor Road_2021 AM Peak_BAR	349	2997	0.116	7.9	0.4	NA	0.1	0.03	59.5	130.62
101	Harrington Road_Manor Road_2021 PM Peak_BAR	355	3543	0.100	7.8	0.4	NA	0.0	0.04	59.5	133.66
101	Harrington Road_Manor Road_2026 AM Peak_BAR	411	3196	0.129	8.3	0.9	NA	0.2	0.07	58.9	158.62
101	Harrington Road_Manor Road_2026 PM Peak_BAR	492	4017	0.122	8.8	1.6	NA	0.2	0.15	58.0	203.13

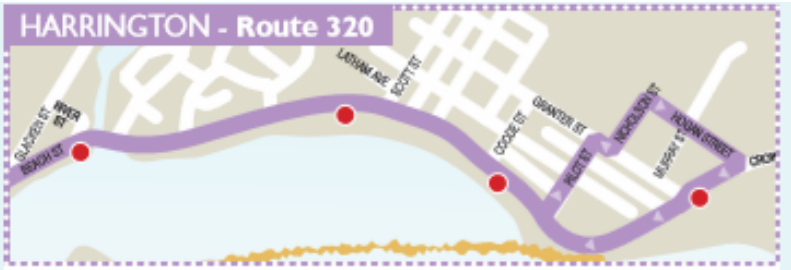
Site Performance - Annual Values				
Site ID	Site Name	Hours Per Year	Demand Flow (Total) veh/h	Cost (Total) $/h
Site Category: (None)				
101	Harrington Road and Manor Road_2021 AM Peak_Roundabout	480	167,520	86,862.41
101	Harrington Road and Manor Road_2021 PM Peak_Roundabout	480	170,400	87,698.61
101	Harrington Road and Manor Road_2026 AM Peak_Roundabout	480	197,280	103,417.10
101	Harrington Road and Manor Road_2026 PM Peak_Roundabout	480	105,120	53,095.23
101	Harrington Road_Manor Road_2021 AM Peak_BAR	480	167,520	62,696.91
101	Harrington Road_Manor Road_2021 PM Peak_BAR	480	170,400	64,158.90
101	Harrington Road_Manor Road_2026 AM Peak_BAR	480	197,280	76,136.69
101	Harrington Road_Manor Road_2026 PM Peak_BAR	480	236,160	97,504.58
		Category Totals	1,411,680	631,570.40

APPENDIX B

HARRINGTON BUS SERVICE


Eggins
COMFORT COACHES
Taree Regional Bus Timetable
Route 309
> Taree to Forster
via Blackhead & Diamond Beach
Route 310
> Taree - Forster
Route 314
> Taree - Old Bar
Route 315
> Taree - Manning Point
Route 319
> Taree - Wingham
Route 320
> Taree to Harrington
via Coopernook
Route 321
> Lansdowne - Taree
Effective from 1 November 2013


REGIONAL MAP
Lansdowne
Taree
see Taree Timetable
Coopernook
Wingham
Harrington
Manning Point
Old Bar
Rainbow Flat
Diamond Beach
Blackhead
Tuncurry
Forster
Route 309
Route 310
Route 314
Route 315
Route 319
Route 320
Route 321



Taree to Harrington via Coopernook & Cundletown
ROUTE 320

SERVICE DAYS	MONDAY - FRIDAY			EXTRA THURSDAY SERVICE
ROUTE NUMBER	320	320	320	320
Centerpoint, Victoria St	7.00am (7.30am)	9.10am	3.20pm	2.00pm
Taree Central, Manning St	7.02am (7.32am)	9.12am	3.22pm	2.02pm
Taree, Oxley St	7.05am (7.35am)	9.15am	3.25pm	2.05pm
Cundletown, Main St	7.10am (7.40am)	9.20am	3.30pm	2.10pm
Coopernook Bus Stop	- (-)	-	3.55pm#	2.20pm
Beach St, Harrington	7.45am (7.55am)	9.50am	4.10pm	2.30pm

Harrington to Taree via Coopernook & Cundletown
ROUTE 320

SERVICE DAYS	MONDAY - FRIDAY			EXTRA THURSDAY SERVICE
ROUTE NUMBER	320	320	320	320
Beach St, Harrington	7.50am (8.00am)	10.10am	4.20pm (4.00pm)	2.35pm
Coopernook Bus Stop	7.55am# (8.10am)	10.30am	4.30pm (4.10pm)	2.45pm
Cundletown, Main St	8.25am (8.15am)	10.45am	4.40pm (4.20pm)	2.55pm
Taree, Oxley St	8.35am (8.20am)	10.50am	4.45pm (4.25pm)	3.00pm
Valley Fair, Victoria St	8.30am (8.25am)	10.55am	4.50pm (4.30pm)	3.05pm
Taree Central, Manning St	8.35am (8.37am)	11.00am	4.55pm (4.35pm)	3.07pm

school run 16 **No service weekends & public holidays**
( ) brackets indicate alternative times during school holidays

APPENDIX C

SITE PHOTOS

Photo No. 1: Looking generally east along Manor Road showing the existing Caravan Park on the left, the existing traffic environment on Manor Road and part of the site boundary on the right.

Photo No. 2: Looking generally south-west from Manor Road showing the part of the development site.

Photo No. 3: Looking left (generally west) along Harrington Road from Manor Road showing the existing traffic environment and available sight distance.

Photo No. 4: Looking right (generally east) along Harrington Road from Manor Road showing the existing traffic environment and available sight distance.