Stockland

Stockland Piccadilly Complex

Transport Impact Assessment for Planning Proposal

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Rev A | 12 August 2020

Job number 259655-00

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1 Introduction

This Transport Impact Assessment has been prepared by Arup on behalf of Stockland. It accompanies a planning proposal seeking to initiate the preparation of a Local Environmental Plan amendment for the land known as 'Stockland Piccadilly Complex' located at 133-145 Castlereagh Street, Sydney (the site) legally described as Lot 10 in DP828419, and shown in Figure 1.

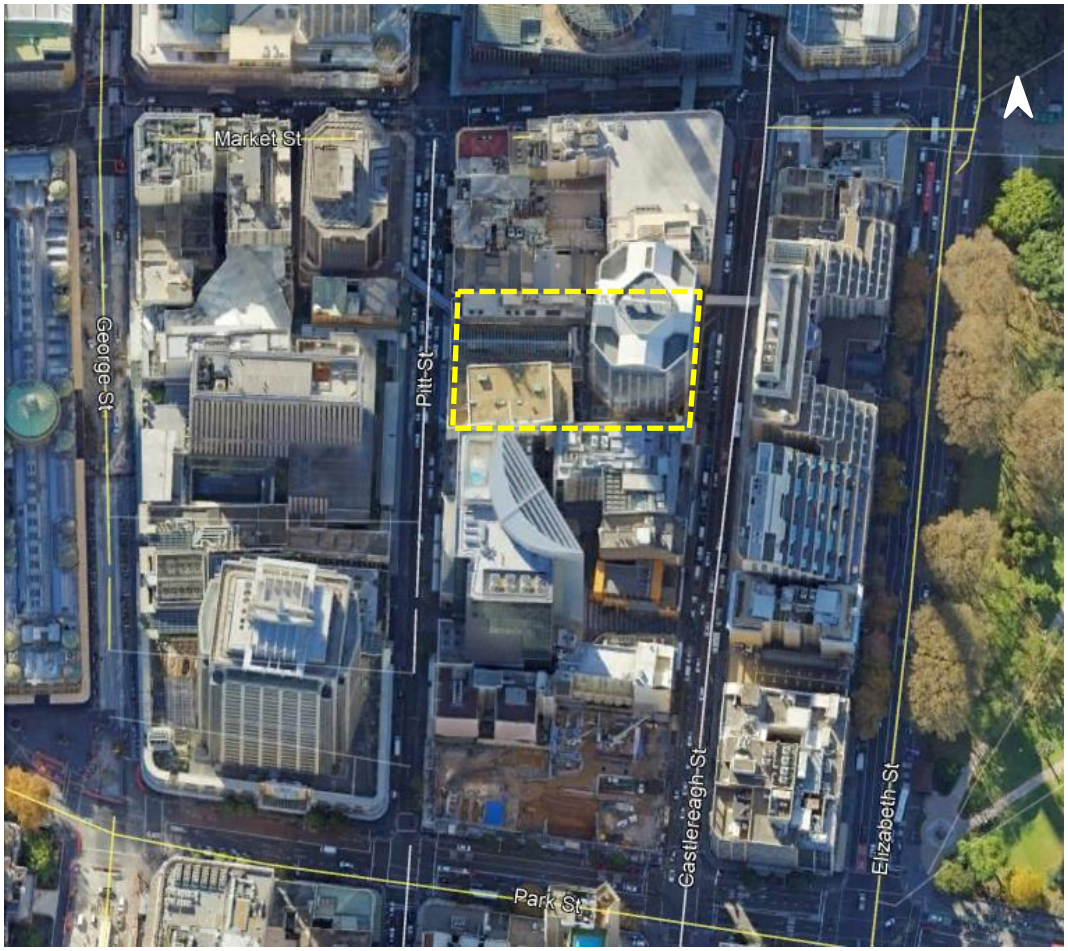


Figure 1: 133-145 Castlereagh Street, Sydney – Stockland Piccadilly Complex

The planning proposal seeks to amend the floor space ratio development standard applicable to the site, under the *Sydney Local Environmental Plan 2012* (the LEP), in accordance with Section 3.33 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

In accordance with Clause 7.20 of the LEP, this planning proposal also seeks amendments to the *Sydney Development Control Plan 2012* (the DCP) to establish site specific provisions to guide the future development, including establishing a building envelope for the site as well as other key assessment criteria.

The intended outcome of the proposed amendments to the LEP and DCP is to facilitate the redevelopment of the site for a commercial office tower development above a retail podium, including Wesley Mission facilities at lower ground level,

together with basement car parking and associated facilities. Such a proposal aligns with the draft Central Sydney Planning Strategy to facilitate additional commercial floor space capacity in Central Sydney while also delivering improved public domain outcomes. Such outcomes will include a northerly aligned direct through-site link between Pitt and Castlereagh Street and enhanced pedestrian amenity and activation at the ground plane.

1.1 Subject site

The site currently comprises three buildings known as the 'Piccadilly Complex' completed in 1991 which has been the subject of progressive improvements to upgrade selected elements within the building. The buildings currently occupying the site are detailed in Table 1**.**

Table 1: Description of existing buildings and improvements

Building	Description
Piccadilly Court	Comprises a 14-storey office building completed in 1975 and first refurbished in 1991 with frontage to Pitt Street.
Piccadilly Shopping Centre	Comprises a 2-storey retail building and the Wesley Mission facilities including the Wesley Church, Lyceum, Wesley Theatre and supporting office space predominately located at basement level. The Wesley Centre facilities comprise the following patron capacity: • Theatre – 950 • Lyceum – 277 • Chapel – 534 A footbridge over Pitt Street connects the building to 55 Market Street to the west.
Piccadilly Tower	Comprises a 31-storey commercial building comprising office floor space and end of trip facilities and four basement levels of car parking accessed from Castlereagh Street. A footbridge over Castlereagh Street connects the building to the Sheraton On the Park located to the east of the site.

1.2 Concept reference design

To demonstrate that the proposed building envelope is capable of accommodating a viable scheme, a concept reference design accompanies the planning proposal within the Urban Design Study. The concept reference design is indicative only and the final detailed design will be the subject of a competitive design process and detailed development application (DA) which will ultimately result in further refinement of the scheme. The ground floor plan is shown in Figure 2.

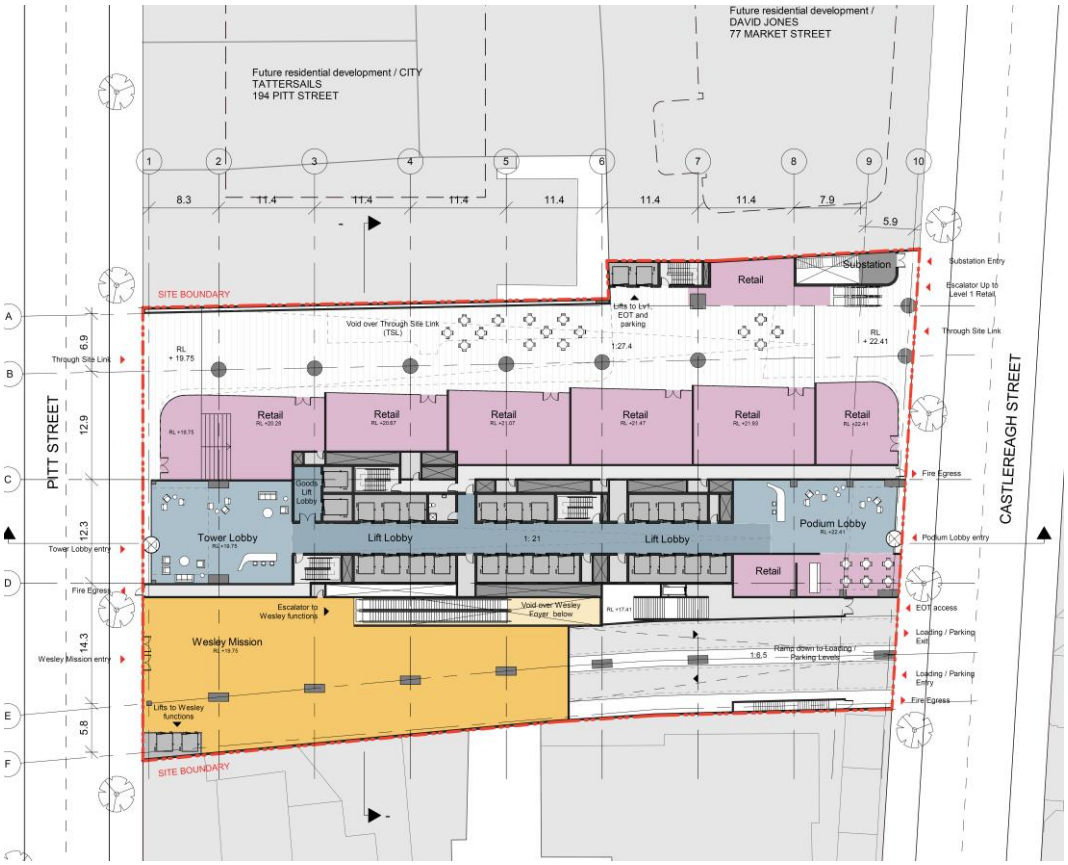


Figure 2: Stockland Piccadilly Complex – Concept Reference Design Ground Plan (3XN, 550001_Drawing number: DA-01-L00, issue date: 14/08/2020)

The concept reference design includes the following elements:

- Basement car parking and mechanical plant (B05-B03);
- Wesley Mission facilities including the Church, Theatre and Lyceum, and supporting offices (B2-B1);
- End of trip, back of house area and plant (B1);
- A northerly aligned east-west pedestrian through-site link connecting Pitt St and Castlereagh St (L00);
- Podium levels (L00-L09) comprising lobby (L00), retail (L00-L01), commercial (L02-L09) and plant (L09); and
- Tower levels (L10-L34) comprising commercial and plant (L19, L35-L36).

1.3 Purpose of report

The purpose of this Transport Impact Assessment is to provide a review of relevant aspects of the proposed planning amendments and conceptual reference design, to evaluate their likely suitability, and requirements for future assessment and detailed design. As the planning submission does not seek consent for the specific development, a detailed quantitative assessment of the conceptual reference design is not considered to be warranted at this stage.

Relevant to the Transport Impact Assessment are the following aspects:

- Existing transport conditions
- Proposed development description
- Parking assessment
- Transport assessment
- Outline Green Travel Plan

Accordingly, this report:

- Reviews the existing transport conditions
- Assesses the proposed development in the context of these conditions and relevant planning controls
- Proposes relevant mitigation and measures to alleviate impacts

2 Existing conditions

2.1 Site location

The site is located within the centre of Sydney CBD, between Castlereagh Street and Pitt Street on a site area of approximately 4,800m^2. The site is categorised as B8 Metropolitan Centre zone Sydney Local Environmental Plan (LEP) 2012.

The site is currently occupied by a mixed-use building including retail, commercial, Wesley Mission and childcare centre with vehicle access from Castlereagh Street (via one-way separated ramps to loading docks and car parking). Surrounding land uses are predominantly retail/commercial development with, the Sheraton Hotel to the east, David Jones Store to the north and Pitt Street to the west. The site location is shown in Figure 1.

The key main and arterial roads in the vicinity of the site include:

- Castlereagh Street
- Pitt Street
- Market Street
- Park Street

The existing site area contains basement levels of car parking and loading area. There are approximately 274 existing public car parking spaces within the basement areas.

Figure 3: Site location

2.2 Road hierarchy

The road hierarchy in the vicinity of the site is shown in Figure 2 with state roads in red and regional roads in blue. The remaining roads are local.

Adjacent to the site, Market Street is a one-way, three lane westbound street running from Elizabeth Street across the CBD to George Street. It then becomes a two-way street between George Street and Sussex Street, where it connects to the Western Distributor. Eastbound movement between York and George Streets is restricted to buses only.

Castlereagh Street is a one-way southbound street running from Hunter Street, in the north, to Hay Street in the south. It is an important bus street and one lane is set aside as a bus lane in the vicinity of the site. Castlereagh Street generally provides three traffic lanes, including the bus lane. It has an additional right turn lane on its approach to Market Street

George Street and Park Street are the main State classified roads in the area as shown in Figure 4.

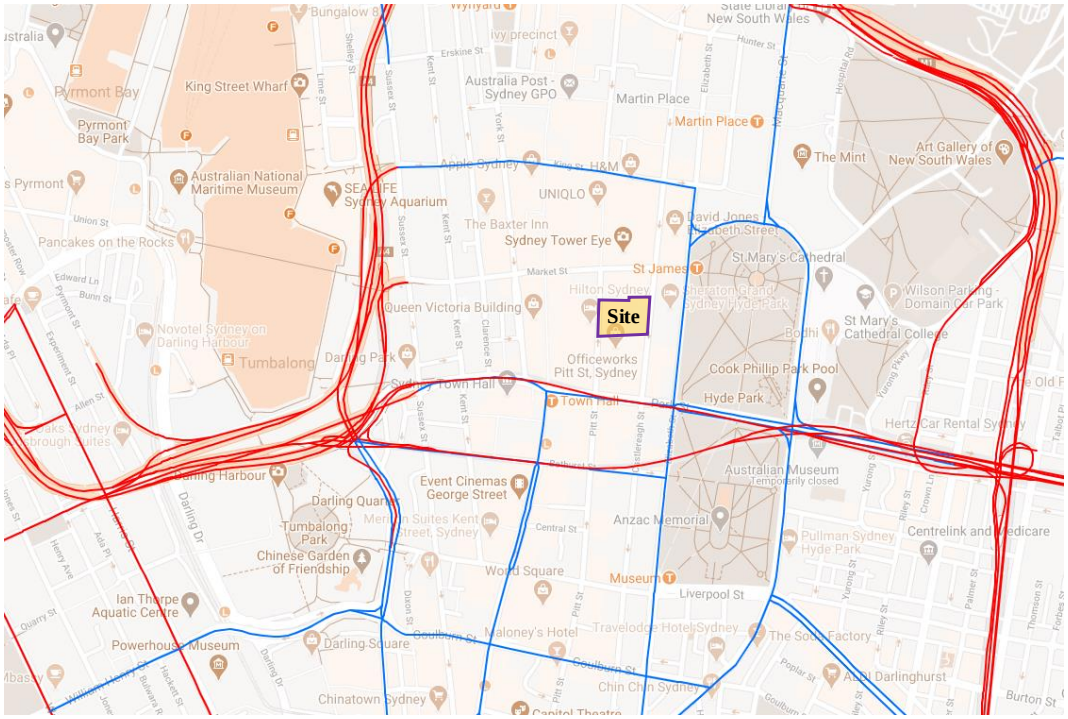


Figure 4: Surrounding road network

2.3 Public transport network

The site is well served by public transport, with St James Station (located approximately 170m – around 2- minute walk from the site), Town Hall Station (located about 400m – around 5- minute walk from the site) and several bus stops located within less than 5 minutes' walk. This public transport infrastructure is presented in Figure 5.

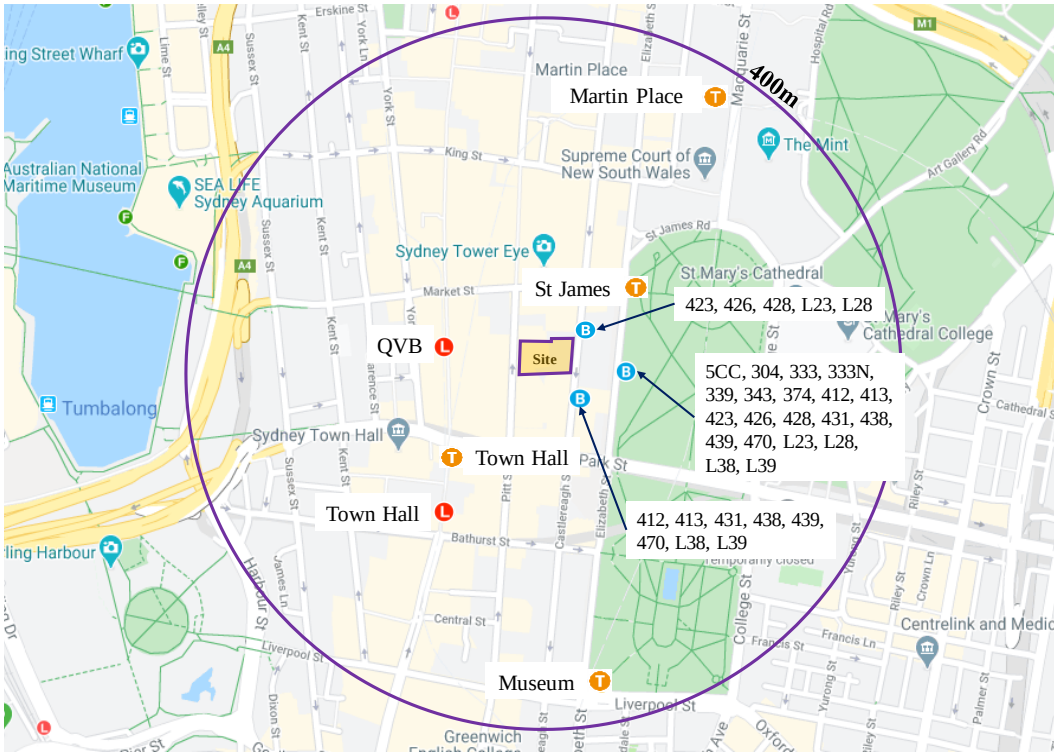


Figure 5: Public transport facilities within 400m of the site

2.3.1 Train services

Town Hall Station and St James Station are located some 400 metres southwest and 200 metres northeast of the site respectively. Apart from these stations, the major rail lines within the Sydney Trains network can be directly accessed or transfers can be made at Central Station, which accesses the majority of the rail network.

In addition, the new light rail is currently operational in George Street to the west of the site, connecting Circular Quay with Randwick/Kingsford via Central with a high frequency service. Interchange is also available at Haymarket for light rail to Dulwich Hill via Lilyfield.

Furthermore, as part of the future Sydney Metro, a station is proposed in the vicinity of the intersection of Park Street and Pitt Street, in close proximity to the site. Pitt Street Station is an underground station, about 17 metres (north end) to 20 metres (south end) below ground level. The station is located below Pitt Street and Castlereagh Street, north of the Park Street intersection and south of the Bathurst Street intersection as shown in Figure 6.

Figure 6: Pitt Street Station location

2.3.2 Bus services

There are several bus routes, operated by Sydney Buses, servicing bus stops within 400m of the site.

Bus services operate along Castlereagh Street, passing the site (with a dedicated bus lane). Other services operate along Elizabeth Street to the east, and along York Street and Clarence Street to the west. The QVB bus interchange in York Street is located some 200 metres west of site. Bus services from these locations connect the CBD with eastern suburbs, northern suburbs, northwest, northern beaches and inner west and southern suburbs.

Table 2 below summarises peak hour services using these bus stops. The closest bus stops are located on Castlereagh Street.

Table 2 Peak hour bus services within 400m of the site

Route Number	Bus stop location	Origin/ Destination of bus route
423	Castlereagh Street	Kingsgrove to City Martin Place
426	Castlereagh Street	Dulwich Hill to City Martin Place
428	Castlereagh Street	Canterbury to City Martin Place
L23	Castlereagh Street	Kingsgrove to City Martin Place
L28	Castlereagh Street	Canterbury to City Martin Place

Route Number	Bus stop location	Origin/ Destination of bus route
5CC	Elizabeth Street	Circular Quay, then St James, Museum, Central
304	Elizabeth Street	Rosebery to City Circular Quay via Zetland
333	Elizabeth Street	North Bondi to City Circular Quay via Bondi Junction
333N	Elizabeth Street	North Bondi to City Circular Quay via Bondi Junction (Night Service)
339	Elizabeth Street	Clovelly to City Gresham St
343	Elizabeth Street	Kingsford to Chatswood
374	Elizabeth Street	Coogee to City Circular Quay via Bream St
412	Elizabeth Street and Castlereagh Street	Campsie to City Martin Place
413	Elizabeth Street and Castlereagh Street	Campsie to City Martin Place
423	Elizabeth Street	Kingsgrove to City Martin Place
426	Elizabeth Street	Dulwich Hill to City Martin Place
428	Elizabeth Street	Canterbury to City Martin Place
431	Elizabeth Street and Castlereagh Street	Glebe Point to City Martin Place
438	Elizabeth Street and Castlereagh Street	Abbotsford to City Martin Place
439	Elizabeth Street and Castlereagh Street	Mortlake to City Martin Place
461	Elizabeth Street	Burwood to City Domain
470	Elizabeth Street and Castlereagh Street	Lilyfield to City Martin Place
L23	Elizabeth Street	Kingsgrove to City Martin Place
L28	Elizabeth Street	Canterbury to City Martin Place
L38	Elizabeth Street and Castlereagh Street	Abbotsford to City Martin Place
L39	Elizabeth Street and Castlereagh Street	Mortlake to City Martin Place

2.4 Walking and cycling

Pedestrian and cycling connectivity in the area is good with a high-quality public domain. Paved footpaths are provided on each side of the road throughout the area for ease of walking. Signalised crossings are provided for the Market Street and Castlereagh Street.

Figure 7 below shows the cycleway map with cycle routes in detail.

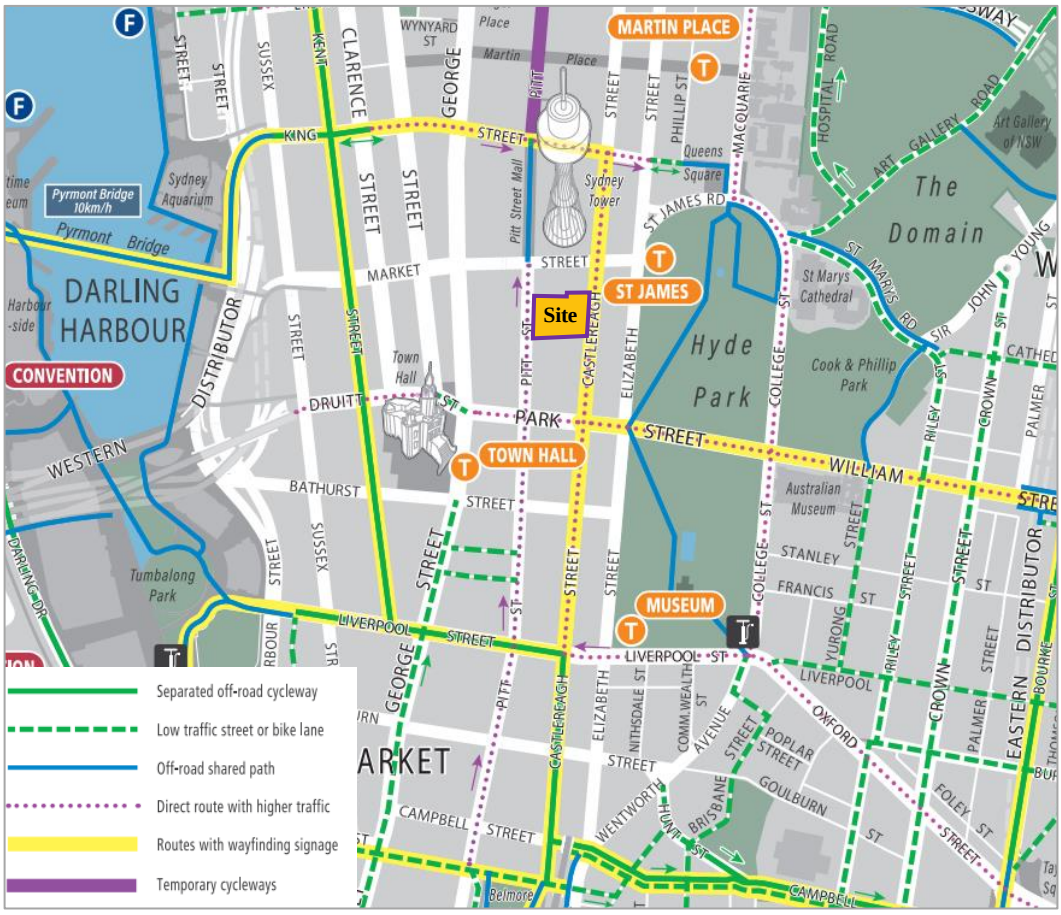


Figure 7: Cycleway map

2.5 Existing Travel Characteristics

The current development is a mixed-use development containing retail/commercial floor space as well as childcare centre and Wesley Centre.

2.5.1 Mode choice

Mode share patterns at the site were analysed using 2016 Method of Travel to Work Census data. The Destination Zones (DZNs) and the origins of trips are built from 2016 Mesh Blocks (MB). The zone within which the proposed site falls (113371093) is shown in Figure 8. The results of the analysis are presented in Table 3.

Table 3: 2016 Travel to Work - Mode Split

Mode	Inbound (People who are working in the area)
Train	53.3%
Bus	22.5%
Ferry	1.3%
Car as driver	8.4%
Car as passenger	1.9%

Mode	Inbound (People who are working in the area)
Walking	5.3%
Cycling	0.6%
Other	6.7%
TOTALS	**100%**
Trips	8,251

Source: BTS, 2016

The data revealed that inbound trips by workers relied more on public transport (77%). Walking and cycling also featured highly (6%).

Figure 8: Site location in the context of Destination Zones (DZNs)

2.6 Existing traffic conditions

It should be noted that by considering the traffic count survey undertaken for the adjacent site (*77 Market Street*[1]) in November 2016, the traffic flows of the surrounding streets are as follows:

- Castlereagh Street carries some 600-1,000 vehicles per hour in the peak periods; and
- Market Street carries some 1,000-1,500 vehicles per hour, two way in the peak periods.

[1] - 77 Market Street, Stage 1 DA, Traffic and Parking report – December 2016 – Colston Budd Rogers & Kafes Pty Ltd

The pedestrian movement counts are only available on Park Street either side of Pitt Street (some 1,900 pedestrian movements, peak hour flow) and on Pitt Street north of Park Street (some 1,400 pedestrian movements). There is no existing pedestrian count data available for any other footpath within the vicinity of the site. Reference should be made to *133 Castlereagh Street - Footpath Analysis* provided separately by Arup.

2.7 Existing site car park and access

The current car park operates as a public "car park use" and is not limited to the servicing the uses on the site. It functions primarily as a casual public car park with some dedicated spaces allocated to the building uses.

The flexible supply of on-site parking supports the out of hours and weekend usage by Wesley Mission, while providing parking that caters for both building tenants and visitors to the site.

Currently the Uniting Church operate with 35 permanently leased spaces, and a further 225 are dedicated for use by Wesley Mission patrons on a casual basis on dedicated days.

There are currently two (2) separate entry and exit accesses located on Castlereagh Street. Entry movements to the site are permitted from a parallel one-way ramp from Castlereagh Street, directing pedestrians via a set-back footpath around the structure. Exit movements from the site are permitted from a conventional perpendicular driveway at the south eastern corner of the site to Castlereagh Street.

The access to the exiting car parking is internally provided with parallel ramps located at the south of the Stockland tower core as shown in Figure 9 (Castlereagh Street level) and in Figure 10 (Pitt Street level).

Figure 9: Existing parallel access ramps – Castlereagh Street level

Figure 10: Existing parallel access ramps – Pitt Street level

2.7.1 Existing site traffic flows

To gain an understanding of the traffic activity throughout the day on all days, boom gate counts/ticket data was conducted from 1 July 2019 to 29 June 2020 at the access driveways.

The traffic flows show that the maximum occupancy occurred on 18 September 2019 and 17 December 2019 with the maximum carpark occupancy of 94% and 92% respectively.

Around 1,000 daily trips (entry and exit movements) were recorded for the highest turnover for the car park with the average parking duration of 5 hours 40 seconds. The average over the period (including Covid conditions) showed that each parking space turned over more than the parking capacity resulting in high turn over of parking.

The maximum two-way combined traffic flows (1 Dec 2019) for the morning peak hours were approximately 55 vehicles and for the evening peak hour were approximately 125 vehicles.

The minimum, average and maximum carpark occupancy percentage for the days between 2 July 2019 and 29 June 2020 is shown in Figure 11.

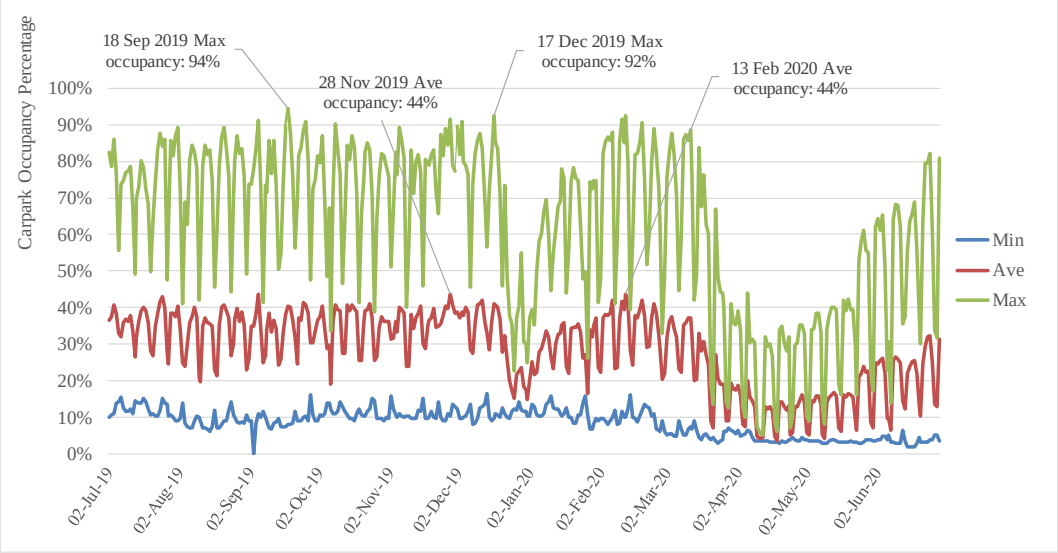


Figure 11: Carpark Occupancy percentage

3 Proposed development

3.1 Description of proposed works

The proposal is planned to consist of the redevelopment of the site for a mixed use commercial development, together with basement car parking and associated facilities. It also involves in delivering improved public domain outcomes. Such outcomes will include a northerly aligned direct through-site link between Pitt and Castlereagh Street and enhanced pedestrian amenity and activation at the ground plane.

For the purposes of this assessment and based on the Concept Reference Design the indicative development comprises:

- 93,100m^2 GFA commercial;
- 6,100m^2 GFA retail;
- 4,150m^2 GFA Wesley Mission facilities accommodating the following existing capacities:
  - Theatre: 950 seats
  - Lyceum: 277 seats
  - Chapel: 534 seats
- 1,000m^2 GFA Childcare centre accommodating a capacity of 55 children and 17 staff
- Consolidated vehicle access from Castlereagh Street (via the existing exit driveway which will be upgraded);
- Through-site pedestrian link between Pitt Street and Castlereagh Street;
- Loading dock on level B1 and part of level B3; and
- Basement car parking (250 spaces).

The proposed development will increase employment and retail densities close to existing and future public transport services and is thus well located to travel to and from the site by means other than private car. The proposal will therefore increase demand for these services. The proposed development is therefore consistent with government objectives and the planning principles of:

a) improving accessibility to 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.

3.2 Proposed site access

It is proposed to relocate the existing vehicular entry access to a location next to the current exit-only vehicular access to Castlereagh Street as illustrated in Figure 12, converting the access and making it as a combined entry and exit vehicle access driveway for the proposed development.

The existing basement 5-level shoring walls are proposed to be retained and integrated into the new construction. Some additional basement excavation required to accommodate the proposed relocation of the parallel entry ramp and is confined to the south west corner of the site.

The access to the car parking will be greatly enhanced by removing major obstacles and intrusions for pedestrians with the removal of the existing parallel access ramp.

It should be noted that a portion of the Castlereagh frontage (within the site) is currently dedicated as a public road and the existing building overhangs the ramp. This land is held in stratum (DP 804650).

The proposed redevelopment reverts the footpath to its proper location. The amendment (via LEP and DCP) would necessitate the extinguishment of this stratum lot with the intention to re-consolidate the area to the parent lot.

Figure 12: Proposed site accesses

3.3 Car parking and loading/servicing

Four levels of car parking are proposed within the site as shown in Figure 15. All vehicular access to the site is proposed via consolidated two-way driveway on Castlereagh Street. The ramp will connect loading and servicing on Basement Level 1 and continue to Level 3 where additional courier bays will be provided (as shown in Figure 13 and Figure 14). Beyond this area, car parking will be provided to Basement Level 5.

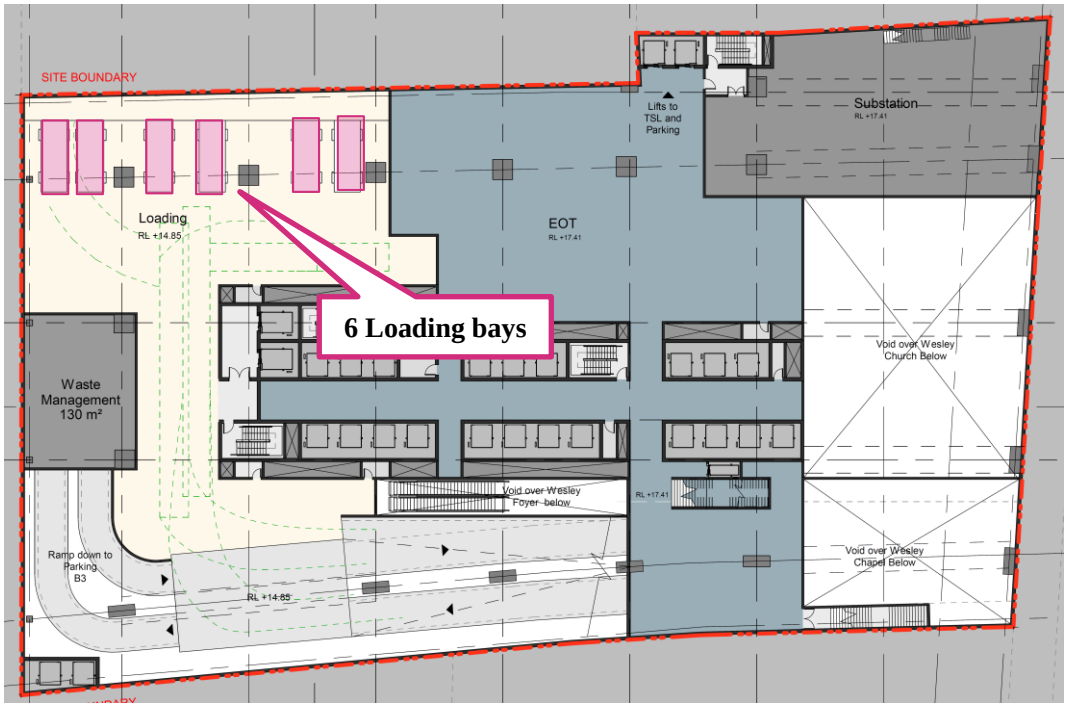


Figure 13: Parking layout – Basement 1

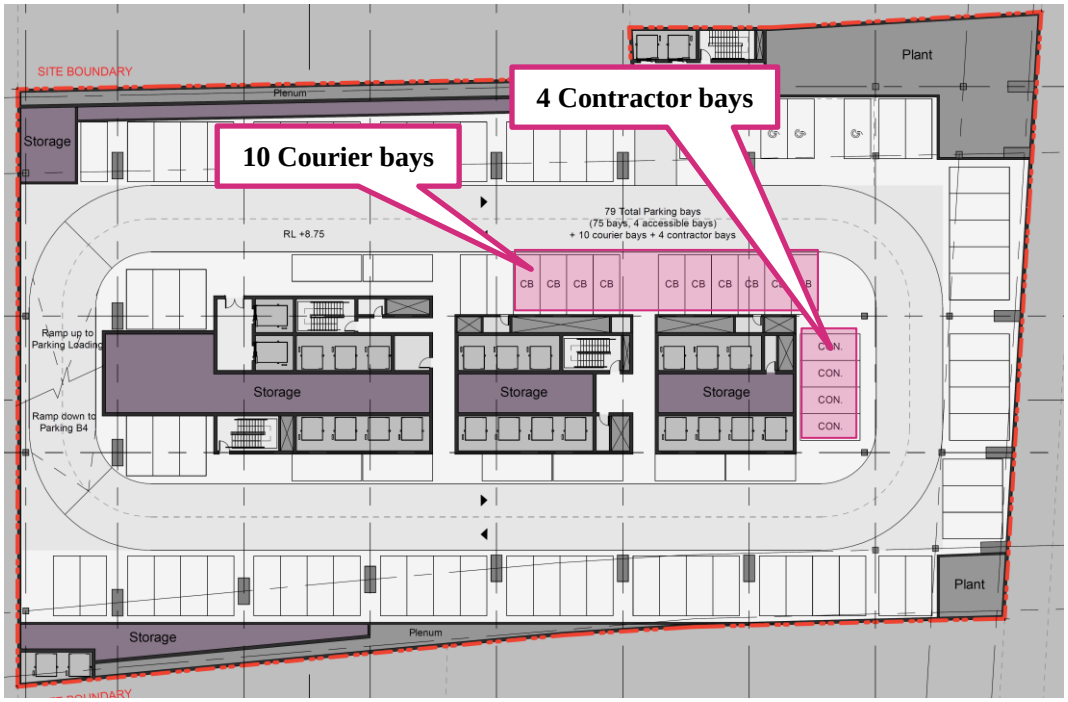


Figure 14: Parking layout – Basement 3

Figure 15: Parking layout – Basement 4 and 5

4 Parking Requirements

4.1 Parking and loading assessment

4.1.1 Car parking spaces

Section 3.11 from the Sydney Development Control Plan 2012 (DCP) and Section 7.5 from the Sydney LEP 2012 noted maximum car parking provisions for the respective uses of the proposed development as listed in Table 4. It is noteworthy that the site is zoned as 'B8' and located on land 'Category A'. In addition, the Commercial / Retail buildings are located on land in 'Category D'.

Table 4: Car parking rates and provision

Development type	No/GFA	Maximum parking rates	Maximum parking Permitted*
Retail premises	6,100 sqm GFA	if the building is on land in category D and has a floor space ratio greater than 3.5:1, the following formula is to be used: $M = (G \times A) \div (50 \times T)$	5.67
Commercial	93,100 sqm GFA		86.44
Childcare Centre	1,000 sqm GFA 55 children 17 staff	1 space plus 1 space for every 100 sqm GFA Passenger pick up and set down areas: - 1 space per 8 children - 1 long term visitor car parking space	11 7 1
Wesley Centre	4,150 sqm GFA Total 1761 seats (Theatre – 950 seats, Lyceum – 277 seats and Chapel – 534 seats)	greater number of spaces: - 1 space for every 10 seats or - 1 space for every 30 sqm GFA	176
Sub Total			**287.11**
Car share	Office premises or retail premises on land Category D PTAL land	- 1 car share space per 30 office/retail car spaces provided	3.07
Total			**290.22**

*If the maximum number of car parking spaces is not a whole number, the number is to be rounded to the nearest whole number

Where:
M is the maximum number of parking spaces, and
G is the gross floor area of all office premises and business premises in the building in m^2
A is the site area in square metres, and
T is the total gross floor area of all buildings on the site in square metres.

By applying the rates to each component of the development, 287 parking spaces would nominally be permitted, plus car share.

The proposed development provides 250 parking spaces across the existing basement levels and results in a 10% reduction compared to the current provision of (274) car parking spaces on the site, and a further 3% compared to the LEP parking rate provisions.

Further, the existing car park will cease to be available for casual public use, and will be limited to use by tenants of the building or surrounding nearby developments through a lease/managed arrangement for times when usage by Wesley Mission patrons is not required. This will significantly reduce the traffic generation caused by the existing casual carpark.

250 parking spaces are proposed over the basement levels which results in around 10% reduction compared to the current provision of (274) car parking spaces on the site and a further 3% compared to the LEP parking rate provisions.

The basement car park levels will be subject to an operational management plan as the car parking spaces dedicated for use by the Wesley Church on Sundays or Christmas / Easter may be leased on weekdays.

The level of parking provision (13% reduction compared to the LEP parking provision) is deemed acceptable for the following reasons:

- The DCP / LEP parking rates are the maximum parking rates permitted for the site. The proposed provision of 250 spaces is less than the maximum and therefore satisfies the requirements of LEP 2012.
- Despite the proposed GFA doubling the existing GFA on the site, car parking as a ratio of the GFA is proposed to be reduced, thereby reducing car mode for the site from an approximate car parking ratio of just over 1:200sqm GFA to under 1:400sqm GFA
- There are opportunities for a mode shift away from private vehicle travel, with the site located in central Sydney near many major transport interchanges such as St James and Town Hall Stations.
- Parking count data reveals that for the existing casual parking, approximately 1,000 daily trips were recorded for the highest daily turnover for the car park. The anticipated daily trips for the proposed commuter office parking is 1 trip in and 1 trip out (i.e. a total of 500 daily trips) which is far less than the existing daily trips on the surrounding road network.
- The flexible supply of on-site parking supports the out of hours and weekend usage by Wesley Mission, while providing parking that caters for both building tenants and visitors to the site.

In summary, the level of on-site parking provision is considered manageable and acceptable for the reasons outlined above.

4.1.2 Accessible parking space

Section 3.11.9 from the DCP and Part 4 of Section 7.8.5 from Schedule 7 requires 1 space for every 20 car parking spaces or part thereof is to be allocated as accessible visitor parking.

However, according to Table D3.5 from *the NCC 2015 Building Code of Australia:*

- 1 space for every 100 carparking spaces or part thereof is required when the building falls in Class 5 category (commercial/office premises) or Class 7a (carpark); and
- 1 space for every 50 carparking spaces or part thereof is required when the building is in Class 6 (retail/shops) or Class 9b (assembly building).

The development, therefore, requires a minimum of six accessible parking spaces.

4.1.3 Bicycle parking

Section 3.11.3 from the DCP requires bicycle parking for the respective uses of the development to be provided in accordance with the rates shown in Table 5.

Table 5: DCP Bicycle Parking Rates and Provision

Type	No/GFA	Class	Minimum Bicycle Parking rate	Minimum spaces calculated
Retail (Shop, Restaurant or café)	6,100 sqm GFA	Employees (Class B)	1 space per 250 m^2 GFA	25
		Customer (Class C)	1 space per 100 m^2 over 100 m^2 GFA + 2 spaces	63
Commercial (Office)	93,100 sqm GFA	Employees (Class B)	1 space per 150 m^2 GFA	621
		Customer (Class C)	1 space per 400 m^2 GFA	233
Wesley Centre Entertainment facility & Place of public worship	4,150 sqm GFA Total 1761 seats	Employees (Class B)	—	
		Customer (Class C)	Greater of 1 per 15 seats or 1 per 40sqm GFA	118
Childcare Centre	1,000 sqm GFA 55 children 17 staff	Employees (Class B)	1 per 10 staff	2
		Customer (Class C)	2 per centre	2
Total			648 employee bicycle spaces 416 visitor/customer bicycle spaces	

*The minimum number of bike parking spaces is to be rounded up to the nearest whole number if it is not a whole number.

The majority of visitors will be office workers or customers in nearby CBD buildings – all of which are unlikely to cycle. Based on this mode share range and with an estimated 8,300 building occupants (assuming visitors as 0.5% of total occupants), approximately 42 visitor bicycle spaces could be considered – lower than DCP requirement (416 spaces). This is consistent with prescriptive Green Star requirements for a 6-star building.

This visitor/customer bicycle parking provision (as a total % of visitors to the site) is similar to that of future major urban renewal precincts in the Sydney CBD – including Quay Quarter Sydney, Darling Harbour Live and Barangaroo. The operator of the public domain area would monitor the demand for bicycle parking in the precinct. Should demand exceed supply and cyclists park their bikes

informally to street furniture, additional bicycle parking could be provided so as not to detract from the public domain area. The current design does not preclude the future provision of additional visitor bicycle parking spaces.

The quantum of secure bicycle spaces for employees will be provided in the basement levels of the development. Employee /staff facilities are to be provided in a secure caged area (Class B facility). Visitor / customer spaces are to be provided in an easily accessible area for the public as bicycle racks (Class C).

In addition, shower, change-room and locker facilities for bike parking will also need to be provided based on the DCP. The final bicycle parking requirements are to be confirmed and further addressed at future detailed DA stage.

4.1.4 Carshare parking spaces

Section 3.11.2 of Council's DCP 2012 contains the following relevant controls with regard to required car share provisions:

Office premises and retail premises on Category D PTAL land requires minimum 1 car share space per 30 car spaces provided. The final number of car share parking spaces depends on the number of carparking spaces ultimately allocated to office or retail premises. This will be further assessed at the Development Application stage.

Parking spaces allocated for car-share vehicles require to be publicly accessible by people who do not occupy the building 24/7. The spaces must be retained as the common property of the Owners Corporation and not sold or leased at any time. The spaces must be made available to car share operators without a fee or charge. The spaces must be well lit and signposted for use only by car share vehicles. The car share spaces are to be available at the same time that the building is occupied.

4.1.5 Motorcycle parking spaces

Section 7.8.4 from the Schedule 7 of the DCP also requires a minimum of 1 motorcycle parking space per 12 car spaces provided (21 spaces) which will be placed amongst the basement car parking levels.

4.1.6 Loading/unloading facilities

For loading facilities, Section 7.8.1 of the DCP Schedule 7 lists service and loading bay rates. This is also mentioned Roads and Maritime Services Guide to Traffic Generating Development (Section 5.2.3). These rates are based on historic data and unmanaged loading docks. Arup conducted a series of surveys of on-street and off-street loading for commercial buildings of more than 20 mixed-use developments in the CBD. This peak loading/servicing activity was correlated to GFAs of buildings. While the level of loading activity is dependent on a number of factors and not simply the GFA of the building, this does provide a useful forecasting tool when assessing the loading and servicing requirements for planned commercial buildings.

For a development of this size, the peak hour loading movement is estimated to be upwards of around 30 truck movements an hour. By assuming two service vehicle activities occur each hour (i.e. half hour dwell times), the development will ultimately require 15 loading bays.

A Loading Dock Management Plan (LDMP) should be prepared for the site to manage the delivery of goods, waste collection and for the purpose of loading/unloading.

The development proposes to provide six truck bays suitable for up to 8.8m Medium Rigid Vehicles (MRVs) on basement level 1. 10 courier van bays and a further four long-stay contractor bays are also proposed on basement level 3.

The maximum height of a vehicle accessing the loading dock on B1 is proposed to be 4.5m to accommodate various delivery services. The largest vehicle expected to enter the site is proposed to be an 8.8m MRV. The proposed parking and loading layouts were reviewed for compliance with AS2890 Parking Facilities. Swept paths are shown in Appendix A.

4.2 Loading Dock Management Plan

A Loading Dock Management Plan will need to be prepared in consultation with the Council and Sydney Coordination Office prior to occupation of the building when tenancies are known to ensure adequate management of deliveries and waste collection.

It is expected that the loading dock will be managed by a booking system. This plan will specifically include the following:

- access arrangements, including vehicle holding;
- driveway operations and safety;
- car parking and loading arrangements;
- delivery schedules and booking system;
- a traffic management strategy; and
- expected delivery vehicle activity.

The plan is to outline how the loading dock will be managed and used by development tenants to ensure all vehicles:

- can be received on-site
- all loading and unloading including waste management will take place on-site
- ensure vehicles are not waiting to enter the site in surrounding public streets

The management plan is prepared for distribution, once approved, to all relevant tenants and external users of the loading area.

5 Transport assessment

5.1 Traffic generation

Estimates of traffic generation of the proposed development are based on surveys of surrounding sites and the relevant TfNSW Guidelines.

The proposed GFA (approx. 103,400m^2) is almost double in scale of the existing mixed-use development on the site (approx. 58,000m^2 GFA) but with a smaller retail component (approx. 8,000 sqm retail existing compared to approx. 6,100 sqm retail proposed).

The number of car parking spaces in the proposed development, will be reduced by 10% in comparison to the existing situation. As such, vehicle trip generation for the various components of the development are described in the following sections.

5.1.1 Commercial/Office

Office traffic generation rates are directly proportional to the number of off-street parking spaces provided within the site. For the purpose of this report, it is assumed that all 250 car spaces will be occupied, with a conservative 50% of the car trips made during the road network peak hour.

With the maximum of 250 spaces allocated to commercial/office component of the site, this equates to a traffic generation of 125 vehicles per hour with 80% in / 20% out in the morning and the reverse in the afternoon.

5.1.2 Retail

Speciality retail at the site would predominantly be smaller shops serving the local precinct. A majority of the trips made would be by customers walking in, as such, any traffic generation related to retail component of the site would be minimal.

Retail traffic generation rates are also proportional to the number of off-street parking spaces provided within the site. Given that no car parking is being provided for this use, there is no traffic generation assumed for retail uses.

5.1.3 Trip generation associated with the Wesley Mission and Childcare Centre

The proposed development seeks to retain the existing capacity and activities for the Wesley Mission facilities. Therefore traffic generation for this use is expected to remain the same. Therefore, traffic generation of the centre is expected to remain the same.

5.1.4 Loading/servicing vehicle activities

With the total development GFA of approximately 93,100 sqm, the peak hour loading movement is estimated to be around 27 truck movements an hour as outlined in Section 4.1.6. This is likely to occur in the AM peak hour only.

5.1.5 Expected traffic generation

Using the future development permissible under the building envelope sought within planning proposal (noting this would be subject to detailed design as part of a Design Competition and future development applications), the following traffic generation is estimated to result as shown in Table 6.

Table 6: Weekday trip generation

Development type	**Number**	**AM peak hour**		**PM peak hour**	
		Rate	**Vehicle Trips**	**Rate**	**Vehicle Trips**
Commercial /Office	250 Parking spaces	0.5 vehicles per hour (80% arrive during peak hour	100	80% leave during peak hour	100
Loading/servicing vehicle activities	30 truck movements	50% arrive during peak hour	15	50% leave during peak hour	15
Total vehicle trips			**115**		**115**
Existing trip generation			55		125
Net vehicle trips generated			**+60**		**-10**

5.2 Road network assessment

The development will have a reduction of 10 vehicle trips during the PM peak period (compared to existing conditions by circa 8%) and is anticipated to generate an additional 60 vehicle trips per hour over existing conditions during AM peak period. The volumes during the AM peak period would equate to an additional vehicle trip being generated every minute and is considered to result in minimal impacts on the surrounding road network. In summary, the traffic impacts for the development are considered negligible.

It should also be noted that the trip rates adopted in this analysis do not take into account the excellent access to public transport available within proximity to the site, which is likely to offset traffic generation for employees and visitors of the site. In summary, the traffic impacts for the development are considered minimal.

5.3 Pedestrian assessment

The approach that was developed for the allocation of development demand (pedestrian demand) is as follows. Reference should be made to *133 Castlereagh Street - Footpath Analysis* provided by Arup separately.

- Transport mode share is estimated based on 2016 Census data for the DZN that includes the site.

- Office workers are allocated to each mode as per the mode share data. Car mode share is split into on-site parking based on the available car parking spaces. Bicycle mode share is assumed to be all accommodated in the proposed end of trip facilities.
- For each mode, trips are split to various stations, stops and car parks based on their distribution surrounding the proposed site. The distribution is assumed to be pro rata to the number of lines/routes/car parks that each location serves.
- Pedestrians are allocated to footpaths from each transport node to the closest building entry to 133 Castlereagh Street. The route choice is generally assumed to be the shortest distance, however where the city grid provides multiple equivalent alternatives, the assignment is distributed to the various routes.
- Consideration has been given to two transport network configuration states:
    - Existing configuration
    - Future configuration that includes the Sydney Metro Pitt Street Station

    The analysis considered the highest demand between these two states for each link separately.

The results show:

- an estimated Pedestrian Comfort Level (PCL) C or better for most of the locations in the vicinity of the site.
- On the footpaths where there are no existing counts, the additional demand associated with development at the site is estimated to increase flow rates by between 0.8 ppl/m/min to 5.7 ppl/m/min. These flows would require up to 0.7 m of effective footpath width to perform at PCL C.
- The footpaths on Market Street have minimal opportunities to increase effective footpath width and may experience performance worse than PCL C depending on the level of existing pedestrian demand.
- The footpaths on Pitt Street are estimated to experience a moderate uplift in demand but have the potential to increase the effective width through conversion of the parking bays to footpath width. Whether widening is needed will depend on the level of existing demand (which is not currently known), the increase of foot traffic due to the Pitt Street Metro Station and potential increase due to other developments in the nearby precinct.
- The proposed design removes the parallel driveway on Castlereagh Street and replaces it with a traditional perpendicular driveway. It is a substantial improvement in terms of pedestrian experience and continuity of shoreline for people with disabilities.
- The proposed development includes a substantially improved through site link that link is wider, straight and has gentle ramps connecting Pitt Street and Castlereagh Street. It has the potential to take pedestrian traffic off busy Market Street, especially those coming from St James Station and heading south-west.

5.4 Through site link

A pedestrian through-site link (connecting Castlereagh Street to Pitt Street) is proposed along the northern part of the site. It is envisaged with daylight into the link and podium (shown in Figure 16) as part of the redevelopment.

This is planned to improve the pedestrian level of services as it will contribute to a better distribution of pedestrian using the surrounding footpaths. However, the impacts of this link on the adjacent 77 Market Street vehicle access need to be considered.

Figure 16: 133 Castlereagh Street, proposed through site link

Access to the proposed 77 Market Street development will be provided via the existing driveway on Castlereagh Street on the southeast of the neighbouring site. This driveway will be upgraded to cater for two-way traffic flow. The access from Castlereagh Street will internally provide queuing for two vehicles plus a zone to allow vehicles to enter/exit either proposed vehicle lift. Passing, waiting and turning from/to Castlereagh Street are extracted from the *77 Market Street, Stage 1 DA traffic report* and presented in Figure 17.

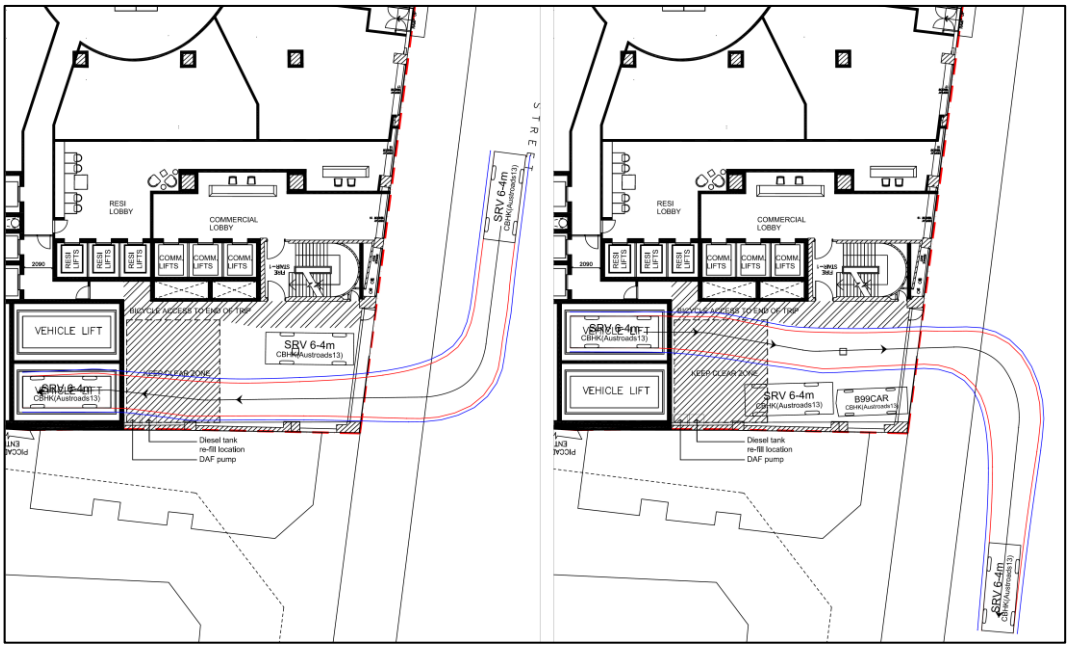


Figure 17: 77 Market Street, vehicle access configuration

Although vehicle drivers in city streets will expect to give way to pedestrians and drive with caution when interacting with high pedestrian volumes, the following safety measures are to be considered as part of the future detailed DA stage:

- there should adequate clearance from the property line to achieve sufficient sight distance for vehicles exiting the adjacent driveways;
- crossing points on Pitt Street and Castlereagh Street must provide adequate sight distance for pedestrians and approaching vehicles;
- the pedestrian path should not be too far from the adjacent carriageway such that path users are outside the peripheral vision of turning drivers;
- ensure that there is adequate space where pedestrian/vehicle conflict points meet the footpath to mitigate congestion and knock on effects onto the road; and
- pedestrian through site link will need to be designed with passive surveillance and good lighting to provide an attractive and safe walking environment.

6 Outline Green Travel Plan

A Green Travel Plan (GTP) is a tool to minimise the negative impact of private vehicle travel on the environment. The Plan is a package of measures put in place to encourage more sustainable travel and should be prepared for construction. A GTP describes ways in which the use of sustainable transport may be encouraged. Using public transport, cycling, walking, working from home, carpooling, making business vehicles more fuel efficient and the use alternative fuels are all more sustainable means of transport than single occupant driving.

More generally, the principles of a GTP are applied to all people travelling to and from a site. Government authorities around the nation are placing increasing emphasis on the need to reduce the number and lengths of motorised journeys and in doing so encourage greater use of alternative means of travel which have less environmental impact than cars.

The main objectives of a Green Travel Plan are to reduce the need to travel and promotion of sustainable means of transport.

The more specific objectives include:

- To reduce the level of single occupancy car borne trips associated with commuting.
- To facilitate the sustainable and safe travel of visitors to the site.
- To reduce site traffic congestion and associated pollution in order to enhance, improve and make safe journeys of minority/sustainable transport mode users.
- To work in partnership with neighbouring organisations/developments, local authorities, retailers and other relevant bodies in achieving the maximum mode shift away from the private car.
- To continually develop, implement, monitor, evaluate and review the progress of the travel plan strategy.
- To facilitate all users' access to key facilities such as retail, leisure, and education.

Sustainable Sydney 2030 also includes an action to promote sustainable travel behaviour by developing Green Travel Plans (GTP) that will be implemented in new developments. A Travel Plan aims to manage transport demand through a series of measures that promote and facilitate more sustainable modes of travel with a view to reducing private motor vehicle use.

To encourage people to make greater use of public transport, cycling, walking and car sharing for commuting as well as to encourage people to leave their cars behind and use public transport services are major objectives of Green Travel Plan.

It is estimated that for the proposed development, there will be a decrease in the car driver mode percentages and an increase in other modes (Train, Bus, Walk and Cycling) percentages when comparing them with the existing Travel to Work percentages outlined in Section 2.5.1.

It is assumed that around 5% reduction in car mode share can be achieved compared to the current mode share for people working in the area.

The site supports a low car mode share by providing 250 car parking spaces on site (around 13% reduction factor to the maximum car parking spaces permitted for the development) and doubling the commercial floor space. The site also encourages alternative modes such as bicycles, public transport, car share, taxis, etc. Appropriate levels of bicycle parking are provided within the basement levels for visitors and staff.

Typically, visitors and staff to Sydney CBD utilise public transport.

A Transport Access Guide (TAG) will be distributed to staff, customers and visitors to the site with information regarding:

- Nearby train stations and bus stops
- Key walking routes
- Carshare spaces on-site
- Bicycle storage area and End of Trip Facilities

It is recommended that Green Travel Plans are prepared prior to occupation of the building once tenants are known.

7 Conclusions

This assessment has described the potential traffic and transport impacts of the proposed mixed-use development at Stockland Piccadilly Complex in Sydney's CBD. Key findings of the review are as follows:

- The site is located in the City of Sydney Council local government area (LGA) and subject to maximum parking rates;
- The development is located within a prime central location close to key interchanges such as Town Hall and St James Station, and has the potential to be a premier Transit-Oriented Development;
- Car parking provision is less than the allowable provision under the LEP 2012;
- Employee bicycle parking will be provided in accordance with the requirements of DCP 2012 and visitor parking can be considered as a public cycle facility;
- The car parking provision of 250 spaces will result in an overall reduction in comparison to the existing parking by approximately 10% and a further 3% compared to the LEP parking rate provisions;
- The development will have a reduction of 10 vehicle trips during the PM peak period (compared to existing conditions by circa 8%) and would generate an additional 60 vehicle trips per hour over existing conditions during AM peak period. The volumes during the AM peak period would equate to an additional vehicle trip being generated every minute and is considered to result in minimal impacts on the surrounding road network. In summary, the traffic impacts for the development are considered negligible.
- Access will be via the existing exit-only driveway to Castlereagh Street. The driveway will be upgraded to provide for two-way traffic flow and remove the parallel vehicle ramp along Castlereagh Street, improving the public domain;
- The proposed access arrangements are appropriate to cater for the estimated level of traffic generation;
- There are four footpaths in the vicinity of the site that have been assessed in *133 Castlereagh Street - Footpath Analysis* provided by Arup separately. At each of these locations, the estimated pedestrian comfort level (PCL) is rated a C or better. On the footpaths where there are no existing counts, the additional demand associated with development at the site is estimated to increase flow rates by between 0.8 ppl/m/min to 5.7 ppl/m/min. These flows would require up to 0.7 m of effective footpath width to perform at PCL C.
- 20 loading bays are proposed for the development which are proposed to be managed and cater for the peak service vehicle generation of the site;
- While an outline Loading Dock Management Plan and Green Travel Plan has been prepared, detailed versions of these plans will be required to be prepared at a later stage.

In summary, the proposed development is considered to have a minimal impact on the local transport network.

Appendix A

Swept paths

A3

A B C D E F G

1 2 3 4 5 6

parking

1:27.4

RL
+ 22.41

Through Site Link

CASTLEREAGH STREET

Retail
RL +21.07

Retail
RL +21.47

Retail
RL +21.93

Retail
RL +22.41

Fire Egress

Podium Lobby
RL +22.41

1: 21

Lift Lobby

Podium Lobby entry

Retail

MRV - Medium Rigid Vehicle

Void over Wesley
Foyer below

RL +17.41

EOT access

MRV - Medium Rigid Vehicle

MRV - Medium Rigid Vehicle

MRV - Medium Rigid Vehicle

MRV - Medium Rigid Vehicle

Loading / Parking
Exit

1:6.5

Ramp down to Loading /
Parking Levels

Loading / Parking
Entry

Fire Egress

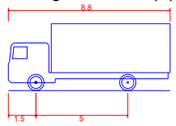
MRV - Medium Rigid Vehicle

MRV - Medium Rigid Vehicle

Legend

- Body Envelope
- 300mm Envelope
- 600mm Envelope
- Wheel Envelope

Design Vehicle(s)



MRV - Medium Rigid Vehicle	
Overall Length	8.800m
Overall Width	2.500m
Overall Body Height	3.633m
Min Body Ground Clearance	0.428m
Track Width	2.500m
Lock to Lock Time	4.00 sec
Curb to Curb Turning Radius	10.000m

Issue	Date	By	Chkd	Appd
C	12/08/20	JRT	JRT	JRT
B	11/08/20	JRT	JRT	JRT
A	31/07/20	JRT	JRT	JRT

For Information

ARUP

Arup, Barrack Place, 151 Clarence Street
Sydney, NSW, 2000
Tel +61(02)9320 9320
www.arup.com.au

Client
Stockland

Job Title
Piccadilly Complex

Drawing Title
Turning Paths
Driveway

Scale at A3 1:250

Discipline Transport

Drawing Status
Draft

Job No	Drawing No	Issue
249470-59	**SKT0002**	**C**

Do not scale

A3

SITE BOUNDARY

MRV - Medium Rigid Vehicle

Loading

EOT
RL +17.41

Waste
Management
< 30 m²

Ramp down to
Parking
B3

RL +14.85

Void over Wesley
Foyer below

RL +17

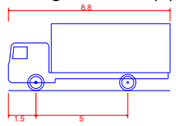
SITE BOUNDARY

6.9
12.9
12.3
52172
14.3
5.8

Legend

- Body Envelope
- 300mm Envelope
- 600mm Envelope
- Wheel Envelope

Design Vehicle(s)



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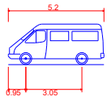
Curb to Curb Turning Radius	10.000m



B99 Vehicle (Realistic min radius) (2004)

Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	2.200m
Min Body Ground Clearance	0.312m
Track Width	1.840m
Lock to Lock Time	4.00 sec
Curb to Curb Turning Radius	6.250m

Issue	Date	By	Chkd	Appd
C	12/08/20	JRT	JRT	JRT
B	11/08/20	JRT	JRT	JRT
A	31/07/20	JRT	JRT	JRT

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Client
Stockland

Job Title
Piccadilly Complex

Drawing Title
Turning Paths
Loading area

Scale at A3 1:250

Discipline Transport

Drawing Status
Draft

Job No	Drawing No	Issue
249470-59	**SKT0001**	**C**

Do not scale