Pro-Invest Group

100-102 Walker Street, North Sydney

Transport Impact Assessment

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1 Introduction

This report has been prepared to accompany a development application (DA) for the re-development of 100-102 Walker Street, North Sydney (the site). The legal description of the site is Lot 1 in Deposited Plan 542915. The site is rectangular in shape with an area of approximately 1,392sqm, a primary frontage to Walker Street of 38.66m to the east and a secondary frontage to Little SpringStreet of 38.45m to the west.

The purpose of this report is to review the existing and future transport context surrounding the site, present the multimodal trip generation associated with the proposed development, the impact of these trips on the transport network and provisions within the development for walking, cycling, parking and loading.

This Detailed DA seeks consent for a 48-storey commercial building, comprising office and retail land uses. TheDA seeks consent for:

- Demolition of existing site and excavation to a depth of RL35 metres.
- The design, construction and operation of a 48-storey office building (inclusive of two levels of roof plant) with a maximum building height of RL239 metres (to the top of the rooftop feature) and a total gross floor area provision of 42,573sqm. The building will accommodate:
  - 40-storeys of commercial office space including terraces on the eastern elevation and building plant at the Low-rise Deck (Level 17), Mid-rise Deck (Level 31) and rooftop (Level 45 and 46).
  - Retail premises (including food and beverage premises and shops) accommodated on the Lower Ground Floor, Upper Ground Floor and Basement Level B1.
  - Pedestrian access to the site from several entries on Lower Ground and Upper Ground from the Walker Street, Little Spring Street and laneway frontages.
  - Repurposing existing vehicular access on Walker Street and construction of six (6) storey basement to accommodate a total of 74 car parking spaces, 2 loading bays, 397 bicycle parking spaces, as well as associated end of trip facilities (EOTF), storage, back of house, services and substation.
  - Provision of a rooftop architectural feature to a total height of RL239.0 metres.
- Landscaping provision across the ground plane and commercial terraces.
- Public domain improvements to facilitate an improved pedestrian experience at ground plane, including activation of street frontages and provision of a 6m-wide open to the sky public pedestrian laneway (of which 100-102 Walker Street Project contributes 50% of this 6m wide Laneway) along the full extent of the northern site boundary providing access from Walker Street through to Little Spring Street.

- The addition of a public lift providing accessible access between Little Spring Street, the Laneway andWalker Street.

The site is located within North Sydney and bordered by Walker Street and Little Spring Street as shown in Figure 1.

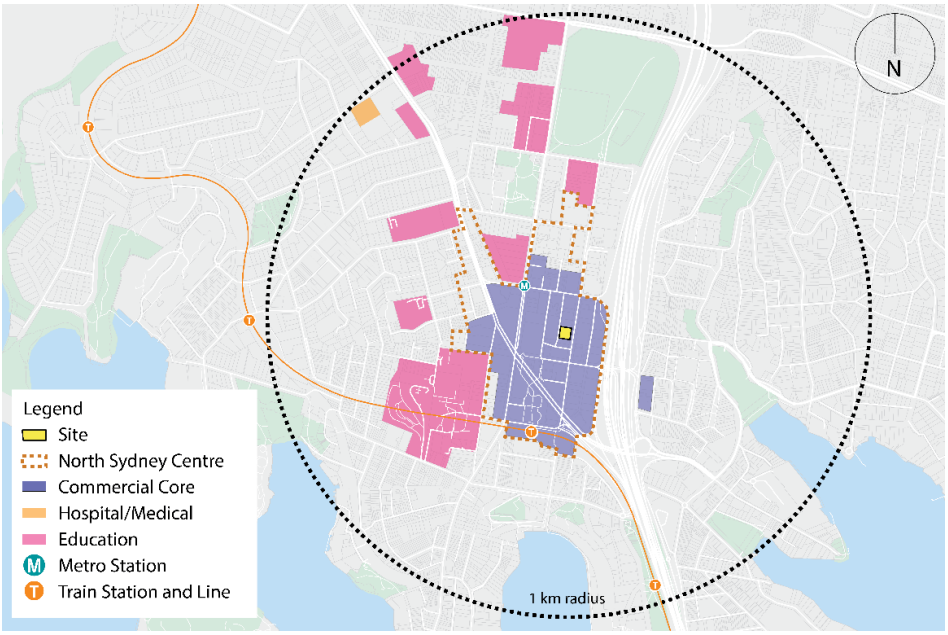


Figure 1: Site Location

1.1 Report Structure

This transport assessment will address the following:

- An overview of the existing transport and planning context;
- A summary of the development proposal;
- Car parking, loading and access arrangements;
- Provisions relating to walking and cycling;
- A multimodal trip generation for the development;
- An assessment of the traffic impacts relating to the development; and
- Travel demand management measures outlined in a Framework Green Travel Plan

2 Existing and Planned Future Conditions

2.1 Site Description

The site area of 100-102 Walker Street is approximately 38 metres by 36 metres. The site currently accommodates an office building of 15 storeys with an estimated Gross Floor Area (GFA) of 10,000m². The current building contains a basement car park split across seven levels which has 102 car parking spaces.

2.2 Walking

The existing infrastructure around the site provides good amenities to support walking. Footpaths connect the site with major public transport services and other trip attractors with signalised pedestrian crossings provided at appropriate locations.

The site is a 7-minute walk from the North Sydney Train station from Miller Street through Gas Lane via the pedestrian bridge over the Pacific Highway Mount Street. A through site link is provided from Walker Street through to Miller Street on the northern boundary of the site connecting the site with bus stops on Miller Street and the future Victoria Cross Sydney Metro station within a 2-minute walk.

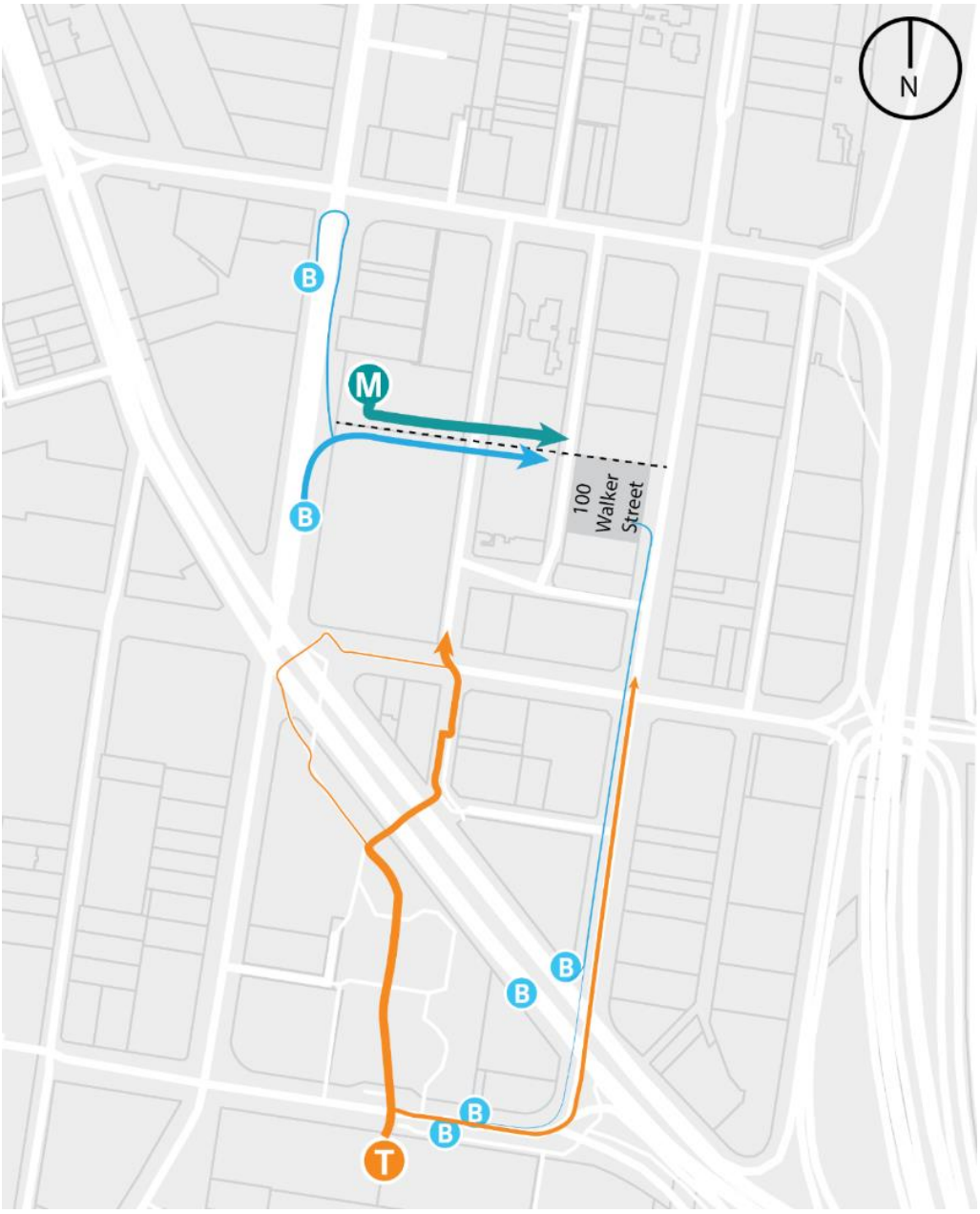


Figure 2: Existing Conditions with Planned Metro Station

2.3 Cycling

There is a range of cycling infrastructure around the site. These routes include:

- Balls Head Road (marked, on-road)
- Alfred Street South (shared cycle path)
- Sydney Harbour Bridge (separated, bi-directional cycleway)

The North Sydney Integrated Cycling Strategy 2013 outlines North Sydney Council's (Council) future plans for cycling routes. Figure 3 presents the existing cycling routes and planned future routes outlined in the cycling strategy relevant to the DA. This includes:

- Route 1: Construction of a separated bi-directional cycleway on Pacific Highway, providing a new north-south connection from Cammeray to the Sydney Harbour Bridge (implementation of this route is in progress)
- Route 3: Upgrade of the North Sydney to Mosman route to marked on-road mixed traffic cycle routes with specific sections upgraded to dedicated cycle lanes (completed)
- Route 5: On-road mixed traffic cycle route and dedicated cycle lane sections from North Sydney to Cremorne (implementation of this route is in progress)

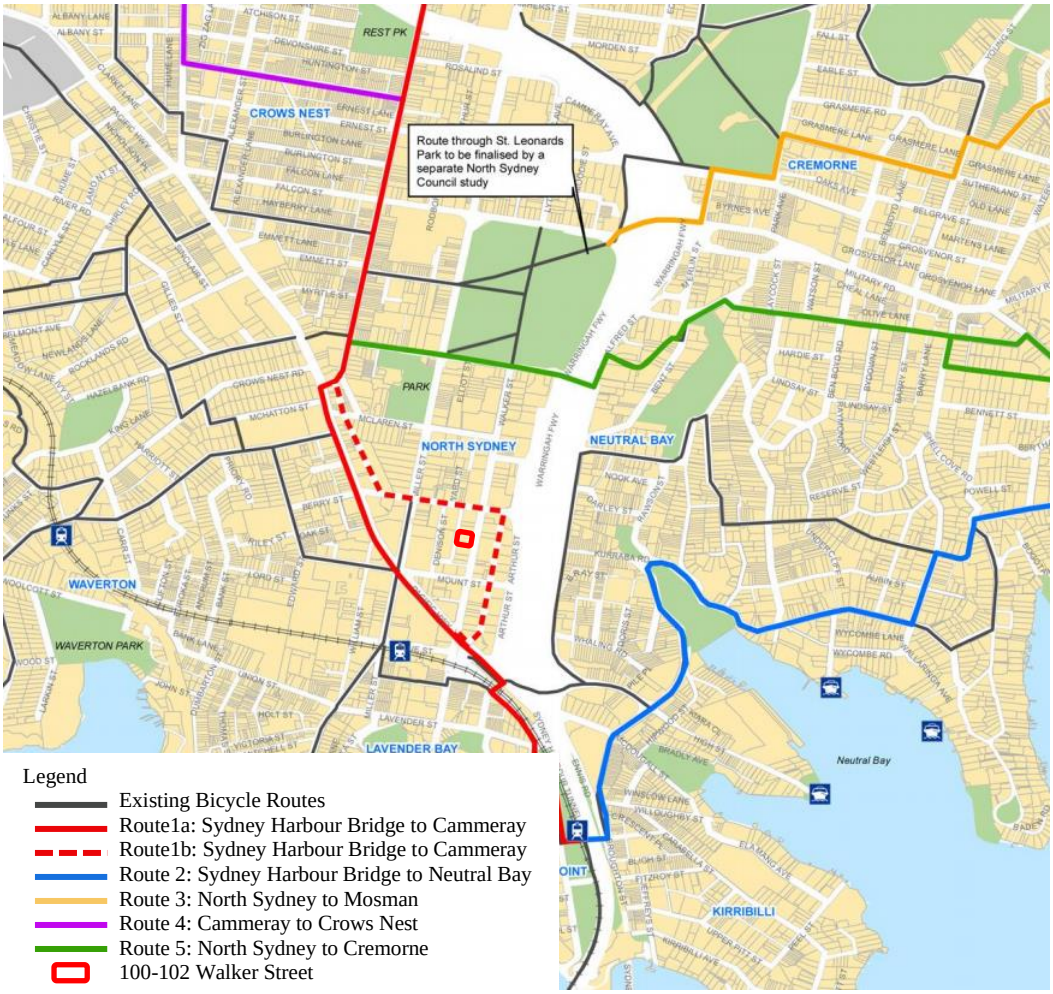


Figure 3: North Sydney Councils Priority Cycle Routes

Source: North Sydney Integrated Cycling Strategy (North Sydney Council, 2013)

2.4 Public transport

A range of public transport services are available within walking distance of the site, with further plans for improvements to public transport accessibility through the Sydney Metro City and South West line.

2.4.1 Train network

The proposed development is located approximately 450m (7-minute walking distance) from North Sydney Train Station and 1.4km (19-minute walking distance) from Waverton Train Station. The train services at North Sydney Train Station include the T1 North Shore & Western Line, the T9 Northern Line and the Central Coast & Newcastle Intercity Line.

All train services stop at Central Station offering direct interchange opportunities to various destinations on the Sydney Trains network including airport train services and the Sydney Buses network. The T9 Northern Line provides a service to Town Hall Station which additionally offers connections to the T4 Eastern Suburbs Line.

2.4.2 Bus network

There is currently an extensive bus network that supports the North Sydney CBD and Sydney City CBD, covering the Upper and Lower North Shore as well as connections to the Northern Beaches. The existing bus network primarily travels along corridors such as the Pacific Highway and Military Road before distributing to various suburbs.

Due to the proximity of the site to North Sydney Station Bus Interchange, there are a wide selection of bus routes with stops within walking distance of the proposed commercial office development. The location of these bus stops is displayed on Figure 4.

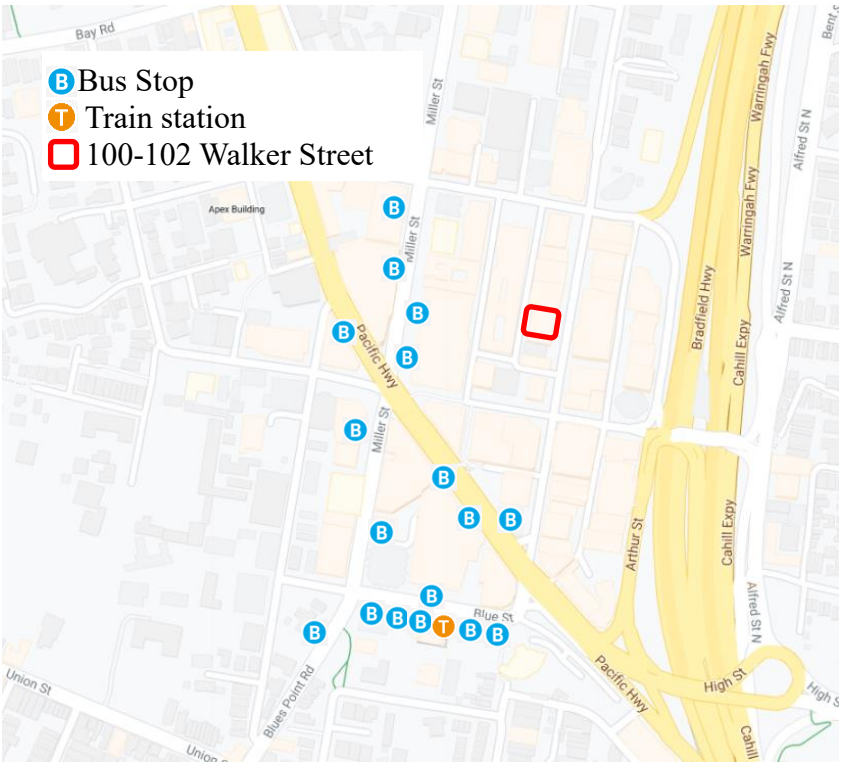


Figure 4: Bus stops in the vicinity of the site

Source: Google Maps

2.4.3 Taxi network

There is a taxi zone at the Blue Street exit of North Sydney Train Station. The taxi zone is a 7-minute walk from the site via Walker Street. The taxi zone location and walking route is outlined in Figure 5.

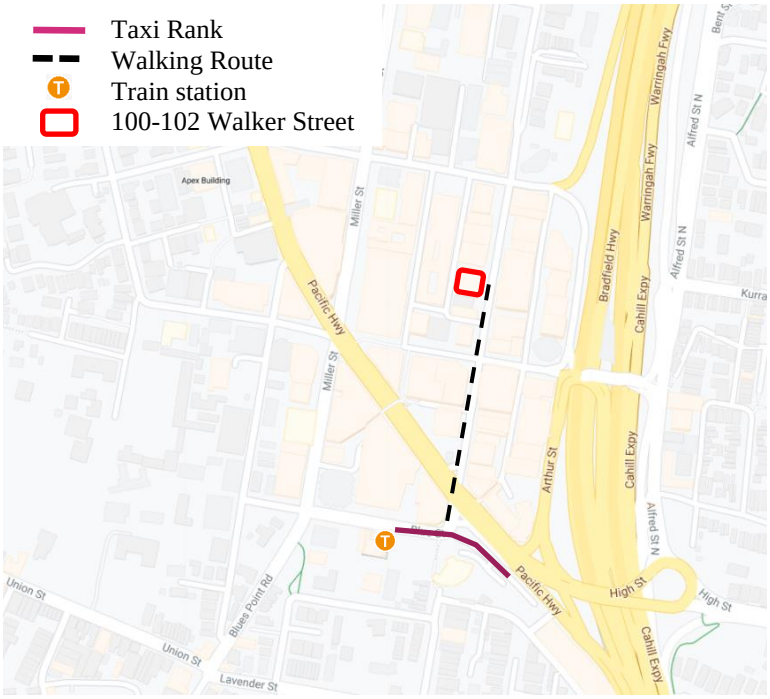


Figure 5: Taxi facilities in the vicinity of the site

Source: Google Maps

2.4.4 Ferry services

The nearest ferry wharves to the site are located at McMahons Point and Milsons Point approximately a 20-minute walk from the proposed development. These provides access to the F3, F4 and F8 ferry services providing connections to Circular Quay, Pyrmont Bay and Parramatta River. Both services operate approximately every 20 minutes at peak times. The walking routes to McMahons Point and Milsons Point are outlined on Figure 6.

Figure 6: Ferry services in the vicinity of the site

Source: Google Maps and Arup desktop research

2.5 Vehicle Access

Vehicle access to the underground car park and basement levels within the site is from Walker Street, with a corresponding egress onto Little Spring Street. Photographs of the entrance and exit are provided on Figure 7 and Figure 8.

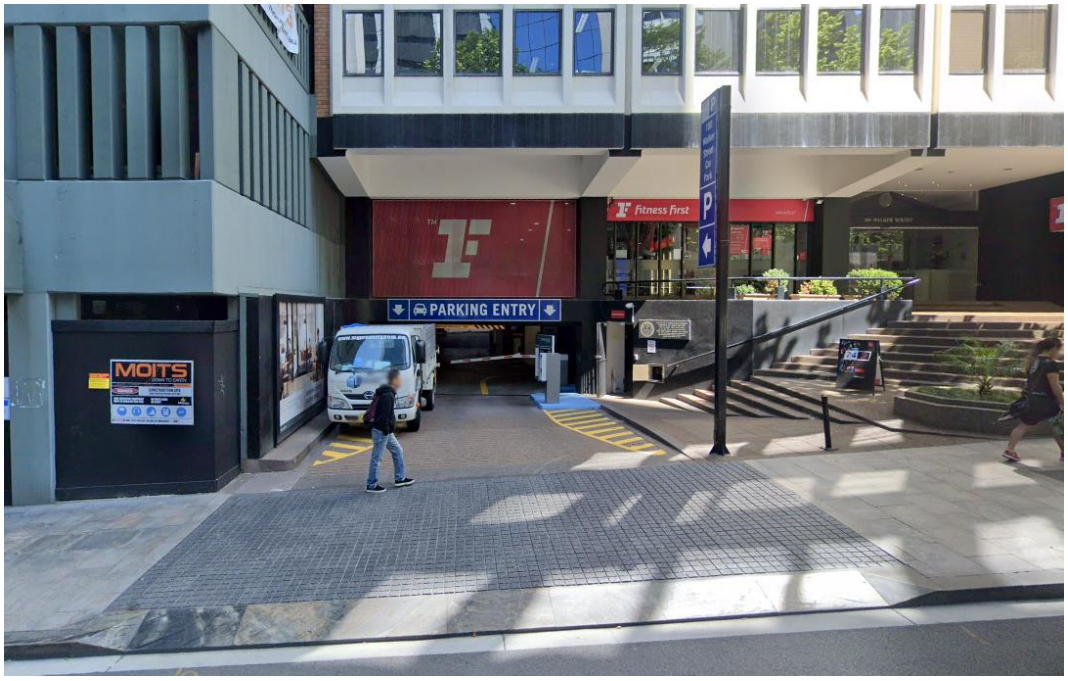


Figure 7: Car park entrance on Walker Street
(Source: Google Street View)

Figure 8: Car park exit on Little Spring Street
(Source: Google Street View)

2.6 On-street parking

As the site is located within the North Sydney CBD, there are limited opportunities for parking on surrounding streets. Generally, on-street parking is metered with short sections of unrestricted parking provided outside of business hours on Little Spring Street.

Walker Street has a mix of half hour, one hour and two hour metered restrictions with a Clearway in operation for northbound vehicles between 6am-10am and between 3pm-7pm Monday to Friday.

Due to the lack of unrestricted parking opportunities on surrounding streets, office workers are generally discouraged from parking on street.

A range of paid parking is available throughout North Sydney are surrounding the site. Surveyed early bird parking was priced around $30 per weekday located on average a 5-minute walk from the development.

2.7 Journey to Work Mode Share

Journey to Work data from the 2016 Census for DZN 114173339 (Figure 9) has been presented in Table 1. This indicates a reasonable proportion of commuters using public transport to access their place of work. Car passenger and motorbike trips have been included in the Car mode share.

Table 1: Existing travel to work mode share

Mode	Mode share (%)
Train	55
Bus	14
Bicycle	1
Walked only	5
Car	25

Figures are rounded to nearest whole number

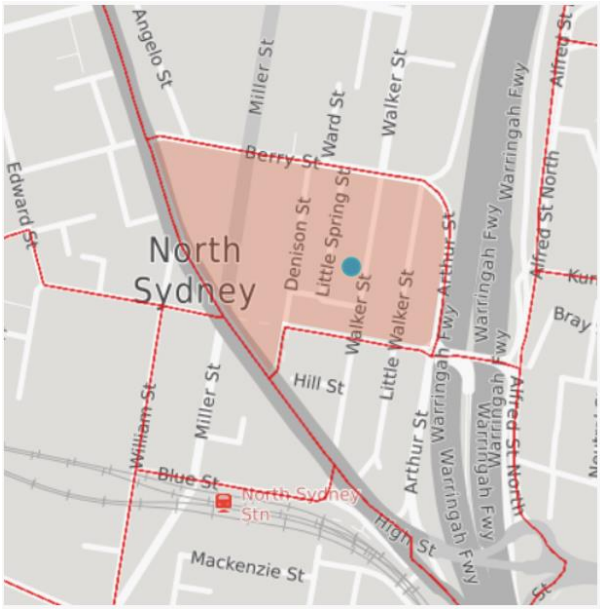


Figure 9: Analysed DZN and location of site (in blue)

Source: ABS

3 Planning Context

This section summarises the key strategic documents and controls that will influence the development and other committed developments or infrastructure projects in the vicinity of the site.

3.1 North Sydney DCP 2013

The North Sydney DCP contains a range of control relating to the Traffic and Transport aspects of the development.

3.1.1 Car parking

Section 10.2 of the DCP outlines parking rates for all land uses. As the development is located in the B3 commercial core the following parking rates will apply to the different uses, as outlined in Table 2.

Table 2: North Sydney DCP parking rates

Land Use	Parking rate
Office	1 space / 400m² GFA
Food and Drink premises (excluding pubs)	1 space / 50m² GFA

3.1.2 End of Trip facilities

Section 10.5 of the DCP specifies requirements for cycle parking and end of trip facilities. The bicycle parking rates for the different land uses within the development are summarised in Table 3.

Table 3: North Sydney DCP bicycle parking rates

	Cycle parking rate	
Land Use	**Occupants**	**Visitor / Customer**
Office	1 space / 150m² GFA	1 space / 400m² GFA
Shop, restaurant or cafe	1 space / 250m² GFA	2+ 1 / 100m² over 100m² GFA

For non-residential uses the DCP states supporting end of trip facilities are also to be provided. These include:

- 1 locker for each bicycle parking space
- 3 showers for the first 20 bicycle parking spaces with an additional two showers for each additional 20 bicycle parking spaces

3.2 North Sydney CBD Future Planning Context

The North Sydney CBD is changing rapidly and anticipates further development and pedestrian activity in the near and medium term. Key among the strategy, planning and policy documents are the North Sydney Public Domain Strategy, integration with the Victoria Cross Metro Station and Over Station Development, and the Ward Street Masterplan. These policies, plans, and projects intend to transform the streets in the zone bounded by Miller Street, Walker Street, McLaren Street, and the Pacific Highway to be pedestrian-centric.

Miller Street will become a pedestrian plaza between the Pacific Highway and Berry Street, and the laneways and minor streets on the interior of the precinct will become either pedestrianised or classified as shared zones, as shown in Figure 10 and Figure 11. These changes intend to improve the amenity and attractiveness of the interior streets in part by eliminating vehicle movements, reducing access and/or vehicle speeds.

Figure 10: North Sydney CBD Mobility Goals

Source: North Sydney CBD Public Domain Strategy (September 2020) pg. 26

Figure 11: North Sydney Traffic Calming Plan

Source: North Sydney CBD Public Domain Strategy (September 2020) pg. 31

In these plans, Denison Street is largely pedestrianised. Spring Street and Little Spring Street are converted to shared zones: streets where vehicles are allowed but restricted to 10km/h and the design is pedestrian-centric so that drivers read the street design and behave as guests in the environment.

The east-west through site link joins the Victoria Cross Metro Station to the Pacific Highway at the west and Walker Street at the east. The through site link is a pedestrian only walkway that will run along the northern side of the 100-102 Walker Street site. There are currently no plans for the east-west link to cross Walker Street. Walker Street will therefore remain a 40km/h, two-way thoroughfare with signalised crossings at Berry and Mount Streets. As illustrated in both Figure 10 and Figure 11, the outcome of these plans is a network of interior streets that are pedestrian-centric while the bounding streets remain open to vehicles.

3.2.1 Sydney Metro

Future plans for the Sydney Metro City and South West line will provide Metro services every 5 minutes linking Chatswood to the CBD and various stations in Sydney's south west. As part of this, Victoria Cross Station will be constructed with the south eastern entrance a short walk from the site, providing a rapid connection to the north west, CBD and south west significantly improving the capacity and reducing journey times to a range of stations. The future plans for Sydney Metro lines and the location of Victoria Cross Station in relation to the site are presented on Figure 12.

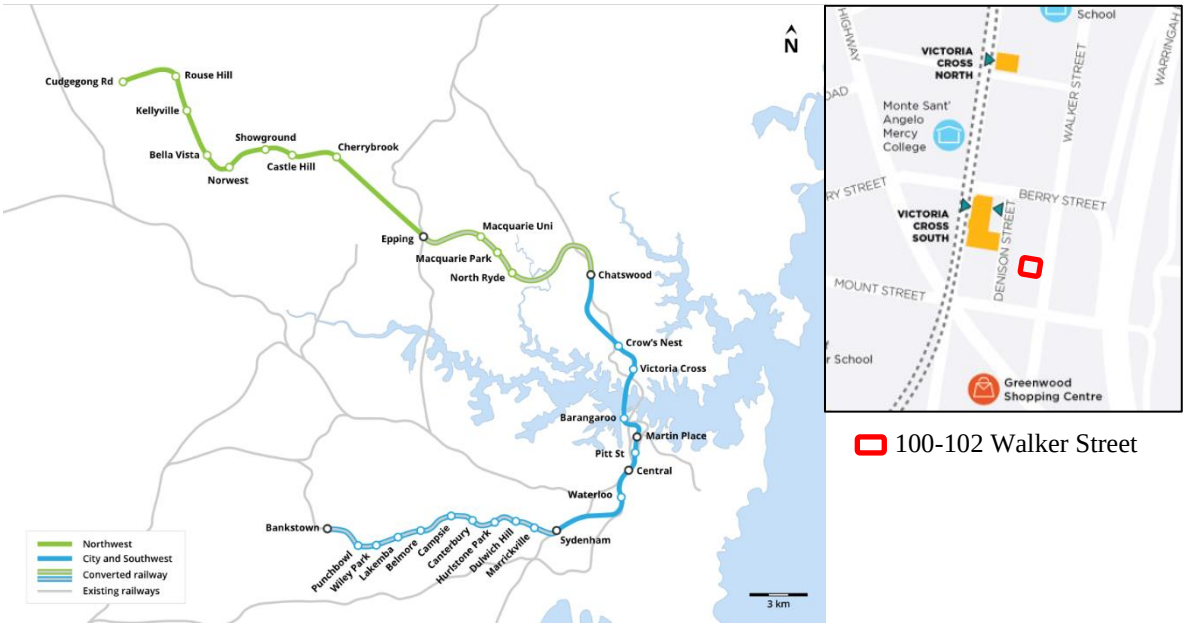


Figure 12: Sydney Metro and Victoria Cross Station

Source: Sydney Metro

4 Description of Development Proposal

This section of the report details the proposed traffic and transport arrangements, relating to the proposed development including compliance with the relevant planning controls.

4.1 Development Overview

The proposed development at 100-102 Walker Street includes the following:

- Demolition of existing site and excavation to a depth of RL35 metres.
- The design, construction and operation of a 48-storey office building (inclusive of two levels of roof plant) with a maximum building height of RL239 metres (to the top of the rooftop feature) and a total gross floor area provision of 42,573sqm. The building will accommodate:
  - 40-storeys of commercial office space including terraces on the eastern elevation and building plant at the Low-rise Deck (Level 17), Mid-rise Deck (Level 31) and rooftop (Level 45 and 46).
  - Retail premises (including food and beverage premises and shops) accommodated on the Lower Ground Floor, Upper Ground Floor and Basement Level B1.
  - Pedestrian access to the site from several entries on Lower Ground and Upper Ground from the Walker Street, Little Spring Street and laneway frontages.
  - Repurposing existing vehicular access on Walker Street and construction of six (6) storey basement to accommodate a total of 74 car parking spaces, 2 loading bays, 397 bicycle parking spaces, as well as associated end of trip facilities (EOTF), storage, back of house, services and substation.
  - Provision of a rooftop architectural feature to a total height of RL239.0 metres.
- Landscaping provision across the ground plane and commercial terraces.
- Public domain improvements to facilitate an improved pedestrian experience at ground plane, including activation of street frontages and provision of a 6m-wide open to the sky public pedestrian laneway (of which 100-102 Walker Street Project contributes 50% of this 6m wide Laneway) along the full extent of the northern site boundary providing access from Walker Street through to Little Spring Street.
- The addition of a public lift providing accessible access between Little Spring Street, the Laneway andWalker Street.

4.2 Proposed Vehicle Access

Vehicle access to the development will be provided off Walker Street and will provide access to the loading dock and tenant parking on subsequent basement levels. The access broadly aligns with the existing access to the site from Walker Street. The layout of the Lower Ground Level including the access point and loading dock are presented on Figure 13.

Driveway access will operate as a give-way arrangement, where exiting vehicles must give way to entering vehicles holding at the give way line if a vehicle is approaching.

Conflicts between vehicles using the access are expected to occur infrequently for the following reasons:

- The loading and parking components of the development are not expected to generate a large number of trips
- Parking is for the commercial uses where traffic flow is expected to be predominantly one-way into the development during the morning peak and one-way out of the development in the evening peak.

Visibility of approaching vehicles will be aided by a convex mirror provided at a suitable location as indicated in Figure 13.

Service vehicles will turn left from the driveway to access the loading bays on the Lower Ground Level. Entering tenant vehicles will be required to turn right and use a ramp to access the parking on the lower basement levels. Exiting tenant vehicles will be required give-way to entering vehicles at the give-way line.

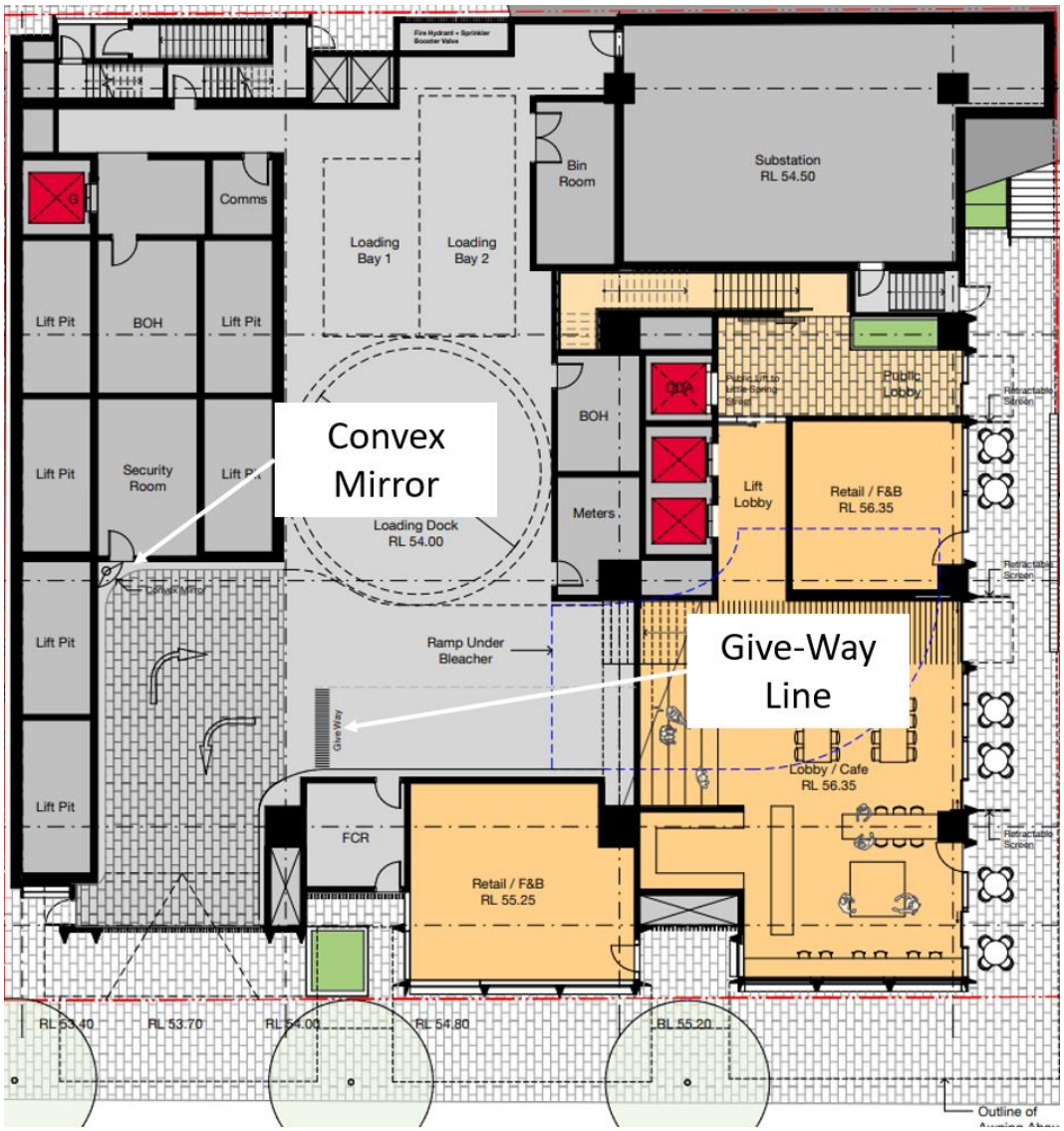


Figure 13: Lower Ground Floor layout
(Source: Bates Smart Development Application Drawing Set)

Swept path analysis of vehicles entering and exiting the site from Walker Street, and all basement levels is presented in **Appendix A**.

4.3 Loading and Servicing

The loading dock to support the proposed development is situated on the Lower Ground Level. The following loading bays are provided:

- Medium Rigid Vehicle loading bay x1
- Small Rigid Vehicle loading bay x1

All servicing vehicles will enter the site in forward gear before using a turntable that will allow vehicles to reverse into the marked loading bays. After unloading all vehicles will leave the site in a forward direction. The loading dock

arrangement is presented on Figure 13. Swept path analysis of servicing vehicles entering and exiting the site are presented in **Appendix A**.

4.4 Parking

Tenant parking for the site is provide across Basement Levels 3 to 6. The maximum car parking requirement that can be provided within the site whilst adhering to the North Sydney DCP is outlined in Table 4.

Table 4: Proposed development parking requirement

Land Use	GFA	Parking rate	Parking requirement
Office	41,476	1 space / 400m² GFA	104
Food and Drink premises (excluding pubs)	1,097	1 space / 50m² GFA	22
Total			126

Given the proposed development will provide 74 parking spaces this complies with the DCP requirement for the site. All parking spaces will be accessed via a two-way ramp down to Basement Level 3 where a boom gate will be located. Access to parking will only be available to tenants. The parking arrangement on Basement Level 3 including the boom gate arrangement is presented on Figure 14.

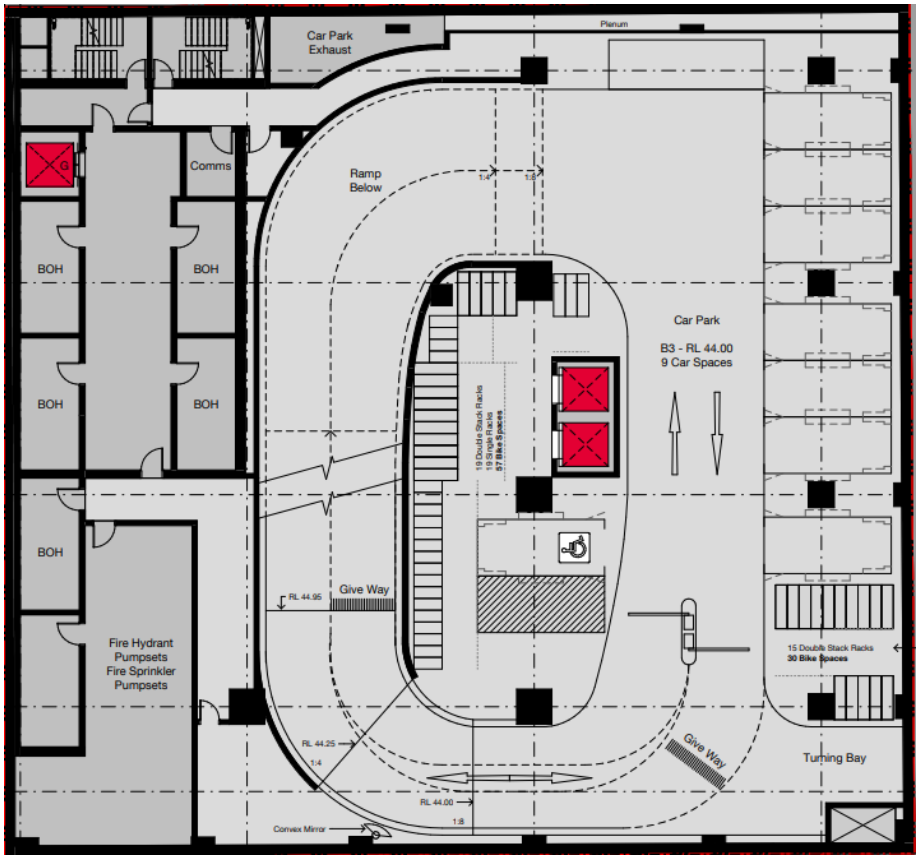


Figure 14: Basement Level 3 layout
(Source: Bates Smart Development Application Basement Drawing Set)

As shown in Figure 14, short one-way sections are provided within car park. As with the site access, conflicts are expected to occur infrequently as traffic flow is expected to be low and predominantly one-way during morning and evening peaks. Additionally, reduced traffic volumes are also expected to travel to the lower levels of basement where there are fewer spaces available. To ensure safe operation, give-way lines have been provided to identify a suitable location for drivers to stop to allow a vehicle in the opposing direction to pass. Visibility of opposing vehicles within the car park will be facilitated by convex mirrors. Swept paths of standard B99 and B85 vehicles passing on the ramp arrangement have been presented in **Appendix A**.

4.4.1 Accessible Parking

To align with the North Sydney DCP, 1-2% of all non-residential parking spaces are to be designated as accessible spaces equating to 1-2 spaces. Two accessible parking spaces are provided within the development on Basement Levels 3 and 4 . Connections to parking levels with disabled spaces will be designed to accommodate mobility impaired users ensuring equitable access.

4.4.2 Bicycle Parking

Bicycle parking spaces are provided to align with the rates outlined in the North Sydney DCP 2013. Table 5 outlines the cycle parking requirement for tenants and visitors.

Table 5: Bicycle parking requirement

Land Use	GFA (sqm)	Tenant parking requirement		Visitor parking requirement	
		Rate	No. spaces	Rate	No. spaces
Office	41,476	1 per 150m² GFA	276	1 per 400m² GFA	104
Shop, restaurant, or café premises	1,097	1 per 250m² GFA	5	2 + 1 per 100m² GFA over 100m²	12
Total			281		116

4.4.3 End of Trip Facilities

Further design development will determine the layout for showers, lockers and changing areas for the end of trip facilities. Indicative provisions and locations are shown on the concept proposal. To comply with the North Sydney DCP the proposed development will provide:

- 397 lockers
- 40 showers

All end of trip facilities will be accessed via a lobby at the Lower Ground Level which connects to the east-west link. Tenants can then use lifts to access the end of trip facilities at Basement Level 2. The route to these lifts is shown in Figure 15.

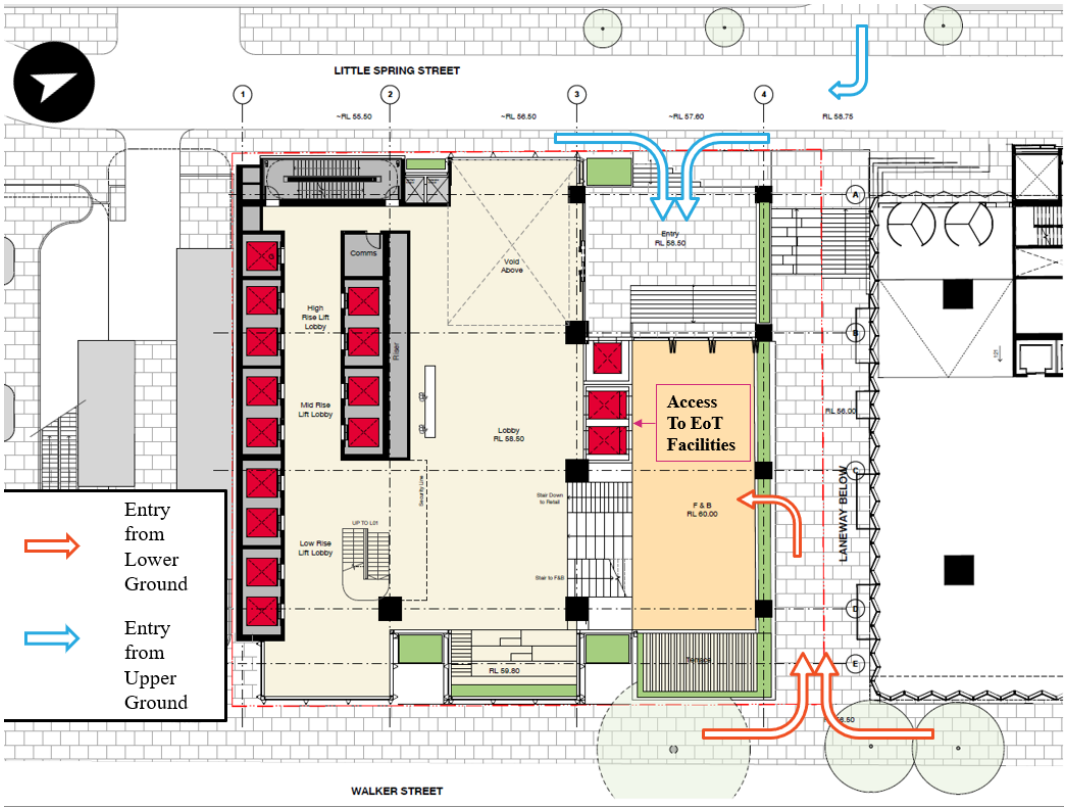


Figure 15: End of trip facilities access
(Source: Bates Smart Development Application Drawing Set)

Cycle parking and associated end of trips facilities including showers, lockers and changing rooms will be provided across Basement Levels 2 and 3. The layout of Basement Level 2 is presented on Figure 16.

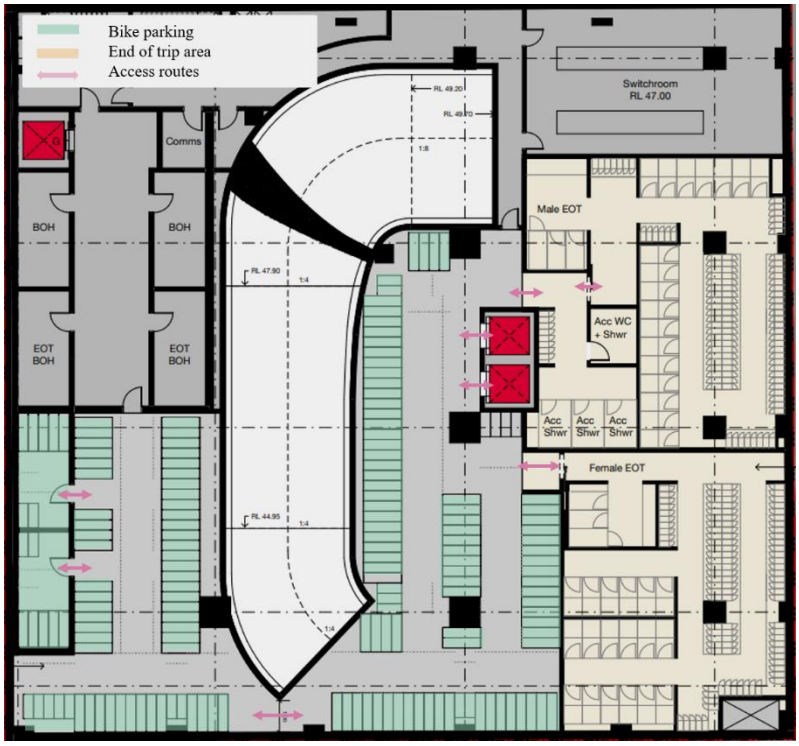


Figure 16: Basement Level 2 layout
(Source: Bates Smart Development Application Drawing Set)

4.5 Travel Demand Management

A Green Travel Plan (GTP) is a tool to minimise the negative impact of private vehicle travel on the environment. The GTP is a package of measures put in place to encourage more sustainable travel and describes ways in which the use of sustainable transport to and from the site may be encouraged.

More generally, the principles of a GTP are applied to all people travelling to and from a site. The main objectives of the GTP are to reduce the need to travel via private vehicle and promote the use of sustainable transport modes.

A Framework GTP developed for 100-102 Walker Street is presented in **Appendix B**.

5 Transport Assessment

This section of the report will assess the impact of the proposed development on the surrounding transport network considering trips by various modes.

5.1 Person Trip Generation

5.1.1 Commercial and retail person trips

A first principles approach was used to calculate the person trips generated by the commercial land use as outlined in Table 6. This assumed one employee per 10m² NLA for commercial and one employee per 30m² for retail, a daily attendance rate of 90% (accounting for those sick / on leave) and 50% of employees arriving in the commuter peak hour.

Table 6: Person trips

Land use	Net Lettable Area (sqm)	Number of employees	AM peak hour trips	PM peak hour trips
Existing				
Office	8,500*	850	383	383
Proposed Development				
Office	36,982	3,698	1,664	1,664
Retail	1,033	35	16	16
Net change				
	-	+2,883	+914	+914

*Based on 85% conversion factor from 10,000sqm GFA

5.1.2 Existing Multimodal Trip Generation

The multimodal trip generation for the existing development has been calculated using 2016 Journey to Work data of the selected DZN area presented in Section 2.7 and the person trips in Section 5.1.Table 7 presents the transport impacts of the development based on the statistical data for the block bound by Berry Street, Arthur Street, Mount Street and the Pacific Highway.

Table 7: Existing Multimodal trip generation

Mode	Mode share	Existing trips	
		AM peak hour	PM peak hour
Train	54%	208	208
Bus	14%	54	54
Bicycle	1%	4	4
Walked only	5%	21	21
Car	25%	96	96

Figures are rounded to nearest whole number

5.2 Assessed Future Mode Share

To account for the wider mode shift changes that the future Metro station would have on the way people travel to and from the development in the future, a detailed future mode share analysis was conducted using Origin-Destination data available from the 2016 Census Journey to Work.

The analysis reviewed areas where existing bus and suburban rail users would likely shift to future Metro services to travel to the site once the Sydney Metro Victoria Cross Station is in operation. As a result, the future mode share presented Table 9 indicates the future bus mode share will decrease however, train mode share (suburban rail + metro) is expected to significantly increase which will result in an overall higher future public transport mode share.

More people are expected to cycle to the future development as the secure bike parking and EOT facilities will be provide a significant improvement. Therefore, the future bicycle mode share to the site is expected to increase in the future.

The reduction of on-site parking and transformation of the North Sydney CBD as outlined in Section 5.3 will also have a positive effect on reducing car travel, contributing to the mode share presented in Table 8.

Table 8: Future mode share

Mode	Future Mode Share	
	AM	PM
Train	81%	79%
Bus	10%	10%
Bicycle	2%	2%
Walked only	5%	5%
Car	2%	4%

5.3 Future Traffic Generation

To establish the future traffic generation relating to the site, the parking provision within the proposed development and future changes to the transport network were considered. Changes to the wider area, such as increased pedestrianisation and walkability of surrounding streets and the Victoria Cross Metro Station are expected to facilitate a mode shift away from private vehicle use.

This supported by limited opportunities for parking on and off-street parking within the centre with provision unlikely to increase in line with the working population of the centre given the current DCP controls. Therefore, it is assumed that only parking provided within the development will generate vehicle trips in the future.

Parking turnover rates have been adopted as per similar assessments undertaken for office developments in Sydney (0.4 trips per space in the AM peak hour and 0.8 trips per space in the PM peak hour).

Table 9 outlines the vehicle trips related to each of these items and presents the net traffic impact.

Table 9: Net traffic generation

Development type	Number of parking spaces	AM peak hour vehicle trips	PM peak hour vehicle trips
Existing development	102	41	82
Proposed Development	74	30	60
Net trips generated		-11	-22

This indicates that due to an overall reduction in parking within the site, it is expected that there will be a net reduction in vehicle trips.

Given the reduction in vehicle trips, the impact to the surrounding network is expected to be negligible and further traffic modelling has not been undertaken. The distribution of this traffic has been considered in Sections 5.5.

5.4 Future Multimodal Trip Generation

The expected future multimodal trip generation for the development has been outlined in Table 10 and is based on the expected traffic generation outlined in Section 5.3 and changes to the surrounding area.

Table 10: Adjusted multimodal trip generation

Mode	Existing				Future				Net change	
	AM mode share	AM peak hour trips	PM mode share	PM peak hour trips	AM Adjusted mode share	AM peak hour trips	PM Adjusted mode share	PM peak hour trips	AM peak hour trips	PM peak hour trips
Train	54%	208	54%	208	81%	1362	79%	1332	1170	1140
Bus	14%	54	14%	54	10%	163	10%	163	109	109
Bicycle	1%	4	1%	4	2%	34	2%	34	14	14
Walked only	5%	21	5%	21	5%	91	5%	91	70	70
Car	25%	96	25%	96	2%	30	4%	60	-66	-36

Figures are rounded to nearest whole number

The trip generation indicates a large proportion of future trips relating to the development will be captured by suburban rail and Metro services, while overall car trips decrease. This uplift to public transport is supported by improvements to walkability around the Metro Station and pedestrian-centric transformation of the North Sydney CBD the Public Domain Strategy seeks to bring.

This indicates that due to an overall reduction in parking within the site, it is expected that there will be a net reduction in vehicle trips.

Given the reduction in vehicle trips, the impact to the surrounding network is expected to be negligible and further traffic modelling has not been undertaken. The distribution of this traffic has been considered in Sections 5.5.

The difference between the existing and future mode share represents the overall change that is expected to occur in North Sydney between the 2016 Journey to Work survey, and when the future mass transit and public domain transformation are completed.

5.5 Traffic Distribution

The distribution of traffic travelling to and from the development has been calculated using 2016 Journey to Work data. The expected routes for vehicles accessing the development in the AM peak and egressing in the PM peak are presented on Figure 17 and Figure 18.

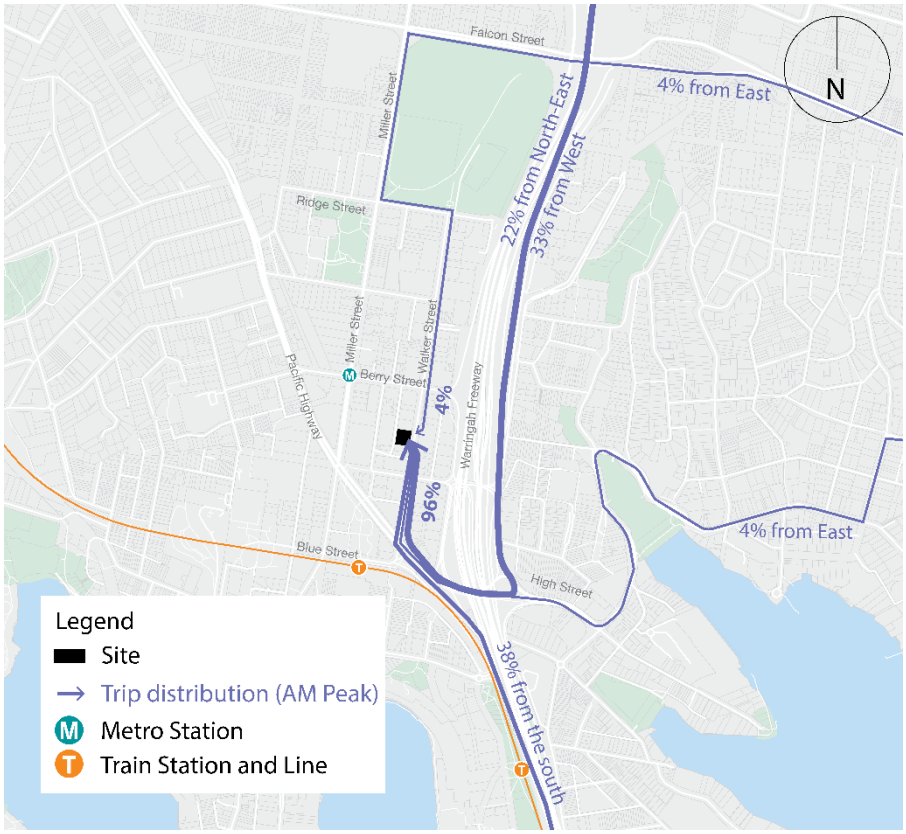


Figure 17: AM peak traffic distribution (Source: Google Maps and ABS JTW)

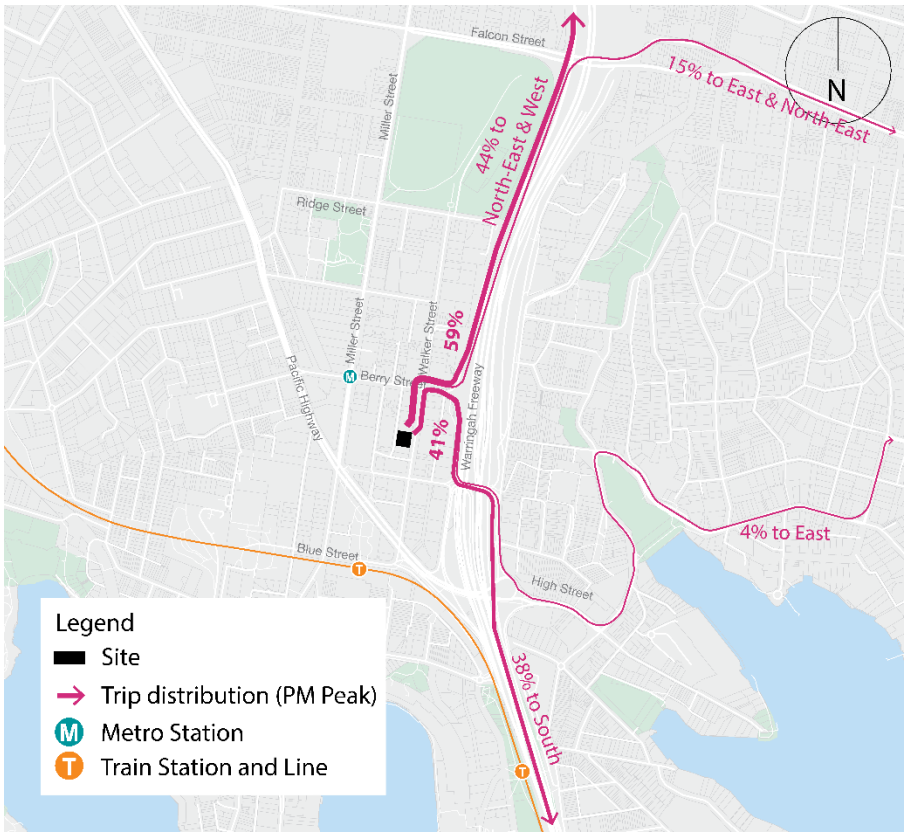


Figure 18: PM peak traffic distribution (Source: Google Maps and ABS JTW)

5.6 Public Transport

The development is forecast to generate demand for train and bus services within walking distance of the site. Approximately 1,200 additional future employees are expected to use suburban rail and Metro service to travel to the site during peak hour. Given that Sydney Metro services have a target capacity of 40,000 passengers per hour and suburban lines can reliably carry 24,000 passengers per hour[1], the development is unlikely to significantly impact rail services capacity.

The proportion of users traveling by bus to the future 100-102 Walker Street development is expected to much smaller in comparison to rail users. The development is expected to generate an additional 110 bus users. There are multiple bus routes that service North Sydney CBD as frequently as every 5 minutes during peak hour, equating to approximately 960 passengers per route[2]. Therefore, this increase of bus users is unlikely to significantly impact bus operations capacity.

5.7 Future footpath provision

Footpaths and laneways surrounding the 100-102 Walker Street development have been assessed using Transport for NSW's Walking Space Guide to determine the Level of Service (LoS) and suitability for facilitate the walking activity in the area.

This analysis that most streets currently perform at LoS F, however future changes within the precinct such as Shared Zones will widen available footpath widths and improve to the Level of Service.

The development will contribute to public realm improvements and level of service by widening a section of the Walker Street footpath and creating a through site link between 100 and 110 Walker Street. The Level of Service of the through site link will improve from LoS F to LoS B, which will support expected pedestrian flows between the Victoria Cross Metro station, the development and surrounding area.

The Walking Space Assessment has been attached in **Appendix C.**

[1] "About Sydney Metro", Sydney Metro, accessed March 1, 2021, https://www.sydneymetro.info/about
[2] Seating and standing capacity of a standard 14.5m city bus.

6 Summary

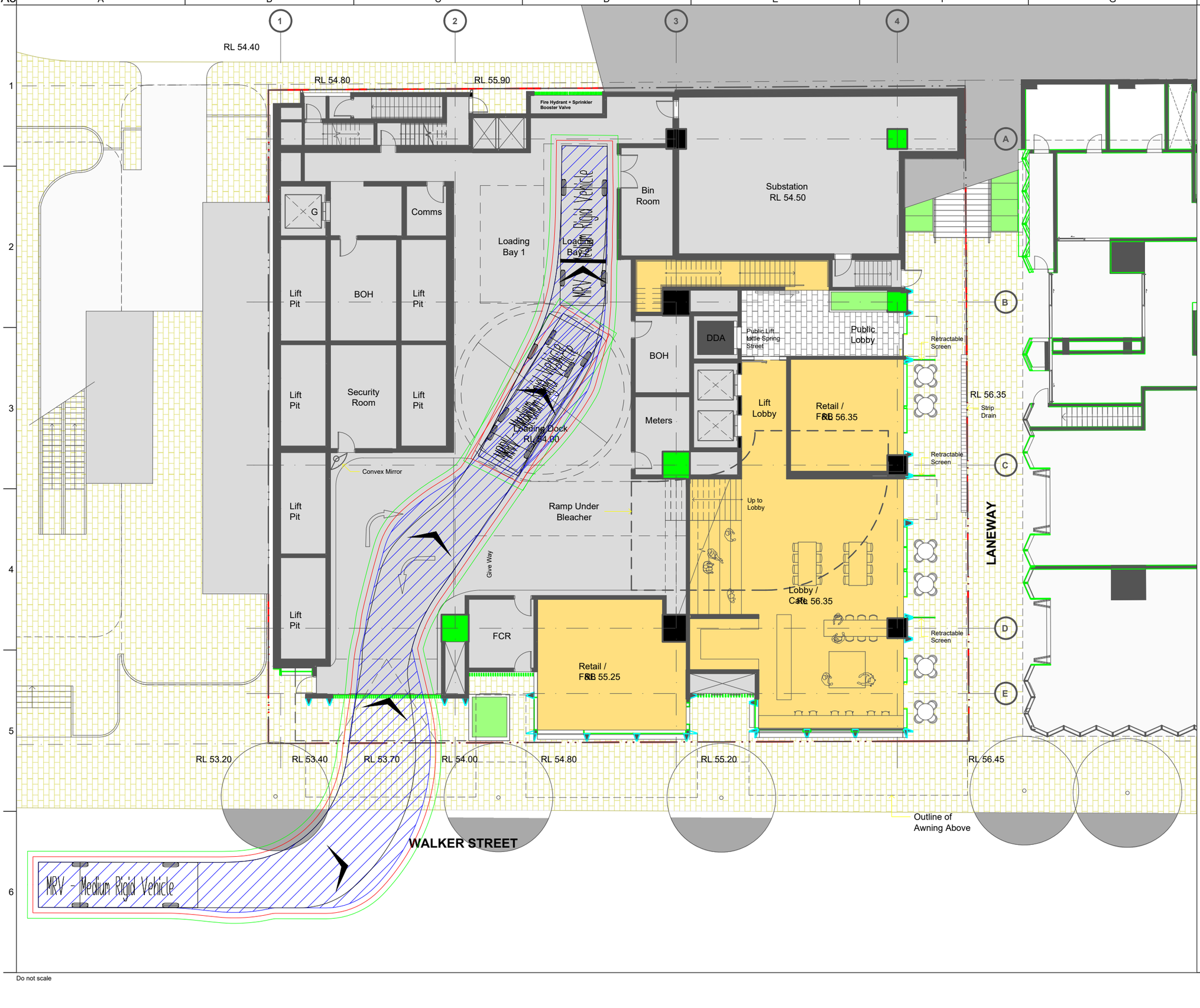
This Transport Impact Assessment assesses the traffic and parking demands of the concept Development Application and demonstrates that the site is capable of accommodating the proposed uses. Key findings of this assessment are as follows:

- The main vehicle access point to the development is located on Walker Street on the eastern boundary of the site;
- The design provides tenant parking spaces across six basement levels. There is an overall reduction in parking provided within the site and number of spaces provided are compliant with the North Sydney DCP 2013;
- The site has high accessibility to public transport through North Sydney Train Station and bus stops on Miller Street and Blue Street. This will be further improved by the opening of Sydney Metro Victoria Cross Station;
- Based on the traffic generation and distribution assumptions, the net traffic generated by the development will decrease causing negligible impacts to the surrounding road network;
- Secure bicycle parking and high quality end of trip facilities are proposed which will support commuting via walking and cycling; and
- Travel demand management measures are also suggested through the Framework Green Travel Plan to encourage a mode shift away for private vehicle.

Appendix A

Swept Path Analysis

A3



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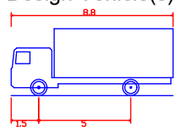
- 600mm Envelope
- Wheel Envelope

Design Vehicle(s)



MRV - Medium Rigid Vehicle

Overall Length	8.800m
Overall Width	2.500m
Overall Body Height	3.533m
Min Body Ground Clearance	0.428m
Track Width	2.500m
Lock to Lock Time	4.00 sec
Curb to Curb Turning Radius	10.000m

Turning paths show vehicles traveling 5km/hr in a forward direction and and 2.5km/hr in reverse

Issue	Date	By	Chkd	Appd
A	17/12/21	CL	EC	EC

For information

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Tel +61(02)9320 9320 Fax +61(02)9320 9321
www.arup.com.au

Client
Pro-Invest Group

Job Title
100 Walker Street

Drawing Title
Swept Path Analysis
Lower Ground Floor
MRV Entry

Scale at A3 1:200

Discipline Transport

Drawing Status
ISSUE

Job No	Drawing No	Issue
284075	**SKT01 - ATR**	**A**

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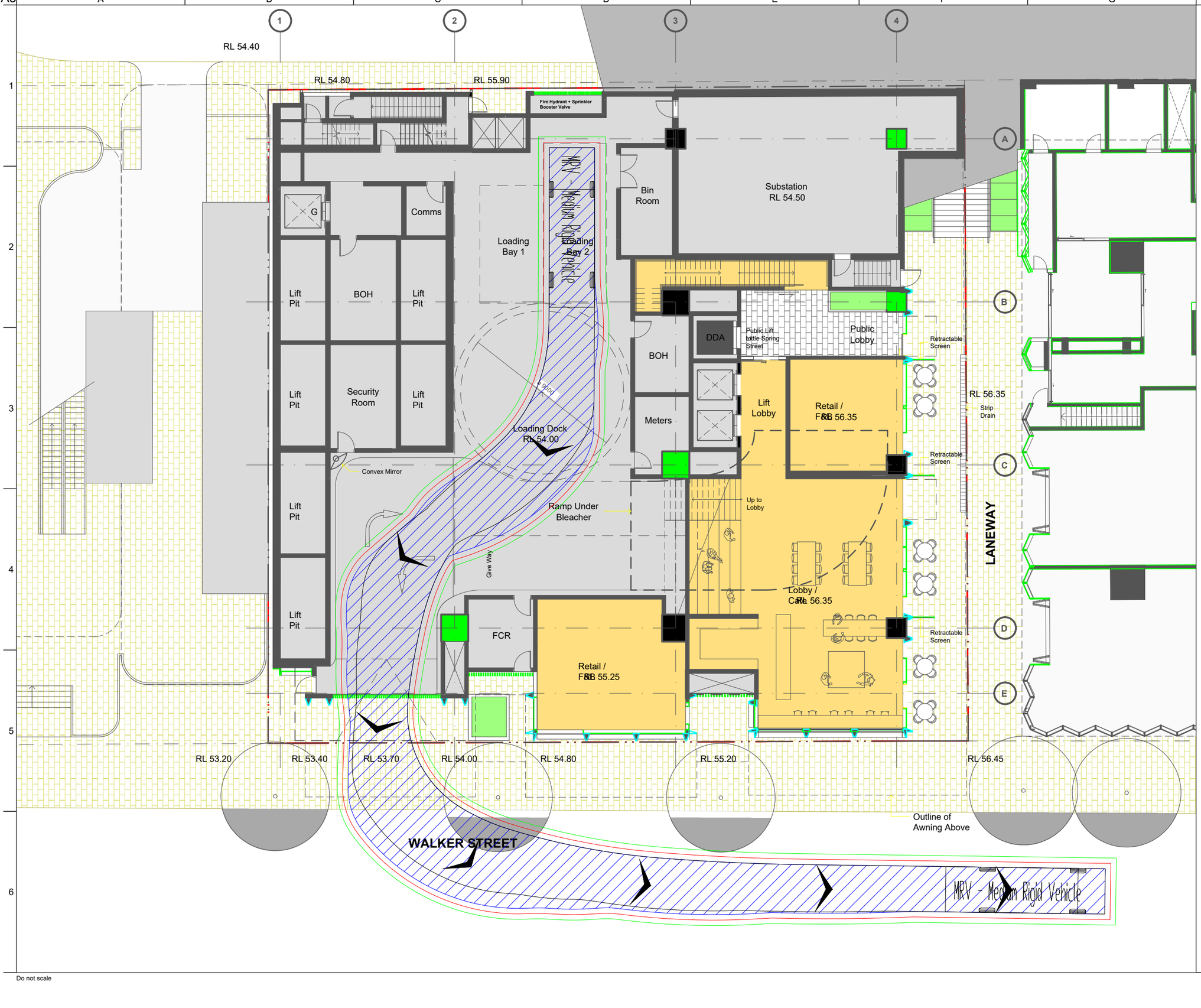
A3



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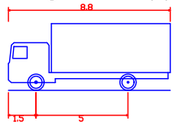
- Wheel Envelope

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

Turning paths show vehicles traveling 5km/hr in a forward direction and and 2.5km/hr in reverse

Issue	Date	By	Chkd	Appd
A	17/12/21	CL	EC	EC

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www.arup.com.au

Client
Pro-Invest Group

Job Title
100 Walker Street

Drawing Title
Swept Path Analysis
Lower Ground Floor
MRV Egress

Scale at A3 1:200

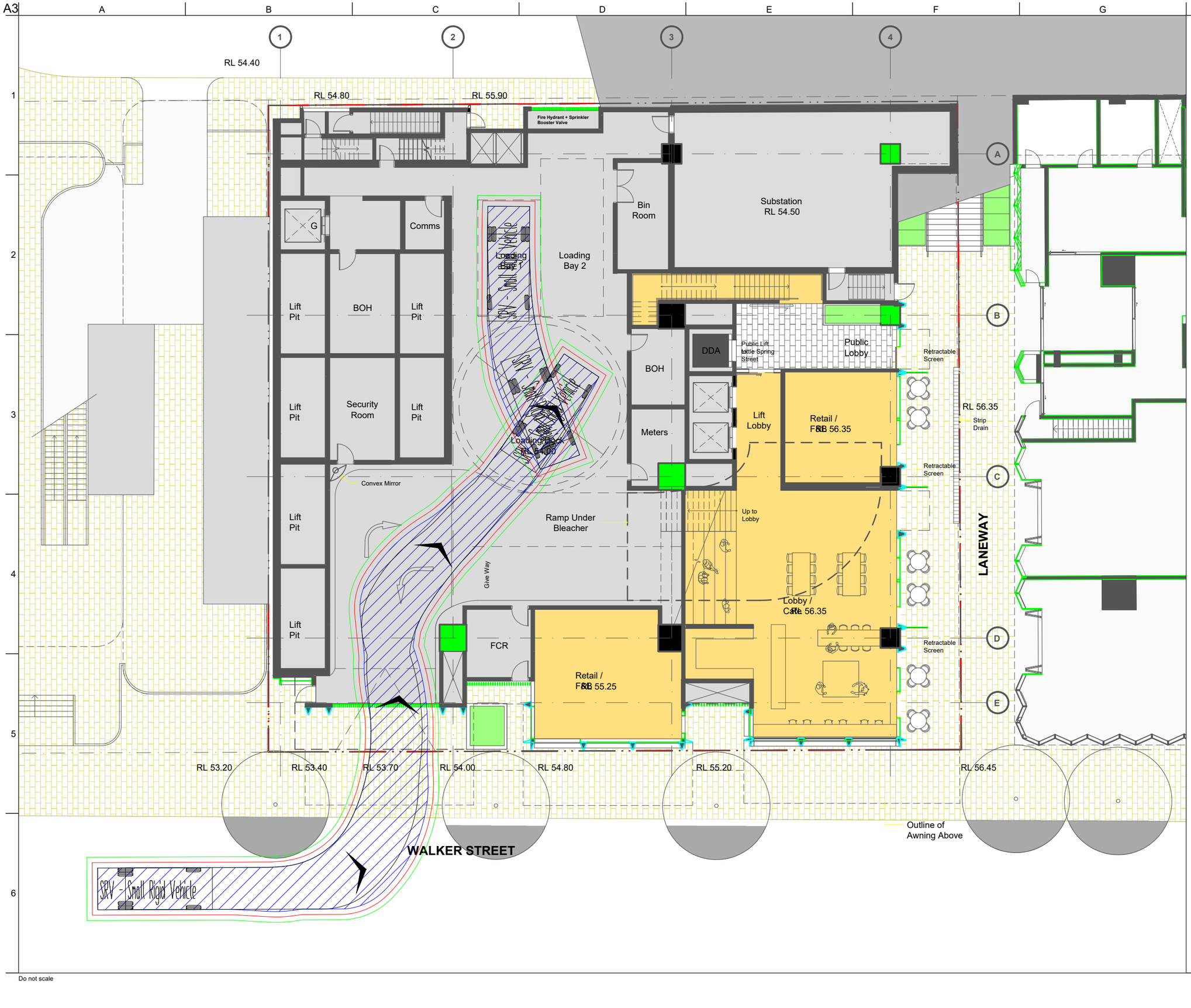
Discipline Transport

Drawing Status
ISSUE

Job No	Drawing No	Issue
284075	SKT02 - ATR	A

Do not scale

A3



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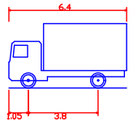
- Wheel Envelope

Design Vehicle(s)



SRV - Small Rigid Vehicle

Overall Length	6.400m
Overall Width	2.330m
Overall Body Height	3.500m
Min Body Ground Clearance	0.328m
Track Width	2.330m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	7.100m

Turning paths show vehicles traveling 5km/hr in a forward direction and and 2.5km/hr in reverse

Issue	Date	By	Chkd	Appd
A	17/12/21	CL	EC	EC

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Client
Pro-Invest Group

Job Title
100 Walker Street

Drawing Title
Swept Path Analysis
Lower Ground Floor
SRV Entry

Scale at A3 1:200

Discipline Transport

Drawing Status
ISSUE

Job No	Drawing No	Issue
284075	**SKT03 - ATR**	**A**

Do not scale

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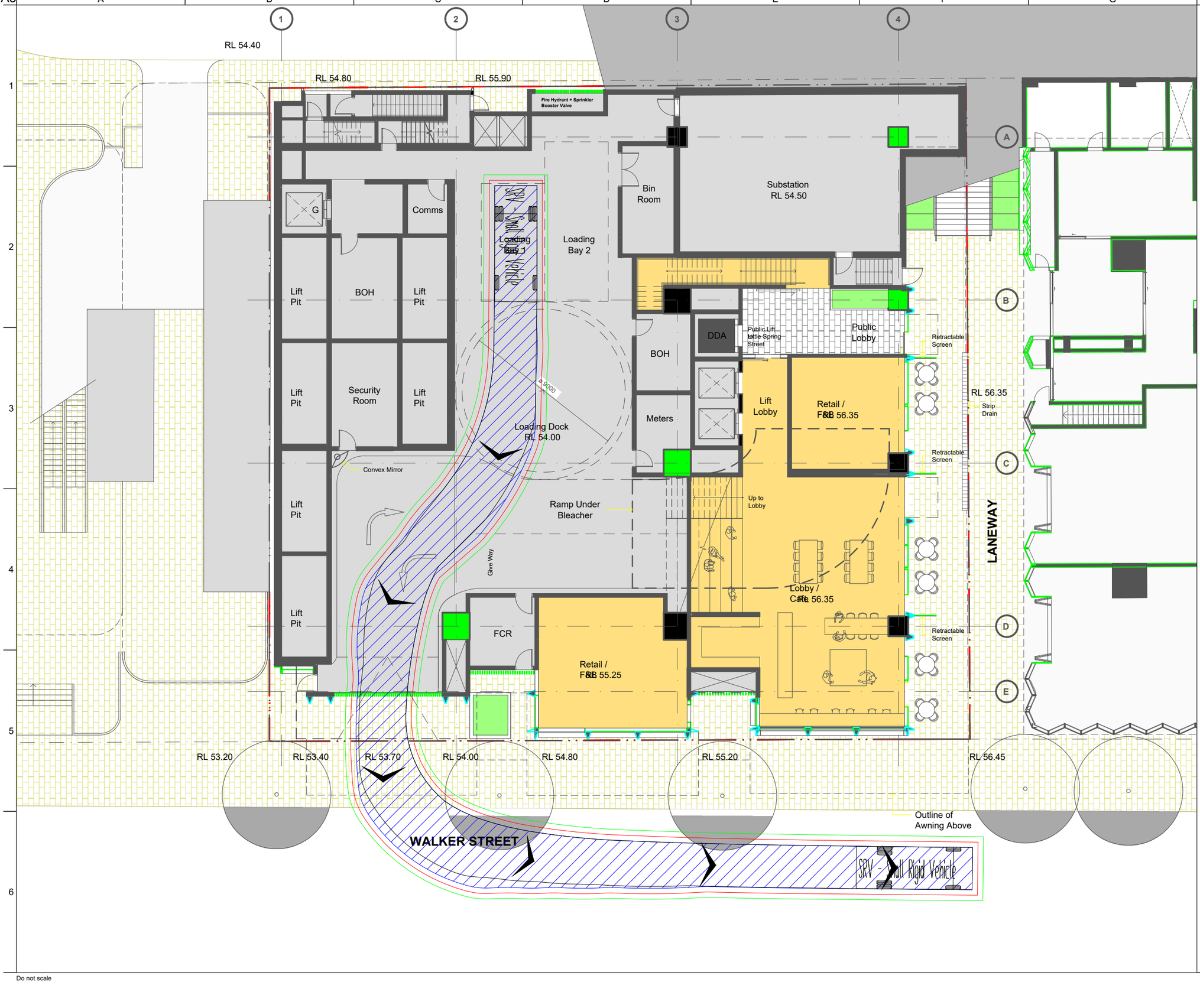

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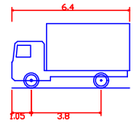

SRV - Small Rigid Vehicle	
Overall Length	6.400m
Overall Width	2.330m
Overall Body Height	3.500m
Min Body Ground Clearance	0.328m
Track Width	2.330m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	7.100m

Turning paths show vehicles traveling 5km/hr in a forward direction and and 2.5km/hr in reverse

A	17/12/21	CL	EC	EC

For information

Issue	Date	By	Chkd	Appd

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www.arup.com.au

Client
Pro-Invest Group

Job Title
100 Walker Street

Drawing Title
Swept Path Analysis
Lower Ground Floor
SRV Egress

Scale at A3 1:200

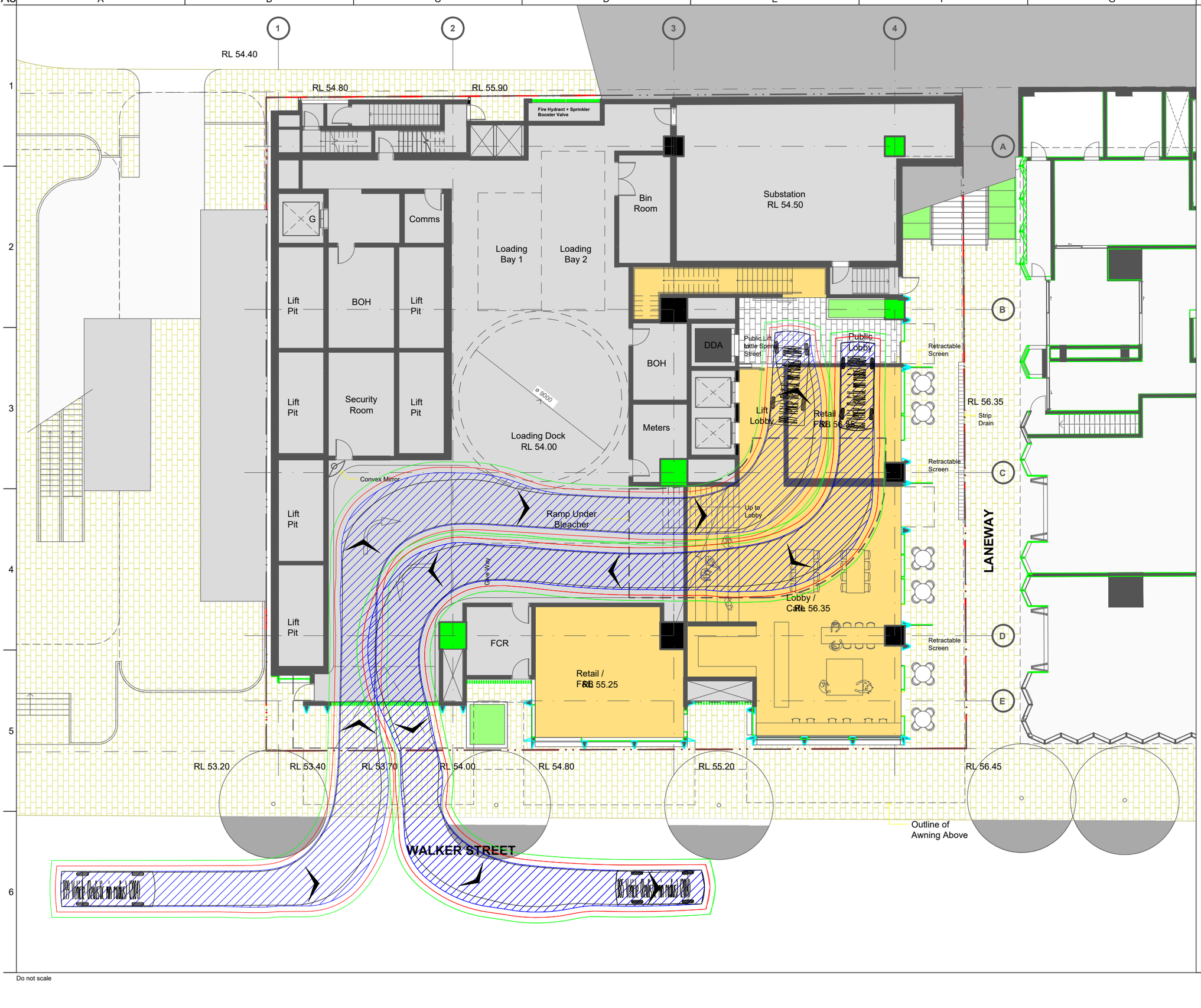
Discipline Transport

Drawing Status
ISSUE

Job No	Drawing No	Issue
284075	**SKT04 - ATR**	**A**

Do not scale

A3



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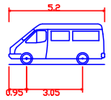
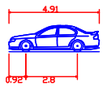
- Wheel Envelope

Design Vehicle(s)



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



B85 Vehicle (8m min radius) (2004)

Overall Length	4.910m
Overall Width	1.870m
Overall Body Height	1.421m
Min Body Ground Clearance	0.120m
Track Width	1.770m
Lock to Lock Time	4.00 sec
Curb to Curb Turning Radius	8.000m

Turning paths show vehicles traveling 5km/hr in a forward direction and and 2.5km/hr in reverse

Issue	Date	By	Chkd	Appd
A	17/12/21	CL	EC	EC

For information

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Client
Pro-Invest Group

Job Title
100 Walker Street

Drawing Title
Swept Path Analysis
Lower Ground Floor
Vehicle Entry & Egress

Scale at A3 1:200

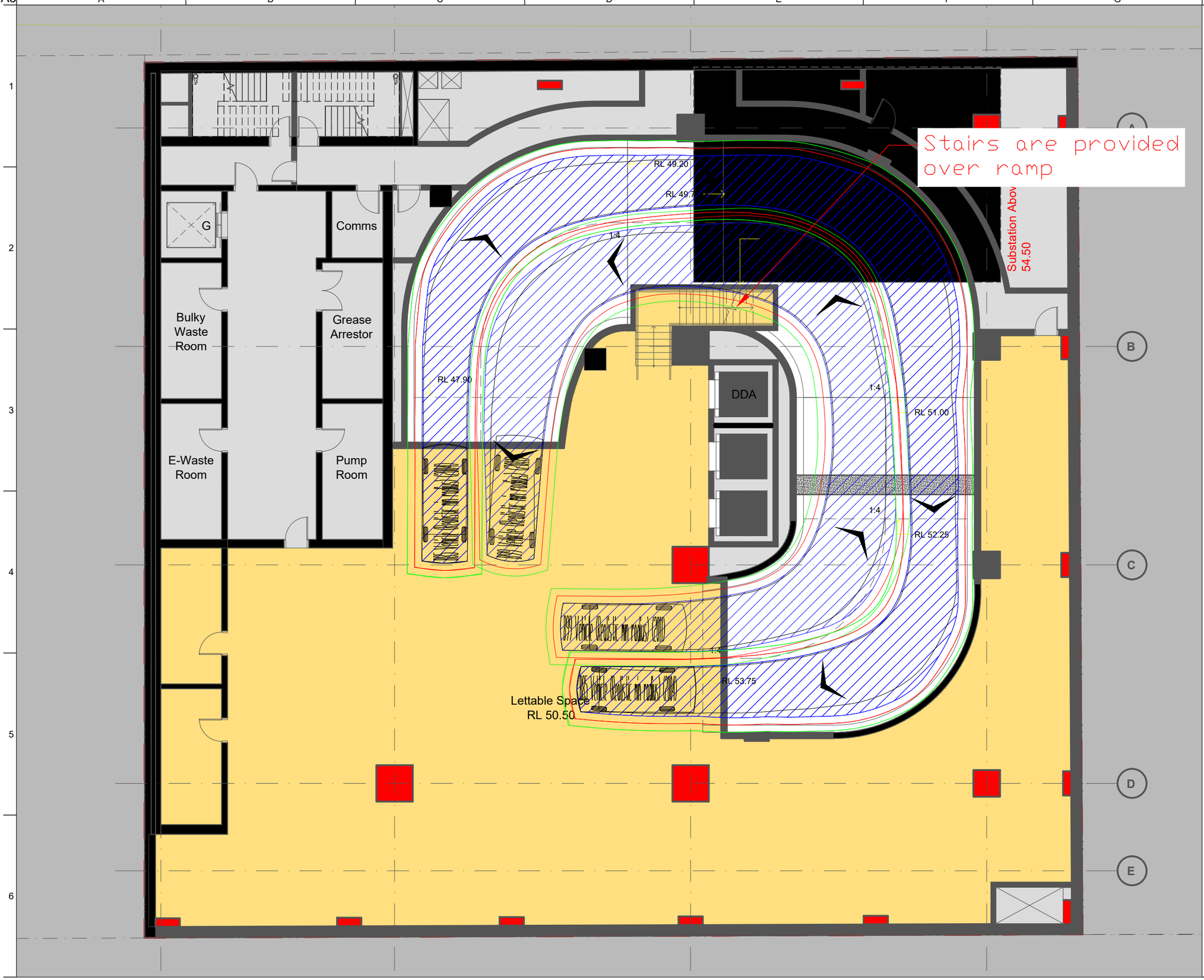
Discipline Transport

Drawing Status
ISSUE

Job No	Drawing No	Issue
284075	SKT05 - ATR	A

Do not scale

A3



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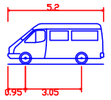
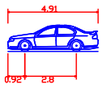
- Wheel Envelope

Design Vehicle(s)



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



B85 Vehicle (8m min radius) (2004)

Overall Length	4.910m
Overall Width	1.870m
Overall Body Height	1.421m
Min Body Ground Clearance	0.120m
Track Width	1.770m
Lock to Lock Time	4.00 sec
Curb to Curb Turning Radius	8.000m

Turning paths show vehicles traveling 5km/hr in a forward direction and and 2.5km/hr in reverse

Issue	Date	By	Chkd	Appd
C	17/12/21	CL	EC	EC
For information				

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Client
Pro-Invest Group

Job Title
100 Walker Street

Drawing Title
Swept Path Analysis
Basement 1

Scale at A3
1:150

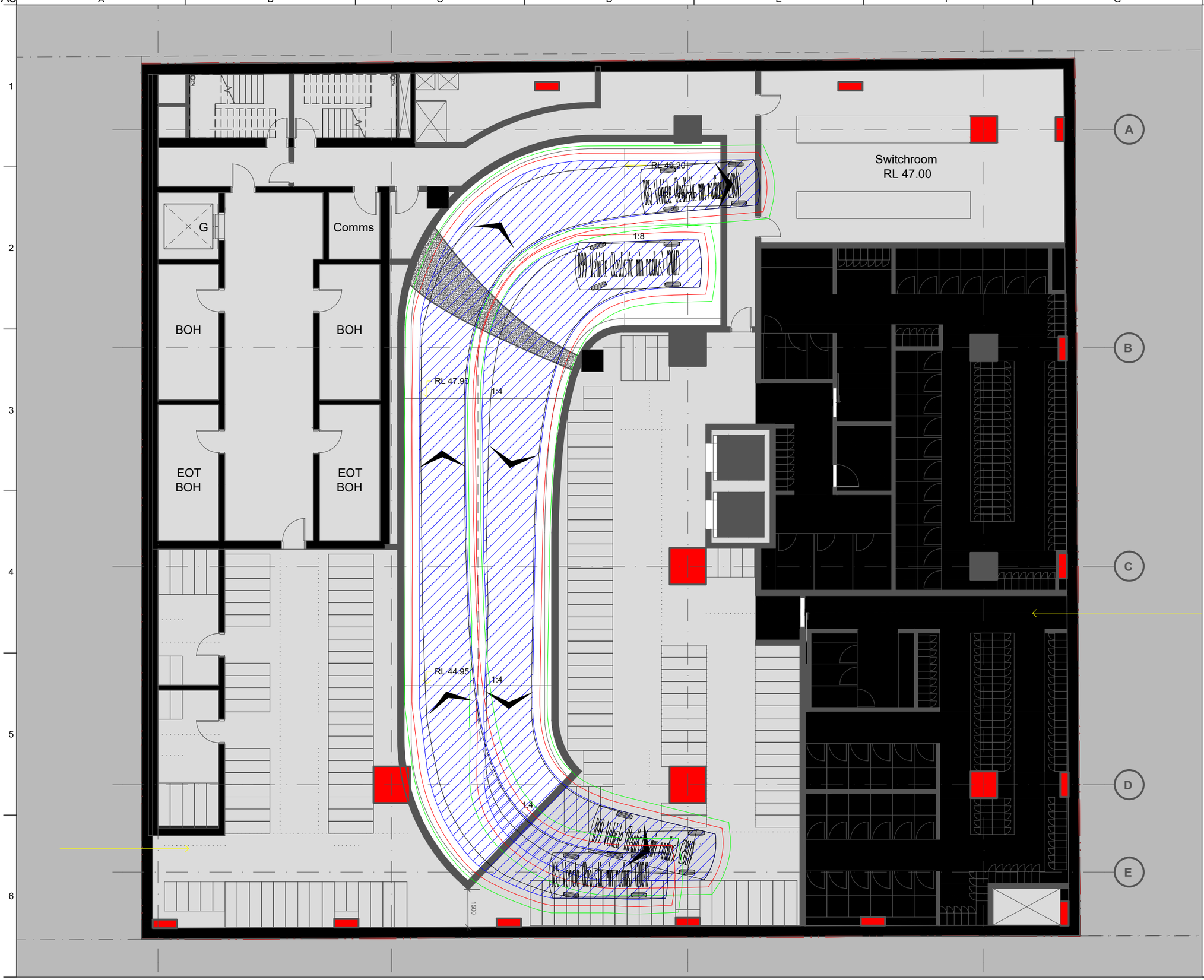
Discipline
Transport

Drawing Status
ISSUE

Job No	Drawing No	Issue
284075	**SKT06 - ATR**	**A**

Do not scale

A3



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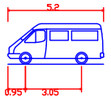
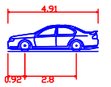
- Wheel Envelope

Design Vehicle(s)



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



B85 Vehicle (8m min radius) (2004)

Overall Length	4.910m
Overall Width	1.870m
Overall Body Height	1.421m
Min Body Ground Clearance	0.120m
Track Width	1.770m
Lock to Lock Time	4.00 sec
Curb to Curb Turning Radius	8.000m

Turning paths show vehicles traveling 5km/hr in a forward direction and and 2.5km/hr in reverse

Issue	Date	By	Chkd	Appd
A	17/12/21	CL	EC	EC

For information

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www.arup.com.au

Client
Pro-Invest Group

Job Title
100 Walker Street

Drawing Title
Swept Path Analysis
Basement 2

Scale at A3 1:150

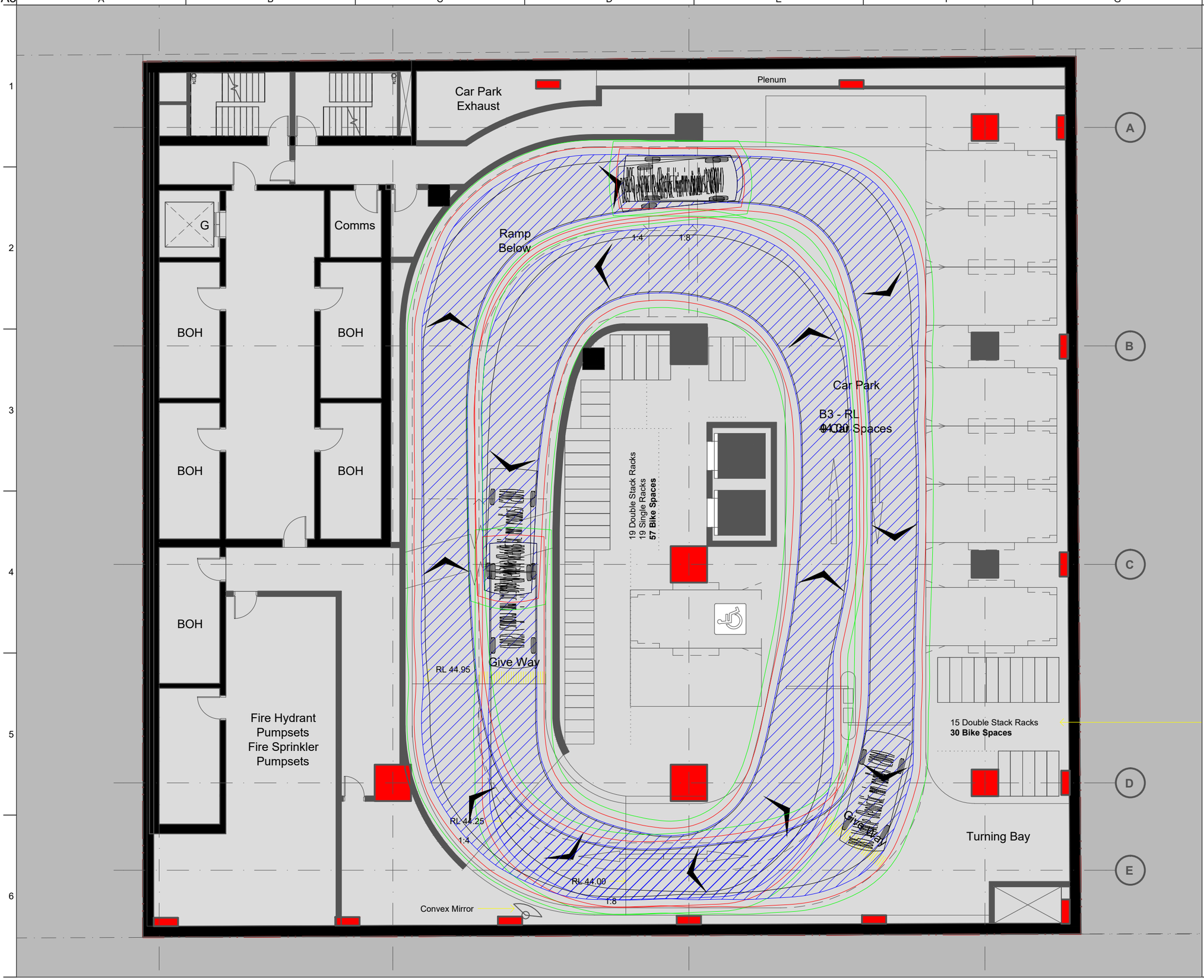
Discipline Transport

Drawing Status
ISSUE

Job No	Drawing No	Issue
284075	**SKT07 - ATR**	**A**

Do not scale

A3



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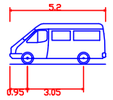
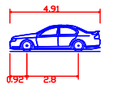
- 600mm Envelope
- Wheel Envelope

Design Vehicle(s)



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



B85 Vehicle (8m min radius) (2004)

Overall Length	4.910m
Overall Width	1.870m
Overall Body Height	1.421m
Min Body Ground Clearance	0.120m
Track Width	1.770m
Lock to Lock Time	4.00 sec
Curb to Curb Turning Radius	8.000m

Turning paths show vehicles traveling 5km/hr in a forward direction and and 2.5km/hr in reverse

Issue	Date	By	Chkd	Appd
A	17/12/21	CL	EC	EC
For information				

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www.arup.com.au

Client
Pro-Invest Group

Job Title
100 Walker Street

Drawing Title
Swept Path Analysis
Basement 3

Scale at A3 1:150

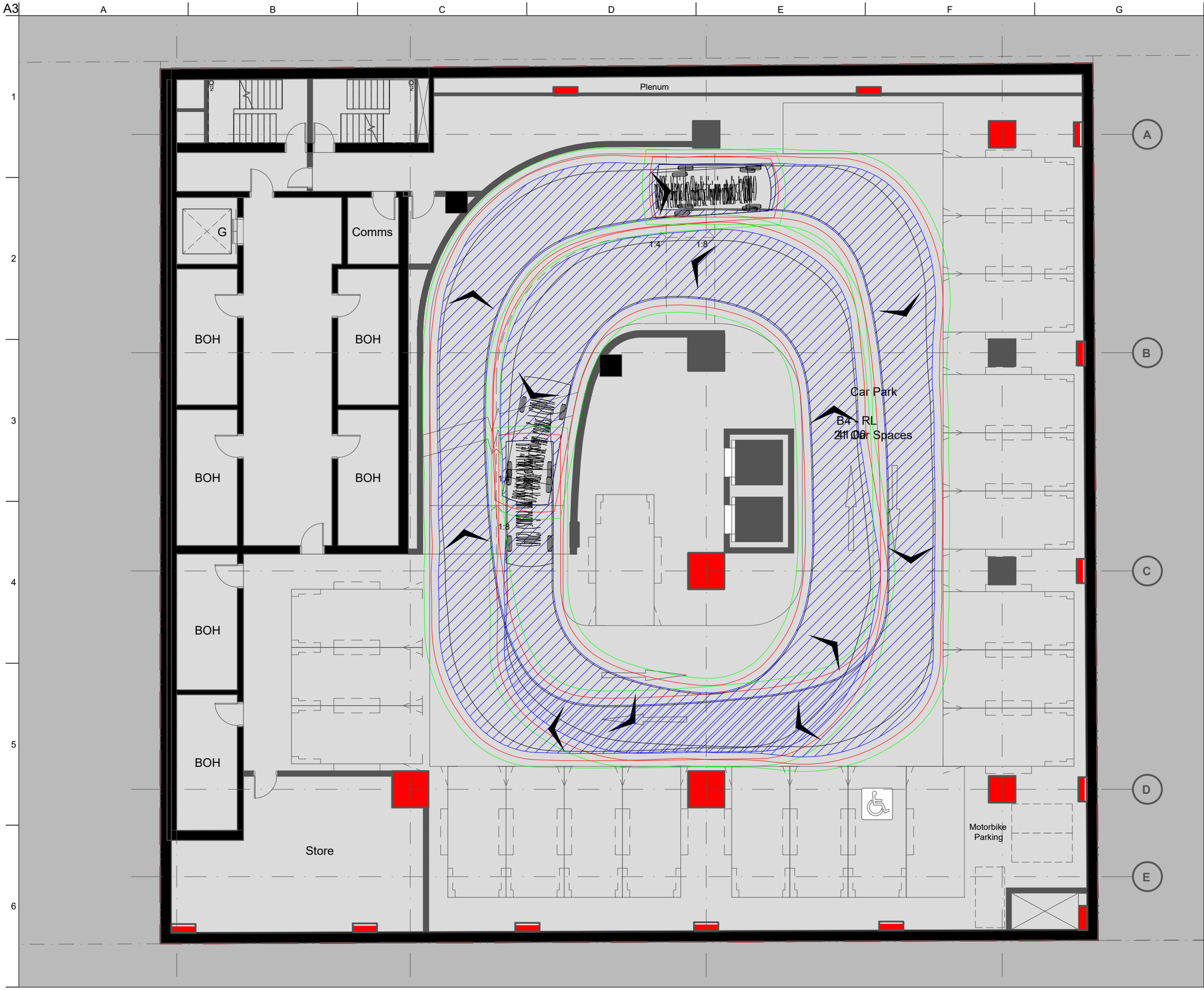
Discipline Transport

Drawing Status
ISSUE

Job No	Drawing No	Issue
284075	**SKT08 - ATR**	**A**

Do not scale

A3



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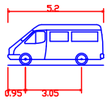
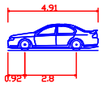
- 600mm Envelope
- Wheel Envelope

Design Vehicle(s)



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



B85 Vehicle (8m min radius) (2004)

Overall Length	4.910m
Overall Width	1.870m
Overall Body Height	1.421m
Min Body Ground Clearance	0.120m
Track Width	1.770m
Lock to Lock Time	4.00 sec
Curb to Curb Turning Radius	8.000m

Turning paths show vehicles traveling 5km/hr in a forward direction and and 2.5km/hr in reverse

Issue	Date	By	Chkd	Appd
A	17/12/21	CL	EC	EC
For information				

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Pro-Invest Group

Job Title
100 Walker Street

Drawing Title
Swept Path Analysis
Basement 4/5

Scale at A3 1:150

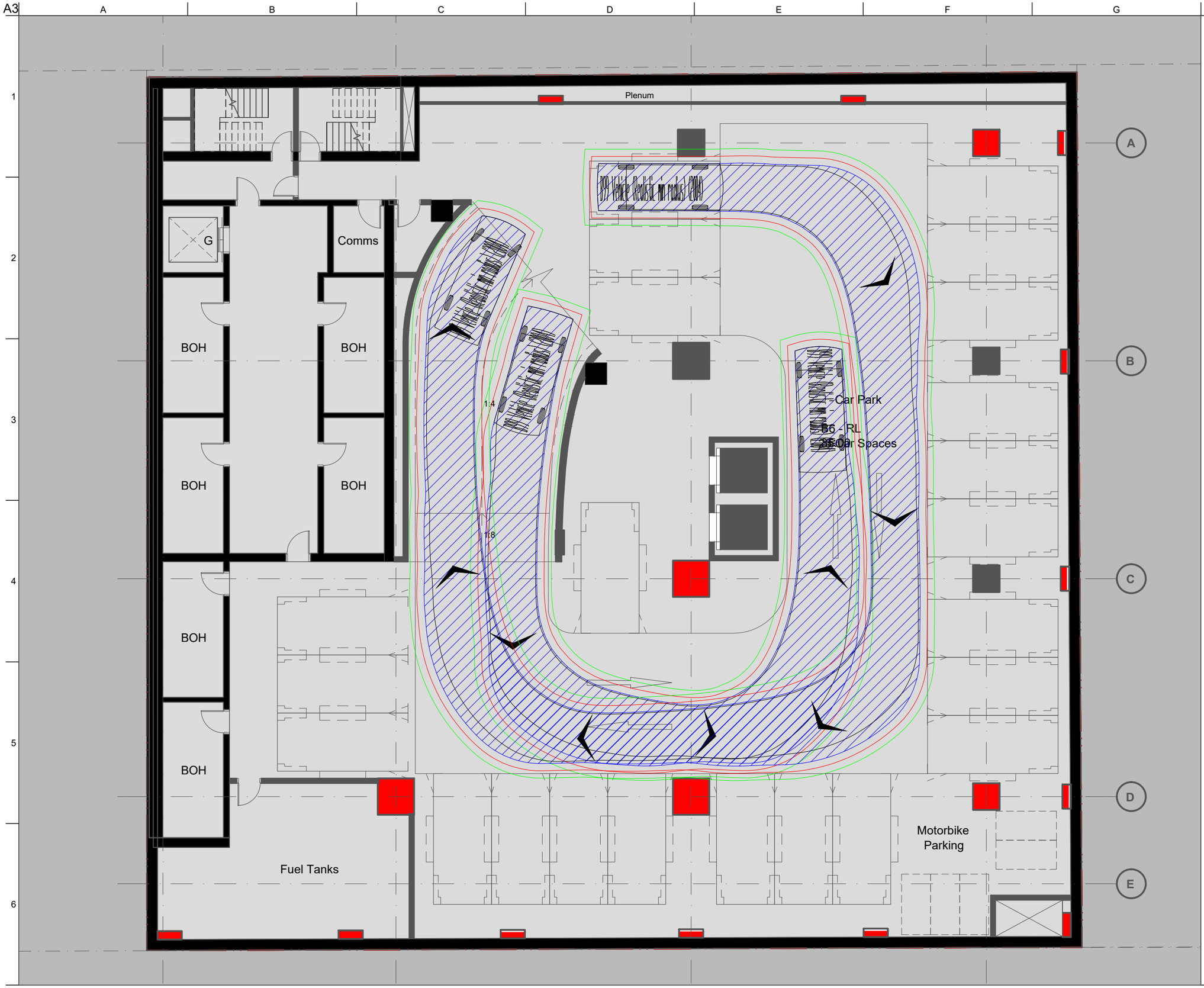
Discipline Transport

Drawing Status
ISSUE

Job No	Drawing No	Issue
284075	**SKT09 - ATR**	**A**

Do not scale

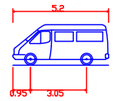
A3



Legend

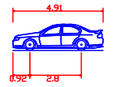
- Body Envelope
- 300mm Envelope
- 600mm Envelope
- Wheel Envelope

Design Vehicle(s)



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



B85 Vehicle (8m min radius) (2004)

Overall Length	4.910m
Overall Width	1.870m
Overall Body Height	1.421m
Min Body Ground Clearance	0.120m
Track Width	1.770m
Lock to Lock Time	4.00 sec
Curb to Curb Turning Radius	8.000m

Turning paths show vehicles traveling 5km/hr in a forward direction and and 2.5km/hr in reverse

Issue	Date	By	Chkd	Appd
A	17/12/21	CL	EC	EC

For information

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Client
Pro-Invest Group

Job Title
100 Walker Street

Drawing Title
Swept Path Analysis
Basement 6

Scale at A3 1:150

Discipline Transport

Drawing Status
ISSUE

Job No	Drawing No	Issue
284075	**SKT10 - ATR**	**A**

Do not scale

Appendix B

Framework Green Travel Plan

Pro-Invest Group

100-102 Walker Street, North Sydney

Framework Green Travel Plan

Final | 17 December 2021

Job number 284075

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Document verification

ARUP

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Document title		Framework Green Travel Plan			**File reference**
Document ref					
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			Prepared by	Checked by	Approved by
		Name	J G	E C	S O
		Signature			
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		Filename			
		Description			
			Prepared by	Checked by	Approved by
		Name			
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			Prepared by	Checked by	Approved by
		Name			
		Signature			
				Issue Document verification with document	✓

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1 Introduction

1.1 Background

This report has been prepared to accompany a development application (DA) for the re-development of 100-102 Walker Street, North Sydney (the site). The legal description of the site is Lot 1 in Deposited Plan 542915. The site is rectangular in shape with an area of approximately 1,392sqm, a primary frontage to Walker Street of 38.66m to the east and a secondary frontage to Little SpringStreet of 38.45m to the west.

This Detailed DA seeks consent for a 48-storey commercial building, comprising office and retail land uses. TheDA seeks consent for:

- Demolition of existing site and excavation to a depth of RL35 metres.
- The design, construction and operation of a 48-storey office building (inclusive of two levels of roof plant) with a maximum building height of RL239 metres (to the top of the rooftop feature) and a total gross floor area provision of 42,573sqm. The building will accommodate:
  - 40-storeys of commercial office space including terraces on the eastern elevation and building plant at the Low-rise Deck (Level 17), Mid-rise Deck (Level 31) and rooftop (Level 45 and 46).
  - Retail premises (including food and beverage premises and shops) accommodated on the Lower Ground Floor, Upper Ground Floor and Basement Level B1.
  - Pedestrian access to the site from several entries on Lower Ground and Upper Ground from the Walker Street, Little Spring Street and laneway frontages.
  - Repurposing existing vehicular access on Walker Street and construction of six (6) storey basement to accommodate a total of 74 car parking spaces, 2 loading bays, 397 bicycle parking spaces, as well as associated end of trip facilities (EOTF), storage, back of house, services and substation.
  - Provision of a rooftop architectural feature to a total height of RL239.0 metres.
- Landscaping provision across the ground plane and commercial terraces.
- Public domain improvements to facilitate an improved pedestrian experience at ground plane, including activation of street frontages and provision of a 6m-wide open to the sky public pedestrian laneway (of which 100-102 Walker Street Project contributes 50% of this 6m wide Laneway) along the full extent of the northern site boundary providing access from Walker Street through to Little Spring Street.
- The addition of a public lift providing accessible access between Little Spring Street, the Laneway andWalker Street.

This Framework Green Travel Plan (GTP) has been prepared to identify measures to be implemented to promote sustainable travel options and encourage trips by modes other than private vehicle. The transport impacts and requirements of the proposed development are detailed in a separate report which has been prepared by Arup to support the Development Application.

The principles of a GTP are applied to people travelling to, from and within the site. Government agencies are increasingly placing greater emphasis on the need to reduce individual trips using private vehicles by encouraging greater use of alternative transport methods that have lower environmental impacts.

This GTP aims to suggest measures that can have positive influences on travel behaviour for those who will use the facilities within the site. It provides an overarching framework whilst also assisting in guiding building wide initiatives for the proposed commercial office development. The initiatives listed within this document could be implemented by the 100-102 Walker Street Building Management team with approval from the Property Owners.

1.2 Site location

The site currently accommodates an office building of 15 storeys with an estimated Gross Floor Area (GFA) of 10,000m². The current building contains a basement car park split across seven levels which has 102 car parking spaces.

The site is located within North Sydney and bordered by Walker Street and Little Spring Street as shown in Figure 1.

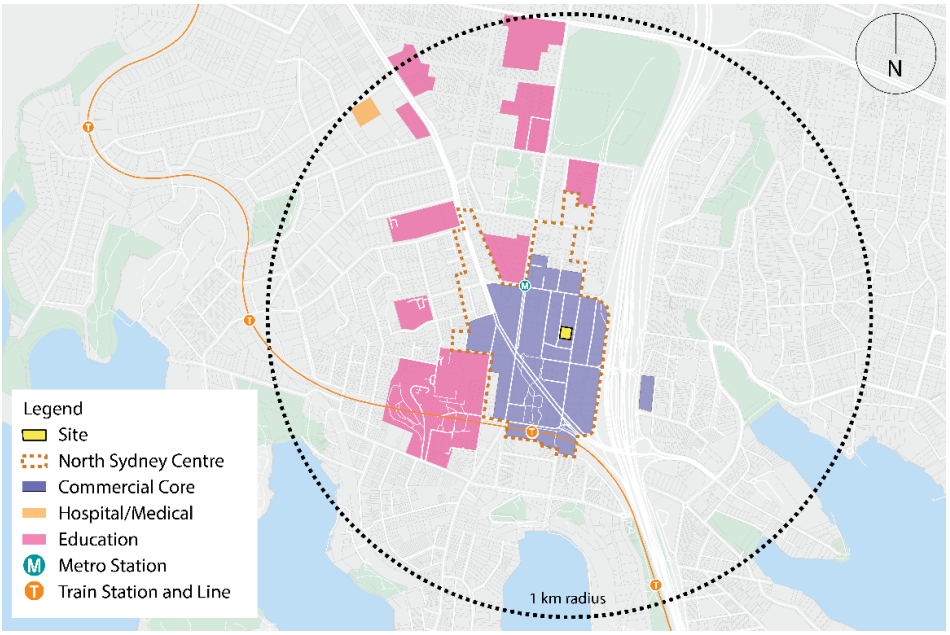

Figure 1: Site Location

Source: Arup

2 Green Travel Plan framework

This GTP focuses on the commercial use within the site and address the following issues:

- What are the objectives for the building in terms of travel including trips to work, retail and other land uses?
- How are the set objectives going to be met? What measures are going to be implemented and encouraged?
- Who is going to be responsible for the management, implementation and administration of the measures?
- Who does the GTP apply to?

The key aim of the plan is to reduce the reliance on private vehicle for the site through maximising the use of public transport, walking and cycling plus the promotion of car sharing. Many of the transport provisions proposed as part of the commercial office development can support this aim.

2.1 What is a Green Travel Plan?

A GTP is a package of measures put in place by a tenant/building manager/developer to encourage more sustainable travel whilst commuting and throughout the course of the working day. It is a means for an organisation to demonstrate a commitment and take a pro-active step towards improving the environmental sustainability of its activities.

2.2 Benefits of a Green Travel Plan

The GTP can bring numerous benefits for the environmental, social and economic context of this proposed commercial office development. These include the following:

- The health of tenants within the site by decreasing stress, travel costs, time and broadening travel choice;
- Reducing traffic congestion;
- Improving air quality; and
- Health benefits in of incorporating exercise into daily travel and an improved quality of life.

2.3 Green Travel Plan objectives

The objectives of a GTP are:

- **Encourage the use of more sustainable transport modes** i.e. walking, cycling, public transport (buses, trains, ferries and future metro) and car sharing in place of the higher energy consumption travel modes such as single occupant car travel, taxi and air travel. This can be achieved by improving people's travel choices through making sustainable modes available and convenient. This broadly aligns with the aim of the North Sydney Transport Plan 2017
- **Raise awareness** of sustainable modes of transportation for tenants or visitors who travel to, from and within the site.
- **Reduce traffic congestion and air pollution** around the site to enhance safer and more enjoyable journeys.
- **Travel Demand Management** by reducing the need for energy intensive car, taxi or air travel through combining journeys for different purposes, travelling to alternative closer locations, or using other means of communications such as audio conferencing, video conferencing and working from home.
- **Develop a monitoring strategy to** review and evaluate the travel plan

2.4 Who does the Green Travel Plan apply to?

The GTP can be applied to office and retail tenants, commuters travelling through the building and visitors to the various uses within the development.

3 Site-specific transport assessment

The proposed commercial office development will predominantly be used for commercial office with supporting retail uses.

3.1 Existing mode share

Journey to Work data from the 2016 Census the was used to understand current travel patterns of the users travelling to the current development and surrounding site. The 114173339 DZN shown in Figure 2, was analysed and encapsulates several blocks of commercial buildings north of the Pacific Highway.

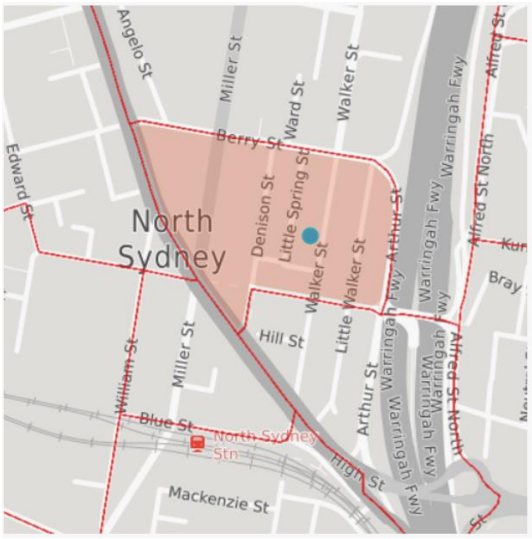

Figure 2: Analysed DZN and location of site (in blue)

Source: ABS

Majority of commuters use public transport to access their place of work in this section of North Sydney, reflecting the site's proximity to public transport services as outlined in Section 3.3. A small proportion (7%) of workers travelled via active travel and a quarter of work trips were made by car /motorbike.

These findings suggest there is potential to improve work related travel towards more sustainable modes, in particular lowering private car travel and increasing active modes.

Table 1:Existing travel to work mode share

Mode	Existing Mode share (%)
Train	55
Bus	14
Bicycle	1
Walked only	5
Car & motorbike	25

3.2 Local environment for pedestrians and cyclists

3.2.1 Walking connections

The existing infrastructure around the site provides good amenities to support walking. Footpaths connect the site with major public transport services and other trip attractors with signalised pedestrian crossings provided at appropriate locations.

The site is a 7-minute walk from the North Sydney Train station from Miller Street through Gas Lane via the pedestrian bridge over the Pacific Highway Mount Street. A through site link is provided from Walker Street through to Miller Street on the northern boundary of the site connecting the site with bus stops on Miller Street and the future Victoria Cross Sydney Metro station within a 2-minute walk.

The existing walking network surrounding the site is outlined on Figure 3.

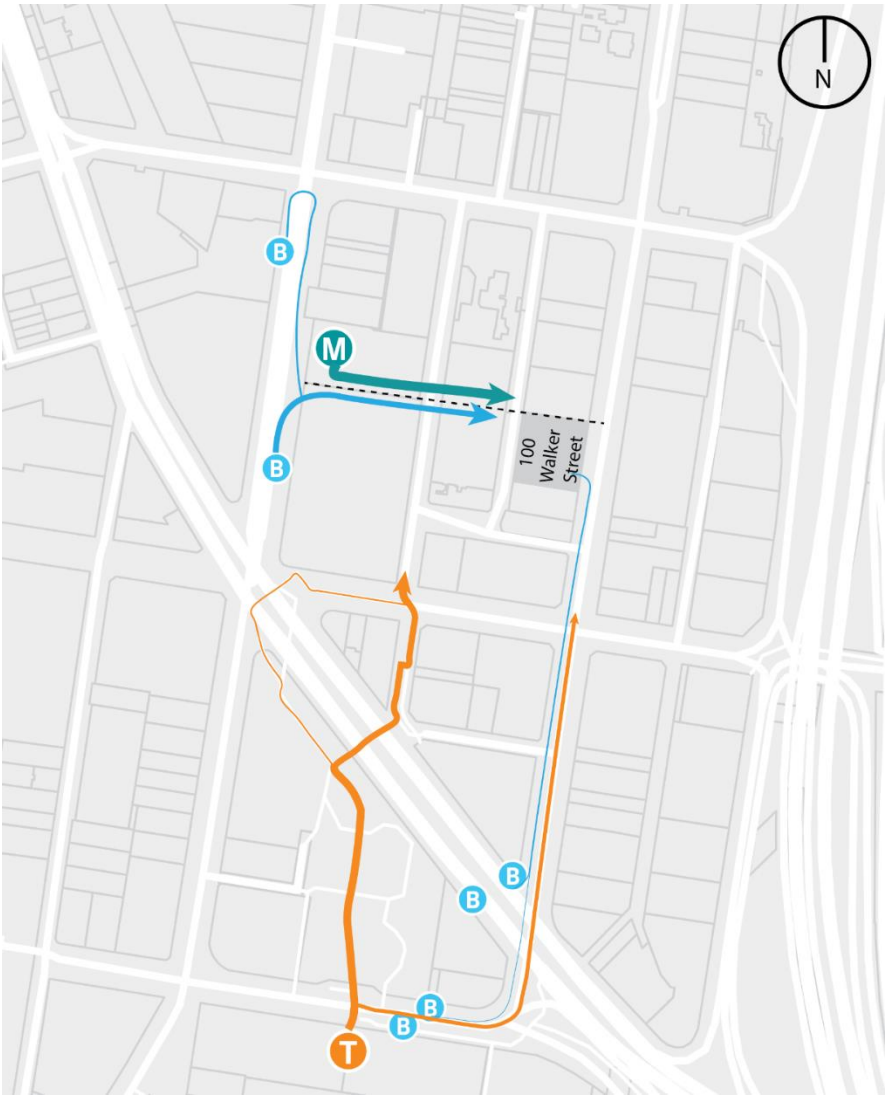

Figure 3: Existing Conditions with Planned Metro Station

Source: Google Maps and Arup desktop research

3.2.2 Cycling network

There is a range of cycling infrastructure around the site. These routes include:

- Balls Head Road and Bay Road (marked, on-road)
- Ridge Street (bi-directional cycleway)
- St Leonards Park and M1 overpass bridge towards neutral bay (shared path)
- Alfred Street South (shared cycle path)
- Sydney Harbour Bridge (separated, bi-directional cycleway)

The North Sydney Integrated Cycling Strategy 2013 outlines North Sydney Council's (Council) future plans for cycling routes. Figure 4 presents the existing cycling routes and planned future routes outlined in the cycling strategy relevant to the DA. This includes:

- **Route 1:** Construction of a separated bi-directional cycleway on Pacific Highway, providing a new north-south connection from Cammeray to the Sydney Harbour Bridge (implementation of this route is in progress)
- **Route 3:** Upgrade of the North Sydney to Mosman route to marked on-road mixed traffic cycle routes with specific sections upgraded to dedicated cycle lanes (completed)
- **Route 5:** On-road mixed traffic cycle route and dedicated cycle lane sections from North Sydney to Cremorne (implementation of this route is in progress)

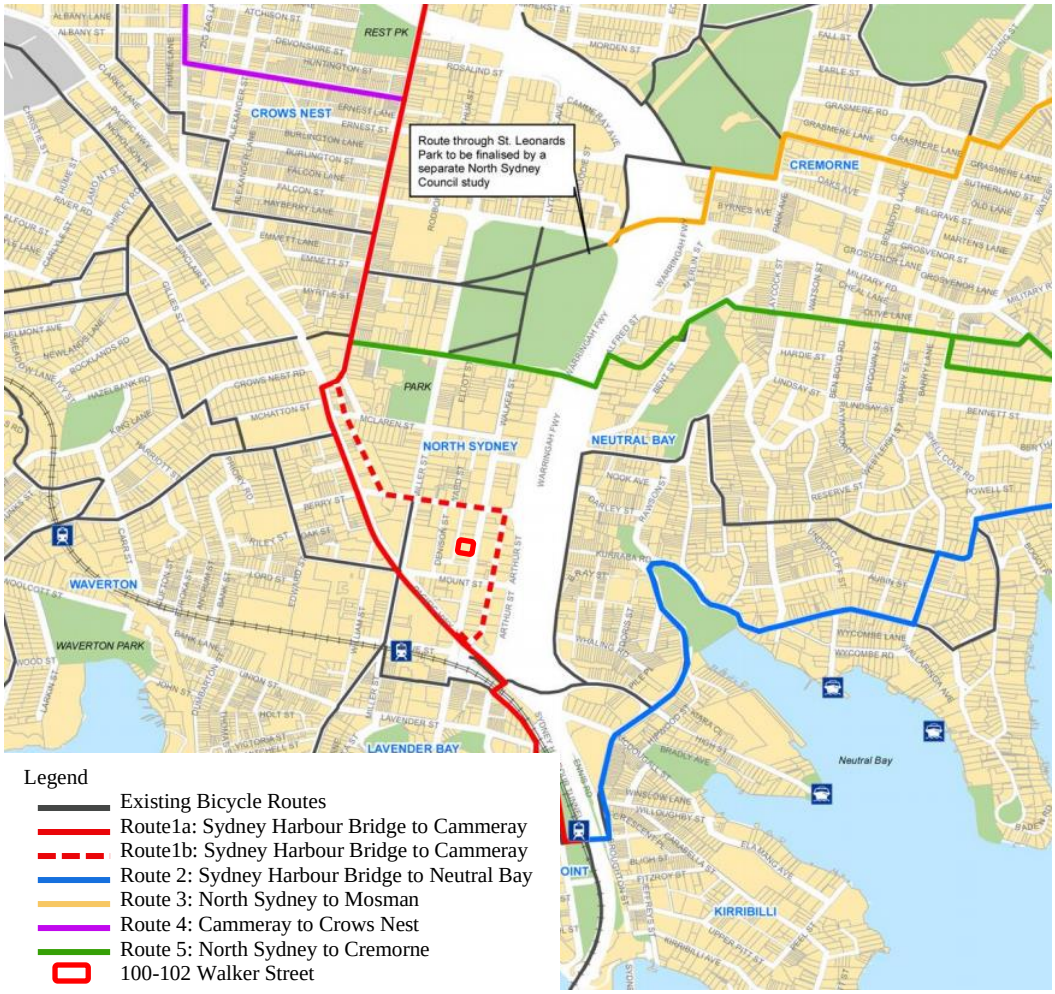

Figure 4: North Sydney Councils Priority Cycle Routes

Source: North Sydney Integrated Cycling Strategy (North Sydney Council, 2013)

3.3 Public transport

A range of public transport services are available within walking distance of the site, with further plans for improvements to public transport accessibility through the Sydney Metro City and South West line. This reflects the high existing public transport mode share, outlined in Section 3.1.

3.3.1 Train network

The proposed development is located approximately 450m (7-minute walking distance) from North Sydney Train Station and 1.4km (19-minute walking distance) from Waverton Train Station. The train services at North Sydney Train Station include the T1 North Shore & Western Line, the T9 Northern Line and the Central Coast & Newcastle Intercity Line.

All train services stop at Central Station offering direct interchange opportunities to various destinations on the Sydney Trains network including airport train services and the Sydney Buses network. The T9 Northern Line provides a service to Town Hall Station which additionally offers connections to the T4 Eastern Suburbs Line.

3.3.2 Sydney Metro

Future plans for the Sydney Metro City and South West line will provide Metro services every 5 minutes linking Chatswood to the CBD and various stations in Sydney's south west. As part of this, Victoria Cross Station will be constructed with the south eastern entrance a short walk from the site, providing a rapid connection to the north west, CBD and south west significantly improving the capacity and reducing journey times to a range of stations. The future plans for Sydney Metro lines and the location of Victoria Cross Station in relation to the site are presented on Figure 5.

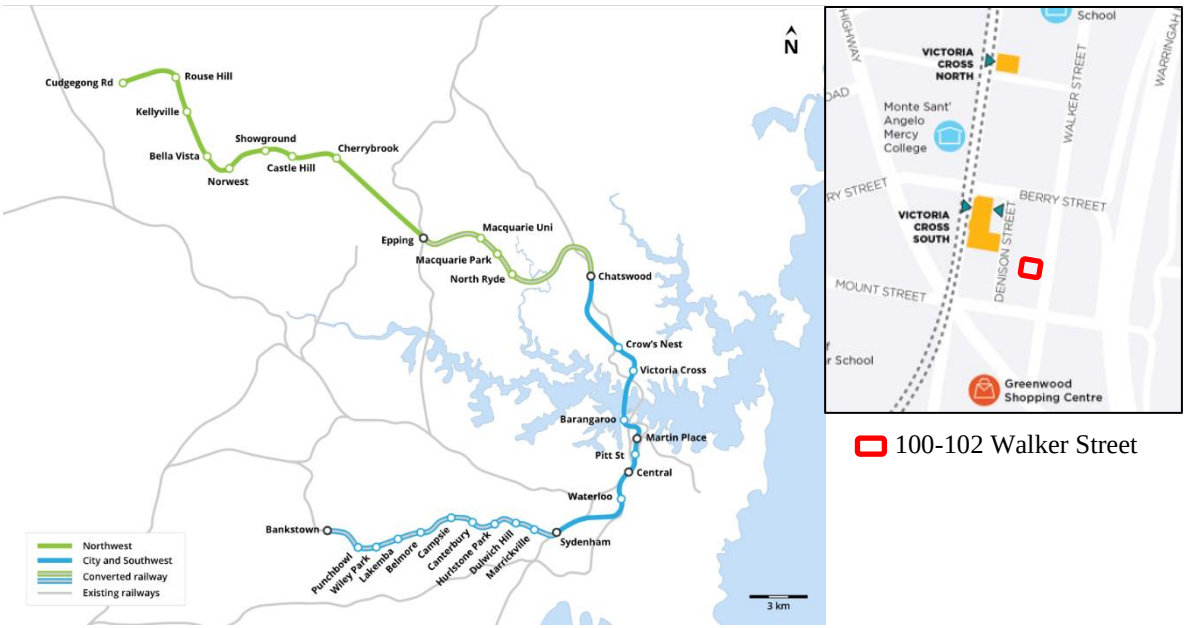

Figure 5: Sydney Metro and Victoria Cross Station

Source: Sydney Metro

3.3.3 Bus network

There is currently an extensive bus network that supports the North Sydney CBD and Sydney City CBD, covering the Upper and Lower North Shore as well as connections to the Northern Beaches. The existing bus network primarily travels along corridors such as the Pacific Highway and Military Road before distributing to various suburbs.

Due to the proximity of the site to North Sydney Station Bus Interchange, there are a wide selection of bus routes with stops within walking distance of the proposed commercial office development. The location of these bus stops is displayed on Figure 6.

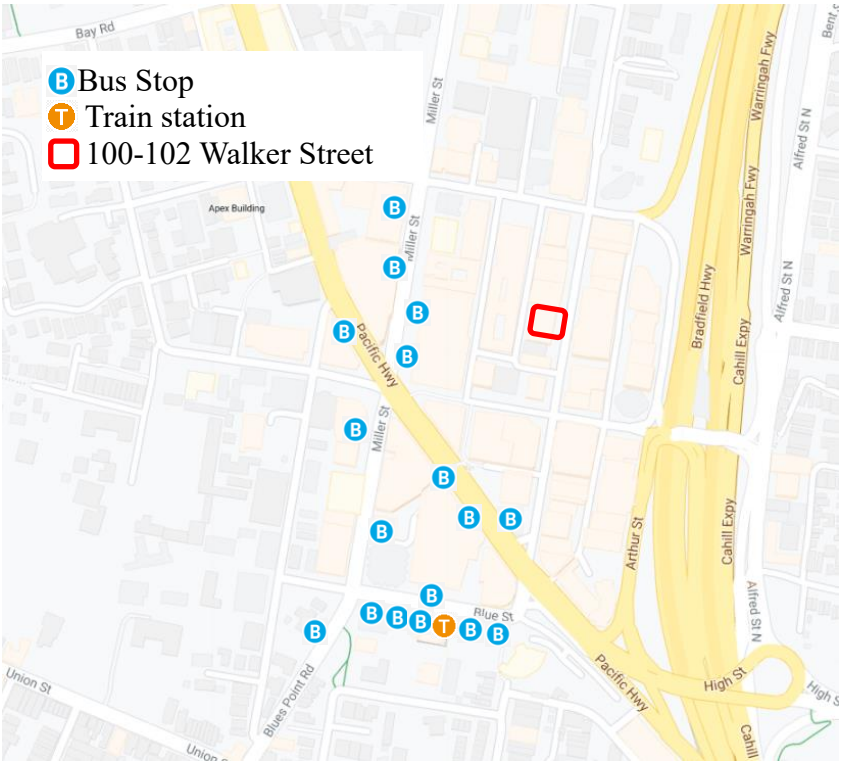

Figure 6: Bus stops in the vicinity of the site

Source: Google Maps and Arup desktop research

3.3.4 Taxi network

There is a taxi zone at the Blue Street exit of North Sydney Train Station. The taxi zone is a 7-minute walk from the site via Walker Street. The taxi zone location and walking route is outlined in Figure 7.

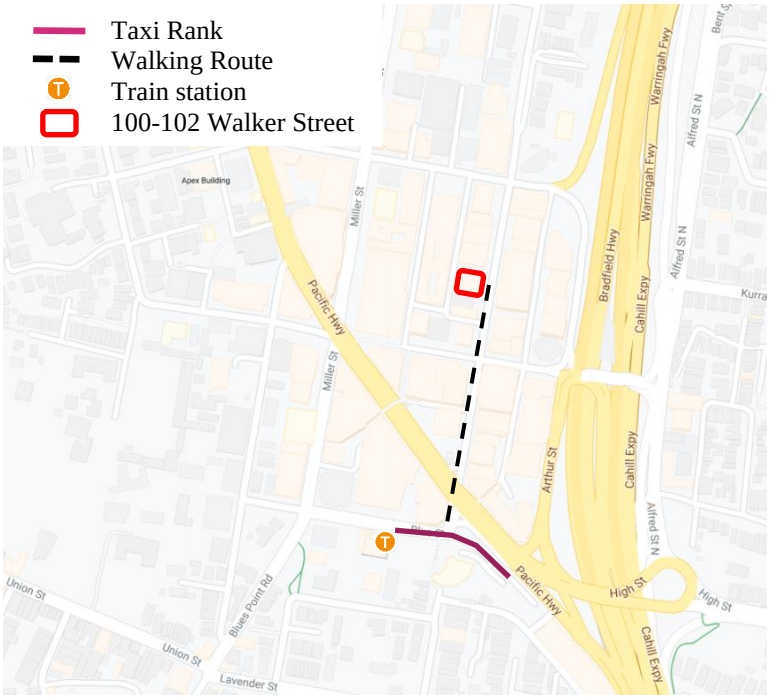

Figure 7: Taxi facilities in the vicinity of the site

Source: Google Maps and Arup desktop research

3.3.5 Ferry services

The nearest ferry wharves to the site are located at McMahons Point and Milsons Point approximately a 20-minute walk from the proposed development. These provides access to the F3, F4 and F8 ferry services providing connections to Circular Quay, Pyrmont Bay and Parramatta River. Both services operate approximately every 20 minutes at peak times. The walking routes to McMahons Point and Milsons Point are outlined on Figure 8.

Figure 8: Ferry services in the vicinity of the site

Source: Google Maps and Arup desktop research

4 Design features provided by the development

4.1 Walking connections

The proposed commercial office development provides access for pedestrians from Little Spring Street and Walker Street. Entry to the lobby from Walker Street is provided from the east-west laneway (northern side of the site) and directly from Little Spring Street as outlined in Figure 9.

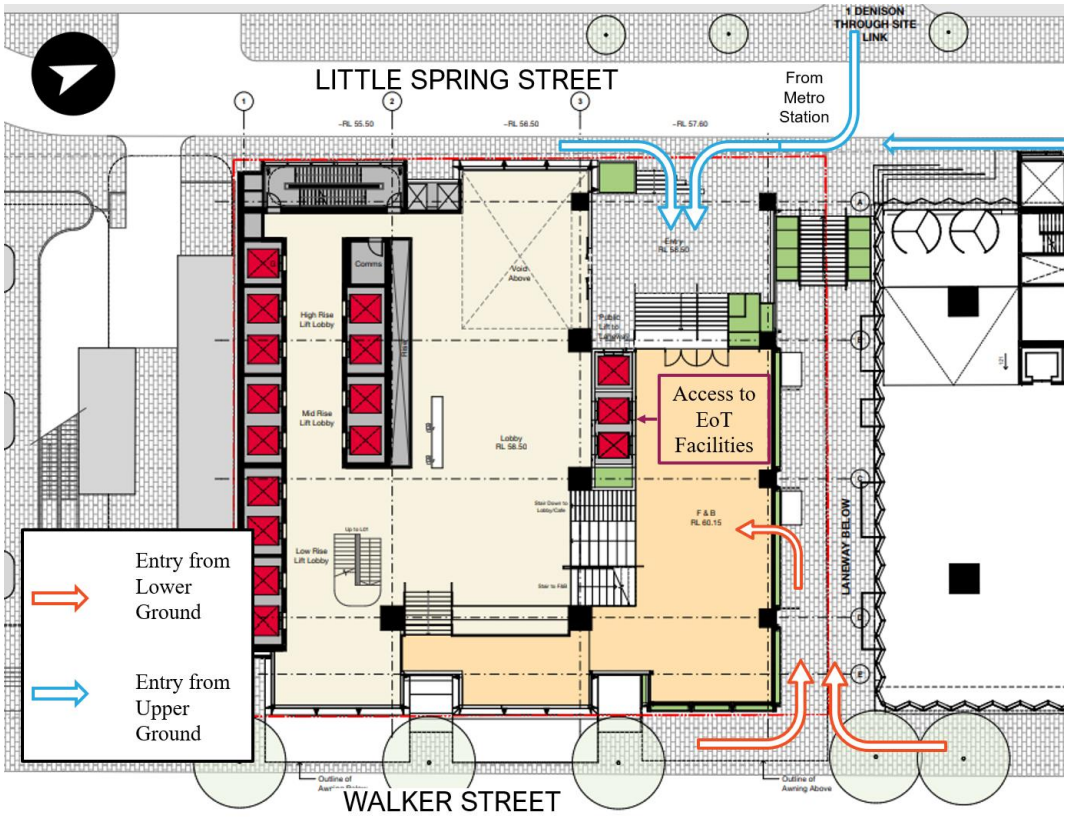

Figure 9: Pedestrian access into the development from lower ground and upper ground

Source: Bates Smart Draft DA Set

Visitors and workers of the development will be able to directly reach the Victoria Cross Metro Station through the Denison Street link which will be expanded as part of the broader laneway strategy for the area presented in the North Sydney Public Domain Strategy. Walking routes are presented in Figure 3.

An existing through site link exists on the southern side of the site. The proposed development will improve this with the aim to directly connect through to 1 Denison and the future Victoria Cross Metro Station. People will also be able to pass through a new northern link creating a secondary pedestrian route between Walker Street and Little Spring Street. These routes are presented on Figure 10.

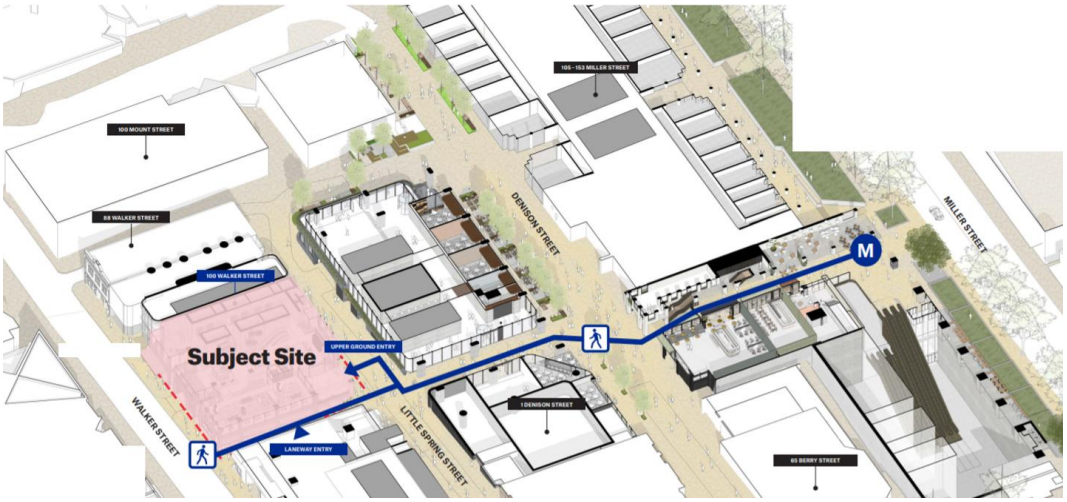

Figure 10: Through site links to the development

Source: Bates Smart concept DA - design report

4.2 Facilities for cyclists

4.2.1 Access to cycling facilities

Access to the bicycle parking and end of trip facilities will be from the dedicated end of trip lobby located on Lower Ground level which is accessed from the east-west through site link.

Tenants can then use lifts to access the end of trip facilities on Basement Level 2. Visitors can first check into reception to receive a lift pass and access bike parking on Basement Levels 2 and 3.

The route for cyclists to the EOT lifts from Walker Street and Little Spring Street is shown in Figure 11.

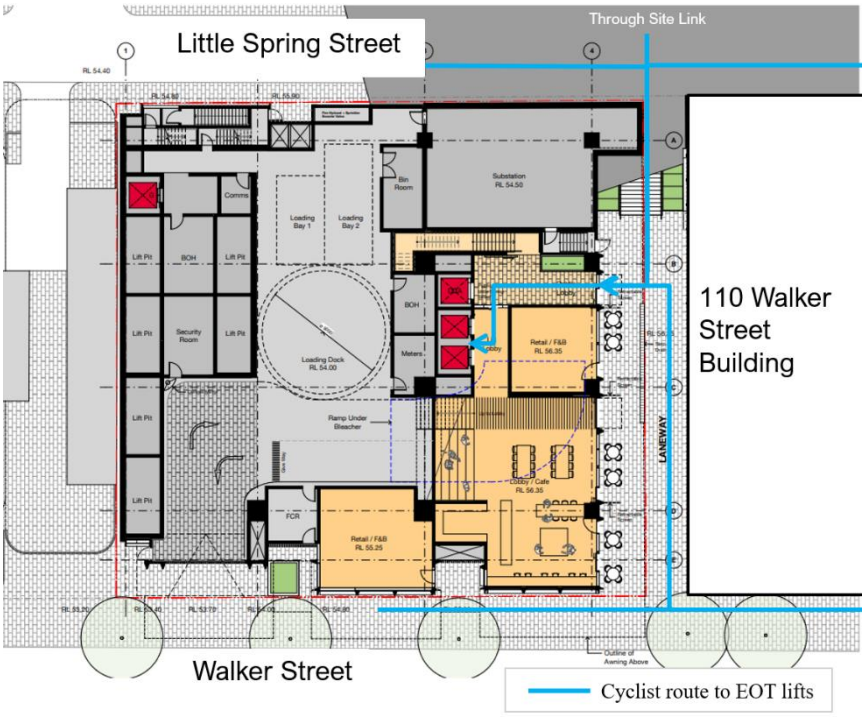

Figure 11 End of trip lifts to B2 bicycle parking

Source: Bates Smart Draft DA Set

4.2.2 Bicycle parking

The development proposes to provide 281 employee bicycle parking spaces and 116 visitor spaces in accordance with the North Sydney 2013 DCP.

All bicycle parking spaces are located on Basement 2 and Basement 3, both will be accessed by lifts via the end of trip lobby.

4.2.3 End of Trip Facilities

To comply with the North Sydney DCP the proposed development will provide:

- 397 lockers
- 40 showers

Bike parking and end of trip facilities will be accessed via a lobby at the Lower Ground Level which will have will take tenants and visitors to Basement Level 2 and Basement Level 3 via lifts.

End of trip facilities are located on Basement Level 2 and includes 397 lockers and 40 showers for employees. Figure 12 shows the proposed layout of bike parking and end of trip facilities.

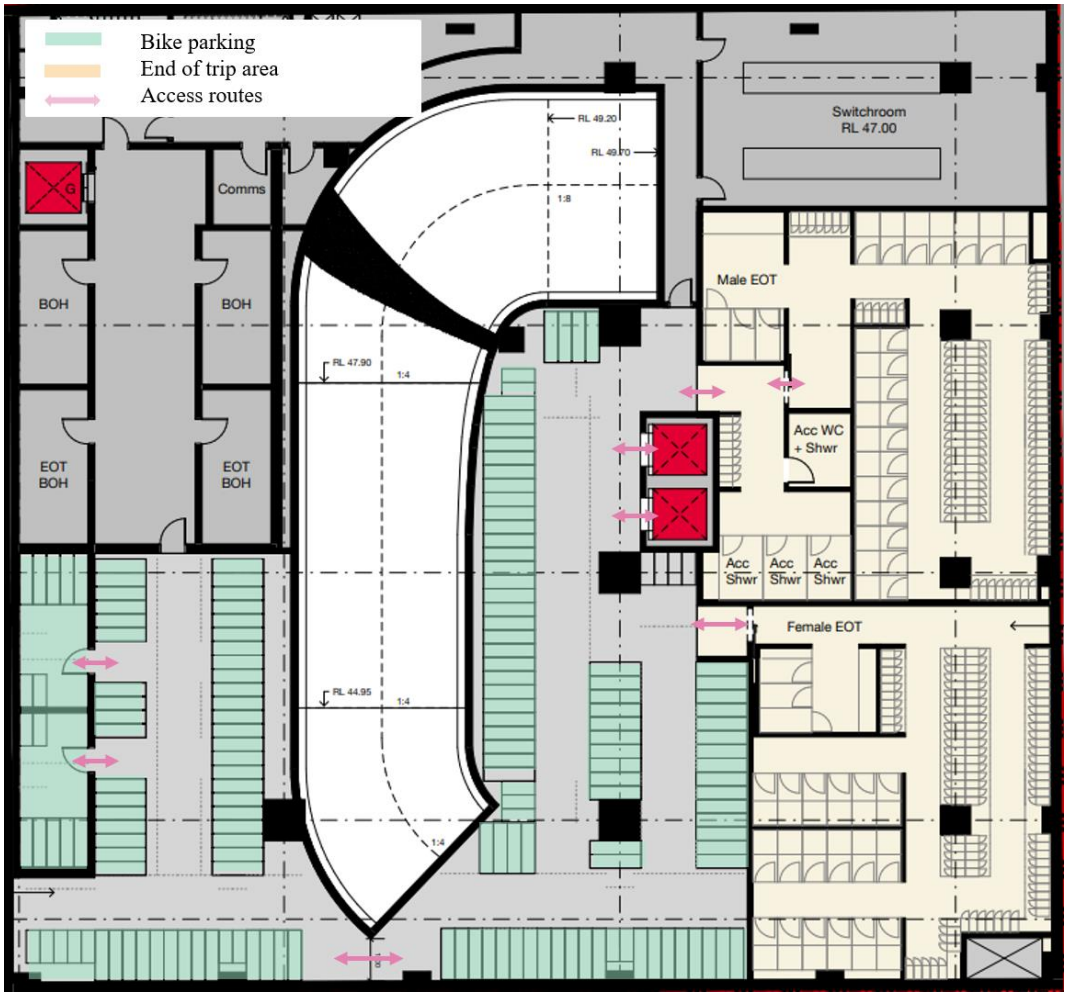

Figure 12: Basement Level 2 layout containing EOT facilities and bike parking

Source: Bates Smart Draft DA Set

4.3 Car parking

The proposed commercial office development will provide 74 private tenant car parking spaces. This figure is lower than the allowable maximum parking spaces (126 spaces) outlined in the North Sydney DCP 2013 for developments in the B3 commercial core.

By reducing the number of car parking spaces available, future tenants will be encouraged to travel to the development using alternative travel modes. Access to the tenant car spaces is via a two-way ramp from Walker Street which will lead to six levels of basement parking.

5 Operational opportunities to improve transport choices

5.1 Target Mode share

Planning for the proposed commercial office development is based on the principle of achieving high usage of public transport, walking, and cycling as methods of travel to, from and through the site. The Green Travel Plan is a constant evolving strategy which seeks to continually improve the way staff travel to work by choosing more sustainable modes.

This Green Travel Plan sets out an initial mode share target (show in Table 2) which is based on Journey to Work (JTW) analysis completed in the Transport Impact Assessment.

The JTW analysis reviewed areas where existing bus and suburban rail users would likely shift to future Metro services to travel to the site once the Sydney Metro Victoria Cross Station is in operation. These findings were used to inform the likely future mode share and indicates the future bus mode share is expected to decrease however, train mode share (suburban rail + metro) is expected to significantly increase which will result in an overall higher future public transport mode share.

The initial mode share target will transition to a medium-term mode share target that seeks to increase active travel so that all bike parking spaces are fully utilised. These changes will help contribute to the NSW Government's target of halving all emissions by 2030 as part of its Net Zero Plan.

Table 2: Initial and medium-term mode share targets for 100-102 Walker Street

Mode	Existing mode share	Initial mode share target	Medium term mode share target
Train and Metro	55%	77%	74%
Bus	14%	10%	10%
Bicycle	1%	4%	8%
Walked only	5%	5%	5%
Car	25%	4%	3%

5.2 Promotion of walking

The GTP aims to promote walking as a form of sustainable travel from other points of interests such as major public transport stops which include North Sydney Train Station, the future Victoria Cross Station and other neighbouring bus stops.

Building tenants should be provided with a Travel Access Guide (TAG) that details surrounding public transport linkages within a reasonable walking

distance. Maps can be distributed via a range of digital platforms including email, tenant portal or mobile phone application.

The GTP Committee should organise and host walking workshops to motivate and inspire building tenants to consider walking when possible. Building tenants and staff should also be encouraged to organise ‘walking meetings’ when reasonable. Walking related articles should be advertised on digital platforms focusing on ‘walking champions’ to highlight best practise in walking to business meeting. ‘Walk to Workday’ could also be an annual event building tenants and staff can participate in.

5.3 Promotion of cycling

As highlighted in Section 3.2.2, the proposed commercial office development has good access to neighbouring cycling networks and provides high quality end of trip facilities. Access to secure bike storage, changing rooms, showers and lockers along will support tenants who wish to cycle to work and may encourage others who would not have considered cycling previously.

The GTP Committee should organise and host bike workshops to motivate and inspire building tenants to consider cycling to work. Bike workshops can include lunch and learn events to educate and promote cycling as a mode of transport, free bike tune ups in the building lobby or CBD cycling tours to build confidence for new bicycle riders. ‘Ride to Workday’ could also be an annual event building tenants and staff can participate in.

Staff who cycle to work regularly should be encouraged to form a Cycling Group where members can organise cycling events, team rides or share notable cycling routes. This group can also inform the GTP Committee of issues relating to the provision of on-site cycling facilities and the maintenance of off-site cycle routes.

5.4 Promotion of public transport

Using public transport as a mode of travel to and from the site has cost benefits for individuals along with wider benefits from an environmental, social and economic perspective. Plans for improved public domain of Little Spring Street outlined in the North Sydney CBD Public Domain Strategy would facilitate better pedestrian links to Metro and train stations.

5.5 Carpooling

Council has previously identified that travel by car has been increasing due to the increased number of workers and visitors to the area. To mitigate this trend the North Sydney DCP 2013 focuses on reducing trips by private vehicle. Carpooling could be encouraged for business related trips and Council has identified this as an emerging trend that can be used to increase vehicle occupancy. Tenants may choose to designate parking spaces located in a convenient location for the use of staff who carpool with more than 2 passengers.

Benefits for tenants who participate in carpooling programs include:

- Saving money as participants may be able to sell their own vehicle or save on parking, tolls and fuel costs by riding together
- Reduce the use of maintenance requirements for their personal vehicles
- Tenants could potentially create personal connections with other fellow carpool tenants they may not have otherwise made
- Carpool programs can foster a greater sense of community

5.6 Demand shifting measures

The following strategies aim to redistribute demand accessing the development. Rather than having typical peaks for commercial workers accessing the building (typically between 8am-9:30am and 5pm – 6:30pm) the following measures aim to make travelling to the site more convenient via public transport and reduces private vehicle usage.

5.6.1 Spreading travel demand

During the peak periods (7am and 9am and 4pm to 6pm), public transport usage can be congested and sometimes a rather unpleasant experience which can sway people from public transport. Public transport services are less congested during the inter-peak and off peak and may offer a better experience for commuters. The building businesses could be encouraged to implement flexible working hours allowing the employees to arrive at work and leave work during the shoulders of the peak e.g., start work at 10am and finish at 6.30 pm or start at 7am and finish at 3.30pm.

5.6.2 Working from home

For user groups who find it hard to sustainably travel to the site via public transport, walking or cycling based on their origin location, reducing the need to travel may be a more sustainable option. Working from home will essentially reduce carbon emissions from travelling to work. Working from home should be offered to staff when needed. This may vary across employers and should be managed by building tenants and staff across the building.

5.7 Marketing and promotion

In addition to encouraging travel by sustainable modes, the GTP should aim to manage travel demand through reducing the number, length and timing of trips.

To provide building tenants and visitors with a choice of convenient sustainable transport options to and from the site throughout the day, the following initiatives could be promoted:

- Use of the Sydney Trains and Metro network to travel to locations within the Sydney CBD and wider Sydney Metropolitan Area
- Walk to places that are close by rather than taking a taxi or uber

- Promote the use of share bikes that are available to the public such as e-bikes

Marketing and promoting the benefits of sustainable travel alternatives is crucial when encouraging staff to adopt the GTP objectives. It is essential that building occupants are made aware of the GTP at an early stage to emphasise the need to reduce single occupancy trips.

To ensure new building tenants and staff are aware of the GTP, an overview of the GTP should be included into all staff induction programs. The GTP Committee can provide content and a guide for staff inductions to relevant building tenants who will lead staff induction programs.

The GTP section of the induction should provide new starters with the following:

- An overview of the purpose of the GTP
- A digital or hard copy of the Travel Access Guide
- A tour of the office to include a visit to cycle parking areas and end of trip facilities
- Information on incentives to use sustainable means of transport e.g. Bike share schemes or how to apply for interest free bike loans.

Furthermore, increasing the awareness of a fully publicised GTP will motivate staff to think about how they travel to work and how to encourage sustainable travel.

Further detail of the monitoring and promotion will be provided in a finalised GTP once tenants are known.

6 Administration

A part of an effective GTP is to nominate personnel to administer and champion the plan from each significant size tenant of the buildings. The representatives could form a Travel Plan Management team enabling a consistent and organised approach for the whole building.

6.1 Monitoring and reviewing

The GTP is a constant evolving strategy, and its success will rely on the ongoing monitoring and review. Although the objectives of the Plan are to educate and promote site users to travel by sustainable modes will not change, it may be possible over time to re-define specific targets and re-assess promoted initiatives.

Target setting should aim to reflect an ambition for continued progress. Assessing the provided targets and identifying if they are being met will provide opportunities to re-define targets. Travel survey questionaries can be distributed to staff and visitors on a yearly basis to understand travel patterns. Assessment of this data should be undertaken by the GTP Committee to understand the changing travel patterns and revaluate benchmarking mode share targets.

Review and update to transport mode splits with regards to the delivery of key transport projects (e.g. Metro systems) should also be undertaken. The GTP Committee should be responsible for undertaking mode share reviews to alter mode share targets.

Additionally, meetings can be held to undertake reviews of measures that are in place for the precinct. The GTP Committee could work with the Building Management team for the co-ordinating and promotion of the GTP. Building manager co-ordinator(s), tenant representatives and Local or State government representatives could also undertake meetings to discuss the uses of the GTP. The objectives provided in the GTP can act as measures of success and may also be used to identify potential refinements. The GTP Committee could further engage with North Sydney Council and the State Government to assist in designing and operating services which aim to meet and support the needs of the precinct's users and furthermore support active and public transport.

Appendix C

Walking Space Assessment

Pro-Invest

100-102 Walker Street

Walking Space Assessment

Final | 17 December 2021

Job number 284075

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Document verification

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1 Introduction

This report has been prepared to accompany a development application (DA) for the re-development of 100-102 Walker Street, North Sydney (the site). The legal description of the site is Lot 1 in Deposited Plan 542915. The site is rectangular in shape with an area of approximately 1,392sqm, a primary frontage to Walker Street of 38.66m to the east and a secondary frontage to Little Spring Street of 38.45m to the west.

This Detailed DA seeks consent for a 48-storey commercial building, comprising office and retail land uses. The DA seeks consent for:

- Demolition of existing site and excavation to a depth of RL35 metres.
- The design, construction and operation of a 48-storey office building (inclusive of two levels of roof plant) with a maximum building height of RL239 metres (to the top of the rooftop feature) and a total gross floor area provision of 42,573sqm. The building will accommodate:
  - 40-storeys of commercial office space including terraces on the eastern elevation and building plant at the Low-rise Deck (Level 17), Mid-rise Deck (Level 31) and rooftop (Level 45 and 46).
  - Retail premises (including food and beverage premises and shops) accommodated on the Lower Ground Floor, Upper Ground Floor and Basement Level B1.
  - Pedestrian access to the site from several entries on Lower Ground and Upper Ground from the Walker Street, Little Spring Street and laneway frontages.
  - Repurposing existing vehicular access on Walker Street and construction of six (6) storey basement to accommodate a total of 74 car parking spaces, 2 loading bays, 397 bicycle parking spaces, as well as associated end of trip facilities (EOTF), storage, back of house, services and substation.
  - Provision of a rooftop architectural feature to a total height of RL239.0 metres.
- Landscaping provision across the ground plane and commercial terraces.
- Public domain improvements to facilitate an improved pedestrian experience at ground plane, including activation of street frontages and provision of a 6m-wide open to the sky public pedestrian laneway (of which 100-102 Walker Street Project contributes 50% of this 6m wide Laneway) along the full extent of the northern site boundary providing access from Walker Street through to Little Spring Street.
- The addition of a public lift providing accessible access between Little Spring Street, the Laneway and Walker Street.

The purpose of this report is to undertake a Walking Space assessment of the footpaths adjacent to the new development at 100-102 Walker Street using Transport for NSW's Walking Space Guide (the guide).

The results generated from the Walking Space Guide will indicate whether sufficient space is provided to achieve a comfortable CBD environment which encourages people to walk. The assessment has been undertaken considering both existing footpath conditions and the expected level of improvement that the future scheme will introduce.

This assessment follows a primarily qualitative method of footpath classification which directly impacts how the Level of Service (LoS) is calculated. The guide recommends using pedestrian counts data if available because it provides a more certain understanding of actual pedestrian activity. However, due to COVID19-impacted working-from-home behaviours, current pedestrian counts would not appropriately represent the magnitude of background footpath flows inherent in the precinct. Likewise, as this report will cover later, the precinct is expected to change dramatically into the future. So, while construction activity and poor pedestrian amenity are the hallmarks of the precinct, the future is expected to reflect a transit rich, pedestrian-centric design with abundant amenity for walking pedestrians. Given these two key factors, existing counts in the precinct likely do not provide a baseline representation on which to base future pedestrian activity. As such, footpath measurements and street types are used to determine the expected LoS for surrounding footpaths.

2 Study Area

The site is legally described as Lot 1 in DP542915 and located in the North Sydney CBD, bordered by Walker Street and Little Spring Street as shown in Figure 1.

Footpaths included in this study are:

- Walker Street (west side) from Mount Street to Berry Street,
- Little Spring Street (east side) from 88 Walker Street to Berry Street,
- Spring Street (east side) from Walker Street to the edge of 88 Walker Street, and
- 100 and 110 Walker through site link from Walker Street to Little Spring Street.

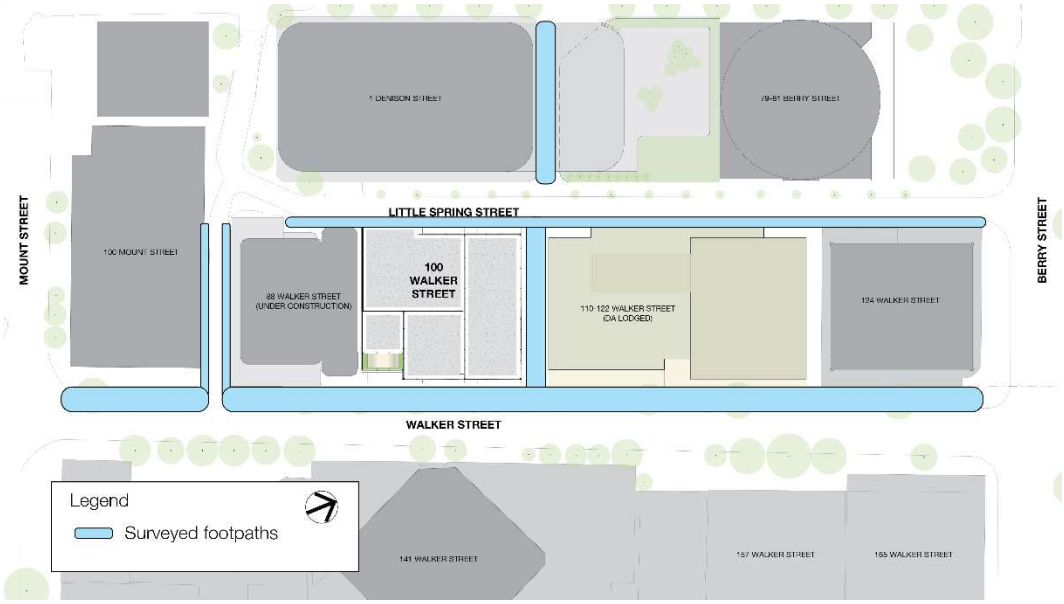

Figure 1: Site location and survey footpaths included in the study

The area around the development primarily comprises of commercial office buildings as shown in Figure 2, with some retail and dining at ground level.

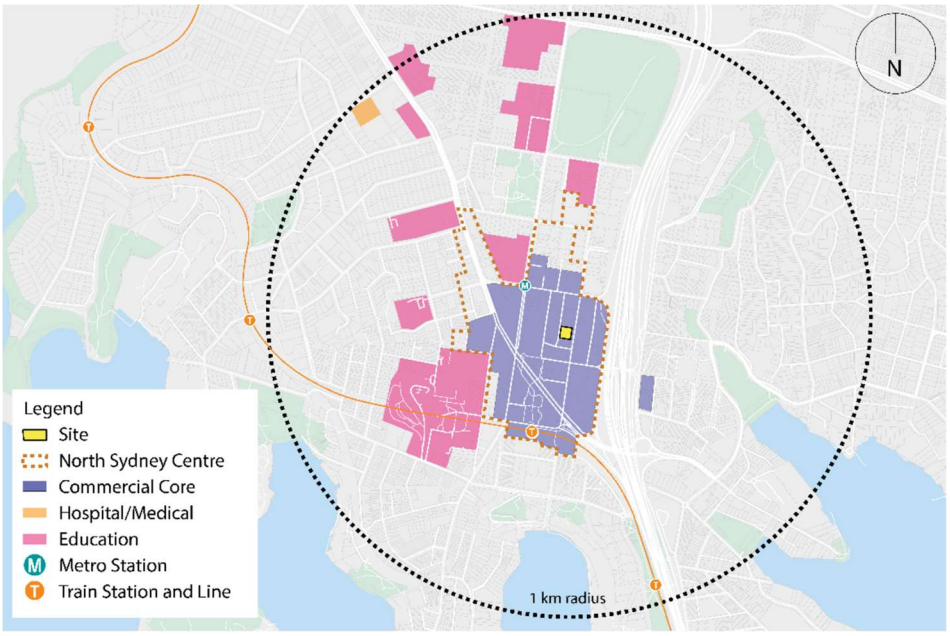

Figure 2: Site context

2.1 Future changes to streets and laneways

The North Sydney CBD is changing rapidly and anticipates further development and pedestrian activity in the near and medium term. Key among the strategy, planning and policy documents are the North Sydney Public Domain Strategy, integration with the Victoria Cross Metro Station and Over Station Development, and the Ward Street Masterplan. These policies, plans, and projects intend to transform the streets in the zone bounded by Miller Street, Walker Street, McLaren Street, and the Pacific Highway to be pedestrian-centric.

Future changes to streets assessed in this report will be:

- Conversion of Little Spring Street to a Shared Zone
- Conversion of Spring Street to a Shared Zone
- Widening of the 100/110 Walker Street through site link staircase.

The future Shared Zones on Little Spring Street and Spring Street will give pedestrians priority and allow them to use the full width of the street. This will effectively widen the Walking Space available and provide a more comfortable walking experience.

The widening of 100/110 Walker Street through site link (Figure 4) as part of the 100-102 Walker Street development, will facilitate higher volumes of pedestrians who will travel to and from the future Victoria Cross Metro station, located less than 100m away from the site.

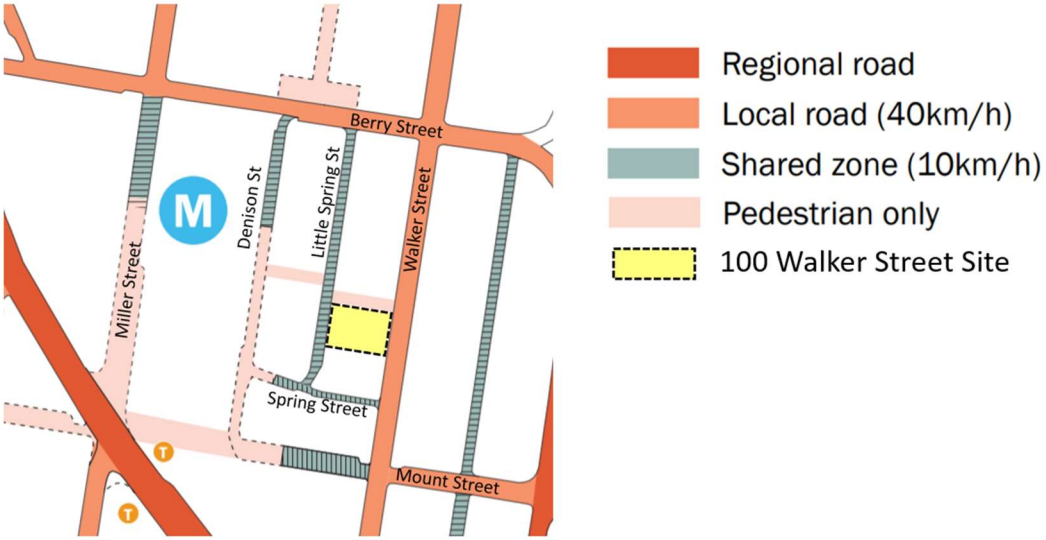

Figure 3: Future classification of streets surrounding the site (Source: North Sydney CBD Public Domain Strategy)

Figure 4: Impression of the future 100/110 Walker Street through site link (Source: Bates Smart, Concept Development Application)

3 Assessment method

The Transport for NSW Walking Space Guide provides a set of guidelines and processes which can help assess the appropriate amount of footpath space needed to allow pedestrian users feel comfortable during peak hours. These widths are based on intensity of use as well as the types of activities and scenarios likely to occur based on land-use and nearby transport.

Normally the Guide recommends using pedestrian counts as part of the assessment. However, due to COVID19-impacted working-from-home behaviours, current pedestrian counts would not appropriately represent the magnitude of background footpath flows inherent in the precinct. As such, footpath measurements and street types are used to determine the expected LoS for surrounding footpaths.

The site is located in the North Sydney CBD, and surrounding footpaths can be characterised as Type 4 based on the commercial land-use. Type 4 footpaths are the second highest classification in terms of expected demand and activity, they are generally 0-100m away from train/metro stations and are in employment or mixed-use areas.

The guide indicates that on Type 4 footpaths, groups of people walking together are certain to pass other groups. Specifically, footpaths should be wide enough to facilitate two pedestrians simultaneously pass another pair of pedestrians in the opposite direction, as shown in Figure 5.

Spring Street and Little Spring Street may currently function as backstreets, however in future they are likely to become Type 4 footpaths as they transform into Shared Zones part of North Sydney's Public Domain Strategy. To provide consistency, this assessment has assumed that all streets and links will be categorised as Type 4 footpaths.

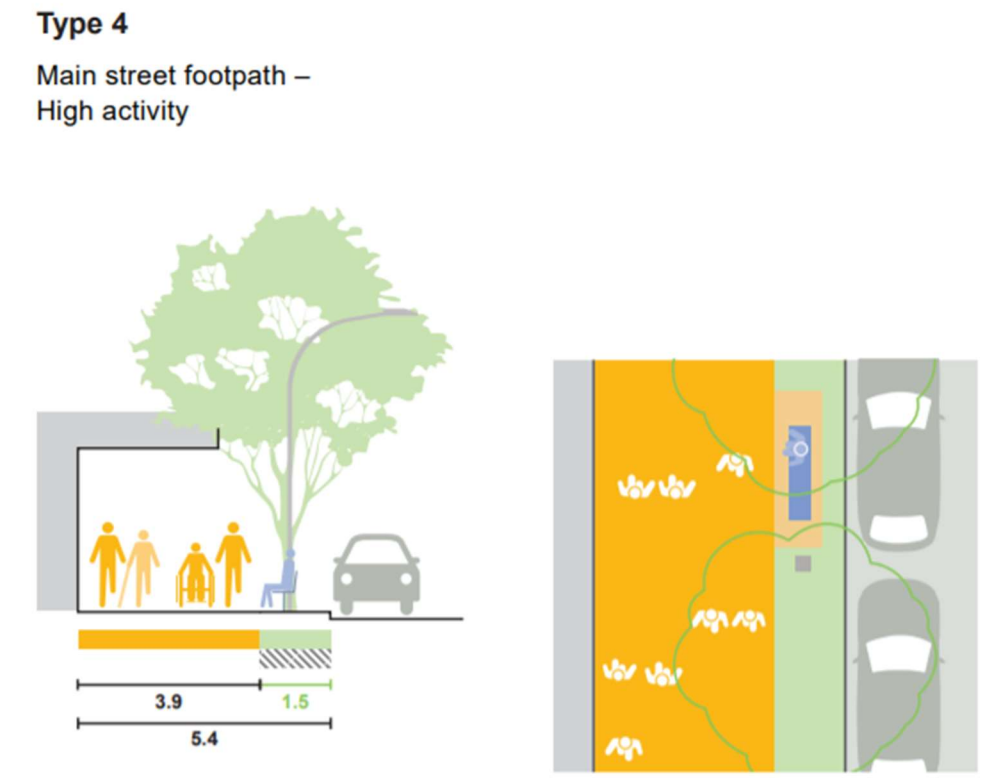

Figure 5: Type 4 footpath and the desirable width (Source: Walking Space Guide, TfNSW)

Definition of Walking Space

The guide defines 'Walking Space' as the unobstructed area which is accessible for pedestrians to walk. This takes into account the impact of obstructions such as poles, trees, seating and adjacent traffic on the overall available Walking Space (see Figure 6).

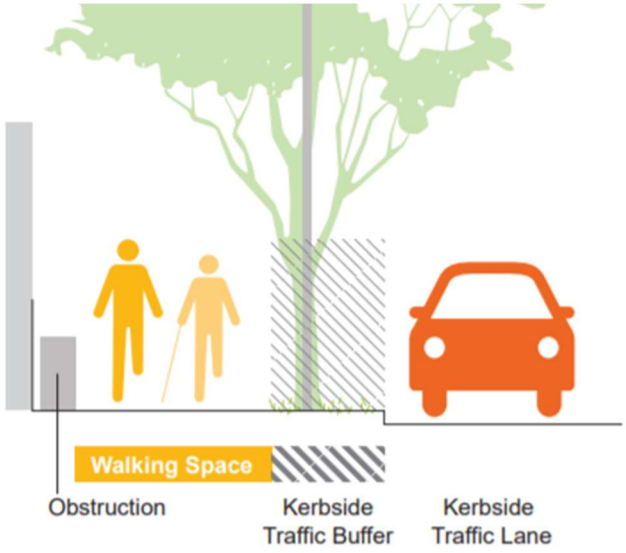

Figure 6: Example cross section, showing the impact of obstructions and kerbside traffic buffer on Walking Space (Source: Walking Space Guide, TfNSW)

Evaluating Walking Space Level of Service

The Walking Space Guide is focused on evaluating the space needed for pedestrians to feel comfortable, based on the level activity and passing requirements for each footpath classification during peak hour. Walking Space width required to achieve each corresponding Level of Service is presented in Figure 7. The different Levels of Service also correspond to the proportion of pedestrians who would feel comfortable walking on the footpath path during peak hour, as seen in Figure 8.

This focus on comfort and space needed for passing differentiates the Walking Space Guide assessment from other pedestrian evaluation tools such as Fruin Level of Service (based on flow and delay) or Transport for London's Pedestrian Comfort Levels (based on personal space).

The guide suggests the design and improvement of streets should seek to achieve a minimum LoS C, which represents half of all pedestrians feeling comfortable when walking on that footpath during peak hour.

For Type 4 footpaths analysed in this study, achieving the desired minimum LoS of C would require 3.7m of Walking Space, while footpaths with Walking Spaces below 2.7m would result in an LoS of F. A footpath performing at Los of F indicates that during peak hour less than 15% of pedestrians passing would feel comfortable, highlighting the need for intervention.

Footpath Type	Adjacent to Active Edge	Walking Space and LOS Types 1-4 Minimum Walking Space in metres (m) Type 5 Minimum Walking Space in metres (m) and Maximum Peak Hour flow rate in PPMM					
		LOS A	LOS B	LOS C	LOS D	LOS E	LOS F
Type 1	-	2.7	2.3	2.0	1.6*	1.3*	Less than 1.3*
Type 2	-	3.0 + 0.6 Passing Zone	2.7 + 0.6 Passing Zone	2.3 + 0.6 Passing Zone	1.9 + 0.6 Passing Zone	1.6 + 0.6 Passing Zone	Less than 1.6 + 0.6 Passing Zone
Type 3	Not Adjacent	3.9	3.5	3.0	2.6	2.2	Less than 2.2
	Adjacent	4.3	3.8	3.2	2.8	2.3	Less than 2.3
Type 4	Not Adjacent	4.8	4.3	3.7	3.2	2.7	Less than 2.7
	Adjacent	5.2	4.6	3.9	3.4	2.9	Less than 2.9
Type 5	Min. width (m)	5.2	4.6	3.9	3.4	2.9	Less than 2.9
	Max. PPMM	4.0	6.0	9.5	13.5	18.0	Greater than 18.0

Figure 7: Walking Space Level of Service classification

Source: Walking Space Guide, TfNSW

Level of Service	Target	Comfort percentile (base of band)
LOS A		85th
LOS B		66th
LOS C	Minimum Target	50th
LOS D		33rd
LOS E	At Risk	15th
LOS F	Intervention Trigger	less than 15th

Figure 8: Walking Space LoS and corresponding comfort percentiles for pedestrians. (Source: Walking Space Guide, TfNSW)

Buffers

The guide accounts for the effect that active building edges and adjacent traffic lanes have on usable Walking Space. The guide acknowledges that pedestrians

will not walk very close to building edges that have many entrances, shop counters (such as coffee counters) or shop windows and will naturally offset themselves. Active building edges are therefore expected to decrease the Walking Space by 0.3m.

Similarly, pedestrians tend to keep additional distance between themselves and the edge of the footpath if there is a traffic lane adjacent, because it is not desirable to walk close to moving traffic.

The guide specifies that at speeds of 40km/h, a traffic buffer of 1.2m should be used and at 50km/h, a traffic buffer of 1.65m be used. This buffer is deducted from the full footpath width and reduces the available Walking Space.

An allowance factor can be applied to reduce this buffer, based on the LoS performance of the footpath. For example, the guide specifies that a LoS F may reduce the traffic buffer from 1.2m to 1.1m, while a LoS D performing footpath may reduce the buffer from 1.2m to 0.9m. This calculation has been included in the Section 5 analysis.

Obstructions

Objects such as signage, bike racks, tree trunks, seating and advertising signs all hinder pedestrians from moving in an unobstructed way and impact the available Walking Space. Most of the streets surveyed have road signs or trees which reduce the Walking Space, and these are especially problematic on narrower footpaths such as Spring Street and Little Spring Street.

The guide specifies that at least 0.8m clear width is needed as a minimum for free movement. Additionally, several poles in a row have the effect of creating an edge, and a 0.2m buffer should be applied. When several poles are located in the middle of footpaths, a 0.2m buffer for each pole also needs to be considered, this means narrow gaps created by multiple poles can make footpaths unusable as shown in Figure 18.

Measurements

In order to capture and identify sections where Walking Space narrows and the corresponding comfort level are below desired levels, the footpaths have been measured at different locations. This has been done at locations where footpath widths change, kerbside conditions change, the street frontage changes (e.g. active frontages with café seating), locations with more activity (such as people waiting at a bus stop), or in sections where there are more obstructions.

4 Site conditions

The site visit was conducted during the late morning on Friday the 19th of November 2021. Dimensions of footpaths in the study area were measured following the guidance detailed in the above section.

At the time of the site visit, the 88 Walker Street building was under construction with hoardings present on Walker Street and Little Spring Street. These hoardings severely impact Walking Space, however due to the temporary nature of this disruption, the regular footpath width without hoardings has been adopted for the purpose of this report.

This section summarises the measured Walking Space. Section 5 further analyses these measurements in accordance with the Walking Space Guide.

4.1 Walker Street

Walker Street was assessed between Mount Street and Berry Street and is approximately 200m long, fronted by office buildings with commercial uses at ground floor level. This analysis has split the western footpath into four sections as indicated in Figure 9.

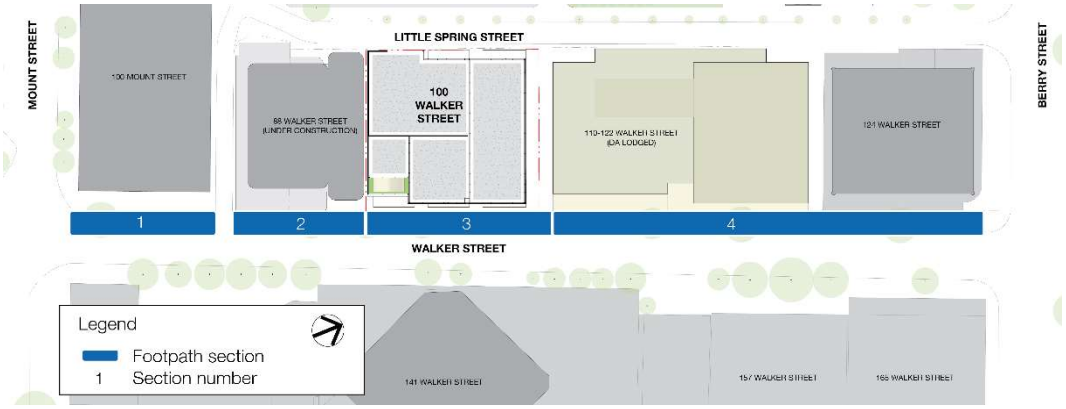

Figure 9: Corresponding sections of Walker Street measured

Source: Draft DA set, Bates Smart

Section 1: 100 Mount Street

A wide footpath has been built outside the recently completed development, however driveway railings block the Walking Space as shown in Figure 10. A traffic lane is present along the edge the footpath which demands a 1.2m traffic buffer (calculated at 40km/h) to be removed from the available Walking Space.

The available Walking Space in this section is 2.5m.

Figure 10: 100 Mount Street cross section measurements

Source: Arup

Section 2: 88 Walker Street

The 88 Walker Street building was under construction at the time of the site visit and hoardings were present along this section of the street which had a large impact to available Walking Space. The narrowest section was 1.2m wide over a raised ramp and two people would not be able to comfortably move past each other.

Due to the temporary nature of these hoardings, this assessment will instead consider the normal footpath conditions for this section. The kerb to building edge width is 2.8m and the Firehouse Hotel acts as an active frontage.

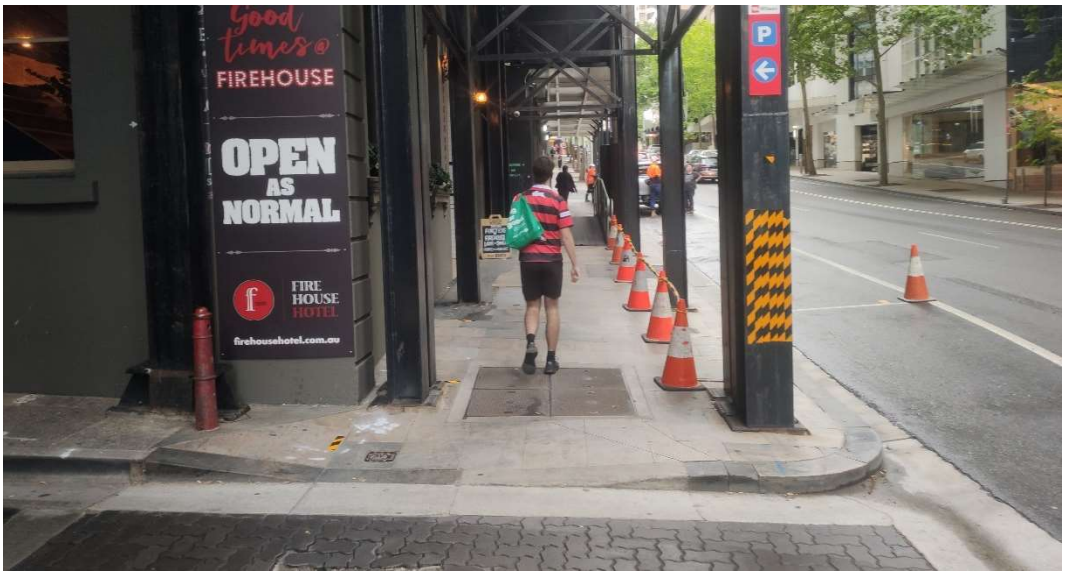

Figure 11: 88 Walker Street measurements showing the temporary construction hoarding posts

Source: Arup

Section 3: 100-102 Walker Street

The footpath width currently provided in this section is a generous 3.8m and the building is set back away from the footpath, leaving space for a small open plaza between the footpath and building edge. Street trees are regularly planted from this section onwards to Berry Street and are located towards the edge of the road, as pictured in Figure 12. Similarly, lighting poles and traffic signs are located near the kerbside which minimises the impact on Walking Space. A parking lane is adjacent to the footpath meaning no traffic buffer will be applied. The clear Walking Space was measured from the concrete planters to the street trees/seating which was found to be 2.6m as shown in Figure 12.

Figure 12: 100-102 Walker Street cross section measurements

Source: Arup

Indicative DA drawings for 100-102 Walker Street estimate that the Walking Space outside the development will slightly increase to 3m, measured from the building front to the indicative location of street trees.

These changes are described in Section 5.2 and impact to Level of Service evaluated in 5.3.

Section 4: 110 – 165 Walker Street

The open courtyard outside 100-102 Walker Street ends and the footpath lines up with the building edge again, passing a series of retail shops, cafés and building lobbies. At the time of survey, minimal stationary activity was observed (e.g. people waiting for coffees) and pedestrians could freely walk through the whole length of footpath.

The walking width measured from building edge to tree was 2.4m, and the presence of an active building edge will reduce this width (by 0.3m).

Figure 13: 110 – 165 Walker Street cross section measurements

Source: Arup

At the driveway of 165 Walker Street, the parking lane reverts back to a traffic lane meaning a 1.2m traffic buffer needs to be considered. Since the street trees are also offset from the kerb by about 1.2m, the Walking Space will remain 2.4m wide.

4.2 Spring Street

Figure 14: Spring Street measurements, north footpath (left side) and south footpath (right side)

Source: Arup

Spring Street is not currently classified as a Shared Zone and operates as a one-way westbound service lane. Both footpaths are narrow and currently have hoarding posts which block pedestrians and reduces the effective walking width.

Placement of a street pole on the south side footpath and café garbage present on the footpath (as shown in Figure 14) takes up space and significantly hinders the ability for pedestrians to walk on the footpath.

During the site visit, it was observed that pedestrians walk on the road because of the narrow footpaths and obstructive hoardings. It was observed that vehicles do not give way to pedestrians, compromising the safety and desirability of this link.

A 1.2m traffic buffer is applied to footpaths on both sides which will significantly lower the walking width to 0.2m (north) and 0.8m (south). The narrow walking width will result in a poor Level of Service, which is calculated in Section 5.1.

4.3 Little Spring Street

Little Spring Street currently operates as a one-way service lane with one lane of kerbside parking. The eastern side footpath which fronts the 100-102 Walker Street site is cluttered with sign-posts, bollards and smart poles which lack consideration for pedestrian Walking Space.

By comparison, the new western side footpath accompanying the new 1 Denison Street development has provided uniformly aligned street trees and smart poles which are less obstructive for pedestrians. The Walking Space provided on this side is 1.9m and provides a more comfortable, continuous walking experience.

It's noted that the section of footpath outside of the 88 Walker Street development at the time of the survey was used as a loading zone and was not available to pedestrians, as shown in Figure 15 and Figure 16.

Figure 15: Corresponding sections of Little Spring measured

Source: Draft DA set, Bates Smart

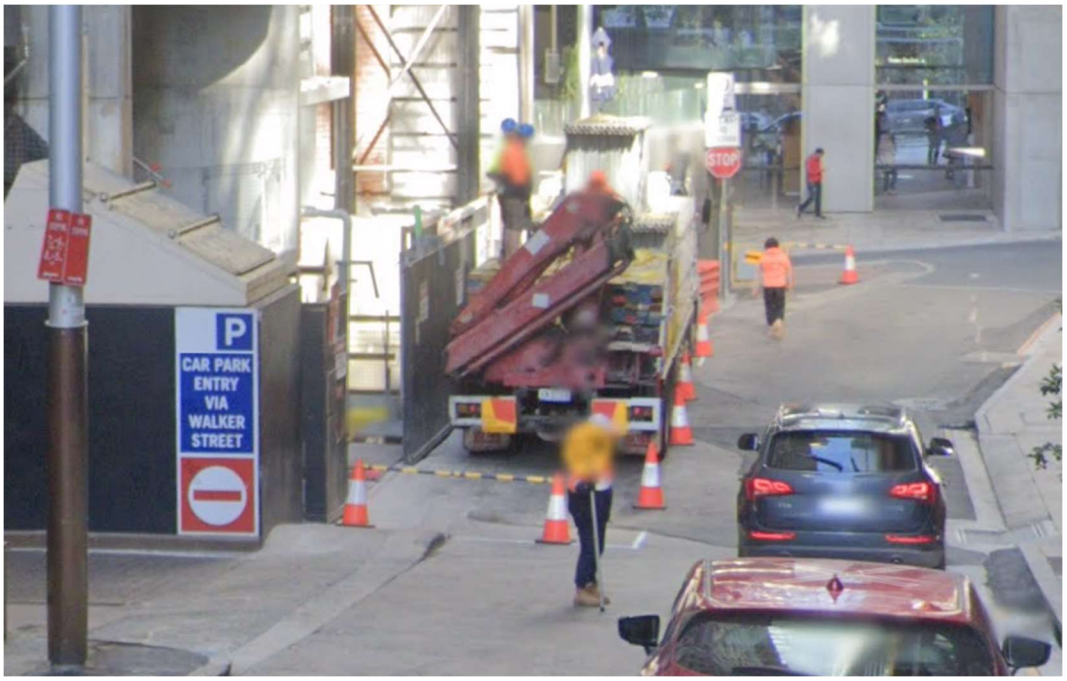

Figure 16: Loading zone on Little Spring Street at the 86 – 94 Walker Street development

Source: Google Street View

Section 1

The footpath width on this section is approximately 1.8m wide, however smart poles have been installed right in the middle of the footpath which effectively reduce the Walking Space to 1.6m (2x0.8m) as shown in Figure 17. As there is short term parking (5 minutes) along this section, no traffic buffer has been applied.

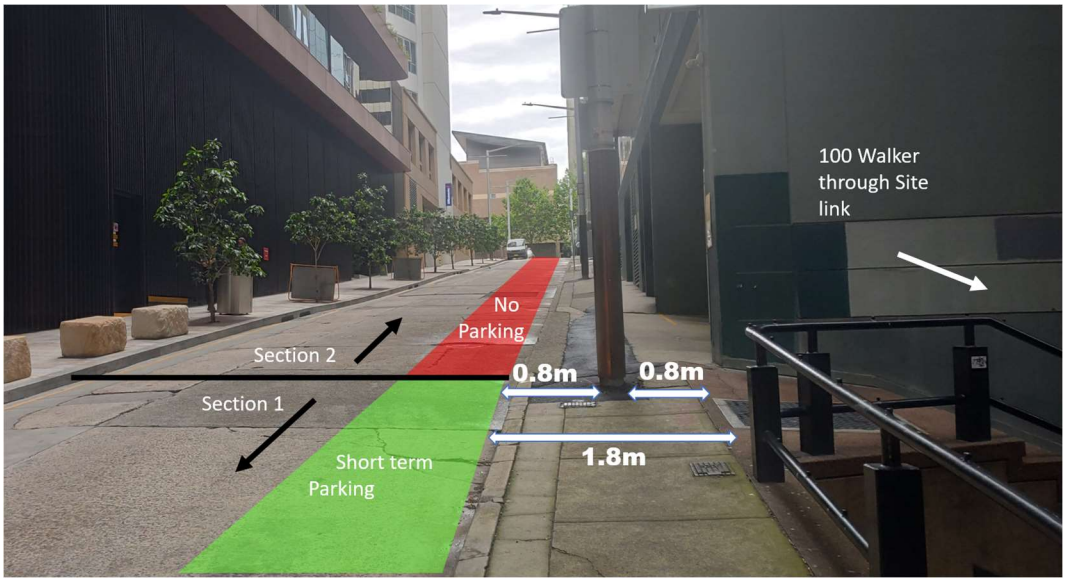

Figure 17: Little Spring Street section 1 measurement

Source: Arup

Section 2

The short-term parking lane shown in Figure 17 transitions to a no stopping zone from the through site to Berry Street. This means a 1.2m traffic buffer will be subtracted from the total footpath width.

Section 2 was surveyed at a narrow point shown in Figure 18, where a bollard and sign pole are positioned next to each other forcing people to squeeze through a small gap. The guide specifies that a 0.2m buffer needs to be considered when multiple poles are next to each other.

After considering all required buffers, both gaps are less than 0.8m and therefore cannot be considered as Walking Space under the guide. Therefore, the Walking Space assigned to this section is 0m.

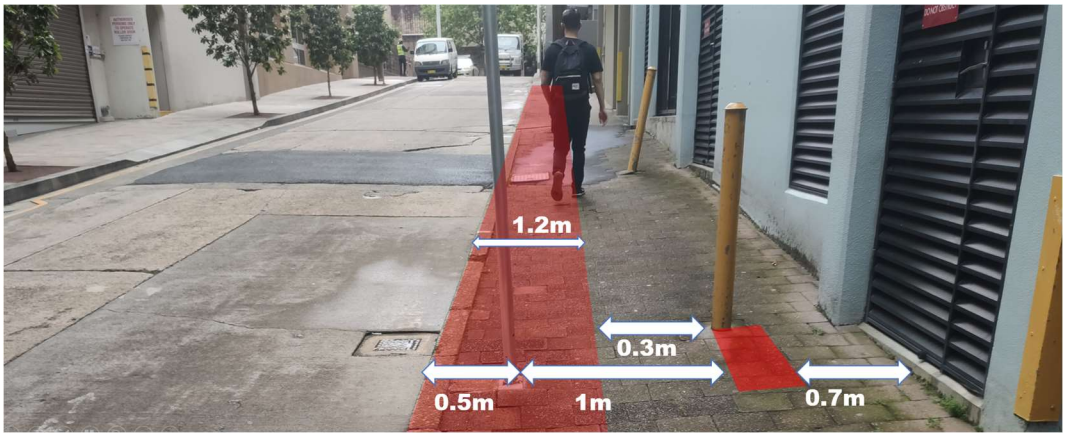

Figure 18: Little Spring Street section 2

Source: Arup

Section 3

Sign poles are less prevalent in section 3 of Little Spring Street compared with section 2, however the total footpath width narrows to 1.4m. Since a traffic lane is directly adjacent to the footpath, a 1.2m buffer has been applied which reduces the Walking Space to 0.2m. The guide states that useable Walking Space must be at least 0.8m wide to be considered. Therefore, the effective Walking Space of this section of Little Spring Street is considered to be 0m.

Figure 19: Little Spring Street section 3 measurement

Source: Arup

4.4 100/110 Walker Street through site link

The through site link between 100-102 Walker Street and 110 Walker Street buildings is a pedestrian only throughfare with a set of stairs towards Little Spring Street. Walking Space between the two buildings is generous at 4.3m wide, however, this width narrows to 1.9m at the stairs.

For assessment purposes, the through site link will be split into two section: the main through site link (4.3m wide) and the stairs (1.9m wide). This will allow more specific evaluation to be made and understand whether the future design adequately improves Walking Space outcomes.

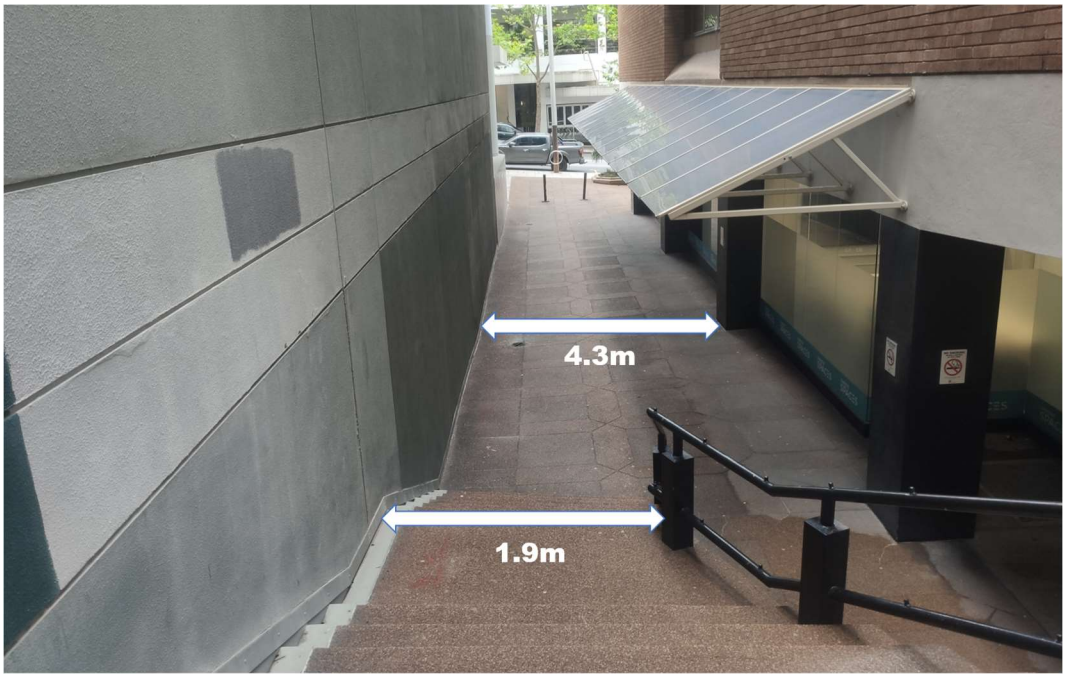

Figure 20: 100/110 Walker through site link measurements (photo taken facing Walker Street) Source: Arup

4.5 1 Denison Street through site link

A new through site link has been built as part of the 1 Denison Street redevelopment which connects Denison Street to Little Spring Street. The link is 7.6m wide without any obstructions, which will help facilitate the future high pedestrian volumes from the Victoria Cross Metro Station.

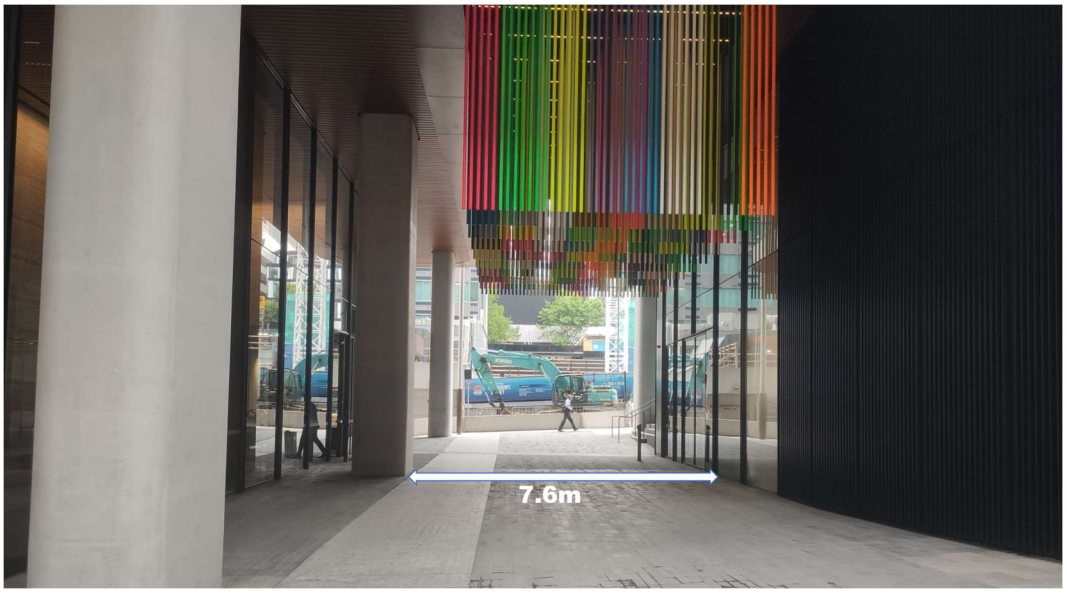

Figure 21: 1 Denison Street through site link measurement. Source: Arup

5 Analysis and results

5.1 Current Level of Service

Based on the measured footpath dimensions and methodology outlined in Section 3, Walking Space of each street/link and respective Level of Service has been calculated and shown in Table 1 and Figure 22. The "adjusted clear Walking Space" has also been calculated by incorporating the traffic buffer adjustment factor (explained in Section 3) on streets with traffic lanes. This in practice helps reduce the impact of traffic buffer and slightly increases the Walking Space width.

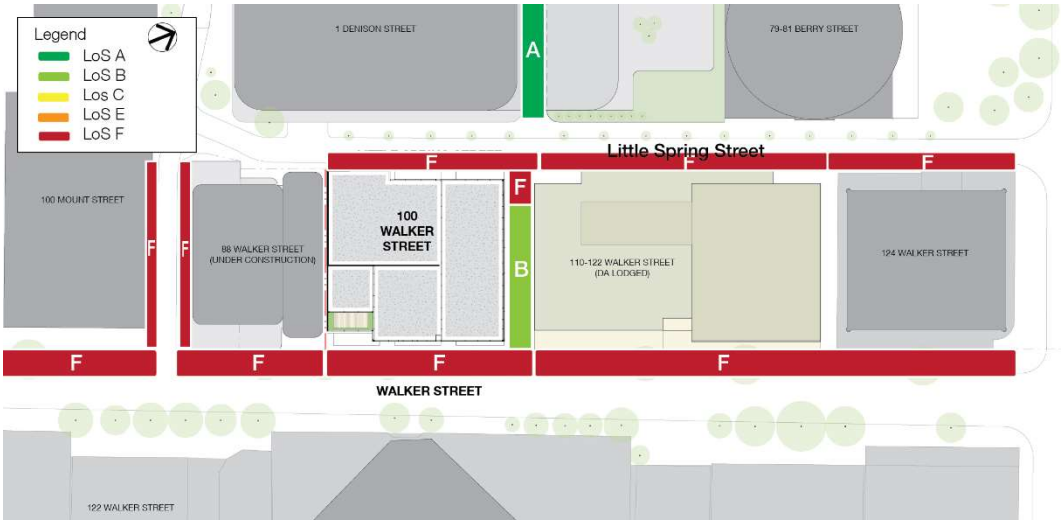

Figure 22: Existing footpath LoS results

Source: Draft DA set, Bates Smart & Arup analysis

Table 1: Existing conditions Walking Space widths and LoS results

Street and section	Category	Traffic Kerbside Buffer	Active edge buffer	Clear Walking Space	Adjusted clear Walking Space+	Walking Space LoS
Walker Section 1	Type 4	Yes	No	2.5m	2.6m	F
Walker Section 2	Type 4	No	Yes	2.8m	2.8m	F
Walker Section 3	Type 4	No	No	2.6m	2.6m	F
Walker Section 4	Type 4	Yes	Yes	2.4	2.5m	F
Spring Street	Type 4	Yes	No	0.2m / 0.8m	0.3m/ 0.9m	F

Street and section	Category	Traffic Kerbside Buffer	Active edge buffer	Clear Walking Space	Adjusted clear Walking Space+	Walking Space LoS
Little Spring Section 1	Type 4	No	No	1.6m	1.6m	F
Little Spring Section 2	Type 4	Yes	No	0m	0m*	F
Little Spring Section 3	Type 4	Yes	No	0m	0m*	F
100/110 Walker though site link	Type 4	No	No	4.3m	4.3m	B
100/110 Walker though site link stairs	Type 4	No	No	1.9m	1.9m	F
1 Denison through site link	Type 4	No	No	7.6m	7.6m	A

*Traffic buffers were adjusted by 0.1m however the Walking Space on these sections still were below the 0.8m threshold, the lowest usable Walking Space, and therefore remain as 0m.
+ For footpaths without a traffic buffer, the adjusted clear walking space will be the same as the clear walking space because no adjustment factor is applied

The results in Table 1 indicate that all footpaths except the 1 Denison through site link and 100/110 Walker through site link currently perform at a LoS of F. The threshold between LoS E and F is 2.7m Walking Space (or 2.9m when next to an active edge).

Most sections of Walker Street nearly reach this threshold, indicating that a small increase in Walking Space would shift the LoS up to E. The placement of smart poles and traffic signs can be reviewed in an effort to provide more clear Walking Space.

It's important to acknowledge that the Walking Space guide bases the adequate footpath width on facilitating the activity and scenarios which are likely to occur based on land-use and transport factors. Type 4 footpaths ideally should provide 3.7m of clear Walking Space to allow a pair of pedestrians pass another pair of pedestrians in the opposite direction.

Most sections of Walker Street had an average of 2.6m Walking Space, which performs more similarly to a Type 2 footpath. Type 2 footpaths are characterised more as a local footpath and only provides enough Walking Space for two people to use at one time. Without sufficient Walking Space, additional pedestrians using the same section of may have to walk very close to the traffic lane or wait for a gap in order to pass.

5.2 Future conditions

As outlined in Section 2.1 of the North Sydney CBD Public Domain Strategy, streets and laneways surrounding the future Metro Station will become more pedestrian-centric to support the increased pedestrian flows and activity. Traffic flows will be rearranged so that streets can be closed or become Shared Zones which will provide a safe, comfortable, active, and pleasant environment.

Traffic and parking lanes on Walker Street have been assumed to remain the same in the future, meaning the traffic buffers will apply to the same sections of Walker Street.

Shared Zones

Among the new Shared Zones are Spring Street Little Spring. As detailed public domain design of these Shared Zones and indicative cross sections are not available at this stage, the following assumptions regarding the future Walking Space will be adopted:

- Spring Street's 3.7m traffic lane will become part of the shared zone. The future street will be assessed as having 3.7m of Walking Space
- Little Spring Street's 4.9m traffic lane will become part of the shared zone. The future street will be assessed as having 4.9m of Walking Space.

These estimates are conservative as they do not take into account the existing footpath space. This was because it's likely these Shared Zones could accommodate street trees, lighting, public art or seating in the future to improve the public realm. The centre of the Shared Zone meanwhile will likely be kept clear of obstructions for pedestrian and occasional vehicle movements.

Design elements of Shared Zones, including change of pavement surface, "Give Way to Pedestrians" pavement markings and 10km/h speed restriction are pedestrian-centric and signal drivers to read the street design and behave as guests in the environment.

Through site link

Indicative designs of the through-site link between the 100-102 and 110 Walker Street developments show the presence of outdoor dining facilities with wide Walking Space available (around 4.5m) for pedestrians for the majority of the link. The stairs leading up to Little Spring Street remains the constraining cross section and is 2.9m in the future reference design as seen in Figure 23.

According to the Walking Space Guide, the stairs would need to be at least 3.9m wide in order to perform at LoS C and allow pedestrians more comfortable use

this main throughfare. It is recommended to widen the stairs up to 4.5m wide to match the width of the rest of the through site link which would increase the LoS to B.

As the DA process and refinement of design is ongoing, the Walking Space analysis should be updated if these dimensions change in the future.

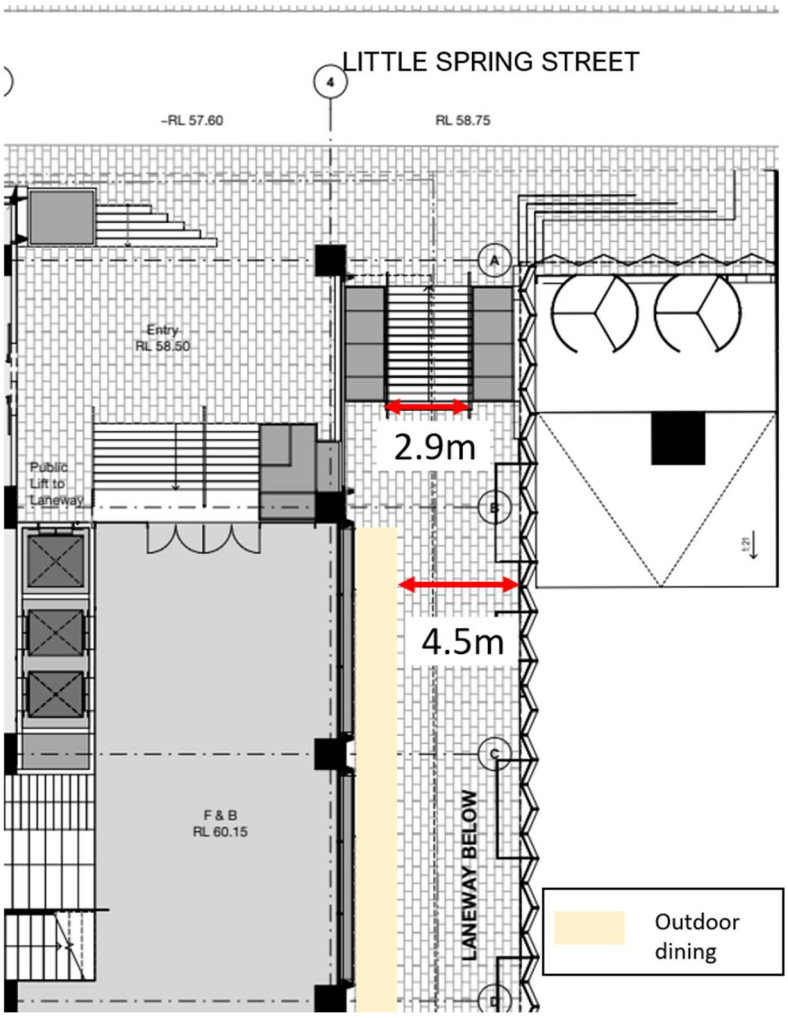

Figure 23: Through site link measurements

Source: Draft DA set, Bates Smart & Arup analysis

100-102 Walker Street footpath

Indicative DA drawings indicate that the Walking Space on Walker Street outside the future 100-102 Walker Street development will increase slightly to 3m, measured from building front to the indicative location of street trees. Since retail will be present at the front of the building, the active building edge factor will apply when evaluating the future LoS.

It is assumed that footpaths for the remainder of the Walker Street section will not change.

5.3 Future Level of Service

Footpaths were re-evaluated based on their future Walking Space width to assess the future Level of Service, results are shown in Figure 24. Table 2 documents whether footpaths will change or remain the same in the future and reveals the improved Level of Service.

Figure 24: Future footpath LoS results

Source: Draft DA set, Bates Smart & Arup analysis

Table 2: Comparison with future conditions and LoS results

	Existing			Future	
Street and section	**Clear Walking Space**	**Walking Space LoS**	**Proposed Changes**	**Clear Walking Space**	**Walking Space LoS**
Walker Section 1	2.6m	F	None	2.6m	F
Walker Section 2	2.8m	F	None	2.8	F
Walker Section 3	2.6m	F	Widening	3.0	E
Walker Section 4	2.5m	F	None	2.5m	F
Spring Street	0.3m/ 0.9m	F	Shared Zone	3.7m	C
Little Spring Section 1	1.6m	F	Shared Zone	4.9m	A
Little Spring Section 2	0m	F	Shared Zone	4.9m	A
Little Spring Section 3	0m	F	Shared Zone	4.9m	A
100/110 Walker though site link	4.3m	B	Widening	4.5m	B
100/110 Walker though site link stairs	1.9m	F	Widening	2.9m	E
1 Denison through site link	7.6m	A	None	7.6	A

New Shared Zones on Spring Street and Little Spring Street improve the LoS to Los C and A respectively. This means there will be enough Walking Space for four pedestrians to comfortably pass each other according to the guide.

Vehicles in Shared Zones must give way to pedestrians at all times and design elements of the street help reinforce the low-speed limit. It is expected that vehicle volumes along Little Spring Street will continue to remain relatively low in the future as it is primarily used to access loading docks and car parking of several developments.

Both these factors indicate that Little Spring Street Shared Zone will likely be available for pedestrians to use throughout the peak as intended by the North Sydney Public Domain Strategy.

The future widening of the stairs of the 100/110 Walker Street through site link will enable the LoS of this section to improve from F to E. However, by further widening the staircase there is the opportunity for the whole of the through site link to reach a LoS of B and create a consistent wide connection between Walker Street and Little Spring Street and offering pedestrians, metro customers and building users of the precinct a more comfortable walking experience.

5.4 Findings

The North Sydney CBD Public Domain Strategy expects up to 20,000 additional workers in the CBD by 2036. With few parking spaces available in each of the office towers, it is expected that the majority of the workforce will undertake at least part of their journey to work by foot during the commuting peak. The high-level walking space benchmarking in the Walking Space Guide classifies footpaths with a peak hour demand of >2,000 people as “Type 5” very high intensity footpaths, the need for future pavement width improvements is apparent.

This qualitative assessment highlights that the Walker Street footpath currently performs at Level of Service F and will continue to do so in the future without improvements. The stairs of the 100/110 Walker Street through site link is expected to continue be a constraining point and perform poorly in terms of walking space. There is opportunity to improve the pedestrian experience of the through site link by widening the stairway.

There is also the opportunity for the width of Walker Street footpaths to be reviewed in more detail in the next iteration of the North Sydney Public Domain Strategy, or in future detailed designs of the precinct.

However, it is expected that the amount of pedestrian activity on Walker Street will reduce as a result of the mode share shift from train to Metro. Therefore, the pedestrian improvements on Little Spring Street are vital in providing a well-connected CBD.

6 Conclusion

Footpaths and laneways surrounding the 100-102 Walker Street development have been assessed using Transport for NSW's Walking Space Guide to determine their current Level of Service and whether they are suitability wide enough to facilitate the walking activity in the area.

Footpaths were measured on a site visit to determine the current available Walking Space. The future Level of Service for these streets and laneways were also assessed by taking into account the future changes proposed in the North Sydney Public Domain Strategy.

It should be noted that the amount of space provided for most existing footpaths is quite low for a variety of historical reasons. It is common that when new standards and guidelines are introduced, old infrastructure does not measure up. In most cases it is not possible to improve everything at once, and it is advisable to move progressively toward good infrastructure standards, and to prioritise works that will address acute problems and create the greatest improvements for the largest number of people.

Key findings are:

- The Walking Space Guide classifies streets in the study area as high activity main street footpaths, which should allow four pedestrians to simultaneously pass and targets a desirable footpath with of 3.7m.
- The current Walking Space available on most footpaths in the study area is not sufficient according to the Walking Space Guide and was evaluated to perform at LoS F.
- The development will contribute minor improvements to the walking experience and footpath performance by widening the stairs of the through-site link between 100 and 110 Walker Street and widening a section of the Walker Street footpath.
- The widening of the stairs in through site link as part of this DA only increases the Walking Space by one meter, improving the LoS from F to E. It's recommended the design of through site link to be revised so that greater Walking Space is provided and so that the entire link can better support future large pedestrian flows between the Victoria Cross Metro station, the development and surrounding area.
- In the future Spring Street and Little Spring Street will become Shared Zones, widening the Walking Space and will drastically improve their LoS to C and A respectively. This improvement indicates that both these streets will be able to support the larger flow of pedestrians and activities envisioned for these laneways (Public Domain Strategy).
- Pedestrian volume counts on Walker Street and subsequent analysis may be helpful to understand demand and understand whether improvements to the Walker Street footpath are required.