WINTEN PROPERTY GROUP

TRANSPORT AND ACCESSIBILITY IMPACT STUDY FOR PROPOSED COMMERCIAL DEVELOPMENT, PACIFIC HIGHWAY AND BERRY STREET, NORTH SYDNEY

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1. INTRODUCTION

1.1 Colston Budd Hunt and Kafes Pty Ltd has been commissioned by Winten Property Group to prepare a report on the transport implications of a proposed commercial development at 177-199 Pacific Highway, North Sydney. The site is located on the south eastern corner of the intersection of Pacific Highway and Berry Street, as shown in Figure 1.

1.2 The site is currently occupied by a commercial development (Norberry Terrace) which includes some 6,923m^2 commercial space. On-site car parking is currently provided for some 60 vehicles with vehicular access from Berry Street.

1.3 It is proposed to demolish the existing development on the site and construct a new commercial building comprising some 44,680m^2. Car parking will be provided within a basement car park.

1.4 The Director-General's requirements for the project include:

> ***4. Transport & Accessibility Impacts (Construction and Operational)***
> *The EA shall address the following matters:*
>
> - *the provision of appropriate on-site car parking for the proposal having regard to local planning controls, RTA guidelines and the high public transport accessibility of the site. (Note: the Department supports reduced car parking rates in areas well-served by public transport).*
> - *a minimalist approach to provision of carparking has been adopted based on the accessibility of the site to public transport.*

- *an estimate of the trips generated by the proposed development and consider how the demand for travel to and from the development is to be managed.*
- *provide a Transport & Accessibility Impact Study prepared in accordance with the RTA's Guide to Traffic Generating Developments, considering traffic generation, service vehicle generation and movements, any required road / intersection upgrades, access loading dock(s), car parking arrangements, and measures to promote public transport usage and pedestrian and bicycle linkages, particularly between the site and North Sydney train station and adjacent bus routes. The key intersections that the Study should consider are:*
  - *Pacific Highway / Walker Street*
  - *Pacific Highway / Miller Street*
  - *Pacific Highway / Berry Street*
  - *Berry Street / Miller Street*
  - *Berry Street / Walker Street;*
- *Provide an assessment of the implications of the proposed development for non-car travel modes (including public transport, walking and cycling).*

1.5 This report has been prepared with reference to the RTA's "Guide to Traffic Generating Developments", and assesses the transport implications of the proposed development through the following chapters:

- Chapter 2 - describing the existing conditions; and
- Chapter 3 - assessing the transport implications of the proposed development.

2. EXISTING CONDITIONS

Site Location and Road Network

2.1 The site of the proposed development is located on the south eastern corner of the intersection of Pacific Highway and Berry Street, as shown in Figure 1. The site is currently occupied by a commercial development (Norberry Terrace) which includes some 6,923m^2 commercial space. On-site car parking is currently provided for some 60 vehicles with vehicular access from Berry Street via an entry/exit driveway at the eastern end of the site, approximately opposite Angelo Street.

2.2 Surrounding land use in the vicinity of the site comprises primarily a mix of commercial and retail uses within the North Sydney CBD. Monte Sant' Angelo College is located north-east of the site with frontage to Miller Street, Berry Street and Angelo Street.

2.3 The road network in the vicinity of the site includes Pacific Highway, Berry Street, Miller Street and Walker Street.

2.4 The Pacific Highway is a major link in Sydney's arterial road network, connecting Sydney's harbour crossings with the north shore. It generally provides a four to six lane divided carriageway with two or three traffic lanes in each direction. Major intersections are signalised with additional lanes for turning traffic. Clearways operate during peak periods in the direction of peak traffic flow. In the vicinity of the site, Pacific Highway provides access through North Sydney to

suburbs to the north including Crows Nest, St Leonards and Chatswood. There are bus stops adjacent to the site on both sides of Pacific Highway.

2.5 Berry Street provides a major east–west route through the area, linking the Pacific Highway with the Warringah Expressway. East of the Pacific Highway, Berry Street is one-way eastbound, with a four lane carriageway. Clearways operate during weekday peak periods and kerbside parking is permitted outside of these times. West of Pacific Highway, Berry Street provides local access to residential and commercial development. The intersection of Berry Street with the Pacific Highway is controlled by traffic signals.

2.6 Miller Street forms part of an arterial route linking Willoughby and Cammeray in the north, with North Sydney. In the vicinity of the site, between the Pacific Highway and Berry Street, Miller Street provides a four lane divided carriageway with one traffic lane and one parking lane in each direction, clear of intersections. Clearways operate in peak periods in the direction of peak traffic flow. The intersections of Miller Street with Berry Street and the Pacific Highway are controlled by traffic signals. There is a taxi rank on the eastern side of Miller Street, just south of Berry Street.

2.7 Walker Street is east of the site and provides a north-south connection through the North Sydney CBD. It provides for one traffic lane and one parking lane in each direction, clear of intersections. The intersections of Walker Street with Pacific Highway and Berry Street are controlled by traffic signals.

2.8 The North Sydney CBD has a 40 kilometre speed limit on its roads, which are designated high pedestrian activity areas.

Traffic Flows

2.9 In order to gauge traffic conditions, counts were undertaken during weekday morning and afternoon peak periods at the following intersections:

- Pacific Highway/Walker Street;
- Pacific Highway/Miller Street;
- Pacific Highway/Berry Street;
- Berry Street/Miller Street; and
- Berry Street/Walker Street.

2.10 The results of the surveys are shown in Figures 2 and 3, and summarised in Table 2.1. The Pacific Highway carried some 1,500 to 3,600 vehicles per hour two-way during the morning and afternoon peak hours.

2.11 Traffic flows in Berry Street, east of Pacific Highway, were some 1,000 to 2,500 vehicles per hour one-way eastbound during the morning and afternoon peak periods. West of the Pacific Highway, Berry Street carried much lower traffic flows of some 100 to 250 vehicles per hour two-way.

2.12 Traffic flows in Miller Street were observed to be some 1,000 to 1,500 vehicles per hour two-way during the morning and afternoon peak periods. Walker Street carried flows of some 550 to 1,500 vehicles per hour two-way. The highest flows in Walker Street occurred between Pacific Highway and Berry Street. The lower flows occurred north of Berry Street and south of Pacific Highway.

2.13 Observations made during peak periods indicate that the existing site access driveway on Berry Street generated some 15 to 20 vehicles per hour two-way.

Table 2.1: Existing two – way (sum of both directions) peak hour traffic flows			
Road	**Location**	**Morning peak hour**	**Afternoon peak hour**
Pacific Highway	North of Berry Street	2,505	1,955
	South of Berry Street	1,950	1,750
	West of Miller Street	1,720	1,525
	East of Miller Street	2,435	1,715
	West of Walker Street	2,315	1,660
	East of Walker Street	3,630	2,495
Berry Street	West of Pacific Highway	255	105
	East of Pacific Highway	1,250	1,030
	East of Miller Street	1,715	1,540
	East of Walker Street	2,200	2,535
Miller Street	North of Berry Street	1,115	970
	South of Berry Street	1,095	985
	North of Pacific Highway	1,270	1,035
	South of Pacific Highway	1,420	1,165
Walker Street	North of Berry Street	920	850
	South of Berry Street	1,095	1,520
	North of Pacific Highway	1,520	1,205
	South of Pacific Highway	545	590

Intersection Operations

2.14 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 and 3 have been analysed using the SIDRA program. 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.

2.15 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 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

2.16 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.

2.17 The SIDRA analysis found that the signalised intersection of the Pacific Highway with Berry Street is operating with average delays of some 45 seconds per vehicle or less during morning and afternoon peak periods. This represents levels of service D, a satisfactory level of intersection operation for a busy intersection during peak periods.

2.18 The signalised intersections of Berry Street with Miller Street and Walker Street are operating with average delays of less than 40 seconds per vehicle during peak periods. This represents level of service C, a satisfactory level of intersection operation.

2.19 The signalised intersections of the Pacific Highway with Walker Street and Miller Street are operating with average delays of less than 35 seconds per vehicle during morning and afternoon peak periods. This represents levels of service C, which is a good level of intersection operation.

Public Transport

2.20 The site is some 5 to 10 minutes walk from North Sydney Railway Station. North Sydney is on the North Shore Line (Berowra – Parramatta via the City) and the Northern Line (Berowra – North Sydney via Strathfield and the City).

2.21 Services on the North Shore Line through North Sydney operate on a five to 10 minute headway in each direction. Services on the Northern Line operate on a 30 minute headway in each direction. During weekday peak periods, services are more frequent.

2.22 Local bus services are provided by Sydney Buses. These services link North Sydney with surrounding areas. There are bus stops on Pacific Highway in front of the site. There are also bus stops on Miller Street and at North Sydney Station. Bus services provide links to all surrounding areas, including the City, North Shore and Northern Beaches.

2.23 There are good pedestrian links between the site and surrounding areas, including North Sydney railway station, bus stops on Miller Street and the highway, and other commercial and retail development in the CBD. All of the surveyed intersections, as well as other intersections in the CBD, include signalised pedestrian crossings.

2.24 Overall, the site has good access to regular public transport services.

3. IMPLICATIONS OF PROPOSED DEVELOPMENT

3.1 It is proposed to demolish the existing development on the site and construct a new commercial building comprising some 44,680m^2. Car parking will be provided within a four level basement car park. Vehicular access is proposed from Berry Street in the location of the existing driveway to the site. This chapter assesses the transport implications of the proposed development through the following sections:

- public transport, walking and cycling;
- work place travel plan;
- parking provision;
- access arrangements and servicing;
- internal circulation and layout;
- traffic generation and effects;
- principles of construction traffic management;
- director-general's requirements; and
- summary.

Public Transport, Walking and Cycling

3.2 As previously discussed, the site is within 10 minutes' walking distance of North Sydney railway station. Services through North Sydney operate on the North Shore and Northern Lines on 10 and 30 minute headways respectively. Bus services also provide a link between North Sydney and surrounding areas. The site is therefore accessible by existing rail and bus services.

3.3 There is a taxi rank on the eastern side of Miller Street, just south of Berry Street. There are good pedestrians links to and from the site provided by:

- pedestrian footpaths on both sides of Berry Street, Pacific Highway, Miller Street; and

- signalised pedestrian crossings at the intersections of Pacific Highway/Berry Street, Miller Street/Berry Street and Miller Street/Pacific Highway.

3.4 The proposed development would increase employment densities close to existing public transport services.

3.5 Government policy 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) improving accessibility to housing, employment and services by walking, cycling, and public transport;

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

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

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

3.6 The proposed development satisfies these aims as follows:

- the site is located in the North Sydney CBD and is highly accessible to public transport services, which offer viable alternatives to travel by car. To support accessibility for cyclists, parking will be provided for bicycles. The site is also readily accessible for pedestrians, being close to residential areas, public transport nodes and existing pedestrian crossings and footpaths around the site;

- the location of the site within the North Sydney CBD and Council's policy of constraining 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 densities within the North Sydney CBD will provide more potential customers for the existing public transport services and hence support their efficient and viable operation.

Work Place Travel Plan

3.7 To encourage travel modes other than private vehicle, it is proposed to adopt a travel demand management approach, through a work place travel plan to meet the specific needs of the site, future tenants and employees. The specific requirements and needs of the future tenants, including number of employees, hours of work, shift times, etc., will be incorporated in the work place travel plan to support the objectives of encouraging the use of public transport.

3.8 The principles of the work place travel plan, to be developed by the future tenants in consultation with Council, RTA and other stakeholders, will include the following:

- encourage the use of public transport, including rail services through North Sydney and bus services along Miller Street and Pacific Highway;
- work with public transport providers to improve services;
- encourage public transport by employees 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.

3.9 The travel plan may take a variety of forms including a green transport plan or company travel plan. The work place travel plan will 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

3.10 North Sydney Development Control Plan 2002 indicates that commercial development in the CBD should provide a maximum of one parking space per 400m^2.

3.11 Council's parking rate for commercial development is a comparatively low rate and is intended to limit traffic generation of commercial developments in CBD areas.

3.12 Application of this rate results in a maximum allowable provision of 112 parking spaces for the proposed development. The proposed provision of some 112 parking spaces is therefore in accordance with this requirement, and is considered appropriate.

3.13 Eleven motorcycle spaces will be provided (one space per 10 car spaces) in accordance with DCP 2002.

3.14 In addition to the proposed car parking, 75 bicycle lockers (one space per 600m^2) and 18 bicycle racks (one space per 2,500m^2) are proposed to be provided in the basement parking levels, in accordance with DCP 2002.

Access Arrangements and Servicing

3.15 Access to the proposed development will be provided via a combined entry and exit driveway at the eastern end of the site on Berry Street. The proposed access driveway is in the same location as the existing driveway to the site.

3.16 As this section of Berry Street is one-way eastbound, turns to and from the development will be right in and right out, the same as the existing situation. The design will provide for vehicles to enter and exit the site in a forward direction.

3.17 The proposed access arrangements are considered appropriate and will be provided in accordance with the Australian Standard for parking facilities (Part 1: Off-street car parking and Part 2: Off-street commercial vehicle facilities), AS 2890.1:2004 and AS 2890.2 –2002.

3.18 Within the upper basement level, a loading dock is proposed. The loading dock will provide for a range of service vehicles, including vans and courier-sized vehicles, as well as small and medium rigid trucks. Five bays will be provided for trucks and nine bays for vans and courier sized vehicles. The proposed access, circulation and manoeuvring areas for service vehicles will be provided in accordance with AS 2890.2 – 2002.

Internal Circulation and Layout

3.19 Car parking will be provided for 112 vehicles within four levels of basement parking. Parking bay dimensions will be provided at least 2.5 metres wide by 5.4 metres long, with an additional 0.3 metres width for spaces located adjacent to structure. Access to car parking spaces will be provided from a 5.8 metre wide circulation aisle.

3.20 Disabled parking spaces will be provided on the upper basement parking level. These spaces will be 2.4 metres wide, with an additional 2.4 metres 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 elsewhere. These dimensions are considered appropriate, being in accordance with AS 2890.6 – 2009.

3.21 Access between the parking levels will be provided by two-way ramps. The ramps will be located centrally and at the southern end of each parking level. Ramp grades, transitions, and height clearance will be provided in accordance with AS 2890.1:2004.

Traffic Generation and Effects

3.22 Traffic generated by the proposed development will have its greatest effects during morning and afternoon peak periods when it combines with commuter traffic. Based on surveys of the traffic generation of similar commercial buildings, commercial parking spaces generate some 0.25 to 0.4 vehicles per hour per space (two-way) during peak periods.

3.23 With an increase in parking provision of some 52 spaces proposed, the increase in traffic generation of the proposed development would be some 13 to 21 vehicles per hour two-way during peak hours. This is a low increase, equivalent to one vehicle every three to five minutes during peak hours.

3.24 Such a low additional traffic generation would not have noticeable effects on the operation of the surrounding road network. Intersections would continue to operate at their existing satisfactory levels of service, with similar average delays per vehicle.

Principles of Construction Traffic Management

3.25 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.

3.26 Construction of the development will commence with site preparation works and demolition of the existing building.

3.27 Construction access will be provided to/from Pacific Highway and/or Berry Street. It is anticipated that works zones will be required along the site frontages on Pacific Highway and Berry Street, outside of the period of clearway restrictions.

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

3.29 Openings in the construction fencing, and at 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.

3.30 The overall principles for traffic management during reconstruction of the car park are:

- provide a convenient and appropriate environment for pedestrians;
- minimise effects on pedestrian movements and amenity;
- provide appropriate safety fencing/hoardings around the perimeter of the construction site;
- provide works zones on Pacific Highway and Berry Street, adjacent to the site, outside of the period of clearway restrictions;

- manage and control vehicular movements to and from the site;
- maintain other 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 to enter and exit the site in a forward direction;
- construction activity to be carried out in accordance with the approved hours of construction;
- maintain safety for workers; 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.

Director-General's Requirements

3.31 The Director-General's requirements are discussed below.

- *the provision of appropriate on-site car parking for the proposal having regard to local planning controls, RTA guidelines and the high public transport accessibility of the site. (Note: the Department supports reduced car parking rates in areas well-served by public transport).*
- *a minimalist approach to provision of carparking has been adopted based on the accessibility of the site to public transport.*

3.32 Parking provision is discussed in paragraphs 3.10 to 3.14.

- *an estimate of the trips generated by the proposed development and consider how the demand for travel to and from the development is to be managed.*

3.33 Traffic generation and its effects are discussed in paragraphs 3.22 to 3.24. Travel demand management is discussed in paragraphs 3.7 to 3.9.

- *provide a Transport & Accessibility Impact Study prepared in accordance with the RTA's Guide to Traffic Generating Developments, considering traffic generation, service vehicle generation and movements, any required road / intersection upgrades, access loading dock(s), car parking arrangements, and measures to promote public transport usage and pedestrian and bicycle linkages, particularly between the site and North Sydney train station and adjacent bus routes. The key intersections that the Study should consider are:*
  - *Pacific Highway / Walker Street*
  - *Pacific Highway / Miller Street*
  - *Pacific Highway / Berry Street*
  - *Berry Street / Miller Street*
  - *Berry Street / Walker Street;*

3.34 This report comprises that study. Traffic generation and its effects are discussed in paragraphs 3.22 to 3.24. Service vehicles and loading docks are discussed in paragraph 3.18. Parking provision is discussed in paragraphs 3.10 to 3.14. Public transport, pedestrians and cyclists, including a work place travel plan, are discussed in paragraphs 3.2 to 3.9. The operation of the intersections nominated by the department are discussed in paragraphs 2.9 to 2.19 and 3.24.

- *Provide an assessment of the implications of the proposed development for non-car travel modes (including public transport, walking and cycling).*

3.35 These matters are discussed in paragraphs 3.2 to 3.6.

Summary

3.36 In summary, the main points relating to the transport implications of the proposed development are as follows:

i) the proposed commercial development will have a gross floor area of some 44,680m^2;

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

iii) a work place travel plan will be implemented for the site;

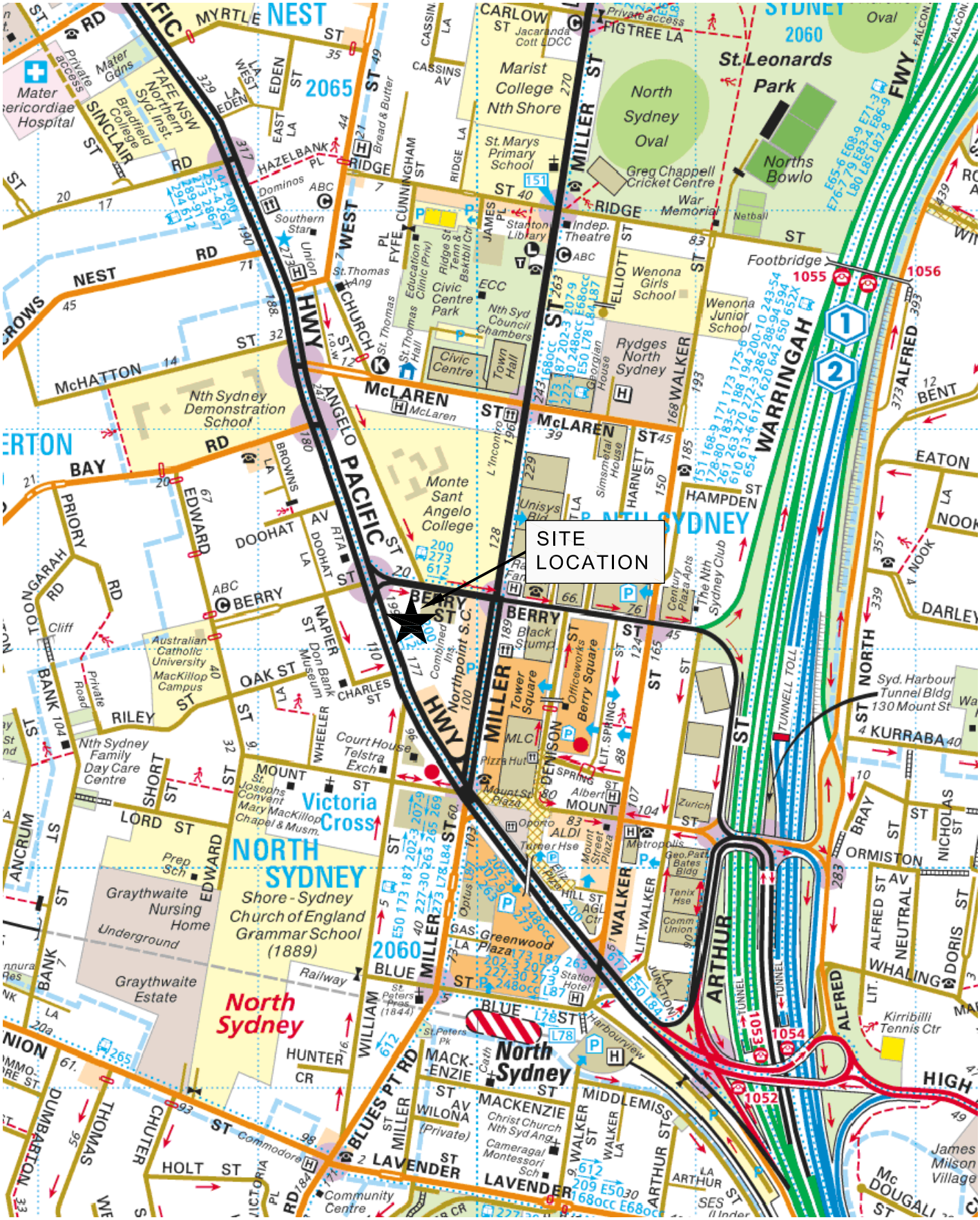
iv) the proposed parking provision is considered appropriate;

v) access, servicing and internal layout will be provided in accordance with AS 2890.1:2004 and AS 2890.2 – 2002;

vi) the proposed development will have a low increase in traffic generation, equivalent to one vehicle every three to five minutes during peak hours;

vii) such a low additional traffic generation would not have noticeable effects on the operation of the surrounding road network; and

viii) the director-general's requirements are discussed in paragraphs 3.31 to 3.35.



Location Plan

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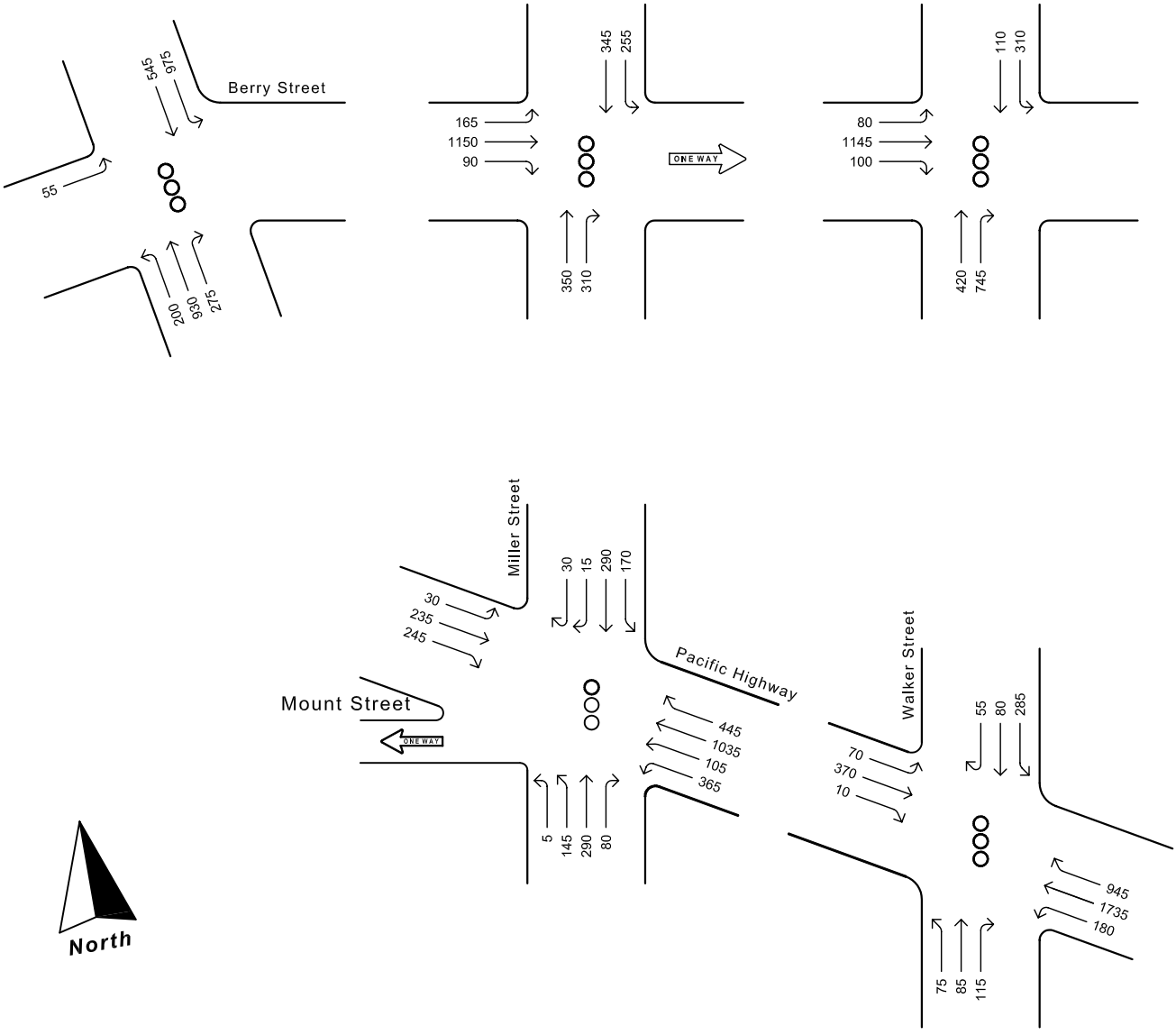
Figure 1



LEGEND

100 - Existing Peak Hour Traffic Flows

- Traffic Signals

Existing morning peak hour traffic flows

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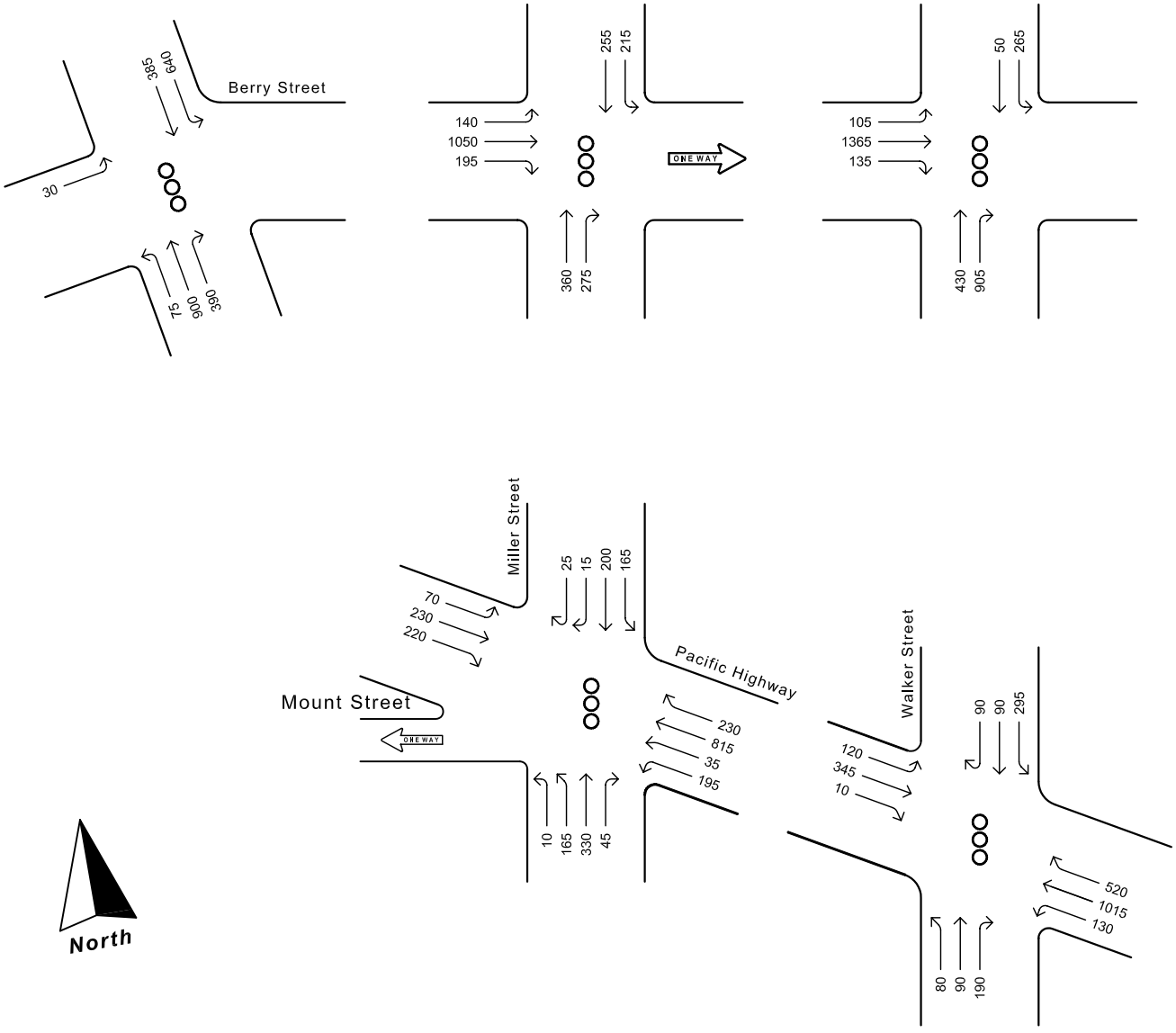
Figure 2



LEGEND

100 - Existing Peak Hour Traffic Flows

- Traffic Signals

Existing afternoon peak hour traffic flows

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Figure 3