CROWN PROSHA JOINT VENTURE

TRANSPORT AND ACCESSIBILITY IMPACT ASSESSMENT FOR PART 3A APPLICATION FOR THE PROPOSED REDEVELOPMENT OF EASTLAKES SHOPPING CENTRE

JULY 2012

COLSTON BUDD HUNT & KAFES PTY LTD
ACN 002 334 296
Level 18 Tower A
Zenith Centre
821 Pacific Highway
CHATSWOOD NSW 2067

Telephone: (02) 9411 2411
Facsimile: (02) 9411 2422
Email: cbhk@cbhk.com.au

REF: 8226/6

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1. INTRODUCTION

1.1 Colston Budd Hunt and Kafes Pty Ltd has been commissioned by Crown Prosha Joint Venture to prepare the Transport and Accessibility Impact Assessment for the Part 3A Application for the redevelopment of Eastlakes Shopping Centre. It is proposed to redevelop the shopping centre into the Eastlakes Village, comprising a mix of retail (12,450m^2 GLA) and residential (361 units and 82 serviced apartments). The site location is shown in Figure 1.

1.2 The shopping centre is located south of Gardeners Road at Eastlakes. It currently provides 11,540m^2 GLA and parking for 460 cars. The centre includes two supermarkets and specialty shops. Access is provided from Gardeners Road at a signalised intersection with Racecourse Place. Access to parking areas is provided from Evans Avenue and Barber Avenue.

1.3 The Director-General's Requirements with regards to transport and accessibility are as follows:-

"6. Transport and Accessibility

- ***The EA shall provide a Transport & Accessibility Impact Assessment (for the site and wider Eastlakes Precinct) prepared with reference to the Metropolitan Transport Plan – Connecting the City of Cities, the NSW State Plan 2010, NSW Planning Guidelines for Walking and Cycling, the Integrating Land Use and Transport policy package and the RTA's Guide to Traffic Generating Developments.***

- ***The EA shall address the recommendations of the report titled: Review of Traffic and Parking Matters prepared by Fred Gennaoui Pty Ltd (Appendix B).***

- ***The EA shall consider those issues outlined within both the RTA's letter dated 22 March 2011 and the letter from NSW Transport dated 9 March 2011 (attached).***

- ***Appropriate on-site parking provision having regard to Council and RTA guidelines and the availability of public transport (Note: the Department supports reduced parking provision in areas well serviced by public transport).***

1.4 Our assessment of the proposed redevelopment of the shopping centre is set down through the following chapters:-

- Chapter 2 - describing the existing conditions; and

- Chapter 3 - setting down the transport and accessibility impact assessment, including addressing the Director-General's Requirements.

2. EXISTING CONDITIONS

2.1 The Eastlakes Shopping Centre is located south of Gardeners Road at Eastlakes, and is generally bounded by Gardeners Road, Evans Avenue, Barber Avenue and Eastlakes Reserve, as shown on Figure 1. It provides 11,540m^2 GLA and parking for 460 cars. The centre includes Woolworths and Aldi supermarkets and 7,000m^{2}of specialty shops. Access to the centre from Gardeners Road is provided at a signalised intersection with Racecourse Place.

2.2 The centre is in two main parts which are separated by Evans Avenue. The northern part of the centre provides specialty retail shops fronting Gardeners Road and a parking area with access from Evans Avenue.

2.3 The southern part of the centre provides the main part of the retail area, including supermarkets and specialty shops. Parking areas are provided with access from Barber Avenue and Evans Avenue. The Evans Avenue access is east of the Racecourse Place intersection which is controlled by a roundabout.

2.4 Surrounding land use includes low to medium density residential development. Eastlakes Reserve adjoins the centre to the west, a school and bowling club to the west in Florence Avenue with other areas of open space. There are golf courses north of Gardeners Road and east of Southern Cross Drive. South and west there is low to medium density residential development.

Road Network

2.5 The road network in the vicinity of the centre includes Gardeners Road, Maloney Street, Evans Avenue, Racecourse Place, Barber Avenue and St Helena Parade.

2.6 Gardeners Road is a major east-west arterial road and forms part of a route linking Kingsford and Randwick in the east with the Princes Highway at Sydenham in the west. In the vicinity of the centre it provides a four to six lane divided carriageway with two to three traffic lanes in each direction. Major intersections are signalised with additional lanes for turning traffic. Gardeners Road has signalised intersections with Racecourse Place and Maloney Street. East of the centre, Gardeners Road provides a grade separation over Southern Cross Drive, which is part of a major north-south arterial route between the city and areas to the south.

2.7 West of the centre, Maloney Street is one of a number of north-south streets which runs south from Gardeners Road and provide access to residential and commercial areas in Eastlakes and Rosebery. Maloney Street has signalised intersections with Gardeners Road and Coward Street. Its intersection with King Street is controlled by a roundabout. Clear of intersections, Maloney Street generally provides for one traffic lane and one parking lane in each direction.

2.8 Evans Avenue runs west from Maloney Street and provides access to residential land uses and the centre. It bends at Eastlakes Reserve and has a roundabout controlled intersection with Racecourse Place. Evans Avenue also provides for entry to and exit from parking areas at the centre. In the vicinity of the centre, Evans Avenue provides traffic calming measures and bus stops. There is a marked pedestrian crossing between the northern and southern parts of the shopping centre. Clear of intersections it generally provides for one traffic lane and one

parking lane in each direction. The intersection of Evans Avenue with Maloney Street is a priority controlled intersection with Maloney Street the major road.

2.9 Racecourse Place runs south from a signalised intersection with Gardeners Road. There are left and right turn lanes on the approaches to the intersection. Racecourse Place provides access to adjacent residential development and the shopping centre at its southern end.

2.10 Barber Avenue runs south from Evans Avenue and provides access to centre car parks and loading docks. It bends around behind the centre and provides access to medium density residential development on the opposite side to the centre. There are restrictions on on-street parking in the vicinity of the centre. St Helena Parade runs south from Barber Avenue at an unsignalised intersection and provides a local route to and from residential areas in the south.

Traffic Conditions

2.11 In order to gauge current traffic conditions, counts were undertaken during Thursday morning, Thursday afternoon and Saturday midday peak periods. These are busy periods on the road network when traffic from the shopping centre and residential development will have its greatest effects and combines with other retail and commuter traffic on the road network. The counts were undertaken at the following intersections on Thursday 16 February 2012 and Saturday 18 February 2012 :-

- Gardeners Road/Racecourse Place;
- Gardeners Road/Maloney Street;
- Evans Avenue/Maloney Street;

- Evans Avenue/Racecourse Place;
- Evans Avenue/Barber Avenue; and
- Barber Avenue/St Helena Parade.

2.12 The results of the surveys are shown in Figures 2, 3 and 4, and summarised in Table 2.1.

Table 2.1: Existing Two-Way (Sum of Both Directions) Peak Hour Traffic Flows

Road	Thursday Morning	Thursday Afternoon	Saturday Midday
Gardeners Road			
– east of Racecourse Place	3500	3490	2805
– west of Racecourse Place	3025	3055	2470
– west of Maloney Street	1555	1865	1530
Racecourse Place			
– south of Gardeners Road	815	745	815
Evans Avenue			
– east of Barber Avenue	280	220	190
– west of Barber Avenue	545	385	380
– east of Racecourse Place	720	720	775
– west of Racecourse Place	375	325	310
– east of Maloney Street	290	375	400
Barber Avenue			
– south of Evans Avenue	325	225	260
– east of St Helena Parade	325	245	225
– west of St Helena Parade	130	210	270
Maloney Street			
– north of Gardeners Road	870	805	775
– south of Gardeners Road	1020	1080	730
– south of Evans Avenue	1200	1265	910
St Helena Parade			
– south of Barber Avenue	385	325	385

2.13 Table 2.1 shows that the highest flows occurred on Gardeners Road, which carried some 1,500 to 3,500 vehicles per hour two-way during the Thursday morning and afternoon peak hours and some 1,500 to 3,000 vehicles per hour during the Saturday midday period. Flows on Gardeners Road were highest east of Racecourse Place and decreasing to the west.

2.14 Flows on Racecourse Place and Evans Avenue (east of Racecourse Place) were some 750 to 800 vehicles per hour two-way during the Thursday morning, Thursday afternoon and Saturday midday peak hours.

2.15 Flows on Evans Avenue (west of Racecourse Place and either side of Barber Avenue), Barber Avenue and St Helena Parade were generally lower at some 200 to 500 vehicles per hour two-way during the Thursday morning, Thursday afternoon and Saturday midday peak hours. Flows on Barber Avenue (west of St Helena Parade) were some 150 to 250 vehicles per hour during the same peak hour periods.

2.16 In addition to the surveyed intersections, traffic counts were undertaken of the number of vehicles entering and exiting the site from Evans Avenue and Barber Avenue. The counts found that the shopping centre generated some 360 vehicles per hour two-way during the Thursday morning peak hour, some 650 vehicles per hour two-way during the Thursday afternoon peak period and some 900 vehicles per hour two-way during the Saturday midday period.

Intersection Operations

2.17 The capacity of the road network is generally determined by the capacity of its intersections to cater for peak period traffic flows. The surveyed intersections shown in Figures 2 and 3 have been analysed using the SIDRA computer program.

2.18 The SIDRA program simulates the operations of the intersections to provide a number of performance measures. The most useful measure provided is average delay per vehicle expressed in seconds per vehicle. Based on average delay per

vehicle, SIDRA estimates the following levels of service (LOS):-

- For traffic signals, the average delay per vehicle in seconds is calculated as delay/(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:-

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.

- 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 the 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.

2.19 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.

2.20 The analysis found that the signalised intersection of Gardeners Road with Racecourse Place is operating with average delays of less than 20 seconds per vehicle during the peak periods. This represents levels of service B, a good level of service. Observations indicate that, on occasions traffic queues in Racecourse Place can extend to the south, back towards the intersection with Evans Avenue. However, these queues occur for only a short time, clear quickly, and do not result in congestion at the intersections of Racecourse Place with Gardeners Road and Evans Avenue.

2.21 The signalised intersection of Gardeners Road, Maloney Street and Dalmeny Avenue is operating with average delays of some 45 seconds per vehicle during the Thursday afternoon peak periods. This represents level of service D, a satisfactory level of service. In the Thursday morning and Saturday midday peak periods the intersection is operating with average delays of less than 35 seconds per vehicle. This represents levels of service C, a satisfactory level of service.

2.22 The unsignalised intersection of Maloney Street with Evans Avenue is operating with average delays of less than 20 seconds per vehicle during the peak periods. This represents level of service B, a satisfactory level of service

2.23 The unsignalised intersections of Barber Avenue with Evans Avenue and St Helena Parade are operating with average delays of less than 15 seconds per vehicle

during the peak periods. This represents level of service A/B, a good level of service.

2.24 The roundabout controlled intersection of Evans Avenue with Racecourse Place is operating with average delays of less than 15 seconds per vehicle during the peak periods. This represents level of service A/B, a good level of service.

2.25 However, there are geometric constraints that affect the operation of the Evans Avenue and Racecourse Place roundabout. These are:-

- the proximity of the existing site access driveway (to the southern part of the site) to the roundabout affects the operation of the intersection with traffic queues from the driveway on Evans Avenue (traffic turning right from Evans Avenue into the car park) extending back into the roundabout;

- larger vehicles, including buses, can have difficulty negotiating the roundabout due to its geometry and centre island radius.

2.26 As discussed in Chapter 3, the proposed redevelopment of the shopping centre identifies an upgrade to the roundabout to accommodate larger vehicles, and the relocation of site access points, which will alleviate traffic queuing on Evans Avenue.

Residential Amenity

2.27 In addition to the physical capacity of the road network, traffic flow can also impact on the amenity of properties fronting the roads carrying the flows. The definition of the impacts on residential amenity by varying levels of traffic flow is

extremely complex. Perceptions of impact vary greatly from person to person. Traffic flows that one person may find perfectly acceptable may be considered excessive by another. Impact is affected by the nature of the street and the area in which it is located, its width, building setbacks, grades, etc. as well as by the speed of traffic and the mix of cars and heavy vehicles.

2.28 The Roads and Traffic Authority has undertaken considerable research into appropriate environmental capacity performance standards on residential streets. Its "Guide to Traffic Generating Developments" defines the following environmental capacity performance standards for local residential streets and collector roads.

- Local roads
  - Environmental goal – 200 vehicles per hour in the peak hour;
  - Maximum flow – 300 vehicles per hour in the peak hour;

- Collector roads
  - Environmental goal – 300 vehicles per hour in the peak hour;
  - Maximum flow – 500 vehicles per hour in the peak hour.

2.29 Table 2.1 shows that St Helena Parade and Evans Avenue (west of Racecourse Place) are carrying traffic flows less than RTA's suggested maximum for collector roads. East of Barber Avenue, flows on Evans Avenue are less than the RTA's suggested maximum for a local road.

2.30 Barber Avenue is generally carrying traffic flows less than the RTA's suggested maximum for a local road. It should be noted that as these roads serve the

shopping centre, flows adjacent to the centre would be expected to be higher than in a residential street.

Parking Conditions

2.31 The shopping centre provides 460 parking spaces within at-grade and structured parking areas. In order to establish parking conditions at the centre, surveys were undertaken on a Thursday afternoon and Saturday midday period. The surveys counted the number of vehicles parked on-site during these periods within the respective parking areas.

2.32 The results of the parking surveys are summarised in Table 2.2. This table shows that the busiest time for parking at the shopping centre was at 12.00pm midday on the Saturday. At this time some 405 vehicles were parked on-site, representing a parking utilisation of some 88%. It should be noted that during this period the northern car park was effectively fully utilised, with some 55 spaces available within the southern car park.

Table 2.2: Eastlakes Shopping Centre Parking Demand Surveys

Time	Northern Car Park	Southern Car Park	Total
Thursday Afternoon			
2.30pm	115	190	305
3.30pm	140	180	320
4.30pm	135	180	315
5.30pm	130	150	280
6.30pm	105	140	245
Saturday Midday			
10.00am	130	195	325
11.00am	155	230	385
12.00pm	160	245	405
1.00pm	160	240	400
2.00pm	160	210	370
Supply	**160**	**300**	**460**

2.33 The peak parking demand on the Thursday afternoon was observed at 3.30pm, with a total number of vehicles parked in the centre of some 320 vehicles. This parking demand represents a parking utilisation of some 70%.

Pedestrians

2.34 Pedestrian facilities are provided in Evans Avenue (a marked crossing linking the two parts of the centre), Gardeners Road (pedestrian crossings at the Racecourse Place intersection) and Barber Avenue (a refuge and crossing east and west of St Helena Parade respectively). Pedestrian accesses to the centre are provided from Gardeners Road, Evans Avenue and from within parking areas.

Public Transport

2.35 Local bus services are provided by Sydney Buses. There are bus stops near the site on Evans Avenue, Racecourse Place and Gardeners Road. These bus stops are considered appropriate and functional to service the site. The bus zone on the eastern side of Racecourse Place is located some 60 metres south of Gardeners Road allowing good access for buses to access the kerbside bus zone.

2.36 Routes 301 and 303 link Circular Quay, the City, Surry Hills, Waterloo, Rosebery, Eastlakes, Mascot, Pagewood, Kingsford, Kensington, UNSW, Kyeemagh, Brighton, Monterey, Ramsgate, Dolls Point and Sans Souci. They operate along Evans Avenue on 10 to 20 minute headway Monday to Friday with more frequent services during the peak times. Weekend services operate on 10 to 30 minute headway. These services turn into Racecourse Place from Gardeners Road and ten turn right from Racecourse Place into Evans Avenue. No services currently

operate in Evans Avenue between Racecourse place and Barber Avenue adjacent to the centre.

2.37 Route 343 operates along Gardeners Road between Kingsford, Rosebery, Zetland, Waterloo, Redfern and the City. It operates on 15 to 20 minute headway 7 days a week with more frequent services during the weekday peak times.

2.38 Route 357 operates along Gardeners Road between Bondi Junction, Randwick, Kingsford and Sydenham. It operates 7 days a week on 60 minute headway, with more frequent services during the weekday peak times.

2.39 Overall, the site has good access to regular bus services.

3. TRANSPORT AND ACCESSIBLITY IMPACT ASSESSMENT

3.1 It is proposed to redevelop the shopping centre providing retail (12,450m^2 GLA), an increase of some 920m^2 and residential (361 units and 82 serviced apartments). There are 122 apartments (50 one bedroom, 69 two bedroom and 3 three bedroom) in the northern part of the site, and 239 apartments (6 studio, 100 one bedroom, 124 two bedroom and 9 three bedroom) plus 82 serviced apartments in the southern part of the site. Vehicular access will be provided from Evans Avenue and Barber Avenue. Parking will be provided in two basement parking levels.

3.2 Our transport and accessibility impact assessment is presented through the following sections:

- policy context;
- public transport, walking and cycling;
- travel access guide;
- parking provision;
- access arrangements;
- internal circulation and car parking arrangements;
- service vehicle arrangements;
- traffic effects;
- construction traffic management;
- responses to Director-General's requirements; and
- summary.

Policy Context

Metropolitan Transport Plan

3.3 The Metropolitan Transport Plan – Connecting the City of Cities has four key policy objectives:

- commuting to work easily and quickly;
- transport and services accessible to all members of the community;
- an efficient, integrated and customer focused public transport system; and
- revitalized neighbourhoods with improved transport hubs.

3.4 It includes a target of 28 per cent of trips to work in the Sydney Metropolitan Region to be undertaken by public transport by 2016, compared to some 22 per cent in 2006.

3.5 To help achieve these objectives, it identifies, in conjunction with the metropolitan strategy, key areas of future housing and employment growth in Sydney to 2020 and 2036. Additionally, it outlines a 10 year funding program to 2020 for the following transport projects:

- rail line extensions for more platforms at CBD stations;
- rail lines to north west and south west Sydney;
- light rail in the CBD and further extension to the Inner West;
- more air conditioned train carriages;
- 1,000 additional buses;
- completion of the 43 strategic bus corridors across Sydney;

- completion of the highest priority missing links in the Sydney Strategic Cycleway Network.

NSW 2021

3.6 NSW 2021: A Plan to Make NSW Number One sets targets to increase the proportion of commuter trips made by public transport for various areas within Sydney by 2016, including:

- 80 per cent in the Sydney CBD;
- 50 per cent in the Parramatta CBD;
- 20 per cent in the Liverpool CBD; and
- 25 per cent in the Penrith CBD.

3.7 It also has targets to:

- improve road safety and reduce fatalities to 4.3 per 100,000 population by 2016;
- double the mode share of bicycle trips made in the metropolitan area by 2016; and
- increase the proportion of the population living within 30 minutes by public transport of a city or major centre in the metropolitan area.

Integrated Land Use and Transport Policy Package (ILUT)

3.8 These policies aim to ensure that urban structure, building forms, land use locations, development designs, subdivision locations and street layouts help achieve the following planning objectives:

(a) improve accessibility to housing, employment and services by walking, cycling, and public transport;

(b) improve the choice of transport and reducing dependence solely on cars for travel purposes;

(c) moderate growth in the demand for travel and the distances travelled, especially by car; and

(d) support the efficient and viable operation of public transport services.

NSW Planning Guidelines for Walking and Cycling and the NSW Bike Plan

3.9 These guidelines provide a walking and cycling focus to the Integrating Land Use and Transport Policy Package. They provide for improved consideration of walking and cycling in land use planning, to assist in creating more opportunities for people to live and work in places with easy walking and cycling access to services and public transport.

3.10 The following sections discuss how the proposed development satisfies these objectives and the measures proposed to achieve them.

Public Transport, Walking and Cycling

3.11 As previously discussed, the site is close to bus services which operate along Gardeners Road and Evans Avenue. These services provide links to the City, the

eastern suburbs and areas to the south. Public transport services offer viable alternatives to travel by modes other than car.

3.12 The redevelopment of the centre includes integration with the existing pedestrian and cycle links in the area. The exiting marked pedestrian crossings in Evans Avenue (east and west of Racecourse Place) will be retained along with the marked pedestrian in Barber Avenue (west of St Helena Parade). There will also be pedestrian links through the centre including directly to Eastlake Reserve.

3.13 The proposed development will be close to existing public transport services, and will therefore be readily accessible by public transport. To support accessibility by bicycles, appropriate bicycle parking is proposed to be provided.

3.14 The proposed development will therefore satisfy the objectives of the Metropolitan Transport Plan, NSW 2021 and Integrated Land Use and Transport, policy package, NSW Planning Guidelines for Walking and Cycling and the NSW Bike Plan as follows:

- enabling residents, employees and shoppers to readily access buses close to the site, for journeys to work and other travel (Metropolitan Transport Plan objective);

- providing pedestrian connections within and through the centre, to improve accessibility for residents in the development as well as the general public (Metropolitan Transport Plan objective, Planning Guidelines for Walking and Cycling);

- providing an appropriate level of on-site parking, with reference to appropriate Council and RMS requirements, to encourage public transport use and increase the proportion of journey to work trips by public transport (Metropolitan Transport Plan objective);

- providing residential development close to other retail, commercial and transport facilities to reduce the need for external travel (ILUT principle, NSW Planning Guidelines for Walking and Cycling);

- being located close to employment centres in Port Botany and Sydney Airport, which are readily accessible by public transport (ILUT principle);

- increasing the proportion of the population living within 30 minutes by public transport of a city or major centre in the metropolitan area (NSW 2021 target); and

- providing appropriate bicycle parking on the site to increase the proportion of trips made by bicycle (NSW Planning Guidelines for Walking and Cycling and the NSW Bike Plan).

3.15 Consultation with Sydney Buses has found that there is no proposal at this stage to reroute either the 301 or 303 services to the east along Evans Avenue, past the centre. Thus there is an opportunity to provide improved pedestrian facilities, taxi and customer set-down/ pick-up areas in this zone between Racecourse Place and Barber Avenue. As part of the proposed redevelopment, an indented set down/pick up area has been provided on the southern side of Evans Avenue (between Racecourse Place and Barber Avenue). This set down/pick up area

would be used for people to be dropped off or picked up by private car, taxis or community buses.

Travel Access Guide

3.16 To encourage travel modes other than private vehicle, a travel demand management approach should be adopted, through a travel access guide to meet the specific needs of the site, future shoppers, employees, residents and visitors. The specific requirements and needs of the future residents, including access to surrounding employment centres, plus local services and facilities, should be incorporated in the travel access guide to support the objectives of encouraging the use of public transport.

3.17 The principles of the travel access guide should be developed in consultation with Council, RMS, Sydney Buses and other stakeholders. Principles would include the following:

- encourage the use of public transport, including local bus services close to the site;
- identify existing bus routes which stop near the site, including the location of bus stops and pedestrian crossings at signalised intersections;
- work with Sydney Buses and other operators to improve services;
- encourage public transport by residents through the provision of information, maps and timetables in the travel access guide;

- raise awareness of health benefits of walking and cycling (including maps showing walking and cycling routes, including through and adjacent to the site);

- encourage cycling by providing safe and secure bicycle parking, including the provision of lockers and rails for residents and visitors;

- provide appropriate on-site parking provision, consistent with appropriate Council/RMS controls and the objective of reducing traffic generation.

3.18 The travel access guide should be developed in accordance with the principles identified by Transport NSW and RMS, and distributed with marketing material for the site. The travel access guide would assist in delivering sustainable transport objectives by considering the means available for reducing dependence solely on cars for travel purposes, encouraging the use of public transport and supporting the efficient and viable operation of public transport services.

Parking Provision

3.19 Botany Council's Development Control Plan for Off-Street Parking indicates the following minimum parking requirements for the proposed development:

- Retail
  - one space per 40m^2 of gross leasable floor area;

- Residential
  - one space per small (55m^2 or less) or medium (more than 55m^2 and less than or equal to 85m^2) dwelling;

- two spaces per large (>85m^2) dwelling;
- one space per five residential dwellings for visitors.

- Serviced Apartments
  - No rates provided.

3.20 By comparison, RMS (formerly RTA), in its *"Guide to Traffic Generating Developments"*, suggests the following parking requirements for residential, retail and service apartments:

- Retail
  - Where the various components of the shopping centre are known, parking demand be estimated based on the following formula:

Peak Parking Demand = 24A(S) + 40A(F) + 42A(SM) + 45A(SS) + 9A(OM) (per 1,000m^2)

where:

A(S): Slow Trade GLA, includes major Department stores such as David Jones and Grace Brothers, furniture, electrical and utility goods stores.

A(F): Faster Trade GLA, includes discount department stores such as K-Mart and Target, together with larger specialist stores such as Fosseys.

A(SM): Supermarket GLA, includes stores such as Woolworths and large fruit markets.

A(SS): Specialty Shops and Secondary retail GLA, includes specialty shops and take-away stores such as McDonalds. These stores are grouped since they tend not to be primary attractors to the centre.

A(OM): Offices, medical GLA.

- High Density Residential
  - 0.6 spaces per one bed unit;
  - 0.9 spaces per two bed unit;
  - 1.4 spaces per 3 bed unit; and
  - 1 space per five residential units for visitors.

- Serviced Apartments
  - No rates provided.

3.21 The proposed shopping centre will comprise some 5,790m^2 GLA of supermarkets, some 5,000m^2 GLA of specialty retail area, some 1,525m^2 of fast trade and some 145m^2 of offices.

3.22 Based on surveys presented in Chapter 2, the existing shopping centre has a peak parking demand of 2.8 spaces per 100m^2 GLA on a Thursday and 3.5 spaces per 100m^2 GLA on a Saturday. Application of the rate of 3.5 spaces per 100m^2 to the proposed redeveloped shopping centre results in a retail parking requirement of 436 spaces.

3.23 Taking into account Council's DCP with 103 apartments larger than 85m^2, RMS Guidelines and surveys of the existing shopping centre the proposed development would require the following parking provision:

Retail – 318 spaces (Council DCP), 436 spaces (surveys) or 536 spaces (RMS).
Residential – 357 spaces (RMS) or 464 spaces (Council DCP).

3.24 With regard to the serviced apartments neither the Council DCP nor RMS Guidelines provide parking rates. Parking requirements for the service apartments have been based on one space per unit. This is similar to the Council and RMS rates for motels.

3.25 The following rates have been adopted for determining parking provision for the proposed development. The adopted rates are within the range based on Council DCP and RMS Guidelines. They represent a balanced approach of providing appropriate parking while encouraging travel by means other than private car.

- Retail
  - 3.5 spaces per 100m^2 GLA;

- Residential
  - one space per one and two bed units;
  - two spaces per 3 bed unit;
  - one space per 5 units for visitors.

- Serviced Apartments
  - one space per unit.

3.26 Using these rates the proposed development would require 972 spaces comprising:

Retail: 436 spaces (94 spaces on the northern side and 342 on the

	southern side);
Residential:	446 spaces (comprising 373 residential and 73 visitor spaces). 150 spaces on the northern side (125 residential and 25 visitor) and 294 spaces on the southern side (248 residential and 48 visitor)
Serviced Apartments:	82 spaces (all located on the southern side)

3.27 1,038 spaces will be provided, satisfying the above requirements. 243 spaces are proposed to be provided on the northern side of site (115 spaces on level B1 and 128 spaces on level B2) and 795 spaces on the southern part of the site (363 on level B1 and 432 on level B2).

3.28 Residential and service apartment parking will be provided on level B2 and the retail parking on level B1. On the northern part of the site, the residential visitor parking will be shared with the retail parking on level B1.

3.29 In addition to car parking, motor cycle and bicycle parking will be provided on levels B1 and B2. Over two per cent of parking spaces will be allocated to disabled parking.

Access Arrangements

3.30 Access to the proposed centre will be retained from Evans Avenue and Barber Avenue. A number of changes are proposed to improve access. The previous potential left in access from Gardeners Road has not been included. As discussed in the subsequent section on traffic effects, the surrounding road network with

the proposed access arrangements will cater for traffic generated by the proposed development. The proposed access arrangements are set out below:

- vehicular access from the northern side of Evans Avenue will be retained and consolidated into a single two-way access point opposite Barber Avenue. A single lane (mountable) roundabout is proposed at the intersection of Evans Avenue, Barber Avenue and the centre access;

- the existing access on the southern side of Evans Avenue, close to Racecourse Place, will be relocated as a fourth leg onto the roundabout controlled intersection of Evans Avenue and Racecourse Place. The roundabout will be upgraded to address the existing geometric constraints;

- the existing access on the northern side of Barber Avenue, close to St. Helena Parade, will be relocated as a fourth leg onto the intersection of Barber Avenue and St. Helena Parade, and the intersection upgraded to a roundabout;

- separate service vehicle access will be provided off Evans Avenue (to the northern part of the site) and Barber Avenue (to the southern part of the site).

3.31 Access arrangements will be designed to comply with the requirements of AS2890.1-2004 and AS2890.2.2002.

Internal Circulation and Car Parking Arrangements

3.32 Residential parking areas will be separated from retail parking (retail parking on level B1 and residential parking on level B2). Inside property lines, driveways will provide a maximum of 1:20 for six metres, with clear areas for appropriate sight

lines to pedestrians. Ramps will have a maximum of 1:5 with appropriate transitions. Retail parking spaces will be 2.6 metres wide (0.3 metres wider for adjacent obstructions) by 5.4 metres long, with 6.6 metre wide aisles. Disabled spaces will be 2.4 metres wide with 2.4 metre wide shared zones and 2.5 metre height clearances (as required by AS2890.6-2009). Due to the proposed column grid, residential spaces will have the same dimensions as the retail spaces (which exceed the requirements of AS2890.1-2004 for residential spaces). Columns will be set back 750 mm from the front of spaces. Height clearance will be 2.2 metres generally, with 2.5 metres above disabled spaces. These are appropriate dimensions, being in accordance with the Australian Standard for Parking Facilities (Part 1: Off-street car parking), AS 2890.1-2004 and AS2890.6 - 2009.

3.33 The car park will be designed for controlled parking with boom gates controlling ingress/egress within the car park. AS2890.1-2004 suggests provision of the following requirements queuing at boom gates:

- queuing for three cars for the first 100 spaces;
- queuing for two cars for the next 100 spaces; and
- queuing for one car for each 100 spaces thereafter.

3.34 Using these rates the northern car park would require queuing for six cars and the southern car park queuing for 11 cars. It should be noted over 50% of the parking in each car park is residential parking with a lower traffic generation and hence actual queuing requirements would lower than suggested by AS2890.1-2004.

3.35 Access to/from the northern car park will be via single lane ingress/egress boom gates from Evans Avenue, with queuing for at least six cars between the ingress

boom gate and property boundary. Between the level B1 and B2 a gate will separate the residential car park from the retail car park.

3.36 Access to/from the southern car park will be via Evans Avenue and Barber Avenue. The Evans Avenue access will be the major access and provide twin lane ingress/egress boom gates with queuing for at least 12 cars between the ingress boom gate and property boundary. The Barber Avenue access will be via single lane ingress/egress boom gates, with queuing for at least six cars between the ingress boom gate and property boundary. Between the level B1 and B2 a gate will separate the residential car park from the retail car park.

3.37 The entry ramps will be designed to accommodate queuing of vehicles with queuing areas not exceeding a grade of 10% and control points not exceeding a grade of 5%. These grades comply with the requirements of AS2890.1-2004.

Service Vehicle Arrangements

3.38 In regards to servicing and loading dock arrangements, the existing shopping centre generates service vehicles ranging from vans and small commercial vehicles to large semi trailers. The existing centre generates some 75 service vehicles per day, including 4 to 5 semi trailers.

3.39 Service vehicles primarily access the centre from Gardeners Road, via Racecourse Place. Large service vehicles including semi trailers access the centre to/from Maloney Street, via Evans Avenue, Longworth Avenue and Barber Avenue.

3.40 As part of the proposed redevelopment of the centre, the following service arrangements are proposed:

- a new service area on the northern part of the site (western side) with access from Evans Avenue. This loading dock would service Aldi and the other development on the northern part of the site (including the residential development). The service area would provide two loading docks (one for Aldi and one for other development) with additional area available for vehicles to wait on site should the docks be occupied. The Aldi dock has been designed for a 12.5 metre truck. All vehicles would enter and depart the service area in a forward direction;

- consolidation of the service areas on the southern part of the site along Barber Avenue to a single location (similar to where the existing Woolworths loading dock is located). The service area would provide four loading docks (two for the supermarket and two for other developments). The supermarket dock has been designed for a 19 metre semi-trailer. All vehicles will enter and depart the service area in a forward direction.

- provision of two service bays within the B1 car park on the southern part of the site. These will cater for vans servicing the specialty shops on the southern part of the site.

3.41 All service areas will be separated from customer parking areas and will have separate access driveways.

3.42 Due the minor increase in retail area and the low number of service vehicles associated with residential development there will be minor increase in the number of service vehicles associated with the proposed development (a likely increase from some 75 to 80 per day).

3.43 Service vehicles will continue to use the same routes as today with service vehicles primarily accessing the centre from Gardeners Road, via Racecourse Place and large service vehicles (including semi-trailers) accessing the centre to/from Maloney Street, via Evans Avenue, Longworth Avenue and Barber Avenue.

3.44 In order to manage and control service vehicle activity, the redevelopment of the centre should also incorporate a service vehicle management plan. This could be included as a condition of consent. The plan would address the following aspects:-

- approach and departure routes for service vehicles;
- loading dock hours of operation, including delivery times;
- service vehicle access arrangements, to ensure that service vehicles enter and exit the site in a forward direction;
- management of loading docks and control of service vehicle activity;
- control of pedestrian movements and car park access in the vicinity of the loading docks.

3.45 The service areas will be designed to comply with the requirements of AS2890.2002 with respect to height clearances, grades and turning areas. The proposed arrangements represent an improvement over the existing situation where loading areas are poorly defined, trucks reverse off the street and mix with customer traffic within car parking areas.

Traffic Effects

3.46 Traffic generated by the proposed redevelopment of the centre will have its greatest effects during the weekday morning, weekday afternoon and Saturday midday peak periods when it combines with other retail and commuter traffic. Traffic counts undertaken at the existing centre indicate that it generates some 3.1, 5.6 and 7.8 vehicles per hour two-way per 100m^2 GLA on Thursday morning, Thursday afternoon and Saturday midday peak hours respectively.

3.47 Surveys undertaken by RMS found that high density residential developments generate some 0.29 vehicles per hour two-way in the weekday morning and afternoon peak hours. This rate has also been adopted for the serviced apartments.

3.48 Based on existing surveys of the shopping centre and the rate of 0.29 vehicles per hour, per unit for the residential component the proposed development (361 units, 82 serviced apartments and an additional 920m^2 GLA of retail area) would generate the following additional traffic:-

- weekday morning - an additional 165 vehicles per hour (30 retail, 130 residential);
- weekday afternoon - an additional 195 vehicles per hour (50 retail, 130 residential); and
- Saturday midday - an additional 220 vehicles per hour (70 retail, 130 residential).

3.49 A proportion of retail traffic will be passing trade, which are vehicles that are already in the existing traffic stream passing the centre. Some 15% to 25% of retail trips (based on surveys undertaken by the RTA) would be passing trade. For

centres 10,000m^2 to 30,000m^2 the RTA guide suggests a rate of 20%. The above additional traffic generation does not allow for passing trade or any reduction in trips due to people who live in the units above the shopping centre working in the shops and walking to work or to shop.

3.50 Interviews of customers in the centre on Thursdays and Saturdays indicated that the existing pattern of movement to and from the centre is generally distributed as shown in Table 3.1.

Table 3.1: Approach and departure routes

Road	Arrival	Departure
Gardeners Road west	20%	20%
Gardeners Road east	30%	30%
Evans Avenue east	10%	10%
Evans Avenue west	25%	25%
St Helena Parade	15%	15%

3.51 The additional development traffic has been assigned to the road network based on customers using approach and departure routes in the same proportions as at present, and taking account of the revised access arrangements. The proposed redistributed flows, including additional development traffic, are shown on Figures 5, 6 and 7, and summarised in Table 3.2.

Table 3.2: Redistributed Peak Hour Two-Way (sum of both directions) Traffic Flows (including additional development traffic)			
Road	**Thursday Morning**	**Thursday Afternoon**	**Saturday Midday**
Gardeners Road			
– east of Racecourse Place	3560	3570	2870
– west of Racecourse Place	3055	3075	2520
– west of Maloney Street	1580	1895	1555
Racecourse Place			
– south of Gardeners Road	905	840	930
Evans Avenue			
– east of Barber Avenue	285	220	200
– west of Barber Avenue	600	500	435
– east of Racecourse Place	620	515	435
– west of Racecourse Place	415	410	390
– east of Maloney Street	340	440	450
Barber Avenue			
– south of Evans Avenue	340	275	265
– east of St Helena Parade	350	285	230
– west of St Helena Parade	95	125	120
Maloney Street			
– north of Gardeners Road	895	830	830
– south of Gardeners Road	1040	1115	775
– south of Evans Avenue	1230	1300	920
St Helena Parade			
– south of Barber Avenue	415	390	430

3.52 Traffic flows would change as follows:

- traffic flows on Gardeners Road would increase by some 20 to 80 vehicles per hour two-way during the peak periods;
- traffic flows on Racecourse Place would increase by some 90 to 115 vehicles per hour two-way during the peak periods;
- the change in traffic flows on Evans Avenue would vary due to the change in access arrangements. East of Barber Avenue the increases would be less than 10 vehicles per hour two-way during the peak periods. West of Barber Avenue traffic flows would increase by some 55 to 115 vehicles per hour two-

way during the peak periods. East of Racecourse Place there would be a decrease of some 100 to 340 vehicles per hour two way during the peak periods. West of Racecourse Place traffic flows would increase by some 40 to 85 vehicles per hour two-way during the peak periods;

- the change in traffic flows on Barber Avenue would vary due to the change in access arrangements. Between Evans Avenue and St Helena Parade traffic flows would increase by some 5 to 50 vehicles per hour two way. West of St Helena Parade traffic flows would decrease by some 35 to 150 vehicles per hour two way;
- traffic flows on Maloney Street would increase by some 20 to 55 vehicles per hour two-way during the peak periods; and
- traffic flows on St Helena Parade would increase by some 30 to 65 vehicles per hour two-way during the peak periods.

3.53 St Helena Parade and Evans Avenue (west of Racecourse Place) would carry traffic flows less than RTA's suggested maximum for collector roads. East of Barber Avenue, flows on Evans Avenue would be less than the RTA's suggested maximum for a local road. Traffic flows on Barber Avenue would generally be less than the maximum for a local road. It should be noted that as these roads serve the shopping centre, flows adjacent to the centre would be expected to be higher than in a residential street.

3.54 The site on the south western corner of the intersection of Gardeners Road and Racecourse Place is currently vacant. A McDonald's was proposed on the site and was the subject of a Land & Environment Court appeal which refused the development. Traffic impacts were an issue in the appeal and given the findings of the court would limit the development potential of that site. Thus, for the

purposes of the assessing the cumulative traffic impacts, the following potential level of development for that site have been provided by the planners:

- some 1,000m^2 of commercial;
- some 16 residential units;
- basement car park; and
- access from Evan Lane.

3.55 Using RMS guidelines, development of this potential scale would generate some 25 to 30 vehicles per hour (two way) in the peak periods. When assigned to the surrounding road network, there would be increases of some 5 to 15 vehicle per hour (two way) on the surrounding road network.

3.56 The cumulative impact of the redevelopment of the shopping centre and the site on the corner of Racecourse Place and Gardeners Road has been assessed. The intersections previously analysed in Chapter 2 have been re-analysed using SIDRA. The SIDRA analysis found that:

- the signalised intersection of Gardeners Road and Racecourse Place will operate with average delays of less than 25 seconds per vehicle during peak periods. This represents a level of service B, a satisfactory level of service. Maximum queues (which are spread over two to three minutes of peak hour) in Racecourse Place would be increased by some 10 metres (one to two vehicles) during the peak periods. Such a minor increase would not affect the operation of the road network;

- the signalised intersection of Gardeners Road, Maloney Street and Dalmeny Avenue would continue to operate with average delays of some 45 seconds

per vehicle during the Thursday afternoon peak periods. This represents levels of service D, a satisfactory level of service. In the Thursday morning and Saturday midday peak periods the intersection would continue to operate with average delays of less than 35 seconds per vehicle. This represents levels of service C, a satisfactory level of service;

- the unsignalised intersection of Maloney Street with Evans Avenue would operate with average delays of less than 25 seconds per vehicle during the peak periods. This represents level of service B, a satisfactory level of service;

- the new roundabout controlled intersections of Barber Avenue with Evans Avenue and St Helena Parade (and the site accesses) would operate with average delays of less than 15 seconds per vehicle during the peak periods. This represents level of service A/B, a good level of service;

- the roundabout controlled intersection of Evans Avenue with Racecourse Place and the site access would operate with average delays of less than 15 seconds per vehicle during the peak periods. This represents level of service A/B, a good level of service. Average delays would increase by some 2 to 4 seconds, however, the average delays would still be less than 15 seconds. As part of the change in access arrangements the existing roundabout would be upgraded to improve the existing geometric deficiencies, including the removal the existing shopping centre car park access located to immediately to the east of Racecourse Place.

3.57 In summary the surrounding road network can accommodate the additional traffic generated by the proposed redevelopment of the shopping centre. Intersections

would continue to operate at satisfactory or better levels of service. There would not be changes in the environmental capacity of the adjacent streets.

Construction Traffic Management

3.58 At this stage a builder has not been appointed for the construction of the development and hence the construction methodology, process and staging have not been defined. The builder will be responsible for the preparation of the construction management plan, which will be lodged with Council and other relevant authorities for approval prior to the commencement of construction.

3.59 Construction of the proposed development will commence with the preparation of the site and excavation of the basement levels. Construction access will be provided to/from Racecourse Place/Evans Avenue. Construction vehicles, transporting material and unwanted spoil from the site, will be loaded with material via the use of excavators. Trucks will generally enter and exit the site in a forward direction, to/from Evans Avenue. In order to minimise impact on local streets, trucks will generally be required to approach and depart the site via Gardeners Road, Racecourse Place and Evans Avenue.

3.60 During construction of the development it would be anticipated that an on-street work zone would be required on Evans Avenue and Barber Avenue, adjacent to the site, at various times. The loading and unloading of construction material from trucks, associated with the overall construction activity, will be carried out either on-site or from the on-street work zone. Construction material will be stored on-site within designated material handling areas.

3.61 The pedestrian movements adjacent to the site will be maintained during the construction period. Pedestrian activity will be protected with the provision of a Class A construction fence erected around the perimeter of the site. Scaffolding and overhead protection will be provided, where required.

3.62 Openings in the construction fencing, at the construction access driveway will be managed and controlled by qualified site personnel. Pedestrian warning signs will be erected adjacent to the driveway. The movement of trucks entering and exiting the site will be managed and controlled by flagmen.

3.63 The overall principles for traffic management during construction of the development will be to:

- provide a convenient and appropriate environment for pedestrians;
- minimise effects on pedestrian movements and amenity;
- provide appropriate safety fencing around the perimeter of the site;
- manage and control vehicular movements to and from the site;
- maintain traffic capacity at intersections and mid-block in the vicinity of the site;
- manage and control the on-street work zone;
- maintain existing on-street parking in the vicinity of the site;

- restrict construction vehicle activity to designated truck routes through the area (to be identified by the appointed builder);

- construction vehicles will generally enter and exit the site in a forward direction;

- construction vehicles will not be permitted to queue on-street in the vicinity of the site;

- construction activity to be carried out in accordance with the approved hours of construction;

- maintain safety for workers;

- provide convenient and appropriate access to the site for construction traffic;

- manage and control vehicle activity in the vicinity of the site; and

- the preparation of the construction traffic management plan, signage detail, control of pedestrians and control and management of construction vehicles in the vicinity of the site will be the responsibility of the appointed builder.

Responses to Director General Requirements

3.64 The Director General Requirements, Fred Gennaoui report, RMS (formerly RTA) letter and Transport NSW letter are appended to our report.

"6. Transport and Accessibility

- ***The EA shall provide a Transport & Accessibility Impact Assessment (for the site and wider Eastlakes Precinct) prepared with reference to the Metropolitan Transport Plan – Connecting the City of Cities, the NSW State Plan 2010, NSW Planning Guidelines for Walking and Cycling, the Integrating Land Use and Transport policy package and the RTA's Guide to Traffic Generating Developments.***

3.65 Reference to the transport policy documents is made in paragraphs 3.3 to 3.9.

3.66 The transport and accessibility impact assessment has been prepared in accordance with the RTA's (now RMS) Guide to Traffic Generating Developments.

- ***The EA shall address the recommendations of the report titled: Review of Traffic and Parking Matters prepared by Fred Gennaoui Pty Ltd (Appendix B).***

3.67 The transport and accessibility impact assessment has addressed the recommendations of Gennaoui Report as follows:

- proposed parking provision is considered appropriate and represents a balanced approach between providing appropriate parking while encouraging travel by means other than private car in an area well serviced by public transport;

- parking layouts will be designed to comply with the requirements of AS2890.1-2004 and AS2890.6-2006;

- the design of the proposed development does not allow for direct left turn ingress from Gardeners Road;

- access to the northern part of the site has been consolidated to a single lane two way access point (opposite Barber Avenue and the intersection upgraded to roundabout control);

- the existing access on the southern side of Racecourse Place has been relocated as a fourth leg onto the roundabout controlled intersection of Evans Avenue and Racecourse Place;

- the existing access on the northern side of Barber Avenue has been relocated as a fourth leg onto the intersection of Barber Avenue and St Helena Parade and the intersection upgraded to roundabout control;

- the existing roundabout at the intersection of Racecourse Place and Evans Avenue will be upgraded to improve the existing geometric deficiencies;

- the traffic analysis has found that there would be minimal impact on queuing in the northbound lane of Racecourse Place and hence no improvements are required as part of the proposed development;

- the traffic assessment has included SIDRA analysis of intersections on the surrounding road network. The analysis included the intersections of Maloney Street with Evans Avenue and Gardeners Road. The analysis found that surrounding intersections would continue to operate at satisfactory or better levels of service;

- the existing marked foot crossing in Evans Avenue will be retained to provide pedestrian connectivity between the two sections of the site;

- a set down/pick-up area is proposed on the southern side of Evans Avenue (between the two sections of the site). This set down/pick up area would be used for people to be dropped off or picked up by private car, taxis or community buses;

- all service areas will be designed to comply with the requirements of AS2890.2-2002 with all vehicles entering and departing the site in a forward direction.

    - ***The EA shall consider those issues outlined within both the RTA's letter dated 22 March 2011 and the letter from NSW Transport dated 9 March 2011 (attached).***

3.68 The transport and accessibility impact assessment has addressed the matters raised by RMS and NSW Transport as follows:

- no closure of Racecourse Place is proposed as part of the this application;

- a detailed assessment of the traffic impacts of the proposed development are provided in Paragraphs 3.45 to 3.56. This includes estimates of traffic generation, traffic distribution and SIDRA analysis;

- an assessment of parking provision (paragraphs 3.18 to 3.28) access (paragraphs 3.29 and 3.30), and parking layout (paragraphs 3.31 to 3.30) are set out Chapter 3 of this report;

- details of service arrangements including number of service vehicles and arrival departure routes are set out in paragraphs 3.37 to 3.44;

- an assessment of non-car travel is provided in paragraphs 3.10 to 3.17. This includes an assessment of accessibility by public transport (buses), cycling and walking. Principles for a travel access guide have been prepared; and

- the transport and accessibility impact assessment has been prepared in accordance with the RTA's (now RMS) Guide to Traffic Generating Developments with reference to the transport policy documents made in paragraphs 3.3 to 3.9.

    - ***Appropriate on-site parking provision having regard to Council and RTA guidelines and the availability of public transport (Note: the Department supports reduced parking provision in areas well serviced by public transport).***

3.69 The proposed parking provision is considered appropriate and represents a balanced approach between providing appropriate parking while encouraging travel by means other than private car in an area well serviced by public transport.

Summary

3.70 In summary the main points relating to the traffic and accessibility impact assessment for the proposed development are as follows:

- it is proposed to redevelop the centre to provide a new shopping centre (retail 12,450m^2 GLA, an increase of some 920m^2) and residential (361 units and 82 serviced apartments);

- the proposed development would increase retail and employment densities close to residential areas and close to existing public transport services and is consistent with government policy objectives to reduce private car travel and encourage public transport use;

- a transport access guide will be implemented for the centre;

- parking provision is considered appropriate and represents a balanced approach between providing appropriate parking while encouraging travel by means other than private car in an area well serviced by public transport;

- access arrangements, internal circulation, and servicing will be provided in accordance with AS2890.1-2004 and AS2890.2-2002;

- the surrounding road network can accommodate the additional traffic generated by the proposed redevelopment. Surrounding intersections would continue to operate at satisfactory or better levels of service. There would be no changes to the environmental capacity of the adjacent streets; and

- the following works are proposed as part of the proposed development:

  - roundabouts at the intersections of Barber Avenue with Evans Avenue and St Helena Parade; and
  - upgrade of the existing roundabout at the intersection of Evans Avenue and Racecourse Place.

Location Plan

Colston Budd Hunt & Kafes Pty Ltd

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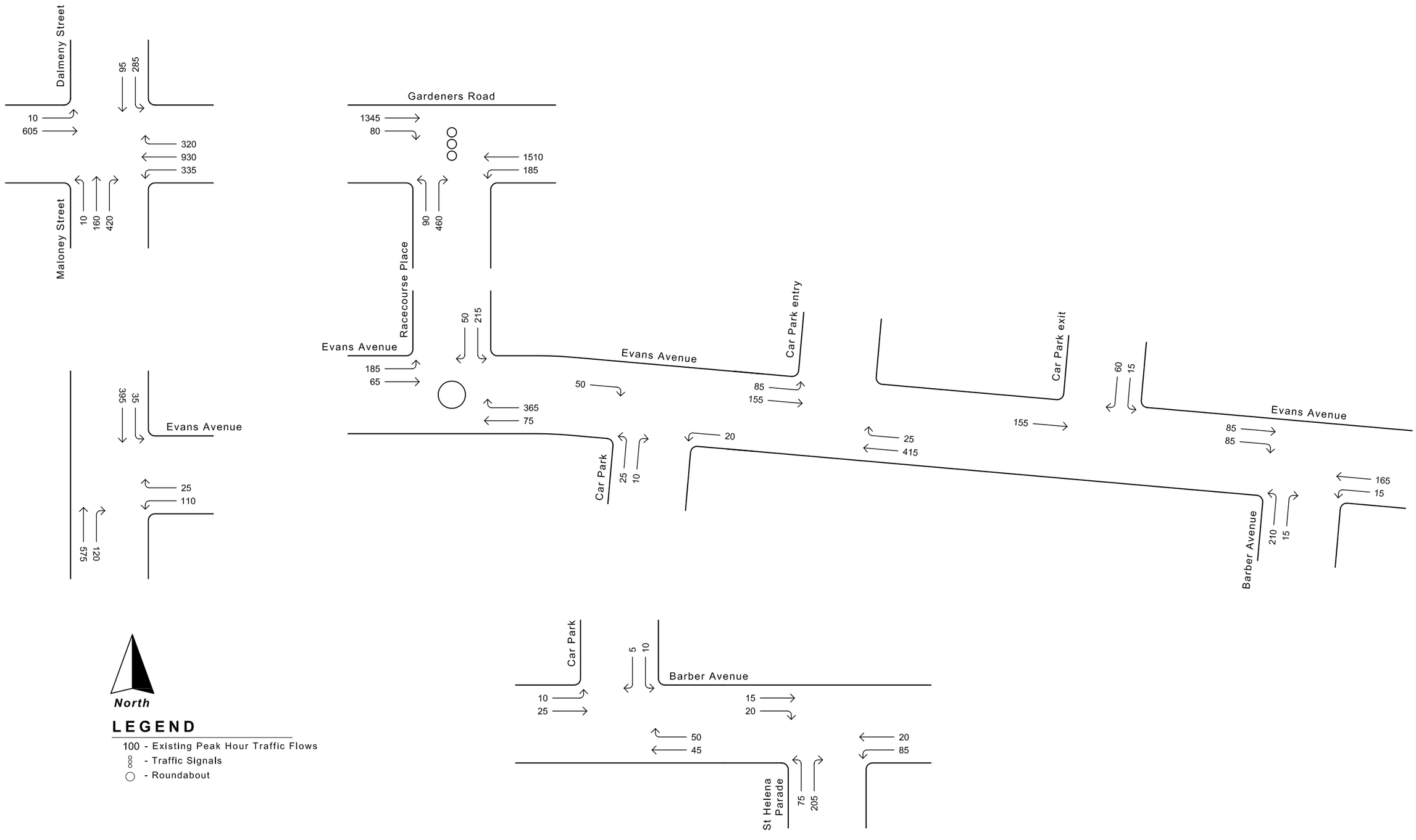
Figure 1



Existing Thursday morning peak hour traffic flows

Colston Budd Hunt & Kafes Pty Ltd

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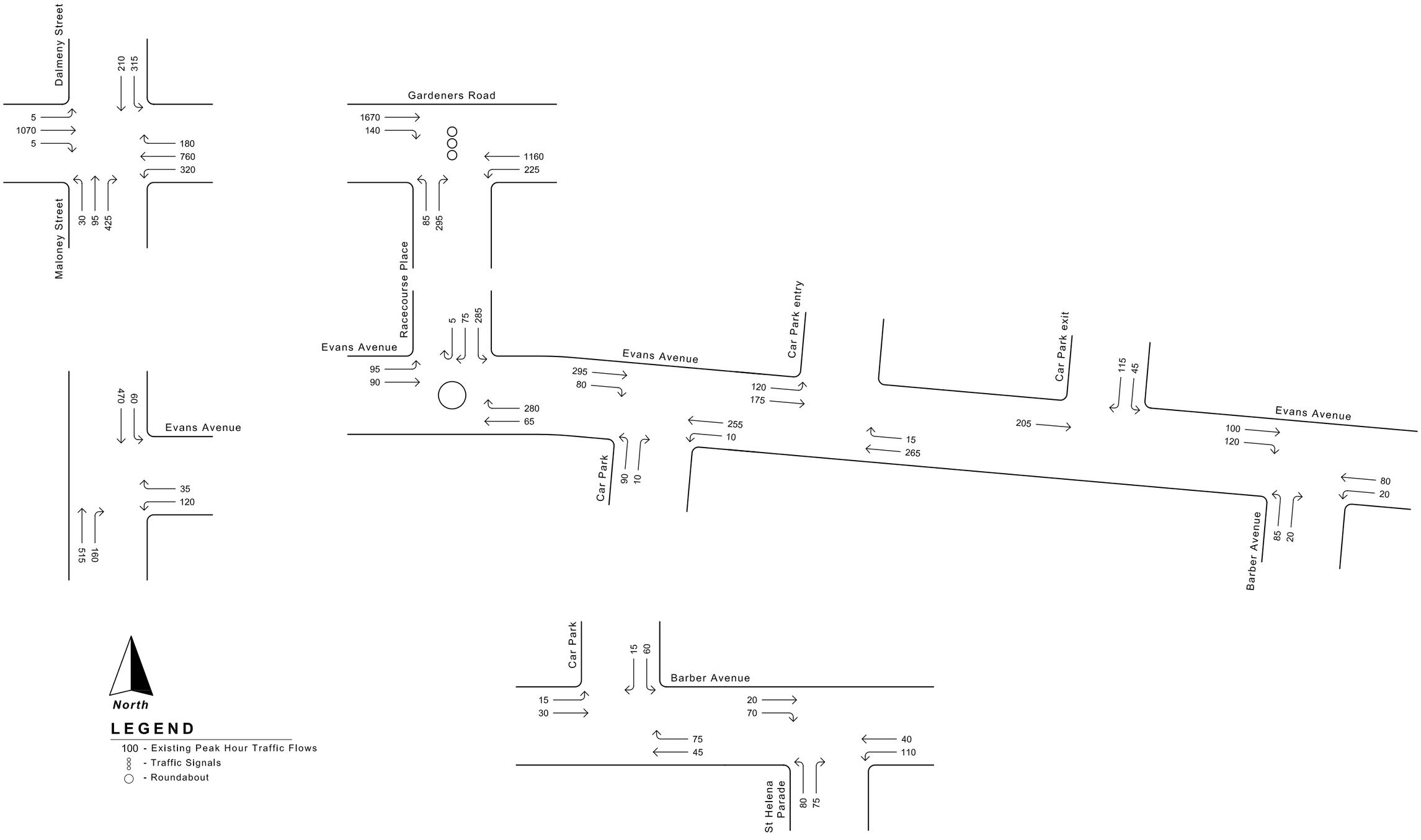
Figure 2



Existing Thursday afternoon peak hour traffic flows

Colston Budd Hunt & Kafes Pty Ltd

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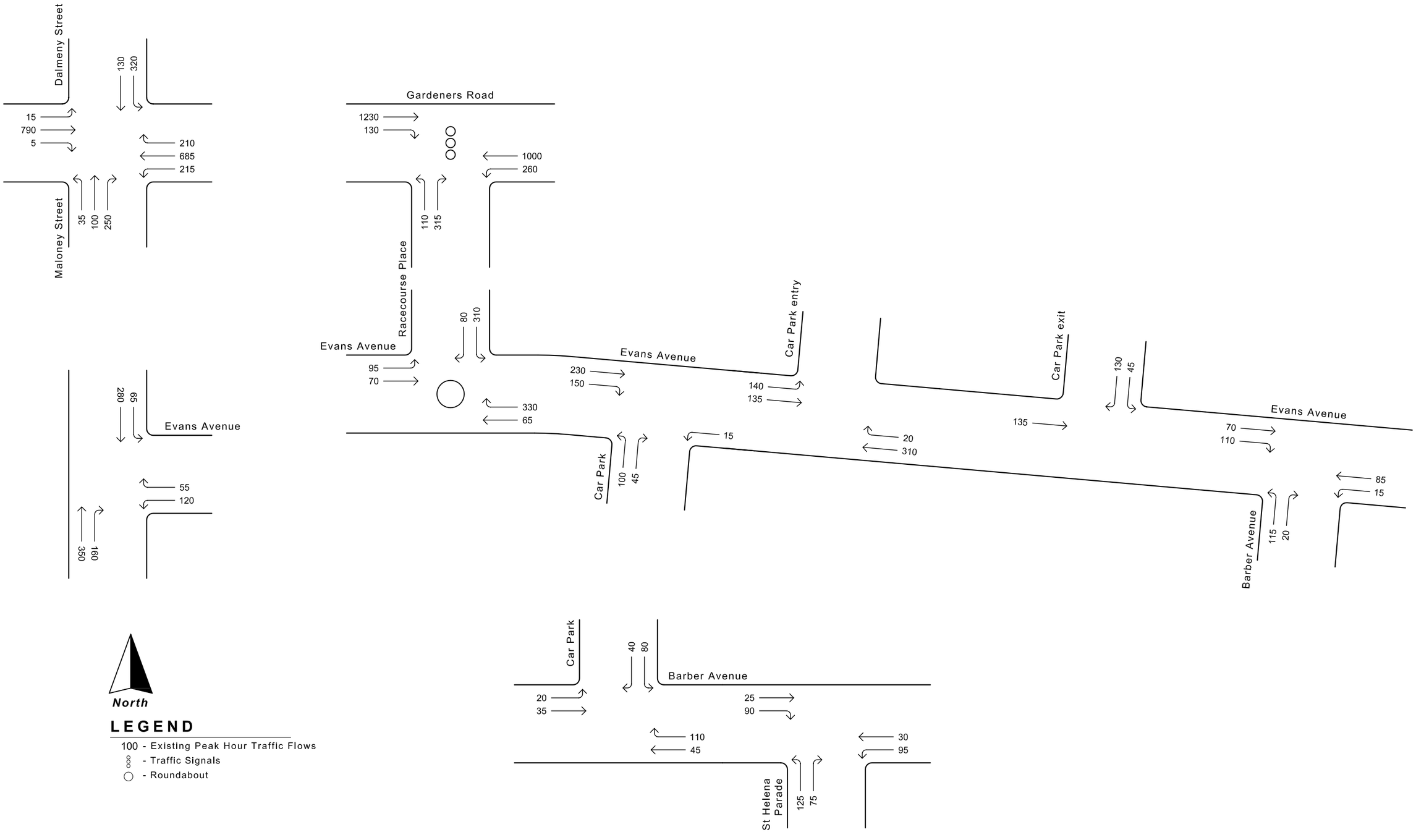
Figure 3



Existing Saturday midday peak hour traffic flows

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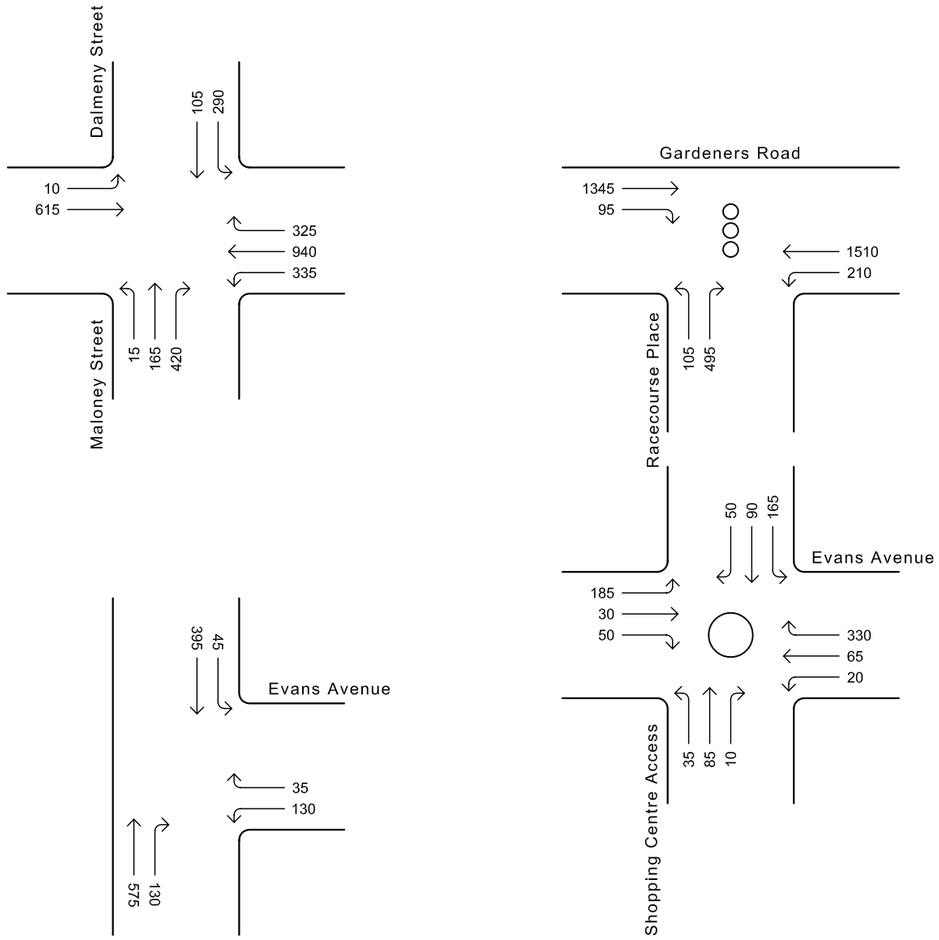
Figure 4



North

LEGEND

100 - Existing Peak Hour Traffic Flows
(+10) - Additional Development Traffic
- Traffic Signals
- Roundabout

Redistributed Thursday morning peak hour traffic flows plus development traffic

Colston Budd Hunt & Kafes Pty Ltd

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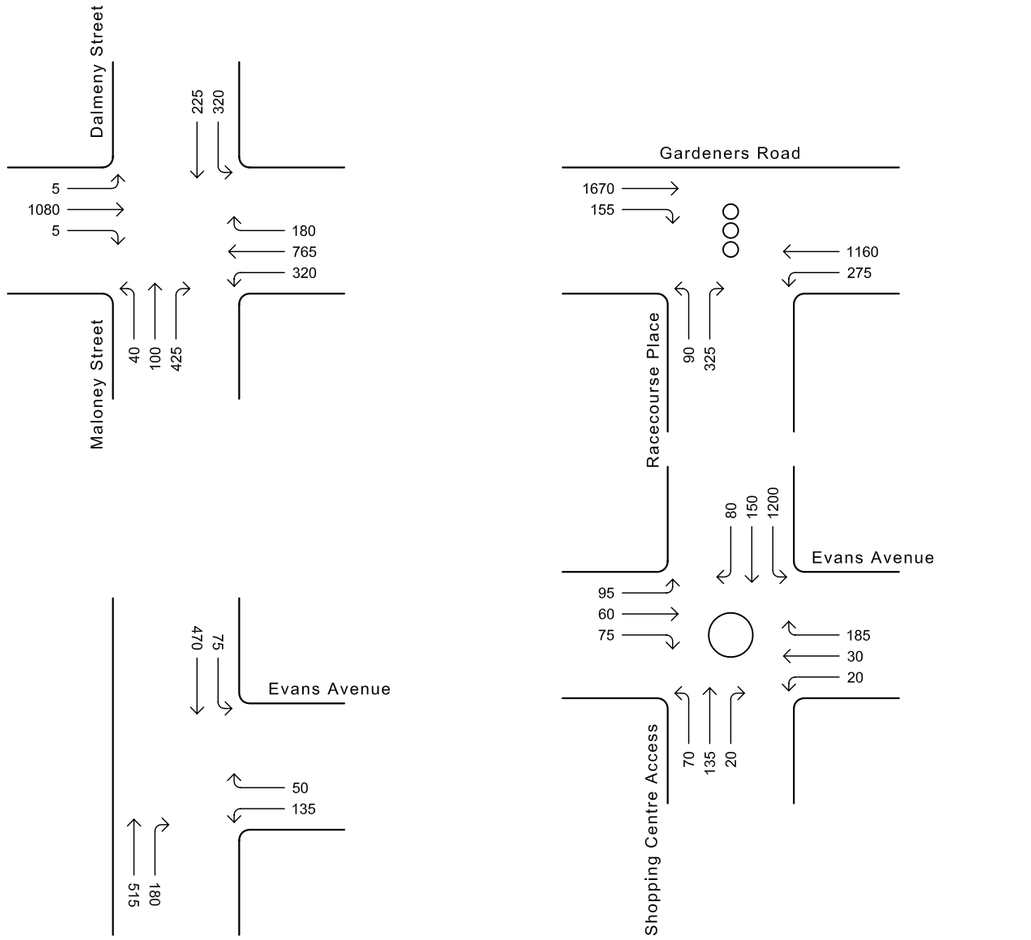
Figure 5



LEGEND

100 - Existing Peak Hour Traffic Flows
(+10) - Additional Development Traffic
- Traffic Signals
- Roundabout

Redistributed Thursday afternoon peak hour traffic flows plus development traffic

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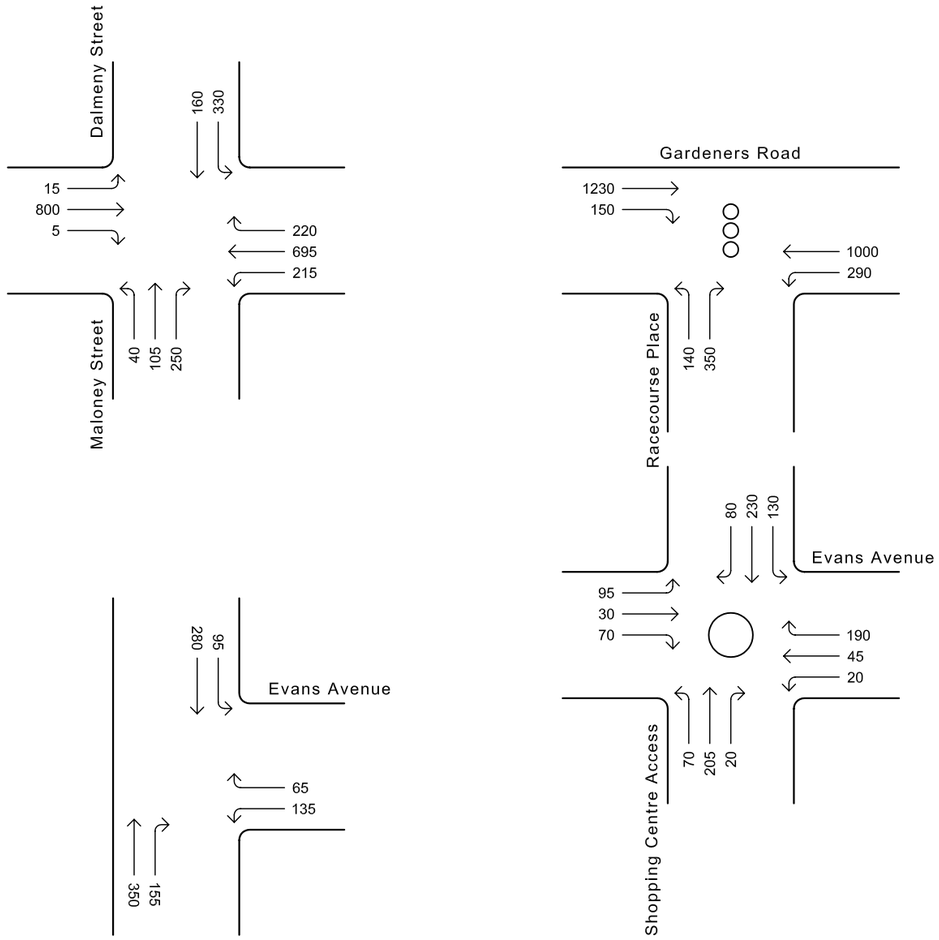
Figure 6



North

LEGEND

100 - Existing Peak Hour Traffic Flows
(+10) - Additional Development Traffic
- Traffic Signals
- Roundabout

Redistributed Saturday midday peak hour traffic flows plus development traffic

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Figure 7