

N R PARKES PTY LTD

**TRAFFIC IMPACT ASSESSMENT REPORT
ON PROPOSED RESIDENTIAL AND
COMMERCIAL CONCEPT DESIGN,
5-7 PARKES STREET, PARRAMATTA, NSW**

28th JANUARY 2014

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1.0 INTRODUCTION

N R Parkes Pty Ltd commissioned Christopher Hallam & Associates Pty Ltd to assess the traffic implications of a concept design for the site known as 5-7 Parkes Street, Parramatta, NSW. The site is located on the south-east corner of the junction of Parkes Street and Anderson Street, as shown in Figure 1 below.

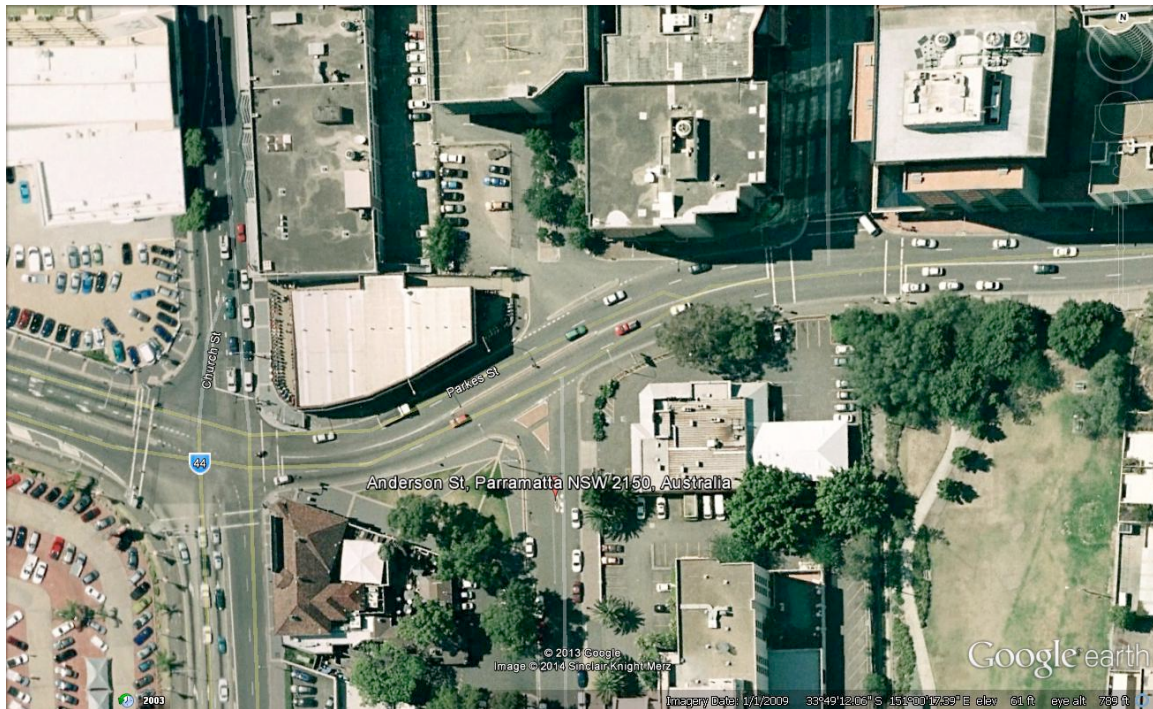


Figure 1 Site Location

The site is currently vacant. In June 2008 development consent was granted for the redevelopment of this site to provide a two-storey registered club, with 1875 sq m of accessible floor area, and with 111 car parking spaces.

In 2010 a new proposal was submitted to Parramatta City Council, for 70 residential apartments and 300 sq m of commercial space, with 75 car parking spaces. The traffic implications of this proposal were set out in a Traffic Report prepared by Brown Consulting, dated November 2010. Consent was subsequently granted for a ground floor commercial use plus 56 apartments.

The current Concept Design was developed in the Urban Design Study prepared by AECOM, dated 23 September 2013. This design proposes approximately 180 residential apartments plus 1530 sq m of commercial(office) space on the ground floor.

We have addressed the traffic implications of this concept design in the following Sections:

- Section 2 sets out our review of the current situation in regard to land use, the road network, current traffic flows and intersection operation;
- Section 3 describes the concept design, comments on access, layout and car parking, estimates the peak traffic generation and assesses the external traffic implications; and
- Section 4 sets out the conclusions.

2.0 CURRENT SITUATION

2.1 Land Use

The site is known as 5-7 Parkes Street, Parramatta (Lot 511 DP 866023). It is bounded to the north by Parkes Street, to the west by Anderson Street, to the east by Jubilee Park and to the south by an hotel. The site currently is not being used.

Along the northern side of Parkes Street Action Motorcycles is on the south-east corner of the junction of Church Street and Parkes Street. There is a public parking station directly off the northern end of Anderson Street (North). To the east of this parking station there is a commercial office building.

On the southern side of Parkes Street west of the site, P J Gallagher's Irish Pub is located. On the eastern side of Anderson Street to the immediate south of the site is the Marriott Courtyard Hotel. Further to the south in Anderson Street are car yards.

2.2 Road Network

To the west of the site, Church Street is an Arterial Road that connects Parramatta CBD with Parramatta Road, Woodville Road and the M4 Motorway. It has a dual carriageway with a central median, with three lanes per direction south of Parkes Street. It has a posted speed limit of 60 km/hr in the vicinity. The junction of Church Street with Parkes Street and the Great Western Highway is a major traffic signal controlled intersection. All movements are allowed, except for the right turn from Parkes Street to Church Street (North). It provides for controlled pedestrian crossings over the western, southern and eastern approaches.

We understand that the Draft Local Environmental Plan proposes a small section of the site on the north-east corner of this Church Street and Parkes Street intersection to be acquired for road widening. This might increase the capacity of this intersection, although this has not been taken into account in our assessment.

Parkes Street is a Sub Arterial Road connecting Parramatta CBD and the Great Western Highway with James Ruse Drive, plus providing access to commercial developments along its length. It has a dual carriageway with a central median, and with two travel lanes in each direction. The posted speed limit is 60 km/hr. At its junction with Anderson Street the central median restricts movements on both the northern and southern sides to left turns in and out.

Anderson Street is a Local Road. The stub section north of Parkes Street provides egress from the public parking station. There is also a laneway immediately to the west of the

parking station that joins with Anderson Street, but only allowing left turn movements at Parkes Street. The southern section of Anderson Street provides access to adjacent properties. It has a carriageway width of approximately 9.6m, and a posted speed limit of 50 km/hr. It generally provides one travel lane per direction. At its southern end, Anderson Street connects with Marion Street, at a priority-control T-junction. Marion Street is a Collector Road providing local distribution and access between its traffic signal controlled junction with Church Street and roads to the East. It has a carriageway of approximately 12.6m, with one travel lane per direction. It has a posted speed limit of 50 km/hr.

2.3 Traffic Flows

We have previously undertaken traffic counts at the junctions of Parkes Street with Church Street/Great Western Highway, with Anderson Street North and with Cowper Street/Valentine Avenue. These counts were undertaken on Tuesday 30th July 2013, in the morning and afternoon peak periods. In addition to these counts, we have collated traffic count data at the junction of Parkea Street and Anderson Street (South), undertaken on Thursday 21st October 2010, in the afternoon peak period. At the key intersection of Church Street, Great Western Highway and Parkes Street, the hours with the highest traffic flows were 8.00-9.00am and 4.00-5.00pm. We have set out on Figure 2 these current peak hour flows. For the junction of Parkes Street and Anderson Street (South), we have estimated the left turn flows for the morning peak hour.

At the main intersection, the eastbound and westbound flows along Parkes Street-Great Western Highway are substantial, but in tidal directions, with heavy eastbound flows in the morning and heavy westbound flows in the afternoon. All movements from Church Street (South) are moderately heavy, with the right turn into Parkes Street being heavier in the morning peak hour. The current operation of this intersection has been reviewed using the SIDRA 6.0 computer program. A guide to the significance of the outputs is shown in Table 2.1 below, taken from the Roads & Maritime Services *Guide to Traffic Generating Developments*.

TABLE 2.1 LEVEL OF SERVICE CRITERIA FOR INTERSECTIONS

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

Table 2.2 sets out the results of this analysis.

TABLE 2.2 SIDRA ANALYSIS OF CHURCH STREET, PARKES STREET & GREAT WESTERN HIGHWAY – CURRENT FLOWS

Approach	Move	AM Avg Delay (secs/veh)	AM Level Of Service	AM 95% Queue (m)	PM Avg Delay (secs/veh)	PM Level Of Service	PM 95% Queue (m)
Church St	Left	47.6	D	205	71.1	F	194
South	Thru	36.2	C	167	58.2	E	142
	Right	70.9	F	322	101.6	F	194
Parkes St	Left	42.2	C	123	35.0	C	210
	Thru	34.9	C	125	27.0	B	215
Church St	Left	84.9	F	61	99.8	F	208
North	Thru	75.6	F	63	89.9	F	208
	Right	102.9	F	24	100.0	F	62
Great West	Left	60.2	E	389	33.8	C	136
Highway	Thru	55.5	D	389	24.6	B	136
	Right	85.3	F	210	127.5	F	135
All	All	56.5	E	(389)	63.7	E	(215)

Table 2.2 indicates that this intersection is very busy in the peak periods, as most users would be aware of. For a traffic signal controlled intersection, the key measure of the level of service is the overall intersection level, which is E in both AM and PM peak periods, indicating that this intersection is close to capacity. Those movements with a level of service of F are the most delayed. The impact of additional development traffic at this intersection is discussed in Section 3. The SIDRA intersection files can be separately provided if required.

At the intersection of Parkes Street and Anderson Street (South), because movements are restricted to left turns only, the main issue with the proposed development's driveway on Anderson Street will be increased delays to traffic turning left from Anderson Street into Parkes Street, having to give way to westbound traffic on Parkes Street. Table 2.3 sets out the results of the SIDRA analysis of the current situation at this intersection.

TABLE 2.3 SIDRA ANALYSIS OF PARKES STREET & ANDERSON STREET (SOUTH SIDE) – CURRENT FLOWS

Approach	Move	AM Avg Delay (secs/veh)	AM Level Of Service	AM 95% Queue(m)	PM Avg Delay (secs/veh)	PM Level Of Service	PM 95% Queue(m)
Anderson St	Left	9.1	A	1	10.2	A	1
Parkes Street	Left	8.2	A	0	8.2	A	0
East	Through	0	A	0	0	A	0
All	All	0.8	(A)	(1)	0.7	(A)	(1)

Table 2.3 indicates very satisfactory current operation at this intersection.

3.0 TRAFFIC IMPLICATIONS OF CONCEPT DESIGN

3.1 Description

The Concept Design is set out in the AECOM report of 23 September 2013 – *5-7 Parkes Street, Parramatta Urban Design Study*. The proposal is Option 3. For traffic impact assessment purposes, the details assumed are:

- * 180 residential apartments
- * Ground floor commercial (office) of 1530 sq m gross floor area
- * Car parking as per LEP
- * Vehicular access off Anderson Street, in accordance with DCP

3.2 Access, Layout and Parking

Access, layout and car parking has been assumed to follow the design principles adopted in the earlier development proposal, as previously discussed in the November 2010 report by Brown Consulting titled *5-7 Parkes Street, Parramatta Development Assessment Report*.

Access and Layout

Clause 4.2 of *Parramatta City Centre Development Control Plan 2007* sets out the site access requirements:

Clause 4.2 – Vehicular Driveways and Manoeuvring Areas

(a) *Driveways should be:*

- *Provided from lanes and secondary streets rather than the primary street, wherever practical;*
- *Located taking into account any services within the road reserve, such as power poles, drainage inlet pits and existing street trees;*
- *Located a minimum of 10 metres from the perpendicular of any intersection of any two roads;*
- *If adjacent to a residential development, setback a minimum of 1.5m from the relevant side property boundary.*

(b) *Vehicle access is to be designed to:*

- *Minimise the impact on the street, site layout and the building façade design, and*
- *If located off a primary street frontage, integrated into the building design.*

- (c) *Where practicable, buildings are to share, amalgamate, or provide a rear lane for vehicle access points.*
- (d) *All vehicles must be able to enter and leave the site in a forward direction without the need to make more than a three point turn.*
- (e) *Separate and clearly differentiate pedestrian and vehicle access.*
- (f) *Locate vehicle access a minimum of 3 metres from pedestrian entrances.*
- (g) *Minimise the size and quantity and visual intrusion of vehicle access points. The preferred width of driveway crossings and car park and service entries is 2.7m.*
- (h) *Vehicular access may not ramp along boundary alignments edging the public domain, streets, lanes, parks, water frontages and the like.*
- (i) *Design of driveway crossings must be in accordance with Council's standard Vehicle Entrance Designs, with any works within the footpath and road reserve subject to a Section 138 Roads Act approval.*
- (j) *Driveway widths must comply with the relevant Australian Standards.*
- (k) *Car space dimensions must comply with the relevant Australian Standards.*
- (l) *Driveway grades, vehicular ramp width/grades and passing bays must be in accordance with the relevant Australian Standard, (AS2890.1).*
- (m) *Vehicular ramps less than 20 metres long within developments and parking stations must have a maximum grade of 1 in 5 (20%). Ramp widths must be in accordance with AS2890.1.*
- (n) *Access ways to underground parking should not be located adjacent to doors or windows of the habitable rooms of any residential development.*
- (o) *For residential development in the Mixed Use zone, use semi-pervious materials for all uncovered parts of driveways/spaces to provide for some stormwater infiltration.*

The main issue with site access is its location. Both the DCP and AS/NZS2890.1-2004 recommend that vehicular access be provided off a minor road, where practical. The site has frontages to both Parkes Street and Anderson Street. With its Sub-arterial road function and its central median, Parkes Street is not a desirable access location, if there is an alternative. Anderson Street provides the alternative, as a Local Road with relatively low traffic flows. The site layout for the approved development of this site locates the driveway off Anderson Street at its southern boundary. This is an appropriate location that meets the locational criteria of the DCP.

As to the width and design of this driveway, we note that clause (g) recommends 2.7m while clause (j) recommends compliance with the relevant Australian Standards. The relevant Standard is AS/NZS 2890.1-2004. For this development, a driveway width of 2.7m would certainly not comply. The Standard recommends a two-way driveway be provided when the projected peak hour two-way traffic movement is in excess of 30 veh/hr. As is further discussed in Section 3.3, the projected peak hour two-way traffic movement is in excess of 30 veh/hr, and hence a two-way driveway is required.

With the limited site frontage to Anderson Street, a driveway width in excess of two traffic lanes would be hard to achieve, while maintaining separation from the Parkes Street intersection. The width proposed in the earlier development proposal, with a kerb to kerb width of 6.895m would be appropriate. We would anticipate that the kerbside between this driveway and Parkes Street would have “No Stopping” restrictions. This would provide some separation between a car entering the site and a following car traveling southbound on Anderson Street. As a point of detail, there would need to be a corner splay to assist a driver leaving the site seeing a pedestrian walking northbound along the footpath. Provided such an arrangement is incorporated in the design, the access driveway could comply with the DCP and the Standard.

Car Parking

Clause 4.3 of the DCP deals with Onsite Parking. These requirements are in some detail. Given the concept design proposal, it is not necessary to comment on these requirements at this stage of assessment. The general requirement we recommend is that the car parking layout comply with AS/NZS 2890.1-2004. For service vehicle access, we recommend that the loading bay(s) comply with AS2890.2-2002. A Small Rigid Vehicle is assumed to be the standard design service vehicle.

In the estimation of traffic generation, the quantum of car parking on the site is relevant. While a specific parking design has not as yet been prepared, some assumptions on the quantum of parking are necessary.

Clause 22C - Car Parking of *Parramatta City Centre Local Environmental Plan 2007* sets out the requirements:

Consent must not be granted for any new building, or an alteration to an existing building that increases the gross floor area of the building, that is to be used for a purpose set out below unless the consent authority is satisfied that car parking will be provided in accordance with the requirements also set out below.

Proposed use of building

Commercial

Number of parking spaces required

1 parking space to be provided for every 100 sq m of gross floor area

Proposed use of building

Multi dwelling housing, 1, 2 and 3 bedrooms

Number of parking spaces required

1 parking space is to be provided for every dwelling plus 1 parking space to be provided for every 5 dwellings for visitors.

For the purposes of this clause, the following are to be included as part of a building's gross floor area:

- (a) *Any area of the building that is used for car parking and is at or above existing ground level;*
- (b) *Any area of the building that is used for car parking below existing ground level, except where the car parking is provided as required by the clause.*

Car parking that is required to be provided in relation to commercial activities must be provided on site unless the consent authority is satisfied that car parking would be adequately provided for elsewhere.

Based on these requirements, the concept design would need 180 parking spaces for the apartment residents, 36 spaces for residential visitors and 15 spaces for the commercial tenants. The provision of the 36 spaces for the residential visitors might be subsequently argued to be unnecessary with the proximity of the site to Parramatta Railway Station and to a large public parking area to the immediate north. For this assessment of the concept design, whether these 36 spaces are provided or not is not a relevant consideration in the assessment of the peak hour traffic generation. The minimum car parking that has been assumed is 180 spaces for the residents and 15 spaces for the commercial tenants.

3.3 Traffic Generation

The traffic generation for the residential apartments can be assessed from the RMS *Guide to Traffic Generating Developments*. This has a residential land use termed “high density residential flat building”, with metropolitan regional and sub-regional centre categories. The metropolitan regional centre category is appropriate for a site in Parramatta, near the CBD. The weekday peak hour traffic generation rate is 0.24 veh/hr/unit, so 180 units will generate 43 veh/hr in the weekday peak hour. Typical distributions would see 70% of this generation in the peak tidal direction, that is, OUT in the morning and IN in the afternoon.

For the 1530 sq m of commercial/office space on the ground floor, the standard generation rate in the RMS Guide is 2 veh/hr/100 sq m GFA, which equates to approximately 30 veh/hr. However this rate of generation assumes the standard RMS rate of car parking provision, of one space per 40 sq m gross floor area. This would calculate out to 38 spaces. However to comply with the LEP, only 15 spaces are proposed for the commercial users. The traffic generation would proportionally reduce at the rate of $15/38 \times 30 = 12$ veh/hr. With commercial uses, about 90% is typically in the peak tidal direction, being IN in the morning and OUT in the afternoon.

Putting together the two components of traffic generation, the total weekday peak traffic generation would be:

<u>Period</u>	<u>IN</u>	<u>OUT</u>	<u>Total</u>
AM	24	31	55 veh/hr
PM	31	24	55 veh/hr

As to the directional distribution of this traffic, the following origins/destinations have been assumed:

<u>Direction</u>	<u>Access Street</u>	<u>Percentage</u>
North	Church Street (North)	10%
South	Church Street (South)	30%
East	Parkes Street	30%
West	Great Western Highway	30%

3.4 External Traffic Implications

Travel Routes

The external traffic implications depend on the actual approach and departure routes utilized. Bearing in mind turning restrictions and the median in Parkes Street, the following routes have been assumed:

<u>Direction</u>	<u>Travel</u>	<u>Route</u>
North	Inbound	Church St-Marion St-Anderson St
	Outbound	Parkes St-Great Western H'way-Marsden St
South	Inbound	Church St-Marion St-Anderson St
	Outbound	50% Parkes St-Church St; 50% Anderson St-Marion St-Church St
East	Inbound	Parkes St-Anderson St
	Outbound	50% Anderson St-Marion St-Church St-Parkes St; 50% local
West	Inbound	Great Western H'way-Church St-Marion St-Anderson St
	Outbound	Parkes St-Great Western H'way

Intersection Capacity

We have added the projected development traffic as estimated above to the current traffic flows shown on Figure 2 and re-analysed the intersections. At the main intersection of Great Western Highway, Church Street and Parkes Street, the SIDRA analysis is set out in Table 3.1.

TABLE 3.1 SIDRA ANALYSIS OF CHURCH STREET, PARKES STREET & GREAT WESTERN HIGHWAY – WITH DEVELOPMENT

Approach	Move	AM Avg Delay (secs/veh)	AM Level Of Service	AM 95% Queue(m)	PM Avg Delay (secs/veh)	PM Level Of Service	PM 95% Queue(m)
Church St	Left	47.4	D	207	72.2	F	197
South	Thru	36.9	C	168	60.0	E	144
	Right	74.5	F	338	111.0	F	208
Parkes St	Left	40.7	C	126	32.2	C	205
	Thru	34.4	C	128	25.2	B	211
Church St	Left	84.0	F	61	118.2	F	232
North	Thru	75.7	F	64	109.6	F	232
	Right	102.0	F	24	101.5	F	63
Great West	Left	59.7	E	403	31.0	C	131
Highway	Thru	55.9	D	403	22.8	B	131
	Right	86.1	F	208	127.6	F	141
All	All	57.2	E	(403)	67.3	E	(232)

The results set out in Table 3.1 should be compared with those in Table 2.2. In the morning peak hour, the average intersection delay shows an increase from 56.5 to 57.2 seconds, with the level of service remaining unchanged at E. There are very minor changes to individual movement delays, but the levels of service of each movement would remain unchanged.

In the afternoon peak period the average intersection delay shows an increase from 63.7 to 67.3 seconds, with the level of service remaining unchanged at E. Again, very minor changes to individual movement delays are indicated but the levels of service remain unchanged.

This is a major intersection in Parramatta, carrying high traffic flows, with consequent high delays. In the 8.0-9.00am period the current traffic flows add up to 3388 veh/hr. The development's additional 30 veh/hr through this intersection is an increase of less than 1%. In the 4.00-5.00pm period the current traffic flows add up to 3222 veh/hr. The development's additional 30veh/hr through this intersection is an increase of less than 1%. Any new development in Parramatta CBD is likely to increase the traffic through this intersection. The development's total site peak hour traffic generation of 55 veh/hr is very low in the scheme of things. For comparison, a McDonalds fast food drive-through restaurant has a peak traffic generation of the order of 150-200 veh/hr.

We conclude that the capacity implications at this intersection for the concept design at the subject site are satisfactory.

The operation of the intersection of Parkes Street with Anderson Street (South) has also been re-assessed. Table 3.2 sets out the results.

TABLE 3.2 SIDRA ANALYSIS OF PARKES STREET & ANDERSON STREET (SOUTH) – WITH DEVELOPMENT

Approach	Move	AM Avg Delay (secs/veh)	AM Level Of Service	AM 95% Queue(m)	PM Avg Delay (secs/veh)	PM Level Of Service	PM 95% Queue(m)
Anderson	Left	9.1	A	1	10.2	A	2
Parkes St	Left	8.2	A	0	8.2	A	0
East	Thru	0	A	0	0	A	0
All	All	1.1	(A)	(1)	0.9	(A)	(2)

Comparing the results set out in Table 3.2 with those for the current situation in Table 2.3, there is insignificant difference. The average movement delays in both the morning and afternoon do not change, with the delay to the left turn from Anderson Street into Parkes Street remaining at 9 seconds in the morning and 10 seconds in the afternoon. In conclusion, there is ample capacity at this intersection for the additional traffic from the site.

The junction of the site driveway with Anderson Street has also been reviewed, with the development traffic. For Anderson Street between the driveway and the site entrance, “No Stopping” restrictions along the eastern side have been assumed. On the western side near the entrance, a short 10 metre section of “No Stopping” has been assumed south of the driveway. Anderson Street approaching Parkes Street would still have only one travel lane, given the left turn restriction. Table 3.3 sets out the results of the SIDRA analysis.

TABLE 3.3 SIDRA ANALYSIS OF ANDERSON STREET & SITE DRIVEWAY

Approach	Move	AM Avg Delay (secs/veh)	AM Level Of Service	AM 95% Queue(m)	PM Avg Delay (secs/veh)	PM Level Of Service	PM 95% Queue(m)
Anderson	Left	8.2	A	0	8.2	A	0
St North	Thru	0	A	0	0	A	0
Site	Left	8.3	A	0	8.3	A	0
Driveway	Right	8.8	A	0	8.9	A	0
Anderson	Thru	0	A	0	0	A	0
St South	Right	8.4	A	0	8.4	A	0
All	All	4.1	(A)	(0)	3.5	(A)	(0)

Table 3.3 indicates that the site driveway will function in a very satisfactory manner, with minimal delays.

We conclude that the external peak period traffic implications at intersections will be satisfactory for the scale of development proposed in the Concept Design.

Future Development in Parramatta CBD

Parramatta CBD is being developed in accordance with its centres hierarchy within the Sydney Region, with a number of development sites currently being considered for redevelopment. We are aware of development proposals at the site known as 76-100 Church Street, on the north-east corner of the Parkes Street and Church Street intersection. This will probably see additional traffic accessed off the northern side of Parkes Street.

We are aware of the strategic plans for the redevelopment of the “Auto Alley” to the south of the site. Again, this could result in additional traffic generated/attracted to Parramatta, as would be expected for such a regional centre. In relative terms, the scale of development for the subject site’s Concept Design is small in traffic generation terms, with its estimated peak hour traffic generation of about 55 veh/hr.

The strategic planning for Parramatta CBD should seek to maximize public transport usage and reduce peak traffic generation by restricting on-site car parking, particularly for non-residential developments, as achieved by the current Local Environmental Plan.

4.0 CONCLUSIONS

1. The site at 5-7 Parkes Street, Parramatta, is currently vacant, but was previously used as a restaurant. Previous development consents included a licenced club and a mixed commercial and residential development.
2. The Concept Design prepared for this site envisages ground floor commercial use (1530 sq m) and a residential tower, with approximately 180 apartments.
3. The location of the vehicular access is in the most appropriate position, in accordance with the DCP and Standards guidelines.
4. With parking for commercial developments restricted in Parramatta CBD, the peak hour traffic generation of the commercial component will be very low. For the residential component, residential uses within central business districts are a positive use in that they can reduce the traffic generation of employment areas within the CBD, allowing workers to walk to work. This means that the external traffic generation of such residential uses is low. For this Concept Design, the total weekday traffic generation is estimated to be approximately 55 veh/hr, which is a low number, being less than one vehicle movement each hour.
5. The operation of the site access and the adjacent intersection of Anderson Street with Parkes Street will be very satisfactory, easily handling the relatively low traffic movements.
6. The major intersection of Great Western Highway, Church Street and Parkes Street is currently very busy, as would be expected with its important gateway location. The addition of the development traffic, which would add less than 1% to the total traffic through this intersection, would have a minimal change in average intersection delay and no change in the level of service.
7. Parramatta CBD is being extensively developed, in accordance with its regional centre function. The subject site is relatively small within this overall development context. From a traffic engineering perspective, the proposed Concept Design for 5-7 Parkes Street is satisfactory.

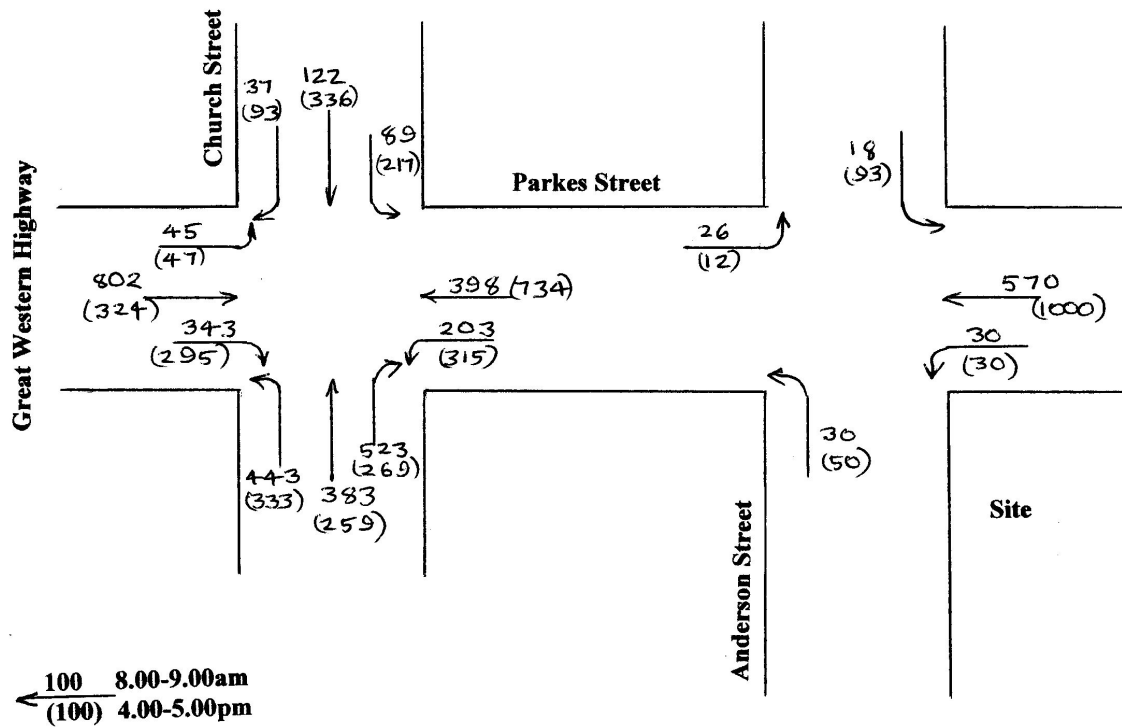


FIGURE 2 CURRENT PEAK HOUR TRAFFIC FLOWS