COLUMBIA PRECINCT CONSORTIUM

TRANSPORT AND ACCESSIBILITY IMPACT ASSESSMENT FOR PART 3A CONCEPT PLAN APPLICATION FOR COLUMBIA PRECINCT AT HOMEBUSH

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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: 8095

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1. INTRODUCTION

1.1 Colston Budd Hunt & Kafes Pty Ltd has been commissioned by the Columbia Precinct Consortium to prepare the Transport and Accessibility Impact Assessment for the Part 3A Concept Plan Application for Columbia Precinct, Homebush. The Concept Plan comprises some 23,100m^2 of showrooms, retail, commercial and storage uses and some 645 residential apartments. The site location is shown in Figure 1.

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

"6. Transport and Accessibility

Prepare a Transport & Accessibility Impact Assessment 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 Transport & Accessibility Impact Assessment should consider traffic generation, any required road/intersection upgrades, access, loading dock(s) and car parking arrangements, existing public transport services, particularly to the adjoining Bakehouse Quarter and surrounding train stations.

An assessment of the implications of the proposed development for non-car travel modes (including all types of public transport, walking and cycling), and identifying measures to mitigate potential impacts on public/private transport, pedestrians and cyclists during the construction stage of the project.

7. Car Parking

The EA must demonstrate the adequate provision of on-site car parking for the proposal, having regard to local EPI controls and RTA guidelines. (Note: the Department supports reduced car parking rates in areas well-served by public transport).”

1.3 Our assessment is set down through the following changes:-

- Chapter 2 - Describing existing transport context;

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

2. EXISTING TRANSPORT CONTEXT

2.1 The existing transport context is described through the following sections:-

- site location;
- regional transport network;
- local road network;
- traffic flows;
- intersection operation;
- public transport;
- Bakehouse Quarter.

Site Location

2.2 The subject land is located as shown in Figure 1. Essentially defined as that land bounded by Parramatta Road, SRA railway land and Sydney Water's Powells Creek stormwater canal, it has an area of approximately 3 hectares. With the exception of public roadway and drainage land, the land is owned by three private landowners.

Regional Transport Network

2.3 The site is located close to the geographic centre of metropolitan Sydney. The site is adjacent to, and can readily access the major east-west routes of the M4 Western Motorway and Parramatta Road (Great Western Highway) and the major north-south ring route (Metroad 3) that runs along Homebush Bay Drive.

2.4 The east-west routes connect east to the City and onto the Eastern Suburbs. This route can be used to access the airport via Southern Cross Drive. The route connects west to Parramatta and on through the Western Suburbs to the Blue Mountains and areas beyond.

2.5 The north-south ring route (Metroad 3) provides a particularly useful regional link. The route crosses all the major radial routes serving the metropolitan area. The route connects to Victoria Road, Epping Road, M2 Motorway and Pacific Highway to the north. These roads provide links to the North Shore and Manly-Warringah. The route also connects, via Blaxland Road or Pacific Highway, to Pennant Hills Road and to the Sydney-Newcastle Freeway. Victoria Road, Blaxland Road and the M2 Motorway provide access to the Hills district.

2.6 The north-south ring route connects to the Hume Highway, M5 Motorway and Princes Highway to the south. The Hume Highway and M5 Motorway provide connections to the south-west to Liverpool, Campbelltown and on to Canberra and Melbourne. The Princes Highway serves the southern suburbs through to Sutherland and onto Wollongong.

Local Road Network

2.7 Currently the local road network serving the subject site is Columbia Lane. This laneway connects into Parramatta Road at an unsignalised T-intersection. All movements are provided at this intersection, with a right turn storage lane in Parramatta Road for movements into Columbia Lane.

Traffic Flows

2.8 Traffic generated by the proposed development will have its greatest effect during weekday morning and afternoon peak periods as well as Saturday midday. In order to gauge traffic conditions, counts were undertaken during these periods at the following intersections along Parramatta Road:-

- Concord Road/Leicester Avenue;
- Columbia Lane;
- George Street; and
- Knight Street.

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

2.10 This table shows that Parramatta Road carried some 1550 to 2100 vehicles per hour two-way during the morning peak hour period and some 1950 to 2650 vehicles per hour two-way during the afternoon peak hour period. On Saturday flows were some 1850 to 2150 vehicles per hour.

2.11 Traffic flows on Concord Road were some 2600 to 3000 vehicles per hour two-way during weekday peak periods. On Saturday flows were some some 2700 to 2800 vehicles per hour.

2.12 Traffic flows on Leicester Avenue were some 2000 to 2200 vehicles per hour two-way during weekday peak periods. On Saturday flows were some 2200 to 2300 vehicles per hour.

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

Road/Location	Weekday Morning	Weekday Afternoon	Saturday Midday
Parramatta Road			
- east of Conord Road	1565	1940	1865
- east of George Street	1835	1180	2125
- east of Knight Street	2060	2635	2130
- west of Knight Street	1790	2365	1860
Concord Road			
- north of Parramatta Road	2985	2665	2725
Leicester Avenue			
- south of Parramatta Road	2220	2080	2140
George Street			
- north of Parramatta Road	945	990	980
Knight Street			
- south of Parramatta Road	360	340	330
Columbia Lane			
- south of Parramatta Road	55	30	35

2.13 Traffic flows on George Street were some 900 to 1000 vehicles per hour two-way during weekday and Saturday peak periods.

2.14 Traffic flows on Knight Street were some 300 to 400 vehicles per hour two-way during weekday and Saturday peak periods.

2.15 Traffic flows on Columbia Lane were some 30 to 60 vehicles per hour two-way during weekday and Saturday peak periods.

Intersection Operation

2.16 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 shown in Figures 2, 3 and 4 have been analysed using the SIDRA program.

2.17 The SIDRA program 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. 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 roundabouts, 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

2.18 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.

2.19 The SIDRA analysis found that the signalised intersection of Parramatta Road and Concord Road/Leicester Avenue is operating with average delays of less than 55 seconds per vehicle during weekday and Saturday peak periods. This represents a level of service D, which is a satisfactory level of intersection operation.

2.20 The SIDRA analysis found that the signalised intersection of Parramatta Road and George Street is operating with average delays of less than 30 seconds per vehicle during weekday and Saturday peak periods. This represents a level of service C, which is a satisfactory level of intersection operation.

2.21 The SIDRA analysis found that the signalised intersection of Parramatta Road and Knight Street is operating with average delays of less than 20 seconds per vehicle during weekday peak periods and less than 15 seconds during Saturday lunchtime. These represent a level of service B, which is a good level of intersection operation.

2.22 The SIDRA analysis found that the unsignalised intersection of Parramatta Road and Columbia Lane is operating with average delays for all movements, with the exception of the right turn out of Columbia Lane into Parramatta Road, of less than 25 seconds per vehicle during the weekday and Saturday peak periods. This represents a level of service B, which is a satisfactory level of intersection operation.

2.23 It should be noted that the right turn movement out of Columbia Lane into Parramatta Road is a small movement. This movement was observed to use gaps in the traffic stream created by the up-stream and down-stream traffic lights.

Public Transport

2.24 The site is well located to the public transport networks. It is located within walking distance of two railway stations at Homebush and Strathfield. Homebush Station is some 300 metres from the site and Strathfield Station is some 900 metres.

2.25 Services on the two main lines through these stations generally operate with headways of some five to 10 minutes in each direction during peak periods and 10

to 15 minutes in each direction outside peaks. Passengers can transfer to and from other parts of the rail system at various locations, notably at Central.

2.26 Local and regional bus services through the area are provided by Sydney Buses. There are bus stops on both sides of Parramatta Road in the vicinity of the site. Bus services in the area include the following routes:-

- Route 408 - Flemington Station or Rookwood Cemetery to Burwood via Homebush and Strathfield;
- Route 458 - Ryde to Burwood via Rhodes, Concord Hospital, North Strathfield and Strathfield;
- Route 459 - Macquarie University to Strathfield via Macquarie Centre and Ryde;
- Route 525 - Sydney Olympic Park and Parramatta to Burwood via Newington and Strathfield;
- Route 526 - Sydney Olympic Park Wharf to Burwood via Newington and Strathfield.

2.27 Strathfield Railway Station also provides a major transport interchange for local and regional bus services operating in the area. Overall, the site has good access to existing public transport services.

Bakehouse Quarter

2.28 There is currently a Part 3A application for the Bakehouse Quarter, which is located on the opposite side of Parramatta Road to the Columbia Precinct. The proposed Bakehouse Quarter development comprises some 23,000m^2 commercial, some 500m^2 retail, some 800m^2 tavern, some 300m^2 restaurant, theatres (some 750 seats) and hotel (some 180 rooms with 350m^2 function area).

2.29 CBHK prepared the traffic and accessibility impact assessment to support the Part 3A application for the Bakehouse Quarter development. That report estimated that the proposed development would have traffic generations through the intersection of Parramatta Road and George Street of some 150 and 200 vehicles per hour, two-way, during the morning and afternoon peak periods respectively.

2.30 The traffic assessment in the following chapter takes into account the traffic generations of both the Columbia Precinct and Bakehouse Quarter developments.

3. TRAFFIC AND ACCESSIBILITY IMPACT ASSESSMENT

3.1 The proposed development comprises some 23,100m^2 of showrooms, retail, commercial, retail and self storage uses and some 645 residential apartments.

3.2 This chapter examines the implications of the proposed development through the following sections:-

- transport policy documents;
- public transport;
- pedestrian and cyclists;
- work place travel plan and transport access guide;
- parking provision;
- access and internal road layout;
- car parking arrangements and servicing;
- traffic generation and effects;
- principles of construction traffic management;
- consultation with RTA;
- Director-General's requirements; and
- Summary.

Transport Policy Documents

3.3 The Metropolitan Transport Plan, State Plan 2010, Integrated Land Use and Transport Policy Package and Planning Guidelines for Walking and Cycling are relevant transport documents for the proposed development. The four documents are discussed below.

Metropolitan Transport Plan

3.4 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
- revitalised neighbourhoods with improved transport hubs.

3.5 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.

3.6 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.

State Plan 2010

3.7 Chapter 1 of the NSW State Plan 2010 (Better Transport and Liveable Cities) 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.

3.8 It also has targets to:

- improve road safety and reduce fatalities to 4.9 per 100,000 population by 2016;
- increase the mode share of bicycle trips made in the metropolitan area to five per cent by 2016;
- increase the proportion of the population living within 30 minutes by public transport of a city or major centre in the metropolitan area; and
- provide capacity for 640,000 new dwellings between 2004 and 2031, including 445,000 in existing urban areas.

Integrated Land Use and Transport Policy Package (ILUT)

3.9 ILUT aims 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.

Planning Guidelines for Walking and Cycling

3.10 These guidelines aim to assist land-use planners and related professionals to improve consideration of walking and cycling in their work. Planning has an important role to play, particularly as it influences urban form, which sets the scene for walkability and cycleability for decades to come. It is anticipated that improving practice in planning for walking and cycling provide will create more opportunities for people to live in places with easy walking and cycling access to urban services and public transport. This will help reduce car use and create healthier neighbourhoods and cities.

3.11 The guidelines set down the benefits of a walkable and cycleable city as follows:

Equity: Give young people, older people and others without a car better access to employment, education and other urban services;

Livability: Reduce the stress, noise, air pollution and visual blight impacts of excessive car use on our neighbourhoods and give people more opportunities for interaction recreation and access to open space;

Cost-effectiveness: To make better use of public land, road systems and public transport infrastructure and to reduce household transport costs.

Health: Promote physical activity to lower the incidence of obesity, depression and other illnesses related to sedentary lifestyles;

Environment: Reduce greenhouse emissions, prevent loss of bushland to sprawling development and improve stormwater quality and flow by reducing the extent of paved surfaces and polluted road run-off;

Safety: Getting people out of cars onto public transport. Walking and cycling are an effective means of reducing the road toll. Crime can be reduced by providing opportunities for passive surveillance.

3.12 The following sections discuss public transport, pedestrians and cyclists, work travel plan and transport access guide, and parking provision in the context of the objectives set down in the transport policy documents.

Public Transport

3.13 As previously discussed, the site is well located to public and services in the area. It is located within walking distance of two railway stations at Strathfield, and Homebush. Services through these stations generally operate with headways of some five to 10 minutes in each direction during peak periods and 10 to 15 minutes in each direction outside of peaks. Bus services also link the site to surrounding areas and to local and regional services operating from Strathfield Railway Station interchange.

3.14 The proposed development provides opportunities to strengthen demand for existing public transport service in the area and provide appropriate access to the Columbia Precinct by these services. Increasing retail and employment densities close to residential areas and close to existing public transport services is consistent with government policy. A public transport strategy will encourage the use of public transport and minimise travel by private vehicles as follows:-

- provide a mix use of employment and residential uses;
- improve the quality of services to minimise the need to travel by private vehicle;
- contain employee car travel and constrain car usage in accordance with government policy; and
- implement work travel plan and transport access guide.

3.15 The proposed development satisfies the objectives of the transport policy documents as follows:-

- the site is highly accessible to public transport services, which offer viable alternatives to travel by car. To support accessibility for cyclists, appropriate parking will be provided for bicycles. The site is also readily accessible for pedestrians, being close to public transport nodes and existing pedestrian connections and footpaths around the site;
- the location of the site and an appropriate level of on-site parking will improve the choice of transport mode and reduce the use of cars for travel purposes;

- the opportunity to moderate demand for travel and distance travelled will be provided by the development being close to existing residential populations and hence providing employment opportunities within a short distance; and

- greater employment and residential densities will provide more potential customers for the existing public transport services and hence support their efficient and viable operation.

Pedestrian and Cyclists

3.16 The proposed development is designed with the opportunity to optimise the use of pedestrian connections to Homebush Station and Homebush Village via Station Street and the pedestrian overpass at the Station Platform. Existing pedestrian access along Parramatta Road to Station Street would remain and be enhanced with the development of the proposed new park fronting Parramatta Road. Additionally the design is intended to take advantage of the existing right-of-footway over the land at 14-16 Station Street (SP67838). This footway, combined with the eventual development of Lot 2 DP814227 as public open space can together provide a shorter means of accessing the station and village. New pedestrian bridges over the Powells Creek stormwater channel will link this passage to the centre of the proposed development.

3.17 It is proposed to extend George Street across Parramatta Road and into the development site along the same alignment by which George Street is laid out on the north side of Parramatta Road. This will allow for the greatest visual connection between the opposite sides of Parramatta Road and will coincide with the location of pedestrian crossing of Parramatta Road at the existing signalised intersection. The new main street is designed to be an extension of George Street from within the Bakehouse Quarter. It will adopt the same alignment of

the existing George Street to promote the visual connectivity between the two areas. It is designed to have large footpath and outdoor seating areas and a high level of streetscape design, detailing and furnishing. Mixed-use commercial ground floor spaces will open directly to the footpath helping to activate this space by generating regular pedestrian traffic. Vehicle traffic will also complement the activity of the street, however the streetscape design will reinforce the street as being a low speed zone for vehicle traffic.

3.18 The proposed new park on the south side of Parramatta Road also has the opportunity to provide the location for a pedestrian/cycle bridge across Parramatta Road linking the new park to the Powells Creek reserve corridor to the north of Parramatta Road, the Bakehouse Quarter and North Strathfield Station.

3.19 The existing footpath network along Parramatta Road and Cooper Street Strathfield provides pedestrian access to Strathfield Station. The proposed development allows for the potential future pedestrian/cyclist access through the new proposed park and linking into potential future pedestrian access, using the railway viaduct and through the railway land to the south-east of the site and on to Strathfield Town Centre. This type of route would reduce the distance to Strathfield Station by some 100 to 200m and provide a primarily off-road cycle pedestrian route as a continuation of the Powells Creek Reserve Corridor.

3.20 The proposed new park on the south side of Parramatta Road also has the opportunity to provide the location for a pedestrian/cycle bridge over Parramatta Road linking the new park to the Powells Creek reserve corridor to the north of Parramatta Road. This link would allow for pedestrian/cyclist access to the full extent of the Powells Creek reserve corridor, providing access to Bicentennial

Park, Sydney Olympic Park, and the Rhodes Peninsula within a range of 2 to 4 kms of the development site.

3.21 The proposed pedestrian and cyclist facilities will satisfy the transport policy objectives of increasing the use of travel modes other than by car.

Work Place Travel Plan and Transport Access Guide

3.22 To encourage travel modes other than private vehicle, it is proposed to adopt a travel demand management approach, through a work place travel plan for employees and transport access guide for residents. The specific requirements and needs of the future tenants and residents will be incorporated in the work place travel plan and transport access guide to support the objectives of encouraging the use of public transport.

3.23 The principles of the work place travel plan and travel access guide, to be developed by the future tenants and residents in consultation with authorities, will include the following:-

- encourage the use of public transport, including rail services through Strathfield and Homebush Railway Stations;
- work with public transport providers to improve services;
- encourage public transport by employees and residents through the provision of information, maps and timetables;
- raise awareness of health benefits of walking (including maps showing walking routes);

- encourage cycling by providing safe and secure bicycle parking, including the provision of lockers and change facilities;

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

3.24 The work travel plan and travel access guide may take a variety of forms including a green transport plan or company travel plan. These will assist in delivering the transport policy 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

3.25 The proposed development comprises the following:-

- storage facilities (Kennards), some 14,400m^2;
- showrooms, some 3,480m^2;
- retail, some 1,300m^2;
- commercial, some 3,000m^2;
- community facilities, some 920m^2;
- some 645 residential units comprising 39 studios, 210 one bedroom, 302 two bedroom, and 94 three bedroom units.

3.26 Strathfield DCP No. 20 – Parramatta Road Corridor Area specifies the following parking requirements:

- Retail development - 1 spaces per 50m^2 (for shops less than 500m^2);
- Office development - 1 spaces per 100m^2 (offices less than or equivalent to 1000m^2 GFA);
- Residential flat buildings - 1 space per 1 and 2 bedroom units;
  1.5 spaces per 3 or more bedroom units;
  1 space per 5 units for visitors.

3.27 With regards to **storage** facilities and showrooms, DCP20 does not have specific rates of parking provision. The RTA Guide also does not have specific rates for these uses.

3.28 With regards to **retail**, the DCP20 rate of 1 space per 50m^2 (2 spaces per 100m^2) is less than the RTA Guide rate formula of 4.5 spaces per 100m^2 for specialty shops. Given the site's proximity to public transport and surrounding residential uses, it is considered appropriate to use the DCP rate of 1 space per 50m^2 for the retail shops.

3.29 With regards to **commercial**, the DCP20 rate of 1 space per 100m^2 is less than the RTA Guide rate of 1 space per 40m^2 (2.5 spaces per 100m^2). Given the site's proximity to public transport services, the DCP rate of 1 space per 100m^2 for commercial is considered appropriate.

3.30 With regards to the **residential** apartments, the DCP20 rate of 1 space per one bedroom unit compares with the RTA Guide rate for sub-regional centres of 0.6 spaces. Given the site's proximity to public transport, a rate of 0.5 spaces per one bedroom unit is considered appropriate. The DCP20 rate of 1 space per two

bedroom unit and 1.5 spaces per three bedroom unit compares with the RTA Guide rate for sub-regional centres of 0.9 and 1.4 respectively. Given the site's proximity to public transport services, a rate of 1space per unit for two and three bedroom units is considered appropriate.

3.31 The DCP20 rate for visitor parking is 1 space per 5 units, which is the same as the RTA Guide rate. Given the proximity to public transport services, a rate of 1 space per 7 units for visitor parking is considered appropriate.

3.32 With regards to **showrooms**, parking demand would be less than that for retail shops. A parking rate of 1 space per 100m^2 (compared to 1 space per 50m^2 for the retail shops) is considered appropriate.

3.33 With regards to the **storage** facilities, Kennards have indicated that a parking provision of 1 space per 150m^2 would be appropriate.

3.34 Finally, the **community facilities** would be expected to only generate small additional parking demands. A rate of 1 space per 200m^2 is considered appropriate.

3.35 Therefore, **in summary**, the proposed parking rates for the Columbia Precinct are as follows:-

- storage facilities, 1 space per 150m^2;
- showrooms, 1 space per 100m^2;
- retail, 1 space per 50m^2;
- commercial, 1 space per 100m^2;
- community facilities, 1 space per 200m^2;

- residential;
  - studio unit, 0.5 spaces per unit;
  - one bedroom, 0.5 spaces per unit;
  - two bedroom, 1 space per unit;
  - three bedroom, 1 space per unit;
  - visitor parking, 1 space per 7 units.

3.36 Based on these parking rates, the parking provision for the proposed development will be 806 spaces comprising:-

- storage facilities - 96 spaces;
- showrooms - 35 spaces;
- retail - 26 spaces;
- commercial - 30 spaces;
- community - 5 spaces;
- residential - 521 resident spaces and 93 visitor spaces.

3.37 This parking provision is consistent with the objectives of the transport policy documents to reduce traffic generation by reducing parking provision.

Access and Internal Road Layout

3.38 In association with the proposed development, access to the site will be provided via a new access road onto the signalised intersection of Parramatta Road and George Street. Columbia Lane will be retained as a one-way entry access from Parramatta Road. The extension of George Street south of Parramatta Road is proposed to incorporate two northbound and two southbound traffic lanes at its intersection with Parramatta Road.

3.39 In association with the proposed Bakehouse Quarter development, it is proposed to reconfigure the traffic lane arrangements in George Street on approach to its intersection with Parramatta Road to incorporate three southbound lanes (one left turn lane and two right turn lanes) and one northbound lane.

3.40 The intersection of Parramatta Road and George Street, as shown on Figure 4, is proposed to include:-

- Parramatta Road
  - widen Parramatta Road adjacent to the site, between Columbia Lane and the stormwater channel, to provide three westbound traffic lanes;
  - retention of two eastbound traffic lanes in Parramatta Road;
  - provision of a new right turn storage lane of some 40 metres in Parramatta Road eastbound;
  - retention of the right turn storage lane in Parramatta Road westbound;
- George Street North
  - three southbound lanes (one left turn lane, a shared through and right turn lane and a right turn lane) and one northbound lane;
- George Street South
  - two northbound lanes (one left turn lane and a shared through and right turn lane) and two southbound lanes.

3.41 Columbia Lane is proposed to be one-way southbound and access from Parramatta Road is likely to be restricted to left turn entry only. The existing right turn access into Columbia Lane will be removed with the provision of a central median in Parramatta Road and an extension of the right turn storage lane for vehicles turning right into George Street north. All departing traffic will do so via the new signals at George Street.

3.42 A series of new service roads will be provided with access to the various buildings within the site, as well as maintaining access to SRA and Energy Australia land to the south. These service roads will provide one traffic lane and one parking lane in each direction, clear of intersections. The roads and intersections within the site will be designed to cater for service vehicles ranging from large rigid trucks to occasional articulated vehicles, requiring access to the SRA and Energy Australia land.

3.43 The internal road layout and the proposed traffic management measures to manage and control vehicular and pedestrian activity within the site are shown on plans prepared by PD Mayoh Architects.

3.44 The road layout has been designed to provide appropriate access arrangements to the proposed development, maintain access for SRA and Energy Australia service vehicles, provide appropriate traffic capacity at intersections within the site and where possible utilise existing road alignments and connections. The road layout will incorporate pedestrian footpaths along the internal roads. Pedestrian connections will be developed, with primary pedestrian routes through the site and public areas linking to Parramatta Road and to public transport facilities.

3.45 The internal road layout and traffic management measures will provide appropriate vehicular and pedestrian connectivity. The proposed arrangements are considered to be functional and appropriate measures to service the proposed development.

Car Parking Arrangements and Servicing

3.46 Car parking associated with the proposed development will be provided in a mix of basement, at-grade and above ground parking. For efficient operation and to spread traffic on the internal road network, parking areas will be provided throughout the site with separate points of entry and exit. Access driveways will be designed to provide for vehicles to enter and exit the car parking areas in a forward direction.

3.47 Access points will be located in appropriate locations relative to intersections within the site. Appropriate queuing space will be provided at the car park entries. The amount of queuing space will depend on the number of spaces provided within the various parking areas. The Australian Standard for Off-street car parking facilities (AS2890.1-2004) recommends that the queuing area should be no steeper than 1 in 10 for at least 80 per cent of the queue length. Ramps will be no steeper than 1 in 20 for the first six metres from the boundary and a maximum grade of 1 in 6 for ramps longer than 20 metres.

3.48 The proposed access arrangements will be provided to cater for the swept paths of cars entering and exiting the car parking areas and will be designed in accordance with AS2890.1-2004.

3.49 Car parking areas will be provided in close proximity to the various buildings within the site. The design of the parking areas will be finalised at the time

development applications are prepared for the individual buildings. Parking areas will be designed in accordance with the Australian Standard for Off-street car parking facilities AS2890.1-2004 and for Off-street disabled parking facilities AS2890.6-2009. Car parking will be provided with dimensions of 2.4 metres wide by 5.4 metres long for residential and commercial tenant spaces and 2.5 to 2.6 metres wide by 5.4 metres long for retail customer and visitor spaces. Adjacent two-way circulation aisles will be provided with aisle widths of 5.8 metres to 6.6 metres, clear of structure.

3.50 Car parking spaces located adjacent to structure will be widened by 300mm to allow for appropriate door opening zones and columns will be set back 750mm from the front of the parking spaces to allow convenient access. Dead end aisles will be extended by one metre to allow appropriate access to end parking bays.

3.51 A proportion of spaces will be allocated for disabled motorists. These spaces will be provided with dimensions of 2.4 metres wide, with an additional 2.4 metre shared zone adjacent to the space, by 5.4 metres long. Height clearance of 2.5 metres will be provided above disabled parking spaces, with 2.2 metres within the remainder of the car park, clear of services and structure.

3.52 Access between the various parking levels will generally be provided by two-way vehicular ramps allowing convenient access and circulation through each of the parking levels. Ramps will be provided with maximum grades of 1 in 5 for ramps less than 20 metres, with transitions of 1 in 10 at the top and bottom of each ramp. Ramps longer than 20 metres will have a maximum grade of 1 in 6. Ramp grades, transitions, widths and clearance will be provided in accordance with AS2890.1-2004.

3.53 Appropriate provision for service vehicles, including garbage collection, maintenance vehicles and deliveries will be made on-site. The development will

be serviced by a range of vehicle sizes from small to large rigid trucks. In addition, provision will be made for articulated vehicles to access the SRA and Energy Australia land to the south of the site.

3.54 The design of the service areas will provide for service vehicles to enter and exit the site in a forward direction. Service bays, manoeuvring areas, circulation aisles and height clearances will be provided for the swept paths of these vehicles in accordance with the Australian Standard for Off-street commercial vehicle facilities AS2890.2-2002. Service vehicle areas will be finalised at the time development applications are prepared for the individual buildings.

Traffic Generation and Effects

3.55 Traffic generated by the proposed development will have its greatest effects during the weekday morning and afternoon peak periods and Saturday midday.

3.56 With regards to **retail uses**, the RTA Guide formula for a Thursday afternoon gives a generation rate of 4.6 vehicles per hour two-way per 100m^2 for specialty shops. This is based on the RTA Guide formula of 4.5 parking spaces per 100m^2. However, the proposed parking provision for retail uses in the Columbia Precinct development is 2 spaces per 100m^2. Given that the generation is directly proportional to the parking provision, the Thursday afternoon generation would therefore be expected to be 2 vehicles per hour two-way per 100m^2 of retail. The morning generation would be lower than the afternoon and we have used one vehicle per hour two-way per 100m^2 of retail. Similarly, the RTA Guide formula for a Saturday midday gives a peak generation of 10.7 vehicles per hour, two-way, per 100m^2 of specialty shops. With the retail parking provision being 2 spaces instead of 4.5 spaces per 100m^2, the Saturday midday generation of the shops would be 4.8 vehicles per hour, two-way.

3.57 With regards to **commercial**, the RTA Guide gives a weekday generation rate of 2 vehicles per hour, two-way, per 100m^2, based on a provision of 2.5 parking spaces per 100m^2. However, the proposed provision for commercial uses is 1 parking space per 100m^2. The weekday morning and afternoon peak period generation would therefore be expected to be 0.8 vehicles per hour, two-way, per 100m^2 of commercial. The Saturday midday generation would be much lower and we have used 0.2 vehicles per hour, two-way, per 100m^2 of commercial.

3.58 With regards to **residential**, the RTA Guide for weekday peak periods gives a rate of 0.29 vehicles per hour, two-way, per unit for sub-regional locations. This is based on the RTA Guide parking rate of 0.6, 0.9 and 1.4 parking spaces for one, two and three bedrooms respectively. The proposed parking provisions for the Columbia Precinct development are lower, at 0.5 per 1 bedroom units, and 1 space per two or three bedroom units. We have therefore used a rate of 0.26 vehicles per hour, two-way, per unit for weekday mornings and afternoons. We have used the same rate for Saturday midday.

3.59 With regards to **showrooms**, the RTA Guide does not have a specific rate. The proposed parking provision for the showroom is 1 parking space per 100m^2 (compared to the retail provision of 2 parking spaces per 100m^2). We have used generation rates for the showrooms of 0.5, 1 and 2.4 vehicles per hour two-way, per 100m^2 for the weekday morning, weekday afternoon and Saturday midday respectively. This compares to 1, 2, and 4.8 vehicles per hour respectively for the retail shops.

3.60 With regards to the **storage facilities**, the use of Kennards during weekday peak periods and Saturday midday is relatively small. Based on the proposed parking

provision of 1 parking space per 150m^2 we have used a traffic generation of 0.4 vehicles per hour, two-way, per 100m^2 for the weekday morning, weekday afternoon and Saturday midday.

3.61 With regards to the **community facilities**, the use of these facilities during weekday peak periods and Saturday midday will be relatively small. Based on the proposed parking provision of 1 parking space per 200m^2, we have used a traffic generation of 0.5 vehicles per hour, two-way, per 100m^2 for the weekday morning, weekday afternoon and Saturday midday.

3.62 Hence, in summary, our traffic assessment of the proposed Columbia Precinct development has been based on the following hourly generation rates per 100m^2, two way:

- morning peak period
  - retail, 1 vehicle per hour;
  - commercial, 0.8 vehicles per hour;
  - showrooms, 0.5 vehicles per hour;
  - storage, 0.4 vehicles per hour;
  - community facilities, 0.5 vehicles per hour;
  - residential, 0.26 vehicles per hour;

- afternoon peak period
  - retail, 2 vehicles per hour;
  - commercial, 0.8 vehicles per hour;
  - showrooms, 1 vehicles per hour;
  - storage, 0.4 vehicles per hour;
  - community facilities, 0.5 vehicles per hour;
  - residential, 0.26 vehicles per hour;

- Saturday midday
  - retail, 4.8 vehicles per hour;
  - commercial, 0.2 vehicles per hour;
  - showrooms, 2.4 vehicles per hour;
  - storage, 0.4 vehicles per hour;
  - community facilities, 0.5 vehicles per hour;
  - residential, 0.26 vehicles per hour.

3.63 Based on the above generation rates, the proposed development would have the following two-way hourly generations:-

- weekday morning
  - some 285 vehicles;
- weekday afternoon
  - some 320 vehicles;
- Saturday midday
  - some 385 vehicles.

3.64 Some of this traffic would be passing traffic, that is already in the existing traffic flows driving past the site. For the retail and showroom traffic we have based our analysis on 25 per cent passing trade, which is the percentage given in the RTA Guide.

3.65 The additional traffic from the proposed Columbia Precinct development has been assigned to the road network, as well as the additional traffic that will be generated by the Bakehouse Quarter development. As noted in Chapter 2, that development is expected to generate some 150 and 200 vehicles per hour two-way through the intersection of Parramatta Road and George Street, during morning and afternoon peak periods. During Saturday midday we have used a

generation of some 200 vehicles per hour two-way through the intersection, for the Bakehouse Quarter development.

3.66 Existing traffic flows plus the additional traffic generated by the Columbia Precinct and Bakehouse Quarter developments are shown on Figures 5, 6 and 7, and summarised in Table 3.1.

3.67 This table shows that flows on Parramatta Road would increase by some 100 to 230 vehicles per hour two-way during the morning peak hour period and by some 130 to 250 vehicles per hour two-way during the afternoon peak hour period. On Saturday flows would increase by some 150 to 280 vehicles per hour.

3.68 Traffic flows on Concord Road would increase by some 50 vehicles per hour two-way during weekday peak periods and Saturday midday.

3.69 Traffic flows on Leicester Avenue would increase by some 30 to 40 vehicles per hour two-way during weekday peak periods. On Saturday flows would increase by some 50 vehicles per hour.

Table 3.1: Existing Two-Way (Sum of Both Directions) Peak Hour Traffic Flows Plus Bakehouse Quarter and Columbia Precinct Traffic

Road/Location	Weekday Morning			Weekday Afternoon			Saturday Midday		
	EX	CP	BQ	EX	CP	BQ	EX	CP	BQ
Parramatta Road									
- east of Conord Road	1565	+60	+45	1940	+75	+60	1865	+90	+60
- east of George Street	1835	+105	+125	1180	+115	+140	2125	+140	+140
- east of Knight Street	2060	+105	+75	2635	+125	+100	2130	+150	+100
- west of Knight Street	1790	+105	+75	2365	+125	+100	1860	+150	+100
Concord Road									
- north of Parramatta Road	2985	+25	+25	2665	+30	+20	2725	+30	+20

Leicester Avenue - south of Parramatta Road	2220	+20	+15	2080	+20	+20	2140	+30	+20
George Street - north of Parramatta Road	945	+80	+100	990	+80	+160	980	+130	+160
George Street (Extension) - south of Parramatta Road	-	+280	-	-	+310	-	-	+375	-
Knight Street - south of Parramatta Road	360	-	-	340	-	-	330	-	-
Columbia Lane - south of Parramatta Road	55	+10	-	30	+10	-	35	+10	-

3.70 Traffic flows on George Street would increase by some 180 to 250 vehicles per hour two-way during weekday peak periods. On Saturday flows would increase by some 250 to 300 vehicles per hour.

3.71 In association with the proposed development Columbia Lane will be changed to one-way southbound and access from Parramatta Road will be restricted to left turn entry only. Traffic flow in Columbia Lane would be some 20 to 30 vehicles per hour one-way during weekday peak periods and on Saturdays.

Intersection Operation

3.72 The intersections previously analysed in Chapter 2 were re-analysed with the additional traffic from the two developments.

3.73 The SIDRA analysis found that with the additional traffic, the signalised intersection of Parramatta Road and Concord Road/Leicester Avenue would continue to operate with average delays of less than 55 seconds per vehicle during weekday and Saturday peak periods. This represents a level of service D, which is a satisfactory level of intersection operation.

3.74 The SIDRA intersection analysis found that with the additional traffic, the signalised intersection of Parramatta Road and George Street as a four way intersection would operate with average delays of less than 42 seconds per vehicle during weekday peak periods and on Saturdays. This represents a level of service C, which is a satisfactory level of intersection operation.

3.75 The SIDRA analysis found that with the additional traffic, the signalised intersection of Parramatta Road and Knight Street would operate with average delays of less than 20 seconds per vehicle during weekday peak periods and less than 15 seconds during Saturday lunchtime. These represent levels of service B and A, which are satisfactory levels of intersection operation.

Principles of Construction Traffic and Pedestrian Management

3.76 At this stage the overall construction methodology, process and staging has not been defined. The builder will be responsible for the preparation of a traffic management plan, which will be prepared prior to the commencement of work, taking into account relevant consent conditions.

3.77 Construction of the development will commence with site preparation works and demolition of the existing buildings on the site. Construction access will be provided to/from Parramatta Road and Columbia Lane.

3.78 Pedestrian footpaths adjacent to the site will be maintained during the construction period. Class A and B construction fencing will be erected around the perimeter of the site, with overhead protection provided where required.

3.79 Openings in the construction fencing and the construction access driveways will be managed and controlled by traffic controllers. The movement of trucks entering and exiting the site will be managed and controlled by traffic controllers.

3.80 The overall principles for traffic management during construction will be:-

- provide a convenient and appropriate environment for pedestrians;
- minimise effects on pedestrian movements and amenity;
- provide appropriate safe fencing/hoardings around the perimeter of the construction site;
- management and control vehicular movements to and from the site;
- provide work zones on adjacent streets where required;
- maintain other existing on-street parking in the vicinity of the site;
- maintain access to existing facilities 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 to enter and exit the site in a forward direction;
- construction activity to be carried out in accordance with approved hours of construction;

- maintain safety for workers;

- maintain access to public transport and encourage workers to travel to/from the site by these services;

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

Consultation with RTA

3.81 A meeting was held with RTA senior officers on 17 February to discuss access arrangements for the proposed Columbia Precinct development.

3.82 With regards to the proposed four-way intersection of Parramatta Road and George Street, it was noted that the signalised intersection is likely to be phased as a double diamond, with pedestrian crossings on the four legs.

3.83 RTA officers requested that this intersection be modelled to determine levels of service and queue lengths. This report provides that information.

3.84 RTA officers requested that the intersection concept drawings for the Parramatta Road/George Street intersection need to be clearly prepared to scale, and in accordance with the CAD survey information and noting affected utility services. This plan will be prepared by the civil engineers.

3.85 The probable need to retain the existing Kennards building on Parramatta Road as well as the Columbia Lane was also discussed.

3.86 RTA officers noted that their first preference would be to close Columbia Lane altogether, once the fourth leg was added opposite George Street. Their second preference would be left-in only. They would not favour left-out, due to likely conflict with the intended widening of Parramatta Road westbound.

3.87 RTA officers suggested that it might be desirable to extend the existing westbound right-turn bay from Parramatta Road to George Street north, regardless of the Columbia Precinct development, which would close the eastbound right turn into Columbia Lane. It was noted that the SRA and Energy Australia also currently use that access. This report discusses the appropriateness of Columbia Lane providing access to the proposed development.

3.88 RTA officers acknowledged the high public transport accessibility of this site, and would expect lower-than-average car ownership and private trip generation rates. They requested information regarding parking provision and traffic effects. This report provides that information.

Director-General's Requirements

3.89 Requirement No.6 is as follows:-

"6. Transport and Accessibility

Prepare a Transport & Accessibility Impact Assessment 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 Transport & Accessibility Impact Assessment should consider traffic generation, any required road/intersection upgrades, access, loading dock(s) and car parking arrangements, existing public transport services, particularly to the adjoining Bakehouse Quarter and surrounding train stations.

An assessment of the implications of the proposed development for non-car travel modes (including all types of public transport, walking and cycling), and identifying measures to mitigate potential impacts on public/private transport, pedestrians and cyclists during the construction stage of the project."

3.90 Reference to the transport policy documents is made in paragraphs 3.3 to 3.12.

3.91 The transport and accessibility impact assessment has been prepared in accordance with the RTA's Guide to Traffic Generating Developments.

3.92 Traffic generation, traffic effects and roadworks are discussed in paragraphs 3.55 to 3.80. Access and internal road layout are discussed in paragraphs 3.38 to 3.54.

3.93 Public transport is discussed in paragraphs 3.13 to 3.15. Pedestrians and cyclists are discussed in paragraphs 3.16 to 3.21. The work travel plan and transport access guide are discussed in paragraphs 3.22 to 3.24. Construction traffic and pedestrian management are discussed in paragraphs 3.76 to 3.80.

3.94 Requirement No.7 is as follows:-

"7. Car Parking

The EA must demonstrate the adequate provision of on-site car parking for the proposal, having regard to local EPI controls and RTA guidelines. (Note: the

Department supports reduced car parking rates in areas well-served by public transport).”

3.95 Car parking is discussed in paragraphs 3.25 to 3.37.

Summary of Findings

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

i) the proposed mix used development includes some 23,100m^2 of showrooms retail, commercial, retail, and self storage uses and some 645 residential apartments;

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

iii) a workplace travel plan and transport access guide will be implemented for the site;

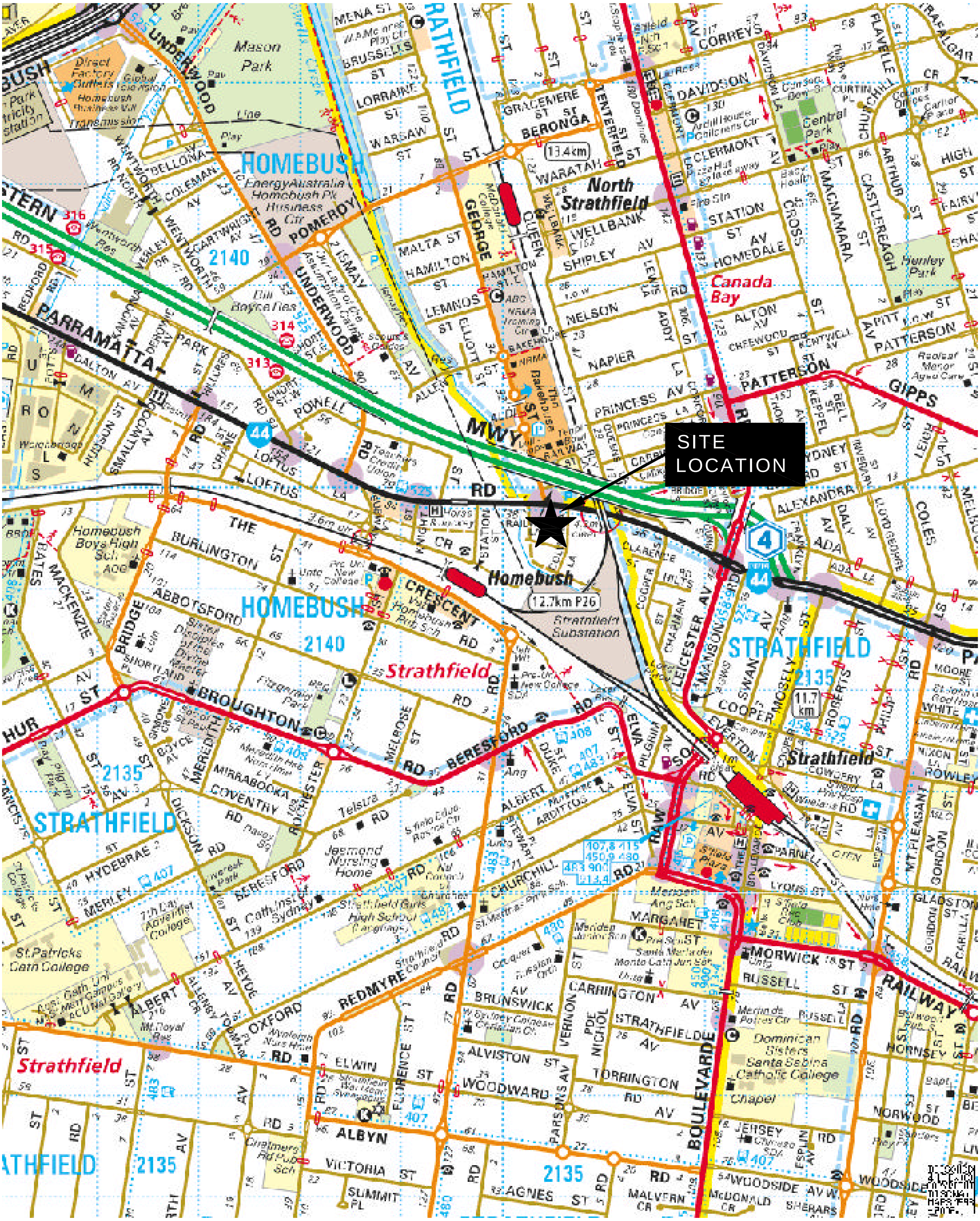
iv) appropriate parking provision is provided to reduce traffic generation;

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

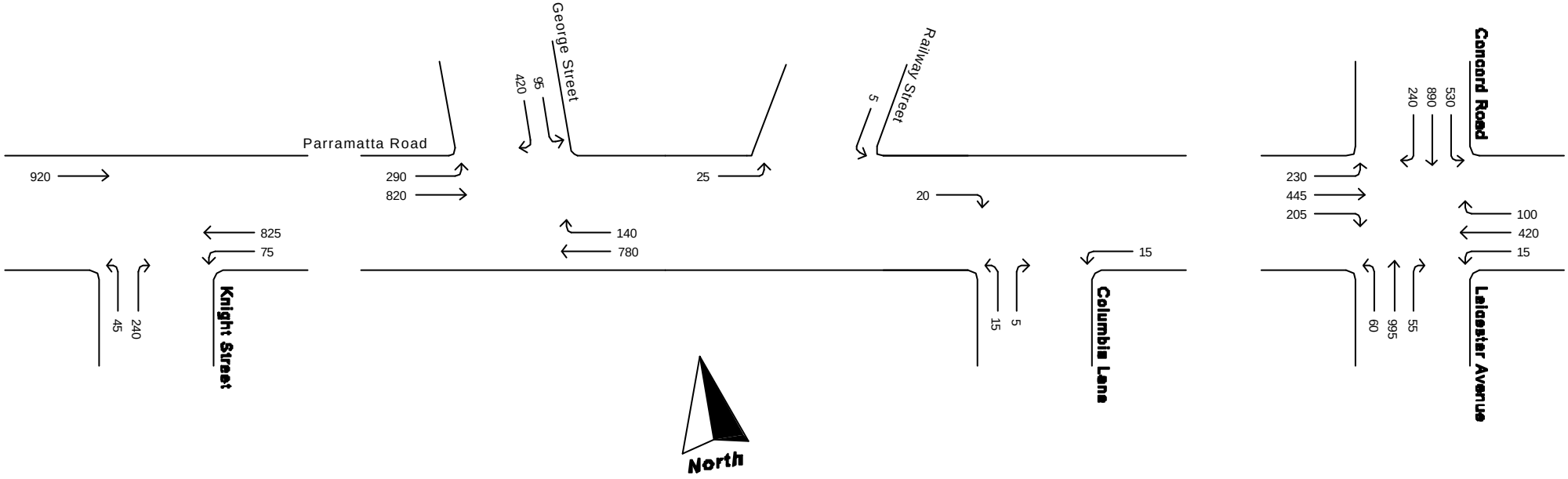
vi) the road network, including the proposed four way Parramatta Road/George Street signalised intersection and the widening of Parramatta Road adjacent to the site, will be able to cater for the additional traffic from the proposed

Columbia Precinct development and the Bakehouse Quarter proposed development;

vii) the Director General's requirements are discussed in paragraphs 3.89 to 3.95.



Location Plan



LEGEND

100 - Existing Peak Hour Traffic Flows

Existing weekday morning peak hour traffic flows

Colston Budd Hunt & Kafes Pty Ltd

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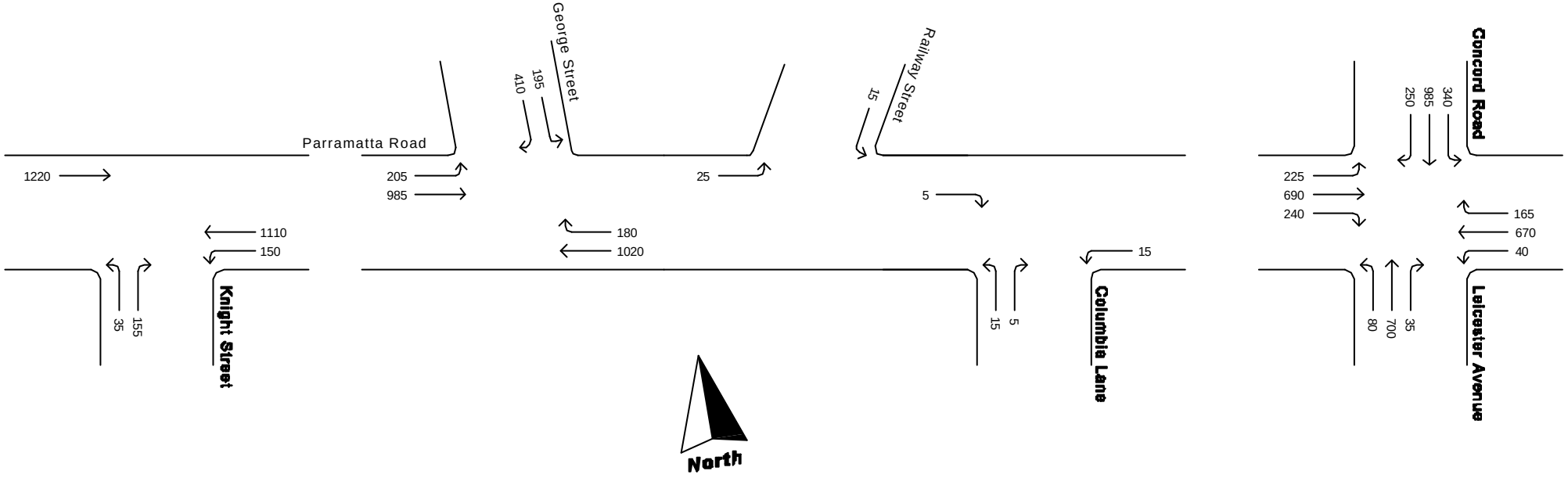
Figure 2



LEGEND

100 - Existing Peak Hour Traffic Flows

Existing weekday afternoon peak hour traffic flows

Colston Budd Hunt & Kafes Pty Ltd

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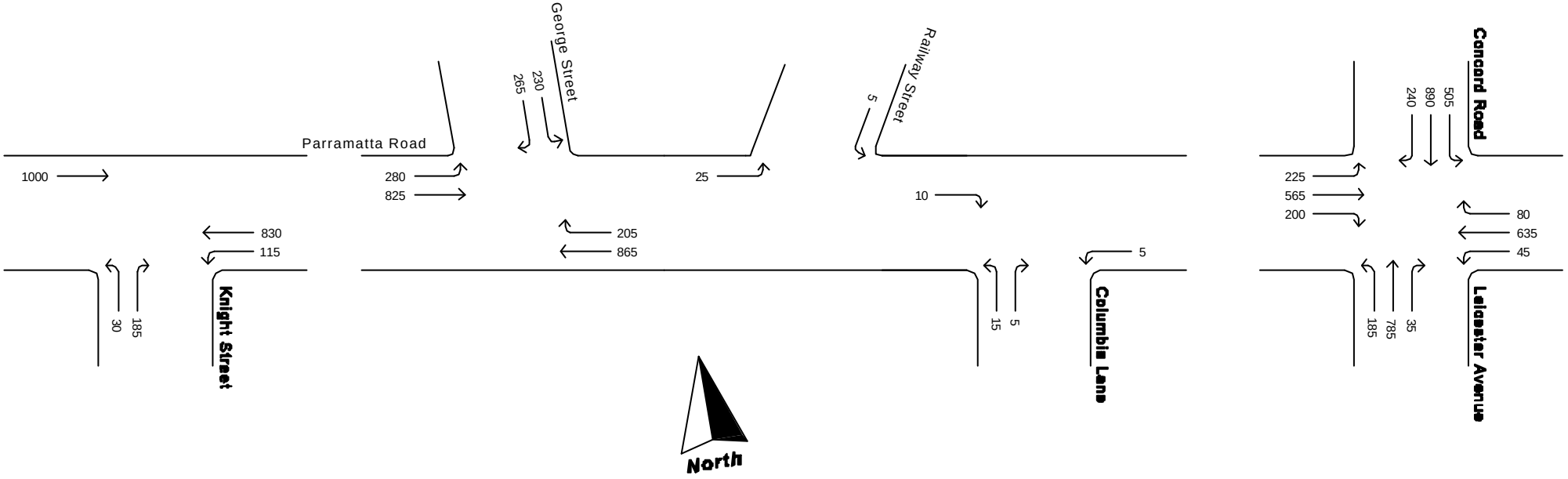
Figure 3



LEGEND

100 - Existing Peak Hour Traffic Flows

Existing Saturday midday peak hour traffic flows

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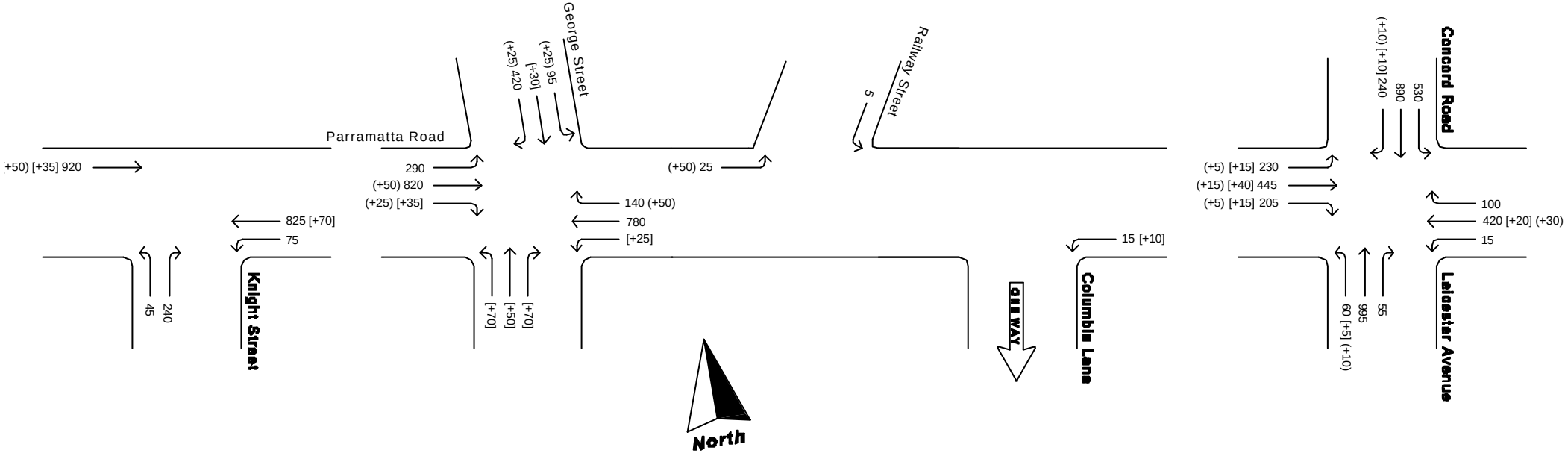
Figure 4



LEGEND

100 - Existing Peak Hour Traffic Flows
(+10) - Plus Bakehouse Quarter Development Traffic
[+10] - Plus Columbia Precinct Development Traffic

Existing weekday morning peak hour traffic flows plus Development Traffic

Figure 5

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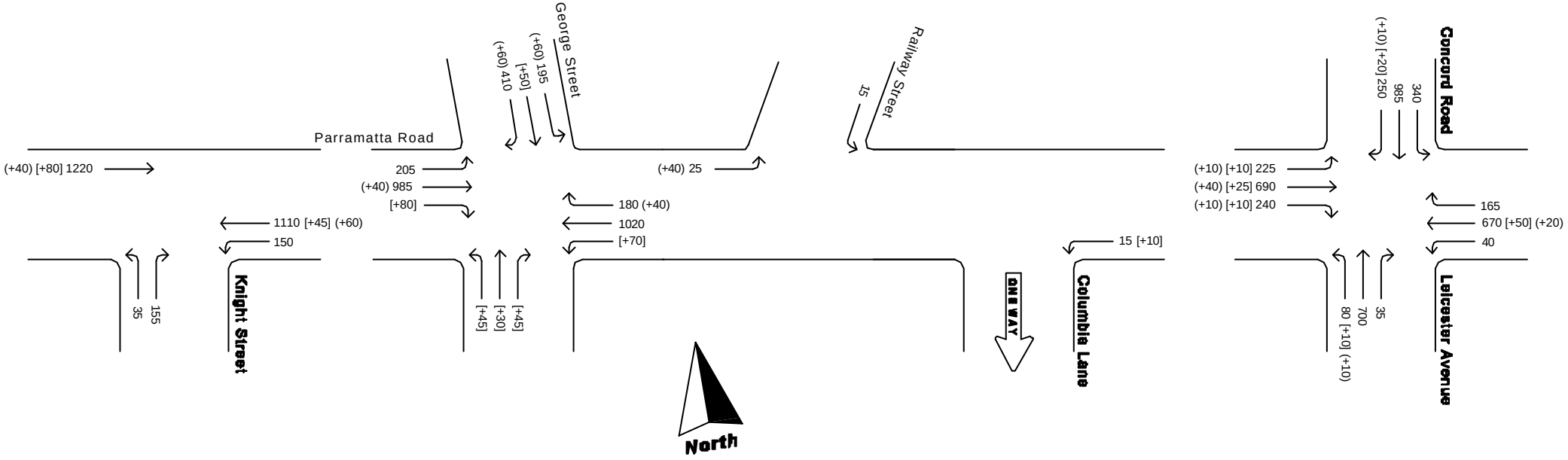

LEGEND

100 - Existing Peak Hour Traffic Flows
(+10) - Plus Bakehouse Quarter Development Traffic
[+10] - Plus Columbia Precinct Development Traffic

Existing weekday afternoon peak hour traffic flows plus Development Traffic

Figure 6

Colston Budd Hunt & Kafes Pty Ltd

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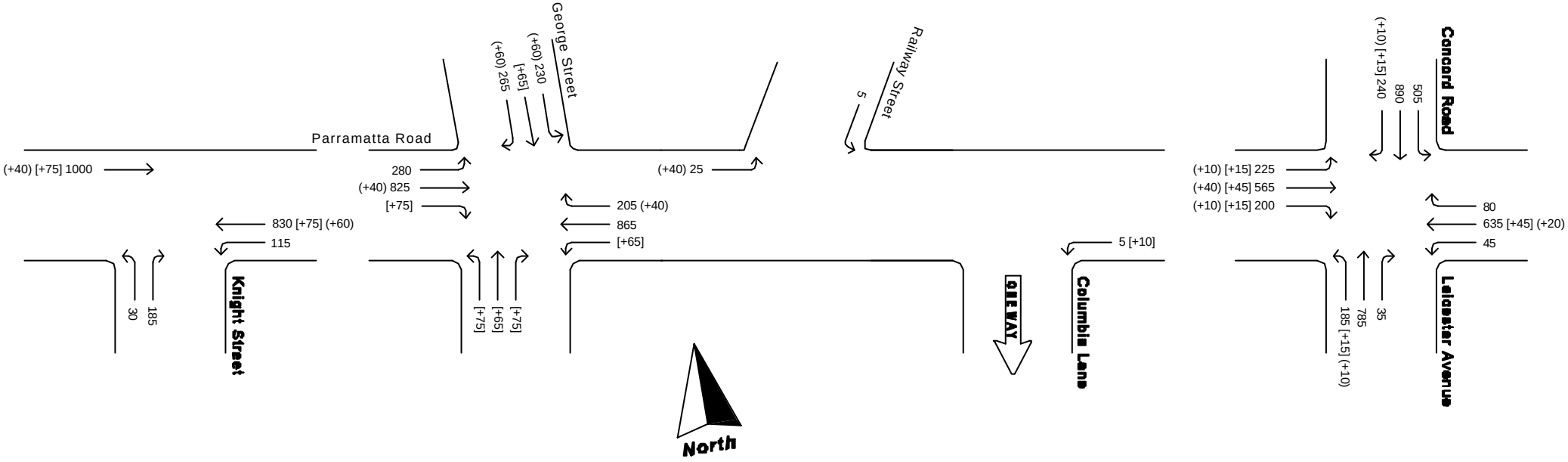

LEGEND

100 - Existing Peak Hour Traffic Flows
(+10) - Plus Bakehouse Quarter Development Traffic
[+10] - Plus Columbia Precinct Development Traffic

Existing Saturday midday peak hour traffic flows plus Development Traffic

Figure 7

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