

STOCKLAND

TRAFFIC REPORT FOR
PLANNING PROPOSAL FOR
PROPOSED MIXED USE
RESIDENTIAL DEVELOPMENT
ON SHORT STREET
CAR PARK SITE, CORRIMAL

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I. INTRODUCTION

- I.1 Colston Budd Rogers and Kafes Pty Ltd has been commissioned by Stockland to prepare a report examining the traffic and parking implications of a planning proposal for a mixed use residential development on the Short Street car park site at Corrimal. The site of the proposed development is shown in Figure I.
- I.2 The site is on the south-eastern corner of the intersection of Princes Highway with Short Street, across the road from the shopping centre.
- I.3 The planning proposal would provide for a scale of development comprising ground floor food and drink premises and 122 residential apartments. Vehicular access would be provided from Short Street.
- I.4 This report assesses the traffic and parking implications of the proposed development through the following chapters:
- Chapter 2 - describing the existing conditions; and
 - Chapter 3 - assessing the traffic and parking implications of the proposed development.

2. EXISTING CONDITIONS

Site Location and Road Network

- 2.1 The site of the proposed development is on the south-eastern corner of the intersection of Princes Highway with Short Street at Corrimal, as shown in Figure 1. It is currently a car park for Stockland Corrimal and provides some 196 spaces. Vehicular access to the car park is provided from Short Street.
- 2.2 The shopping centre is on the block north of the site. It comprises a Woolworths supermarket and specialty shops. The total GLA at the centre is some 9,759m². Vehicular access to parking and loading areas at the centre is provided from Short Street and Railway Street. There are some 520 parking spaces at the centre, including the parking on the subject site.
- 2.3 There are community facilities and playing fields east of the site, and residential properties south of the site on Princes Highway. There are commercial properties on the western side of the highway, through Corrimal.
- 2.4 The Princes Highway is a major road connecting Wollongong with its northern suburbs. In the vicinity of the site it provides a four lane undivided carriageway with two traffic lanes in each direction, with parking permitted clear of intersections. It has a 60 kilometre per hour speed limit south of Short Street, and a 50 kilometre per hour speed limit north of Short Street.
- 2.5 Short Street runs east from Princes Highway at a signalised intersection. Tarrawanna Road forms a fourth (western) approach to the intersection. Short Street is a dead end east of the site. It provides for two traffic lanes in each
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direction near the highway and one traffic lane and one parking lane in each direction further east. It provides access to parking at the shopping centre, on the northern side of the road (to the main parking areas at the centre) and on the site. East of the site, Short Street provides access to community facilities.

Traffic Flows

- 2.6 Traffic generated by the proposed development will have its greatest effects during weekday morning and afternoon periods when it combines with other traffic on the surrounding road network.
- 2.7 In order to gauge traffic conditions, counts were undertaken at these times at the following locations:
- Princes Highway/Short Street/Tarrawanna Road;
 - Short Street/site access; and
 - Short Street/shopping centre access.
- 2.8 The results of the surveys are shown in Figures 2 and 3, and summarised in Table 2.1.

Table 2.1: Existing two-way (sum of both directions) peak hour traffic flows			
Road	Location	AM peak hour	PM peak hour
Princes Highway	North of Short Street	870	1,010
	South of Short Street	895	1,025
Tarrawanna Road	West of Princes Highway	420	550
Short Street	East of Princes Highway	515	765
Shopping centre access	North of Short Street	270	495
Subject car park access	South of Short Street	75	55

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- 2.9 Table 2.1 shows that Princes Highway carried traffic flows of some 850 to 1,050 vehicles per hour two-way during the surveyed peak hours. Tarrawanna Road and Short Street carried lower flows of some 400 to 800 vehicles per hour two-way. The shopping centre access north of Short Street carried some 250 to 500 vehicles per hour. The subject car park generated some 60 to 80 vehicles per hour two-way during the surveyed peak hours.

Intersection Operations

- 2.10 The capacity of the road network is largely determined by the capacity of its intersections to cater for peak period traffic flows. The surveyed intersections have been analysed using the SIDRA program for the traffic flows shown in Figures 2 and 3.
- 2.11 SIDRA simulates the operations of intersections to provide a number of performance measures. The most useful measure provided is average delay per vehicle expressed in seconds per vehicle.
- 2.12 Based on average delay per vehicle, SIDRA estimates the following levels of service (LOS):
- ρ For traffic signals, the average delay per vehicle in seconds is calculated as $\text{delay}/(\text{all vehicles})$, for roundabouts the average delay per vehicle in seconds is selected for the movement with the highest average delay per vehicle, equivalent to the following LOS:
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0 to 14	=	"A"	Good
15 to 28	=	"B"	Good with minimal delays and spare capacity
29 to 42	=	"C"	Satisfactory with spare capacity
43 to 56	=	"D"	Satisfactory but operating near capacity
57 to 70	=	"E"	At capacity and incidents will cause excessive delays. Roundabouts require other control mode.
>70	=	"F"	Unsatisfactory and requires additional capacity

ρ For give way and stop signs, the average delay per vehicle in seconds is selected from the movement with the highest average delay per vehicle, equivalent to following LOS:

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

2.13 It should be noted that for roundabouts, give way and stop signs, in some circumstances, simply examining the highest individual average delay can be misleading. The size of the movement with the highest average delay per vehicle should also be taken into account. Thus, for example, an intersection where all movements are operating at a level of service A, except one which is at level of service E, may not necessarily define the intersection level of service as E if that movement is very small. That is, longer delays to a small number of vehicles may not justify upgrading an intersection unless a safety issue was also involved.

- 2.14 The analysis found that the signalised intersection of Princes Highway with Short Street and Tarrawanna Road operates with average delays of less than 25 seconds per vehicle during peak periods. This represents level of service B, a good level of service.
- 2.15 The access driveways to parking at the shopping centre and the subject car park are operating with average delays for the highest delayed movements of less than 15 seconds per vehicle during peak periods. This represents level of service A/B, a good level of service.

Public Transport

- 2.16 Local bus services are provided by Premier Illawarra. There are bus stops on both sides of the site, adjacent the shopping centre. Services also use Tarrawanna Road. Services include:
- route 2: Stanwell Park to Wollongong via Wombarra, Coledale, Austinmer, Thirroul, Corrimal and Fairy Meadow;
 - routes 3/8: Wollongong to Northern Suburbs loop (in both directions) via Towradgi, Bellambi Point, Corrimal and Balgownie;
 - route 7: Wollongong to Bellambi Point via Cabbage Tree Lane, Balgownie and Corrimal.
- 2.17 The site is some 15 minutes' walk from Corrimal railway station. Rail services operate through Corrimal in both directions, connecting Wollongong and areas to the south with the northern suburbs and areas to the north including Sydney.
- 2.18 The site is therefore well located to public transport services.
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3. IMPLICATIONS OF PROPOSED DEVELOPMENT

3.1 The planning proposal would provide for a scale of development comprising ground floor food and drink premises and 122 residential apartments. Vehicular access would be provided from Short Street. This chapter assesses the implications of the proposed development through the following sections:

- ❑ public transport;
- ❑ parking provision;
- ❑ access, servicing and internal layout;
- ❑ traffic generation and effects; and
- ❑ summary.

Public Transport

3.2 As discussed in Chapter 2, buses currently use Princes Highway and Tarrawanna Road, adjacent to the site. Rail services also operate through Corrimal.

3.3 The proposed development will provide increased residential and service densities close to public transport and will strengthen the demand for these services.

3.4 The proposed development is therefore consistent with government objectives and the planning principles of:

- (a) improving accessibility to employment and services by walking, cycling, and public transport;
 - (b) improving the choice of transport and reducing dependence solely on cars for travel purposes;
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- (c) moderating growth in the demand for travel and the distances travelled, especially by car; and
- (d) supporting the efficient and viable operation of public transport services.

Parking Provision

- 3.5 Appropriate parking for the development will be provided at the development application stage, taking into account the following:
- appropriate planning controls;
 - the location of the development relative to public transport services;
 - the close proximity of other services and facilities in Corrimal;
 - government objectives to reduce traffic generation; and
 - overlapping demands of the various components of the development.
- 3.6 With regards to shopping centre parking, the centre currently provides some 9,759m², comprising some 5,961m² supermarket plus 3,798m² specialty shops.
- 3.7 The DCP includes a requirement of one space per 25m² GFA for retail. Based on GLA being some 90 per cent of GFA, the shopping centre would require some 430 spaces. By comparison, the RMS “Guide to Traffic Generating Developments”, which is based on extensive surveys, recommends the following parking provision for supermarkets and specialty shops in shopping centres:
- supermarkets: 4.2 spaces per 100m²; and
 - specialty shops: 4.5 spaces per 100m².
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- 3.8 The shopping centre would therefore require some 420 spaces. As noted in Chapter 2, the main shopping centre site provides some 324 spaces. The proposed development would include 125 retail parking spaces, in addition to the parking for the proposed development. Retail parking would therefore be some 450 spaces, which satisfies the DCP and RMS guidelines.

Access, Servicing and Internal Layout

- 3.9 Vehicular access would continue to be provided from Short Street. Separate driveways would be provided to the residential and non-residential components.
- 3.10 The driveway to the non-residential component would be generally in the location of the existing site driveway. The residential driveway would be further east.
- 3.11 The residential parking would be provided above-ground. Non-residential parking would be provided at-grade and in a basement level.
- 3.12 At the development application stage, parking spaces will be designed in accordance with the Australian Standard for Parking Facilities (Part 1: Off-street car parking and Part 6: Off-street parking for people with disabilities), AS 2890.1:2004 and AS 2890.6:2009, with respect to space dimensions, aisle widths, column locations and height clearances.
- 3.13 Provision for service vehicles will be included in the development. An on-site loading dock will be provided for the food and drink premises, which will also be used by garbage collection vehicles and furniture vans for the residential component. The bay will be designed to accommodate a large rigid truck, with appropriate height clearance and manoeuvring area to allow vehicles to enter and exit the site in a forward direction.
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Traffic Generation and Effects

- 3.14 Traffic generated by the proposed development will have its greatest effects during weekday peak periods when it combines with other traffic on the surrounding road network.
- 3.15 Surveys undertaken by RMS found traffic generations of 0.19 and 0.15 vehicles per hour per apartment during weekday morning and afternoon peak hours respectively, for high density apartments in town centres. For medium density apartments, the rates 0.4 to 0.65 vehicles per hour per apartment. The development is for higher density apartments, close to public transport and other services in Corrimal. It's traffic generation is therefore likely to be between these rates. We have assessed 0.4 vehicles per hour per apartment.
- 3.16 For take-away food and drink premises, RMS guidelines recommend an afternoon design generation rate of 100 to 180 vehicles per hour. We have assessed 180 vehicles per hour, and 50 per cent of this generation during the morning.
- 3.17 The proposed development would therefore generate some 140 and 230 vehicles per hour two-way during morning and afternoon peak periods respectively. The additional traffic has been assigned to the road network. Existing traffic flows plus the additional development traffic are shown in Figures 2 and 3, and summarised in Table 3.1.
- 3.18 Short Street would carry traffic increases of 140 to 230 vehicles per hour two-way at peak times. Increases on Princes Highway and Tarrawanna Road would be lower at some 35 to 90 vehicles per hour two-way.
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Table 3.1: Existing two-way peak hour traffic flows plus development traffic

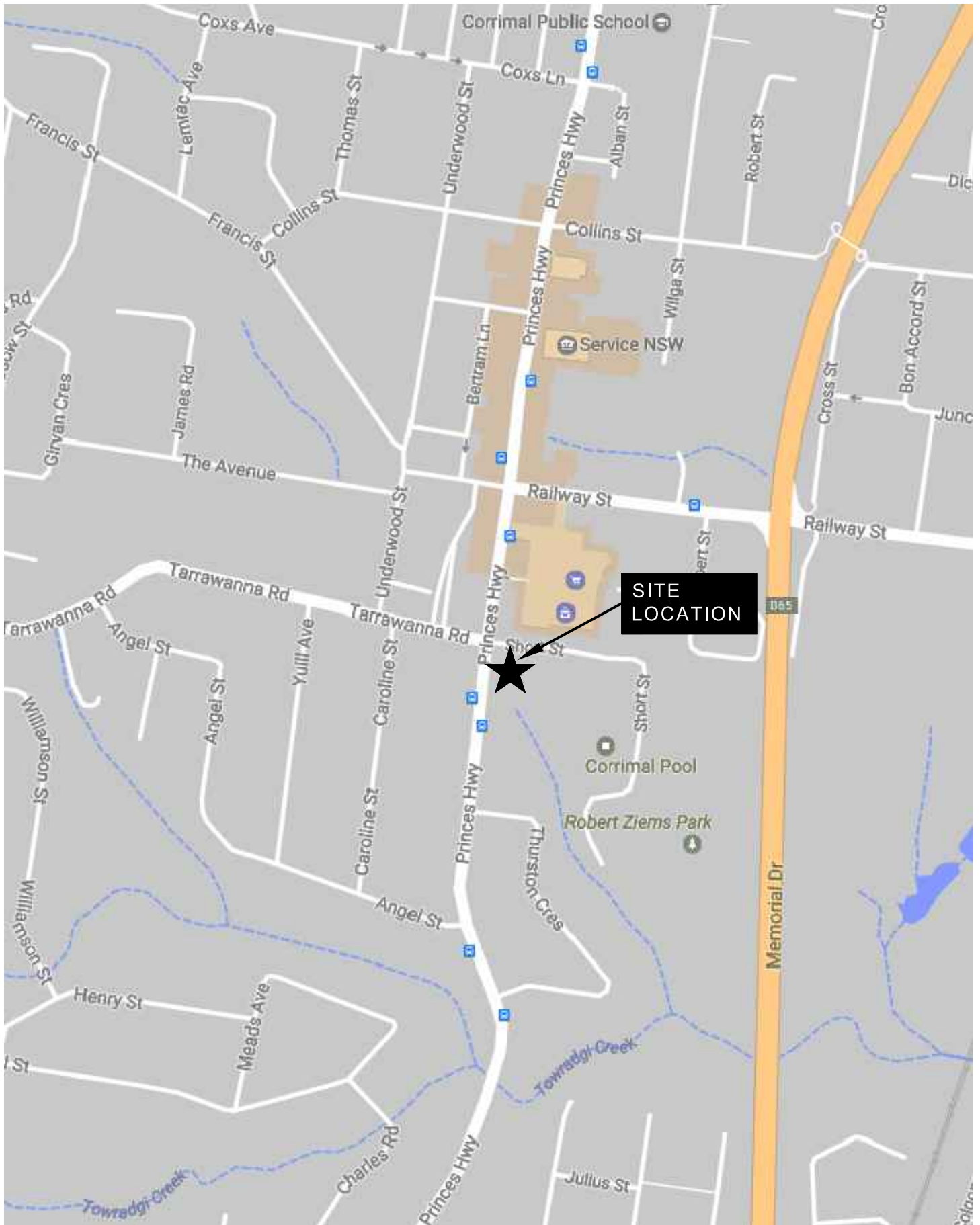
Road	Location	AM peak hour		PM peak hour	
		Existing	Plus development	Existing	Plus development
Princes Highway	North of Short Street	870	+55	1,010	+85
	South of Short Street	895	+50	1,025	+90
Tarrawanna Road	West of Princes Highway	420	+35	550	+55
Short Street	East of Princes Highway	515	+140	765	+230
Car park access	North of Short Street	270	-	495	-
Site accesses	South of Short Street	75	+140	55	+230

- 3.19 The intersection of Princes Highway with Short Street and Tarrawanna Road has been re-analysed with SIDRA for the additional development traffic flows shown in Figures 2 and 3. The analysis found that the intersection would operate with average delays of less than 28 seconds per vehicle during peak periods. This represents level of service B, a good level of service.
- 3.20 The access driveways to the subject site and shopping centre on Short Street would operate with average delays for the highest delayed movements of less than 15 seconds per vehicle during peak periods. This represents level of service A/B, a good level of service.
- 3.21 Therefore, the road network will be able to cater for the additional traffic from the proposed development.

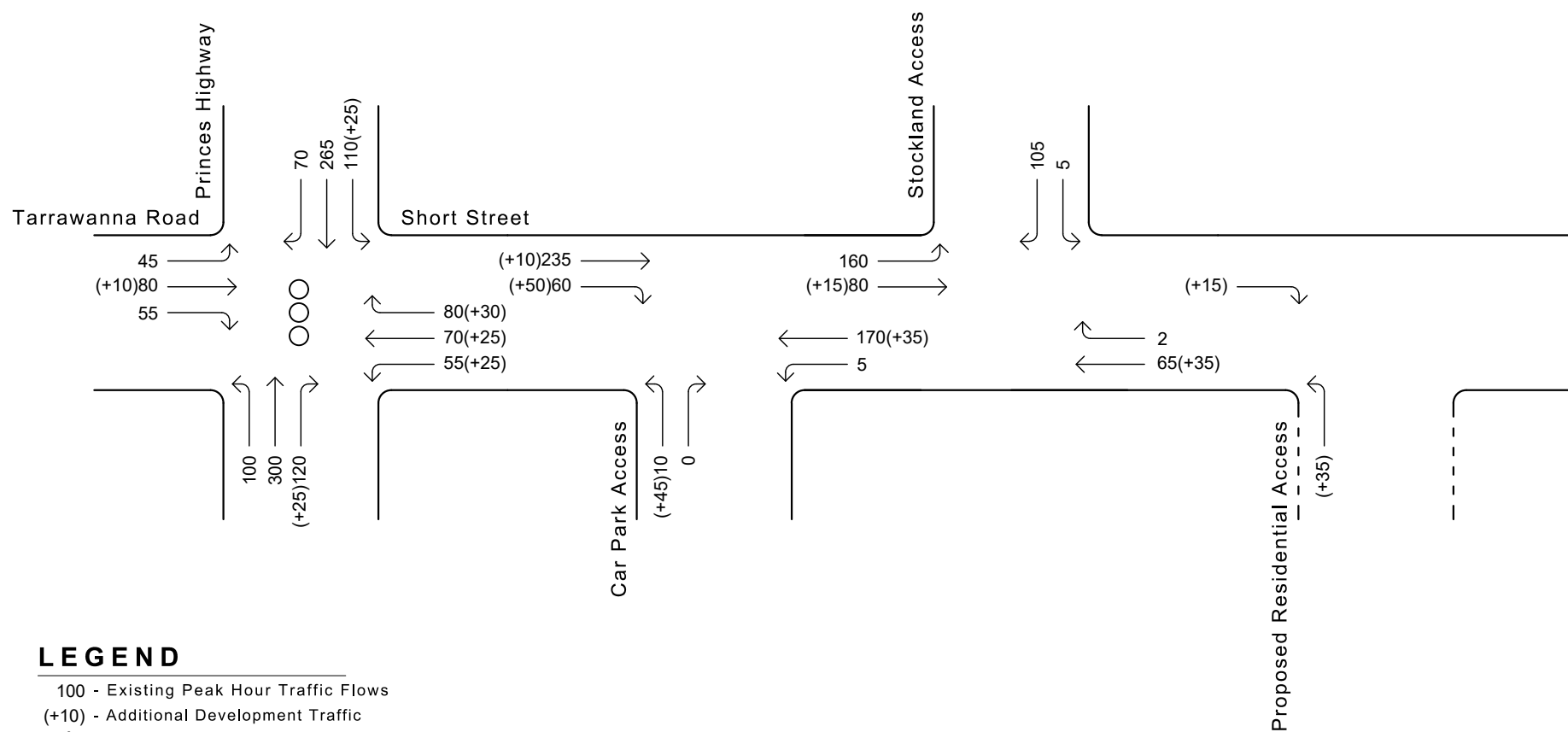
Summary

- 3.22 In summary, the main points relating to the traffic implications of the proposed development are as follows:

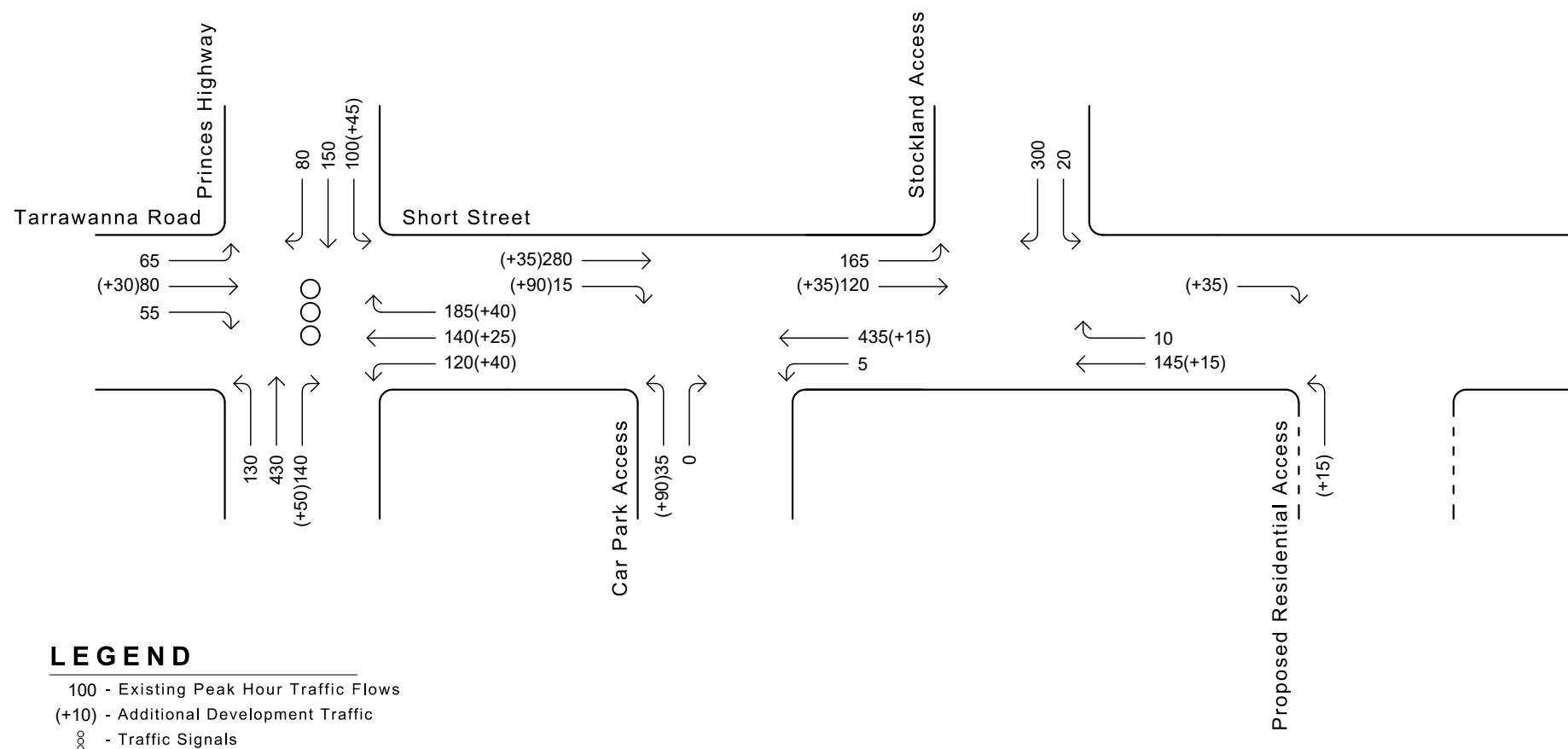
- i) the planning proposal would provide for a scale of development comprising 122 residential apartments and a 478m² food and drink premises;
- ii) the proposed development will be readily accessible by public transport;
- iii) appropriate parking will be provided;
- iv) vehicular access, internal circulation and layout will be provided in accordance with AS 2890.1:2004, AS 2890.2-2002 and AS 2890.6:2009; and
- v) the road network will be able to cater for the traffic generation of the proposed development.



Location Plan



**Existing weekday morning peak hour
traffic flows plus development traffic**



**Existing weekday afternoon peak hour
traffic flows plus development traffic**