

HOLT POINT PTY LTD

TRAFFIC AND PARKING IMPACT ASSESSMENT

FOR

RE-ZONING PLANNING PROPOSAL

AT

**642-644 CANTERBURY ROAD,
1-3 PLATTS AVENUE,
2A, 2B, 2C, 2D LIBERTY STREET,
BELMORE**

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Report No.: 23/14**

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4	Sensitivity SIDRA Modelling	Sensitivity modelling can only be carried out once a corridor study is carried out.
5	Letter to Canterbury Council	A letter will be produced by RMS and to be issued to Canterbury Council in support of the rezoning planning proposal.

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- PD2 Scenario PM Peak Hour Future Volumes at Canterbury Road/ Kingsgrove Road.

1.0 INTRODUCTION

1.1 Background

An application is to be made by Statewide Planning Pty Ltd for a Rezoning Planning Proposal for a development site at 624-644 Canterbury Road, Belmore. The planning proposal seeks to rezone to facilitate a Residential Mixed – Use development.

The proposal seeks to rezone to **B5 zoning**, the amalgamated lots 624-644 Canterbury Road, Nos. 1-3 Platts Avenue and 2A, 2B, 2C and 2D Liberty Street, Belmore and also suggest the extension of this planning envelope to 650-658 Canterbury Road and 2 Liberty Street.

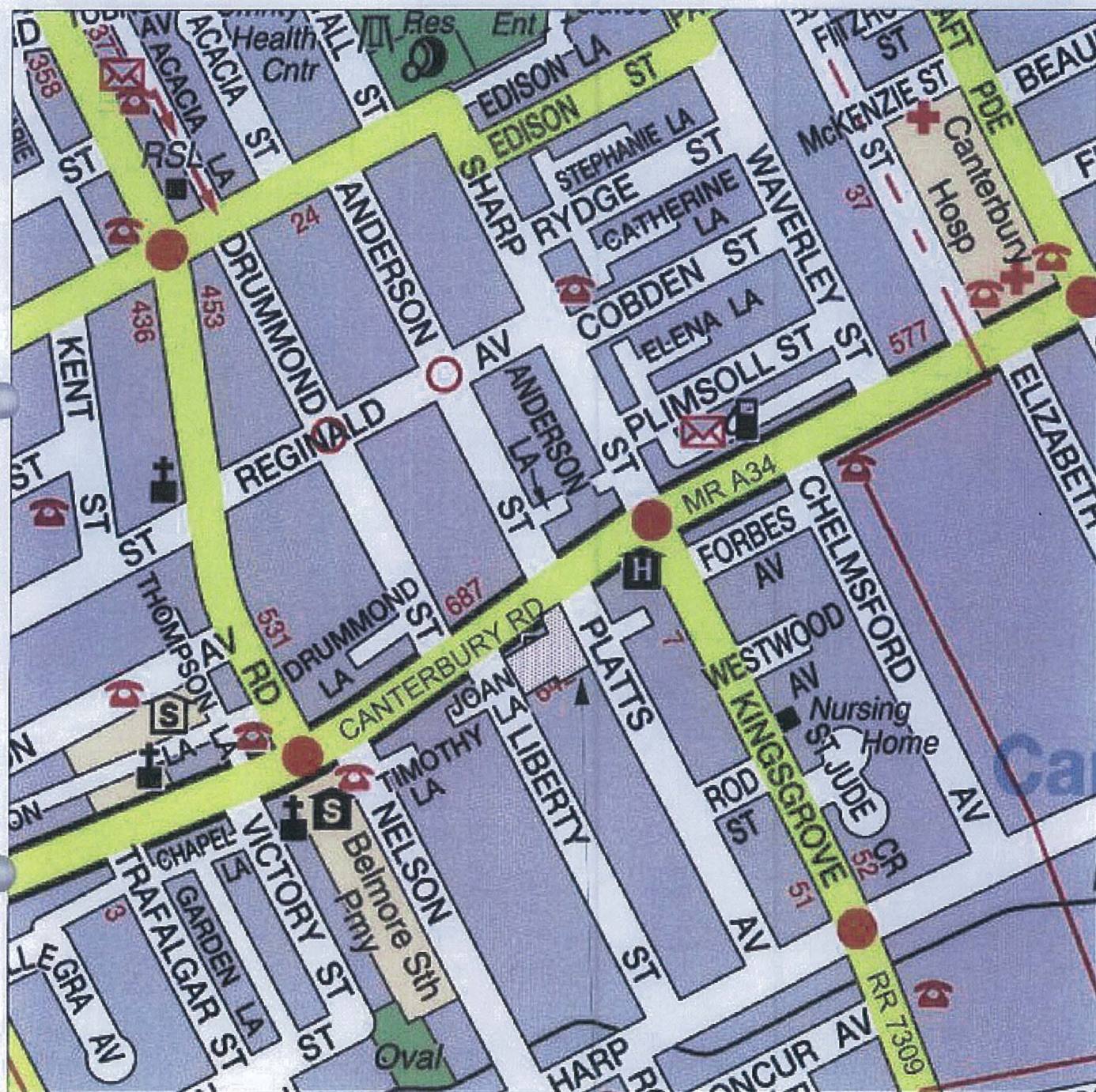
The site is shown in **Figure 1 Locality Plan**. The Lot numbers, D.P.'s and residential addresses are shown in **Figure 2**. The site area is **4557.8** square metres which includes all of the amalgamated lots.

1.2 Scope of Report

This report addresses *the traffic and parking issues* for the proposed 'mixed use development'.

We have also read the following Strategic documents:-

- Canterbury Council's LEP 2012.
- Canterbury Council's DCP.
- Canterbury Council Planning Proposal to Amend Local Environmental Plan 2012.



PROPOSED SITE -
 642-644, CANTERBURY ROAD
 1-3 PLATTS AVE, 2A, 2B, 2C, 2D
 LIBERTY STREET
 BELMORE

SCALE 1:20000

0m 400m 800m

FIGURE 1
 LOCALITY MAP

LIBERTY STREET

CANTERBURY ROAD

PLATTS AVENUE

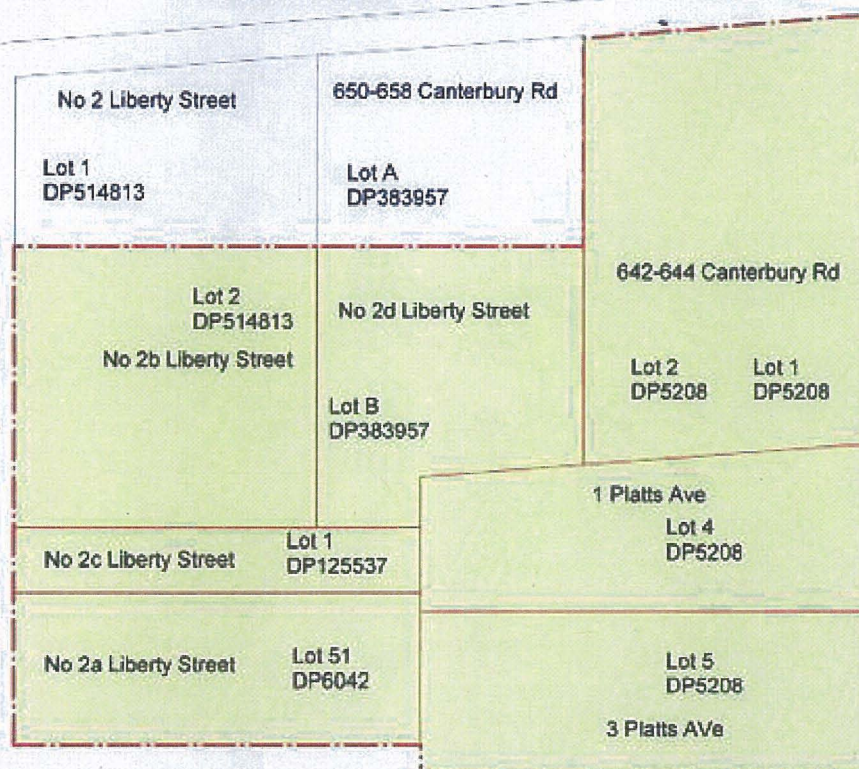


FIGURE 2
CADASTRAL PLAN

2.0 EXISTING TRAFFIC CONDITIONS

2.1 Existing Road Network

The site has a frontage of approximately 29.8 metres to Canterbury Road and a frontage to Platts Avenue of 71.3 metres and a site frontage to Liberty Street of 45.8 metres. The site is located in the Belmore Centre and has good access to bus services.

Canterbury Road runs east west linking Lewisham to Bankstown. It has a 60km/hr speed limit. It is a classified Main Road A34. The nearest permanent Counting Station No 24014 is located in Canterbury Road at Wiley Park east of Canarys Road. The 2012 ADT data is 18,000 vehicles eastbound and 19,300 westbound. The 2005 AADT published by the RMS was 37,009.

Kingsgrove Road is a Regional road No 7309 and runs parallel to Platts Avenue. This Road is accessed from Rod Street via Platts Avenue. Kingsgrove Road has Signal Control at Canterbury Road to the north and connects to the M5 Motorway south of the subject site.

The road inventory and number of traffic lanes are illustrated in Figure 3.

The Belmore suburb map is located in Appendix C

2.2 Road Inventory and Parking

The signposted parking restrictions are *clearway restrictions* on the eastern and western sides of Canterbury Road signposted 6:00-10:00am and 3:00-7:00pm Monday-Friday. There is 1 hour parking restrictions in Platts Avenue on the eastern side for 3 spaces between Canterbury Road and Forbes Avenue.

Platts Avenue is a Local street with *left out* and *left in* only. There is a 'No Right Turn' ban into Platts Avenue from Canterbury Road and *out of* Platts Avenue into Canterbury Road. This street has very low traffic volumes.

Liberty Street is a Local street which runs north south, which also has *left-in* from Canterbury Road and a 'No Right Turn' ban from Canterbury Road into Liberty Street and from Liberty Street into Canterbury Road. It has no parking restrictions.

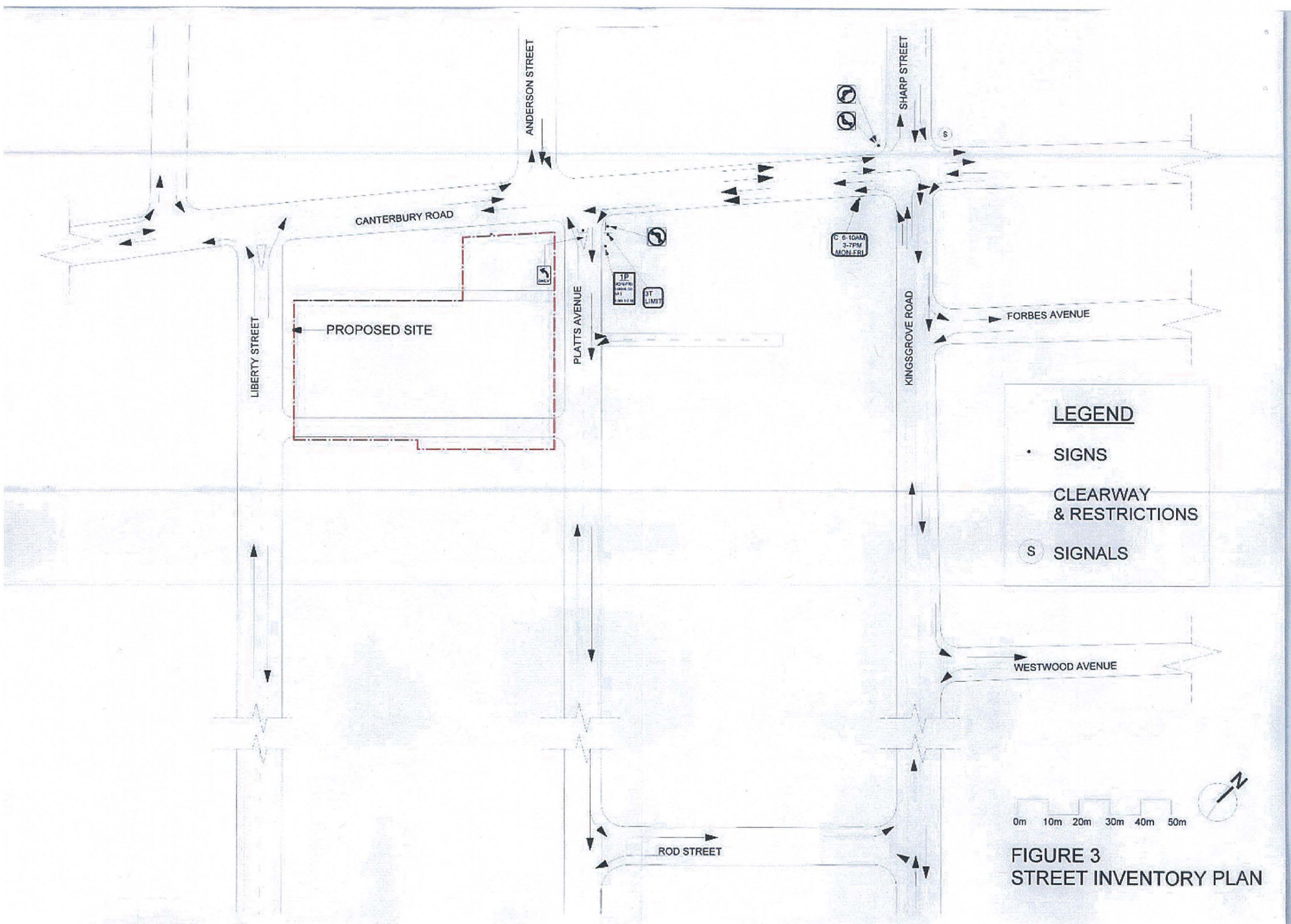


FIGURE 3
STREET INVENTORY PLAN

2.3 Existing Peak Hour Traffic Volumes

Traffic Counts were made at the following intersections in *15 minute intervals* on **Thursday 6/11/2014** from **7:00am to 9:00am** and **4:00pm to 6:00pm** to correspond with the commuter peak hours:-

- **Platts Avenue/ Canterbury Road**
- **Kingsgrove Road / Canterbury Road**

The **am** peak hour was **7:15am – 8:15am** at all intersections. The **pm** peak hour was **5:00 – 6:00pm**. The *existing peak hour* count summary is shown in **Figure 4**. The results of the surveys are located in **Appendix D**.

Illegal right hand turns were recorded at the intersection of Platts Avenue and Canterbury Road.

2.4 Intersection Performance

The signalized intersections have been analysed using **SIDRA** Version 5, 2011.

The network performance is determined by the Level of Service (**LoS**) Average Vehicle Delay (**AVD**), Degree of Saturation (**DoS**) and maximum delay on the critical movement at the intersections during peak hours. The Level of Service criteria for intersections are explained in **Table 4.2** taken from the *RTA Guide to Traffic Engineering Developments*.

Table 4.2
(RTA Guide To Traffic Generating Developments)
 Level of Service criteria for intersections.

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way & Stop Signs
A	< 14	Good operation	Good operation
B	15 TO 28	Good with acceptable delays spare capacity	Acceptable delays & spare capacity
C	29 TO 42	Satisfactory	Satisfactory, but accident study required
D	43 TO 56	Operating near capacity	Near capacity & accident study required
E	57 TO 70	At capacity; at signals, incidents will cause excessive delays Roundabouts require other control mode	At capacity, requires other control mode

The results of the analysis are set out in **Table 2.4**

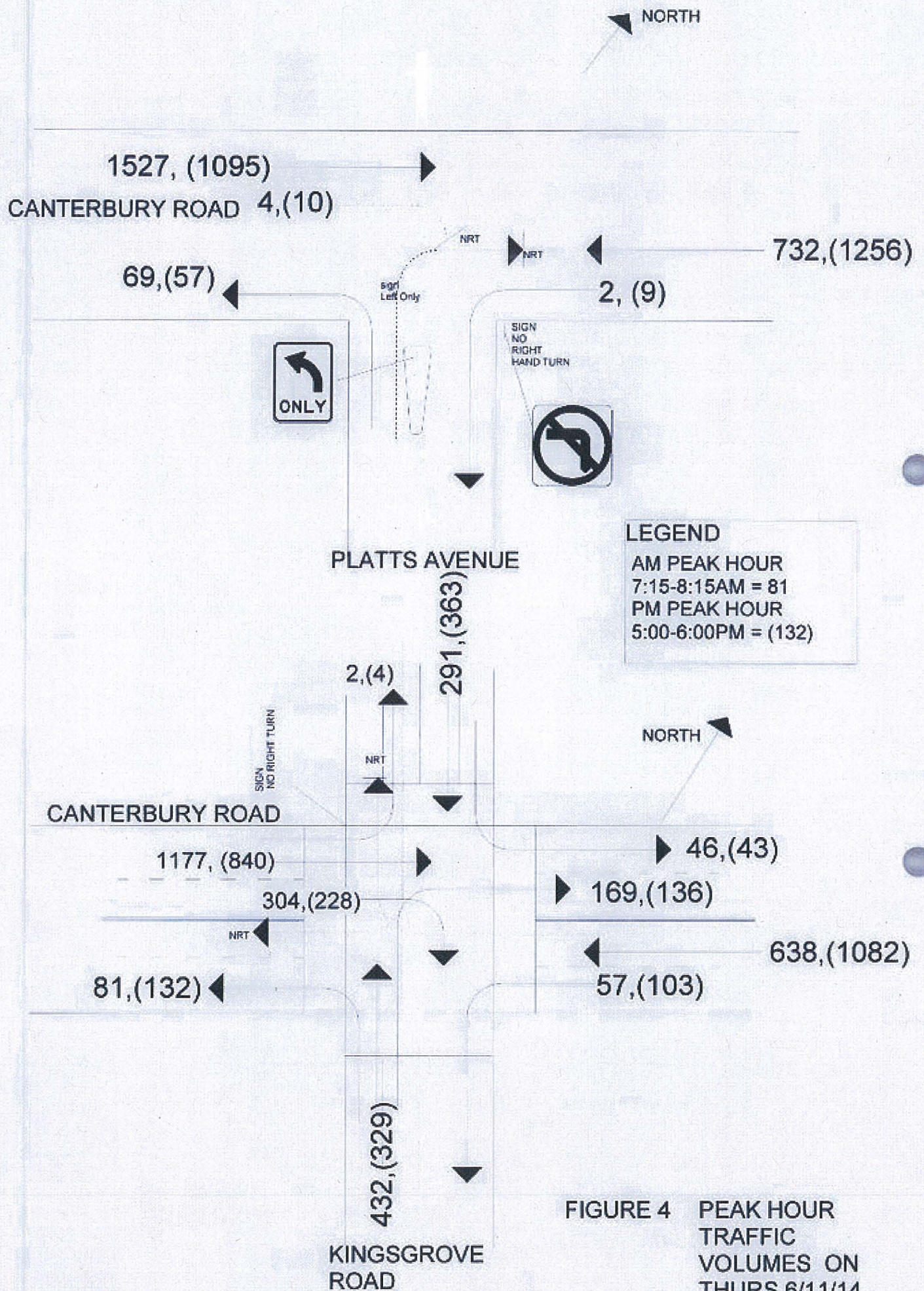


FIGURE 4 PEAK HOUR
 TRAFFIC
 VOLUMES ON
 THURS 6/11/14

2.4 (Continued)**Table 2.4 Intersection Performance**

	Intersection	Peak Hour	Level of Service LoS	Degree of Saturation DOS	Average Delay per Veh.	Critical Movement Delay per Veh.
G	Canterbury Road/ Platts Avenue	8:00am-9:00am	A (WORST B)	0.412	0.4Secs.	Left turn from Platts Avenue into Canterbury Rd 12.6 SECS
		4:15pm-5:15pm	A (WORST D)	0.342	0.7Secs.	Left turn from Platts Avenue into Canterbury Rd 29.6 SECS
S	Canterbury Road/ Kingsgrove Road	8:00am-9:00am	D (WORST F)	0.943	50.1Secs	RHT from Kingsgrove Rd to Canterbury Rd 104.8 secs
		5:00pm-6:00pm	C (WORST F)	1.22	40.8Secs	RHT from Kingsgrove Rd to Canterbury Rd 274.2 secs

- (1) Degree of Saturation is the ratio of demand to capacity for the most disadvantaged movement.
- (2) Average delay is the delay experienced on average by all vehicles. The value in brackets represents the delay to the most disadvantaged movement.
- Level of Service is a qualitative measure of performance describing operational conditions. There are six levels of service, designated from A to F, with A representing the best operational condition and level of service F the worst. The LoS of the intersection is shown in bold, and the LoS of the most disadvantaged movement is shown in brackets.

Note: S Signals

G Give Way

2.5 Current Uses of Existing Site

The current uses are as follows:-

No. 642-644	Vacant Kitchen workshop/ warehouse
No. 1 Platts Ave	Residential Dwelling House.
No. 3 Platts Ave	Residential Dwelling House.
No. 2b Liberty Street	Warehouse/Office.
No. 2c	Unknown
No. 2d	Unknown
No. 2a	Residential Dwelling House

The buildings and driveways along the Canterbury Road frontage and of the subject site are shown in **Photographs P1 to P4**

2.6 Vehicle Driveway Access to Site

There is a single driveway to No. 2b Liberty Street, and 2c is *shared* with 2d and 2a has a separate single driveway access. Nos. 642-644 has *two* single vehicular driveways from Platts Avenue, No 1 Platts Avenue has a single driveway access and No 3 has a single driveway access to Platts Avenue.



PHOTO P1 View East along Canterbury Road towards subject site.

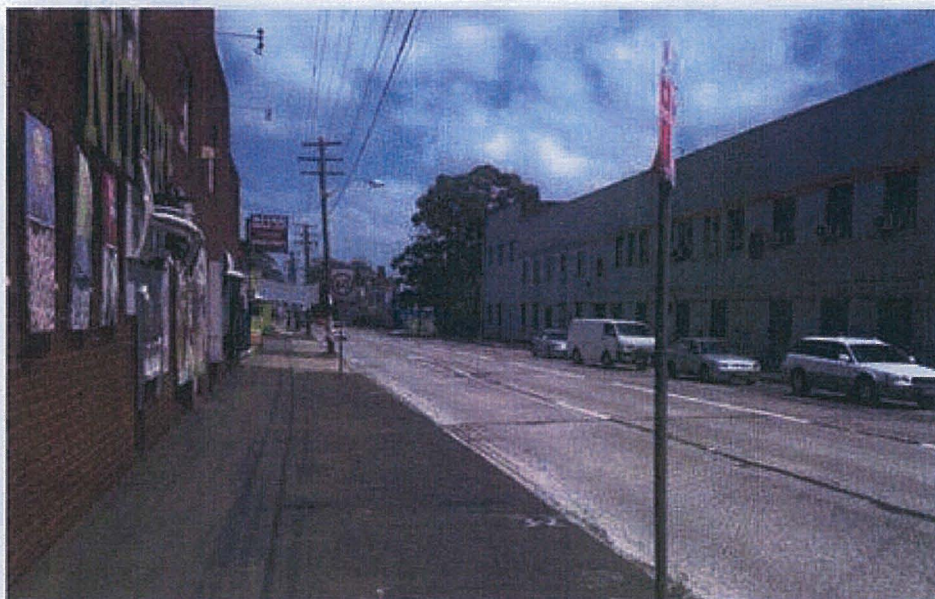


PHOTO P2 View West along Canterbury Road outside subject site 642-644.



PHOTO P3 View North West of intersection of Platts Avenue and Canterbury Road.



PHOTO P4 View South West along Platts Avenue.

2.7 Public Transport

The site is well served by public transport services. Belmore Railway Station is a 15 minute walk from the corner of Platts Avenue and Canterbury Road.

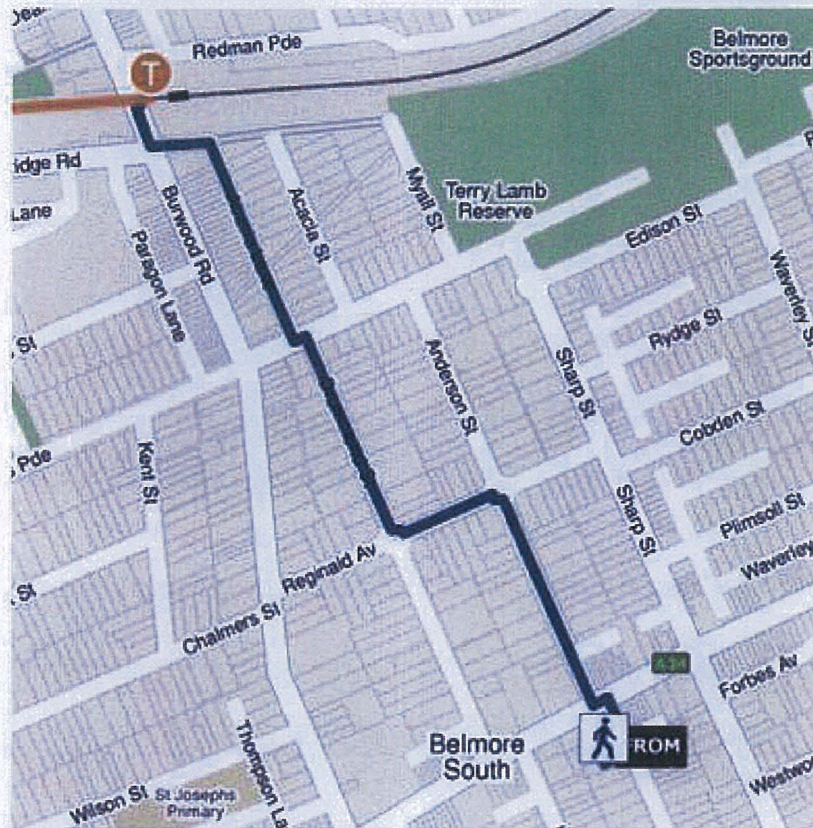


Diagram A: Walking Distance From cnr Platts Ave and Canterbury Rd to Belmore Station.

There are 4 routes that have regular 7 day services within a 15 minute walking distance of the site. The services and Service providers are:-

Bus Service Operator	Description	Route No.	Service	Walk Time to Site.
Sydney Buses	Stop No. 219213 Kingsgrove Road	Route 490	Hurstville to Drummoyne	1 min.
Sydney Buses	Stop No. 219215 Canterbury Road near Sharp Street	Route 487	Canterbury to Bankstown.	4 mins.
Sydney Buses	Stop No. 219215 Canterbury Road near Sharp Street	Route 415	Campsie to Chiswick	4 mins.
Sydney Buses	Stop No. 220876 William Street	423	City to Kingsgrove	11 mins.

3.0 TRANSPORT AND TRAFFIC ISSUES TO BE ADDRESSED

3.1 Roads and Maritime Services Response to Canterbury Road LEP 2012

The Roads and Maritime Services *response*, dated 7th August 2014, to the proposed planning amendments to the **CLEP 2012**, are as stated below.

Roads and Maritime Services will support the *proposed rezoning of Site A.1* subject to the 'traffic impacts' being fully considered. In this regard, the increase in maximum developable yield should be quantified and the resultant potential traffic impacts assessed. If the potential traffic impacts are likely to be significant, Roads and Maritime may require the *traffic impacts at key intersections* with (and access points on) Canterbury Road adjacent to the site to be considered and modeled using **SIDRA**.

A.2 Part of 677-687 Canterbury Road and 48 Drummond Street, Belmore 642-658 Canterbury Road, and 2, 2B and part 2C-2D Liberty Street Belmore (B6 to B5).

Roads and Maritime Services would *not support additional access points to Canterbury Road for future development/subdivisions* where *alternative local road access is available* and therefore access should be provided or maintained to the adjoining local roads where practicable.

4.0 TRAFFIC EFFECTS OF PROPOSED DEVELOPMENT

4.1 Floor Areas and Uses

The gross floor areas for the business premises and the gross leasable floor areas for the residential components have been calculated by Geoform Architects. These areas and the number and type of each residential unit on each level are contained in Table 4.1. The FSR for the site is calculated to be 2.7:1.

Table 4.1 Floor Areas and Uses

USE	LEVEL	Gross Floor Area M ²	Gross Leasable Floor Area M ²			
BUSINESS COMPONENT				1BR.	2BR.	3BR
	Ground	901.8*				
RESIDENTIAL COMPONENT						
	GFA	12326.1				
	LEVEL					
	1	1468.2		1	19	1
	2	1648.2		1	9	1
	3	2080		2	23	1
	4	1780.1		5	14	0
	5	1294.8		10	8	0
	6	1059.3		10	5	0
	7	991.5		8	6	0
	8	694.9		6	4	0
	9	694.9		6	4	
	10	199.1		2	1	
				51	93	3

Note* 486.7 sqm is not included in the FSR as it is located in the basement, but is included for the purposes of calculating traffic generation

There are a total of 147 residential units. The Ground floor plan and sections through the proposed development are located in **Appendix A** of this Report.

The proposed Draft amendments to the CLEP 2012, Zone B5 permits business premises, bulky goods premises. It also permits shop-top housing. As stated in Canterbury DCP Part 6.8, Belmore is classified as a Large Centre. Parking rates for Large Centres have been used in the calculation of parking requirements.

4.2 Estimated Residential and Workforce Population

In the Canterbury Council Development Contributions Plan 2013, the number of persons per dwelling type is listed as 1.53 persons per 1 bedroom dwelling or unit, 2.4 persons per 2 bedroom unit and 3.3 persons per 3 bedroom unit.

The number of employees and *car travel mode* has been determined from reviewing the data in the *RMS TDT04/2013* and the *RTA Land Use Traffic Generation Data and Analysis Reports* for Bulky Goods Developments No 18 and for Office Blocks No 1. The average rates given are shown in **Table 4.2**.

Table 4.2 Comparison Summary: Area m² per Employee

Facility	GFA m ²	No Of Staff Average
RMS Bulky Goods Retail RMS TDT 04a/2013		
Average	2765.9	18.8
Area m ² per employee	147.12	
RTA Bulky Goods Retail Data and Analysis 18		
Average	2440.15	154
Area m ² per employee	158.45	
RMS Offices TDT 04a/2013		
Average	14086.7	614.9
Area m ² per employee	22.9	
RTA Office Blocks Data and Analysis 1		
Average	4873.5	240.7
Area m ² per employee	20.2	

For the purposes of this report as the use is not yet determined we have assumes an average rate as *1 employees per 50m² of Gross Floor Area*. The car travel mode for Belmore area of 75% is then *multiplied by the number of employees* to obtain the *traffic generated by the business premises component*.

4.3 Car Parking Requirements and Provision

4.3.1 Residential Parking

Residential car park has been calculated in accordance with **Canterbury Development Control Plan Part 6.8 Parking and Vehicle Access**.

Parking has been calculated for residential car parking as shown in **Table 4.3.1**. The required number of spaces for the residential component is **137 spaces**.

4.3 (Continued)**4.3.2 Business Premises Parking**

The car parking for the business premises has been calculated in accordance with CDCP Part 6.8. The definition of 'commercial premises' as described in the CLEP 2012 definitions is listed below.

business premises means a building or place at or on which:-

- (a) an occupation, profession or trade (other than an industry) is carried on for the provision of services directly to members of the public on a regular basis, or
- (b) a service is provided directly to members of the public on a regular basis,

and includes a funeral home and, without limitation, premises such as banks, post offices, hairdressers, dry cleaners, travel agencies, internet access facilities, betting agencies and the like, but does not include an entertainment facility, home business, home occupation, home occupation (sex services), medical centre, restricted premises, sex services premises or veterinary hospital.

Note: *Business Premises are a type of Commercial premises.*

commercial premises means any of the following:

- (a) business premises,
- (b) office premises,
- (c) retail premises.*

Note Under the draft LEP amendments, retail premises are a prohibited use.*

The car parking for the business premises has been calculated in accordance with CDCP Part 6.8. Refer to Table 4.3.1 for the car parking requirement.

Table 4.3.1 Car Parking Requirements for Mixed Use Development

Unit type/Use	Parking Rate	Unit No	No of Required Spaces
1 Bed	0.8 space/unit	51	40.8
2 Bed	1 space/unit	93	93
3 Bed	1 space/unit	3	3
Visitor	not required	147	
TOTAL FOR RESIDENTIAL			136.8(137)
		Area GFA	
Business Premises	1 space/60m ²	901.8	15.03
Staff	1 space/200m ²		4.5
Total for Retail			19.5(20)
TOTAL PARKING FOR DEVELOPMENT			157

As the business premises use has not yet been determined for the site the required number of parking spaces has been calculated using the higher car parking rate for retail. For Business Commercial premises the rate is 1 space per 60m². The calculated number of spaces for the retail/ business premises component is 20 spaces.

4.4 Bicycle Storage Facilities

In order to encourage the use of bicycles by residents and workforce, it is proposed to provide '*bicycle storage racks/rails and bicycle lockers*' within the basement car park to encourage commuter and recreational cycling.

The suggested storage facilities are provided as a guide for the proposed development.

	Bicycle Lockers		Bicycle rail/racks
Residential	1 per 10 units	PLUS	1 per 12 units
Retail/Restaurant	1 per 450m ²	PLUS	1 per 150m ²

4.5 Internal Parking Layout and Circulation

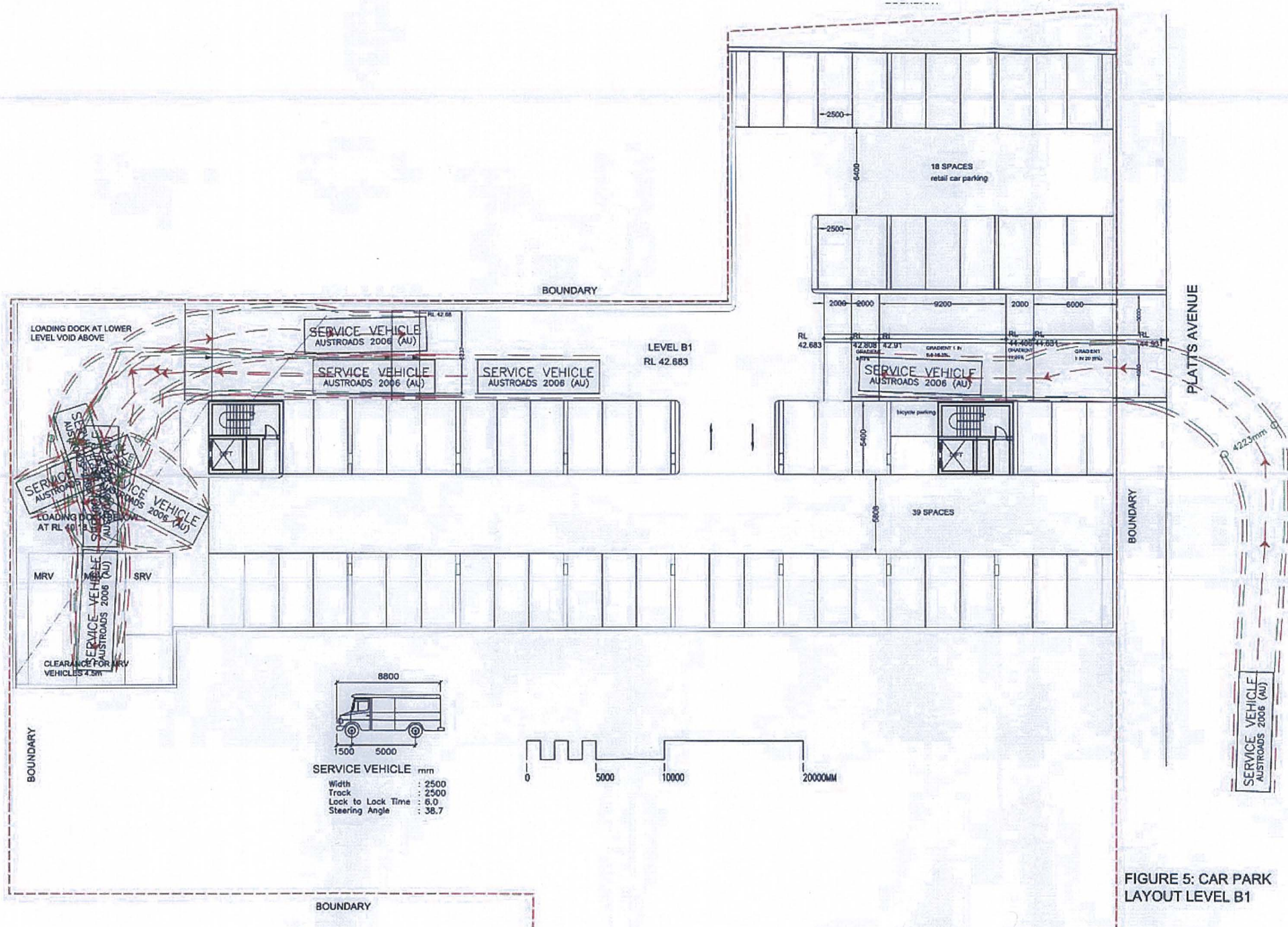
The two-way (combined) driveway is shown on **Figure 5** and extends from ground level RL 44.931 to Basement B1 at RL 42.683. As the number of car spaces is *less than 300*, the class of parking is predominantly residential **1A residential and employee car parking** and Platts Avenue is a *local road*, a *combined driveway is permissible* for an access driveway **Category 2** in **Table 3.1 in AS/NZS 2890.1 – 2004**. The driveway width is 8.6 metres and the pavement width between kerbs is 7.6 metres.

The driveway gradient has been checked and can be designed at 5% over the first 6 metres and then a transition of 11.25% for 2 metres and then graded at 15.38% (1 in 6.5) for 9.2 metres then graded at 9.13% for 2 metres, then graded at 6.25% for 2 metres to RL 42.683. The parking bay dimensions are 2.5 by 5.4 for the **Residential User Class 1A** but the aisle width is 6.0 metres and *exceeds the standard 5.8 metres*.

The parking bay dimensions required in the *Retail Car Parking* are 2.7 by 5.4 metres to comply with **User Class 3A** in **Figure 2.2 in AS/NZS 2890.1**. The aisle width is 6.4 metres. As the aisle width is 0.6m greater than the required 5.8m, the space width can be reduced to 2.5 metres. The column locations have not been determined so the parking lay out is *conceptual* and all dimensions need to be *confirmed* in the *detail design*. The *retail parking spaces* are shown in **Figure 5**. Level B2 basement has not been prepared as part of this report.

4.5.1 Internal Access Lane

A new access lane, as shown on the Architects Drawing **SK10** located in **Appendix A** has been created to provide a *Shared Zone* for *Pedestrians* and a *low volume* of vehicles.



4.6 Estimated Traffic Generation

The proposed building is a *high density residential flat building* in a *town centre of Belmore*. Based upon the traffic generation rates in the **RMS TDT 2013/04a Guide to Traffic Generating Developments Updated Traffic Surveys**. Residential units are expected to generate **0.19 vehicle trips** in the **AM** peak hour and **0.15 trips**, per unit in the **PM** peak hour. Based upon surveys conducted by this firm, the *directional distribution* for the residential traffic is **75% out** and **25% in** in the **am** peak hour and **67% in** and **33% out** in the **pm** peak hour.

For the business premises, the **RMS** traffic generation rates **TDT 04a/2013** for Bulky Goods Retail premises in the peak hour period is **2.7 vehicles per 100m²**.

In the **am** peak hour, the traffic generation by the business premises - retail will be mainly due to *staff arriving* for work. The number of retail employees is estimated to be **16**, as shown in **Table 4.6**. The **GFA** for the retail shops is **803m²**, as shown in **Table 4.1**. A further allowance of **10%** of the **pm** peak generation has been allowed for *shoppers* in the **am** peak. The *directional distribution* assigned for retail shopper trips is **50% in** and **out** in the **pm** peak hour. The estimated traffic generation is shown in **Table 4.6**.

Table 4.6 Peak Hour Traffic Generation by Proposed Mixed Use Development.

Use	Peak Hour	Generation Rate/Unit	No. of Units	Traffic Generation		
				IN	OUT	TOTAL
Residential Units	8.00-9.00am	0.19 trips/hr	147	7	21	28
	4.00-5.00pm	0.15 trips/hr	"	14.74(15)	7.26(7)	22
Business Premises		2.7/100m ² *	901.8 GLAm ²			
	8.00-9.00am			2.43	2.43	4.86
	4.00-5.00pm			12.17	12.17	24.34
Employees	18					
	8.00-9.00am			13.5	0	13.5
TOTAL AM PEAK				22.93(23)	23.43	46.43(46)
TOTAL PM PEAK				26.91(27))	19.43(19)	46.34(46)

Notes:

AM Peak Hour For Residential is based on 0.25 in and 0.75 out and in the PM Peak Hour 0.66 IN and 0.33 OUT.

AM Peak Hour trips for the Business Premises is 10% In and 10% OUT .PM peak hour assumes 50% IN and 50% OUT. The number of employees is calculated as 901.8/50m²(18) x 75% mode split for car driver for Belmore.

* Generation rates for Bulky Goods Stores from TDT 04a/2013

4.7 Intersection Performance

In order to assign the 'trip distribution', the Journey to Work data for residents and those employees commuting to Belmore have to be reviewed from the *JTW Explorer* figures from the 2011 Journey To Work Data.

Journey To Work In Belmore		Percentage %
Work in the Area	2139	76
Canterbury	998	47
Bankstown	348	16
Strathfield	213	10
Hurstville	148	7
Kogarah	121	6
Sutherland	76	4
Liverpool	68	3
Canada Bay	57	3
Ryde	57	3
Campbelltown	53	2

Note: the number of unknown locations were taken out from the total figure

Where do the residents Work

No of people living in Belmore		
	3793	100
Sydney City	1039	27
Canterbury	936	25
Strathfield	317	8
Bankstown	299	8
No Fixed Place	292	8
Botany	221	6
Marrickville	221	6
Auburn	156	4
Kogarah	144	4
Canada Bay	128	3

Note: the number of unknown locations were taken out from the total figure

The additional traffic volumes in the **am** and **pm peak hours** have been distributed to the *road network in the study area* based upon the 'turning volumes' at the intersections, shown in **Figures 6 and 7**. The future **am** and **pm** peak hour traffic volumes are shown in **Figure 8**. The *signalized intersections* have been analysed using **SIDRA Version 5.0**. The results are set out in **Table 4.7**.

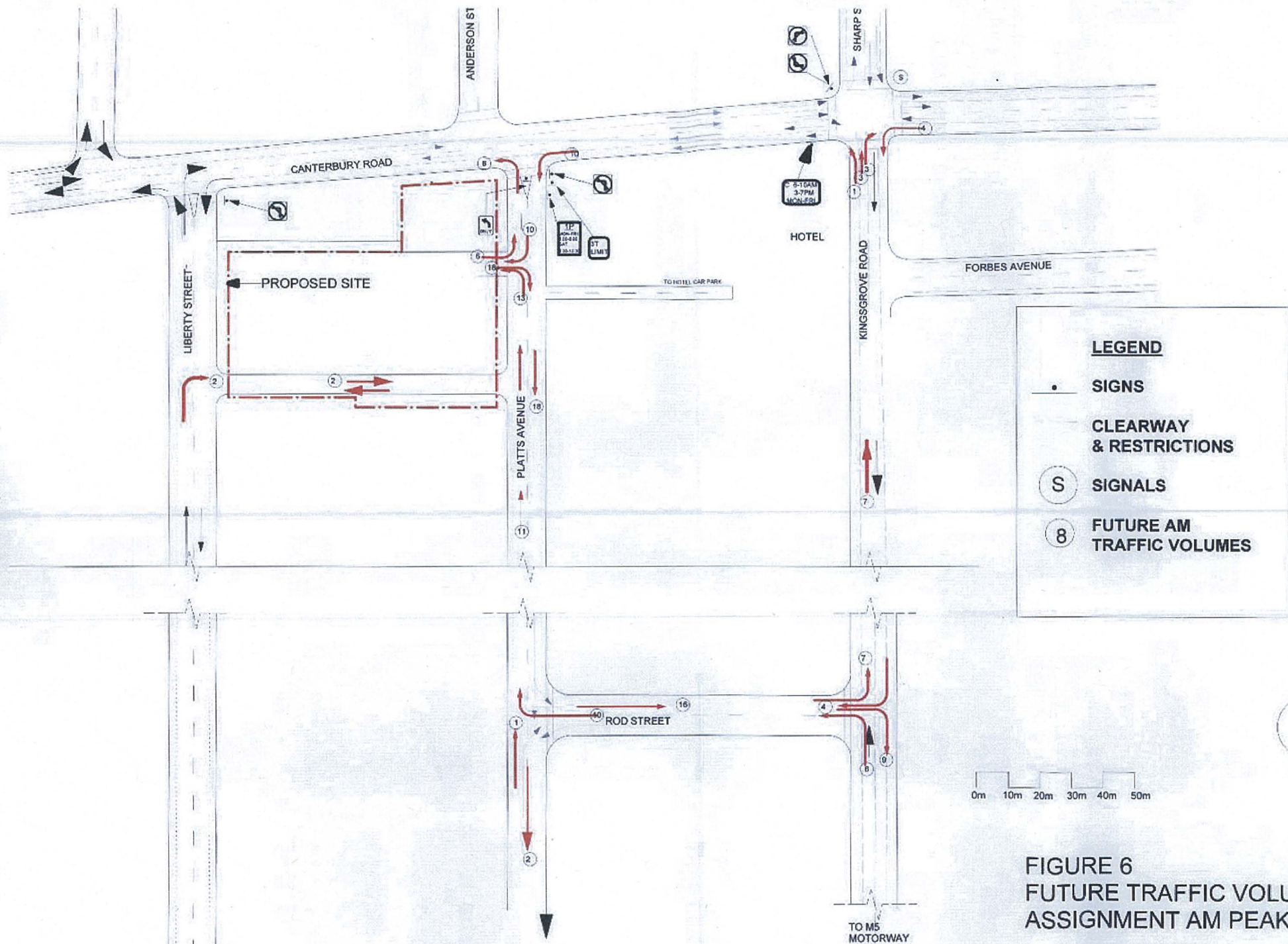
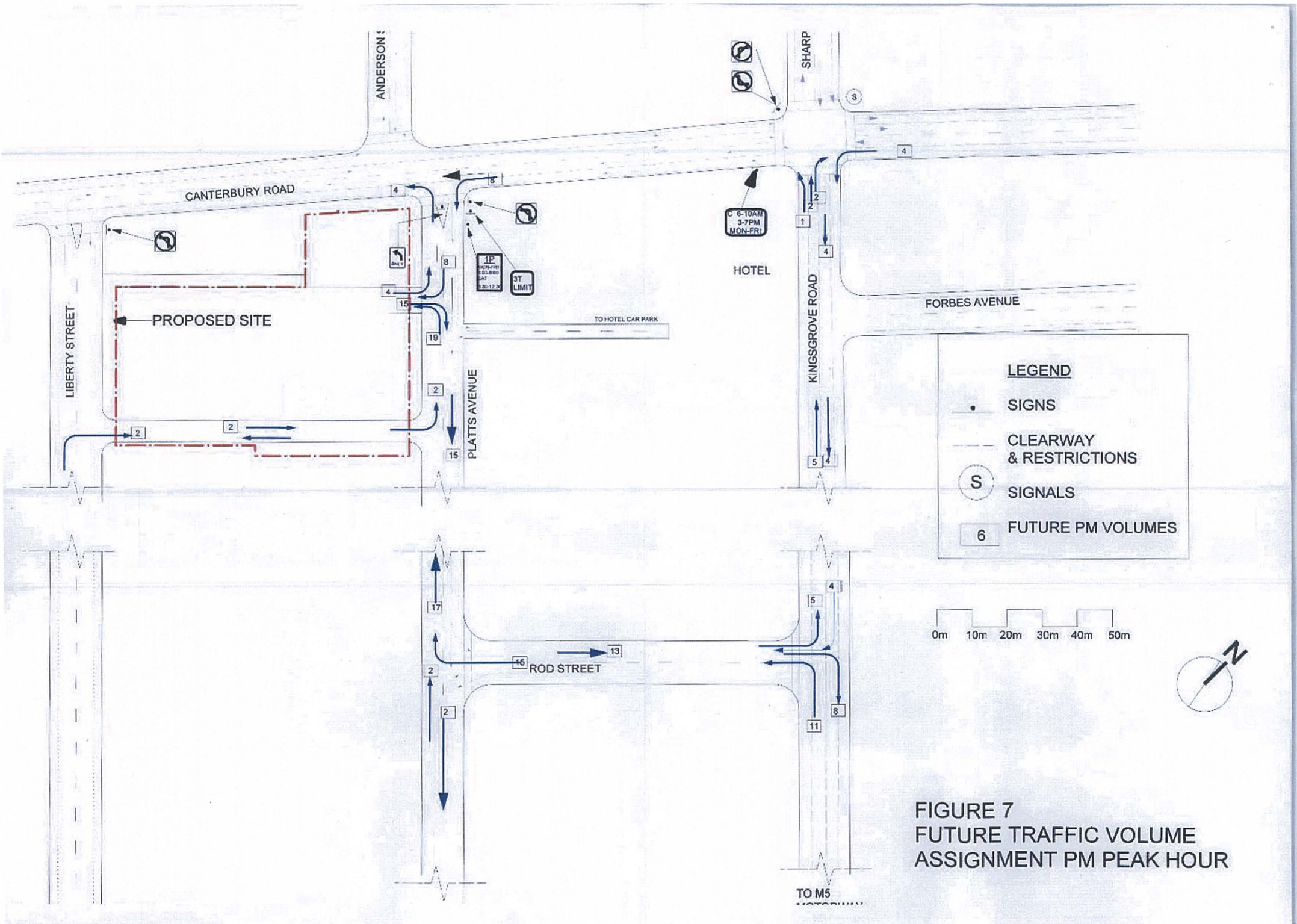


FIGURE 6
FUTURE TRAFFIC VOLUME
ASSIGNMENT AM PEAK HOUR



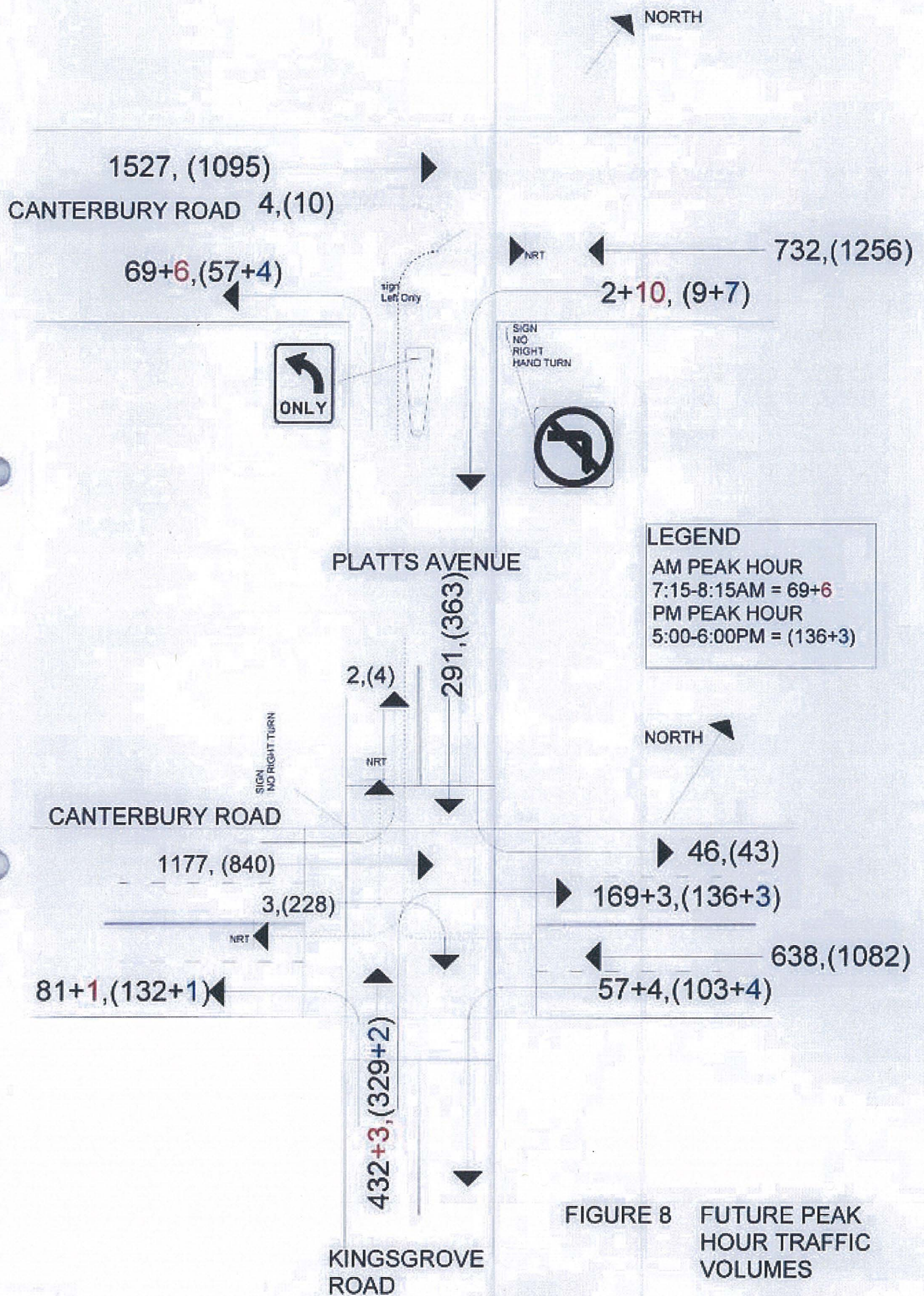


FIGURE 8 FUTURE PEAK HOUR TRAFFIC VOLUMES

4.7 (Continued)

Table 4.7 Intersection Performance

	Intersection	Peak Hour	Level of Service LoS	Degree of Saturation DOS	Average Delay per Veh.	Critical Movement Delay per Veh.
G	Canterbury Road/ Platts Avenue	8:00am-9:00am	A (WORST B)	0.412	0.4Secs.	Left turn from Platts Avenue into Canterbury Rd 12.6 SECS
		4:15pm-5:15pm	A (WORST D)	0.342	0.7Secs.	Left turn from Platts Avenue into Canterbury Rd 29.6 SECS
S	PD1 Scenario Canterbury Road/ Kingsgrove Road	8:00am-9:00am	D (WORST F)	0.95	52.1Secs	RHT from Kingsgrove Rd to Canterbury Rd 99.1secs
		5:00pm-6:00pm	C (WORST F)	1.22	41.6Secs	RHT from Kingsgrove Rd to Canterbury Rd 279.6 secs

- (1) Degree of Saturation is the ratio of demand to capacity for the most disadvantaged movement.
- (2) Average delay is the delay experienced on average by all vehicles. The value in brackets represents the delay to the most disadvantaged movement.

Level of Service is a qualitative measure of performance describing operational conditions. There are six levels of service, designated from A to F, with A representing the best operational condition and level of service F the worst. The LoS of the intersection is shown in bold, and the LoS of the most disadvantaged movement is shown in brackets.

Note: S Signals

G Give Way

The intersection at Canterbury Road/ Kingsgrove Road is unsatisfactory in the **AM** peak hour and requires *additional capacity*. Whilst this development has been modelled for the future development as shown in Scenario PD1, this scenario will have little change to the operational capacity of this intersection as shown in Table 4.7. **SIDRA** results are located in **Appendix F**. There is *minimal change* to the **SIDRA** Outputs for Platts Avenue/ Canterbury Road Intersection for future traffic volumes.

Future traffic impact assessment studies at Development Application Stage may include additional intersections that may form part of the way finding routes by residents. These may include the intersections of Harp Street and Kingsgrove Road and Forsyth Street/ William Street and Kingsgrove Road.

4.8 Delivery / Service Vehicles

The proposed development has a gross retail floor area of **901.8m²** and **147** residential units.

Based upon *Table 5.1 in the RTA Guide to Traffic Generating Developments* the number of unloading bays for business premises/ bulky goods is not specified but under other uses it is given as 1 space per 2000m² of GFA. The requirement for the residential units is **1 space** for every **50** units under **200** units, therefore **3** bays are required. The total requirement is **4 bays**.

Based upon a paper prepared by J B Watters for a M Eng Sc., thesis in 1972, the *arrival rates* in Sydney suburbs from surveys were:-

Mixed small shops – 3.5 arrivals per 929m² GLFA (λ)

The average service rate where the driver unloads the truck only was **8.5 to 10.5 vehicles per hour (μ)**.

The estimated *arrival rate* for the retail shops of **901.8m²** is **3.39 arrivals**

The total arrival rate *3.39 divided by the service rate of 10 vehicles per hour (μ) is 0.339*. If we provide **3 spaces** in total for retail and residential. The probability of a truck having to queue is less than 1%. The majority of retail deliveries are made in the mornings before **12 noon**. A Management Plan may be required so that the *residential unloading / loading requirements are carried out after the busy retail deliveries period and on weekends*.

The Swept Path diagram showing the **MRV** truck entering a loading bay and a **SRV** vehicle *exiting concurrently* from a loading bay is shown in **Figure 5**.

The design has provided for **2 MRV loading spaces** and **1 SRV space**.

4.9 Provision of Alternative Transport

It is recommended that a "Green Travel Plan" be adopted for this development to *reduce car based travel* to encourage employees in the retail tenancies to make *greater use* of public transport, cycling, walking and car sharing for the journey to work.

The following initiatives are recommended:-

1. Bicycle storage, showers and changing facilities be provided to encourage cycling by employees and bicycle storage for residents.
2. Provide train and bus timetables to staff and residents.
3. Provide a walking map that shows walking distances to bus stops, schools, parks and local shops.