Traffic Impact Assessment

58-68 Regent Street, Kogarah

For: Quantum Group

Date: 10th April 2018

Caldwell & Kent CONSULTING

Ref: CKC 58REG01

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Proposed Residential Development

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Definitions

DA:	Development Application
Proposal:	Construction of a Residential Development
RMS:	Road and Maritime Services
DCP:	Kogarah Council's Development Control Plan – 2013
LEP:	Kogarah Council's Local Environmental Plan – 2012
AS2890.1:	Australian Standard for Off-Street Parking Facilities AS2890.1-2004

1. Introduction

Caldwell & Kent Consulting (CKC) have been engaged by Quantum Group Pty Ltd to assist with the Development Application process for the construction of a proposed residential development, located at 58-68 Regent Street, Kogarah, which is part of the Georges River Council LGA (formerly known as Kogarah Council). The proposed residential development will accommodate a total of 96 residential units, with associated parking provided within the six split levels (three levels when viewed in cross section) of basement car parking.

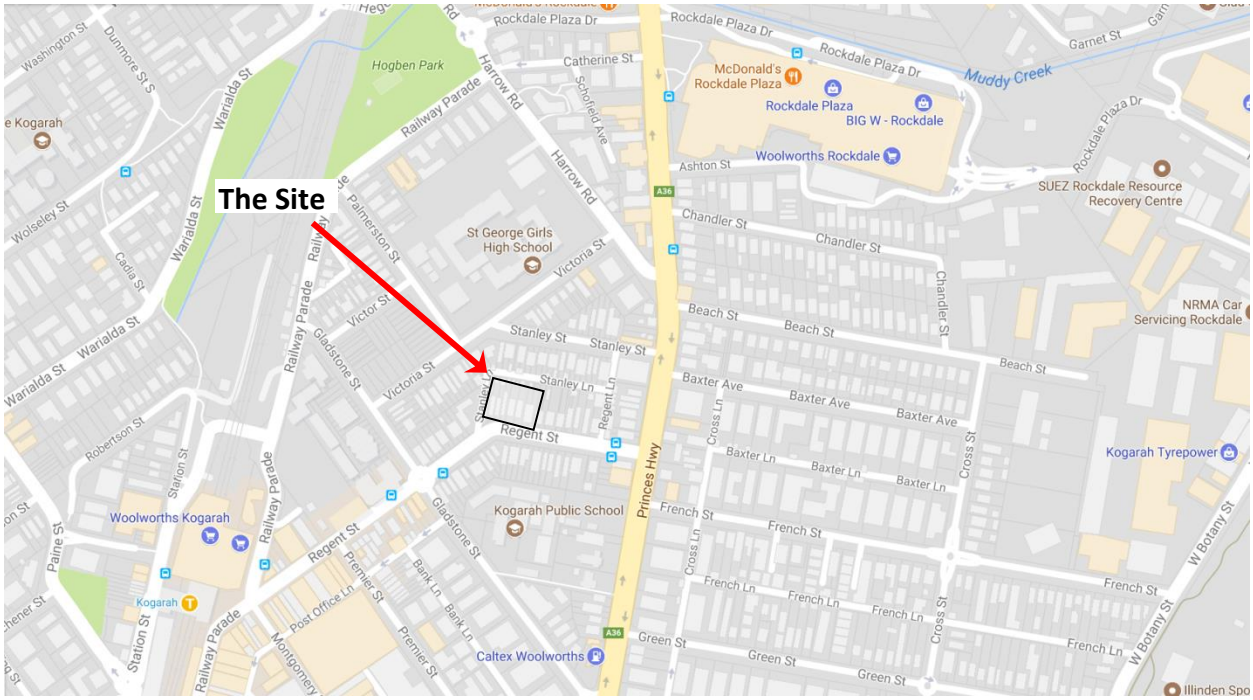

Figure 1-Site Location (Source Google Maps)

The purpose of this report is to present the traffic and parking assessment associated with the proposed residential development, and to determine the implication of the projected change in traffic activity on the surrounding road network.

The report is structured as follows:

Section 2: Site Description
Section 3: Overview of Existing Traffic Conditions
Section 4: Description of the Proposed Development
Section 5: Traffic Impact Assessment
Section 6: Parking Provision

Section 7: Access Arrangements
Section 8: Conclusions and Recommendations
Section 9: Attachments

The following documents were referenced for the preparation of this report:

- Kogarah Local Environmental Plan 2012 (SLEP 2012);
- Kogarah Council Development Control Plan (DCP July2016);
- The Road and Maritime Services Guide to Traffic Generating Development;
- Australian Standard for Parking Facilities Part 1: Off-Street Car Parking (AS2890.1-2004);
- Australian Standard for Parking Facilities Part 3:Off-Street Bicycle Parking Facilities (AS2890.3-1993) and
- Australian Standard for Parking Facilities Part 6: Off-Street Parking for People with Disabilities (AS2890.6-2009)

2. Site Description

The site is located at 58-68 Regent Street, in a predominantly residential area and forms part of the Georges River Council LGA (formerly known as Kogarah Council). The site is located on the Northern side of Regent Street and occupies an area of approximately 2016m^2.

The site comprises of five individual lots Lot No 155, 156, 157 of DP1388, Lot A, B of DP324952 and Lot 158 of DP666394 has frontages on Regent Street and Stanley Lane. The site is located approximately 350 metres north east of the Kogarah station which is serviced by the 'T4 Eastern Suburbs & Illawarra Line'. In accordance with the recent strategic planning policy adopted by the Government of NSW, the areas located closer to the train station are experiencing transition from low to high density housing.

The site is currently occupied by five (5) individual single storey residential dwellings and is accessible via the driveways located along the Stanley Lane frontage.

Figure 2-The Site (Source NSW Imagery-Six Maps)

2.1. Alignment to Council Strategy

Georges River Council issued the "Kogarah North Precinct Draft Urban Design Strategy" in April 2017 which provides the master planning for the precinct. It is clear from the extensive work compiled within the document that Council intends to elevate the amenity and aesthetic of the area.

In regards to the operation of the site, the Strategy shows Stanley Lane being joined to Stanley Street via a small pocket park or 'green space'. In addition the Strategy Document gives consideration to Stanley Lane being bicycle and Pedestrian friendly.

Where possible, this report has taken into consideration the concepts outlined in this document. Firstly the Regent Street frontage does not include driveways and intentionally directs all vehicular access into Stanly Lane thereby reducing the complexity of traffic activity along Regent Street. This ensures that Regent Street places greater priority on pedestrian access between the bus stops on The Princes Highway and the nearby train station.

The site's parking provision has been prepared in line with SEPP 65 and Council's DCP (see section 6). The proposal ensures the minimum number of spaces has been provided while still ensuring the on-site parking provision is adequate to cater for the projected parking demand. Providing a parking provision below the maximum DCP rate, will ensure lower levels of traffic activity on Stanley Lane – thereby encouraging reduced car usage and higher public transport usage.

In addition, the section of Stanley Lane leading off Regent Street joins a green space or 'pocket park' where it forms an L-bend. It is important that the level of traffic along Stanley Lane is kept low during peak times to improve pedestrian access. This has been considered within the design.

2.2. Road Classification Map

The following map shows the hierarchy of the surrounding road network as classified by Road and Maritime Services (RMS).

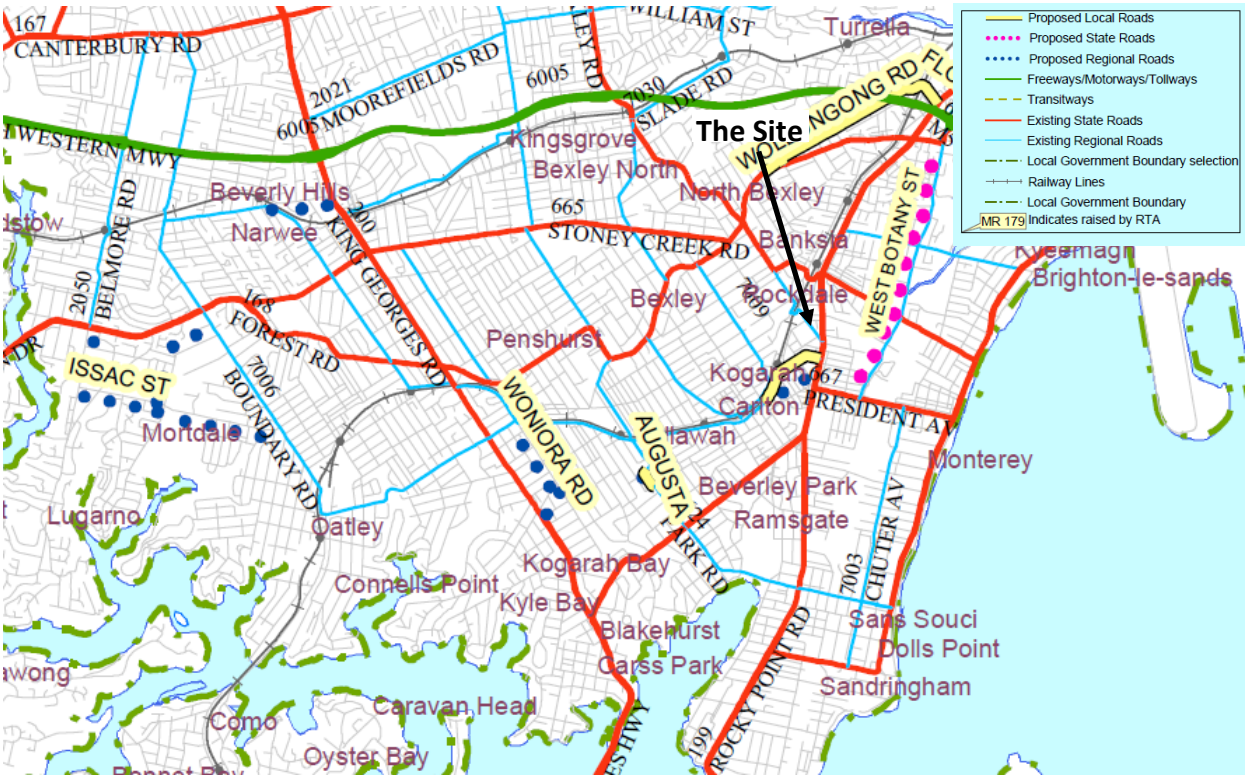

Figure 3-Surrounding Road Network (Source RMS Website)

3. Overview of the Existing Traffic Conditions

3.1. Description of Road Environment

Princes Highway is classified as a State Road and connects South Coast region with the Sydney CBD. The Highway follows a North-South alignment. Within vicinity of the subject site the carriageway is divided and comprises three traffic lanes in each direction. On-street parking is restricted to the western side of the Highway and is subjected to clearway restriction (i.e. no stopping during morning commuter peak period). It has a posted speed limit of 60kmph with a provision of paved footpaths along both sides of the carriageway.

Regent Street is classified as a Regional Road and connects Railway Parade (southern end) with Princes Highway (northern end). The carriageway is undivided and comprises one traffic lane in each direction with a posted speed limit of 50kmph. A paved footpath is available along both sides of carriageway with on-street parking permitted.

President Avenue is classified as a State Road and connects Princes Highway with The Grand Parade. It follows an East –West alignment and has a posted speed limit of 60kmph. The carriageway is undivided and comprises of two traffic lanes in each direction with on-street parking permitted. The intersection of President Avenue with the Highway is signalised with all turning movements permitted and includes pedestrian crossing facility available on all approaches except the northern approach.

Stanley Lane is classified as a Local Road and operates as a Loop Road. It has a posted speed limit of 50kph. The intersection of Stanley Lane with Regent Street operates as a priority control intersection with vehicles travelling along Regent Street having priority over the motorists accessing Stanley Lane. Stanley Lane provides primary vehicular access to the subject site.

Regent Lane is classified as a Local Road and operates as a laneway joining Stanley Street with regent Street. The carriageway is undivided and comprises one traffic lane in each direction with on-street parking permitted. Midpoint along Regent Lane it joins Stanley Lane forming a T-intersection.

3.2. Public Transport

The site is well serviced by both trains and buses. The nearest train station located within the vicinity of the site is Kogarah Station, which is situated approximately 350 metres northeast. Kogarah Train Station is serviced by the 'T4 Eastern Suburbs & Illawarra Line'. This service operates between Cronulla/Waterfall and Bondi Junction via Sydney CBD. During the morning peak period (08:00-09:00am), the service operates with a frequency of six inbound (to Bondi Junction), and five outbound services (to Cronulla) trains.

Figure 4- Train Service Map (Source NSW Transport Info Website)

Bus services within vicinity of the development site are operated by Sydney Buses Network and are accessible via Regent Street. The table below summarises the bus services operating within vicinity of the subject site:

Table 1: Bus Services

Route Number	Service Type	Origin	Destination
422	Daily	Kogarah	City
476	Daily	Rockdale	Dolls Point*
477	Daily	Rockdale Station	Miranda
947	Daily	Kogarah	Hurstville

* Route No 476 operates as a Loop Service

3.1. Bike Path

In order to promote cycling within the LGA, Rockdale City Council has developed an extensive bike plan which identifies the existing bike path available within the LGA. A copy of the bike plan is presented as Figure 5.

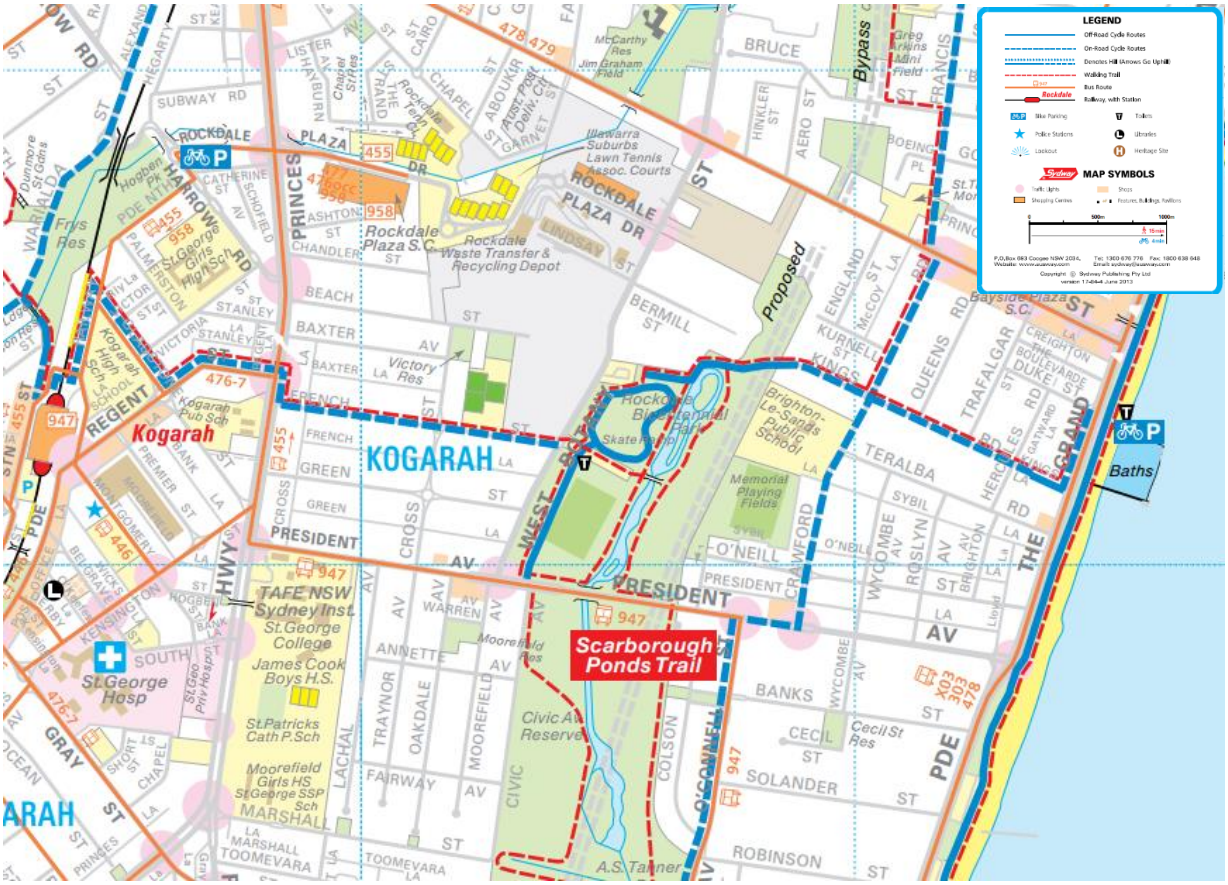

Figure 5-Bike Plan (Source NSW Rockdale City Council's Website)

The above plan indicates that the existing bike route operates along French Street which connects to the wider bike route servicing various suburbs located within the LGA.

3.2. Existing Traffic Generation of the Site

The subject site is located within a predominantly residential area and is currently occupied by five (5) individual dwellings. The traffic activity associated with the existing development was determined with reference to the RMS Guide to Traffic Generating Development (The Guide). In relation to the existing uses (i.e. residential use), the Guide classifies the existing residential use as a "Dwelling House" and recommends the following trip generation rates:

Weekday peak hour vehicle trips = 0.85 per dwelling

Application of the above trip generation rate to the existing floor area results in the following vehicle trips per hour:

Table 2: Existing Traffic Generation Activity

Use	Area(m^2)	Trip Generation Rate	Veh/hr
Residential	5 dwellings	0.85 per dwelling	4.25
Total			**4.25**

The above table indicates that the site currently generates approximately 4.25 (say 5) vehicle trips per hour during peak period.

4. Description of the Proposed Development

The development proposal involves the construction of a 12 storey residential development that will accommodate a total of 96 units - comprising the following:

- 16 x one bedroom units;
- 69 x two bedroom units; and
- 11 x three bedroom units

The proposal involves an on-site parking provision of 129 car spaces and a loading dock located within the six split levels of the basement car park. Furthermore, as part of the proposal a car wash space –located on Basement Level 2 will be provided.

All vehicular access to the basement level car park will be restricted to private cars and utility vehicles, which will be accessible via a new driveway leading off the Stanley Lane frontage.

As part of the proposal, all existing driveways on the frontage will be closed and the resultant space will be given back to the council.

Architectural plans associated with the proposal have been prepared by PBD Architects, and the plans indicating the basement levels of the car park are presented as **Attachment A**.

5. Traffic Impact Assessment

5.1. Trip Generation

The traffic activity associated with the proposal has been calculated with reference to the 'RMS Guide to Traffic Generation Developments' (the Guide). The proposal involves the construction of a 12 storey residential use development accommodating a total of 96 units.

RMS has recently released a Technical Direction TDT 2013/4a, which acts an update to the Guide and provides traffic generation rates for various land uses. The RMS Guide classifies the proposed residential development as high density and TDT 2013/4a specifies the following traffic generation rates:

Morning peak hour vehicle trips = 0.19 vehicle trips per unit; and

Evening peak hour vehicle trips=0.15 vehicle trips per unit

Application of the above trip generation rates to the proposed development results in approximately 18.24 and 14.4 vehicle trips, during morning and evening peak hour respectively.

5.2. Impact Assessment

The development is proposed on a site that currently has a peak hour traffic generation of 5 vehicle trips (please refer to Section 3.4 of this report for further details).

The projected traffic activity associated with the proposal indicates the site is likely to generate peak hour traffic of 18.24 (say 18) vehicle trips. A comparison of the existing traffic activity with the projected traffic activity indicates that the new development will result in an increase of 13 vehicle trips an hour- or a vehicle trip approximately every 5 minutes.

The minimal increase in traffic activity is likely to be less than the typical daily variation, which is usually 10% of the peak hourly flow. Additionally, the minimal increased traffic activity will not impact existing, and post development intersection modelling. Therefore no formal Sidra intersection analysis has been undertaken as part of this project.

In conclusion, the proposal is likely to generate a maximum of 18 vehicle trips an hour - which represents an increase of 13 vehicle trip an hour - and this increase is highly unlikely to have any detrimental impact on the operation of the surrounding road network.

5.3. Operation of Stanley Lane

There has been debate in regards to the operation of Stanley Lane. Suggestions has included converting Stanley Lane to operation One way. This is to be discussed as part of a planning workshop with Council.

6. Parking Provision

6.1. Planning Requirements

The development site is located within the Georges River Council's LGA. The proposed development site is located within a 'R4 High Density Residential Zone' and the Kogarah Development Control Plan 2013 (KDCP 2013) specifies the following parking provision rates:

Table 3: DCP Parking Requirements

Description	Car Park Provision
One Bedroom Unit	1.0 space per unit
Two Bedroom Unit	1.0 spaces per unit
Three Bedroom Unit	2.0 spaces per unit
Residential Visitor Space	1 space per 4 unit

The DCP further recommends that the dimension of the on-site parking spaces should be provided in accordance with AS2890.1. This is detailed in Section 7 of the report.

We note that the subject site is located at a distance of 350 metres north east of Kogarah Station and is located in the area which is well serviced by both trains and buses. SEPP65 recommends for any development site located within 800 metres of a railway station or light rail stop in the Sydney Metropolitan Area; that the minimum car park requirement for residential developments (including visitor parking) should be the (minimum) of the following:

- Parking Provision rates recommended by the Local Council's DCP; or
- Parking Provision rates set out in The Guide to Traffic Generating Developments.

Table below presents the comparison of the Council's parking provision rates with the RMS Guide to Traffic Generating Developments.

Table 4: DCP and RMS Parking Requirements

Description	No. of Units	Council's Parking Rate		RMS Parking Rate	
		Rates	No. of Car Spaces	Rates	No. of Car Spaces
One Bedroom Unit	16	1.0 space per unit	16	0.4 spaces per unit	6.4
Two Bedroom Unit	69	1.0 space per unit	69	0.7 spaces per unit	48.3
Three Bedroom Unit	11	2.0 spaces per unit	22	1.2 spaces per unit	13.2
Residential Visitor Space	96	1 space per 4 unit	24	1 space per 7 unit	13.7
Total No. of Car Spaces	**96**	**131**		**81.61(Say 82)**	

6.2. Proposed Parking Provision

The proposal involves an on-site provision of 129 car spaces comprising the following:

- Resident Spaces – 115 including 10 adaptable parking spaces; and
- Visitor Spaces – 14 car spaces.

The proposed parking provision is in excess of the minimum parking requirements specified by RMS Guidelines and lower than the DCP requirement (i.e. maximum parking rate). Therefore the proposed on-site parking provision is compliant with the requirement of SEPP 65 and considered suitable to service the proposed development.

Furthermore we reviewed the "Traffic Generation Analysis Report – Impact of the New City Plan on Regional Roads in the LGA" prepared by Kogarah Council in 2016. This report was prepared in response to the submission made by RMS and TfNSW to Kogarah Council's planning proposal for the New City Plan. As part of this report car ownership data for the residents living along the railway line for the suburbs located within the LGA was reviewed. The car ownership data suggested 19.3% of Kogarah residents living along the railway line, did not own a car. Therefore a parking provision slightly lower than Council's DCP parking rates (i.e. maximum rates), is considered reasonable.

In this regard, the on-site parking provision is considered suitable to service the proposed residential development and is unlikely to generate additional on-street parking demand.

6.3. Bicycle Parking

In order to encourage alternate modes of Transport, the DCP recommends all development should include an on-site bicycle provision. In relation to the proposed residential use, Clause 3 of the Chapter B4 (KDCP) stipulates the following bicycle parking rate:

1 bicycle space per 3 dwelling plus 1 space per 10 dwellings

Application of the above would result in an on-site bicycle parking provision of 42 spaces. The proposal involves an on-site parking provision of 42 including 10 visitor spaces. Therefore, the proposed on-site bicycle parking provision is considered compliant with the requirements recommended within the DCP.

7. Access Arrangements

7.1. Car Parking Arrangement

The proposed car parking arrangement has been assessed according to the requirements listed in AS2890.1 (2004). Table 1.1 of AS2890.1 provides a classification of the off-street parking facilities based on various land uses, which is essential in determining the associated parking space dimensions. The majority of the development is proposed to be occupied by residential use. Therefore, the proposed parking provision has been assessed against the 'Type 1A' user class with a 90 degree parking space configuration (which is associated with Residential and Employee Parking). In relation to the Type 1A user class, Figure 2.2 of the AS2890.1 specifies the following parking dimensions:

- Space width – 2.4 metres
- Space length – 5.4 metres
- Aisle width – 5.8 metres

The proposed basement level of the car park accommodates a total of 129 parking spaces, including 10 adaptable parking spaces. The space dimensions were measured at a minimum of 2.4 metres wide and 5.4 metres long, with an associated aisle width exceeding 5.8 metres, thereby meeting the minimum requirements stipulated by AS2890.1. In this regard, the proposed car parking arrangement has been designed in accordance with the Australian Standard.

7.2. Vehicle Access

The width of the proposed ramp connecting the basement level car park and driveway was measured to be 3.2 metres wide which is suitable to accommodate one way flow.

During the morning peak hour, the proposal is likely to generate a total of 18 vehicle movements (for details please refer to Section 5.1 of this report) and would involve most of the commuting drivers exiting the site. Typically, during the morning peak period it is standard engineering practice to assume 80% of the total traffic generated from the residential development will exit the site and the remaining 20% arrives at the site. Application of the above to the projected traffic activity associated with the subject development will result in 15 vehicles exiting the site and three (3) vehicle entering the site and vice versa during the evening peak period.

In this regard, the driveway generally operates as a one-way driveway and therefore in accordance with the Australian Standard (Section 3.2 of AS2890.1), a recommended minimum width of 3.0 metres is required to accommodate one-way driveway.

Additionally, as part of the proposal, a traffic management plan involving convex mirror will be implemented on-site to manage the traffic flow along the narrower section of the proposed ramp. Details of the operation of traffic management plan will be presented at a later stage.

Furthermore, the majority of the users of the proposed car park will be residents who are highly likely to be familiar with the site conditions and would be expected to exercise due care while accessing the car park.

In this regard, the proposed access way configuration, including traffic management plan, is considered adequate to service the proposed residential development.

7.3. Driveway Arrangement

As part of the proposal, all vehicular access to the site will be provided via a new driveway introduced along the Stanley Lane frontage. Table 3.1 & Table 3.2 of AS2890.1 specifies the width of the access driveway, which is directly proportional to the on-site parking provision and also the type of frontage road.

Taking into account the proposed driveway is located on Stanley Lane (which is classified as a Local Road) and the basement car park has a capacity of 129 parking spaces, Table 3.1 classifies the proposed driveway as 'Category 2'. Table 3.2 subsequently recommends the driveway width should be within a range of 6.0-9.0 metres, as a combined entry and exit. The width of the proposed driveway is in excess of 6.0 metres and is therefore considered compliant with the Standard.

Additionally in order to access the driveway configuration we have undertaken Swept Path Analysis utilising the AutoTrack simulation software. The Swept Path Analysis was undertaken utilising the recommended vehicle type and is presented as **Attachment B**. The swept path analysis concluded that the width of the driveway is suitable to service the proposed residential development.

7.4. Sight Distance

Section 3.2 of AS2890.1 specifies the recommended sight distance associated with the driveway. The sight distance requirement is prescribed in accordance with the posted speed limit along the frontage road.

The proposed residential development will be accessible via a driveway located along the Stanley Lane frontage, which has a posted speed limit of 50kph. During our site visit we observed the vehicles were travelling under the posted speed limit.

Section 3.2 of the Standard specifies a desirable visibility distance of 69 metres, and a minimum distance of 45 metres for streets having a posted speed limit of 50kph.

The proposed driveway is located on a straight section of Stanley Lane however the reduced setback distance of adjacent properties restricts the visibility of motorist exiting the site. We understand there is a proposal to redevelop the neighbouring properties and all future developments would include a minimum setback of 3.0 metres. The increased setback is highly likely to improve the visibility of motorist

exiting the site. In this regard, the proposed driveway arrangement is considered safe and appropriate to service the proposed residential development.

7.5. Servicing

The proposed residential development is likely to require vehicular access for the following uses:

- Refuse Collection; and
- Furniture removalists.

Refuse Collection

Based on the information provided to CKC we understand the refuse collection will be undertaken by a private contractor who utilises a refuse collection vehicle with following dimensions:

- Truck Length – 6.4 metres;
- Turning Radius – 10.5 metres (Kerb to Kerb); and
- Overall Height – 2.08 metres.

As part of the proposal, the refuse collection bins will be located on Basement level 1 and therefore, to assess the access arrangement via a refuse collection vehicle CKC have undertaken swept path assessment. The swept path assessment was undertaken using the above vehicle type and is presented as **Attachment B**. The swept path analysis concluded that the width of the driveway is suitable to service the proposed residential development.

Furniture Removalists

Given the site constraints, any occasional requirements for delivery vehicles (including Furniture removalist) will utilize the existing on-street parking provision available within vicinity of the subject site which is considered a standard practice for a residential development of this size.

7.6. Ramp Grades

The review of the proposed plan indicates all vehicular ramps have a maximum gradient of 12.5% (1 in 8), which is compliant with the requirements of the Australian Standard for Off-Street Parking Facilities.

8. Conclusions and Recommendations

- The provision of 129 car parking spaces for the proposed residential development is considered sufficient to handle the project parking demand;
- Based on the information provided, the proposal does not generate any increase in safety risk to pedestrians or drivers as a result of the access and parking configuration;
- The proposed development will not negatively impact the current traffic conditions; and
- An assessment of the car park layout, including the circulatory ramp, proposed parking spaces and associated aisle width, indicate the car park layout is compliant with the relevant applicable Standards (AS2890.1 & 2890.6).

9. Attachments

Architectural Plan indicating Access and Car Park Arrangement

Turning Path Assessments:

Swept Path Assessment of Refuse Vehicle Accessing the site

Swept Path Assessment of B99th Exiting the site

Swept Path Assessment of B85th Entering the Basement level car park