

Appendix H

Traffic & Car Parking Report

**PROPOSED SENIORS LIVING APARTMENTS
AT
222 MAIN ROAD, TOUKLEY**



TRAFFIC IMPACT ASSESSMENT

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**TOUKLEY SENIORS LIVING APARTMENTS,
222 MAIN ROAD TOUKLEY**

TRAFFIC IMPACT ASSESSMENT

EXECUTIVE SUMMARY

Rustrum Pty. Limited, has engaged Rob Caldwell of Traffic Engineering Services to prepare a traffic impact assessment for a proposed Seniors Living Apartment complex located at 222 Main Road Toukley. The proposal comprises 53 self-care residential units and parking for 70 cars on the site.

The development's parking design complies with the requirements of :-

- SEPP (Housing for Seniors or People with a Disability) 2004;
- Australian Standard AS2890.1 – 1993;
- Wyong Shire Council DCP No. 61, and
- RTA's Guide to Traffic Generating Developments

The provision of an additional parking space in the forecourt will be of benefit to emergency vehicles and medical practitioners. The pick-up and drop-off area at the porte cochere will eliminate the need for vehicles to stop on Main Road, and will provide for taxis and mini-bus transport services.

Traffic generated from the site will be able to access Main Road from two, reconstructed existing driveways, with both driveways operating at Level of Service A.

However, whilst right turns are possible from Main Road, there are potential conflicts created by right turning vehicles, particularly when delays are experienced though the lack of acceptable gaps in through traffic, combined with parked cars which prevent through traffic from continuing. This condition of course, applies to all 16 driveways between Dunleigh Street and Peel Street.

This safety issue is the only adverse effect that can be identified and this study has investigated several corrective measures.

The detailed assessment identifies that the most efficient "whole of precinct" traffic management solution is to install a median turn lane on Main Road to allow all businesses located on the section between Dunleigh Street and Peel Street to turn right into their property using a median turn lane (refer to Section 5 Option 4, page 18).

The median Turn Lane is considered as being the most beneficial in terms of efficiency and safety of Main Road, its intersection with Peel Street, pedestrian

links to public transport, access for other properties and residential amenity of local streets. The opportunity for removal of on-street parking on both sides of Main Road, possibly allowing cycle lanes to be added, is worthy of further investigation.

Apart from enhancing traffic flow and safety for through traffic on this section of Main Road (MR 519), this solution also has a significant benefit for all of the businesses between Dunleigh Street and Peel Street and should not therefore be acted upon as a result of one application for redevelopment of one site in that precinct. That decision should properly be decided by RTA / Wyong Shire Council perhaps in association with the Toukley Strategy.

The intersection of Main Road with Peel Street and Yaralla Road is congested, confusing and hazardous. The complexity of traffic flow is due to the offset of the two intersecting roads and this is aggravated by the egress driveway from a drive through liquor store on the north east corner. Irrespective of any further developments in the area, including the proposed Seniors Living Apartments, traffic engineering remedial measures, such as traffic signals should be investigated to alleviate deficiencies.

The detailed assessment sets out a number of reasons why the RTA advice dated 4 February 2009 to the NSW Department of Planning (requiring all vehicular access to the development to be via Rowland Terrace) should be re-considered:-

- Connecting the Rowland Terrace car park to the main carpark requires a tunnel through the narrowest section of the site and results in the loss of all 4 apartments on the lowest planned level – this is not feasible;
- NSW Department of Planning have restricted the height of the development thus preventing the developer from relocating those apartments to a higher level;
- Wyong Council have consistently advised the developer that ingress and egress from Rowland Terrace will not be tolerated and have vetoed any suggestion along those lines;
- Having all vehicular access from Rowland Terrace will result in a dramatic increase in traffic on that road and a subsequent loss of amenity to the other residents of that street;
- Having all vehicular access from Rowland Terrace will result in an increase in traffic to Peel Street and its junction with Main Road – an intersection that is already overstressed;
- Any further congestion and increase in delays at the Peel Street approach to Main Road will result in increased usage of Lakeview Street and Elder Street as alternative routes to Main Road and this will impact on the residential amenity of those streets.
- The door width/gradient and alignment of the driveway to Rowland Terrace is only suitable for up to 30 vehicles in a peak hour as it is not wide enough for two-way traffic. Ref. Australian Standard AS 2890.1 cl.3.2.2
- A Mid Coast sewer main currently crosses the site through the area where the parking connecting tunnel will have to be located in order to use a

Rowland Terrace access.. Wyong Council will not permit a sewer main to be located under a building.

The detailed planning for implementation of a Median Turn Lane should include a review of parking and access to businesses in the precinct between Dunleigh Street and Peel Street by both RTA and Wyong Shire Council. Ideally, the traffic management package could be designed and installed within the period of construction of the Seniors Living Apartments.

As an interim measure, both during construction and until the Median Turn Lane is installed the Main Road driveways to the site should be signposted as follows:-

- Ingress driveway should have a NO RIGHT TURN sign facing towards westbound traffic on Main Road, and a NO EXIT sign facing internal traffic..
- Egress driveway should have NO ENTRY signs facing both eastbound and westbound traffic on Main Road, and a NO RIGHT TURN sign facing internal traffic.

This will limit access to the site to left turns into the ingress driveway and left turns out of the egress driveway.

This traffic impact assessment has included liaison with RTA and Wyong Council traffic engineers, liaison with architects on access and parking design, surveys from 6 hours of DVD recording of traffic movements, SIDRA3.2 traffic analyses at intersections and driveways, resident and local businesses interviews, site inspections and surveys, identification of issues and objectives, development, evaluation and refinement of options and the application of RTA and Austroads Traffic Engineering Guidelines.



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TRAFFIC ENGINEER

Proposed Seniors Living Apartments
222 Main Road, Toukley.

TRAFFIC IMPACT ASSESSMENT

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Appendix 4 - Austroads Kerb Extension – Pedestrian Nib

1. Introduction

Rustrum Pty. Limited, has engaged Rob Caldwell of Traffic Engineering Services to prepare a traffic impact assessment for a proposed Seniors Living Apartment complex located at 222 Main Road Toukley. The proposal comprises 53 self-care residential units and parking for 70 cars on the site.

The location of the proposed complex is shown in Figure 1, below.



Figure 1
Location of proposed Seniors Living Apartments

The 53 dwelling unit development comprises 4 one bedroom units, 44 two bedroom units and 5 three bedroom units. There is also a community room, gym, salon/clinic and office, and an atrium near the main entrance/ porte cochere.

This traffic impact assessment is based on the apartment complex being fully developed and occupied.

2. Parking Requirements

2.1 The RTA, in their “Guide to Traffic Generating Developments” specifies the following parking requirement for Housing for Aged and Disabled Persons (resident funded developments):-

2 spaces per 3 residential units + 1 space per 5 units for visitor parking.

For the proposed resident funded complex, the requirement would be 36 resident spaces plus 11 visitor spaces, making a total of 47 parking spaces.

The RTA recognises that there is a significant difference between resident funded developments and subsidised developments:-

“Resident funded developments tend to have a higher per unit cost and attract residents with higher financial resources. The car ownership levels of such residents are likely to be relatively high, as is the associated traffic generation and parking requirements of these residents. Subsidised developments, which are often run by religious organisations, are usually associated with lower car ownership levels and consequently lower corresponding generation rates.”

The RTA rate for hostels, nursing and convalescent homes would not be appropriate for resident funded, seniors living, self care residential developments.

2.2 Wyong Council’s Development Control Plan No. 61, CARPARKING, does not have a parking generation rate for this type of development.

Wyong Council’s DCP 61 – Parking (Section 5.0 Parking for the Disabled) states that :-

“Where access for the disabled is required to and within a building, parking for disabled persons shall be located adjacent to the nearest access for the disabled to the building and the path of travel from the parking area shall have adequate width and gradient for the purpose. Carparking spaces for disabled persons shall be nominated on any development application, shall have minimum widths of 3.2 metres, is to provide one space per one hundred spaces of parking and shall comply with the requirements of Australian Standard 2890.1.”

As the requirement is for 1 disabled space per hundred and there are 17 spaces over 3200mm (when measured in accordance with Clause 2.4.5 in AS2890.1 – 1993), the parking supply meets with this requirement.

Wyong Council’s DCP 61 Summary Table of Parking Requirements for Specific Land Uses relating to Housing for Aged or Disabled Persons states that:-

“parking requirements shall be as per SEPP No. 5”.

2.3. NSW State Environmental Planning Policy - Disabled Parking

SEPP No. 5 was superseded by SEPP (Seniors Living) 2004 which has itself been superseded by SEPP (Housing for Seniors or People with a Disability) 2004.

The current NSW requirement is therefore detailed in SEPP (Housing for Seniors or People with a Disability) 2004.

Schedule 1 Item 5 in SEPP (Housing for Seniors or People with a Disability) 2004 states:-

“Private car accommodation

If car parking (not being car parking for employees) is provided:

- (a) car parking spaces must comply with the requirements for parking for persons with a disability set out in AS 2890, and*
- (b) 5% of the total number of car parking spaces (or at least one space if there are fewer than 20 spaces) must be designed to enable the width of the spaces to be increased to 3.8 metres, and*
- (c) any garage must have a power-operated door, or there must be a power point and an area for motor or control rods to enable a power-operated door to be installed at a later date.”*

There are 70 spaces available for parking and 5% are required to be designed to enable the width of the spaces to be increased to 3.8 metres – the proposed development has 7 parking spaces at 3800mm wide (10%) – the development therefore complies with Schedule 1 Item 5(b).

A note attached to Clause 10 of SEPP (Housing for Seniors or People with a Disability) 2004 states:-

“Note. The concept of seniors housing is intended to be a shorthand phrase encompassing both housing for seniors and for people with a disability. This Policy deals with both kinds of housing.

Accommodation provided by seniors housing does not have to be limited to seniors or people with a disability. Clause 18 provides that seniors housing may be used for the accommodation of the following:

- (a) seniors or people who have a disability,*
- (b) people who live within the same household with seniors or people who have a disability,*
- (c) staff employed to assist in the administration of and provision of services to housing provided under this Policy.”*

These notes highlight that a number of occupants of this Seniors Living development may be seniors who do not have a disability at all, or may be seniors who have a disability which would not require a parking space wider than 2700mm – thereby reducing the need for the wider disabled car parking spaces.

It is understood that the intent of Schedule 1 Item 5(a) in SEPP (Housing for Seniors or People with a Disability) 2004 is to ensure that, in addition to the minimum 5% of car spaces required to be 3800mm (as per Schedule 1 Item 5(b)) - that a maximum of a further 4% of car spaces are 3200mm to satisfy Schedule 1 Item 5(a), the requirements of AS2890.1 – 1993 and the requirements of Wyong Council's DCP No. 61..

SEPP SL has a parking requirement for Seniors Living of 0.5 parking spaces per bedroom and if this rate is applied to the 107 bedrooms, the total parking requirement is 54 spaces.

2.4 Australian Standard AS2890 disabled parking requirement

The current relevant AS2890.1 – 2004 does not deal with off street parking for people with disabilities other than to note that another Standard (AS/NZS 2890.6) is intended to reference these requirements when published and:-

“Pending such publication it is intended that existing requirements for parking for people with disabilities in AS2890.1 – 1993, which has been made ‘available superseded’, will be observed.”

AS2890.1 – 1993, at Clause 2.4.5 states that:-

Parking spaces for use by people with disabilities shall be in accordance with the user classifications in Table 1.1. Guidelines for the scale of provision of parking spaces for people with disabilities are given in Appendix C. The guidelines can be applied to the aggregate of both on and off-street spaces in a particular locality where they serve the same developments.

Parking spaces for use by people with disabilities shall comply with the following requirements:

- (b) Space width. The parking space width shall be not less than 3.2 m, which, if necessary, includes overlap allowances as specified in Item (c).*
- (c) Overlap allowances. At the sides of a parking space an overlap of 500 mm may be used when the unobstructed width of the adjoining surface is not less than 1000 mm(see Figure 2.6), provided that the adjoining surface meets the requirements of Item (a), and is at the same level as the parking space, but is not another parking space.*

Appendix C1 Guidelines in AS2890.1 – 1993 detail the percentages of available car parking spaces which shall be provided for people with disabilities. While the listings do not specifically refer to Seniors Living developments it is noted that the maximum percentage required is 4 percent of available parking spaces.

2.5 Proposed Development Status Summary

The Toukley Seniors Living Apartments' parking design complies with the requirements of :-

- SEPP (Housing for Seniors or People with a Disability) 2004;
- AS2890.1 – 1993; and
- Wyong Shire Council DCP 61, and
- RTA's Guide to Traffic Generating Developments

Seven (7) of the 70 proposed parking spaces are 3800mm wide. SEPP requires that 5% of spaces (4) are 3.8 metres wide. The seven spaces are those numbered P19, 20, 28, 34 35 63 and 64. Refer to figure 3, page 6, figure 4, page 7 and figure 5, page 8.

Eleven (11) other parking spaces are either 3200mm wide or can be designated as 3200mm wide as they are 2700mm with a 500mm usable space beside them – as referenced in Clause 2.4.5(c) and detailed in Figure 2.6 in AS2890.1 – 1993. These are spaces numbered P1, 2, 5, 6, 11, 27, 41, 42, 56 and 70, on the plan.

In all, 17 spaces, or 24% of the parking spaces are available for people with disabilities and the remainder of the parking spaces are 2700mm wide – which allows for full opening of car doors.

In order to minimize usage of blind aisles, spaces 11 to 41 and 57 to 70 should be signposted as Resident Reserved Parking Only. Signs should direct visitor parking to spaces 42 to 56. The basement level should be signposted as Resident Parking Only at the top of the ramp, between P49 and P56, where there is a turning bay available.

2.6 Parking Survey of a Similar Development

By way of comparison, Traffic Engineering Services has conducted an interview survey and traffic movement survey at a similar self-care residential complex at Salamander Bay, Port Stephens. Salamander Haven was constructed in 2006/7 and contains 58, two bedroom self-care residences. Fifty (50) of the residences are in duplex format and there are 8 in a two-storey block with parking underneath.

The village is located within 200m walking distance of the Salamander Bay Village Shopping Centre which is similar in size to the Toukley Shopping Centre. This survey showed parking generation to be 1 space per dwelling unit plus 1 space per 4 dwellings for visitor parking. Full details of the Salamander Bay surveys are given in Appendix 2.

Applying these rates the parking requirement would be $53 + 14 = 67$ spaces.

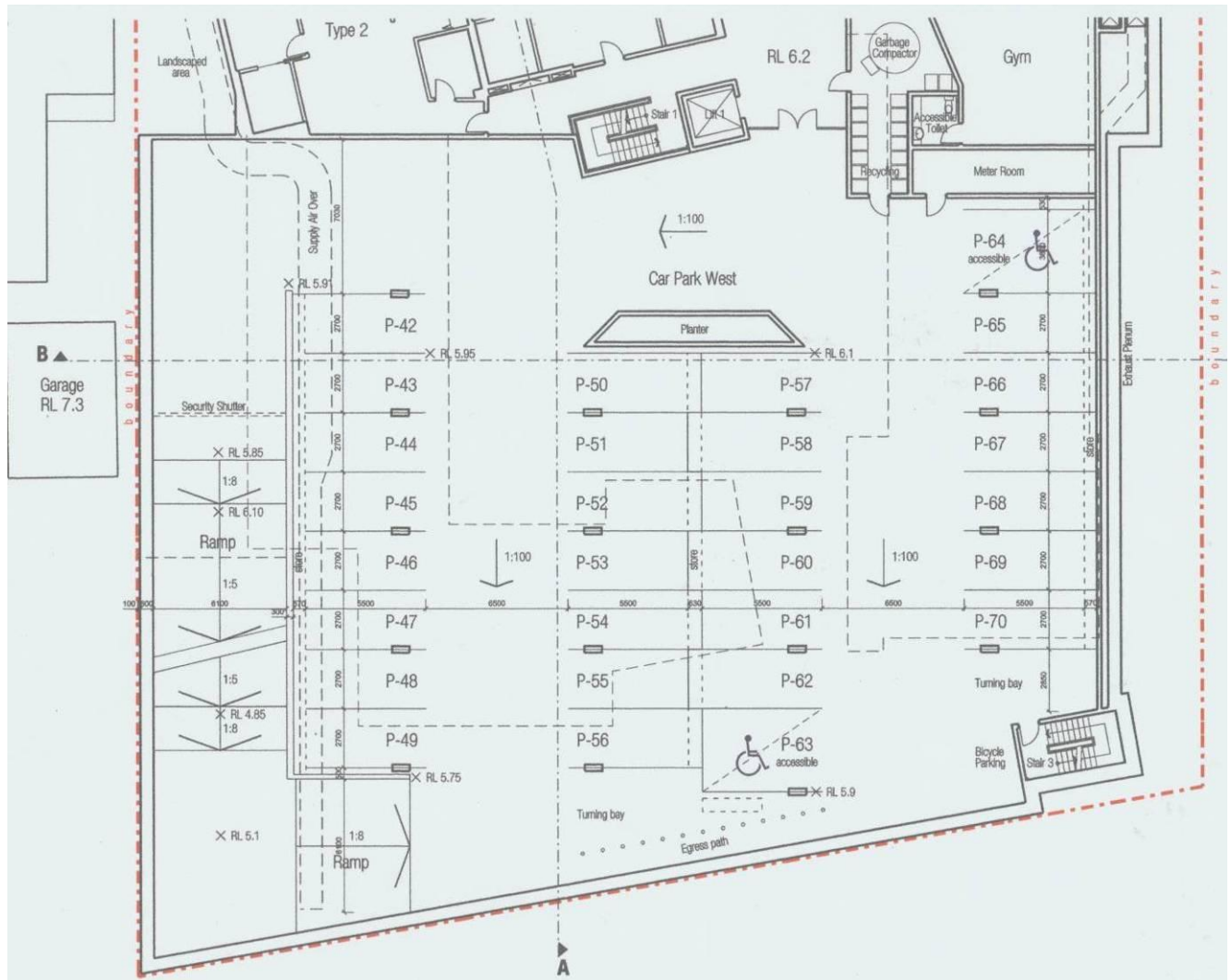


Figure 2

First lower level parking.

**Spaces P57 to P70 to be designated RESIDENT PARKING ONLY.
 Ramp to lower level to be signposted RESIDENT PARKING ONLY.
 Visitors could be directed to any non-resident spaces between P42 and P56.**



Figure 3

Second lower (Basement) level parking
RESIDENT PARKING ONLY

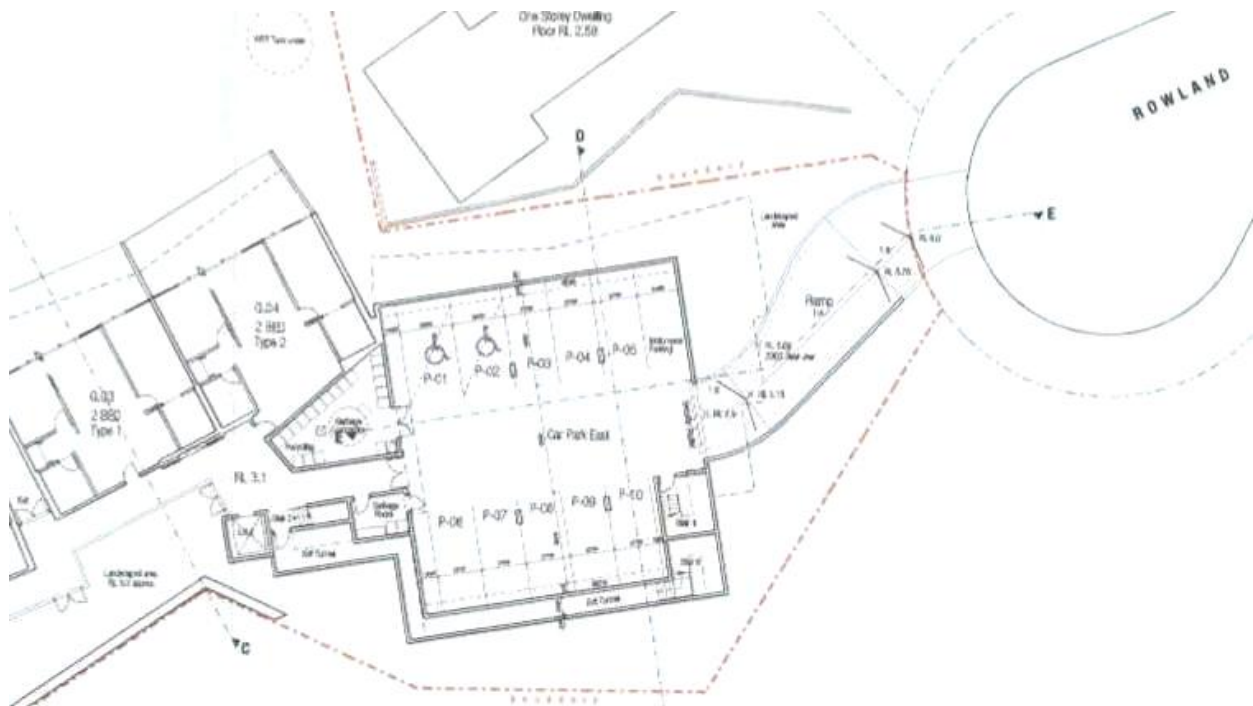


Figure 4
Parking area accessed from Rowland Terrace.

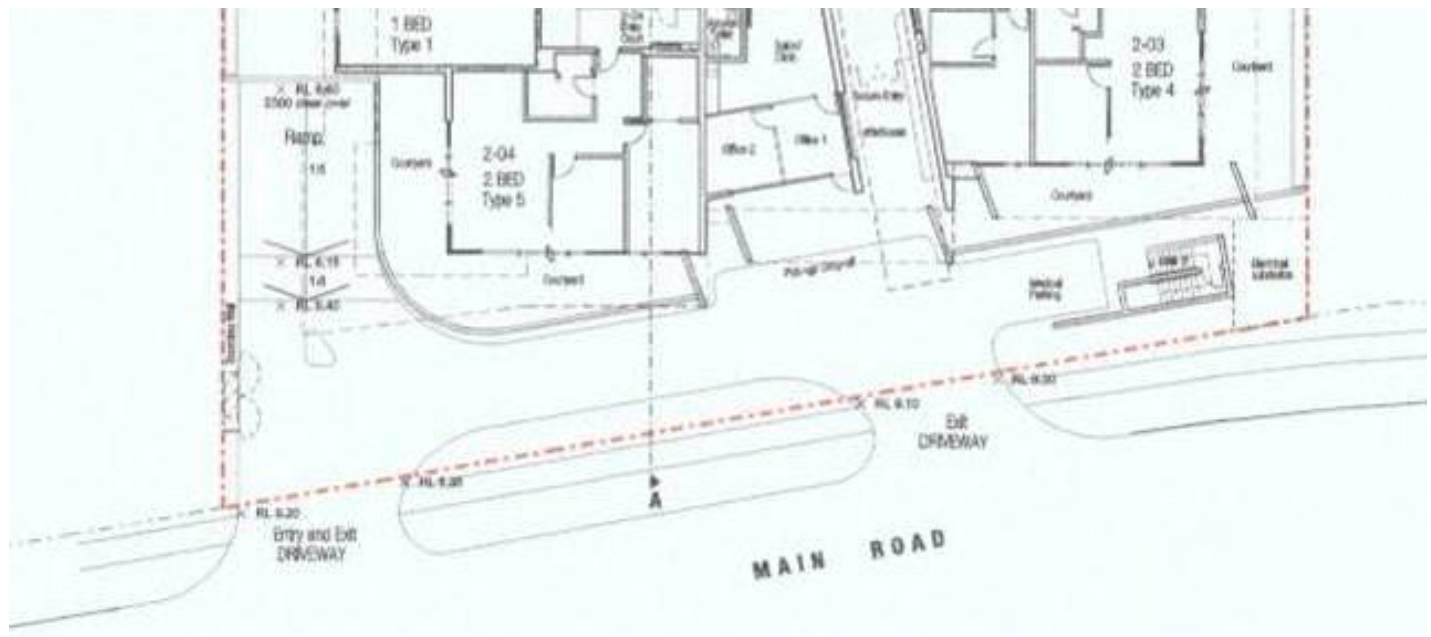


Figure 5.
**Main Road driveways, forecourt parking space and porte cochere,
 and ramp to two lower level parking areas.**

3. Existing Roads and Traffic

Main Road is a classified RTA Main Road, MR 509, and functions as a sub-arterial road linking the beachside Central Coast suburbs of Nora Head and Noraville, through Toukley, to the Pacific Highway and the Sydney – Newcastle Expressway (F3), 11.5 kilometres to the west of the site. The nearest railway station is at Warnervale, 8.2km to the west.

Main Road has a carriageway width of 13 metres, with 3.5m wide footpaths each side. The footpath along the frontage of the development site has a 2m wide grass verge adjacent to the kerb and a 1.2m wide concrete footpath which is 0.3m from the property line.

The site is approximately mid-way between Dunleigh Street and the Peel Street-Yaralla Road intersection, and is flanked by the Beachcomber Resort (Hotel/Motel) on the west and Toukley Gardens on the east. The property also has frontage to Rowland Terrace, a residential cul-de-sac which connects to Peel Street.

Peel Street has a carriageway width of 13m and 3.5m wide footpaths. There are no paved footpaths on Peel Street, north of the ambulance station.

Rowland Terrace has a pavement width of 9.1 metres and there are no paved footpaths.

The intersection of Main Road and Peel Street – Yaralla Road is a staggered tee junction which operates as a cross intersection with overlapping opposing right turns on Main Road. The intersection, shown in Figure 2 below, is further complicated by an egress driveway from the Liquorland drive-through liquor store on the north east corner.



Figure 2
Intersection of Main Road with Peel Street (top) and Yaralla Road

Traffic Engineering Services has conducted a turning movement traffic survey at the intersection. The survey was carried out on Thursday 18 September, 2008, between 2pm and 5pm. The peak hour traffic movements were recorded between 3.45 and 4.45 pm. The complete results of the traffic survey are attached as Appendices 1a and 1b.

The peak hour traffic volumes have been applied to the intersection analysis program, aaSIDRA3.2, which was developed by Akcelik & Associates Pty. Ltd., and the Australian Road Research Board.

This program measures the performance level of traffic conditions, including volume/capacity ratios, average delays experienced by motorists, queue lengths and Level of Service criteria. There are five Level of Service (LoS) measures, from A to F. LoS A indicates free flow, no delay conditions, and LoS F indicates severe congestion with frequent, long delays. The maximum LoS for design purposes is LoS C.

The output of this program, given as Table 1 below, shows the Main Road approaches are operating satisfactorily at LoS A, but the Peel Street and Yaralla Road approaches are experiencing long delays, and are recording LoS F and E respectively. The right turn from Peel Street is showing average delays of 222 seconds, (3 minutes, 42 seconds) along with a volume capacity (v/c) ratio of 0.838. Even the other movements with average delays of 50 seconds contribute to the unsatisfactory traffic conditions. Likewise, the right turn movement out of Yaralla Road is experiencing average delays of 115 seconds. The intersection is in need of some form of remedial engineering and the possibility of installing traffic signals should be addressed.

In addition to the complexity of turning movements, the presence of an egress driveway from the Drive-thru Liquor Store, exacerbates congestion, and right turn movements out of the driveway are extremely hazardous.

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Movement Summary

Main Road, Toukley

**Peel St - Yaralla Rd. Thurs. 18 Sept.2008, Peak Hour
3.45-4.45pm**

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Yaralla Road.										
1	L	94	2.1	0.537	32.6	LOS D	22	0.81	1.15	10.3
2	T	19	5.0	0.541	31.8	LOS D	22	0.81	1.08	14.5
3	R	8	11.1	0.250	115.2	LOS F	7	0.97	1.00	4.9
Approach		123	3.3	0.537	38.5	LOS E	22	0.82	1.13	10.0
Main Road E.										
4	L	99	2.0	0.264	5.7	LOS A	0	0.00	0.58	28.7
5	T	539	7.1	0.264	5.7	LOS A	33	0.55	0.00	41.8
6	R	33	3.0	0.264	15.1	LOS C	33	0.91	1.02	20.5
Approach		671	6.1	0.264	6.1	LOS A	33	0.49	0.14	40.0
Peel Street.										
7	L	17	5.6	0.360	52.9	LOS F	11	0.93	1.03	7.0
8	T	15	6.2	0.356	50.7	LOS F	11	0.93	1.01	8.4
9	R	31	3.2	0.838	222.2	LOS F	28	0.99	1.20	2.7
Approach		65	4.6	0.837	133.1	LOS F	28	0.96	1.11	3.8
Main Road W.										
10	L	119	1.7	0.492	5.7	LOS A	0	0.00	0.58	31.7
11	T	702	7.0	0.492	0.0	LOS A	0	0.00	0.00	50.0
12	R	178	5.1	0.248	8.5	LOS A	10	0.60	0.82	20.5
Approach		999	6.0	0.492	2.2	LOS A	10	0.11	0.21	43.2
All Vehicles		1858	5.8	0.838	10.6	Not Applicable	33	0.32	0.28	31.6

Table 1

SIDRA 3.2 Intersection Performance Summary Table

4. Traffic Generation from the Proposed development

4.1. RTA Traffic Generation Rates

The RTA's "Guide to Traffic Generating Developments" has not established a traffic generation rate for a seniors living development but interpretation of the RTA's research suggests that the rate could be similar to medium density residential flat buildings, for which the RTA suggests the following:-

- Smaller units and flats up to 2 bedrooms:
Daily vehicle trips, 4 to 5 per dwelling, Peak Hour 0.4 to 0.5 per dwelling.
- Larger units (3+ bedrooms) Daily vehicle trips, 5 to 6.5 per dwelling, Peak Hour, 0.5 to 0.65 vehicle trips per dwelling.

The RTA recognizes that some adjustments to the traffic generation rate may be necessary depending on the location of shops, schools and recreation facilities, and, on the availability of public transport.

The RTA also encourages surveys of similar establishments to make comparisons and establish an appropriate rate for the development and its location.

4.2. Traffic Generation Surveys

Traffic Engineering Services has conducted a traffic survey at an existing similar development in Salamander Bay, Port Stephens. This survey included a door-to-door interview/questionnaire as well as a vehicle movement count. The survey was undertaken on Thursday, 5 February, 2009, between 2pm and 5pm, and included all traffic entering and leaving the development's driveways off Diemars Road, Salamander Bay. The questionnaire form and the full results of this survey are given in Appendix 2.

The peak hour for traffic generated by Salamander Haven was between 2.30 and 3.30 pm, when 28 vehicles, including visitors were observed. Of these 13 (46%) were leaving and 15 (54%) were arriving.

The peak hour traffic generation rate for 48 dwellings was 0.58 vehicle trips per dwelling, including visitors and service vehicles..

4.3 Traffic Generation from Proposed Development.

Applying the generation rate of 0.6 trips per dwelling unit to the fully developed and occupied 53 units as proposed, the estimated volume of peak hour traffic generated is computed as follows:

Total traffic generation: **53 x 0.6 = 32 vehicle trips**

It is assumed that the directional distribution of this additional traffic will be similar to the directional split at Salamander, viz. 46% or 15 leaving, and 54% or 17 entering during the afternoon peak hour.

5. Traffic Impact

Whilst it is acknowledged that the RTA does not support vehicular access from Main Road, this Traffic Impact Assessment considers all access options in terms of traffic impact, including intersection capacity and road safety. The options to be evaluated include:-

1. Two driveways on Main Road giving access to 60 parking spaces, and one driveway on Rowland Terrace giving access to 10 parking spaces, with no turn restrictions at the Main Road driveways.
2. As above with no right turns at Main Road Driveways
3. As above with a right turn lane on Main Road, specifically for these driveways.
4. As above with a Median Turn Lane on Main Road, between Dunleigh Street and Peel Street.
5. No vehicular access to Main Road. i.e. All traffic access via Rowland Terrace.

Option 1 – Allow Right Turns at the Driveways.

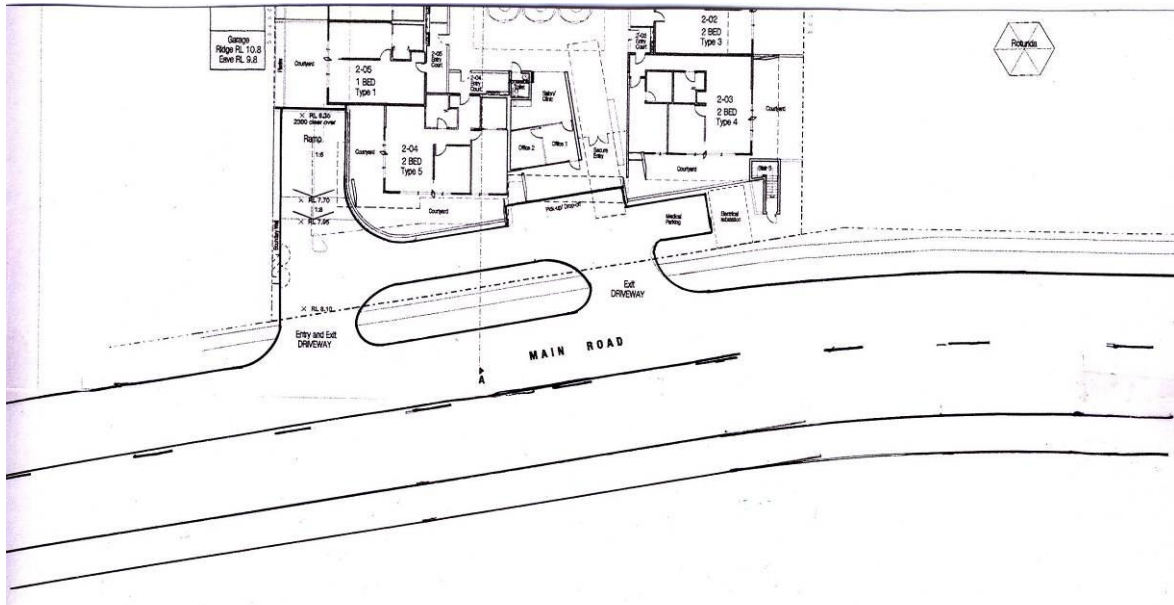


Figure 3

Proposed Driveways on Main Road – Right Turns Permitted

The proposed driveways are at locations of existing driveways which provided access to residential developments on the site prior to the land acquisition for this project.

At the proposed driveways shown on the architects plan, and in Figure 3 on the previous page, it is estimated that directional distribution of driveway traffic on Main Road will be approximately 50-50. ie. at the ingress driveway 9 will make right turns and 8 will make left turns and at the egress driveway 7 will make right turns and 8 will make left turns.

These numbers have been applied to SIDRA 3.2, and as can be seen from the outputs in Tables 2 and 3, all approaches on Main Road and the driveways, will operate at LoS A , even though the right turn in and left turn in are showing LoS B. This is only because the delays exceed 10 seconds.

These are satisfactory operating conditions in terms of road and intersection capacity and there is no need for any changes to traffic control or management at the driveways.

However, as with all other driveways between Dunleigh Street and Peel Street, if there are parked cars adjacent to the kerb, a following vehicle cannot overtake a stationary right turning vehicle on its left. This is a capacity restriction and a safety issue and is most likely the reason that the RTA does not support vehicle access

from Main Road. A three hour traffic survey recorded 21 right turns into driveways and 17 right turns out of driveways on this section of Main Road.

Movement Summary

Main Road, Toukley

No.. 222 Ingress

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Main Road E										
5	T	663	5.0	0.351	0.0	LOS A	0	0.00	0.00	50.0
6	R	9	0.0	0.008	11.3	LOS B	0	0.00	0.83	18.1
Approach		672	4.9	0.351	0.2	LOS A		0.00	0.01	49.6
Main Road W										
10	L	8	0.0	0.533	11.3	LOS B	0	0.00	0.83	23.7
11	T	999	5.0	0.533	0.0	LOS A	0	0.00	0.00	50.0
Approach		1007	5.0	0.533	0.1	LOS A		0.00	0.01	49.8
All Vehicles		1679	4.9	0.533	0.1	Not Applicable	0	0.00	0.01	49.8

Table 2
SIDRA 3.2 Output for the ingress Driveway

Movement Summary

Main Road, Toukley

222 Egress

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Main Road E.										
5	T	663	5.0	0.214	0.0	LOS A	0	0.00	0.00	50.0
Approach		663	5.0	0.214	0.0	LOS A		0.00	0.00	50.0
222 Egress										
7	L	8	0.0	0.020	7.8	LOS A	1	0.72	0.79	14.9
9	R	7	0.0	0.017	7.9	LOS A	0	0.72	0.79	14.4
Approach		15	0.0	0.020	7.9	LOS A	1	0.72	0.79	14.7
Main Road W.										
11	T	999	5.0	0.529	0.0	LOS A	0	0.00	0.00	50.0
Approach		999	5.0	0.529	0.0	LOS A		0.00	0.00	50.0
All Vehicles		1677	4.9	0.529	0.1	Not Applicable	1	0.01	0.01	49.6

Table 3
SIDRA 3.2 Output for the Egress Driveway

Movement Summary

Main Road, Toukley

Peel St - Yaralla Rd. with 10 parking spaces to Rowland Tce.

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Yaralla Road.										
1	L	98	2.0	0.580	35.8	LOS E	25	0.82	1.20	9.6
2	T	20	4.8	0.583	35.1	LOS E	25	0.82	1.11	13.6
3	R	8	11.1	0.265	122.3	LOS F	7	0.97	1.01	4.6
Approach		128	3.1	0.581	41.7	LOS E	25	0.83	1.17	9.4
Main Road E.										
4	L	99	2.0	0.269	5.7	LOS A	0	0.00	0.58	28.7
5	T	546	7.0	0.269	5.8	LOS A	34	0.55	0.00	41.7
6	R	35	2.9	0.269	15.4	LOS C	34	0.92	1.03	20.2
Approach		680	6.0	0.269	6.3	LOS A	34	0.49	0.14	39.8
Peel Street.										
7	L	18	5.3	0.388	56.1	LOS F	12	0.93	1.05	6.6
8	T	16	5.9	0.386	54.0	LOS F	12	0.93	1.02	8.0
9	R	32	3.1	0.914	265.6	LOS F	34	1.00	1.27	2.3
Approach		68	4.4	0.916	154.2	LOS F	34	0.96	1.14	3.3
Main Road W.										
10	L	121	1.7	0.496	5.7	LOS A	0	0.00	0.58	31.7
11	T	707	7.1	0.496	0.0	LOS A	0	0.00	0.00	50.0
12	R	180	5.0	0.253	8.6	LOS A	10	0.60	0.82	20.4
Approach		1009	6.0	0.497	2.2	LOS A	10	0.11	0.22	43.2
All Vehicles		1885	5.8	0.914	11.8	Not Applicable	34	0.33	0.29	30.3

Table 4
SIDRA 3.2 Output for when the development is fully occupied with driveways on Main Road and some traffic from the Rowland Terrace access.

Of course there will be additional traffic using the Main Road – Peel St –Yaralla Rd intersection, including the traffic using the driveways and the traffic using the 10 parking spaces off Rowland Terrace. This traffic has been added to the SIDRA 3.2 analysis and, as can be seen in Table 4. the average delays for traffic turning right off Peel Street have increased from 222 seconds to 265 seconds, and the v/c ratio has increased from 0.838 to 0.914, indicating that there is still a need for engineering remedial measures

Option 2 – Median to Prevent Right Turns

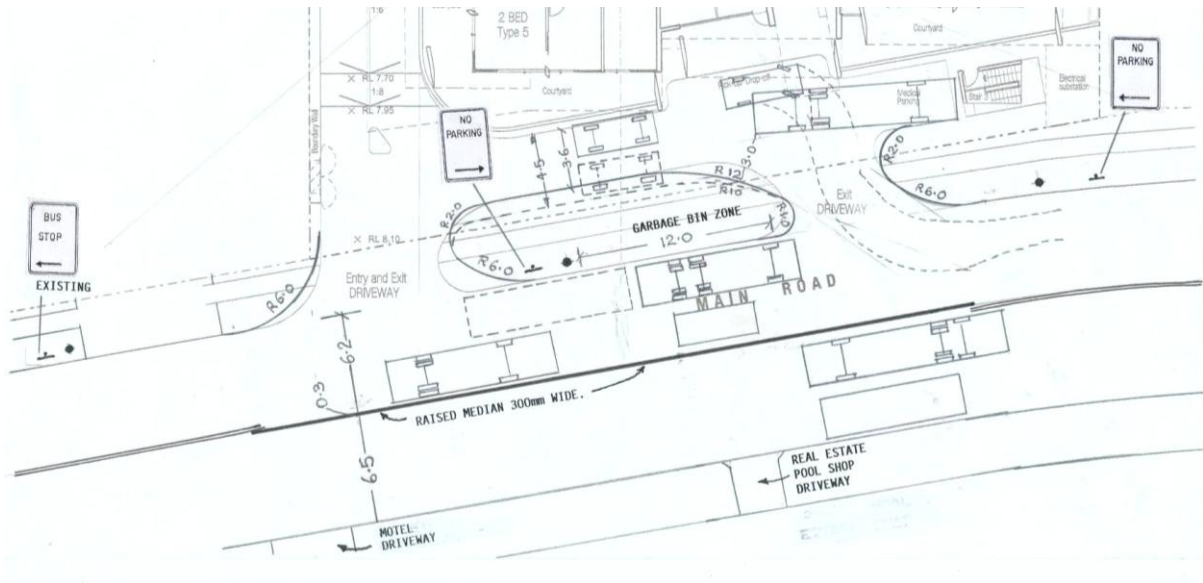


Figure 4

Raised Median to prevent right turns

Whilst this will prevent right turn out of the egress driveway, westbound traffic intending to turn right into the ingress driveway will probably continue to the main driveway to the forecourt of the Beachcomber Resort to make a U-turn. This is transferring and exacerbating the safety hazard associated with the right turn.

Vehicles leaving the site and intending to travel west will have to make a left turn, and then find a place to turn around. One option is to make a left turn into the next driveway (Toukley Gardens carpark), make a three point turn and then make a right turn back onto Main Road. Other options include making a left turn into Peel Street, a U turn and then the difficult right turn back on to Main Road. Another is to make a right turn at Yaralla Road, a right turn into Beachcomber Street, a right turn onto Dunleigh Street and then a left on to Main Road at the traffic signals.

Again, these options are all transferring and exacerbating the safety hazard associated with the right turn. The banning of the right turns at the driveways will also increase congestion, delays and conflicts at the already complex traffic situation at the Peel Street intersection. In addition, the median will prevent right turns into existing businesses on the south side.

Option 3. – Right Turn Lane

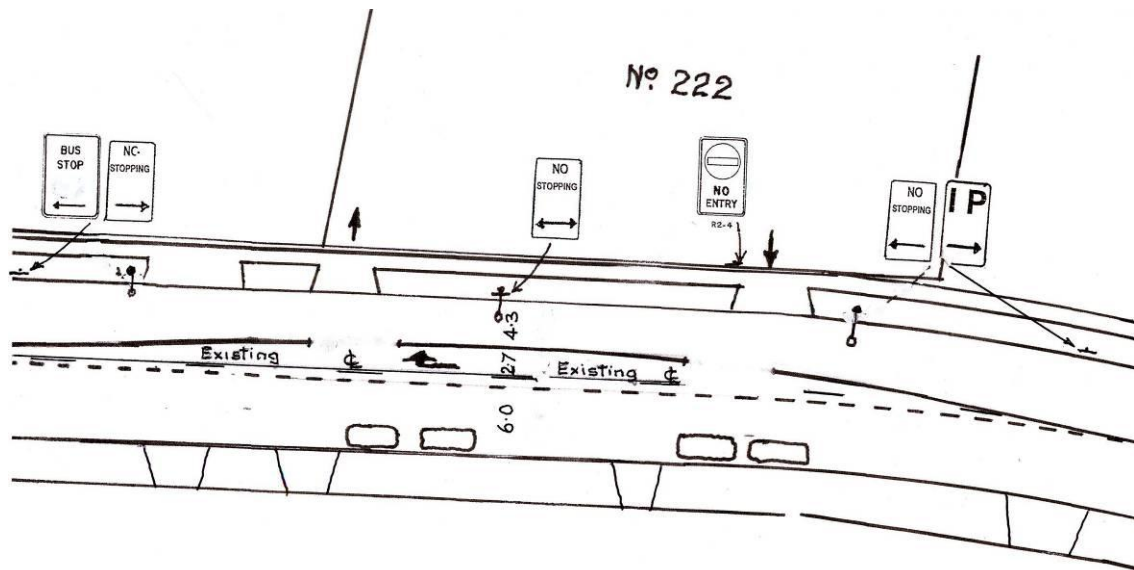


Figure 5
Right turn lane for the subject driveways.

This option will enhance capacity of the through lanes of Main Road and allow following vehicles to pass a stationary right turning vehicle. It would necessitate the removal of parking from the north side of Main Road and creating a NO STOPPING zone.

Whilst this is a cheap, cost effective way of enhancing capacity and safety at this location, it would not be of benefit to traffic making right turns into and out of driveways on the south side of the road.

Option 4. Median Turn Lane



Tourle Street MR 108 Newcastle



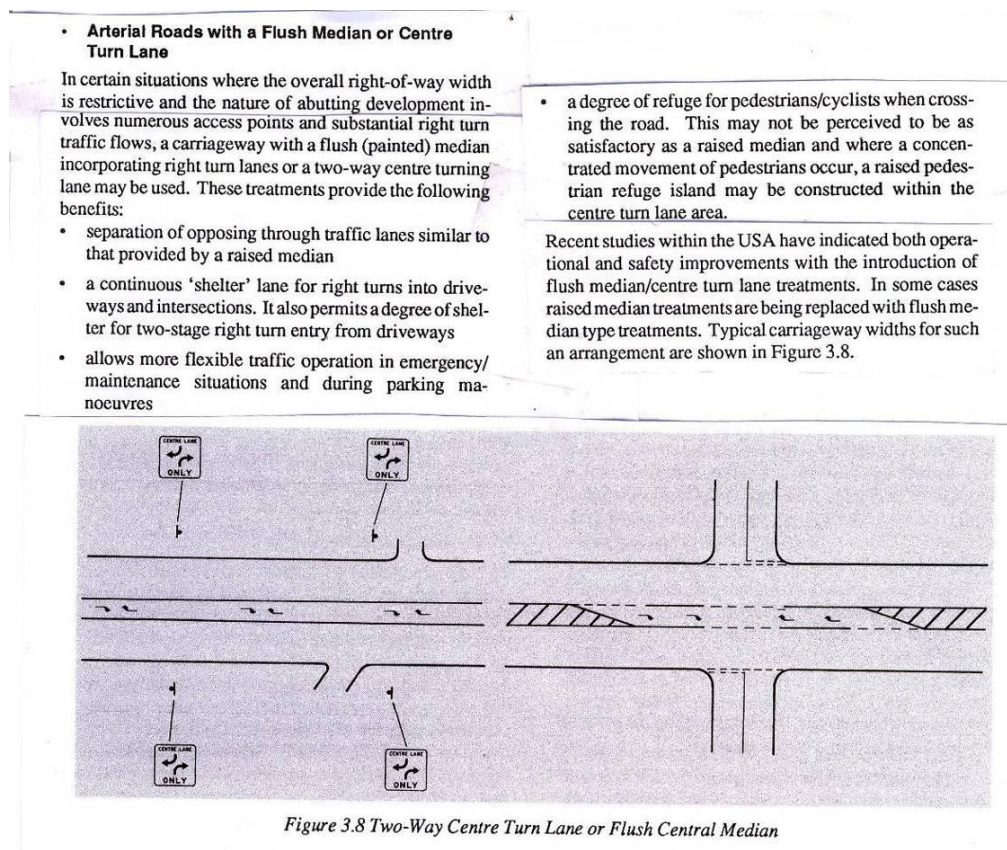
Argyle Street SH 25 Moss Vale



A median turn lane is a lane in which traffic from both directions can shelter in order to make a right turn.

The one shown on the right in Moss Vale is not signposted as such and is only 2.4m wide. It is, however, used frequently by right turning vehicles.

The principles and application guide for a median turn lane are given in the Austroads "Guide to Traffic Engineering Practice – Part 9 – Arterial Road Traffic Management" A copy of the section in this publication is given below.



Copy from Austroads "Guide to Traffic Engineering Practice

On Main Road, Toukley, between Dunleigh Street and Peel Street the situation is almost identical to the situation described in the Austroads Guide. There are optional lane widths for Main road and the dimensions suggested in Figure 6 are considered the most practical. Whilst the turn lane shown is only 2.7m wide, observations at locations where 2.7m wide turn lanes are in use on busy roads, such as along the New England Highway through East Maitland, indicate that the width is sufficient. This plan retains parking on the south side of Main Road, and as all developments fronting this side of main road also have off-street parking, a more efficient traffic arrangement would be to have a 3m wide median turn lane flanked by 5m wide through lanes with 1.5m kerb indentations for bus zones and taxi zones. There would be NO STOPPING zones on both sides of Main Road. This configuration could also provide the opportunity to add 1.5m wide **cycle lanes** in each direction with the through lanes being 3,5m wide.

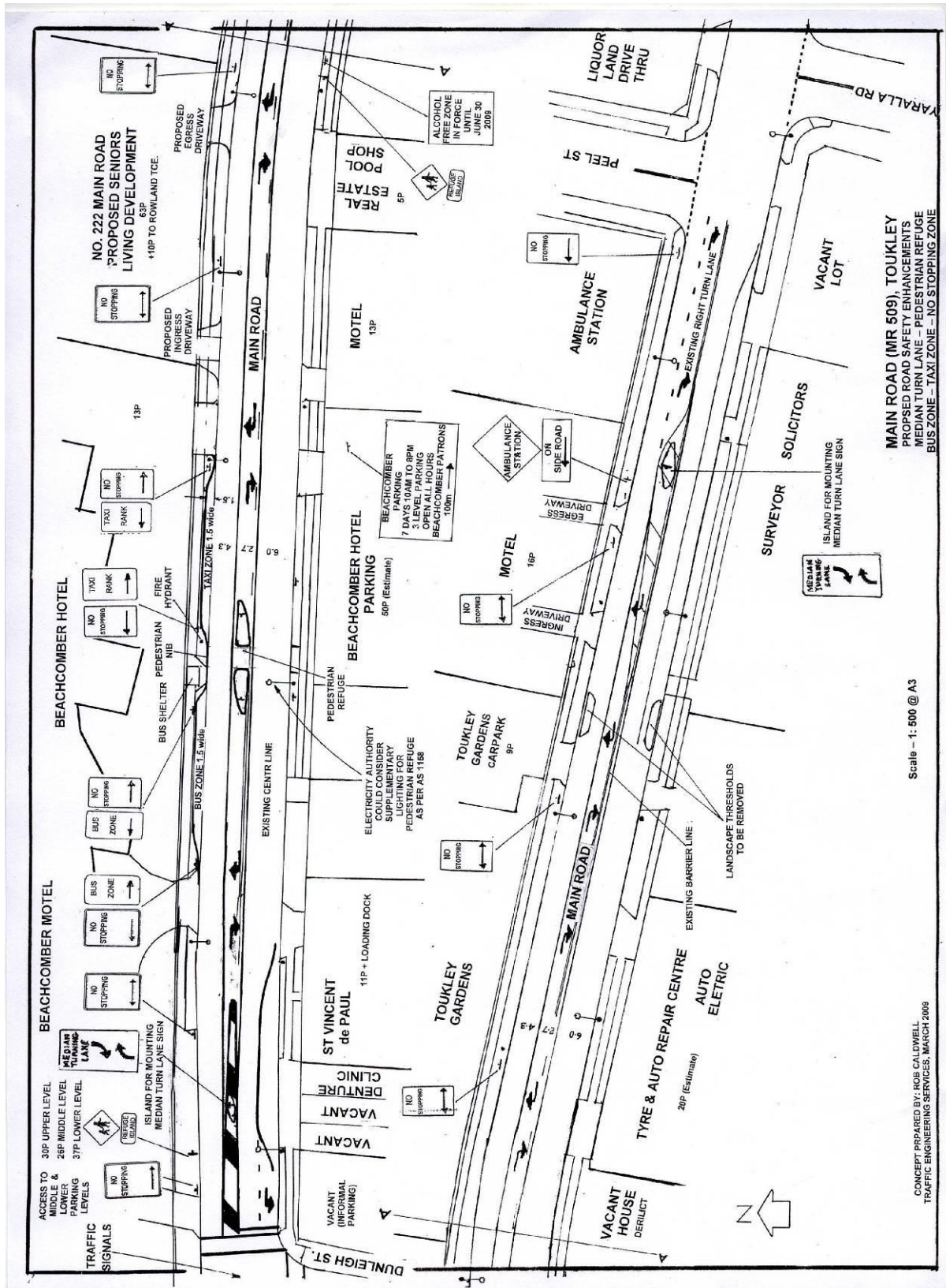


Figure 6
Median Turn Lane between Dunleigh Street and Peel Street, Toukley.

The plan shown in Figure 6 is for a Median Turn Lane linking to existing painted medians, between Dunleigh Street and Peel Street intersections.

The design is illustrative and is subject to detailed topographical survey and design.

Incorporated in this concept is a pedestrian refuge, located to provide protection for pedestrians, particularly at night when patrons park cars in the Beachcomber parking area on the south side of the road, and then walk to and from the Hotel. It will also benefit Hotel patrons who are using the westbound bus services.

The refuge will also be of benefit to residents of the Seniors Living Apartments in accessing the westbound bus service. The pedestrian refuge and the kerb extension (pedestrian nib) are derivatives of the design elements given in Austroads "Guide to Traffic Engineering Practice – Part 13, Pedestrians". Copies of these design elements are given in Appendices 3 and 4.

Discussions about this concept with businesses, including the Hotel Management, were very favourable.

It will not only be beneficial in terms of safety and convenience for drivers using any of the 16 driveways in the section, but will improve the capacity of the through lanes, This will in turn benefit the two intersections, and will minimize any impact that the traffic generated by the proposed development may have on the road infrastructure..

Option 5.

The RTA has advised that the preferred form of vehicle access to the site is via Rowland Terrace. This would mean that all traffic generated would have to access the site from Peel Street. As demonstrated earlier in this report, the Peel Street approach to the intersection with Main Road is already operating at Level of Service F, with average delays of .3 minutes 42 seconds and a volume/capacity (v/c) ratio of 0.837.

With the 10 parking space carpark accessing Rowland Terrace as shown on the plans, the additional traffic generated would increase average delays to 4 minutes 25 seconds and the v/c ratio to 0.916. (See SIDRA output in Table 4.

If all 70 parking spaces were to be accessed via Rowland Terrace, the peak hour traffic volume on Rowland Terrace would increase by 32 vehicles, the delays at Peel Street approach to Main Road would increase to over 5 minutes and the v/c ratio would be 1.00. (ref. SIDRA output in Table 5.)

As a result of this, more traffic would be forced to filter through other back streets such as Lakeview Street and Elden Street to gain access to Main Road. It was revealed through discussions with a resident of Rowland Terrace, that this is a common practice for local residents, because of the difficulties using Peel Street.

Having all parking accessed from Rowland Terrace would obviously have a detrimental effect on the residential amenities of these streets, and particularly in Rowland Terrace itself.

Main Road, Toukley

Peel St - Yaralla Rd. with 73 parking spaces to Rowland Tce.

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Yaralla Road.										
1	L	94	2.1	0.667	46.9	LOS E	31	0.85	1.32	7.7
2	T	25	3.8	0.667	46.2	LOS E	31	0.85	1.20	11.2
3	R	8	11.1	0.265	121.9	LOS F	7	0.97	1.01	4.7
Approach		129	3.1	0.668	52.0	LOS F	31	0.86	1.27	8.0
Main Road E.										
4	L	99	2.0	0.276	5.7	LOS A	0	0.00	0.58	28.7
5	T	539	7.1	0.276	5.7	LOS A	34	0.54	0.00	41.8
6	R	42	2.4	0.276	15.6	LOS C	34	0.93	1.04	20.1
Approach		680	6.0	0.276	6.3	LOS A	34	0.48	0.15	39.7
Peel Street.										
7	L	23	4.2	0.444	56.3	LOS F	14	0.93	1.07	6.6
8	T	19	5.0	0.444	54.1	LOS F	14	0.93	1.04	8.0
9	R	37	2.7	1.000*	303.3	LOS F	44	1.00	1.40	2.0
Approach		81	3.7	1.000	168.6	LOS F	44	0.96	1.21	3.0
Main Road W.										
10	L	128	2.3	0.498	5.7	LOS A	0	0.00	0.58	31.7
11	T	702	7.0	0.498	0.0	LOS A	0	0.00	0.00	50.0
12	R	178	5.1	0.248	8.5	LOS A	10	0.60	0.82	20.5
Approach		1009	6.0	0.498	2.2	LOS A	10	0.11	0.22	43.1
All Vehicles		1899	5.7	1.000	14.1	Not Applicable	44	0.33	0.31	28.1

Table 5

Apart from the issue of additional traffic on the residential streets, there are some physical constraints which would have to be overcome, such as:-

- A sewer main which cannot be built over,
- A tunnel connecting the two carparks would mean the loss of four dwelling units, which could not be relocated due to height restrictions, and
- The door width/gradient and alignment of the driveway to Rowland Terrace is only suitable for up to 30 vehicles in a peak hour as it is not wide enough for two way traffic. Ref. Australian Standard AS 2890.1 cl.3.2.2

6. Future Traffic Growth

This analysis has not taken into consideration growth in Main Road Traffic during the time it will take for the proposed estate to fully develop.

With annual traffic growth of 2% (compounding), over the next 10 years the peak hour volume of traffic on Main Road will increase from 1579 to 1970 vph. When this increase is applied to the SIDRA 3.2 analyses, it can be seen in Tables 6 and 7, that there is minimal impact on the traffic efficiency at the ingress and egress driveways, but, as can be seen in Table 8, the already intolerable situation at the Peel-Yaralla intersection worsens considerably. The average delays for the right turn movement are approaching 10 minutes, and the Level of Service for all movements on Peel Street and Yaralla Road approaches are at LoS F. The eastbound right turn on Main Road will reach LoS D.

Movement Summary										
Main Road, Toukley										
No.. 222 Ingress										
Give-way										
Vehicle Movements										
Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Main Road E										
5	T	826	5.0	0.437	0.0	LOS A	0	0.00	0.00	50.0
6	R	9	0.0	0.008	11.3	LOS B	0	0.00	0.83	18.1
Approach		835	4.9	0.437	0.1	LOS A		0.00	0.01	49.7
Main Road W										
10	L	8	0.0	0.667	11.3	LOS B	0	0.00	0.83	23.7
11	T	1247	5.0	0.664	0.0	LOS A	0	0.00	0.00	50.0
Approach		1255	4.9	0.664	0.1	LOS A		0.00	0.01	49.8
All Vehicles		2090	4.9	0.667	0.1	Not Applicable	0	0.00	0.01	49.8

Table 6

Movement Summary

Main Road, Toukley

222 Egress

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Main Road E.										
5	T	826	5.0	0.266	0.0	LOS A	0	0.00	0.00	50.0
Approach		826	5.0	0.266	0.0	LOS A		0.00	0.00	50.0
222 Egress										
7	L	8	0.0	0.037	15.1	LOS C	1	0.85	0.89	11.4
9	R	7	0.0	0.032	15.2	LOS C	1	0.85	0.90	11.0
Approach		15	0.0	0.037	15.1	LOS C	1	0.85	0.90	11.2
Main Road W.										
11	T	1247	5.0	0.660	0.0	LOS A	0	0.00	0.00	50.0
Approach		1247	5.0	0.660	0.0	LOS A		0.00	0.00	50.0
All Vehicles		2088	4.9	0.660	0.1	Not Applicable	1	0.01	0.01	49.6

Table 7

SIDRA
INTERSECTION

Movement Summary

Main Road, Toukley

Peel St - Yaralla Rd. with 10P Rowland Year 2020 @ 2% pa

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Yaralla Road.										
1	L	117	1.8	1.298	126.6	LOS F	60	1.00	1.33	3.2
2	T	32	3.1	1.280	125.9	LOS F	60	1.00	1.24	5.0
3	R	11	2.0	0.300	301.5	LOS F	88	1.00	1.05	2.0
Approach		257	2.6	1.293	129.4	LOS F	88	0.75	0.93	2.9
Main Road E.										
4	L	123	1.6	0.365	5.7	LOS A	0	0.00	0.58	28.7
5	T	672	7.0	0.365	10.6	LOS B	53	0.54	0.00	36.6
6	R	44	2.3	0.364	25.4	LOS D	53	1.00	1.11	14.8
Approach		839	6.0	0.365	10.6	LOS B	53	0.48	0.14	34.9
Peel Street.										
7	L	21	4.5	1.000#	310.4	LOS F	51	1.00	1.53	1.4
8	T	21	4.5	1.000#	308.3	LOS F	51	1.00	1.45	1.7
9	R	42	2.4	1.000*	559.1	LOS F	54	1.00	1.76	1.1
Approach		86	3.5	1.000	431.3	LOS F	54	1.00	1.62	1.3
Main Road W.										
10	L	148	2.0	0.614	5.7	LOS A	0	0.00	0.58	31.7
11	T	877	7.0	0.613	0.0	LOS A	0	0.00	0.00	50.0
12	R	222	5.0	0.380	11.4	LOS B	17	0.70	0.95	17.5
Approach		1246	6.0	0.613	2.7	LOS A	17	0.13	0.24	42.1
All Vehicles		2331	5.8	1.298	35.4	Not Applicable	88	0.36	0.34	17.3

Table 8

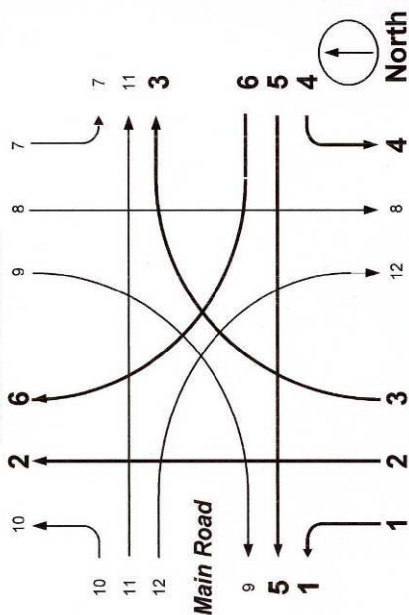
This of course, is for the scenario that there are 10 of the development's parking spaces accessed from Rowland Terrace, and 60 accessed from the ingress and egress driveways on Main Road. If all 70 spaces are accessed from Rowland Terrace, the Peel Street approach to Main Road will experience even longer delays and queues, leading to further intrusion into the residential amenity of alternative streets.

Apart from installing traffic signals at the intersection, there will also be a need to improve the mid-block capacity of Main Road, not only here, but over the entire length of the sub-arterial road, from Noraville to the F3 Freeway. Capacity enhancements such as removal of parking, and, installing median turn lanes and separate turn lanes at intersections are obvious necessities to optimize volume-capacity for one lane in each direction. For signalized intersections to match the mid-block capacity created by these measures, intersection approaches may have to be widened (including property acquisition) to allow two approach and departure lanes for through traffic.

Capacity improvements beyond this stage cannot be foreseen, and other, broader scale transportation planning options will need to be investigated.

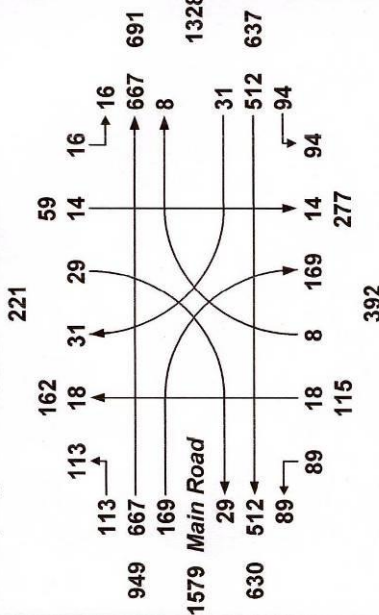
Traffic Engineering Services Intersection Traffic Count Form (2a) - Sheet 1/2

Peel St - Yaralla Rd



MOVEMENTS 1 to 6

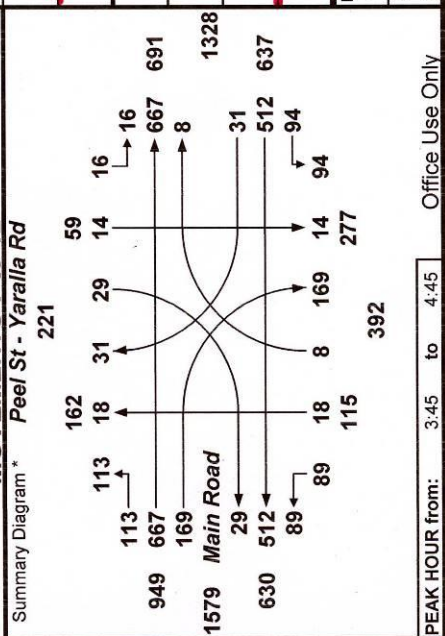
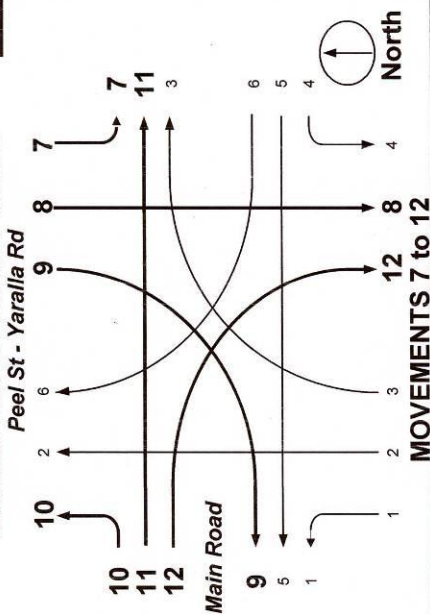
Summary Diagram * Peel St - Yaralla Rd



PEAK HOUR from: 3:45 to 4:45 Office Use Only

Location		Toukley		Major Road		Main Road		Minor Road		Observer	
Date	Thurs Sep 2008	18	18	Weather	Time	Time	Time	Time	Time	Amanda	
mins ending	15	1	2	3	4	5	6	7	8	hour totals	
		light + heavy	light + heavy	light + heavy	light + heavy	light + heavy	light + heavy	light + heavy	light + heavy	light + heavy	
		1	2	3	4	5	6	7	8	15 min totals (1-12)	
		1	2	3	4	5	6	7	8	light + heavy	
2:15	16	2	3	4	5	6	7	8	9	320	
2:30	28	1	1	18	141	3	3	3	3	375	
2:45	37	4	0	22	137	3	3	3	3	400	
3:00	21	6	0	15	125	7	7	7	7	380	
3:15	20	5	1	17	125	4	4	4	4	375	
3:30	15	4	1	18	120	8	8	8	8	379	
3:45	27	6	1	22	159	7	7	7	7	424	
4:00	26	4	2	27	133	9	9	9	9	451	
4:15	20	6	2	20	119	4	4	4	4	378	
4:30	20	4	2	16	106	8	8	8	8	396	
4:45	23	4	2	31	154	10	10	10	10	535	
5:00	27	9	2	22	144	9	9	9	9	426	
Duration	280	55	17	252	1576	76	76	76	76	4839	
Totals	89	18	8	94	512	31	31	31	31	1760	
Peak Hour											

Traffic Engineering Services
Intersection Traffic Count Form (2a) - Sheet 2/2



Location		Toukley		Main Road		Minor Road		Major Road		Peel St - Yaralla Rd		Observer
Date	Thursday 18 Sep 2008	Time	from	Time	from	Time	from	Time	from	Time	from	
mins ending	15	7	8	9	10	11	12	15 min totals	light + heavy	light + heavy	hour totals	light + heavy
2:15	5	1	5	14	101	32	320					
2:30	4	1	6	14	121	37	375					
2:45	7	4	7	15	119	45	400					
3:00	6	4	2	25	122	47	380					
3:15	1	3	1	16	147	35	375					
3:30	2	3	5	19	149	35	379					
3:45	3	1	6	22	137	33	424					
4:00	6	4	8	23	168	41	451					
4:15	2	2	7	34	134	28	378					
4:30	2	3	6	22	165	42	396					
4:45	6	5	8	34	200	58	535					
5:00	3	1	7	19	136	47	426					
Duration	47	32	68	257	1699	480	4839					
Totals	16	14	29	113	667	169	1760					
Peak Hour												

Appendix 1 b

Appendix 1b

Appendix 2

TRAFFIC ENGINEERING SERVICES

SENIORS LIVING / RETIREMENT VILLAGE TRANSPORT SURVEY - 2009

Traffic Engineering services (TES) has conducted a Transport Survey at the Salamander Haven Village at Salamander Bay.

Salamander Haven was constructed in 2006/7 and contains 58, two bedroom self-care residences. 50 of the residences are in duplex format and there are 8 in a two-storey block with parking underneath.

The village is located within 200m walking distance of the Salamander Bay Village Shopping Centre which contains a supermarket, drive-in liquor store, medical centre, chemist, baker, butcher, take away food shops, news agency, and some specialty shops. A larger regional shopping centre is located 4 kilometres away, and the Nelson Bay CBD is a further 4 km away.

Two of the residences were vacant and the occupants of 6 dwellings were away at the time of the survey. The respondents were asked the questions given on the attached survey form. The respondents occupied 48 dwellings, and the following results were obtained:-

Dwellings with sole occupant	20	41.7%
Dwellings with two occupants	28	58.3%
Dwellings with no cars	5	10.4%
Dwellings with one car	40	83.3%
Dwellings with two cars	3	6.25%
Dwellings with mobility scooter	1	2.1%
Car parking demand	46	0.94, say, 1 parking space per dwelling.
No. of vehicle trips on Thurs.	43	(Respondent Replies)
No. of vehicle trips on Fri.	26	(Respondent Replies)
Peak Daily Vehicle Trips	43	1.8 vehicle trips per day (in + out).
Walk to local shops Thur.	38	1.6 walk trips per dwelling per day (in + out)
Walk to local shops Fri.	34	
Public bus service use:-		
To Nelson Bay		Never - 41, Sometimes - 7, Regularly - 0.
To Newcastle		Never - 36, Sometimes - 9, Regularly - 3
To Sydney		Never - 31, Sometimes - 8, Regularly - 9

In addition, a traffic survey between 2.00pm and 5.00pm on Thursday 5 February, 2009, recorded the following vehicle movements.

15 Minutes Ending Accumulation*.	Vehicles arriving	Vehicles Leaving	Total vehicles	Visitor Parking
2.15	2	3	5	6
2.30	3	4	7	5
2.45	4	3	7	8
3.00	6	4	10	8
3.15	3	7	10	12
3.30	0	1	1	7
3.45	3	4	7	9
4.00	4	3	7	5
4.15	3	2	5	6
4.30	1	0	1	9
4.45	5	1	6	8
5.00	1	2	3	6
Peak hour 2.30 to 3.30	13	15	28	12

Traffic Generation Rate: 0.58 vehicle trips per dwelling in the peak hour,
(say, 0.6 vph)

Visitor Parking demand: 0.25 parking spaces per dwelling, or 1 space per 4 dwellings.

- *Vehicles observed visiting included visiting friends & relatives (vfr's), parents picking up or dropping off children (Grandparent baby-sitting), service vehicles such as home maintenance, appliance repairers/installers, and chemist delivery vehicles. A local Bowling Club runs a free, regular mini-bus service between the village and the club.

On the basis of this survey of a similar facility in a similar environment, it is recommended that the parking supply for the Toukley Seniors Living be 1 space per dwelling unit + 1 visitor space per 4 dwelling units.

For the proposed 53 dwelling units, the parking supply would be $53 + 14 = 67$.

The plans show 70 spaces within the building, one space in the forecourt near the stairs, and a pick-up / drop-off space in the porte cochere.

Appendix 2
Page 2

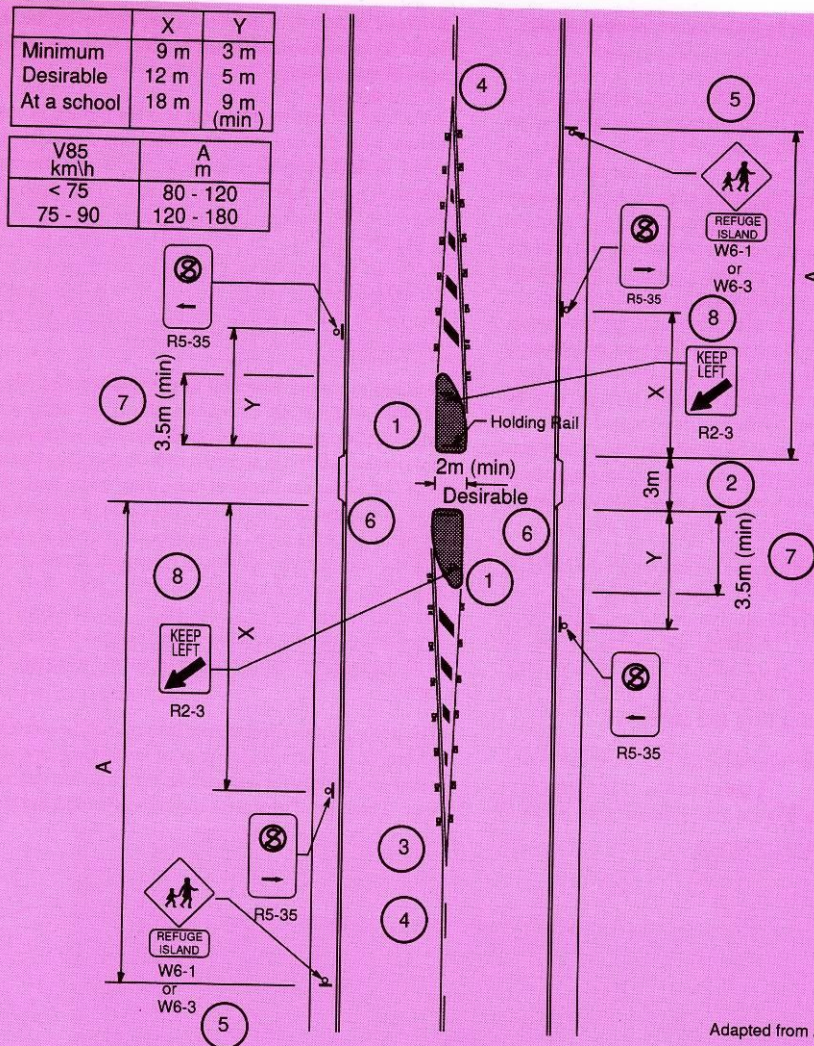
TRAFFIC ENGINEERING SERVICES

Harbourside Haven Transport Survey Salamander Haven Village

		Dwelling Number:-				
House Number	eg	1	2	3	4	5
No. of persons In Household	2					
No. of Cars	1					
No of trips Thursday (Car) Friday	1 0					
Mobility Scooters 1						
No. of trips Thursday (Scooter) Friday	0 1					
Harb'side Bus Tues.	no					
Harb'side Bus Thur.	yes					
Port Stephens Bus	*R					
To Nelson Bay	*S					
Newcastle *N						
Sydney	*S					
Village Shops Thur.						
Walk	no					
Scooter	yes					
Village Shops Fri.						
Walk	no					
Scooter	yes					

- Never, Sometimes, Regularly

3 and 5 February, 2009.



NOTES:

1. Island kerbs may be painted white.
2. If the refuge is used in conjunction with a marked crossing, the spacing between the islands should be increased accordingly.
3. Length of painted median should be increased or other delineation devices considered if visibility to the island is reduced by vertical or horizontal alignment. Unidirectional raised retroreflective pavement markers are provided at 5.0m spacings.
4. Painted median is preceded by barrier line extending for 30m minimum.
5. Where refuges are used on arterial or high speed roads, pedestrians or children warning signs W6-1 or W6-3 (minimum size B), as appropriate, are erected together with supplementary plate REFUGE ISLAND (W8-25) in advance of the refuge.
6. Perambulator ramps should be constructed if practicable.
7. When used at intersections, the length of the innermost island may be reduced to accommodate turning traffic. A suggested minimum length is 1.25m.
8. A suitable hazard marker from the D4 Series (See AS1742.2) may be used under the Keep Left (R2-3) Sign. Mounting heights need to be selected so as to avoid obscuring visibility of child pedestrians.
9. Street lighting in accordance with AS 1158.1 should be provided.
10. Pedestrian assist handrails may be provided the island is at least 2m wide. If provided they shall be frangible.

Figure 3.6 Pedestrian Refuge

3.4.2 Footpath (Kerb) Extensions/Pedestrian Nibs

Pedestrian safety and traffic management can be improved with the introduction of footpath extensions (also known as kerb extensions or pedestrian nibs). This consists of a local widening of the footpath into the carriageway by using up to two-thirds of the width of an adjacent shoulder or kerbside parking lane, (see Figures 3.7 & 3.9). Extended footpaths may be used at minor intersections and at midblock locations where there is kerbside parking, particularly angle parking. Pedestrians are able to store within the widened zone which also accommodates the kerb ramp. The most appropriate locations for this type of treatment are on collector roads and local streets and in strip shopping centres, where pedestrian traffic is high and the restriction on vehicular traffic can be accepted. The treatment is most common at mid-block sites where a pedestrian crossing facility exists and is becoming more common in local traffic management schemes in conjunction with a 'road hump' or 'slow point'.

Extended footpaths are not appropriate where the kerbside lane is used for moving traffic during peak periods, when parking is prohibited or clearways are utilised, eg on many urban arterial roads. However the treatment can be appropriate where primary arterial roads pass through rural towns and along which there is unlikely to be a requirement for parking bans and clearways.

This form of treatment reinforces the existence and prominence of the crossing and the presence of pedestrians to other road users, (see Figure 3.8). It reduces the width of

the road pedestrians have to cross, improves the inter-visibility between pedestrians and motorists and discourages illegal parking.

A footpath extension treatment is often formed in combination with the embayment of parking, typically retrofitted in older commercial areas but is now becoming common practice in new street design. The width of the extension will be dependant on the overall road width, but is usually 2.0m to 2.3m wide and 6m to 10 m long. The provision of footpath extensions in combination with a central pedestrian refuge island offers a less expensive alternative to a signalised crossing, although without the other benefits offered by traffic signals.

It is not generally essential to provide warning signs in advance of footpath extensions unless the signs are required for an associated pedestrian facility, but any signing provided should be in accordance with the requirements of AS1742.13 for similar road narrowing treatments. However, it is important to suitably delineate these treatments by painting of the kerbs and by pavement marking including the use of retro-reflective pavement markers where necessary to avoid vehicles colliding with them. The drainage of the roadway adjacent to the nibs needs to be considered and the kerbline shape should be compatible with the turning characteristics of street sweeping equipment.

The design of these treatments in conjunction with special paving for traffic management or aesthetic purposes can cause uncertainty for pedestrians as to who has the right of way. This type of treatment should be avoided, but if used,

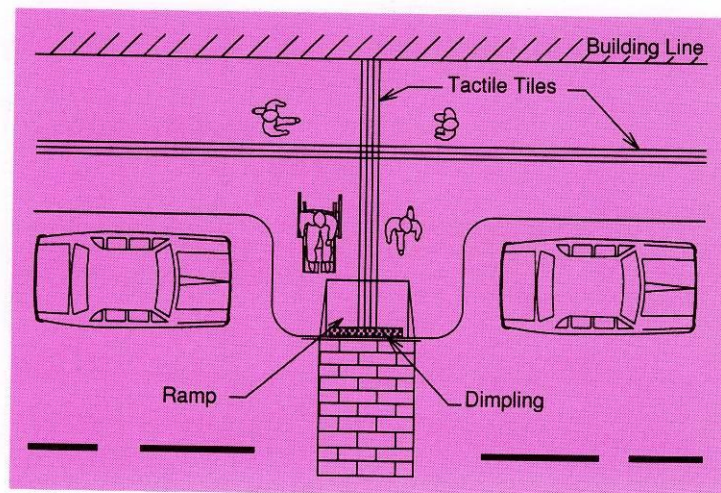


Figure 3.7 Extended Kerb (Footpath)

Appendix 4.