

Attachment A13

**Pedestrian Footpath Analysis - 133-145
Castlereagh Street, Sydney**

Stockland

Stockland Piccadilly Complex

Footpath Analysis for Planning Proposal

249470-59_ Piccadilly Complex Footpath Analysis

V3 | 10 August 2020

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 249470-59

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Job title		Stockland Piccadilly Complex		Job number		249470-59	
Document title		Footpath Analysis for Planning Proposal		File reference			
Document ref		249470-59_ Piccadilly Complex Footpath Analysis					
Revision	Date	Filename	133 Castlereagh Street Footpath Analysis_Draft.docx				
Draft 1	3 Jul 2020	Description	First draft				
			Prepared by	Checked by	Approved by		
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		Signature					
V2	25 Jul 2020	Filename	249470-59_Piccadilly Complex Footpath Analysis_V2 (200725)				
		Description					
			Prepared by	Checked by	Approved by		
		Name	Michael Rumbold	Eric Rivers	Glenn Wheatley		
		Signature					
V3	10 Aug 2020	Filename	249470-59_Piccadilly Complex Footpath Analysis_V3 (200810)				
		Description					
			Prepared by	Checked by	Approved by		
		Name	Michael Rumbold	Eric Rivers	Glenn Wheatley		
		Signature					
		Filename					
		Description					
			Prepared by	Checked by	Approved by		
		Name					
		Signature					
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Contents

	Page
1 Introduction	1
1.1 Subject site	2
1.2 Concept Reference Design	2
1.3 Purpose of report	3
2 Study Area	5
2.1 Proposed development	5
3 Existing Conditions Assessment	6
3.1 Existing pedestrian counts	6
3.2 Site observations	7
3.3 Existing footpath dimensions summary	12
4 Assessment Approach, Assumptions & Methodology	13
4.1 Approach: Passenger Comfort Level (Transport for London)	13
4.2 Approach: Allocation of development demand	15
4.3 Analysis Assumptions	17
5 Analysis & Results	18
5.1 PCL Assessment	18
5.2 Qualitative Assessment	19
6 Conclusion	21

1 Introduction

This Footpath Analysis 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.

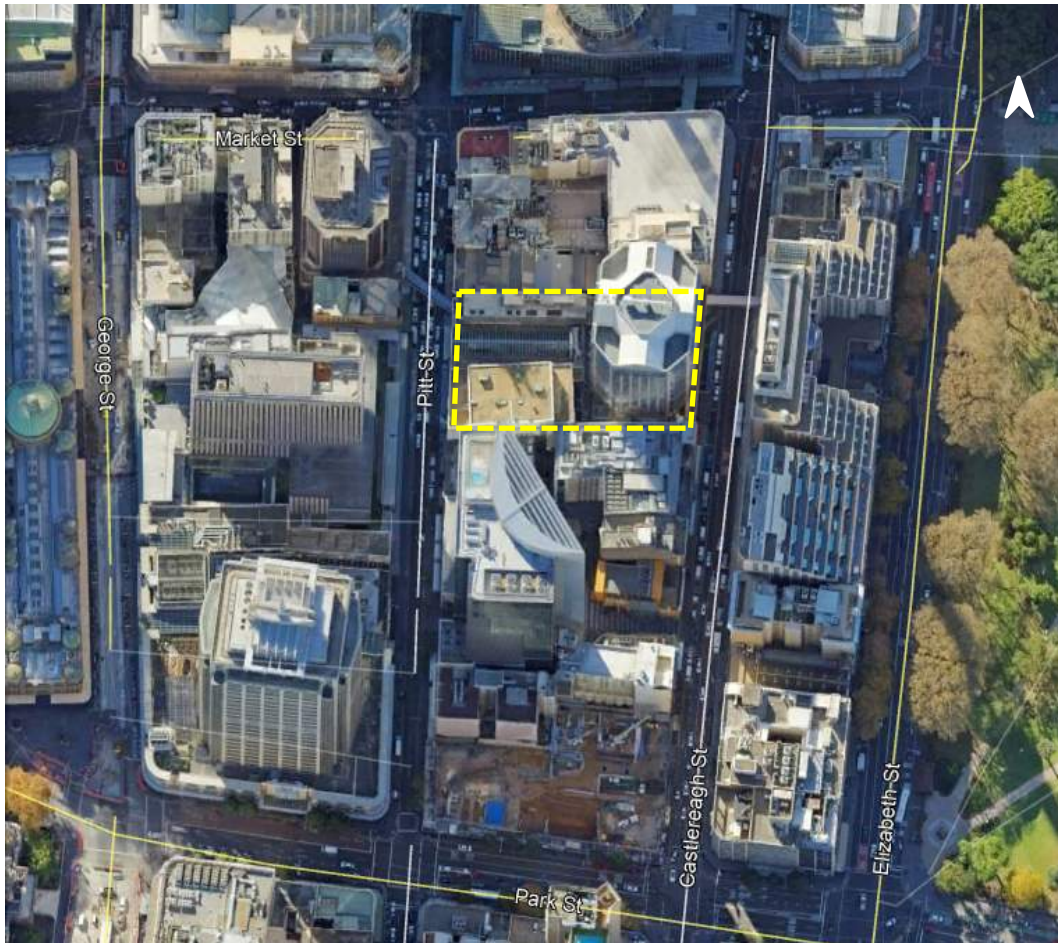


Figure 1: 133-145 Castlereagh Street, Sydney – Stockland Piccadilly Complex

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 mixed-use commercial development 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 office space predominately located at basement level. The Wesley Centre facilities comprise the following patron capacity: <ul style="list-style-type: none"> • 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. The building includes two lobby spaces, the main Castlereagh Street entrance and a smaller northern entrance to the through site link. 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. The ground floor plan is shown in Figure 2.

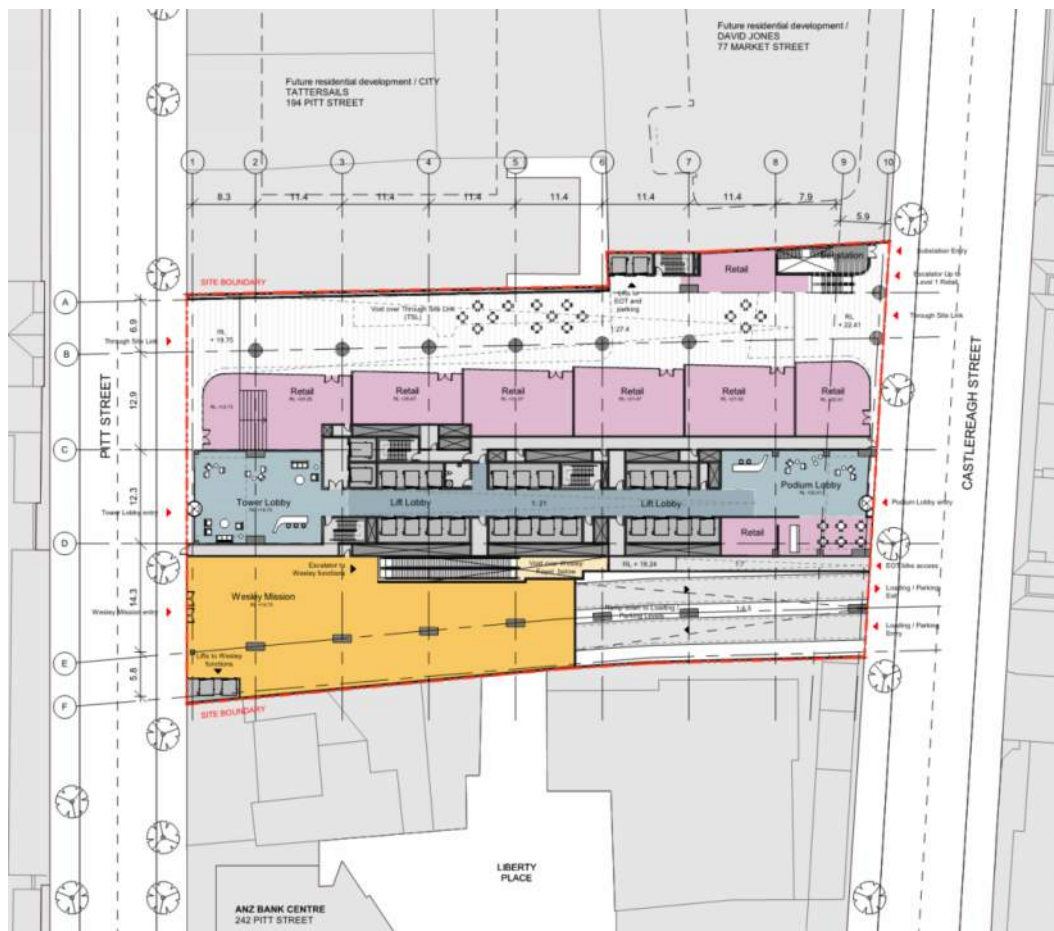


Figure 2: Stockland Piccadilly Complex – Concept Reference Design - Ground plan (3XN, 55001_200805)

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 City of Sydney (CoS) Draft Guidelines for Site Specific Planning Proposals in Central Sydney require that a Pedestrian Comfort Levels (PCL) assessment following the Transport for London (TfL) Pedestrian Comfort Guidance document be undertaken for new developments in the Sydney CBD.

The purpose of this report is to document the pedestrian activity and comfort assessment of the footpaths adjacent to the new development at 133-145 Castlereagh Street, as outlined in Transport for London's PCL assessment tool. The objective of the assessment is to understand existing and future pedestrian flows and behaviour on the footpaths adjacent to the proposed development. TfL's PCL tool requires that pedestrian activity and movement on footpaths and formal crossings be assessed under existing conditions. No mention is made of assessment of future year scenarios. Given that the aim of the assessment is to understand the impact of the development on the footpaths, the performance of the footpaths has been evaluated for the future year of 2026, the target year of opening of the tower.

A typical PCL assessment would include an assessment of the future do nothing conditions (base case) to compare against the 'with development' case. Given that this assessment is being carried out during the COVID-19 pandemic, when the majority of CBD workers are working from home, there has not been an opportunity to collect reasonable existing conditions pedestrian flow data as part of this project. Understanding this, and through agreement with CoS, the approach taken in this assessment considers the uplift demand generated by the building and qualitatively compares it to the available and potential footpath widths.

2 Study area

The study area is outlined in Figure 3. The proposed development site has dual frontages to Pitt Street and Castlereagh Street, and is highlighted in blue. The footpaths assessed as part of this study are shown in pink. These include the footpaths that provide direct access to the building entrances on Castlereagh and Pitt Streets as well as secondary footpaths that connect to the surrounding transport nodes. Given that the surrounding land use in the area is primarily commercial, the site has been classified as ‘Office and Retail’ under the PCL area categories.

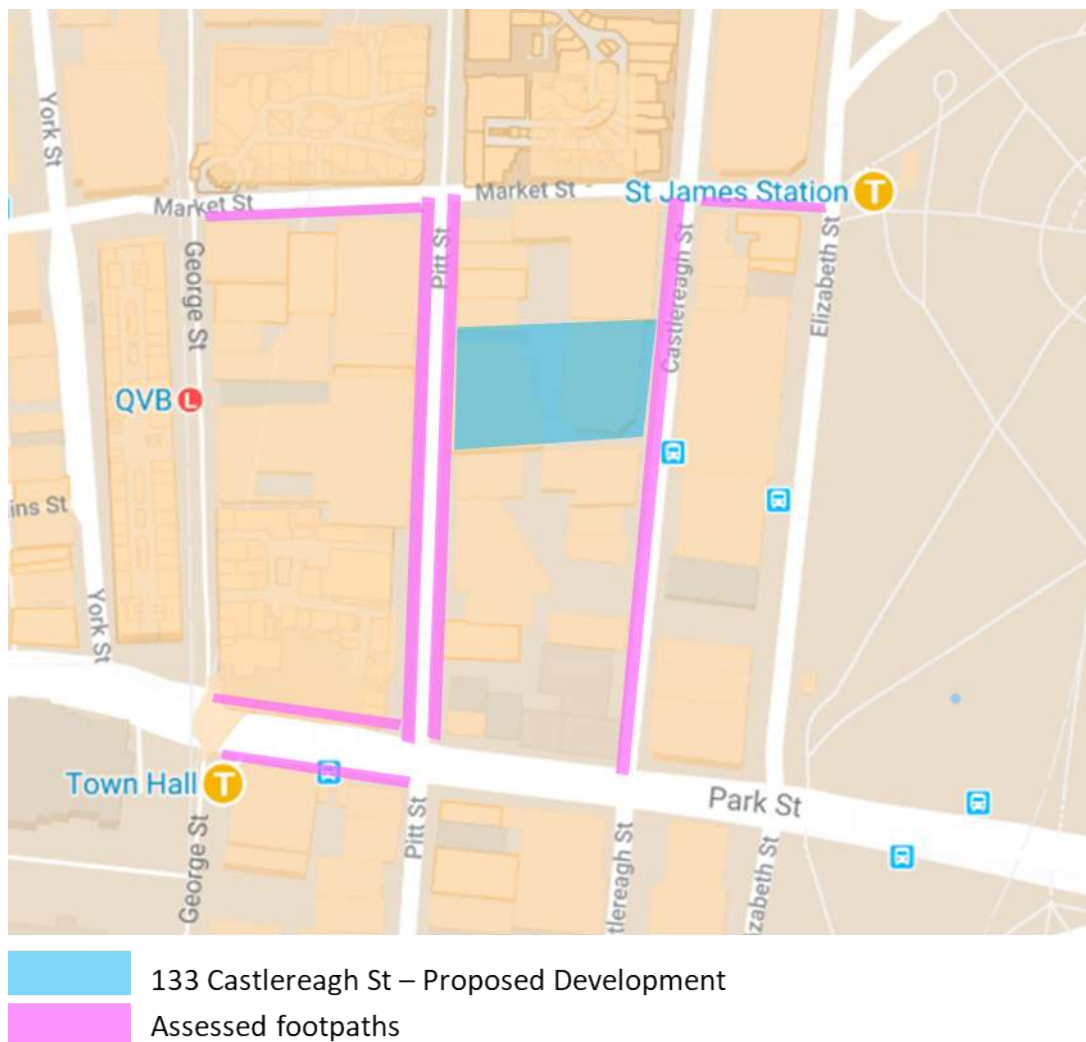


Figure 3: Study Area

2.1 Proposed development

A summary of the Concept Reference Design that informs this planning proposal is outlined in Section 1.2. For the purpose of this assessment the net increase in commercial population between the existing condition and the proposed development has been adopted. It is assumed that the net increase in commercial population is 4,500 staff.

3 Existing conditions assessment

As discussed above, this study is being undertaken in the midst of the COVID-19 pandemic. During this period, attendance at workplaces has dramatically reduced as most people are working from home, particularly office workers. Therefore, any surveys of pedestrian demand carried out at this time would not represent a realistic baseline demand.

In lieu of being able to conduct specific pedestrian surveys, we have reviewed a number of other documents that could potentially include recent pedestrian surveys prior the COVID-19 pandemic, including:

- Development Application: 194 & 196-204 Pitt Street, Sydney
- Development Application: 65-77 Market Street, Sydney
- Chatswood to Sydenham, EIS, May 2016 (relevant for Pitt St Station)

The two neighbouring development applications did not include any indication of existing pedestrian counts in the area. However, the Chatswood to Sydenham EIS included pedestrian counts in the Pitt Street and Park Street area, undertaken in 2015 in support of the Station development.

A site visit was conducted to get an understanding of physical characteristics of the footpath network in the study area.

3.1 Existing pedestrian counts

The Chatswood to Sydenham EIS included 2015 AM Peak hourly pedestrian counts as outlined in Figure 4. The EIS shows that existing counts are only available on Park Street either side of Pitt Street and on Pitt Street north of Park Street. There is no existing pedestrian count data available for any other footpath within the study area.

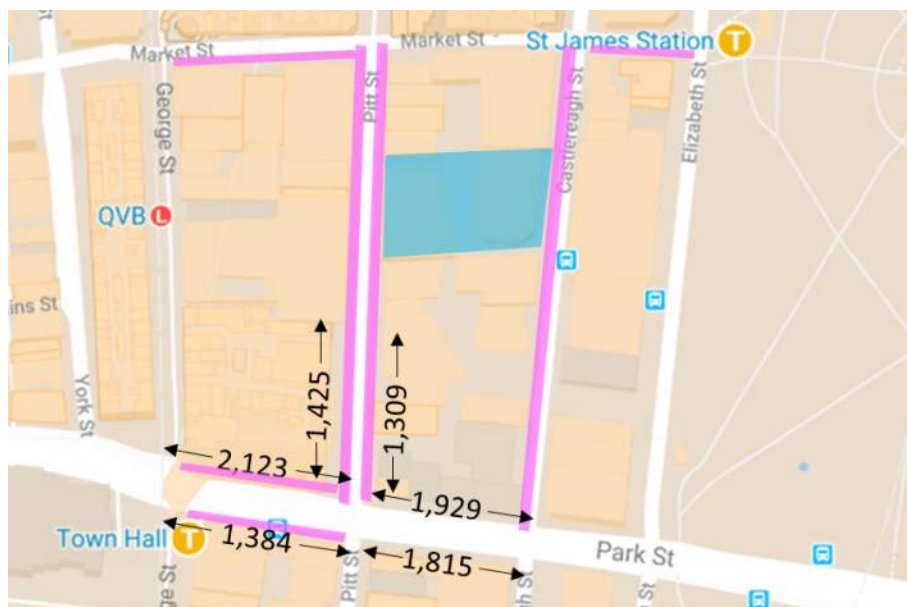


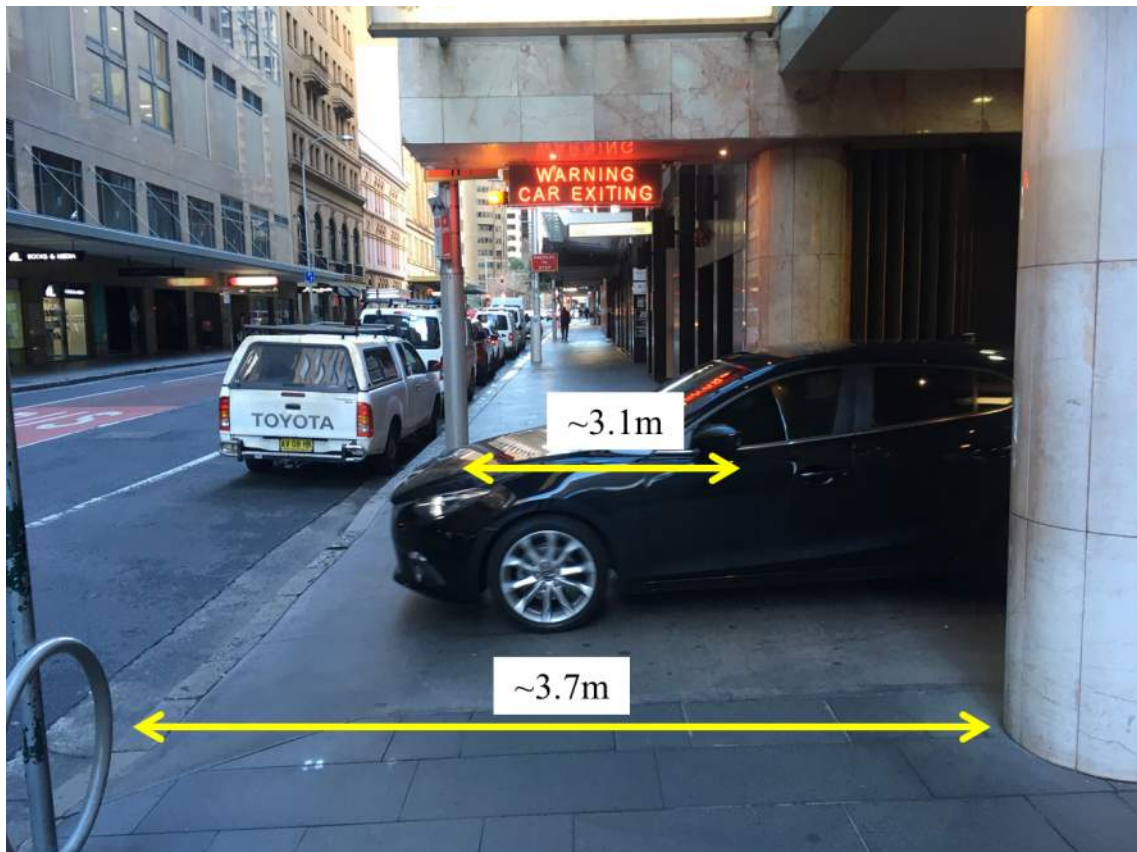
Figure 4: Existing pedestrian movement counts, 2015 Peak Hourly flows

3.2 Site observations

Observations of footpath infrastructure in the study area were taken on 29 June 2020 and included a review of the estimated total footpath width to the kerb as well as the effective footpath width including losses due to roadside furniture and parking bay insets. The findings of the observations are summarised in this section.

3.2.1 Castlereagh Street

Castlereagh Street is a main north-south thoroughfare that provides direct access to the proposed development. Its western footpath between Market Street and Park Street is characterised generally as shown in Photograph 1 and Photograph 2. This shows an approximate total of 3.7 m between building property and the kerb, and between 2.8 m and 3.1 m of effective width depending on the location.

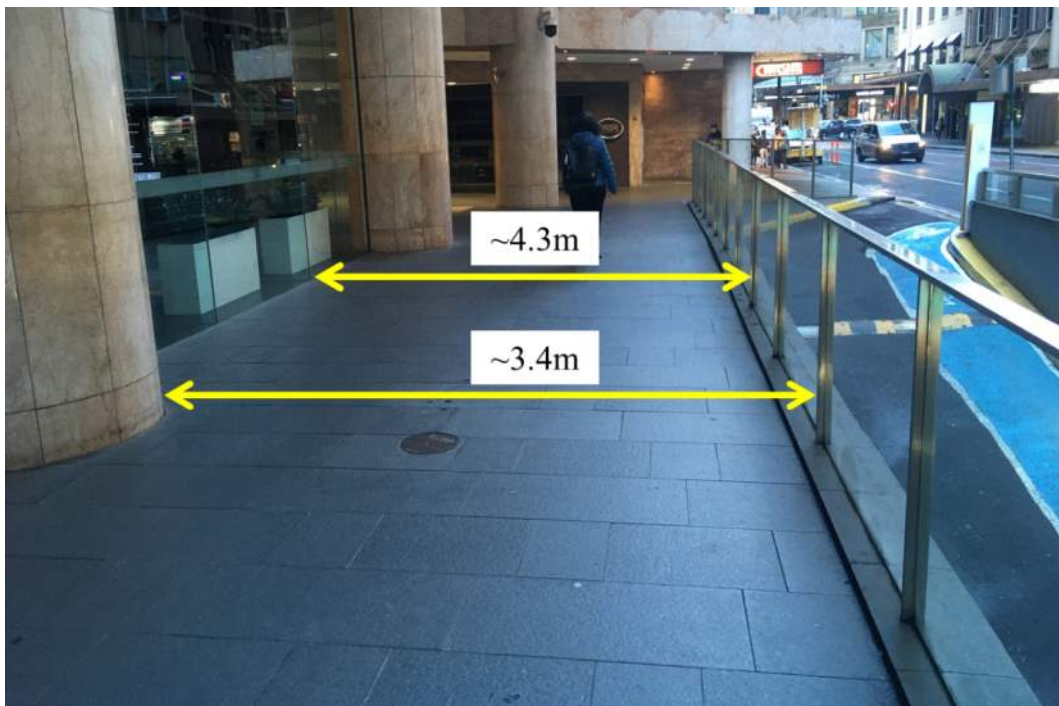


Photograph 1: Castlereagh Street west, looking south, just south of the proposed development



Photograph 2: Castlereagh Street west, looking south, midblock

Adjacent to the development site there is an existing ramp down to the existing car park which diverts the footpath as shown in Photograph 3. In this instance the effective width is approximately 3.4 m. As part of the proposed development the existing car park ramp that runs parallel to the footpath will be replaced with a more standard perpendicular ramp. The footpath in this area will be reinstated to match the existing footpath either side of the site (as shown in Photograph 1).

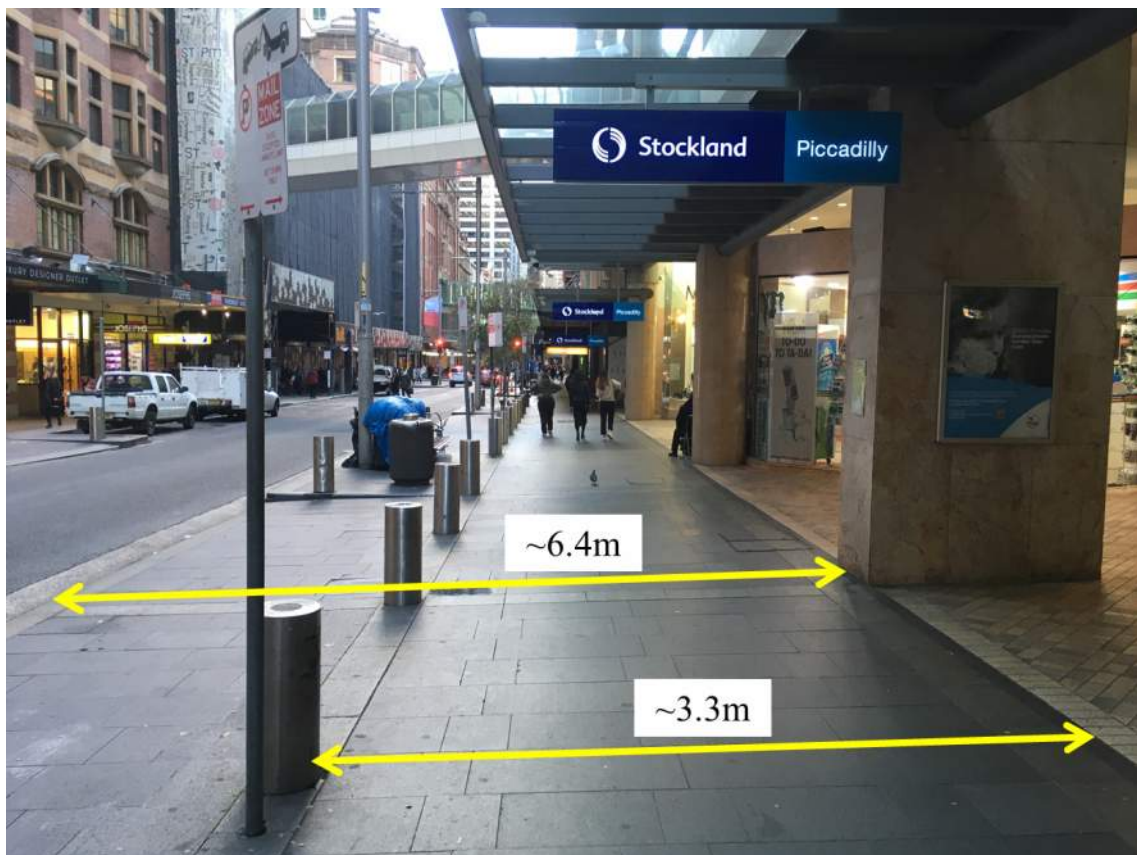


Photograph 3: Castlereagh Street, looking north, adjacent to proposed development site

3.2.2 Pitt Street

Pitt Street is a main north-south thoroughfare that provides direct access to the proposed development. Its eastern footpath between Market Street and Park Street is characterised generally as shown in Photograph 4. This shows an approximate total of 6.4 m between building property and the kerb. At various locations along the road there are parking bays built into the kerb and protected by bollards. The effective width is generally in the order of 3.3 m for the entire length of this road section. At locations where there aren't car parks there is other furniture along a similar line that maintains a consistent effective width.

The western footpath is very similar to the eastern footpath shown in Photograph 4.



Photograph 4: Pitt Street, looking north, adjacent to proposed development site

3.2.3 Market Street

Market Street is a main east-west thoroughfare that provides connections to St James Station and the bus stops and Ferry to the west and north west. Its southern footpath between Elizabeth Street and George Street is characterised generally as shown in Photograph 5. This shows an approximate total of 3.7 m between building property and the kerb, and 3.1 m of effective width. This profile is reasonably consistent for the entire length of footpath with minimal obstructions that reduce the effective width further than shown.

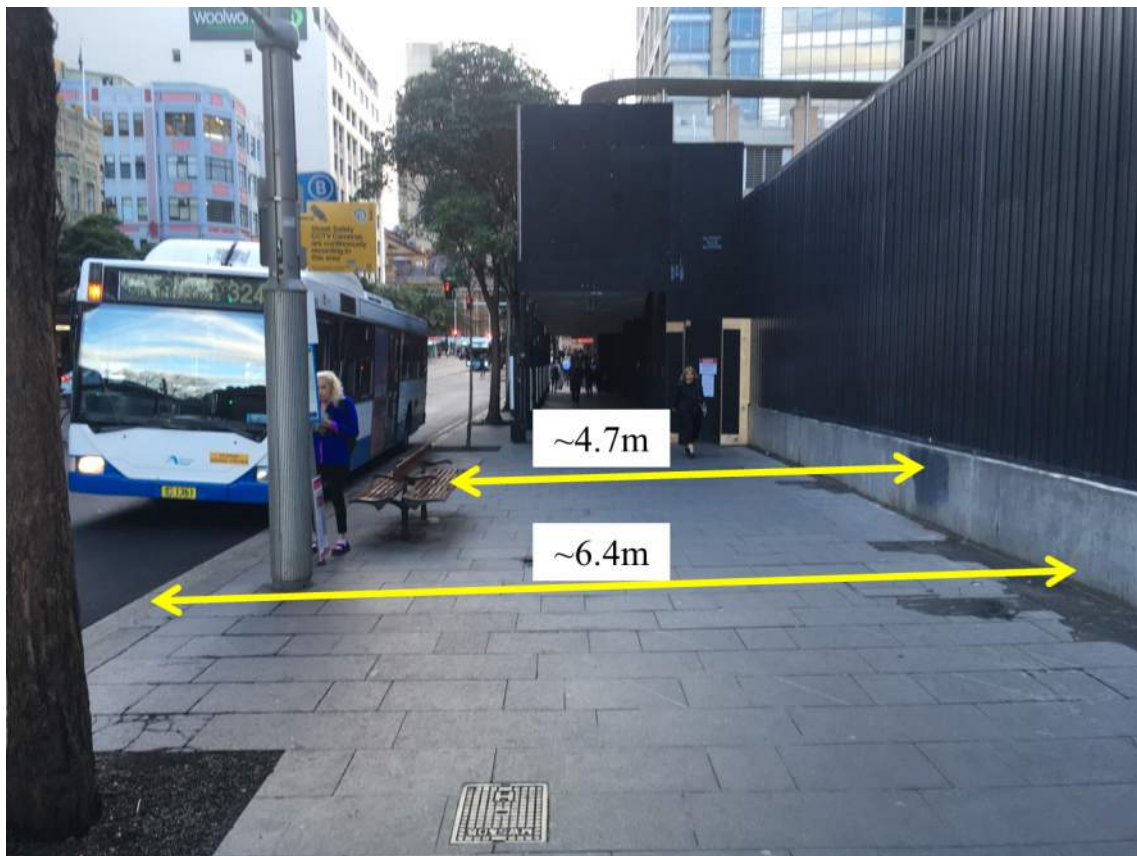


Photograph 5: Market Street, looking west, west of Castlereagh Street

3.2.4 Park Street

Park Street is a main east-west thoroughfare that provides connections to Town Hall Station and is the site of the future Pitt Street Metro station. Its northern footpath between Elizabeth Street and George Street is characterised generally as shown in Photograph 6. This shows an approximate total of 6.4 m between building property and the kerb, and 4.7 m of effective width. This profile is reasonably consistent for the entire length of footpath. This footpath includes wider furniture obstruction than the other streets, including trees and benches.

The southern footpath is very similar to the northern footpath shown in Photograph 6.



Photograph 6: Park Street, looking west, west of Castlereagh Street

3.3 Existing footpath dimensions summary

Figure 5 summarises the effective footpath widths outlined in the Site Observation sections above.

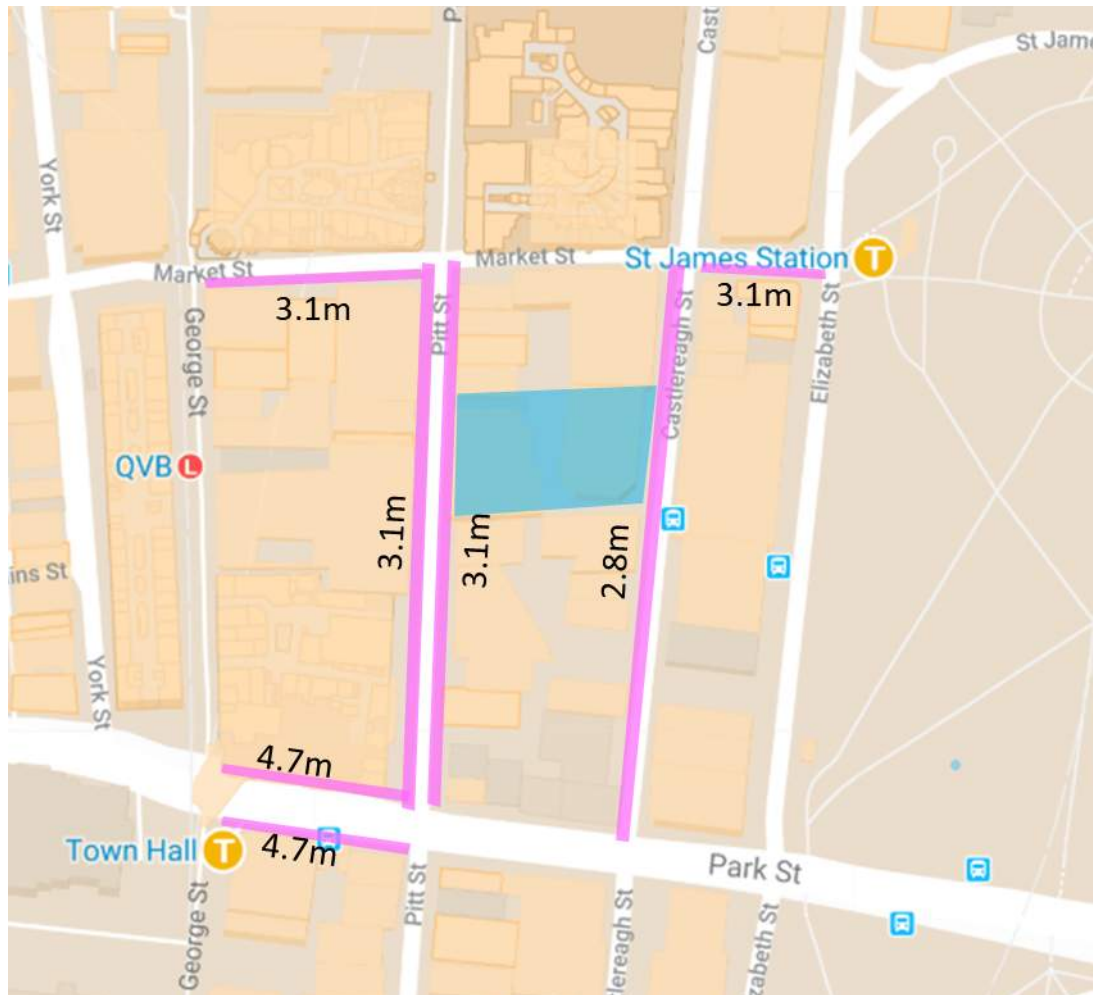


Figure 5: Approximate effective footpath widths within study area

4 Assessment approach, assumptions and methodology

A spreadsheet-based assessment has been undertaken to evaluate the performance of the footpaths based on a combination of the existing flows and estimated building demand flows.

For locations where existing pedestrian counts have been sourced, two scenarios have been assessed:

1. **2026 AM Peak Base Case:** Future 2026 performance including background growth due to employment, with no development at the site.
2. **2026 AM Peak With Development:** Future 2026 performance including background growth due to employment and the net impact of the development at the site.

For locations with no existing pedestrian counts available the following is assessed:

1. **AM Peak Development only:** PCL footpath width assessment to support the increased demand associated with the proposed development
2. **Qualitative assessment** of the existing footpath and its ability to support a future increase in demand, based on the current allocation to roadside furniture.

4.1 Approach: Passenger Comfort Level (Transport for London)

The ‘*Pedestrian Comfort Guidance for London*’ has been developed by Transport for London (TfL) to assist those planning London’s streets in helping to provide an attractive and comfortable experience for pedestrians on footpaths. This guidance has been adopted by the City of Sydney for assessment of footpaths as a temporary framework until an official guide can be agreed between CoS and TfNSW. We understand CoS and TfNSW are currently discussing a localised version of the PCL that may be adopted and introduced in the near future.

The PCL guide identifies five different types of street categories: High Street, Office and Retail, Residential, Tourist Attraction and Transport Interchange. The footpaths analysed as part of this work has been categorised as Office and Retail given the area is dominated by commercial office buildings.

Figure 6 and Figure 7 show the different Passenger Comfort Levels (PCLs) identified in the guidance document. The guidance states that PCL C+ is the maximum flow that would be categorised as ‘acceptable’ for footpaths in an Office and Retail area, with PCL C– being categorised as ‘at risk’. PCL C+ is equivalent to a maximum flow rate of 20 people/minute/metre (see Figure 6). The guidance is silent on the categorisation of the PCL C rating, which is equivalent to a maximum flow rate of 23 people/minute/metre. A PCL C rating could therefore be deemed to be ‘borderline acceptable’.



Figure 6: Pedestrian Comfort Levels on Footways (Transport for London)

	HIGH STREET		OFFICE AND RETAIL		RESIDENTIAL		TOURIST ATTRACTION		TRANSPORT INTERCHANGE	
	Peak	Ave of Max	Peak	Ave of Max	Peak	Ave of Max	Peak	Ave of Max	Peak	Ave of Max
A	COMFORTABLE		COMFORTABLE		COMFORTABLE		COMFORTABLE		COMFORTABLE	
B+										
B	ACCEPTABLE				ACCEPTABLE		ACCEPTABLE			
B-	AT RISK		ACCEPTABLE				AT RISK		ACCEPTABLE	
C+	UNACCEPTABLE/ UNCOMFORTABLE				AT RISK	AT RISK	UNACCEPTABLE/ UNCOMFORTABLE			
C-			AT RISK	AT RISK	AT RISK				AT RISK	
D					UNACCEPTABLE/ UNCOMFORTABLE					
E										
	Peak and Average of Maximum Activity levels have similar guidance as people visiting retail areas stated they were particularly sensitive to crowding.		The “at risk” level is set at a lower PCL during the Average of Maximum Activity than peak flows. This is because of the greater number of single travellers and the short duration of maximum activity.		The “at risk” level is set at a lower PCL than peak flows in Residential Areas to reflect the short time this is likely to occur. A site visit to Residential sites is particularly important to check if there is school activity or a bus stand in the area.		Peak and Average of Maximum Activity levels have similar guidance as people visiting tourist areas are likely to be particularly sensitive to crowding		The “at risk” level is set at a lower PCL during the Average of Maximum Activity than peak flows. This is because of the greater number of single travellers and the short duration of maximum activity.	

Figure 7: Guidance for different area types (Transport for London)

4.2 Approach: Allocation of development demand

The development demand has been allocated to the footpath network based on the following approach:

- Transport mode share is estimated based on 2016 Census data for the Destination Zone (DZN) that includes the site.
- Office workers are allocated to each mode as per the mode share data. Car mode share is split into onsite 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. 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 St Station

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

Transport mode share for the site was calculated based on analysis of Census Journey to Work 2016 dataset for destination zones (DZN) 113371093

Incoming work trips to these zones were analysed and the resulting mode share is summarised in Table 2. It is evident that public transport accounts for most trips made to the study area.

Table 2: Journey to Work mode share for study area

Mode	Percent of work trips made to study area
Train	54.7%
Bus	23.2%
Private Car and taxi	13.4%
Walked only	6.0%
Ferry	1.4%
Bicycle	1.0%
Tram	0.3%

Figure 8 shows the allocation of transport nodes that provide access to the development site. It is assumed that 50% of passengers using Town Hall Station will use the underground and in building links through the Galleries Victoria Site.

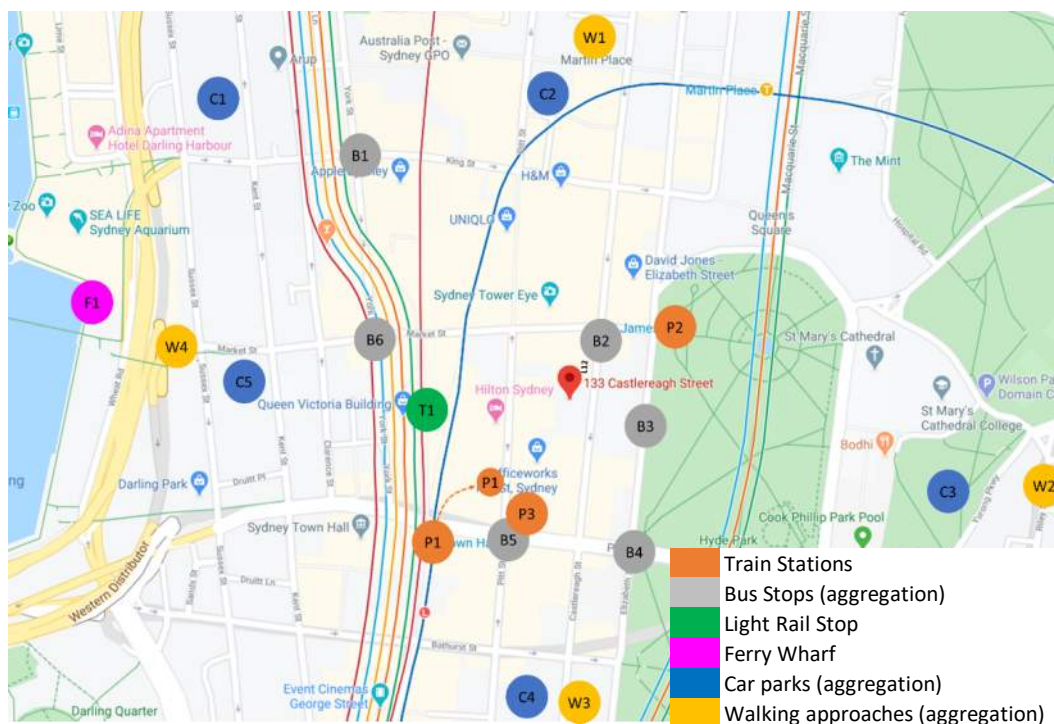


Figure 8: Transport Node allocation

Figure 9 provides a summary of the estimated approach directions based on this analysis. This shows that the dominant approach is the south-west which is driven by Town Hall and Pitt Street Stations. The north east and north west approaches are estimated to be similar in size, while the south east is a very minor approach direction.

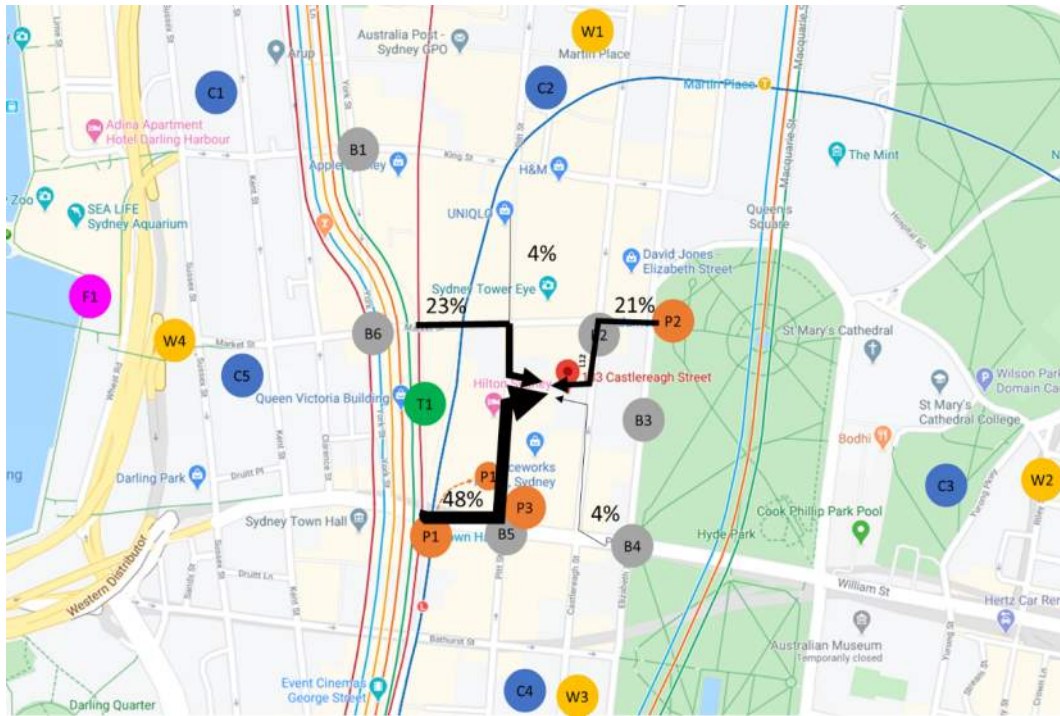


Figure 9: Estimated Approach directions

4.3 Analysis assumptions

The following assumptions have been adopted:

- Peak 1-minute flows have been used in the assessment.
 - For development demand, the peak 1-minute demand is assumed to be equivalent to 1.14% of the building population. This is based on studies of commercial buildings in the Sydney CBD. This includes consideration of staff attendance rates.
 - For background demand it is assumed that the peak 1 minute represents 2% of the peak hour demand, based on the peak 15 minutes being 30% of the peak hour and a flat profile within the peak 15 minutes.
- A growth rate of 1.4% per annum has been assumed to estimate flows on the footpaths in 2026. The 1.4% per annum growth rate has been estimated based on projected employment figures from Transport for NSW's Travel Zone Projection 2016, version 1.51 for the travel zone within which the site is located.
- Edge effects of 200 mm are applied to the kerb, building edges and furniture edges as per the guidance in the TfL Pedestrian Comfort Guidance for London document.

5 Analysis and results

5.1 PCL assessment

Table 3 presents the results of the PCL assessment. Where there is existing pedestrian count data this includes a comparison of the future base case with the future with development scenarios. Where existing pedestrian counts are not available, an assessment of the required width to support the uplift generated by the development has been provided.

Table 3: PCL Assessment Results

Location	Existing Effective Width (m)	2026 Base Case		2026 With development		
		Peak minute flow (ppl/m/min)	PCL	Peak minute flow (ppl/m/min)	PCL	width req ^d for PCL C (m)
Market St south, btw George and Pitt	2.7	*	*	3.6	N/A	0.4
Market St south, btw Castlereagh and Elizabeth	2.7	*	*	5.3	N/A	0.6
Pitt St west, between Market and project site	2.9	*	*	0	N/A	0.0
Pitt St east, between Market and project site	2.9	*	*	5	N/A	0.6
Castlereagh St west, between Market and project site	2.7	*	*	5.7	N/A	0.7
Pitt St west, between project site and Park	2.9	11.3	B	14.6	B-	N/A
Pitt St east, between project site and Park	2.9	10.4	B+	17.7	C+	N/A
Castlereagh St west, between project site and Park	2.4	*	*	0.8	N/A	0.1
Park St north, btw George and Pitt	4.3	11.4	B	12.5	B	N/A
Park St south, btw George and Pitt	4.3	7.2	A-	8.4	B+	N/A

*No existing pedestrian count data available

The results show:

- All four of the locations with existing counts are showing an estimated PCL C or better in line with the criteria.

- The estimated flow rates on the footpaths where there are no existing counts range from 0.1 ppl/m/min to 5.7 ppl/m/min. These flows would utilise up to 0.7 m of effective footpath width whilst operating at PCL C and is therefore considered acceptable.

5.2 Qualitative assessment

For each of the locations where there are no existing pedestrian counts, a qualitative assessment has been undertaken. This assessment considers the estimated development demand allocated to the link and compares it against the current provision. Additionally, there is consideration of potential widening through rationalisation of street furniture or car parking. Table 4 summarises this assessment.

Table 4: Qualitative Assessment

Location	Width required for PCL C (m)	Existing effective width (m)	Existing total width (m)	Comment
Market St south, btw George and Pitt	0.4	2.7	3.7	Small width required. Minimal street furniture currently with little scope to rationalise. Minimal overall impact.
Market St south, btw Castlereagh and Elizabeth	0.6	2.7	3.7	Small width required. Minimal street furniture currently with little scope to rationalise. Minimal overall impact.
Pitt St west, between Market and project site	0.0	2.9	6.4	No estimated development demand. No impact.
Pitt St east, between Market and project site	0.6	2.9	6.4	Small width required. Opportunity to increase effective width through conversion of indented parking bays into footpath and reconfiguration of street furniture if required, but not expected at this stage.
Castlereagh St west, between Market and project site	0.7	2.7	3.7	Small width required. Opportunity to increase effective width through conversion of indented parking bays into footpath and reconfiguration of street furniture if required, but not expected at this stage.
Castlereagh St west, between project site and Park	0.1	2.4	0.0	Negligible estimated development demand. Negligible impact.

The assessment shows:

- All footpaths have small increases in demand that require widths less than 1m.
- 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 have the potential to increase the effective width through conversion of the indented parking bays into footpath if it is required based on the level of the existing demand.

In addition to the qualitative assessment of the footpaths in the study area above, the below comments are made with regards to the proposed design and its impact on pedestrian flows:

- The existing driveway on Castlereagh Street that provides access to the basement car park currently has a major impact on the quality of the pedestrian experience along the footpath. In the current state, pedestrians are forced to divert around the driveway, creating challenges for all users but especially people with visual impairments. The proposed design removes the parallel driveway and replaces it with a traditional perpendicular driveway which allows the reinstatement a straight and linear footpath which is consistent for the full length of Castlereagh Street. It is therefore a substantial improvement in terms of pedestrian experience and continuity of shoreline for people with disabilities.
- The existing through site link includes horizontal shifts as well as level changes and is not an attractive or intuitive option for thoroughfare movements. The proposed development includes a substantially improved through-site link which is wider, straight and has gentle ramps connecting Pitt Street and Castlereagh Street. It will provide a legitimate link for pedestrians who want to travel east west. It has the potential to take pedestrian traffic off busy Market Street, especially those moving between St James Station and points south-west of the Piccadilly Complex.

6 Conclusion

Stockland propose to develop a new commercial tower in the Sydney CBD. The assessment of any potential impact of the proposed development has been atypical due to the current COVID-19 pandemic, which has ruled out the possibility of conducting existing pedestrian counts. Fortunately, a small set of existing counts have been sourced from the Chatswood to Sydenham EIS.

For locations where existing pedestrian counts have been sourced, two scenarios have been assessed:

3. **2026 AM Peak Base Case:** Future 2026 performance including background growth due to employment, with no development at the site.
4. **2026 AM Peak With Development:** Future 2026 performance including background growth due to employment and the net impact of the development at the site.

For locations with no existing pedestrian counts available the following is assessed:

1. **AM Peak Development Only:** PCL footpath width assessment to support the increased demand associated with the proposed development
2. **Qualitative Assessment** of the existing footpath and its ability to support a future increase in demand, based on the current allocation of roadside furniture.

Key findings from the assessment include:

- There are four footpaths that have been assessed that have existing count data. At each of these the estimated PCL is 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.
- 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 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.