



Traffic Engineers and Transport Planners

Traffix Group Pty Ltd
ABN 32 100 481 570

Address
Suite 8, 431 Burke Road
Glen Iris Victoria 3146

Contact
Telephone 03 9822 2888
Facsimile 03 9822 7444
admin@traffixgroup.com.au
www.traffixgroup.com.au

REZONING & DEVELOPMENT PLAN

SEAWARD DRIVE, CAPE PATERSON

Traffic Engineering Assessment

Prepared for

WALLIS WATSON CAPE PATERSON PTY LTD

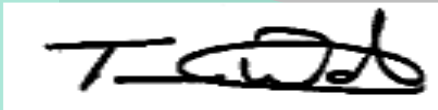
30 JUNE 2016

OUR REFERENCE: 15708R8986D

REZONING & DEVELOPMENT PLAN

SEAWARD DRIVE, CAPE PATERSON

Traffic Engineering Assessment

Study Team:	Jason Walsh B.E. (Civil), B.SC., V.P.E.L.A.	Nath Chewta B.E. (Civil), B.BA
Released By:	 SIGNED	30 June 2016 DATE
Document Status:	Final	

COPYRIGHT: The ideas and material contained in this document are the property of Traffix Group (Traffix Group Pty Ltd – ABN 32 100 481 570, Traffix Survey Pty Ltd – ABN 57 120 461 510, Traffix Design Pty Ltd – ABN 41 060 899 443). Use or copying of this document in whole or in part without the written permission of Traffix Group constitutes an infringement of copyright.

LIMITATION: This report has been prepared on behalf of and for the exclusive use of Traffix Group's client, and is subject to and issued in connection with the provisions of the agreement between Traffix Group and its client. Traffix Group accepts no liability or responsibility whatsoever for or in respect of any use of or reliance upon this report by any third party.

CONTENTS

1	INTRODUCTION	1
2	EXISTING CONDITIONS.....	2
2.1	EXISTING TRAFFIC CONDITIONS.....	2
2.2	ROAD NETWORK.....	4
2.3	INTERSECTION OF TAROOH STREET AND SEAWARD DRIVE	6
2.4	EXISTING TRAFFIC CONDITIONS.....	6
3	PROPOSAL	7
3.1	GENERAL.....	7
3.2	DEVELOPMENT PLAN – ROAD NETWORK.....	7
4	TRAFFIC CONSIDERATIONS.....	8
4.1	TRAFFIC GENERATION AND DISTRIBUTION.....	8
4.2	SEAWARD DRIVE.....	9
4.3	SEAWARD DRIVE / TAROOH STREET INTERSECTION	9
4.4	CAPE PATERSON ROAD SITE ACCESS.....	10
5	CLAUSE 56 ASSESSMENT	13
5.1	PROPOSED DEVELOPMENT PLAN ROAD LAYOUT	13
6	CONCLUSIONS	17

1 INTRODUCTION

Traffix Group has been retained by Wallis Watson Cape Paterson Pty Ltd to undertake a traffic engineering assessment of the proposed rezoning and development plan for land situated at the northwest corner of the intersection of Cape Paterson Road and Seaward Drive in Cape Paterson.

A report prepared by Traffix Group, dated 28 August, 2013, was submitted to and reviewed by Council to further discussions regarding the Development Plan. In this course of preparing that report, the site was inspected, traffic data collected and reviewed, plans considered and implications of the development assessed.

Since that time, the Development Plan has undergone amendments to integrate and capture the comments arising from these discussions.

The amended report following, provides an update to the original traffic engineering assessment to traffic matters associated with the proposed amendments and development plan.

2 EXISTING CONDITIONS

2.1 Existing Traffic Conditions

The subject land is located at the northwest corner of the intersection of Cape Paterson Road and Seaward Drive in Cape Paterson. A locality plan of the subject land is presented in Figure 1, and an aerial image in Figure 2.

The subject land is irregular in shape, and has direct frontages to Cape Paterson Road and Seaward Drive of some 1,110 metres and 1,430 metres respectively. It is largely vacant, with the exception of a two (2) dwellings, one in the southeast portion and one in the western portion of the site.

The site is zoned Farming (FZ) under the Bass Coast Planning Scheme. Surrounding land uses are predominantly used for farming and agriculture, with the exception of a comprehensive development zone and residential properties located directly south of the subject land as presented in Figure 3.

The Wonthaggi town centre is located approximately 7 kilometres north of the subject land.



Figure 1: Locality Plan



Figure 2: Aerial Image of Cape Paterson



Figure 3: Planning Zone Map

2.2 Road Network

Seaward Drive is a local road under the management of Bass Coast Shire Council. Seaward Drive is aligned east-west and connects Cape Paterson Road in the east with Wilsons Road in the west.

Along its length, Seaward Drive is typically configured as a formed, gravel road in reasonable condition, with relatively heavily vegetated verges. On the eastern end, Seaward Drive is sealed between Toorah Street and Cape Paterson Road. The level of vegetation becomes sparser along the subject land's frontage from approximately the centre of the established residential allotments to the south.

Seaward Drive has a varying trafficable width of between 5.6 metres (near Taroo Street) to 6.1 metres (near Spear Street), and operates as a two-way carriageway.

Photographs of Seaward Drive are illustrated in Figure 4 and Figure 5.

Cape Paterson Road (Bunurong Road), adjacent to the subject land, is an arterial road under VicRoads care. Aligned generally in a north-south direction, Cape Paterson Road extends between Garden Street in Wonthaggi, where it continues as Billson Street, and Wheeler Drive in Cape Paterson where it continues as Surf Beach Road.

Cape Paterson Road is configured with a sealed carriageway, which accommodates a through traffic lane and shoulder in each direction. Cape Paterson Road operates with a posted speed limit of 100km/h, reducing to 60km/h on the approach to Cape Paterson approximately 150 metres north of Seaward Drive.

Photographs of Cape Paterson Road are provided at Figure 6 and Figure 7.

Taroo Street is a local Council Road aligned north-south extending between Seaward Drive in the north and Surf Beach Road in the south. Taroo Street has a pavement width of 6.2 metres and is centrally located within a 15 metre wide road reservation.

Taroo Street has a default built-up area speed limit of 50km/h.

Spear Street is a local street under the management of Council. Spear Street is a formed gravel road in reasonable condition, typically configured with grass verges. Spear Street, near to Seaward Drive has a trafficable width of 4.4 metres.

Spear Street is generally aligned northwest-southeast, and provides a connection between Seaward Drive and Taroo Street.

Photographs of Taroo Street and Spear Street are provided at Figure 8 to Figure 11.



Figure 4: Seaward Dr (near Spear St) – View East



Figure 5: Seaward Dr (near Spear St) – View West



Figure 6: Cape Paterson Rd – View North



Figure 7: Cape Paterson Rd – View South



Figure 8: Tarooth St – View North



Figure 9: Tarooth St – View South



Figure 10: Spear St – View North



Figure 11: Spear St – View South

2.3 Intersection of Tarooh Street and Seaward Drive

The intersection of Seaward Drive and Tarooh Street is on a crest, with a large batter slope on the south-east corner of the intersection, restricting sight distance to and from the eastern leg of the intersection.

To address sight distance issues, the intersection has been arranged as a modified T-intersection, with priority given to the Tarooh Street south leg through to the Seaward Drive east leg and vice-versa. In addition, right turns from the Seaward Drive east leg are prohibited into the Seaward Drive west leg.

The Seaward Drive west leg is controlled with a 'Stop' sign, and vehicles at this point must yield to traffic on the Seaward Drive east approach and the Tarooh Street south approach.

2.4 Existing Traffic Conditions

To determine the prevailing traffic conditions near the subject land, traffic surveys were commissioned or sourced including:

- Traffic survey data sourced from Bass Coast Shire for Seaward Drive and Spear Street. The traffic surveys were undertaken Thursday 28th February to Monday 4th March, 2013.
- Peak hour turning movement counts at the intersections of Cape Paterson Road / Seaward Drive and Cape Paterson Road / Cape Paterson – Inverloch Road. The surveys were commissioned Wednesday 10th July 2013, 3:30pm - 5:30pm, and Thursday 11th July 2013, 7am - 9am.
- A tube count survey on Seaward Drive between Cape Paterson Road and Tarooh Street. The counter was positioned approximately 100 metres east of Tarooh Street and data was collected for a period of 14 days from Wednesday 10th July to Tuesday 23rd July, 2013. It is noted that the survey included days within the school holidays (Wednesday 10th to Sunday 14th July).
- A video survey at the intersection of Seaward Drive and Spear Street. The video recorded data on Wednesday 10th July 3:30pm - 5:30pm, and Thursday 11th July 2013, 7am-9am.

The key results of the available survey data are presented as follows:

Seaward Drive

- Average two-way daily (7-day) traffic volume of 128 vehicles per day (July 2013), with a peak of 178 vehicle movements recorded on the Saturday in the school holidays.
- Average two-way daily peak traffic volume of 125 vehicles (Feb / March 2013).
- Weekday AM peak hour (11am-12pm Saturday 13th July, 2013) - 19 vehicles.
- Weekday PM peak hour (12-1pm Saturday 13th July, 2013) - 22 vehicles.

Cape Paterson Road

- Two-way AM peak hour (8-9am) - 97 vehicles.
- Two-way PM peak hour (4.30-5.30pm) - 158 vehicles.

Based on the understanding that there has been limited growth and development within the township, it is not expected that traffic conditions have changed significantly since the time of the traffic surveys.

3 PROPOSAL

3.1 General

The amendment proposes to rezone the subject land as General Residential 1 (GRZ1) and seek approval of a Development Plan through application of a Development Plan Overlay. The Development Plan anticipates a yield of 914 dwellings.

3.2 Development Plan – Road Network

The Development Plan illustrates a connective road network, with a centrally located primary east-west road extending from Cape Paterson Road through the subject land before turning south and connecting to Seaward Drive near to the western boundary. Access streets form to the north and south of the primary east-west road to provide access to individual allotments.

Secondary connections are provided to Seaward Drive with:

- The main access located midblock between the intersections of Spear Street and Park Parade Road;
- Two (2) lower order access points between Park Parade Road and the main east-west connector access; and
- A single lower order access point between Taroo Street and Cape Paterson.

4 TRAFFIC CONSIDERATIONS

4.1 Traffic Generation and Distribution

The Development Plan anticipates a yield of 914 dwellings.

Cape Paterson, like many coastal towns, experiences a level of transient population, as occupancy of dwellings peak in the summer period. At other times, many dwellings are not occupied.

Traffic associated with holiday makers is inherently transient and seasonal in nature. In this regard, the absolute peak traffic movements are expected to be generated on few occasions during the year.

Notwithstanding, for the purposes of this assessment, a conservative traffic generation rate of 10 vehicle trips per day per lot, inclusive of one (1) vehicle trip per lot in peak hours will be adopted. Application of this rate to the upper yield of 914 dwellings, results in a projected traffic generation of 9,140 trips per day, inclusive of 914 movements in peak hours

Given there are no major traffic attractors (shopping centres, schools etc.) proposed within the Development Plan, all traffic generated by the subdivision is assumed to have destinations external to the subject land.

In this regard, it has been broadly assumed that:

- 67% of traffic will be distributed to the north (Wonthaggi and towards Melbourne); and 33% of traffic will be distributed to the south (existing township shops, beach, and towards Inverloch).
- Traffic distributed to the north will use the site access to Cape Paterson Road.
- Traffic distributed to the south will use the Cape Paterson Road access (40%), the eastern site access to Seaward Drive (40%, evenly distributed to Cape Paterson Road and Spear Street) and the western site access to Seaward Drive (20%, all to Spear Street or Park Parade).
- All in and out movements will be proportioned as 80% departures and 20% arrivals at each access.

Based on the above, a plan illustrating the projected daily volumes for roads within the Development Plan is attached as Appendix A.

It is presumed that the peak traffic generation will occur at the end of school holiday periods, when holiday makers vacate Cape Paterson and return to their usual place of residence. At this time, it is expected that the general distribution of traffic will comprise 80% departures and 20% arrivals.

Figure 12 has been prepared to illustrate the peak traffic movements for access to the broader road network.

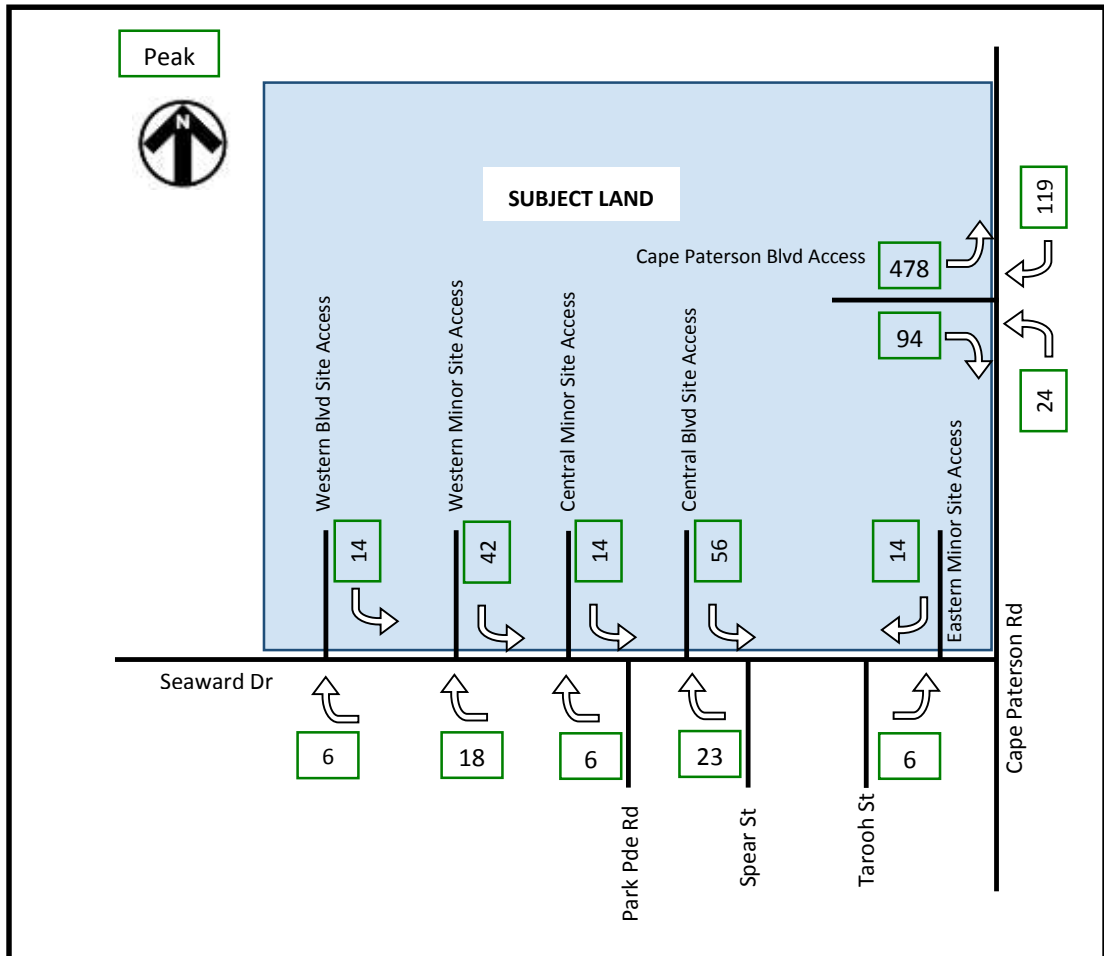


Figure 12: Projected Site Generated Traffic Movements

4.2 Seaward Drive

The traffic counts highlight an average weekday daily volume of 128 vehicles for Seaward Drive. Further review of the counts reveals traffic volumes were higher in the school holiday period, with an absolute peak daily traffic volume of 178 vehicles recorded on the Saturday during the school holiday period.

This is a relatively low level of traffic.

It is not considered that development of the subject land will be largely dependent on Seaward Drive, as the development plan includes a more attractive east-west route central to the development area. Nonetheless, future residents will use parts of Seaward Drive to access the beach and existing shops, and residents in the southern part of the development plan area may use Seaward Drive when destined to the south towards Inverloch.

The location and length of Seaward Drive also suggests that the road should provide a collector function for existing and future residents. In view of the foregoing, it is considered that Seaward Drive would benefit from construction of the road to provide a 7.3 metre pavement, suitable for its expected function, particularly east of Spear Street.

4.3 Seaward Drive / Taroo Street Intersection

To properly resolve a future road network for Cape Paterson, the intersection of Seaward Drive and Taroo Street should be amended to re-instate the primary east west function of Seaward Drive, but maintain a safe intersection.

The development plan illustrates a roundabout control device proposed at the intersection of Seaward Drive and Taroo Street. With consideration to the above, this would be an acceptable intersection control treatment provided that the land north of the intersection is

made available for a roundabout and associated civil works (designed to the relevant standard), the topology is suitable and appropriate sight distance is provided, particularly for the Taroo Street approach.

An alternate treatment would to partly close the Taroo Street leg of the intersection to only permit left turn entry from Seaward Drive. That is no movements from Taroo Street to Seaward Drive. Egress for residents in Taroo Street would be via Surf Beach Road and Cape Paterson Road, or alternatively via Anglers Parade / Spear Street / Seaward Drive.

The timing of the intersection upgrade should be assessed based on the traffic volumes on Seaward Drive and Anglers Road. It is anticipated that the treatment would occur generally around the same time the traffic volumes on Seaward Drive trigger the requirement for sealing of the road. A traffic assessment could be undertaken to confirm its requirement at that time.

4.4 Cape Paterson Road Site Access

The traffic surveys indicate that Seaward Drive does not experience significant fluctuation in traffic volumes between the summer months of February and March when compared to the surveys undertaken during the cooler months of July.

Notwithstanding, there is a reasonable expectation that traffic will periodically intensify during the holiday season. We note that our traffic surveys were undertaken outside of peak tourist times¹. To account for this, we have conservatively assumed Cape Paterson Road will carry twice the amount of traffic recorded in the July 2013 traffic surveys.

These volumes are still regarded as relatively low for the function of the road.

Based on the above assumptions and projected peak traffic movements from the site, Figure 13 has been prepared to illustrate the peak traffic movements at the site access.

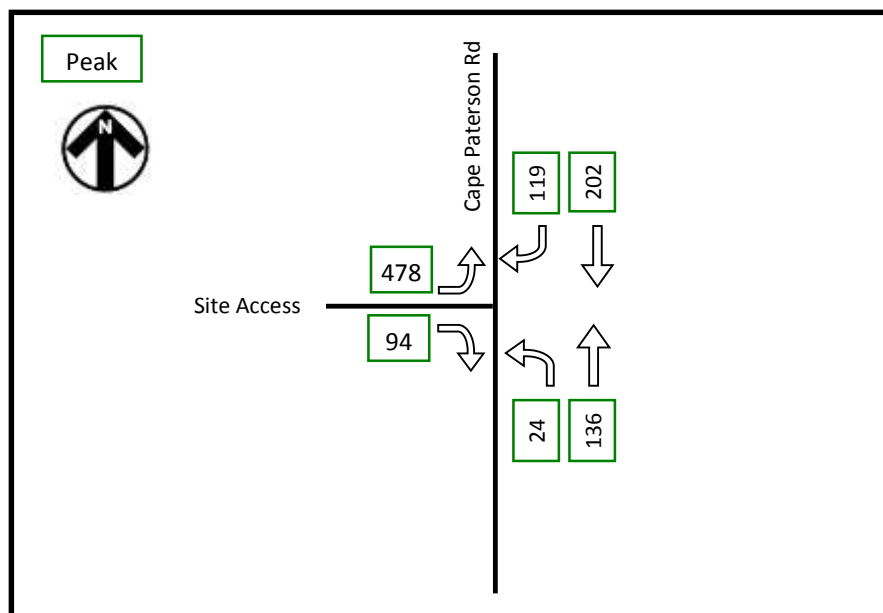


Figure 13: Projected Post Development Traffic Volumes – Cape Paterson Rd / Site Access

Cape Paterson Road has a prevailing speed limit of 100km/h in the vicinity of the site access, with a reduced speed of 60km/h prevailing further to the south. It is likely that as development occurs on the subject land, the speed limit at the site’s frontage to Cape Paterson Road will also reduce. It has been conservatively assumed for assessment

¹ Winter school holidays

purposes that the speed limit of Cape Paterson Road will reduce to 80km/h at the proposed site access.

Based on the projected traffic volumes and speed limit, Section 4 of the Austroads Guide (Part 4A) specifies the provision of an AUL left turn treatment and a CHR (full length) right turn treatment. It is considered that the above treatments are appropriate in this instance given the east-west connector street is proposed to serve as the primary route through to Cape Paterson Road.

A conceptual site access intersection layout at Cape Paterson Road is depicted in Figure 14.

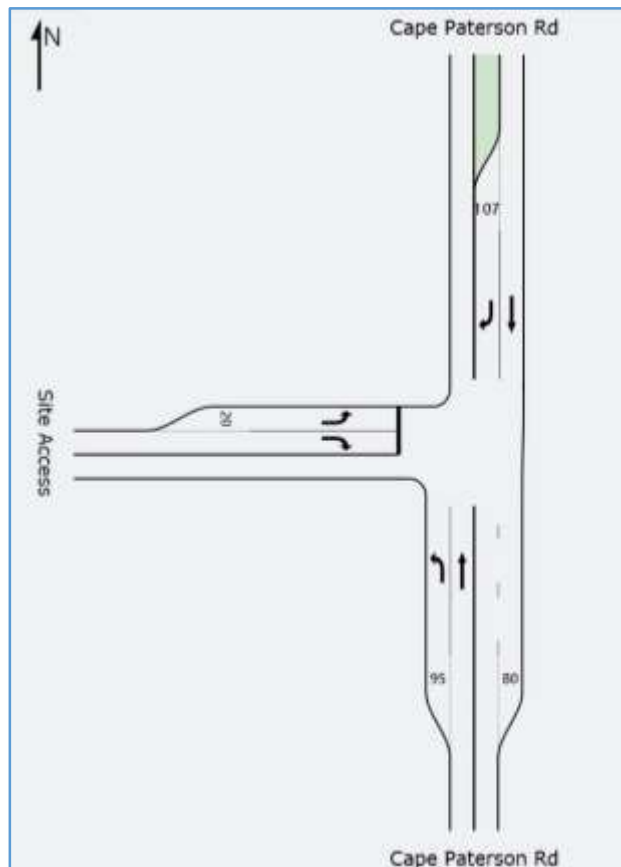


Figure 14: Conceptual Intersection Layout

To determine the suitability of the proposed access and turn treatments to Cape Paterson Road, the proposed intersection arrangement and volumes detailed in Figure 13 have been input to SIDRA.

SIDRA is a computer program originally developed by the Australian Road Research Board, which can be used to analyse the operation of intersections. SIDRA provides information about the capacity of an intersection in terms of a range of parameters, as described below:

Degree of Saturation (D.O.S.) is the ratio of the volume of traffic observed making a particular movement compared to the maximum capacity for that movement. Various values of degree of saturation and their rating are shown below.

- **Up to 0.6** Excellent
- **0.6 to 0.7** Very Good
- **0.7 to 0.8** Good
- **0.8 to 0.9** Acceptable
- **0.9 to 1.0** Poor

- **Above 1.0** Very Poor

95th Percentile Queue represents the maximum queue length, in metres, that can be expected in 95% of observed queue lengths in the peak hour.

Average Delay (seconds) is the average delay time that can be expected for all vehicles making a particular movement in the peak hour.

The results of the SIDRA analysis are presented in Table 1, and show that an access to Cape Paterson Road could operate in the 'very good' category and provide for convenient access to and from the site.

The large majority of residents of the proposed development arriving to Cape Paterson are expected to enter via the proposed Cape Paterson Road site access (which will be upgraded to standard to accommodate the projected development traffic).and directly drive to their residence to unload their vehicles etc, prior to heading to the town centre using the proposed Seaward Drive site access points.

In this regard, and given the multiple site access points proposed, the intersection of Cape Paterson Road and Seaward Drive is anticipated to serve very little traffic associated with the proposed development. To this end, we are of the view the development does not necessitate any works at this intersection.

Table 1: Cape Paterson Road / Site Access Intersection Performance SIDRA

Leg	Movement	Tourist Period Peak		
		DoS	Av. Delay (s)	95 th 'ile Queue (m)
Cape Paterson Rd (S)	Left	0.01	10	-
	Through	0.08	-	-
Cape Paterson Rd (N)	Through	0.11	-	-
	Right	0.12	11	3
Site Access (W)	Left	0.65	14	33
	Right	0.14	13	4

5 CLAUSE 56 ASSESSMENT

The traffic and parking requirements for subdivisions are outlined in Clause 56 of the Bass Coast Planning Scheme.

The general access and mobility objectives of Clause 56.06 guidelines are:

Clause 56.06-2 Walking and cycling network objectives

To contribute to community health and wellbeing by encouraging walking and cycling as part of the daily lives of residents, employees and visitors.

To provide safe and direct movement through and between neighbourhoods by pedestrians and cyclists.

To reduce car use, greenhouse gas emissions and air pollution.

Clause 56.06-5 Walking and cycling network detail objectives

To design and construct footpaths, shared path and cycle path networks that are safe, comfortable, well constructed and accessible for people with disabilities.

To design footpaths to accommodate wheelchairs, prams, scooters and other footpath bound vehicles.

Clause 56.06-6 Public transport network detail objectives

To provide for the safe, efficient operation of public transport and the comfort and convenience of public transport users.

To provide public transport stops that are accessible to people with disabilities.

Clause 56.06-4 Neighbourhood street network objective

To provide for direct, safe and easy movement through and between neighbourhoods for pedestrians, cyclists, public transport and other motor vehicles using the neighbourhood street network.

Clause 56.06-7 Neighbourhood street network detail objective

To design and construct street carriageways and verges so that the street geometry and traffic speeds provide an accessible and safe neighbourhood street system for all users.

Clause 56.06-8 Lot access objective

To provide for safe vehicle access between roads and lots.

The assessment of the proposed subdivision refers to the requirements of Clause 56 and other relevant considerations follows.

5.1 Proposed Development Plan Road Layout

The amended Development Plan includes a connective road network that provides convenient connections to the broader road network, and a legible internal road network promoting direct and easy access throughout the subdivision.

We are of the view that the intersection of the access place (north of the connector street and nearest the eastern property line) with the main connector street, would require a right turn ban so that queues, potentially generated by a right turning vehicle, do not extend beyond the site. A detailed assessment during the subdivision application stage should confirm if such a restriction is required.

Based on the projected traffic volumes (Appendix A) and the expected function of internal roads, a road hierarchy plan has been developed and is attached as Appendix B.

The proposed cross sections of the different street types, with reference to Table C1 of Clause 56.06-8, is outlined as follows.

Connector / Collector Street - (Up to 6,000vpd)

With consideration to the Infrastructure Design Manual (IDM), we are of the view that a 24 metre wide reservation width is appropriate, given the low density nature of the development and the expectation for off-street car parking.

A 24 metre wide road reserve, comprising a 7.0-7.6 metre wide trafficable carriageway, 2.3 metre wide car parking lanes, and at least 4.2 metre wide verges will satisfactorily accommodate the projected daily traffic volumes and car parking demand. A shared path on one side of the road is a variation however, given the location and context of the development site and ability to practically cycle on the pavement, this is considered acceptable.

A variation is provided when one side of the road reservation abuts a reserve, and is reduced to 22.5 metres with a road pavement of 7.0-7.6 metres. This is typical for applications of this nature. The relevant cross sections are provided at Figure 15 and Figure 16.

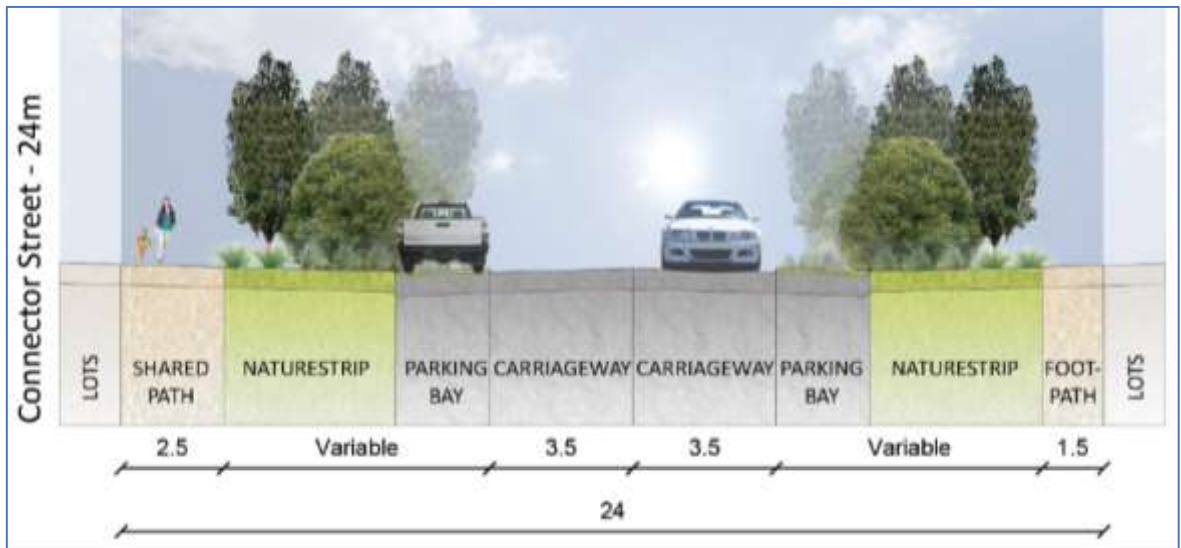


Figure 15: Proposed Collector Street (24 metres)

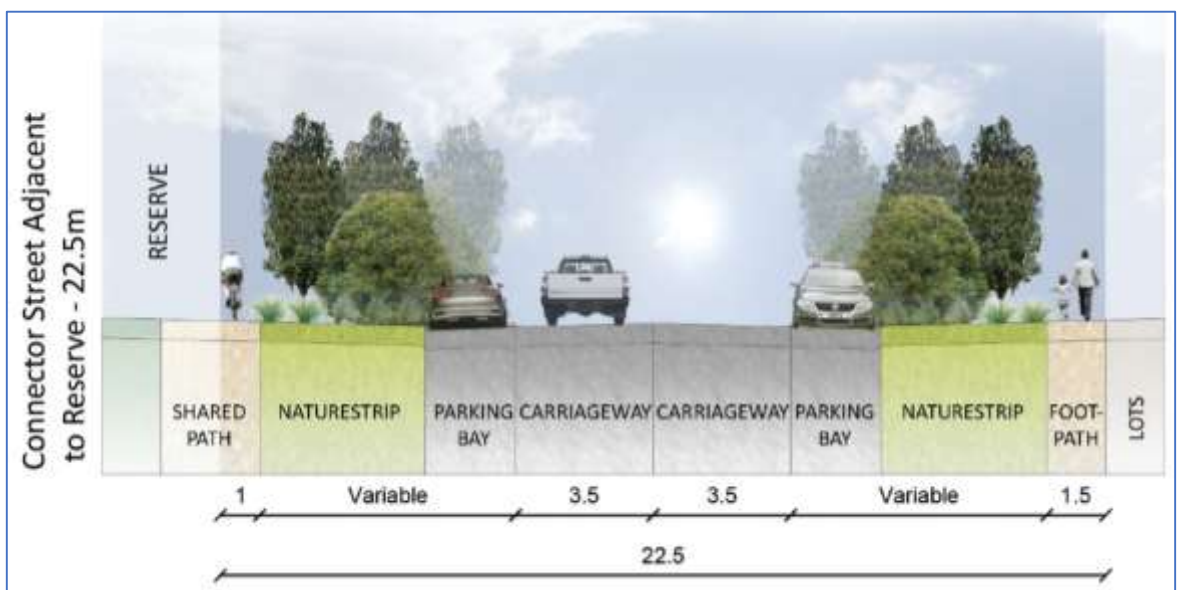


Figure 16: Proposed Collector Street Adjacent a Reserve (22.5 metres)

Access Street (up to 1,000vpd)

Sixteen (16) metre wide road reservation containing a centrally located 7.3 metre trafficable pavement, consistent with Clause 56, the IDM guidelines and standard practice.

A variation is provided when one side of the road reservation abuts a reserve, and is reduced to 14.5 metres with a road pavement width to 7.3 metres. The relevant cross sections are provided at Figure 17 and Figure 18.

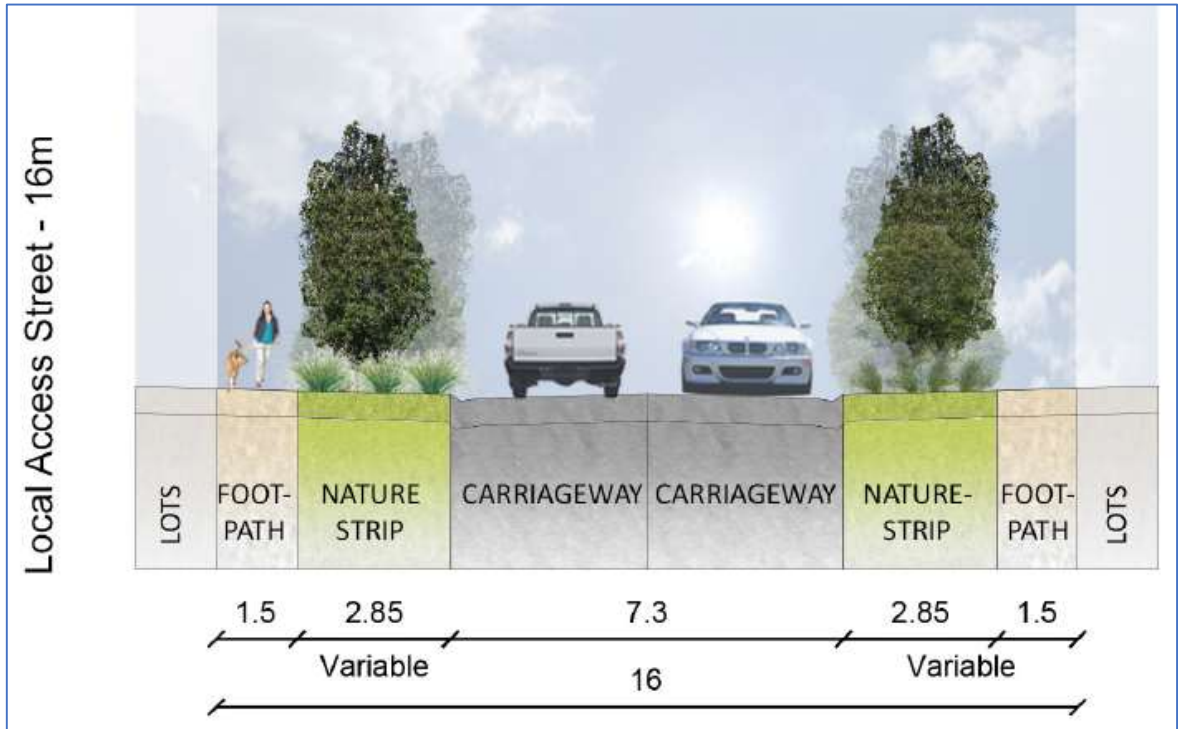


Figure 17: Proposed Access Street (16 metres)

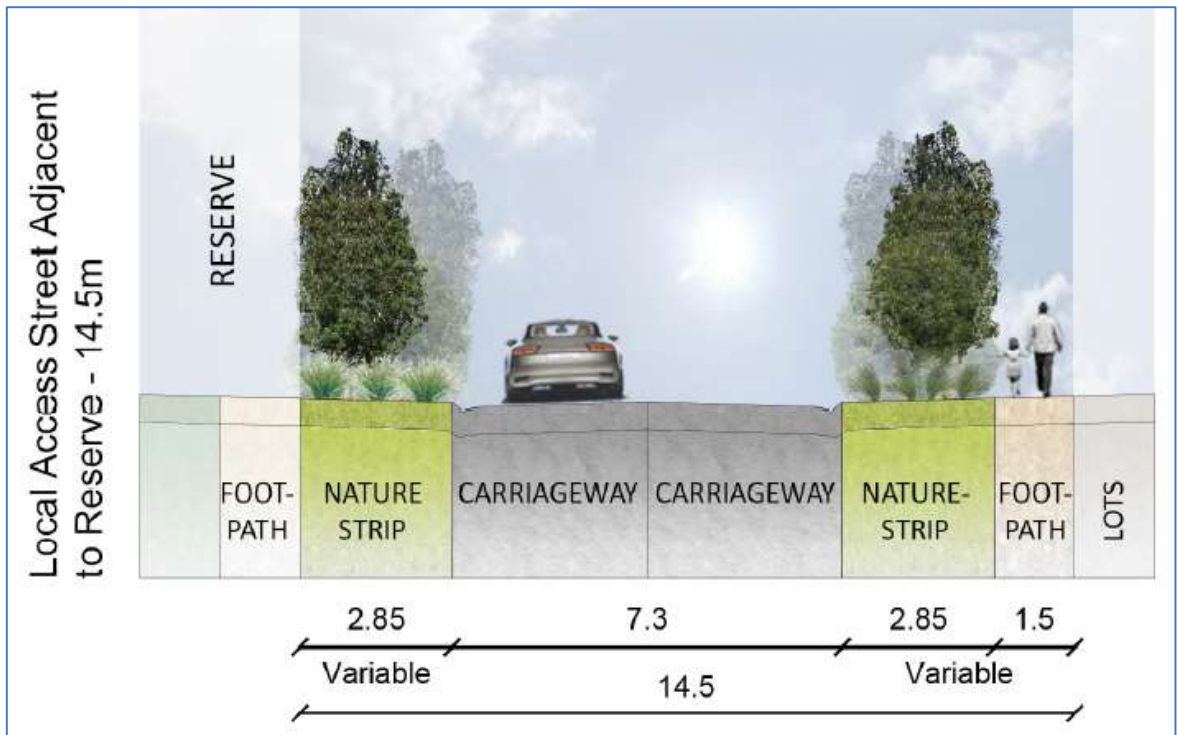


Figure 18: Proposed Access Street Adjacent a Reserve (14.5 metres)

The court bowl treatments provided at the end of cul-de-sacs will allow for service and emergency vehicles to turn around and exit the subdivision in a forwards direction. Specifically, the court bowl is proposed to be constructed with a radius of approximately 10 metres, which in our view is satisfactory, and will ably provide for the turning of emergency and service vehicles.

Overall, we are satisfied that the proposed road layout and access arrangements have been designed in accordance with the objectives of the Planning Scheme, good design practice and will operate practically and efficiently for all road users, including pedestrians, cyclists and motorists.

6 CONCLUSIONS

Having inspected the site, perused relevant documents and amended plans, and undertaken an assessment of the traffic impacts, it is concluded that:

- a) The proposed Development Plan meets the intent of the standards and objectives of Clause 56 of the Planning Scheme in relation to vehicle access, carriageway arrangements, pedestrians and on-street parking provisions. Detailed designs will be further assessed as part of individual planning permits for each stage.
- b) The development will generate an upper limit in the order of 9,140 additional vehicle trip ends per day inclusive of 914 vehicle trip ends during the peak tourist season, which is expected to occur only on few occasions annually.
- c) The proposed accesses to Cape Paterson Road and Seaward Drive will provide practical and convenient access to the site. Detailed designs will be further assessed at the planning permit stage.
- d) The intersection of Seaward Drive and Taroo Street should be amended to re-instate the primary east west function of Seaward Drive, but maintain a safe intersection. The intersection treatment should consider the available land, existing intersection conditions, topology and sight distance.
- e) Access arrangements for waste collection, service vehicles and emergency vehicles are appropriate, and
- f) There are no traffic engineering reasons why the proposal for up to 914 lot residential subdivision at Seaward Drive, Cape Paterson should be refused, subject to appropriate conditions at the planning permit stage.

