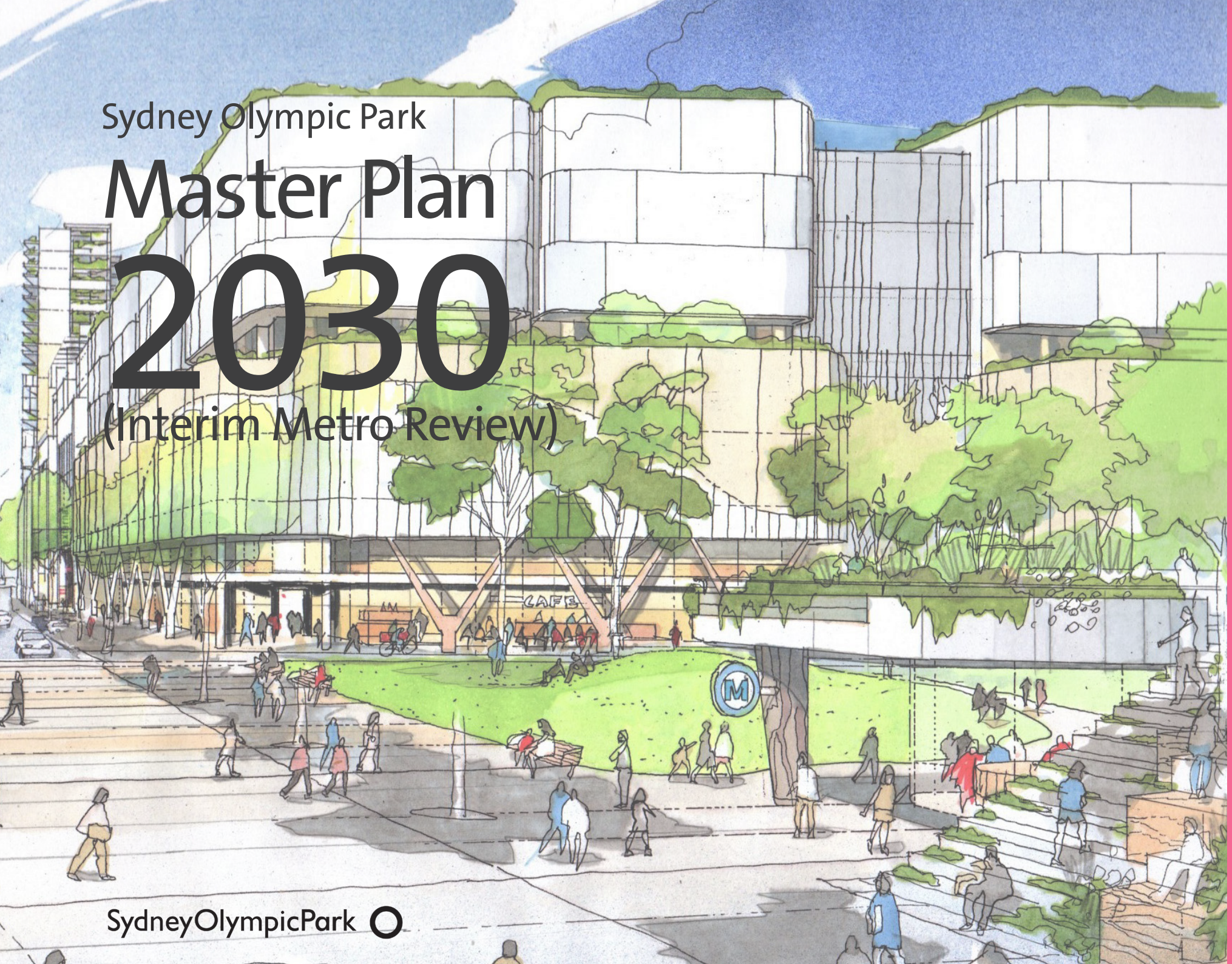
Sydney Olympic Park

Master Plan 2030

(Interim Metro Review)



SydneyOlympicPark

ANNEXURE 4: TRANSPORT STRATEGY

Design
for a better
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Sydney Olympic Park Master Plan 2030
Interim Metro Review

Transport Strategy 2021

Sydney Olympic Park Authority

5 August 2021

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Sydney Olympic Park Master Plan 2030
Interim Metro Review
Transport Strategy 2021

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	Name	Date	Signature
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Glossary of terms and abbreviations

ATL	Active Transport Link
CoP	City of Parramatta Council
DPIE	Department of Planning, Industry and Environment
bph	Buses per hour
GFA	Gross floor area
GMA	Greater Metropolitan Area
GPOP	Greater Parramatta to Olympic Peninsula
GSC	Greater Sydney Commission
KnR	Kiss-and-Ride
LoS	Level of Service

LRV	Light Rail Vehicle
PnR	Park-and-Ride
PLR	Parramatta Light Rail
PLR2	Parramatta Light Rail Stage 2
PMM	Pedestrians per meter per minute (ped/m/minute)
SMW	Sydney Metro West
SOP	Sydney Olympic Park
SOPA	Sydney Olympic Park Authority
TfNSW	Transport for New South Wales
tph	Trains per hour

Table of Contents

Background and context

Transport Strategy Review

1.1 Introduction

The Sydney Olympic Park Master Plan 2030 (2018 Review) sets out the vision for the revitalisation of Sydney Olympic Park (SOP) with a vibrant new town centre, educational facilities, shopping precinct, new homes, more jobs and increased open space and community facilities while enhancing the Park's role as the premier destination for cultural, entertainment, recreation and sporting events.

Following the commitment by the NSW Government to the delivery of Sydney Metro West within Sydney Olympic Park, Sydney Olympic Park Authority (SOPA) is pursuing an amendment to the Master Plan to facilitate and accommodate the Metro station within Central Precinct. A key component of the amendment includes refinement and changes to the street network and changes to built form controls to enable the Metro station and integrated station development.

Central Precinct is bounded by Murray Rose Avenue to the north, Australia Avenue to the east, Sarah Durack to the south and Olympic Boulevard to the west. Dawn Fraser Avenue and Herb Elliot Avenue in the north of the precinct have established urban characters comprising office buildings with continuous shopfronts along both streets, centred on the existing T7 heavy rail Train Station. Whilst the remainder of the Central Precinct, currently comprises low rise, large floorplate commercial and industrial buildings, hotels and residential flat buildings.

In summary, the amendments to the Master Plan include:

- Integration of Sydney Metro West station box into the Central Precinct;
- Integration of a pedestrian plaza from Olympic Boulevard to the Metro station;
- Location of the bus interchange on Figtree Drive;
- Refinement of the street hierarchy to integrate with the Metro station;
- Integration and connection of Central Urban Park to the Abattoir Precinct;
- Integration of fine grain streets and through site links into the urban network;
- Amendments to the land use controls to integrate the Metro station into the Central Precinct;
- Amendments to the building height controls and other planning controls as necessary.

The Metro site (Figure 1.1) comprises several parcels of land, totalling 3.3ha whilst the Central Precinct comprises 26.3ha of land.

The update of the transport strategy is focussed on the sites, street network and associated transport services which support the Metro station.

This strategy update is based upon the Transport Strategy which is in place for Sydney Olympic Park Master Plan 2030 (2018 Review). As the new yield for the Metro station sites remain the same as that of the previously approved master plan, a precinct wide traffic assessment will be included in the next 5-year review of the SOP Master Plan 2030.

The introduction of Sydney Metro, its connections with the Sydney Trains network and the associated feeder bus services represents an improved transport condition from that outlined in for Sydney Olympic Park Master Plan 2030 (2018 Review).Transport Strategy and is likely to result in a further significant shift to public transport.

Figure 1.1: Central Precinct and Metro station site location

1.1 Strategic and regional context

Sydney Olympic Park (SOP) has evolved from the site of the "best Olympic Games ever" in the year 2000 to Sydney's premier sports and leisure destination and emerging mixed use precinct.

SOP is approximately 7km east of Parramatta CBD and 15km west of Sydney CBD (Figure 1.2).

Designated a separate suburb in 2009, SOP covers an expansive region south of the Parramatta River bounded by the key arterials Silverwater Road (A6), Homebush Bay Drive (A3) and M4 Motorway.

In the 2018 *Greater Sydney Region Plan – A Metropolis of Three Cities,* SOP was identified as a Strategic Centre within the Central City District. It has also been identified as a Key Strategic Centre within the Greater Sydney Regional Plan and is well placed between the Central River City and the Eastern Harbour City to provide functionality for both.

The Central City plan identifies that SOP will develop into a lifestyle precinct with "*the potential to attract anchor tenants specialising in sports, health and physical education*". This will likely focus sporting excellence infrastructure around the existing venues within SOP.

The region has also been identified for over 10,000 dwellings (23,000 residents) and 34,000 workers to form a 'vibrant mixed-use town centre' in addition to a centre for sporting excellence.

SOP currently has indirect, infrequent and slow journey times to both the Central River City CBD in Parramatta and the Eastern Harbour City CBD in Sydney. This is despite its strategic location between the two centres.

Major public transport infrastructure improvements are proposed within SOP, including Sydney Metro West and the proposed Parramatta Light Rail Stage 2.

For active modes, the Park is well situated as part of the Principal Cycle Network between Parramatta and Sydney. Vehicular traffic primarily enters SOP via Homebush Bay Drive or Hill Road from the M4 Motorway. This was recently widened east of the site as part of WestConnex project.

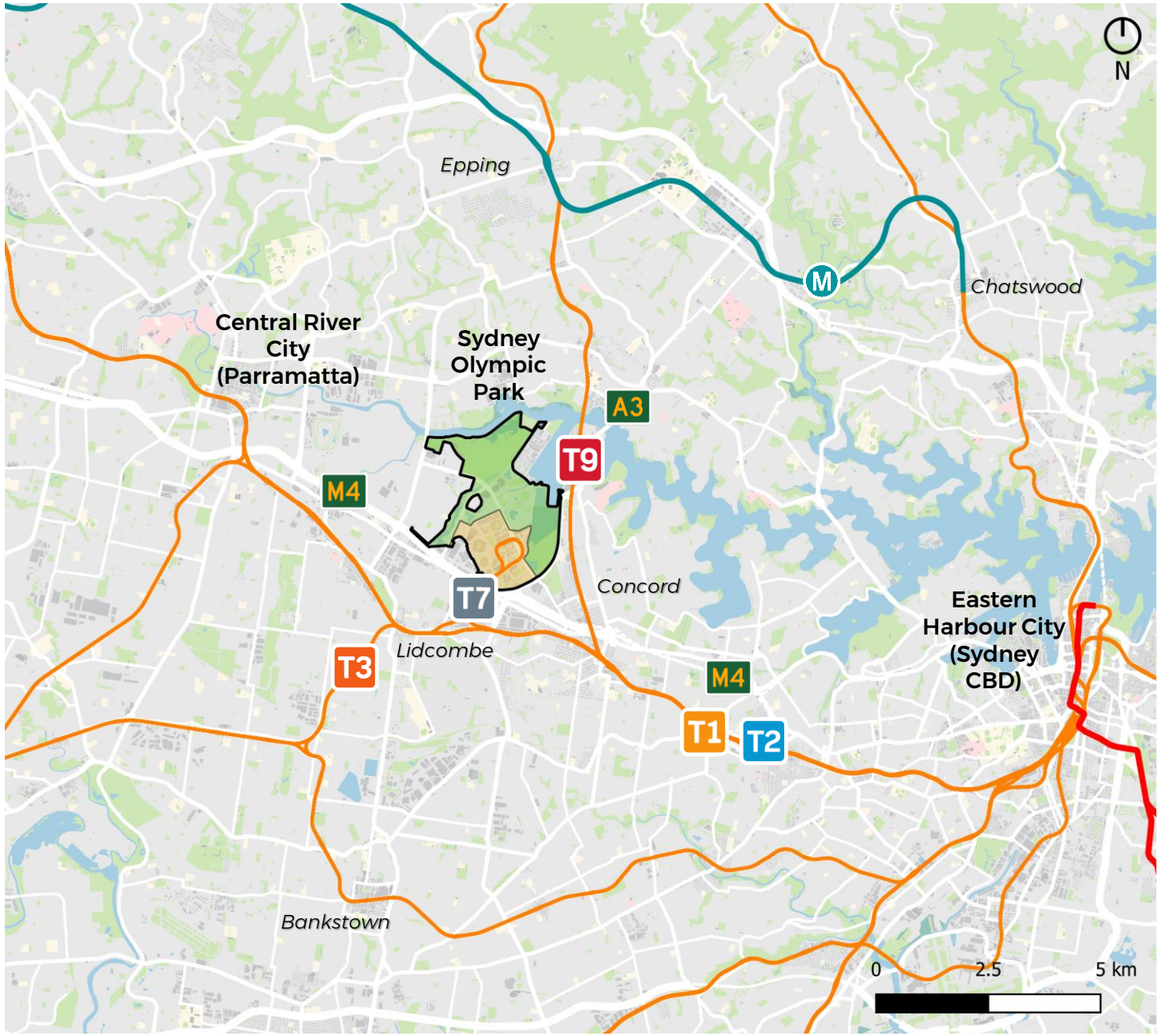


Figure 1.2: Sydney Olympic Park Regional Overview

1.2 Future transport projects

Significant transport infrastructure investment is expected in and around Sydney Olympic Park (SOP) as it becomes a key entertainment, employment and residential hub to the adjacent Central River City.

Rail

Sydney Metro West (SMW) will connect the Central River and Eastern Harbour cities of Sydney to become the easiest and most reliable journey for customers travelling between the Sydney and Parramatta CBDs (Figure 1.3).

Source: Sydney Metro West Interactive Map Portal (2021)

Figure 1.3: Sydney Metro West

The project is expected to be complete in the early 2030's and is the reason for this assessment.

In addition to increased rail capacity, SMW will improve the accessibility of SOP by drastically reducing travel times to both Sydney and Parramatta CBDs as highlighted in Table 1.1.

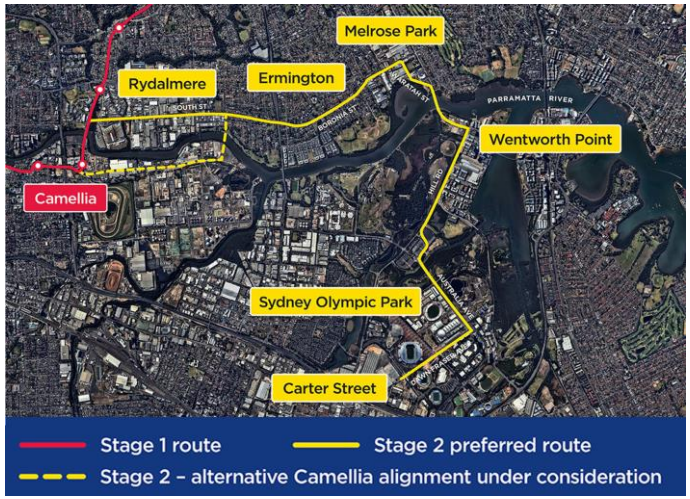
Table 1.1: Forecast travel time savings

Direction	Travel time from SOP (minutes)		
	Existing	SMW	Saving
To Parramatta CBD	23	4	~19
To Sydney CBD	38	<15	>20

Source: Sydney Metro West Environmental Impact Statement (2020)

Light Rail

The proposed Parramatta Light Rail Stage 2 (PLR2) will extend the PLR1 network (under construction) from Camellia to Carter Street via Rydalmere, Ermington, Melrose Park, Wentworth Point and Sydney Olympic Park (Figure 1.4).



Source: Parramatta Light Rail (2019)

Figure 1.4: Parramatta Light Rail Stage 2

For SOP specifically, PLR2 will increase accessibility between the precinct and key residential and educational precincts north of the Parramatta River whilst improving connectivity between SOP precincts.

The PLR2 concept also proposes a new bridge across Parramatta River between Wentworth Point and Melrose Park. This new crossing will also significantly increase the bus and active transport catchments to the north of SOP.

Funding for further investigations were recently announced in the State budget in June 2021. Hence, the additional capacity provided by this project have not been considered in the assessment. However consideration of the project has been included with respect to opportunities for future integration.

Bus

Bus operations are likely to change within SOP as a result of the aforementioned transport infrastructure and the proposed developments throughout SOP.

Changes may include relocation of bus stops and potential re-routing of bus services, including:

- Stop relocation from Dawn Fraser Avenue to Figtree Drive to improve interchange with Sydney Metro. Future of buses in Park Street is directly related to access changes associated with PLR2.
- Relocation of Dawn Fraser Avenue stops and re-routing of services to potentially south of the sports and aquatic precincts to extend public transport coverage and compliment the PLR2 alignment
- Minor changes to stops and routes to accommodate new road alignments in Central and Carter Street Precincts.

Similarly, routes may be changed or added to better align to their role as feeder services to the rail options.

Overall, with respect to the Central Precinct, connectivity via bus will be retained, albeit walking distance may increase slightly as stops are relocated. It is envisaged the relocated stops will remain within typical 5-10 minute walking catchments.

Active Transport

Based on the City of Parramatta (CoP) Bike Plan (2017), numerous additional links or improvements to existing facilities are proposed by council and other projects to improve connectivity throughout the Greater Parramatta and Olympic Peninsula region.

Delivery timeframes are not included in the plan, although key links have been identified based on CoP's multi criteria assessment which considered proximity to existing infrastructure, education precincts and public transport among other factors. These links may be delivered by 2036 to align with CoP's 20 year vision and mode-share targets.

1.3 Study area

Central Precinct

As illustrated in Figure 1.5, the Central Precinct consists of:

- Murray Rose Avenue businesses
- T7 Olympic Park Station
- Dawn Fraser Avenue retail
- Herb Elliott Avenue Commercial offices
- Abattoir heritage precinct
- Novotel, Ibis and Pullman Hotels
- Legacy warehouses and buildings from the former Australia Centre business park which have all been converted into large plate commercial offices
- Mirvac Pavilions residential development

Since 2016, significant changes to the environment surrounding the Central Precinct have been proposed, including identifying potential land use changes, new developments and additional transport infrastructure.

In 2020, Transport for NSW acquired three development sites within the Central Precinct (sites 40, 47 and 48) to construct a Metro station and the associated integrated station development on the Sydney Metro West Line.

The Central Precinct has key connections with the following adjacent precincts:

- Parkview Precinct
- Stadia Precinct
- Parklands
- Boundary Creek
- Central Sport
- Sydney Showground

Sydney Metro sites

The lots on which the Metro station is located upon include master plan development sites 40, 47 and 48. The land uses proposed on these sites as part of the integrated station development include:

- Residential
- Non-residential
- Retail
- Commercial
- Education

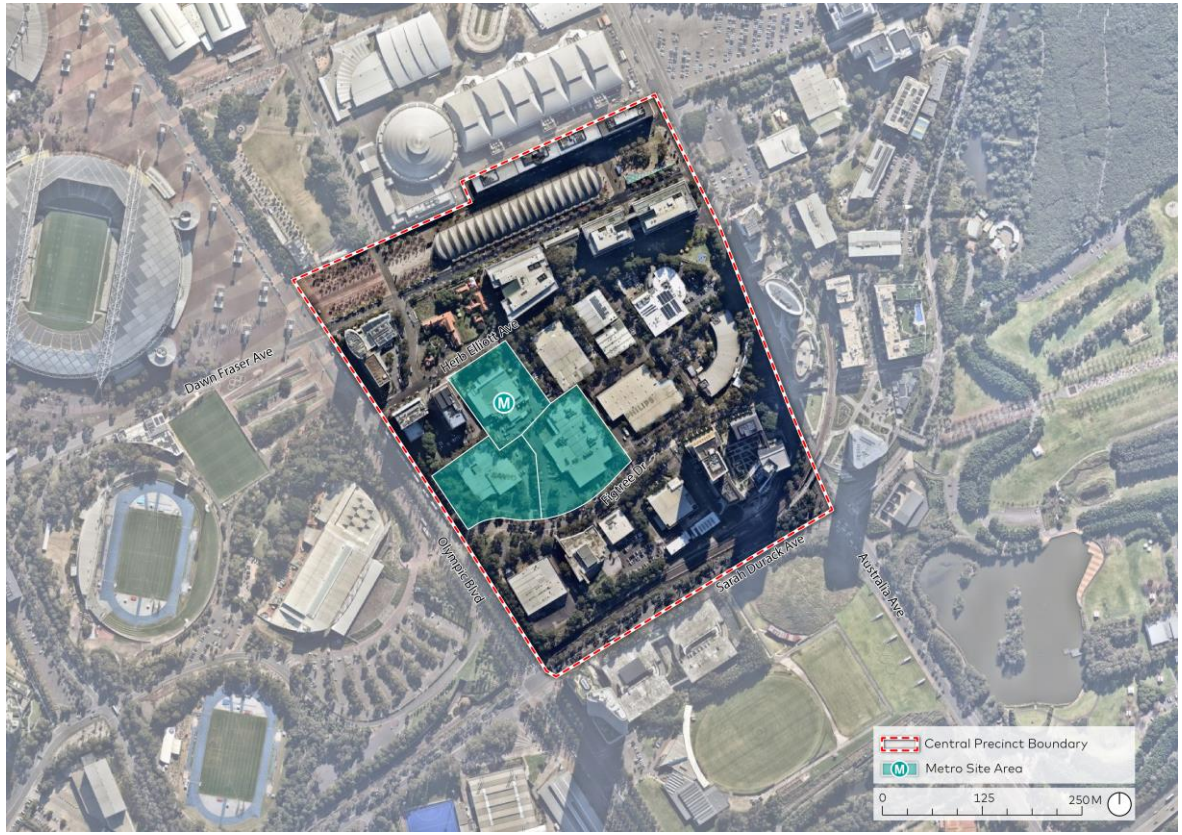


Figure 1.5: Sydney Metro station sites within the Central Precinct

1.5 Purpose of document

This document seeks to review and update information related to transport planning within the Central Precinct and describe how it has evolved since the Sydney Olympic Park Master Plan 2030 (2018 Review).

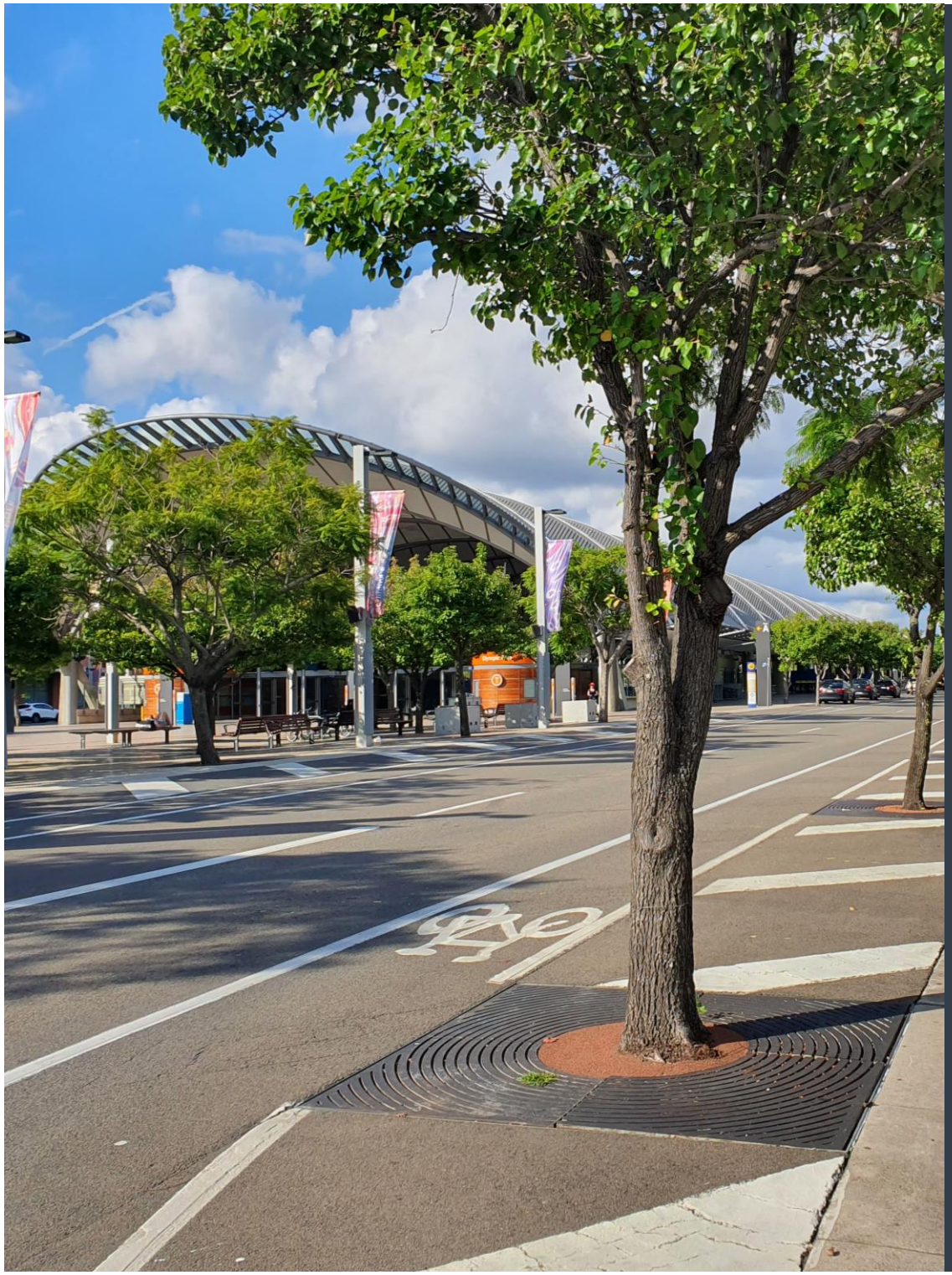
This includes consideration of changes to and integration with the wider Olympic Peninsula. This includes a strategic level analysis of:

- Background and Strategic Context – The regional setting and the park's influence within the Central River City and Greater Parramatta Olympic Peninsula
- Public and Active Transport – Review of existing and future provision with recommendations on strategies and upgrades to increase non-car mode shares.
- Pedestrian Analysis – An assessment of current pedestrian numbers and likely impact on space, clearance and width requirements for events and walking catchments.
- Traffic and access strategy – identifying preferred access and egress points for the precinct.
- Transport Infrastructure – Identification of transport infrastructure which will facilitate development within the Central Precinct.

As noted previously, this strategy update will leverage, and refine the work undertaken to date including the various guidance documents developed by the Government architect and Transport for NSW such as those highlighted in Figure 1.6.

SOPA is seeking an interim amendment to the SOP Master Plan 2030 (2018 Review) to update the Sydney Metro development sites and controls for the Central Precinct. This document forms an input to this and is focused on traffic and movement within the Central Precinct directly influenced by the Sydney Metro sites and integrated station development located within.

Figure 1.6: Relevant studies and guidance



Existing transport conditions

Transport Strategy Review

2.1 Existing public transport connections

The Central Precinct is located near the heart of Sydney Olympic Park, and is hence well connected to the active and public transport services and infrastructure which service the region.

Rail

Located 300m from the centre of the Central Precinct, Olympic Park station provides access to the T7 Olympic Park line. During normal operations, shuttle services operate between Lidcombe and Olympic Park with up to 6 trains per hour everyday.

Approximately 2,400 people currently travel through Olympic Park Station per day. Of these, approximately 200 interchange with connecting bus services.

Bus

Several regular bus routes operate through Sydney Olympic Park, either terminating at Olympic Park Station in Park Street or continuing through the precinct along Dawn Fraser Avenue. Bus routes that travel through SOP include:

- Route 525 (Parramatta – Burwood) up to 3 buses per hour (bph) in each direction
- Route 526 (Burwood – Rhodes Shopping Centre) up to 2 bph in each direction
- Route 533 (Chatswood - Sydney Olympic Park via Rhodes & North Ryde) up to 6 bph in each direction.

Additionally, bus services operate along Carter Street:

- Route 401 (Lidcombe Station loop) 2 bph during weekday peak periods only.

The busiest bus stops in Sydney Olympic Park are located within the Central Precinct and are located on Australia Avenue, Park Street and Dawn Fraser Avenue.

The existing T7 Olympic Park station is within the 400m walking catchment of the Central Precinct.

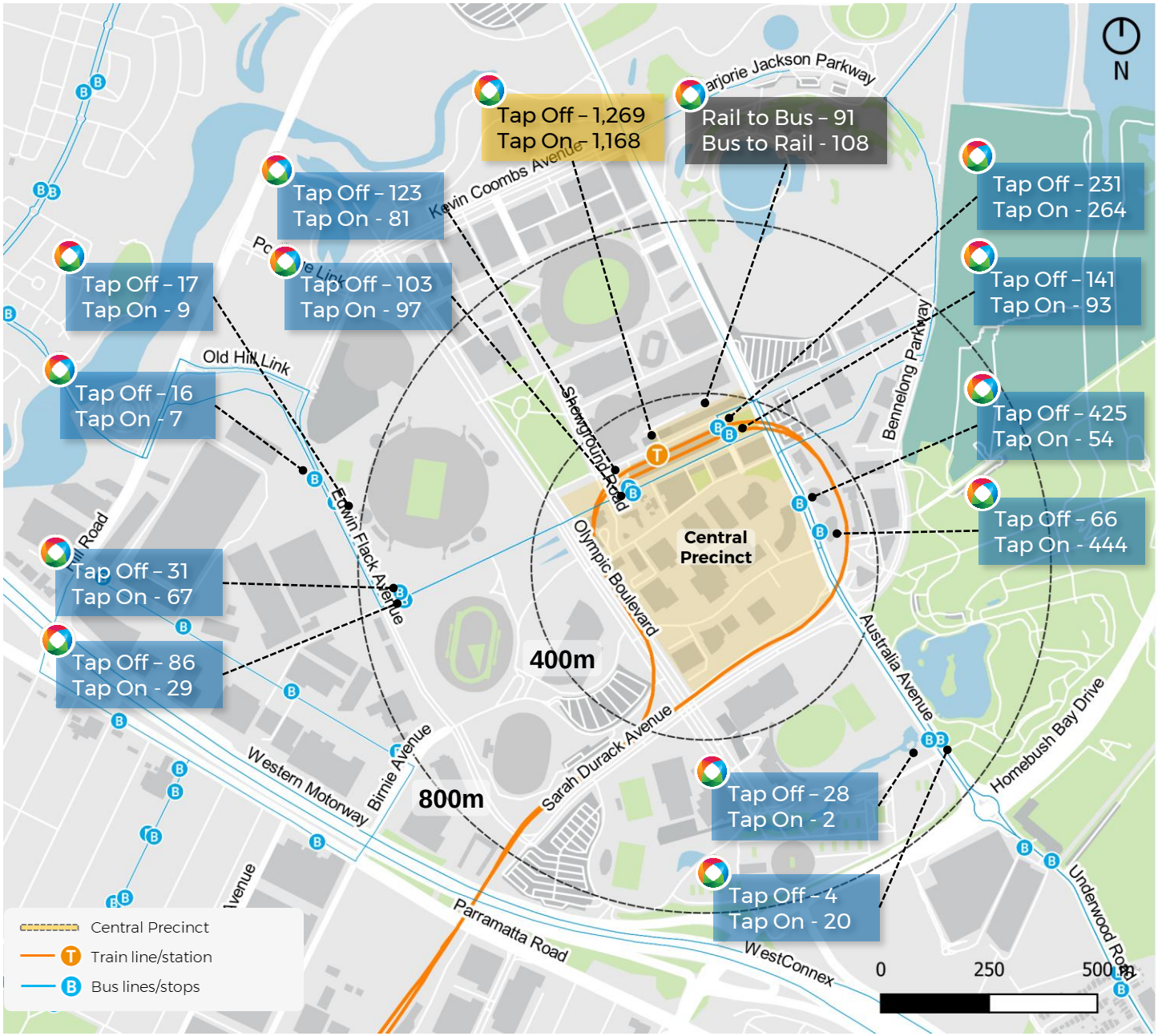


Figure 2.1: Current Public Transport passengers (rail and bus) (Transport for NSW, March 2019)

2.2 Existing active transport connections

Active Transport

Existing walking and cycling infrastructure provides connectivity within the Olympic Peninsula, as well as connections to the:

- North (Rhodes, Ryde) via Bicentennial Park
- East (Sydney CBD) via Bicentennial Park or Underwood Road through to key routes along Queens Road and Lyons Road.
- West (Parramatta CBD) through John Ian Wing Parade and Holker Busway through to M4 Cycleway and Parramatta Valley Cycleway
- South (Lidcombe) via Hill Road and Birnie Avenue.

Sydney Olympic Park has a network of 34km of shared pathways which link the town centre with the Parklands. On road cycle lanes also exist on the major roads which bound the Central Precinct. Olympic Boulevard is a low volume street with wide traffic lanes and provides a safe environment for cycling even though it is not designated as a cycling route.

In recent years, development funded upgrades to walking and cycling infrastructure include the grade separation of both the railway and Bennelong Parkway through the Opal Tower development. This key link also reinforces the existing bridge across Australia Avenue from the linear green space at the southern end of the Central precinct. This network also ties in with the intersection of Figtree Drive and Australia Avenue. These links are vital for providing safe and efficient access to the Parklands from the Central Precinct.

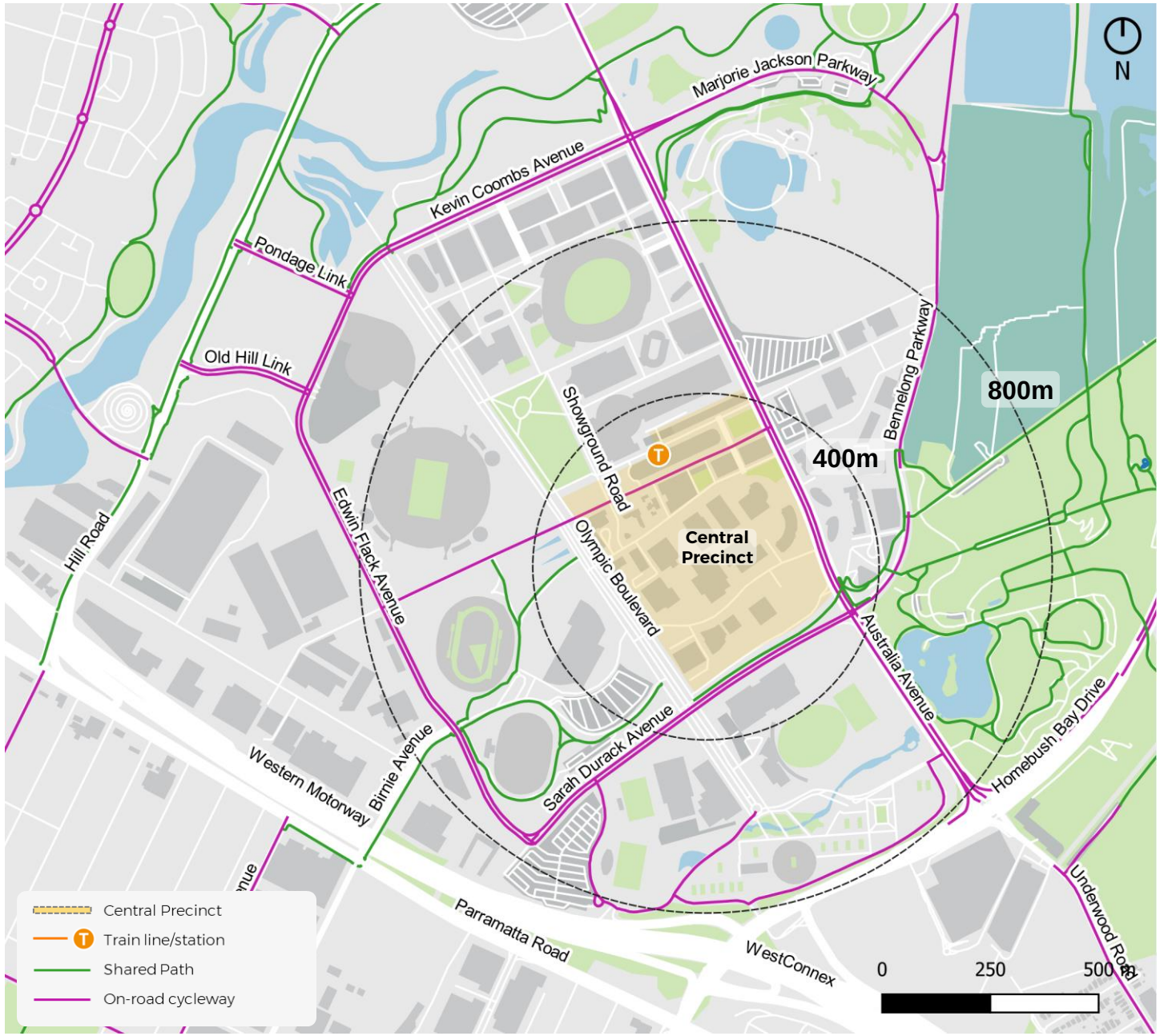


Figure 2.2: Current Active Transport Connectivity

2.3 Existing traffic performance

Traffic performance of the Olympic Peninsula road network is heavily influenced by the surrounding adjacent developments such as Wentworth Point, Newington and Carter Street .as well as development generated by Sydney Olympic Park.

Whilst Newington is well established, Wentworth Point is reaching the end of its transition from industrial to high density waterfront residential whilst Carter Street is reaching approximately 25% completion of its redevelopment.

The key intersections for the Central Precinct include the gateway intersection of Australia Avenue and Homebush Bay Drive (A3) and the intersection of Australia Avenue, Sarah Durack and Bennelong Parkway. Both of these intersections are planned for upgrades and funding has been approved.

In mid 2019 and early 2020, extensive traffic surveys and performance assessment was undertaken as part of a review of the Sydney Olympic Park Event Transport Management Plan. This study assessed three key scenarios:

- Weekday PM commuter peak
- Weekday PM commuter peak with State of Origin event
- Weekend PM peak with both a Stadium Concert (Queen) and an Arena concert (Alice Cooper)

Figure 2.3 outlines the traffic performance of key intersections on the local SOP road network. During non-event PM weekday commuter peak, all intersections operate at Level of Service (LoS) A or B with the exceptions of Australia Avenue / Herb Elliott Avenue, Australia Avenue / Sarah Durack, Edwin Flack Avenue and Dawn Fraser Avenue and Edwin Flack Avenue and Pondage Link which operate at LoS C or D.

When events coincide with the PM peak (event arrival) poor levels of service are experienced at Australia Avenue / Sarah Durack, and Edwin Flack Avenue and Pondage Link which operate at LoS E or F..

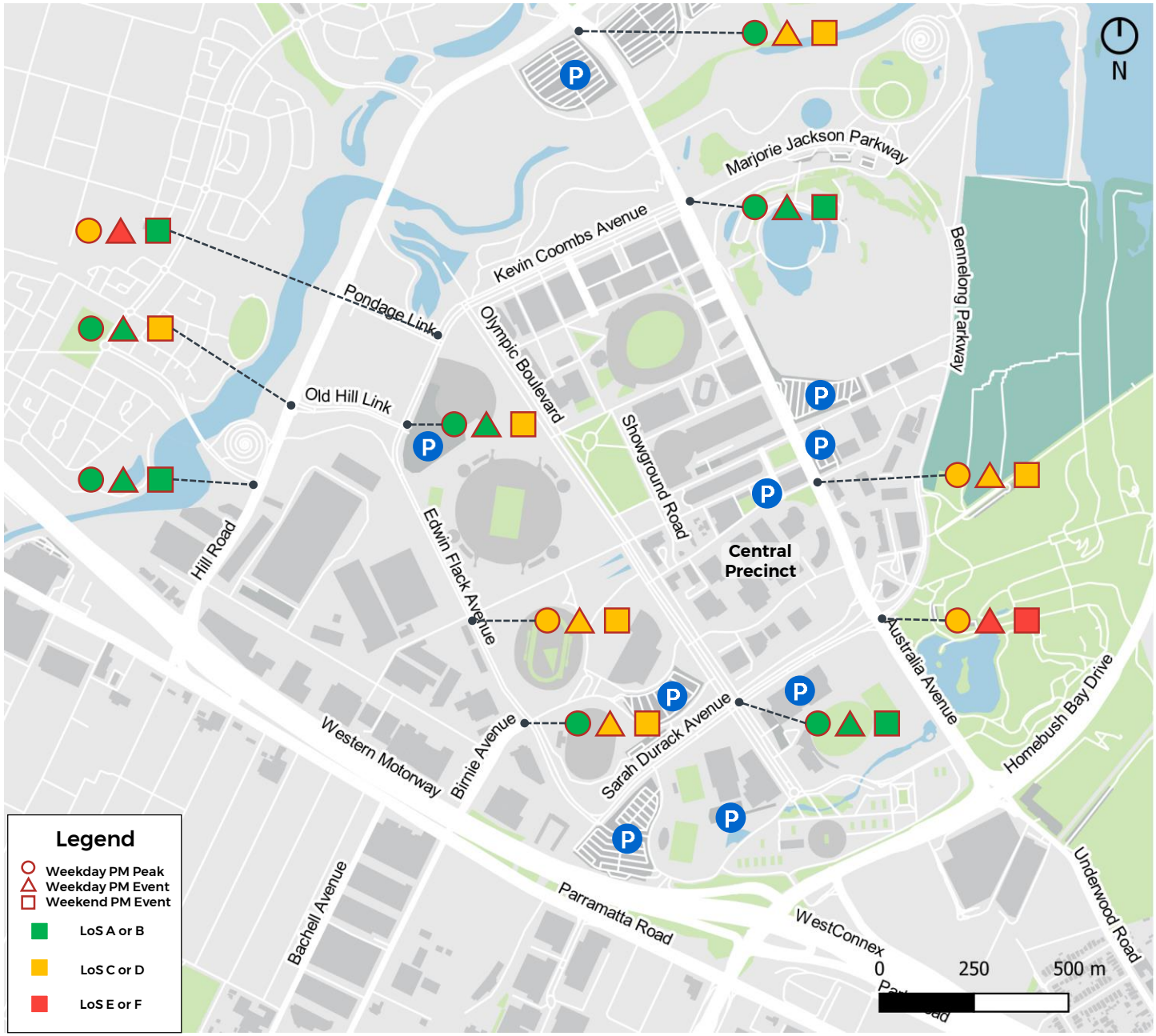


Figure 2.3: Existing event arrival (PM peak) traffic performance

2.4 Existing event traffic performance

For the weekend PM peak period (event arrival), only the Australia Avenue / Sarah Durack intersection operates at LoS E or F.

Figure 2.4 outlines the traffic performance of key intersections on the local SOP road network during event departures. For both events this time period was typically around 10:00pm when background local traffic is low.

During the weekday event departure, all intersections operate satisfactorily with the exceptions of Australia Avenue / Herb Elliott Avenue, Australia Avenue / Sarah Durack which operate at LoS E or F. This is directly related to the amount of event parking provided in car parks P6A, P6D and P8. A significant amount of informal drop-off and shared mobility services.

On the weekend event egress the only poor performing intersection was Hill Road and Old Hill Link which distributes traffic to the South west and North west of Sydney via the M4 Motorway, Parramatta Road and Silverwater Road.

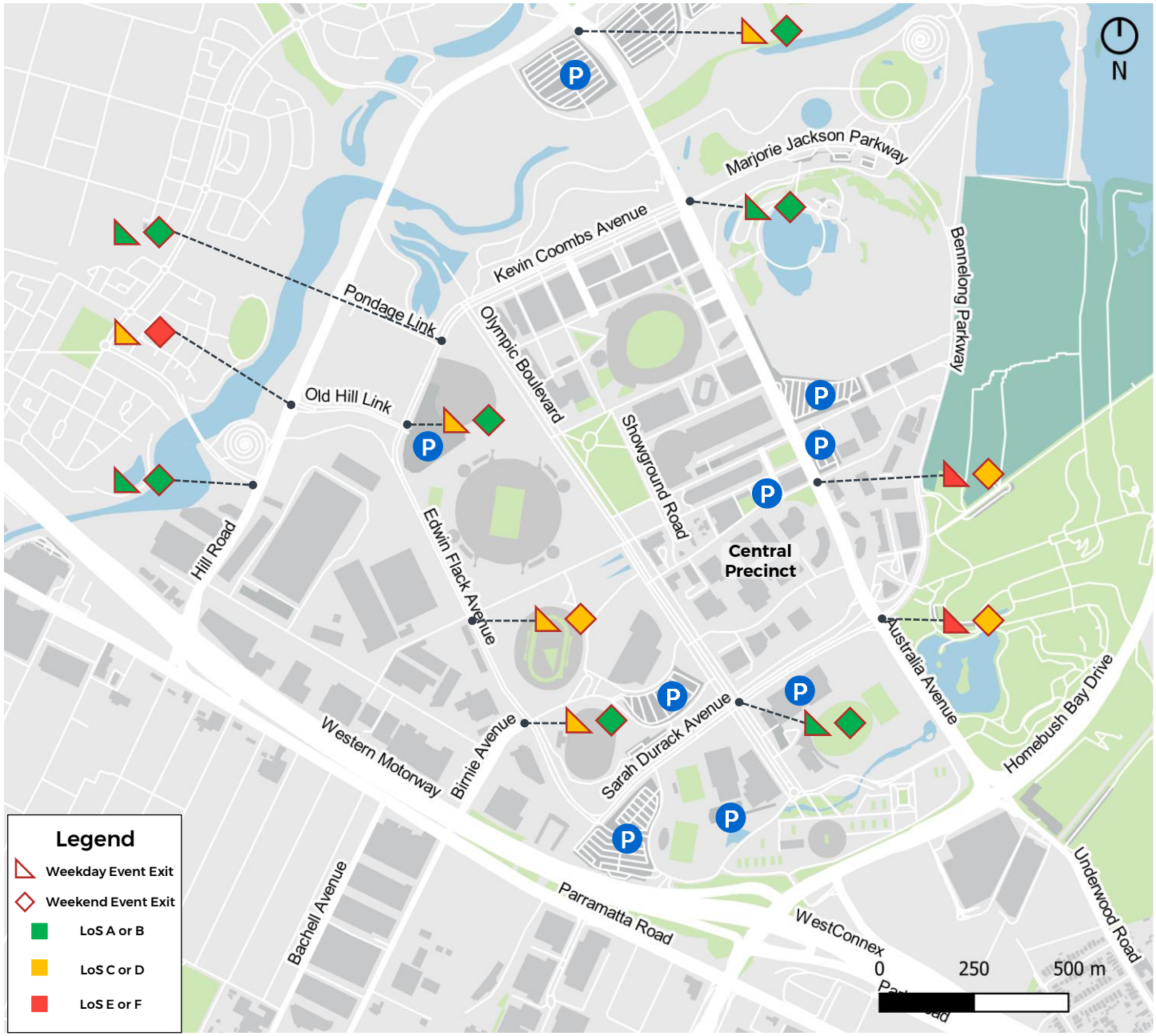


Figure 2.4: Existing event departure traffic performance

2.5 Existing public parking

On-street parking

There are a total of 199 existing on-street parking spaces located within the Central Precinct (Figure 2.5). :The majority of these are around the existing Town Centre adjacent to Olympic Park Station. There is only limited parking in Figtree Drive.

- Dawn Fraser / Murray Rose (90 spaces)
    - 1/2 P spaces (90)
- Herb Elliott Avenue (64 spaces)
    - 2min spaces (6)
    - ¼P spaces (9)
    - ½P spaces (11)
    - 1P spaces (26)
    - Taxi (9)
    - Accessible (3)
- Figtree Drive (32 spaces)
    - 2P spaces (32)
- Showground Road (13 spaces)
    - 1P spaces (13)

Off-street parking

There is only one off-street public parking facility located within the Central precinct in P8 Car Park located on Herb Elliott Avenue which has a capacity of 212 spaces.

There is a significant amount of off-street parking (2,805 spaces) immediately adjacent to the Central precinct. This parking supports both events and recreational facilities such as the Aquatic Centre and Sydney Showground.

- P2 – 495 spaces
- P3 – 1,449 spaces
- P6A – 640 spaces; P6D 221 spaces

Figure 2.5: Current on-street parking within the Central Precinct

2.6 Existing travel behaviour

Journeys from SOP for work (2016 Census)

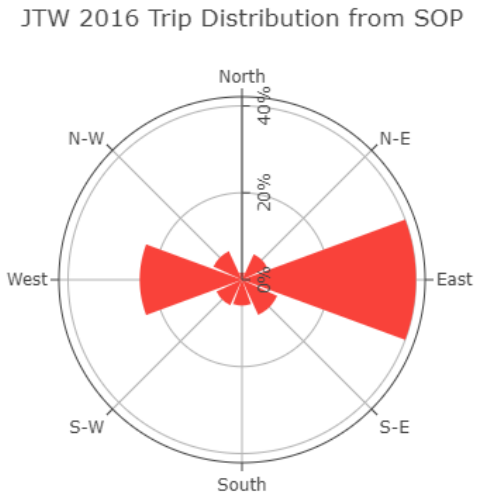
The majority of residents commuting from Sydney Olympic Park currently head east from the precinct primarily to Sydney CBD or internally within the Homebush Bay – Silverwater LGA.

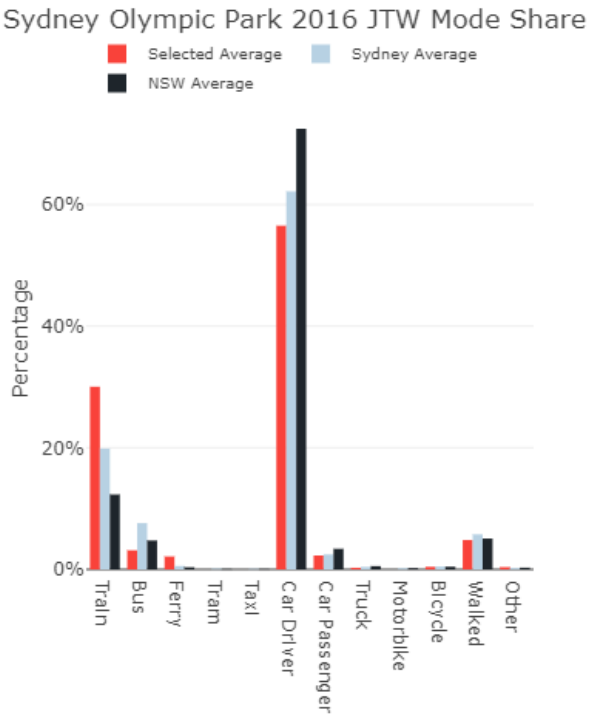
Train travel is higher than the Sydney average accounting for approximately 30% of trips. This is likely constrained by the need to transfer from T7 services to mainline T1/T2 services at Lidcombe.

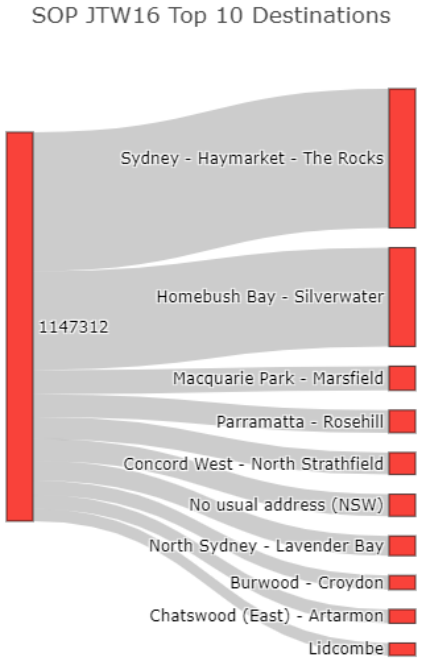
Overall, car travel driver is the dominant mode with driver and passenger trips accounting for around 55% of trips. This is typical existing travel behaviour for Western Sydney.

Bus travel is low accounting for approximately 3% of all trips which is lower than the Sydney average. Sydney Olympic Park is not located on a rapid bus corridor.

Overall, walking trips are in line with the Sydney and NSW average indicating that there is some sufficiency in terms of homes and jobs.







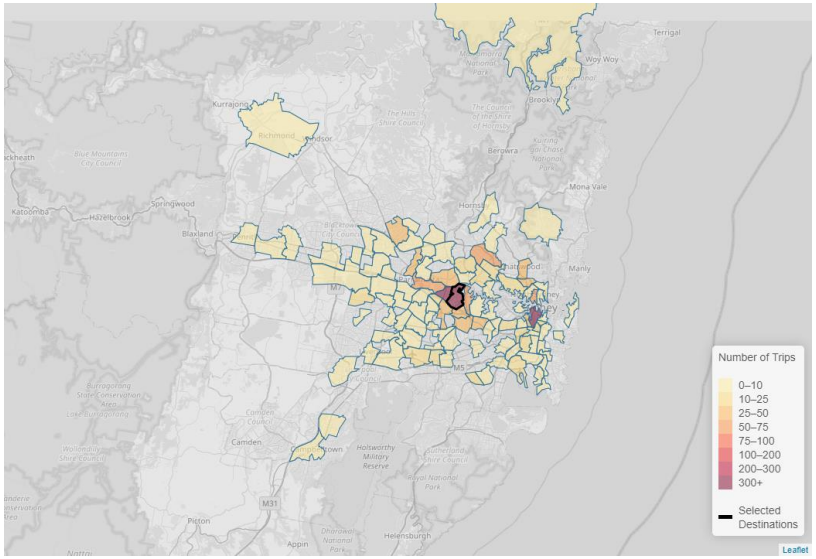


Figure 2.6: Journey to work data from Sydney Olympic Park to work

2.6 Existing travel behaviour

Journeys to SOP for work (2016 Census)

The majority of those working at SOP come internally from the Homebush Bay – Silverwater LGA. There is also an agglomeration of origins in the north west and west

More than 80% travel to work by car or as a passenger. This is significantly higher than both the Sydney and NSW averages.

Travel by all modes of public transport are less than the Sydney and NSW averages.

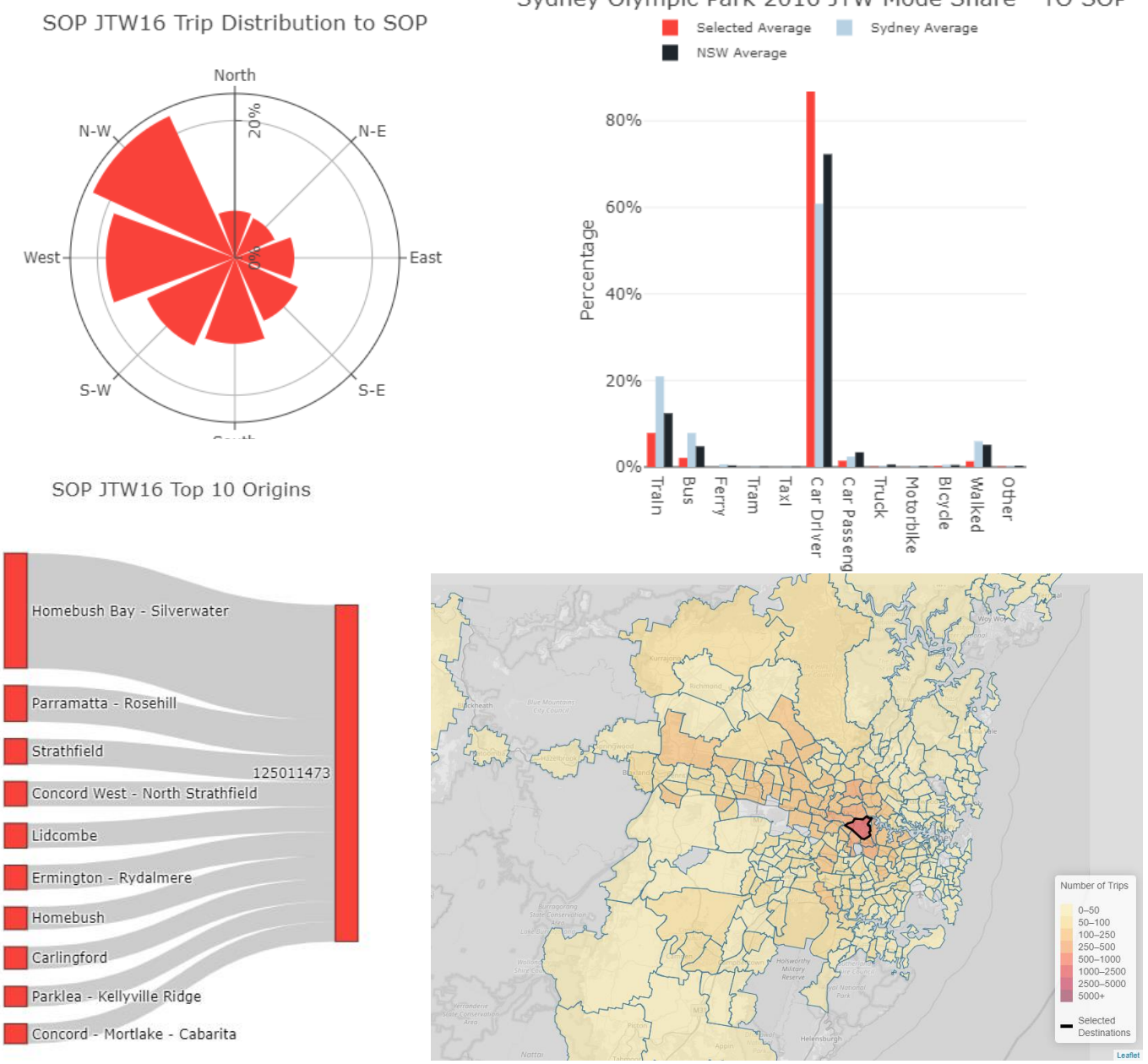


Figure 2.7: Journey to work data to Sydney Olympic Park for work

2.6 Existing travel behaviour

To understand the travel behaviour for different trip purposes beside commuter trips, and analysis of SA3 zones from the 2018/19 Household Travel Survey has been undertaken. Sydney Olympic Park is located within the Auburn SA3 zone.

A number of centres have been selected for comparison which represent the areas adjacent to SOP (Strathfield / Burwood) and those which are considered more like the future character of SOP (Chatswood and Ryde). The travel analysis by SA3 is summarised in Table 2.1.

The key trip purposes for the Auburn SA3 include:

- Social / Recreation (30.3%)
- Commute (22.8%)
- Serve passenger (14.8%)
- Shopping (14.6%)
- Education / Childcare (7%)
- Personal business (5.7%)
- Work-related business (3.1%)
- Other (1.7%)

The Auburn SA3 has the lowest non-car mode share of 38% when compared with other centres. with walking and train being the dominant sustainable transport modes.

Despite the extensive network of cycling connections, only 0.3% are classified in the "other" category. The adjacent zone of Strathfield / Burwood has close to the Sydney average of 2%.

Bus travel within the Auburn SA3 is significantly lower than other centres due to the dominance of train and the lack of rapid bus routes., frequency of service and span of hours of operation.

An analysis of transport accessibility for a 30 minute journey time using private vehicle and public transport has been undertaken using WSP's Customer Connectivity Tool for public transport trips and a GIS analysis using Google vehicle travel time data for a Tuesday at 8:30am from 2019 (pre-Covid).

As can be seen in the following figures, accessibility to and from SOP within 30 minutes travel time during the AM peak is significantly greater for private vehicle over public transport even considering traffic congestion.

The same 30 minute extent for car is beyond most of the suburbs of the 60 minute catchment for public transport.

Table 2.1: Travel mode and trips (2018/19) Household Travel Survey (SA3s)

Transport Mode	Auburn	Strathfield / Burwood	Chatswood / Lane Cove	Ryde / Hunters Hill
Walk only	11.8% / 51,000	17.1% / 119,000	19.5% / 127,000	13.7% / 90,000
Walk linked	14.5% / 63,000	30.3% / 211,000	21% / 136,000	20.6% / 134,000
Other	0.3% / 1,000	1.9% / 13,000	1.4% / 9,000	1% / 7,000
Train	9% / 39,000	13.3% / 93,000	4.9% / 32,000	4.3% / 28,000
Bus	2.6% / 11,000	5% / 35,000	7.3% / 47,000	8.2% / 54,000
Vehicle passenger	17.5% / 75,000	8.5% / 59,000	12.7% / 82,000	15.5% / 101,000
Vehicle driver	44.3% / 191,000	23.9% / 167,000	33.1% / 215,000	36.5% / 239,000
Non-car mode share	38.2% / 431,000	67.6% / 471,000	54.1% / 351,000	47.8% / 313,000

2.7 Precinct accessibility

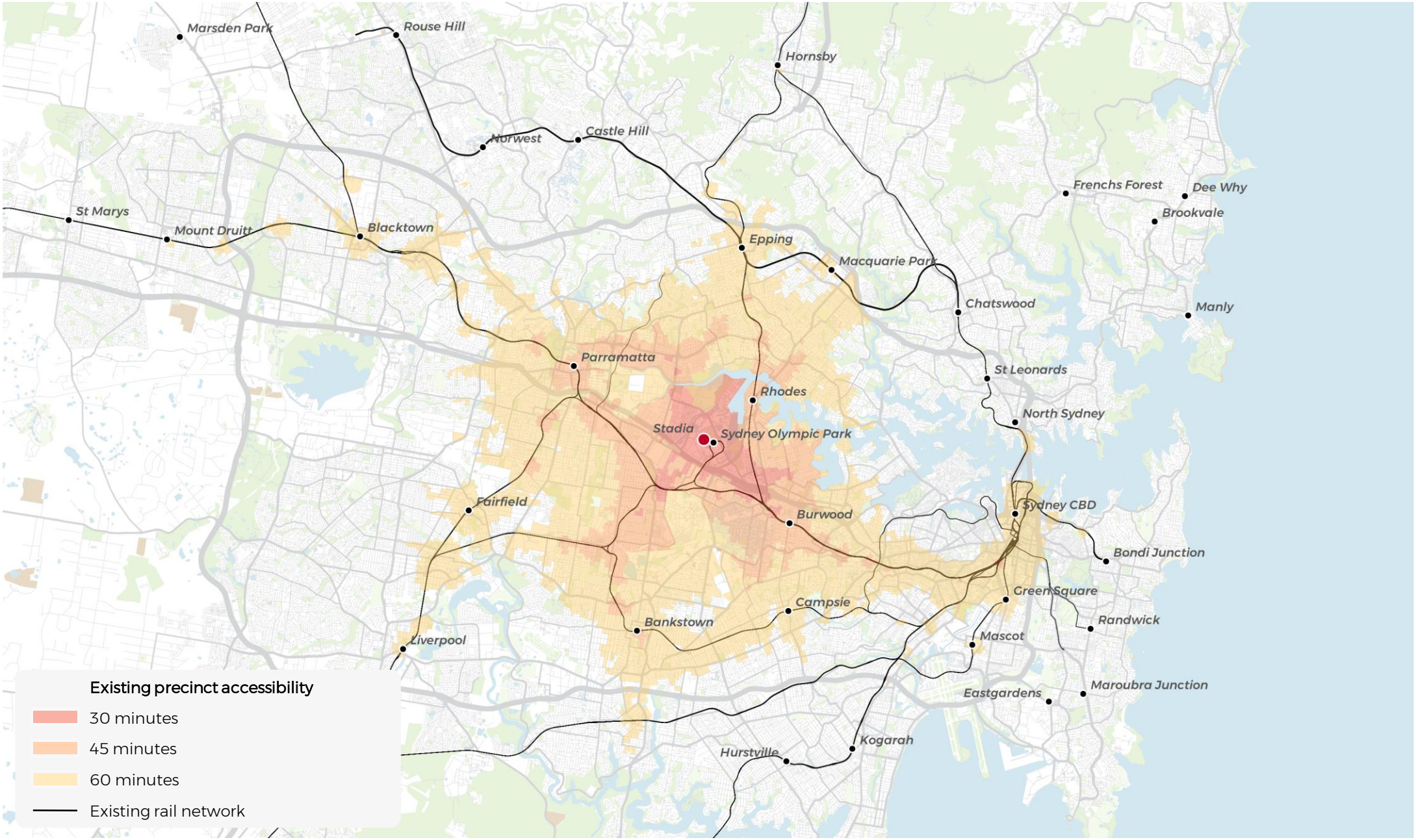


Figure 2.8: Central Precinct accessibility – existing public transport network

2.7 Precinct accessibility

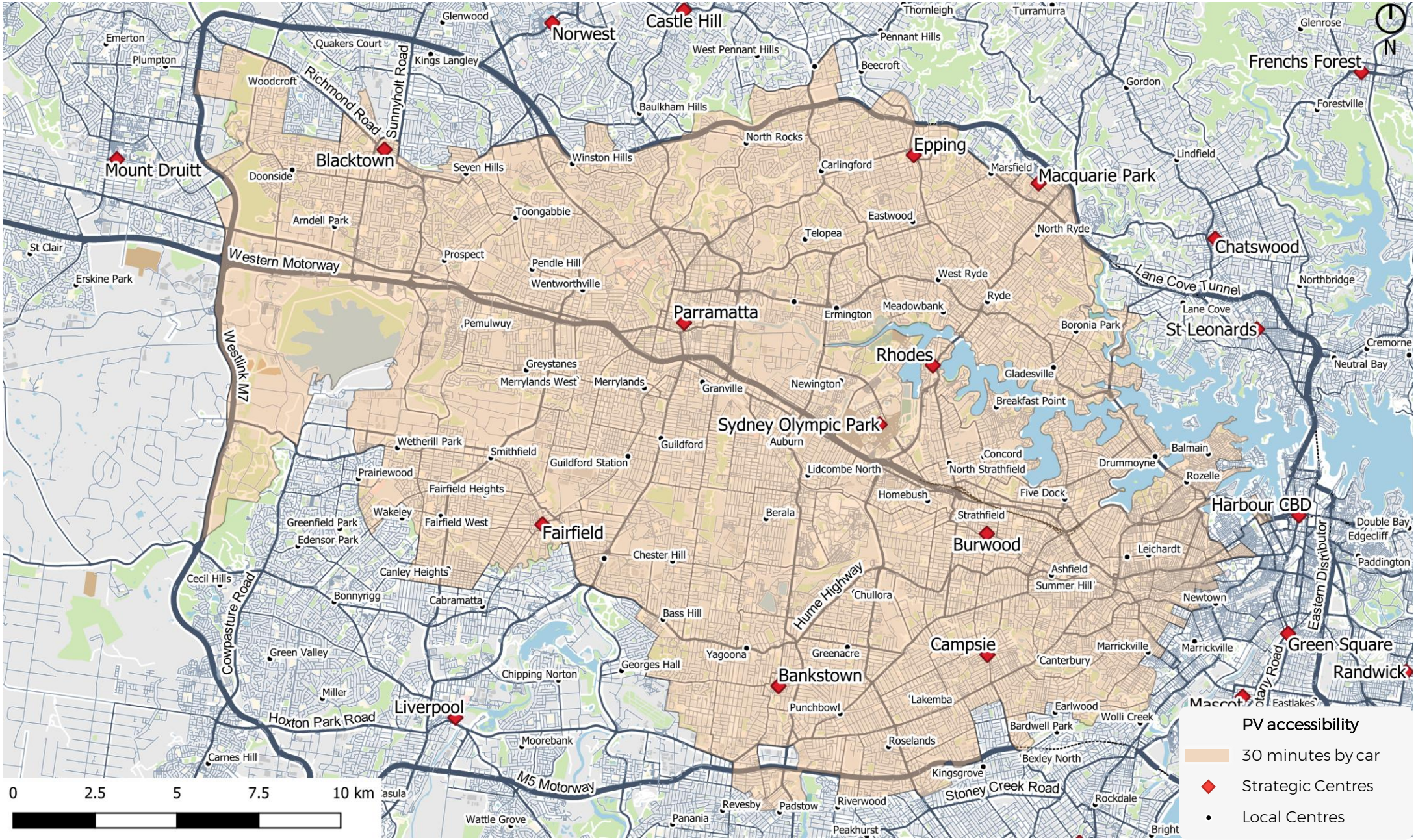


Figure 2.9: Central Precinct accessibility – existing private vehicle (AM peak)

2.8 Event transport mode split

In developing the Central Precinct, maximising the accessibility and integration between developments and transport infrastructure (existing and proposed) is vital. However, any changes must not preclude the ability of Sydney Olympic Park, as Sydney's premier sports and entertainment precinct, to host major events. In particular at Stadium Australia and Qudos Bank Arena, which reside within the Stadia Precinct.

This document considers two simplified operational scenarios for events at Sydney Olympic Park:

- Regular events (assumed 10,000-20,000 attendees)
- Major events (assumed > 50,000 attendees)

The key difference between these scenarios is the event patronage, which often defines the public transport services and infrastructure available to event customers.

Transport provisions for other large events, such as the 20,000 to 50,000 range, often have a combination of transport provisions for a regular or major event depending on the sporting code or concert type.

During 2017 and 2018, up to 34 events had 20,000 attendees or greater, of which up to 12 exceeded 50,000 (excluding the Royal Easter Show). This data represents a steady state for events pre-Covid.

However, the definition (or threshold patronage) for regular, large or major event is not consistent across all transport operators.

Hence, with addition of potential future transport options (including Sydney Metro West and Parramatta Light Rail Stage 2), it is recommended that an agreed definition for events scenarios are adopted for consistency with all transport operators within SOP.

Existing event transport provisions

Currently during a typical regular event:

- T7 Olympic Park line operates as a shuttle service to Lidcombe.
- Regular route buses continue to operate

Figure 2.10 illustrates the typical regular event mode split.

During major event operations, public transport options are expanded to include:

- T7 Olympic Park line operating between Central and Blacktown
- Special event buses.

Figure 2.11 illustrates the typical major event mode split.

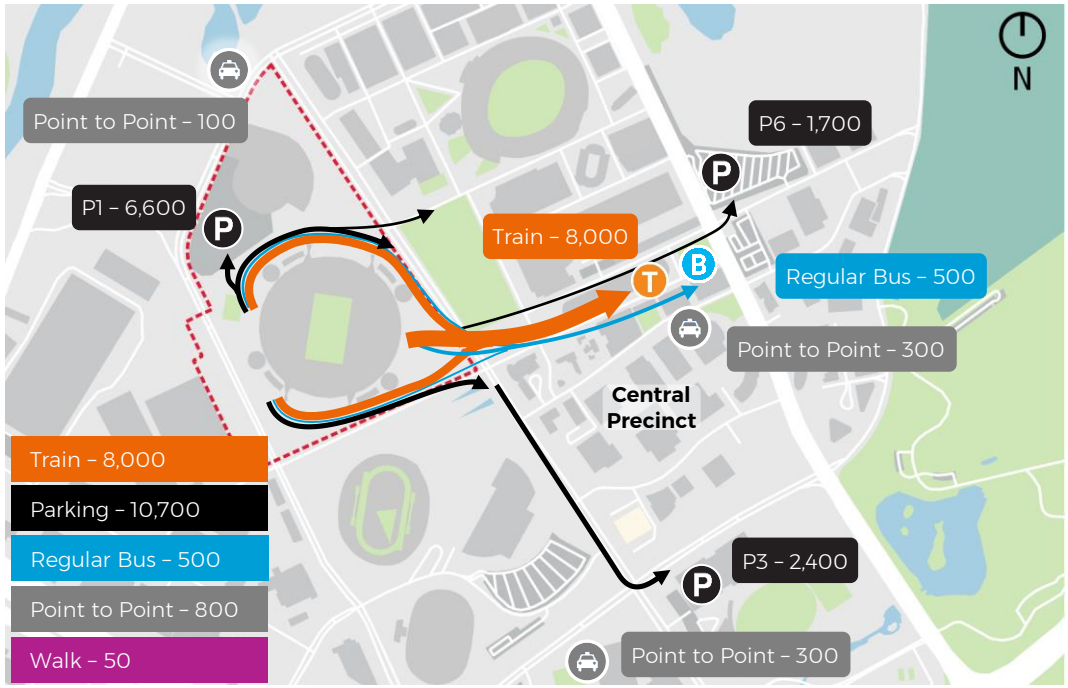


Figure 2.10: Regular event mode split - existing (typical 20,000 event)

Figure 2.11: Major event mode split – existing (typical 83,500 event)

2.9 Existing event bus operations

Current overview

Event buses operate in SOP during some large and major events to:

- supplement rail capacity and provide reliable public transport access to areas not well serviced by rail
- provide flexibility in increasing service delivery at relatively short notice.

Currently nine event bus routes operate to and from SOP during select large and major events (Table 2.2).

Table 2.2: Event bus routes

Route	Destination
1A	Warriewood via Chatswood and Dee Why
1B	Warriewood via Macquarie Park and Mona Vale
2	Glebe via Ryde
4	Maroubra via Campsie and Rockdale
5A	Hills Showground Station via Northmead
5B	Rouse Hill Town Centre via Bella Vista
6	Woronora via Bankstown
7	Cronulla via Hurstville
8	Dural via Carlingford

As illustrated in Figure 2.12 event buses utilise existing bus priority infrastructure within the vicinity of SOP, and operate from two dedicated bus terminals within SOP. The bus routes are split between the two terminals:

- Plaza Terminal (on Olympic Boulevard near Qudos Bank Arena) accommodates routes 5A, 5B, 6, 7 and 8
- Aquatic Terminal (on Olympic Boulevard near the Aquatic Centre) accommodates routes 1A, 1B, 2 and 4

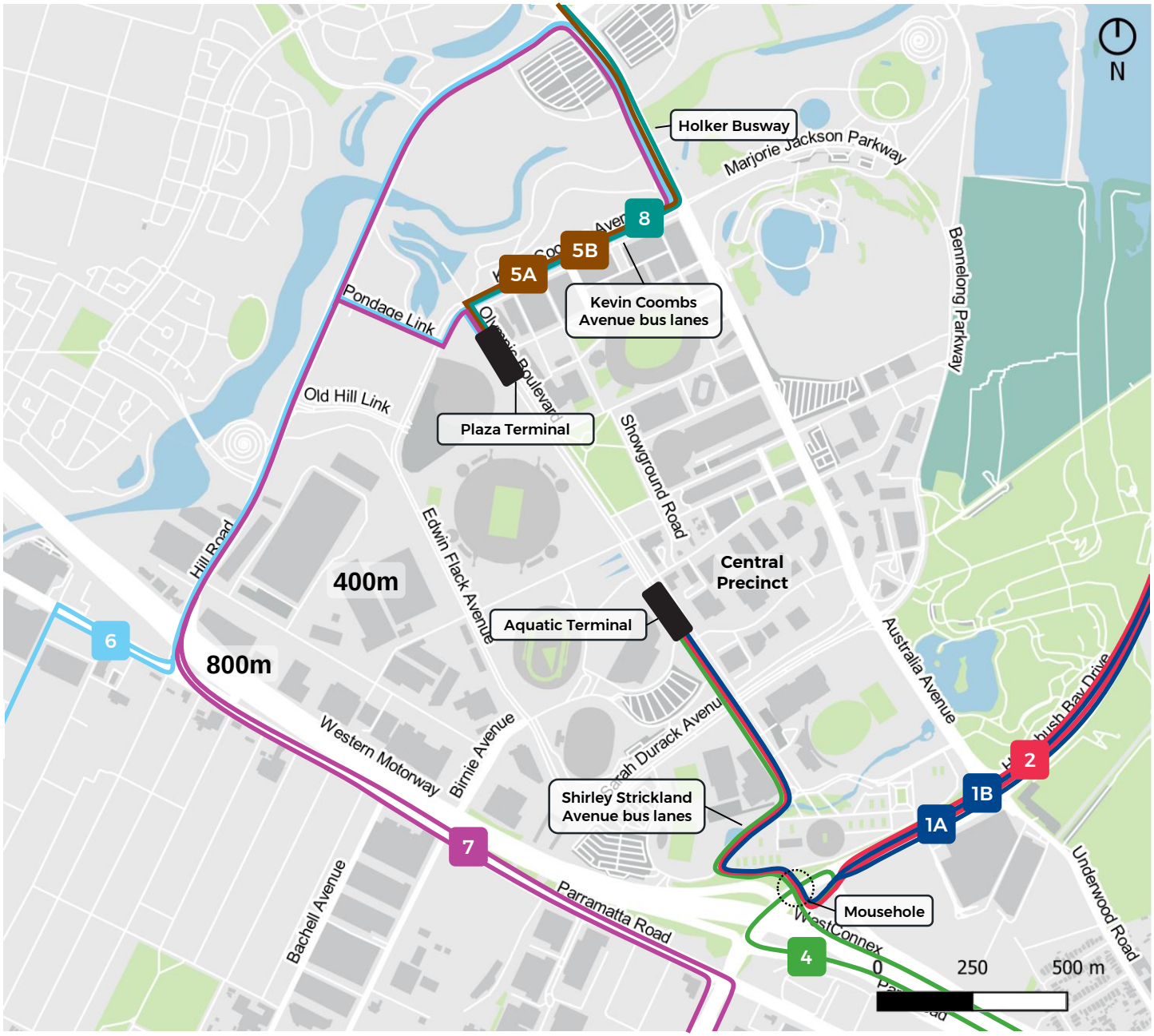


Figure 2.12: Existing event bus operations

2.10 Existing constraints

There are a number of existing constraints to transport and movement around the Olympic Peninsula which influence access to and from the Central precinct.

1. High car mode share for journeys to work TO SOP.
2. Central location in the Sydney road network which experience congestion in all directions during commuter peaks.
3. Regional road network constraints on key adjacent arterials including Homebush Bay Drive (A3) and Silverwater Road (A6), Parramatta Road (A44).
4. Peak directional movements to and from SOP during the commuter peaks e.g. local residents from SOP travelling east to the Sydney CBD and workers travelling TO SOP from the north west, west and south west.
5. Local road network constraint points at Australia Avenue at Sarah Durack Avenue / Bennelong Parkway and Australia Avenue / Homebush Bay Drive intersection.
6. Significant development associated with rezoning from industrial to high density residential without supporting transport infrastructure upgrades, particularly public transport
7. Shared road capacity with Wentworth Point and Newington.
8. Key gateway intersections also used by road based public transport
9. Significant availability of off street parking
10. Road closures for events impacting residents and workers
11. Commuter peak rail travel on the T1 Western line eastbound to the city is at capacity
12. Limited north-south public transport accessibility through the Olympic Peninsula
13. Requirements for interchange to travel east and west from Olympic Park station

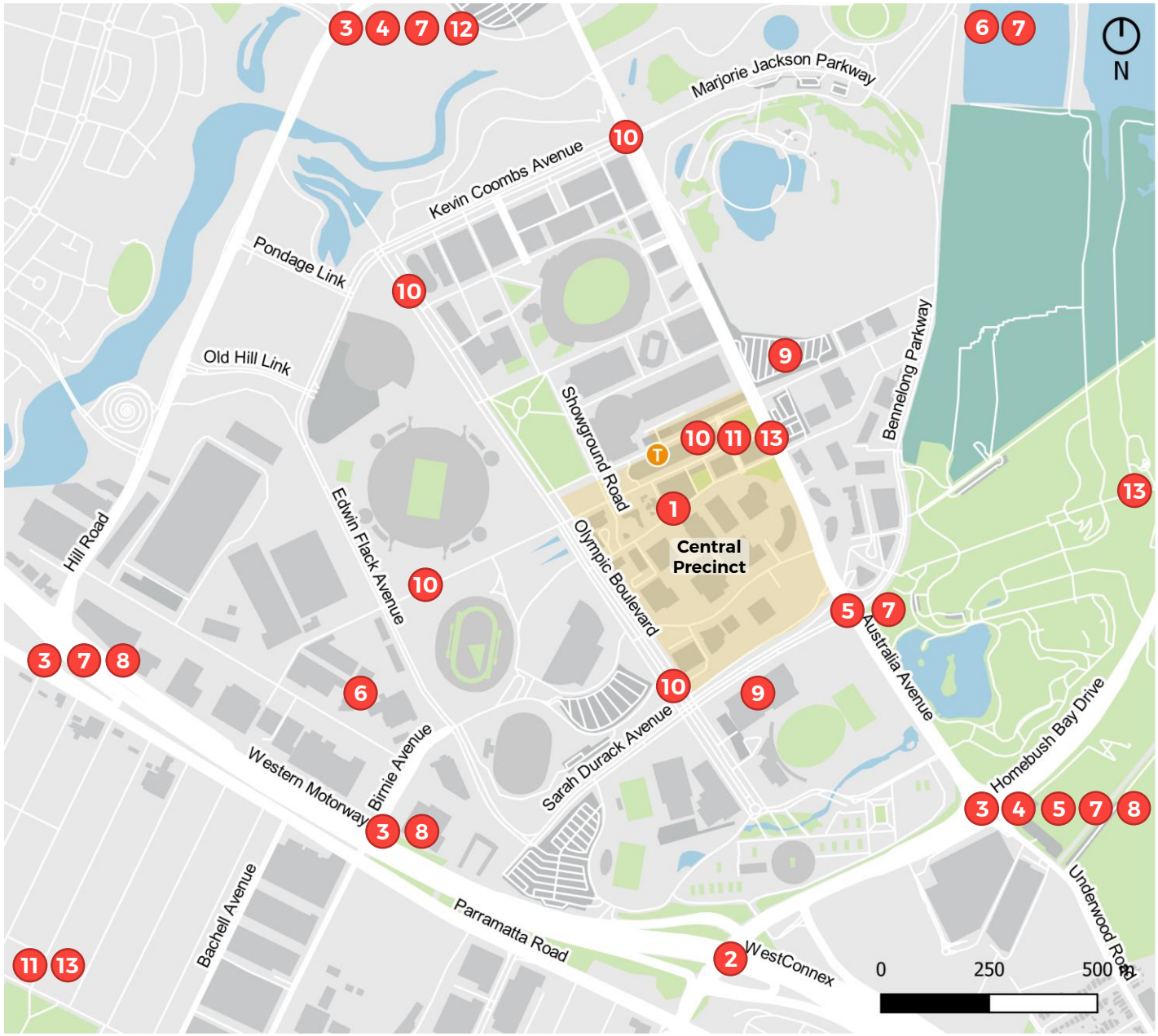


Figure 2.13: Existing constraints

2.11 Existing opportunities

Acknowledging the existing constraints in Section 2.10, Sydney Olympic Park is also the site of leading application of emerging technologies in mobility. It is also the focus of government investment in rapid transit (light rail) and mass transit (metro).

Sydney Olympic Park is also a master planned site with a solid structural foundation and world class public realm.

1. High quality and inclusive urban domain which supports walking and cycling for all levels of mobility
2. Transit oriented development and a diversity of land uses
3. Access to open space
4. A well structured local road network
5. Parking controls which demonstrate progressiveness in terms of the Western Sydney context
6. Planned public transport upgrades such as Sydney Metro West and Parramatta Light Rail Stage 2 which will facilitate associated feeder public transport networks and reduce the reliance on private car
7. Sydney Metro to provide relief for existing heavy rail services running at capacity e.g. T1 Western Line
8. Local demographics which support the uptake in public transport and associated lower car ownership
9. High levels of bicycle parking provision
10. Connected and automated vehicle precinct shuttle trials
11. Extensive cycleway network
12. Grade separated pedestrian facilities
13. On-street electric vehicle charging facilities
14. Variable Message Sign network
15. Local business community organisation

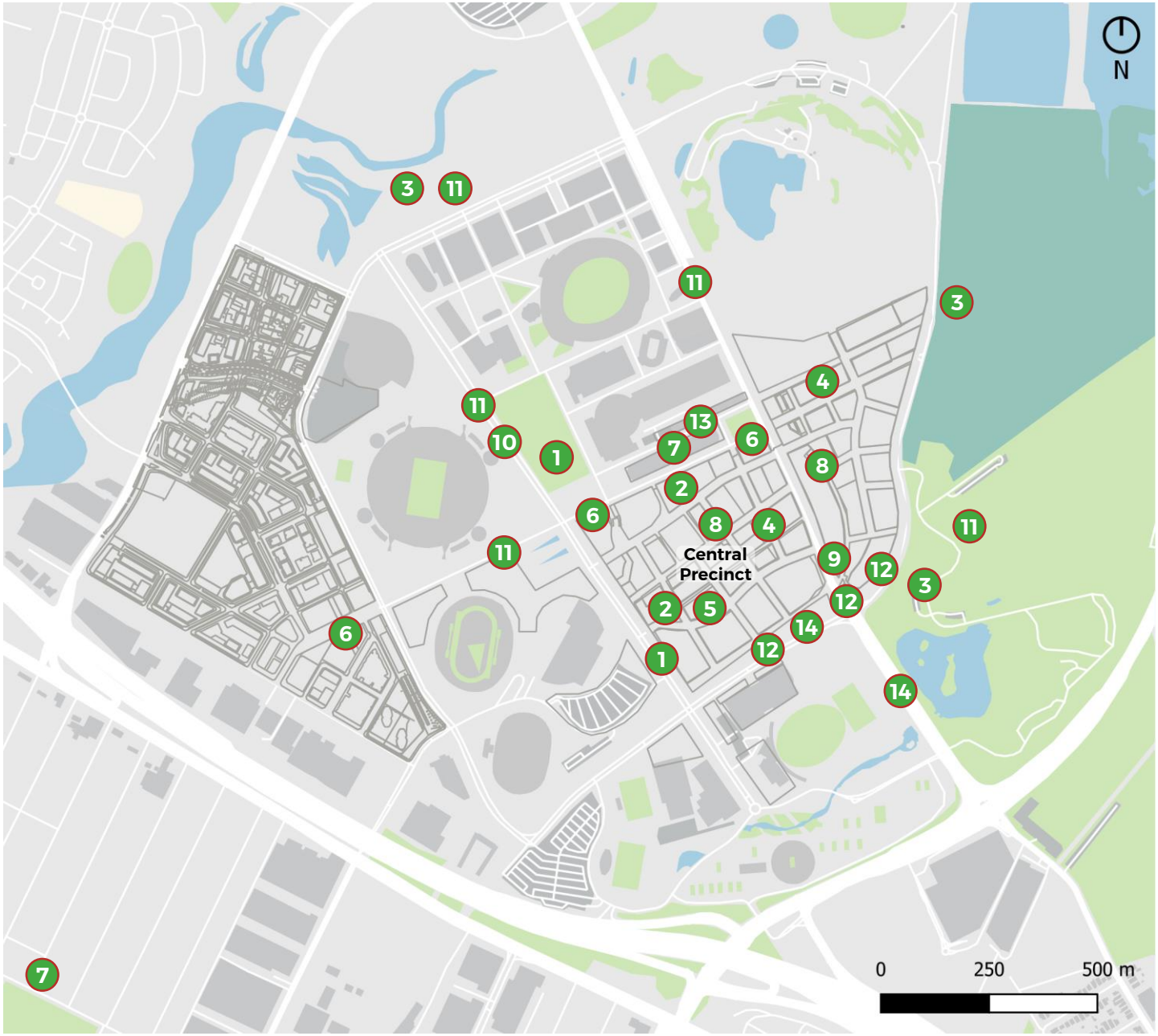


Figure 2.14: Existing opportunities

2.11 Existing opportunities

Accessible urban realm

As a legacy of the Sydney 2000 Paralympic Games, the NSW government has invested significantly in creating an urban realm that is navigable for people with all levels of mobility. The establishment and support for the SOP Access Committee has led to the maintaining of standards through new developments.

This commitment to accessibility has seen SOP host many events such as the Invictus Games. The urban environment will be future ready as the general population ages as the precinct becomes an established residential community.

Extensive shared pathway network

Sydney Olympic Park has developed an extensive network of 35km of shared paths for cyclists and pedestrian to access places within the town centre and the surrounding Parklands. There is also an extensive network of footpaths, on road cycle lanes, bridges and underpasses which connect the town centre with the parklands.

Electric vehicle charging

With the support of a key business tenant at Sydney Olympic Park (NRMA), an on-street electric vehicle charging station has been established in Murray Rose Avenue within the Town Centre.

Tesla have also established an electric vehicle charge point within P1 Car Park on Level 2.

Connected and Automated Vehicle Trial

A connected and automated vehicle trial was undertaken in 2019 at Sydney Olympic Park by Transport for NSW. Two smart shuttles operated in the Sydney Olympic Park town centre, connecting passengers to Olympic Park Station, restaurants and car parks. The shuttles operated on Olympic Boulevard, Herb Elliot Avenue, Park Street and Dawn Fraser Avenue with each shuttle can carry a maximum of 11 passengers.

Photo 2.1: Invictus Games athletes navigating the urban realm

Photo 2.2: Shared pathway network through Bicentennial Park (Source: SOPA)

Photo 2.3: On-street electric vehicle charging in Murray Rose Avenue

Photo 2.4: Connected and Automated Vehicle Trial on Olympic Boulevard (Source: TfNSW)

Central Precinct modifications

Transport Strategy Review

3.1 Central Precinct Master Plan

The Central Precinct Master Plan has evolved since SOP Master Plan 2030 (2018 Review) to incorporate the Metro station, the associated integrated station development and surrounding public realm required to accommodate large flows of passengers using the station during events.

The street network is similar to the previous master plan in the central and eastern ends of the Central precinct. The function of the street network has been reimagined with more shared streets to accommodate higher levels of walking and cycling whilst maintaining access to development sites.

The Western end of the Central Precinct has been modified to accommodate::

- Sydney Metro station box – access across the box is restricted to pedestrian and cycling movements only
- Large event crowds entering the metro station from Olympic Boulevard via the new Western Plaza
- Integrated station development connecting with the adjacent retail precinct to the east via above ground and subterranean pedestrian links
- Accommodating transport functions associated with the metro station e.g. pedestrian access, cycle access and storage, bus interchange, kiss and ride and taxi and shared mobility services

Broader precinct wide design elements include:

- Creation of a walkable core with key traffic and surface public transport circulation happening on the edges of the precinct
- Establishing low speed shared streets in the core of the precinct and adjacent to the Abattoir precinct
- Safe, efficient and enjoyable walking and cycling connections through the precinct and connecting to the parklands and other recreational spaces and facilities
- Establishing shared basements between development sites where possible and accessing these off local streets
- Key gateway intersections supported by traffic signals for all direction movements and to facilitate bus priority
- Connections to adjacent public parking structures with pedestrian facilities such as traffic signals and pedestrian bridges
- A variety of street types and lanes to reduce size of blocks increasing walkability
- Designation of speed limits to create safer environments for walking and cycling

Figure 3.1: Illustrative Central Precinct structure plan

3.2 Modifications to Central Precinct Master Plan

The key changes to the street network from that outlined in the Infrastructure Framework which supported SOP Master Plan 2030 (2018 Review) are outlined in Figure 3.2

The key changes to the vehicle movement strategy include:

- The elevation in function of Figtree Drive to be a Town Street, similar to that of Herb Elliott Avenue. This is to facilitate vehicle access to and from the precinct from gateway intersections which the distribute traffic across the precinct via local and shared streets. Figtree Drive will also be the key route for feeder bus services to the Metro station and interchange located between Precinct Streets A and B.
- The intersection of east-west streets with Australia Avenue will be restricted in their access. The east-west lane will operate as left in only in a one –way direction east to west. Precinct Street C will be a shared street with left-in and left-out movements only.
- As there is no vehicle movement proposed east-west across the Metro station box, the only road connection with Olympic Boulevard will occur at the existing intersections of Herb Elliott Avenue and Figtree Drive. Precinct Street B will also be closed across the Western Plaza to vehicle traffic.
- The intersection of Precinct Street D and Figtree Drive has been identified as a new intersection as it is likely to carry the most turning movements within the Central Precinct as it provides access to most development sites off Precinct Street D (north-south). The nature of this intersection upgrade will be subject to further analysis in the next 5-yearly review of SOP Master Plan 2030.
- Intersection upgrades associated with the proposed Parramatta Light Rail Stage 2 are included for completeness and will influence the overall intersection control strategy.

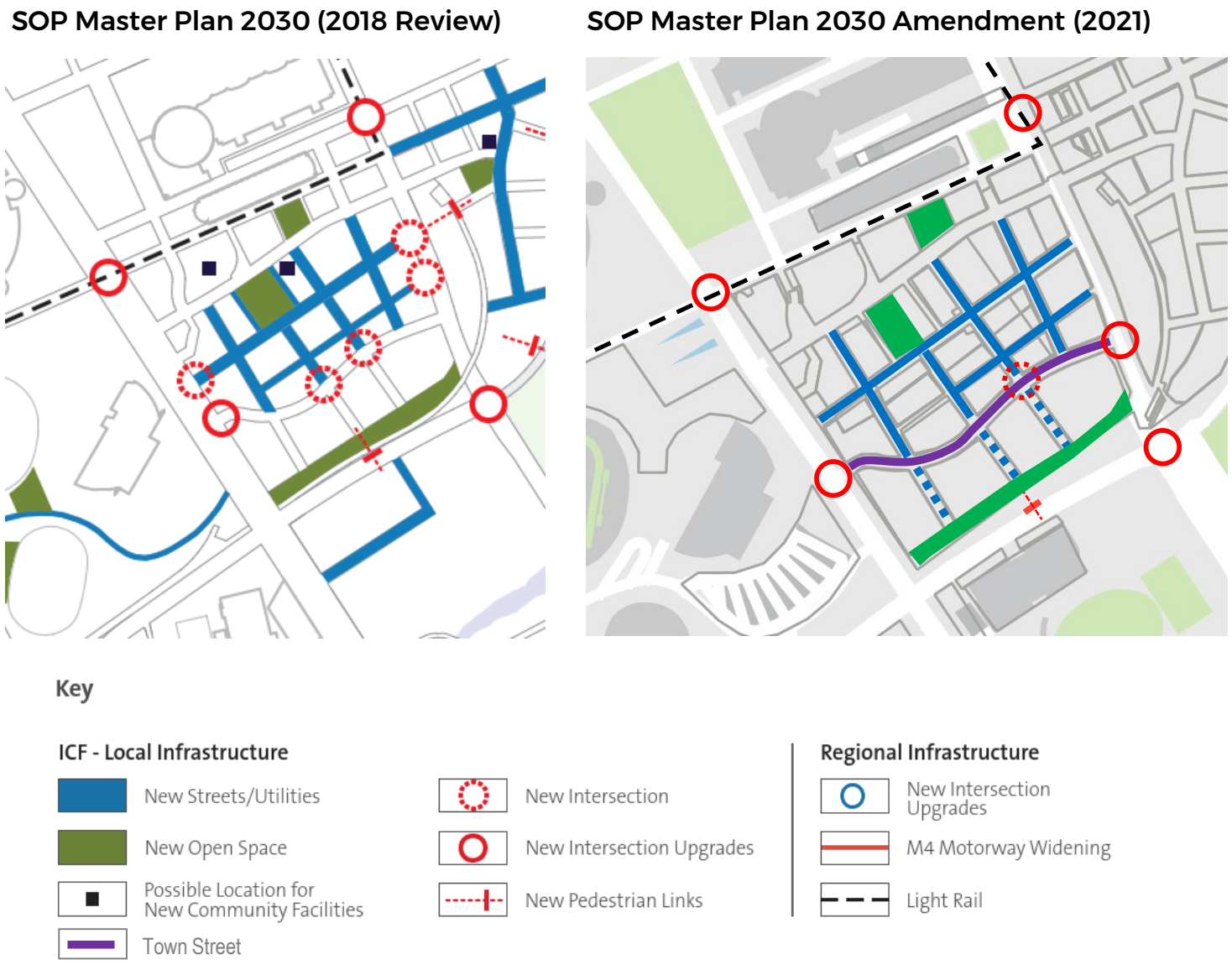


Figure 3.2: Central Precinct street network – 2018 Review and Amendment (2021)

3.2 Modifications to Central Precinct Master Plan

The land uses and yields associated with the modification of the Central Precinct master plan to incorporate Sydney Metro remain unchanged.

The key differences as shown in Figure 3.3 is that the residential zone identified north of Figtree Drive is now zoned mixed use. Residential is placed on the edge of the precinct overlooking the Parklands and open space.

Similarly the commercial zoning south of the central east-west street is also now zoned mixed use. The commercial core is now located centrally between the T7 Olympic Park station and the new Metro station supporting the transit orientated development established in previous versions of the master plan.

The master plan now incorporates a green space in the West End Plaza. The central park also remains placing community uses at the heart of the precinct.

Mixed uses and retail are centred in the precinct and are located in close proximity to the Metro station.

Hotels and serviced apartments are located in the north west corner of the precinct adjacent to venues and Olympic Boulevard.

SOP Master Plan 2030 (2018 Review)

SOP Master Plan 2030 Amendment (2021)

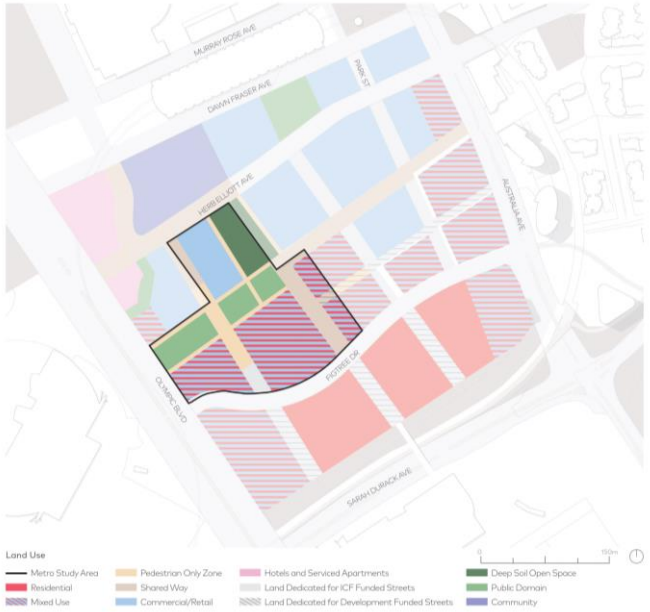


Figure 3.3 Central Precinct land uses - 2018 Review and Amendment (2021)

3.3 Movement and Place

A high-level Movement and Place assessment was undertaken based on the proposed street network and neighbouring land uses.

Main Roads

The boundary roads of Sarah Durack Avenue and Australia Avenue act as the main through routes for Sydney Olympic Park. Whilst there are some place functions along these corridors they provide the main movement function not just for the Central Precinct but for Sydney Olympic Park as a whole.

Main Streets

Three Main Streets sections have been identified on Olympic Boulevard, Figtree Drive and Herb Elliott Avenue. These sections have a high mix of both place and movement functions. For example, Figtree Drive will accommodate future bus services (providing interchange with future Metro services) and rich place functions associated with the city core and neighbouring mixed use developments.

Civic Spaces

Civic Spaces are concentrated through the heart of the precinct around the main retail centre and future Metro. These connections also extend north connecting the core to the existing uses on Dawn Fraser Avenue and around the T7 Sydney Olympic Park Station. Bringing together the plazas and parks around the Metro station with the Abattoir heritage precinct by designating Herb Elliott Avenue and Showground Road as civic spaces is a key component of the plan. It will also support the interchange between light rail and Metro services. These corridors will be characterised by places to dwell and see with minimal movement functionality.

Local Streets

The remaining streets are classified as Local Streets where the majority of residential development and connecting local retail functions occur. These streets will primarily serve these local functions and discourage through movement.

Figure 3.4: Central Precinct Movement and Place analysis

3.4 Central Precinct Master Plan – Street network

The Central Precinct master plan is a network of streets and spaces which prioritise the movement of people over vehicles.

The street network is made up of:

- Pedestrian only plazas
- Pedestrian only laneways
- Service and basement access laneways
- Shared streets
- Local streets
- Main streets
- Avenues

A simple and legible speed regime which supports road safety and encourages walking, cycling and street life is proposed within the Central Precinct. This speed regime has been developed in line with the NACTO Global Street Design Guide.

10 km/h

A shared street or similar environment mixes users at very low speeds, at most 15 km/h, with both activity and geometry keeping speeds low.

- Shared streets (Precinct Streets A, B [North], C)
- Service and basement access laneways

30 km/h

Use speed management techniques to limit speeds to 30 km/h or lower on streets with a high degree of activity in all modes and high demand for pedestrian crossings. This is a safe speed for cycles to ride in mixed traffic and presents low risks to people walking along and crossing the street. This condition is often applicable on neighbourhood main streets and large central city streets.

- Main streets (Olympic Boulevard, Figtree, Herb Elliott, Dawn Fraser, Murray Rose)
- Local streets (Precinct Streets B, D, Park, Showground, streets south of Figtree)

50 km/h

On some large streets with cycle tracks, large sidewalks, medians, and frequent signalized intersections and pedestrian crossings, it is possible to accommodate traffic speeds of 50km/h, using signal progressions, trees and furnishings, and 3-m wide lanes to discourage speeding.

- Avenues (Australia, Sarah Durack)

The most effective way to reduce fatalities and severe injuries on streets is to reduce vehicle speeds. The vast majority of people killed in traffic are struck on streets with high speeds, even though those streets represent only a small portion of a city's total activity and movement. (NACTO, 2017)

Speed is the primary factor in crash severity and the likelihood of a crash occurring. Increased speeds result in longer reaction times, a narrower cone of vision, and increased stopping distances while providing less time for others to react. An increase in average speed of 1 km/h results in a 3% higher risk of a crash and a 4–5% increase in fatalities. (NACTO 2017)

Figure 3.5: Future Central Precinct street network

3.5 Future precinct public transport connections

Key drivers into the future

With the arrival of Sydney Metro West to Sydney Olympic Park from 2030, the transport offering will support not just those living or working in the park but the wider region.

To maximise this city shaping infrastructure, a series of supporting public transport services are also proposed to support this including Stage 2 of Parramatta Light Rail and enhanced bus services which will act as feeder services from Wentworth Point, Melrose Park and Rhodes to the Metro.

The emergence of the Carter Street Precinct as a high density residential, village and business park with 6,200 dwellings adjacent to M4 Motorway also supports the need to connect this precinct with current and future transport modes in Sydney Olympic Park.

The provision of Metro services will mean that the transport focus within the Olympic Park will shift from the existing T7 station towards the Central Precinct, This is also likely to change the development focus more into the Central and Parkview Precincts.

Modifications to the road network around Carter Street will also place greater emphasis on connections from the west via John Ian Wing Parade.

It is important that the new feeder bus network and Parramatta Light Rail stage 2 complement each other which is why buses would be removed from Dawn Fraser Avenue in the future and rerouted to provide broader precinct coverage.

Bus infrastructure improvements

The Sydney Metro project has identified a number of intersection modifications at Australia Avenue / Figtree Drive and Olympic Boulevard / Figtree Drive to facilitate bus movements to and from the Metro station and proposed bus interchange.

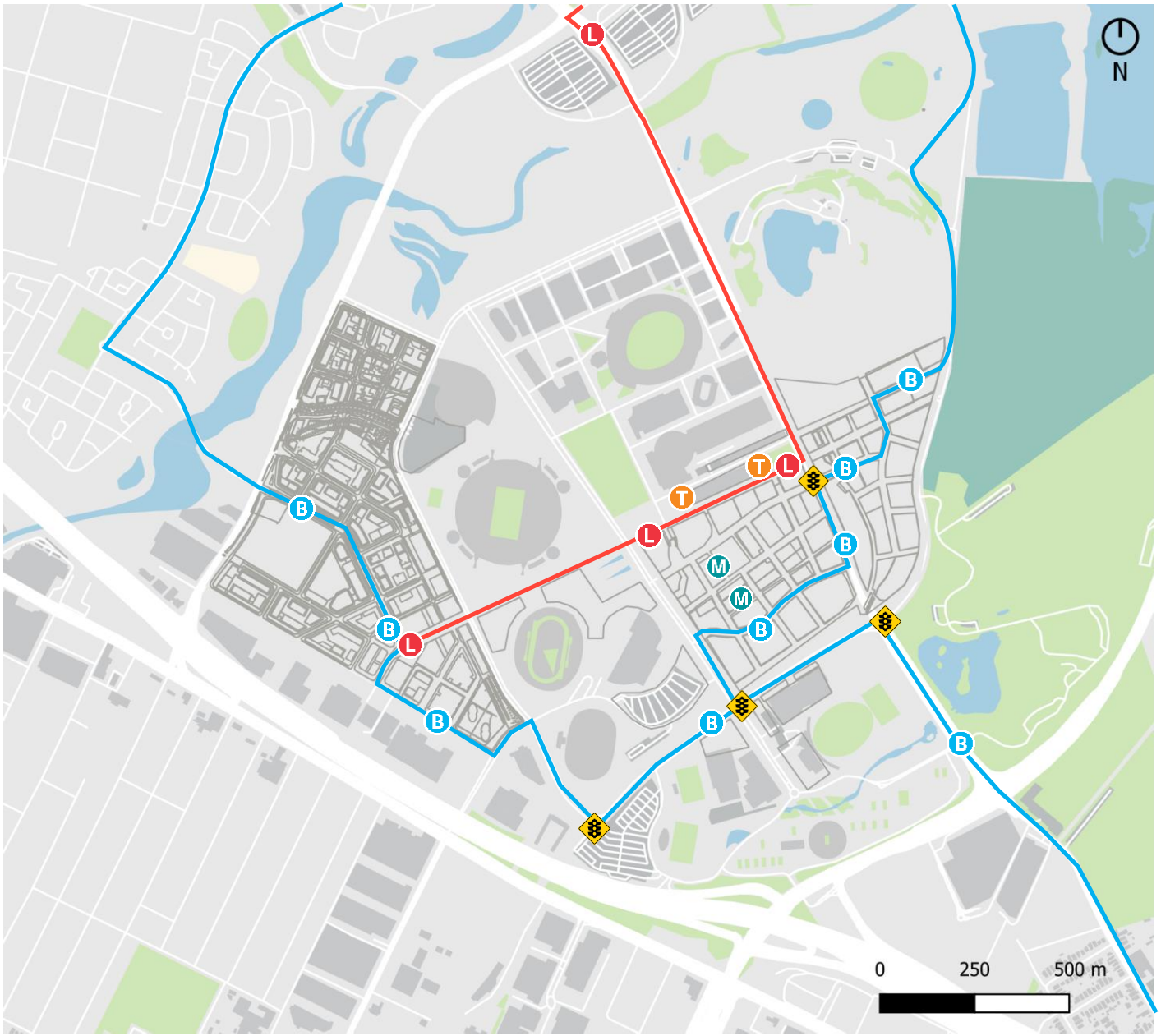


Figure 3.6: Future proposed light rail and bus connections to the Central Precinct

3.6 Future local connections – Bus and light rail

Local bus services

Local bus services will provide key linkages to SOP and future Metro services particularly from locations which will not be served by light rail or mainline train services.

Currently bus services operate via Australia Avenue and Sarah Durack Avenue to destinations including Rhodes, Parramatta, Newington, Strathfield, Burwood and Chatswood. Terminating services for service 533 operate on a loop from Australia Avenue via Park Street.

Future services are proposed to operate via Figtree Drive to provide interchange with Metro services within the Central Precinct. From here through services will operate via Parkview Drive to serve this precinct.

The future of bus services terminating in Park Street at the rear of the T7 station will be developed in line planning for Parramatta Light Rail Stage 2. In the future, the main transport interchange at SOP will be in Figtree Drive at the Metro station.

Parramatta Light Rail

Stage 2 of Parramatta Light Rail is proposed to connect Sydney Olympic Park and Carter Street to Parramatta via Wentworth Point, Melrose Park and Rydalmere.

Within SOP, services will operate along the Holker Busway, Australia Avenue and Dawn Fraser Avenue with stops proposed at Jacaranda Square and Showground Road (for transfer to Metro services and Stadium Australia) and terminate at Carter Street.

Figure 3.7: Proposed Central Precinct public transport connectivity

3.7 Future local connections – Walking and cycling

As outlined in Section 3.4, the Central Precinct street network has been redesigned to prioritise walking and cycling. Whilst the entire Central precinct is walkable, the key pedestrian and cycling links are outlined in Figure 3.8.

The key feature of the street network of the Central Precinct is the strong active transport (walking and cycling) axis of Precinct Street C and the Western Plaza and Precinct Street A.

The Western Plaza has been established to accommodate the large crowds entering and exiting the Metro station during events.

The key shared streets are Precinct Street A (north of Figtree Drive), Precinct Street B [North] and Precinct Street C (East of Precinct Street A to Australia Avenue). These shared streets will form the core of the precinct and support the retail and mixed uses which front these streets.

The section of Herb Elliott Avenue west of the alignment of Precinct Street A and the park edge will be shared to bring the park and Western Plaza together with the historic Abattoir precinct. It will also provide an attractive environment to access the proposed light rail stop on Dawn Fraser Avenue and T7 Olympic Park Station.

A series of pedestrian laneways will link the Metro station entries and the edges of Central Park to the rest of the precinct. A key pedestrian laneway from the bus interchange on Figtree Drive will provide a direct connection for customers interchanging between modes.

Other key cycling links are via Dawn Fraser Avenue, Olympic Boulevard and the liner park at the southern end of the precinct which provides access to Bicentennial Park.

Key linkages will be via a new walking and cycling bridge to P3 car park via Precinct Street A and the proposed intersection upgrade of Figtree Drive and Australia Avenue.

Figure 3.8: Proposed Central Precinct walking and cycling connectivity

3.8 Future local connections – Private vehicle and freight

Whilst the Central precinct master plan prioritises walking, cycling and public transport, there remains an requirement to provide efficient access for private vehicles and freight.

The movement strategy in Figure 3.9 shows the private vehicle and freight movements focussed on three of the four gateway intersections into the Central precinct at:

- Australia Avenue / Figtree Drive
- Australia Avenue / Herb Elliott Avenue / Parkview Drive
- Olympic Boulevard / Figtree Drive

The main streets also ensure that the main traffic routes are kept on the periphery of the precinct to facilitate the shared streets in the centre.

These main streets are supported by local street Precinct Street D to provide access into the core of the precinct and serve the majority of development sites with a commercial, retail and mixed use land uses. These sites are also the ones likely to generate the most vehicle traffic including heavy vehicles for retail deliveries.

These key movement corridors are not expected to carry large volumes of cyclists or pedestrians even though they will be supported with footpaths. Parallel active transport routes have been established to avoid conflicts.

The movement strategy acknowledges the large volumes of traffic that utilise Australia Avenue and the significantly lower volumes using Olympic Boulevard. This strategy allows vehicles to enter via the south on Australia Avenue, turn left into the precinct and leave via Olympic Boulevard.

The establishment of traffic signals at both ends of Figtree Drive also facilitates the movement of buses through the interchange and the precinct. And also pedestrian cycle access to the Parklands and Aquatic Centre.

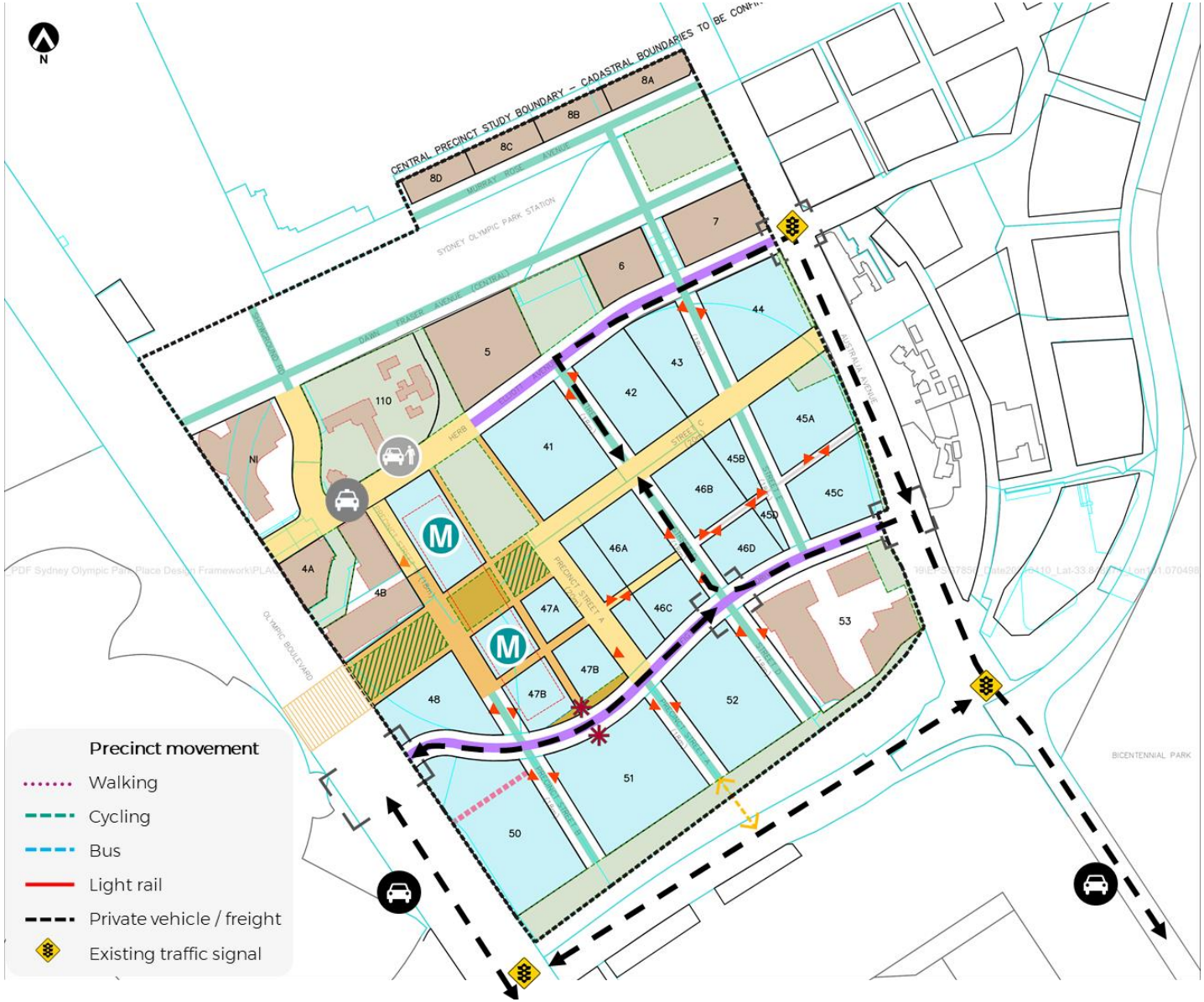


Figure 3.9: Proposed Central Precinct private vehicle and freight movement network

3.9 Future local connections – Integrated movement network

The Central Precinct master plan is supported by an integrated movement network that provides access and amenity to key local places whilst also minimising conflicts between transport modes.

The alignment of key walking and cycling corridors to public transport nodes will support the local uptake of sustainable transport and reduce the reliance on private vehicles.

- Western end
    - Heavy rail
    - Light Rail
    - Metro
    - Bus
- Eastern end
    - Heavy rail
    - Light rail
    - Bus

The integrated movement network facilitates the continuation of bus routes through the precinct during all sized events as the event pedestrian priority precinct is established north of the intersection of Olympic Boulevard and Figtree Drive. This is important for the growing residential and business community located within the Central Precinct.

The strategic positioning of traffic signals ensures that all transport modes are supported at key gateway locations on the local network including pedestrians, cyclists, buses and general traffic and freight.

Key connections to adjacent precincts are also facilitated through key infrastructure such as traffic signals, active transport bridges and underpasses.

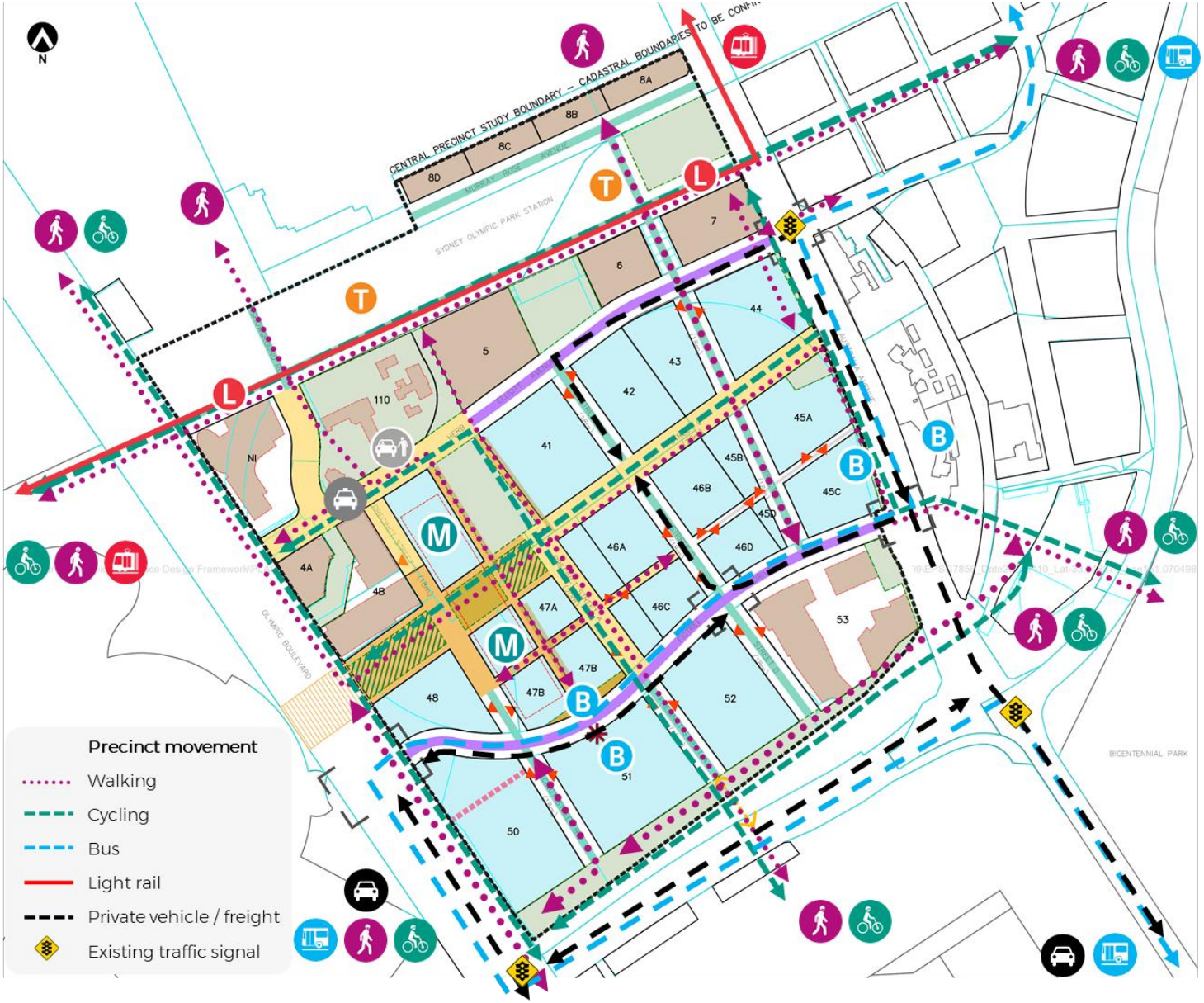


Figure 3.10: Proposed Central Precinct integrated movement network

Future transport conditions

Transport Strategy Review

4.1 Future transport connections

Proposed precinct-wide improvements which would improve connectivity to the Central Precinct include:

- New east-west cycle facilities along Parramatta Road
- Continuation of on-road facilities on Homebush Bay Drive
- Additional connectivity through the proposed Carter Street development

Other improvements to be potentially delivered by infrastructure projects include:

- Shared path along M4 East to be delivered as part of WestConnex
- Improvements along Dawn Fraser Avenue, Hill Road through to Wentworth Point and a potential river crossing through to Melrose Park to be delivered with PLR Stage 2.

Summary

Figure 4.1 illustrates the:

- Indicative locations of the proposed public transport infrastructure
- Proposed active transport infrastructure
- Indicative development masterplans for the adjacent precincts also undergoing development as part of separate projects.

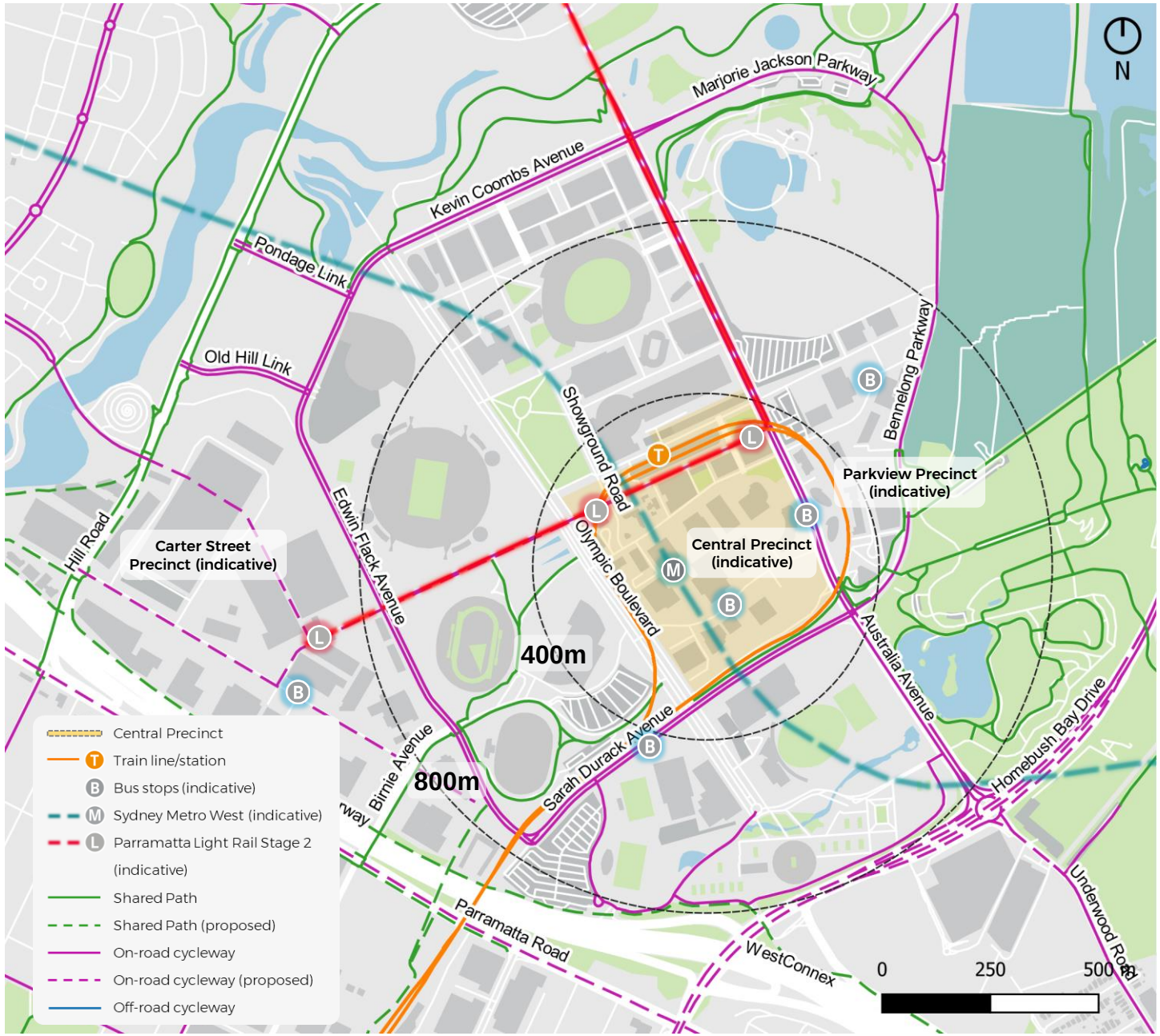


Figure 4.1: Future Active and Public Transport Connectivity

4.2 Public transport capacity comparison

The proposed public transport infrastructure (and changes to existing services) are expected to substantially increase the number of customers who can travel to or from the precinct.

As a proxy for the increased capacity, the cumulative line capacities for each transport mode operating within or near the precinct have been compared for the following scenarios:

- Existing
- Future: SOP Master Plan 2030 (2018 Review)
- Future: SOP Master Plan 2030: 2021 Transport Strategy (this document)
- Future: 2030 Uncommitted

It is noted the line capacity is the maximum number of customers that can be carried by the service per hour and does not reflect the capacity available to Central Precinct customers.

It is likely that other customers would be using the service for part or all of the service length. Detailed patronage analysis would be required to estimate this customer demand, which is not included in this study.

The line capacity comparison is used to highlight the relative improvement in capacity for precinct customers.

It is expected the role of bus services would change in the future to be feeder services to support the proposed light rail and/or metro. It is unclear what future routes or frequencies would be implemented. However at a minimum, the existing capacity would be maintained albeit in a different role. Hence, bus capacity has been assumed to be consistent between the existing and future scenarios.

Existing scenario

The Central Precinct is serviced by regular Sydney Bus and Sydney Trains services during normal operations.

Figure 4.2 summarises the combined capacity of these services in the peak direction during the AM peak hour.

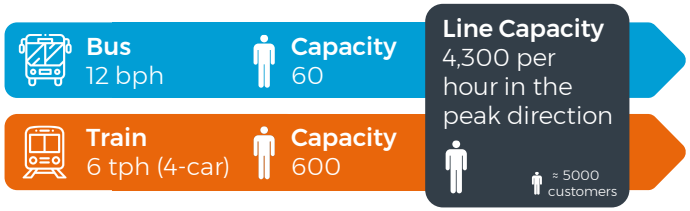


Figure 4.2: Existing public transport capacity

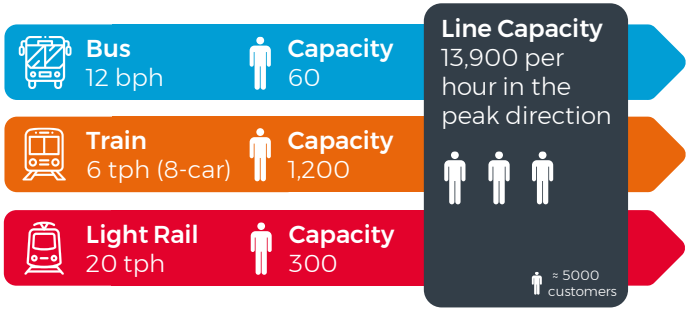
Future scenario: 2018 Review

In the SOP Master Plan 2030 (2018 Review), an earlier iteration of Parramatta Light Rail was assumed to be operational for 2030.

This service was proposed to operate between Parramatta and Strathfield, with a proposed stop on Australia Avenue near Murray Rose Avenue.

Additionally, Sydney Trains services have been assumed to increase operations to 8-car services, hence doubling capacity.

As summarised in Figure 4.3 the combined capacity of these services triples the line capacity compared to the existing scenario to support the development outlined in the SOP Master Plan 2030.



Source: Sydney Olympic Park Master Plan 2030 Review: Traffic and Transport Strategy (2016)

Figure 4.3: Future public transport capacity – SOP MP2030 (2018 Review)

Future scenario: 2021 Transport Strategy Review

As discussed in Section 1.2, this document assumes that Sydney Metro West (SMW) is operational by 2030.

SMW is designed with an ultimate service headway of 2-minutes (30 tph). However, it is assumed the service frequency will be lower at the opening of the project.

A headway of 4-minutes (15tph) has been adopted in the assessment. This assumption is consistent with the proposed operations of Sydney Metro City & Southwest at opening.

Similarly, the service capacity of 1,150 is adopted based on the existing Sydney Metro rolling-stock.

The addition of SMW significantly increases the combined customer capacity to more than five times that of the existing services (Figure 4.4).

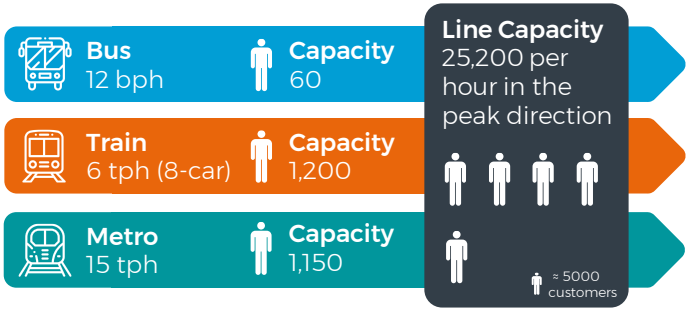


Figure 4.4: Future public transport capacity – SOP MP2030 2021 Transport Strategy Review

Furthermore, the addition of SMW offsets the capacity that would not be realised due to the removal of light rail. Overall capacity is doubled when compared to the 2018 Review scenario.

Therefore, it is evident that there is sufficient public transport capacity to support the development previously proposed in the 2030 Master Plan (2018 Review), and further development if required.

4.2 Public transport capacity comparison

Future scenario: 2030 Uncommitted

As discussed in Section 1.2, Parramatta Light Rail Stage 2 (PLR2) is not a committed project, and hence has not been included in the Master Plan 2030 (2021 Transport Strategy) scenario.

However it is envisaged PLR2 will be delivered in the future to support the ongoing development and growth in the Greater Parramatta and Olympic Peninsula (GPOP) region. As a result, it has been included for context.

As evident in Figure 4.3, PLR2 does not substantially increase the combined line capacity from the Master Plan 2030 (2021 Transport Strategy) scenario (Figure 3.8).

However PLR2 provides capacity between the key GPOP precincts including Rydalmere, Ermington, Melrose Park and Wentworth Point through to Sydney Olympic Park. Hence, the addition of PLR2 is likely to improve accessibility between these regions and the Central Precinct, which is discussed in Section 1.2.

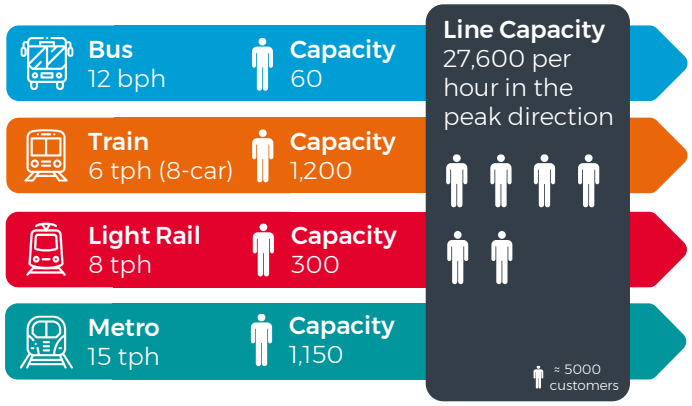


Figure 4.5: Future public transport capacity – Post 2030

4.3 Future precinct accessibility

With the increased capacity, the proposed public transport infrastructure will inevitably increase accessibility to and from the precinct.

The accessibility of the Central Precinct has been defined by the locations customers can reach within 30, 45 or 60 minutes using public transport in a typical weekday AM peak period.

The accessibility analysis considers the locations which can be reached from the centre of the central precinct within the aforementioned time periods. This time includes the walk time from the Central Precinct to the public transport stop or station.

It is noted accessibility in the inbound direction to the Central Precinct may be slightly lower compared outbound direction (shown in subsequent analysis and figures). This is due to the peak direction services, which operate towards Sydney CBD with improved frequency or stopping patterns. However for the purpose of this assessment, the difference does not tangibly impact results or recommendations.

As discussed previously, it is unclear what future bus routes or frequencies would be implemented. Hence the accessibility analysis retains existing bus operations, and does not include any potential improvements.

Existing accessibility

Precinct customers can access Silverwater, Rhodes and Strathfield within a 30 minute period (Figure 2.8).

The following time is required to access the CBDs :

- Just over 30 minutes for Parramatta Station, and up to 45 minutes for all destinations in Parramatta CBD
- Up to 60 minutes for Sydney CBD.

Future accessibility

As illustrated in Figure 4.6, the addition of SMW significantly increases the 30 minute catchment, and include the Parramatta CBD and a portion of Sydney CBD. The Sydney CBD catchment shown is indicative pending the decision and announcement for the location of the SMW CBD Station. For this study the station is assumed to be located in north of the CBD.

With SMW, travel between the entire Sydney CBD and the Central Precinct is possible within 45 minutes (Figure 4.7), as well as key strategic centres including:

- Epping
- North Sydney
- Chatswood
- Bondi Junction.

Additionally, SMW increases accessibility to key residential areas to support the commercial and educational land uses proposed in the Central Precinct, including:

- GPOP (including Parramatta and Westmead)
- Blacktown and surrounding suburbs
- Inner west (from Concord through to Balmain/Glebe)
- Sydenham to Bankstown urban renewal corridor.

With the existing transport and SMW, travel between Central Precinct and locations along the central band between Greater Penrith and the Eastern Harbour City regions is possible (Figure 4.8).

The future addition of PLR2 has less of a impact of connectivity with strategic centres around Greater Sydney. However as alluded to previously, it increases connectivity (Figure 4.6) through the GPOP region with the following educational and residential hubs within 30 minutes:

- Newington
- Meadowbank
- Melrose Park
- Ermington.

4.3 Future precinct accessibility

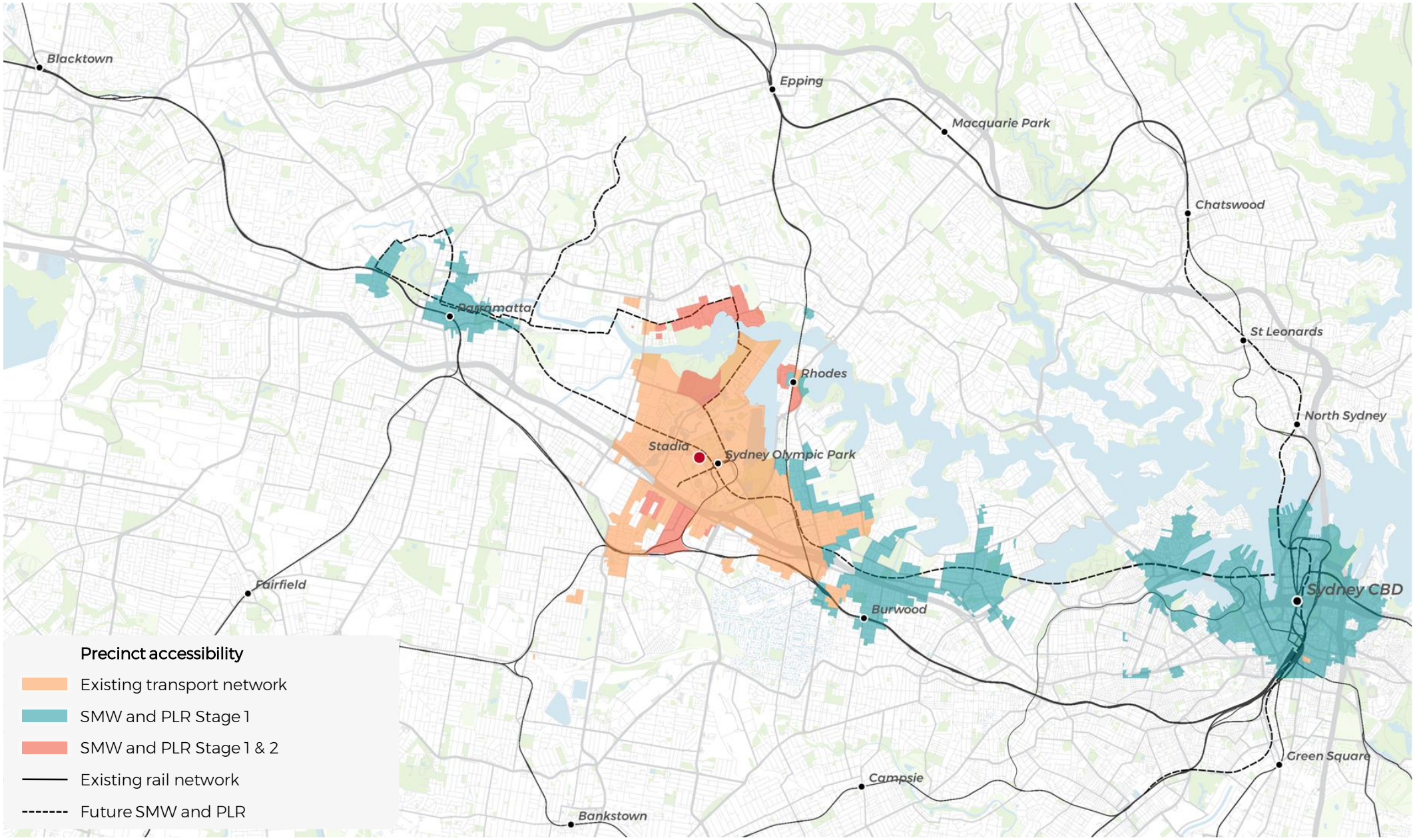


Figure 4.6: Central Precinct accessibility – future public transport network (30-minute)

4.3 Future precinct accessibility

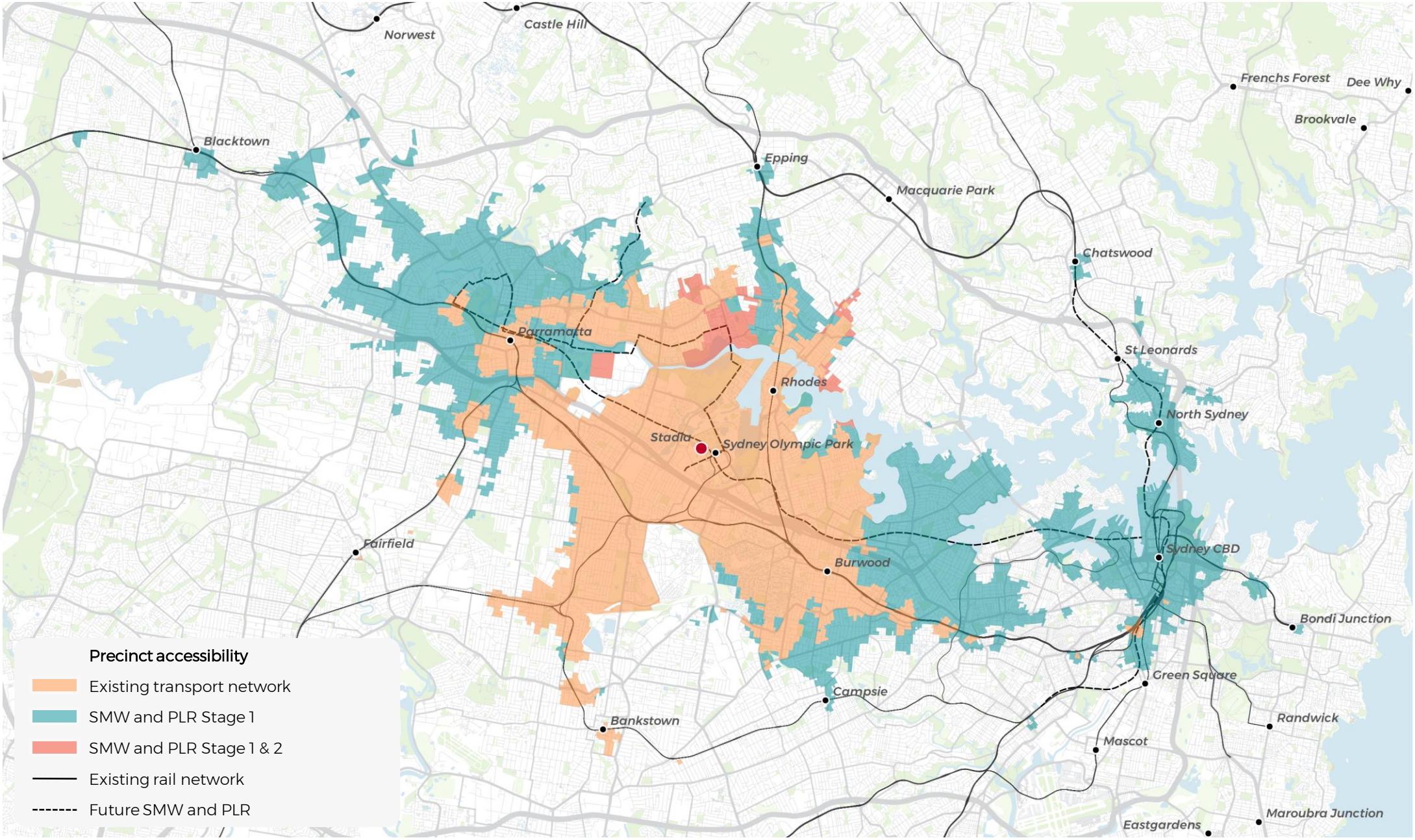


Figure 4.7: Central Precinct accessibility – future public transport network (45-minute)

4.3 Future precinct accessibility

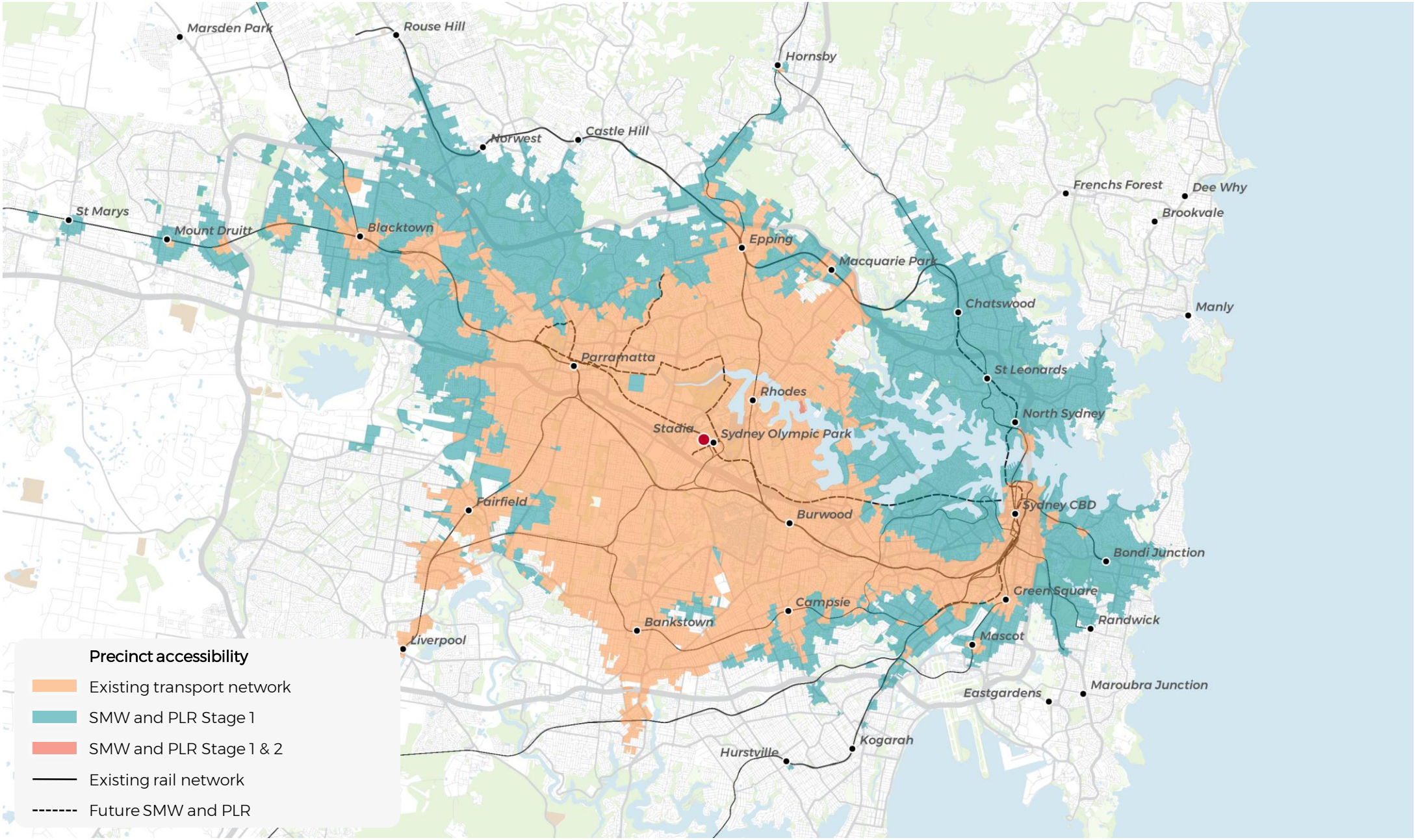


Figure 4.8: Central Precinct accessibility – future public transport network (60-minute)

4.4 Future event transport mode split

Future event transport provisions

Currently during regular events, the public transport mode-share is approximately 40%, which is considerably less compared to a major event (~70%).

This drop can be attributed in part due to reduced connectivity through:

- T7 Olympic Park line operating only as a shuttle service to Lidcombe.
- No special event bus provision.

These changes may increase customer travel time or introduce additional inconvenience as customers are forced to interchange or wait for infrequent services.

This reduced level of service, combined with the availability of parking, result in a lower public transport mode-share.

However, with the addition of SMW, the public transport catchment significantly increases. As such it is envisaged that with the addition of metro, the higher public transport mode share can be achieved during regular events (Figure 4.9).

During major events in the precinct, it is envisaged special events buses will continue to operate after the introduction of SMW (Figure 4.10). This scenario retains the existing public transport mode share of approximately 70%, with majority accommodated by the two rail modes (60%).

However it is noted that, the buses will likely be consolidated at the Plaza Terminal to facilitate uninterrupted road access to the new Central Precinct. The consolidated Plaza Terminal is discussed in mode detail in Section 4.6.

Considerations for future events with PLR2

In future scenarios, event customers using the T7 Olympic Park line are expected to continue queueing on Dawn Fraser Avenue either side of the station, whilst a large volume of pedestrians are expected to head south along Olympic Boulevard to access the proposed metro station and P3 and P4 car parks.

This may result in a future conflict with PLR2. During the PLR2 planning stages, it is recommended the following options are investigated to ensure the safety of event customers and minimise conflict with event crowds:

- Temporarily terminating light rail services near Australia Avenue
- Marshalling and overlays to control pedestrian queueing and flows across Dawn Fraser Avenue.

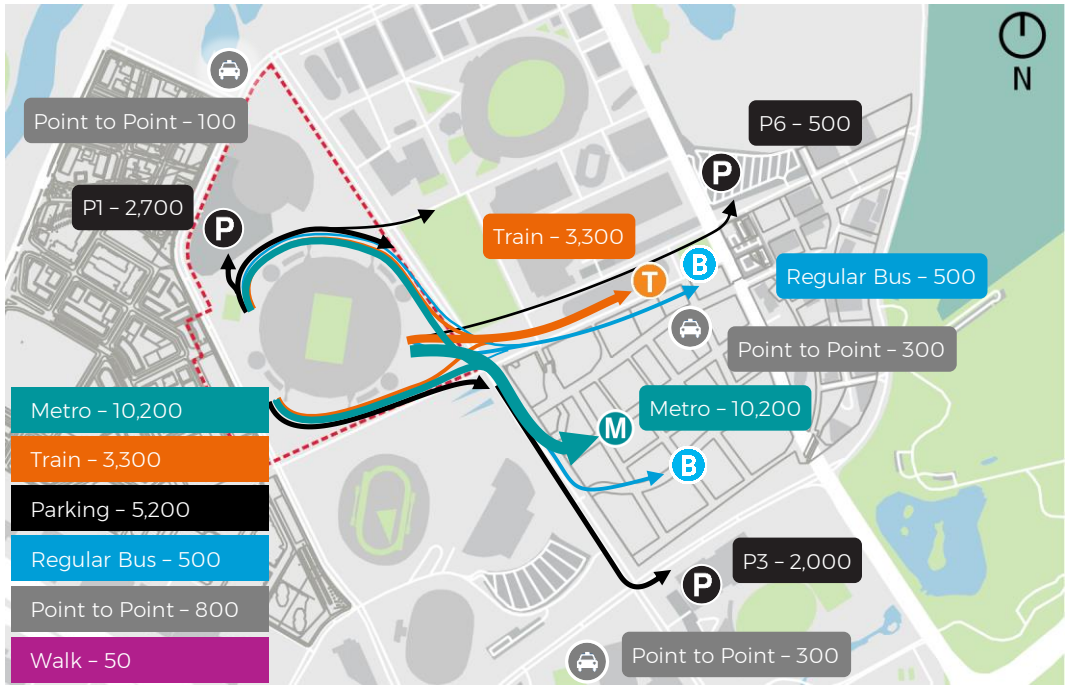


Figure 4.9: Regular event mode split - future (typical 20,000 event)

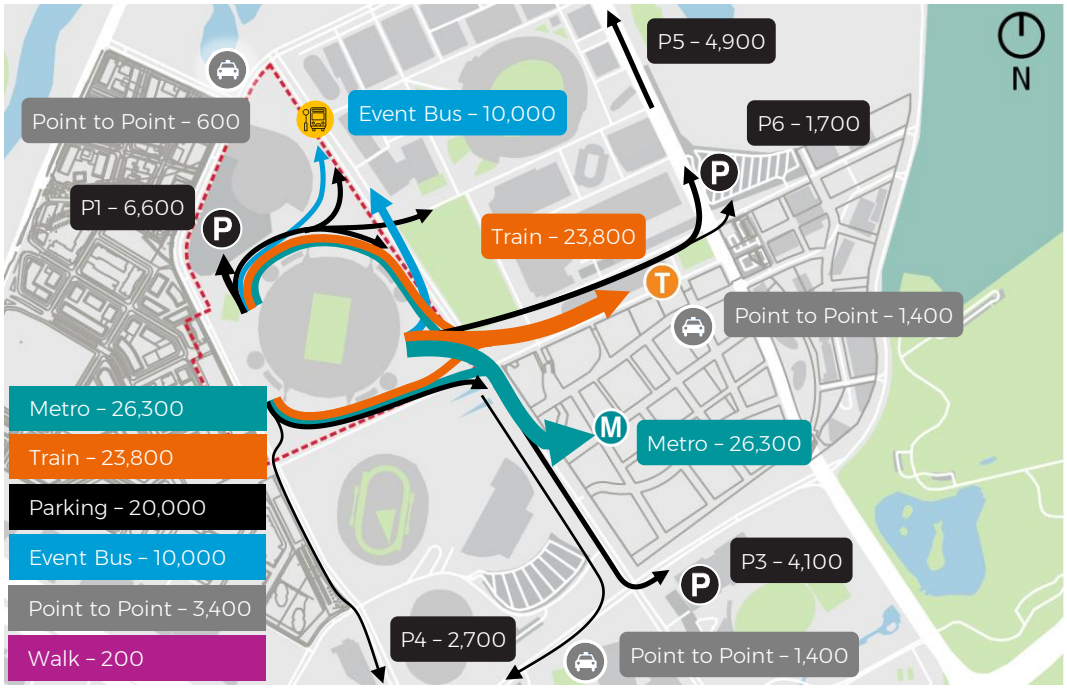


Figure 4.10: Major event mode split – future (typical 83,500 event)

4.4 Future event transport mode split

Future event transport provisions – stretch target

The previous scenario (Figure 4.10) retains the existing public transport mode share for major events. However, with the addition of SMW and potentially PLR2, the improved catchment and convenience could result in an increased public transport mode share.

As illustrated in Figure 4.11, a stretch target of 80% for public transport has been adopted. This target would be reliant on:

- Continued operation of the T7 Olympic Park line operating between Central and Blacktown
- SMW operating at frequencies consistent with the commuter peak periods
- Inclusion of Parramatta Light Rail Stage 2
- Reconfigured special event bus routes to operate between SOP and areas not serviced by the light or heavy rail network..

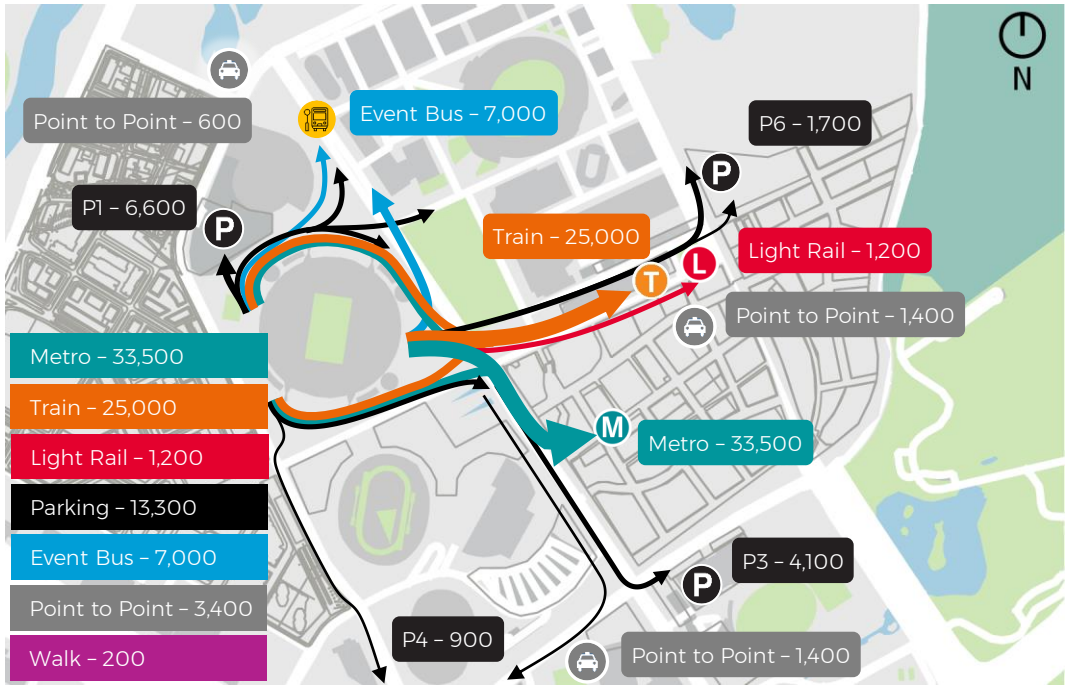


Figure 4.11: Major event mode split - future stretch target (typical 83,500 event)

4.5 Future event bus operations

Future overview

The Master Plan 2030 (2018 Review) proposed that bus operations be consolidated at the Plaza Terminal. This change is proposed to facilitate uninterrupted road access to the new Central Precinct.

The arrangement proposed in the previous study (Traffic and Transport Strategy, 2016) retained the existing bus routes, with the following changes on approach to SOP.

Routes 1A, 1B and 2

Access and exit via Bennelong Bridge (as per inset of Figure 4.12). It is noted that use of Bennelong Bridge would require additional clarification from the Department of Planning, Industry and Environment (DPIE), as the environmental approvals for the project noted the bus operations strategy for the bridge must:

> *"restricting use of the bridge for local bus services, and minimising use of the bridge for regional through traffic, including event services to [SOP]"*

Source: Homebush Bay Bridge Project Approval, Dept. of Planning and Infrastructure 2013

However, the proposed use of the bridge could be justified as 'minimising use' given that:

- Major event bus services would only operate approximately 20 days a year
- Only three of the routes would utilise the bridge

An alternative consideration would be use of the potential Parramatta River bridge crossing towards Melrose Park proposed by PLR Stage 2.

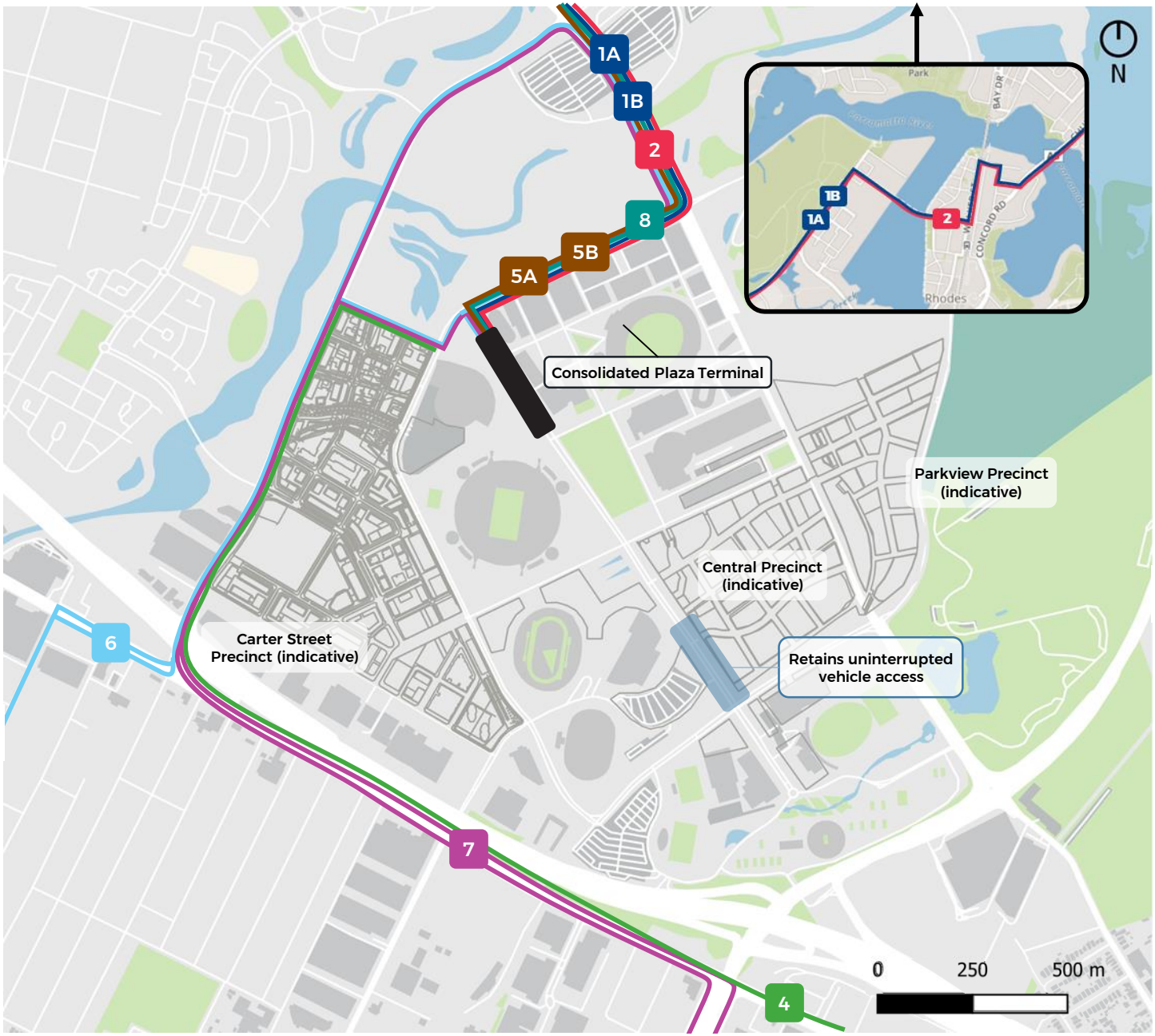


Figure 4.12: Future event bus operations (inset: use of Bennelong Bridge between Rhodes and Wentworth Point)

4.5 Future event bus operations

Consolidated Plaza Terminal arrangement

As summarised in Table 4.1 the previous study (Traffic and Transport Strategy, 2016) retained the existing bus routes and included recommendations on the number of bus bays required for each route.

These recommendations were based on:

- Ranks consisting of either two or three bays depending on route patronage
- Peak patronage data for each individual route, which equated to a total capacity of approximately 12,500 customers.

It is noted these provisions consequently include a level of flexibility, as the typical major event bus mode share split is estimated at 10,000 customers (Figure 2.5).

Table 4.1: Consolidated event bus requirements

Routes	Active bus bays
1B	Up to 4
1A, 2 and 8	3
4, 5A, 5B, 6 and 7	2

Source: Sydney Olympic Park Master Plan 2030 Review: Traffic and Transport Strategy (2016)

However, it is noted the terminal arrangement should also include the flexibility to accommodate:

- Changes to routes and frequency in response to changes in rail capacity and coverage including SMW. SMW would provide alternative to some:
    - Route 2 customers through stations in the inner-west including the Bays Precinct.
    - Some route 1A/B, 5A/B and 8 customers who may have more attractive options though the T9 Northern Line through the proposed interchange at North Strathfield.
- Leverage new and proposed bus priority including Bennelong Bridge and potential Parramatta River crossing towards Melrose Park
- Scalable operations for large or major events, as well as longer events such as Royal Easter Show.

The proposed design (Figure 4.13) replaces existing infrastructure to provide a flexible terminal arrangement consisting of:

- Permanent bus ranks within the existing terminal footprint.
- Temporary bus infrastructure south of the existing bus turning circle
- Additional bus turning circle for major event operations.

This arrangement allows for flexibility during operations, including:

- Ability to provide capacity for major event mode by using the permanent and temporary facilities
- Ability to operate a rationalised footprint terminal in lower patronage events. The design includes the ability to accommodate 8 independent routes within the reduced footprint at approximately 30 buses per hour per route
- Reduced permanent infrastructure which may be underutilised post SMW and PLR Stage 2.
- Retains legibility and efficient bus operations
- Maintains the clear-width required to accommodate event egress pedestrian demands based on the pedestrian analysis undertaken in Section 5. The approximate pedestrian envelope is highlighted in Figure 4.13 (refer to yellow line).

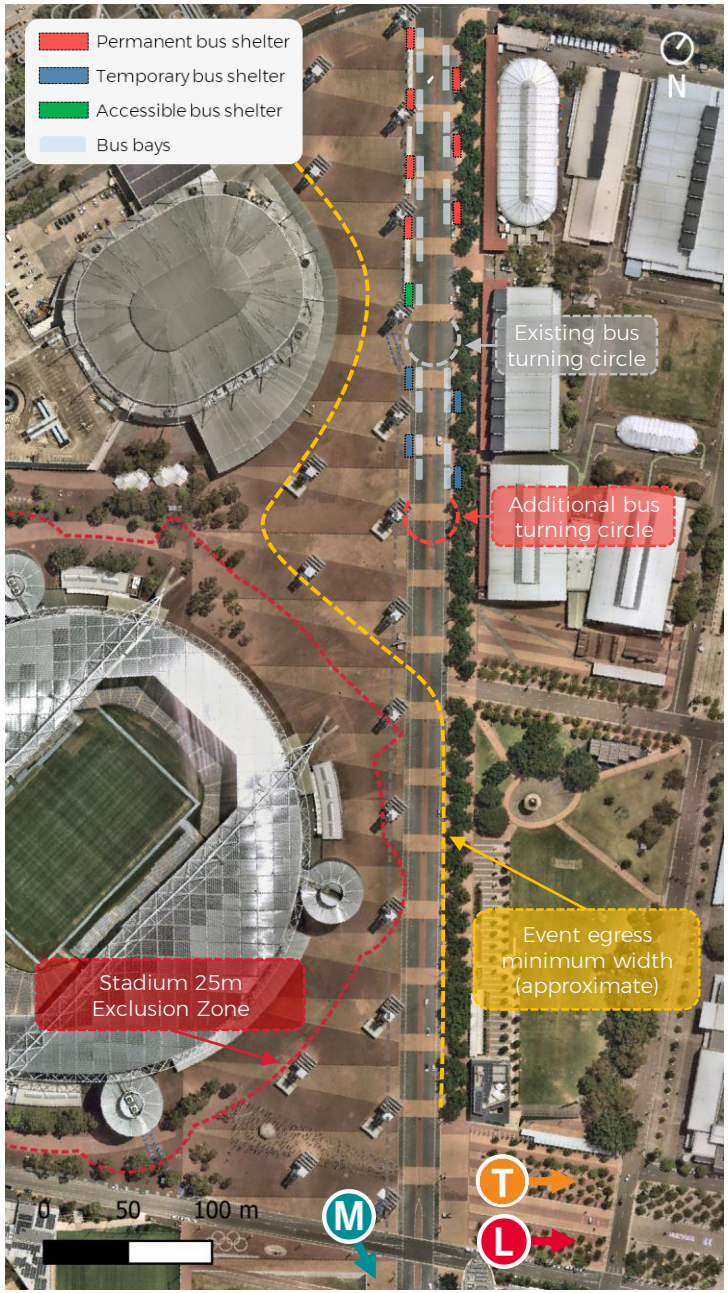


Figure 4.13: Future event bus operations

4.5 Future event bus operations

The proposed arrangement can accommodate:

- Up to 7 independent routes in the reduced footprint arrangement
- Up to 9 routes (with increased capacity for 2 routes) in major event mode

Table 4.2 summarises how these routes could be operated.

Table 4.2: Proposed event bus operations by region

#	Bays	Sydney region serviced	
		Reduced arrangement	Major event arrangement
Permanent facility			
1	2	North-east	North-east A
2	2	North	
3	2	North-west	North-east B
4	2	Inner-west	North
5	2	South-east	North-west A
6	2	South A	
7	2	South B	North-west B
8	1	Accessible bus bay	
Temporary facility			
9	2	Not in use	Inner-west
10	2	Not in use	South-east
11	2	Not in use	South A
12	2	Not in use	South B

Arrangement would require:

- Removal of 4 existing bus shelters and all plinths
- Provision of new bus shelters 8 permanent (shorter structures for head of queue only)
- Retain existing kerb line and bus turning circle
- Provision of new turning circle (and associated kerb works) approximately 110m south of existing turning circle
- No kerb work required between new and old turning circle
- Provisions (fixture on surface) to allow temporary bus shelters
- Provision of 12 variable plinths for head of queue (permanent and temporary locations)
- Provision of movable variable message boards to assist way-finding.

It is recommended a detailed study of bus operations and movements be undertaken to inform the specification and concept design of the terminal.

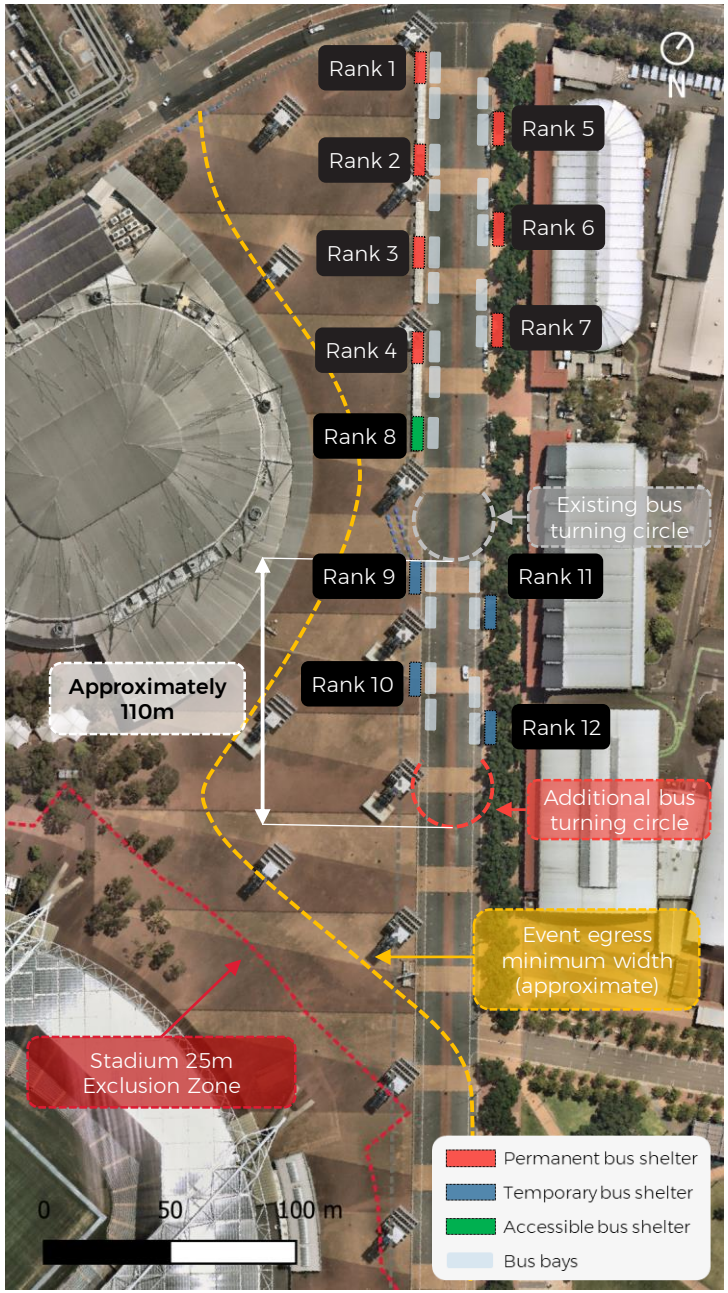


Figure 4.14: Future event bus operations

4.6 Opportunities to improve integration

From the perspective of Central Precinct customers, the proposed transport infrastructure (public and active) offer significant benefits, although there are number of opportunities or considerations to maximise the benefit for these customers.

Rail

SMW significantly increases capacity available to Central Precinct customers, as well as drastically reducing travel time between key strategic centres and CBDs.

Access to and from SMW within the precinct can be improved by facilitating unhindered access to the proposed station in the Central Precinct.

This can be achieved by covered or direct access from Olympic Boulevard and Dawn Fraser Avenue to minimise walking time.

Light Rail

Though not committed, it is envisaged PLR2 will be delivered in the future. As illustrated by the accessibility analysis, PLR2 increases connectivity to other GPOP regions which may encourage a higher non-car mode share for shorter trips.

To assist future integration with the Central Precinct, it is recommended:

- Development does not preclude an alignment along Dawn Fraser Avenue
- Stop locations are co-ordinated to serve key destinations within Central and other precincts without precluding or constraining event operations. This includes maintaining clear connectivity to Sydney Trains and Sydney Metro West.

Bus

Relocation of bus stops due to SMW and PLR2 will slightly extend the walking distance between bus stops and the Central Precinct. Subsequently, provision of walking and cycle friendly facilities and wayfinding between the Central precinct and the relocated bus stops will encourage and maintain use.

Potential shared use of new bridge across Parramatta River opening up new bus catchments e.g. Melrose Park.

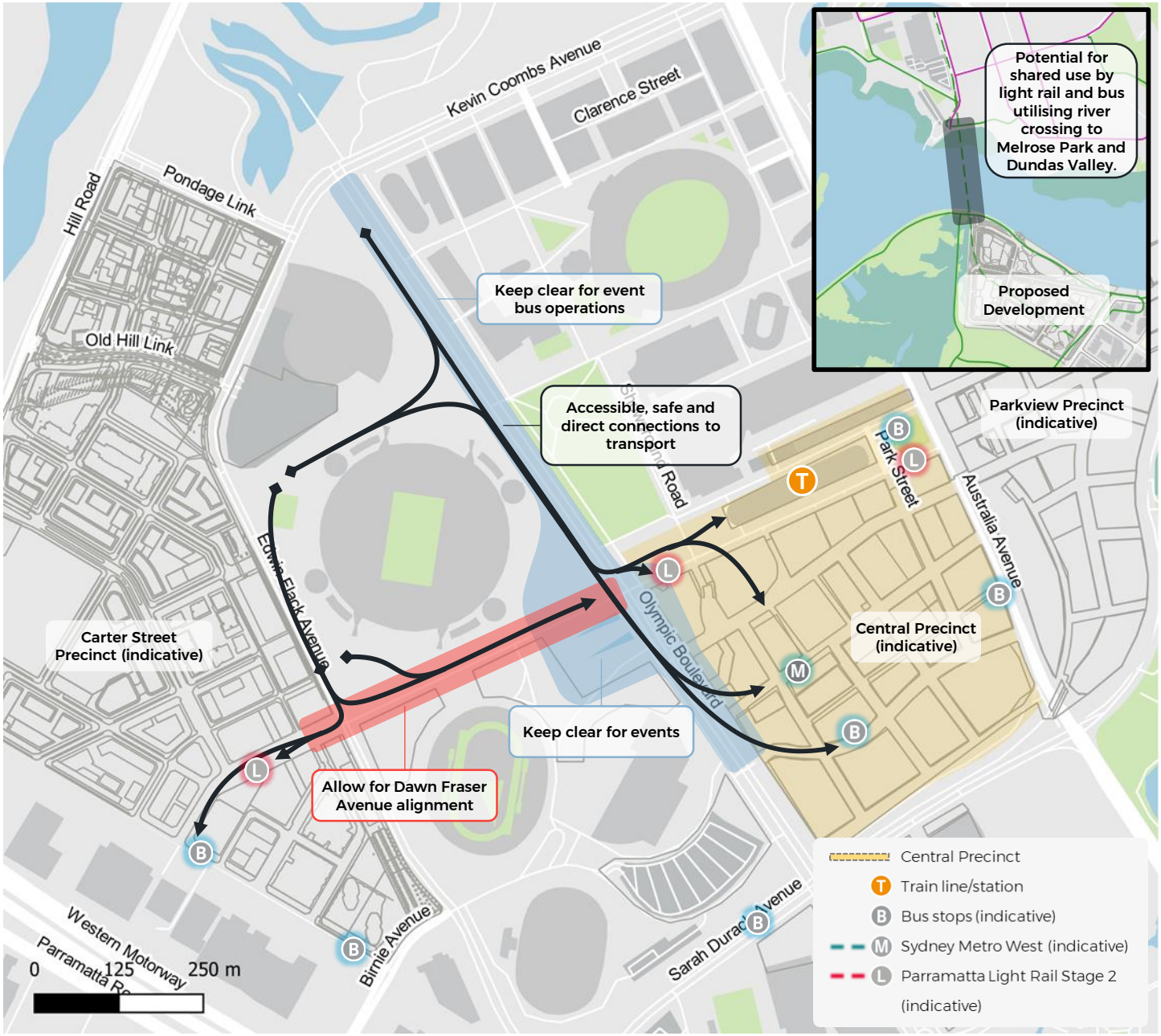


Figure 4.15: Opportunities for integration with Public Transport

4.6 Opportunities to improve integration

Active Transport

Within Sydney Olympic Park, key links for the Central Precinct are the north-south and east-west corridors which form the spine for travel within SOP, including to other precincts and transport modes.

Currently Olympic Boulevard is generally a low speed environment with sufficient paved width to act as the informal north-south spine. With the intensification of the Central Precinct, the role and spatial availability on this road may change. Hence active transport facilities should be accommodated and formalised within the proposed development.

Similarly, cycle provisions on Dawn Fraser Avenue should be upgraded to ensure the safety of users as traffic volumes are expected to increase with development. It is recommended painted on-road facilities be upgraded to on-road with physical separation.

These provisions should continue along Uhrig Road through to Carter Street to develop an uninterrupted network through to existing connections to and across Parramatta Road.

Active transport links proposed with PLR2 may formalise these facilities (and change the road environment) to create a safer cycling environment, although options should be investigated in the interim (or in the situation PLR2 does not proceed).

As the Central Precinct becomes an origin and destination in its own right, opportunities for end of trip facilities and secure bike parking should be included in the development to encourage walking and cycling.

Outside of Sydney Olympic Park, the connections to CBDs and surrounding precincts should be encouraged, including

- PLR2 Active transport links which formalise connectivity along Hill Road and provides a second river crossing to Melrose Park (see inset)
- New east-west cycle facilities along Parramatta Road
- Improved connectivity across Parramatta Road and M4 which act as a barrier to the south.

Figure 4.16: Opportunities for integration with Active Transport

Walking and cycling analysis

Transport Strategy Review

5.1 Walking accessibility

Figure 5.1 shoes the current walking isochrones for 5, 10 and 15 minutes interval from the proposed Metro station.

This shows that the majority of the Central Precinct is within 5 minutes walk of the Metro station entrance. This is key as this precinct includes the majority of retail and community functions and represents the highest residential densities.

The other major precincts including the Stadia and Parkview precincts are also within a 10 minute catchment.

Southern sections of the Carter Street Precinct are within 15 minutes via Dawn Fraser Avenue. All sections of the development are within a 20 minute walk of the proposed Metro station.

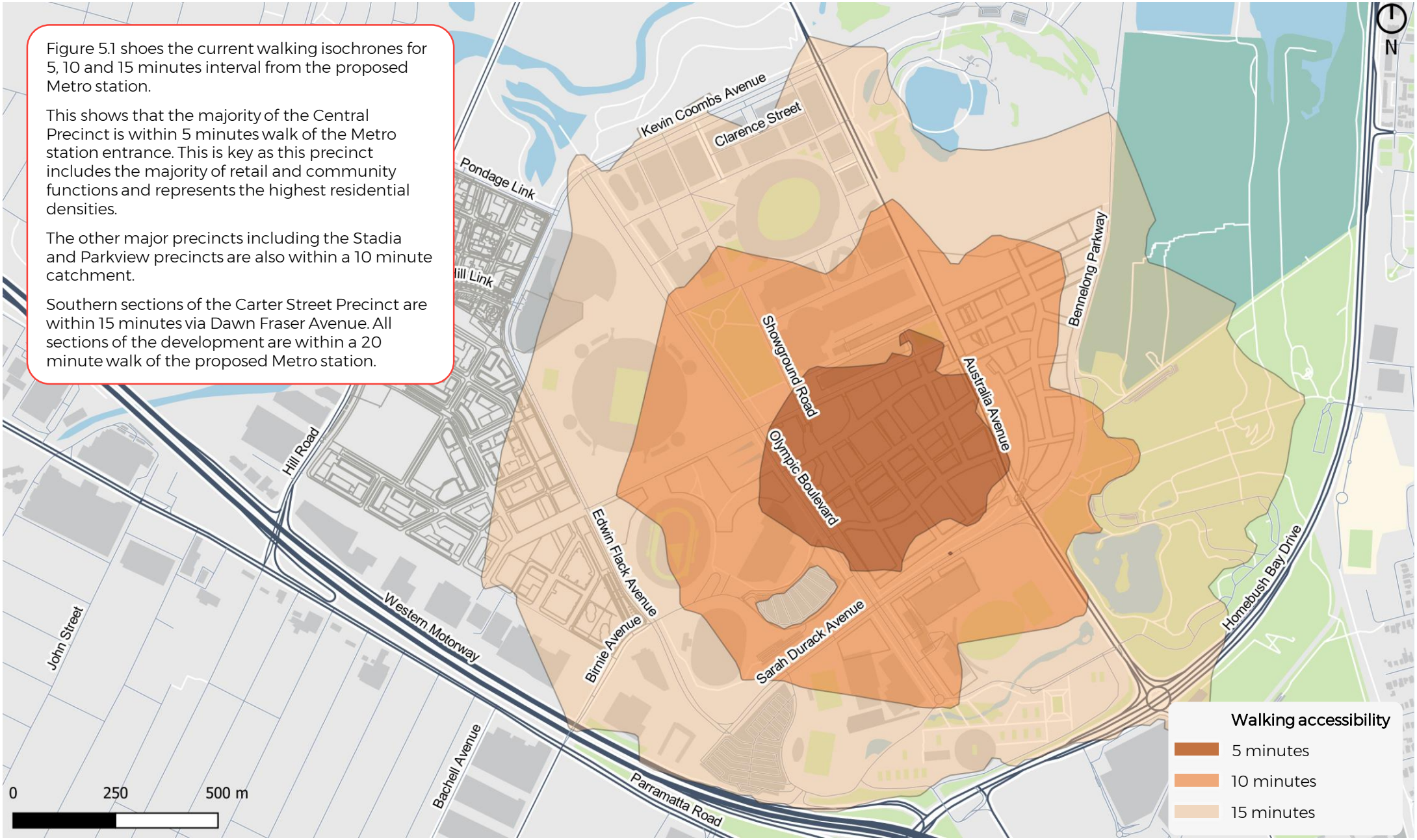


Figure 5.1: Walking accessibility

5.2 Cycling accessibility

As noted in Section 4.7, the Olympic Park has excellent cycling infrastructure both to and within the park. This is reflected in the accessibility to the Metro station by cycling.

Most of the Parklands is within 10 minutes by cycle which extends to Wentworth Point, Rhodes and Lidcombe within 15 minutes.

The use of cycling as a modal choice would need to consider provision for end of trip facilities and safe crossing points on major roads.

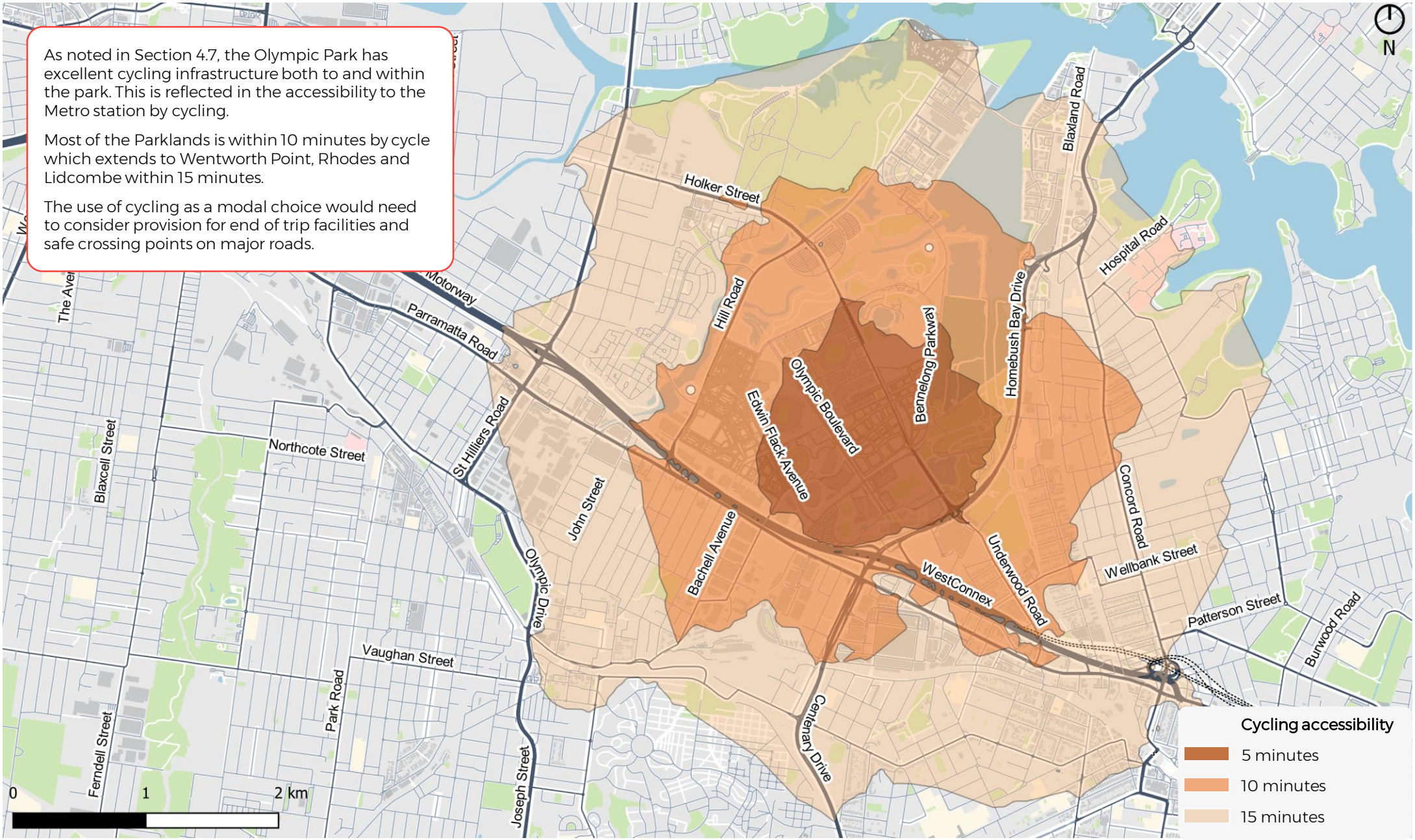


Figure 5.2: Cycling accessibility

5.3 Event pedestrian assessment

As the home to Sydney's premier sports and entertainment venues, any development within the Central Precinct must not preclude the ability to host major events at Stadium Australia and Qudos Bank Arena.

Currently the detailed footprint and characteristics of the development are not known. Hence the aim of the pedestrian analysis is to quantify the event mode pedestrian flows (and associated congestion and safety considerations). This information can then be used in development of the building footprint.

Figure 5.3 summarises the assessment methodology adopted. The methodology leverages and updates the previous modelling undertaken in the *Red Zone Pedestrian and Traffic Study* (WSP, 2018).

The subsequent sections of this chapter summarise the:

- Key considerations and inputs for the model development
- Outcomes of the pedestrian capacity assessment.

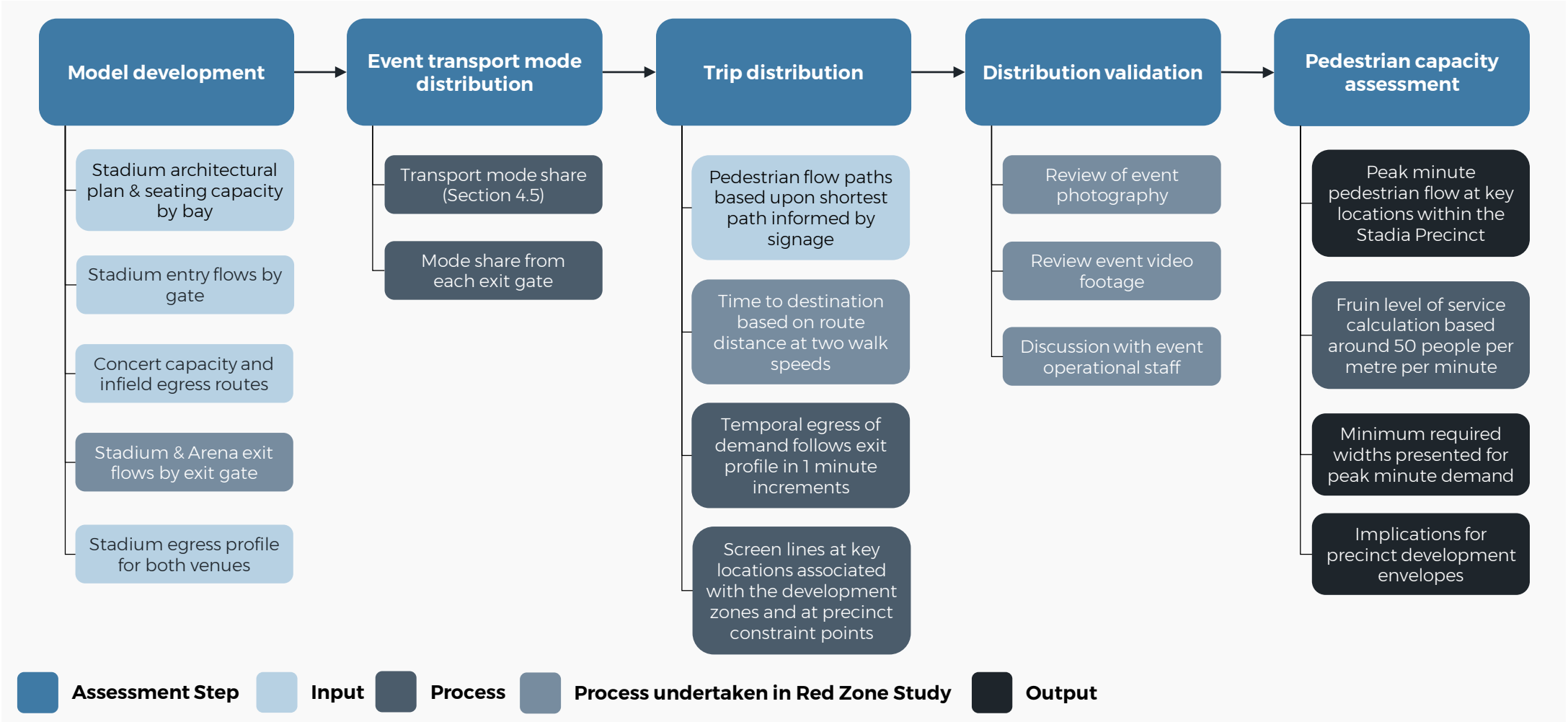


Figure 5.3: Pedestrian assessment methodology

5.3 Event pedestrian assessment

Venue capacity

Stadium Australia has a current seating capacity of 83,500 seated spectators for major events. The stadium is relatively evenly balanced in terms of seating accommodation (Figure 5.4).

In concert mode, an additional 14,800 spectators can be accommodated on the field. This is possible when concerts are performed "in the round" with a central stage minimising the number of "seat kills" (obstructed viewing seats).

Qudos Bank Arena has a capacity of approximately 21,500 spectators.

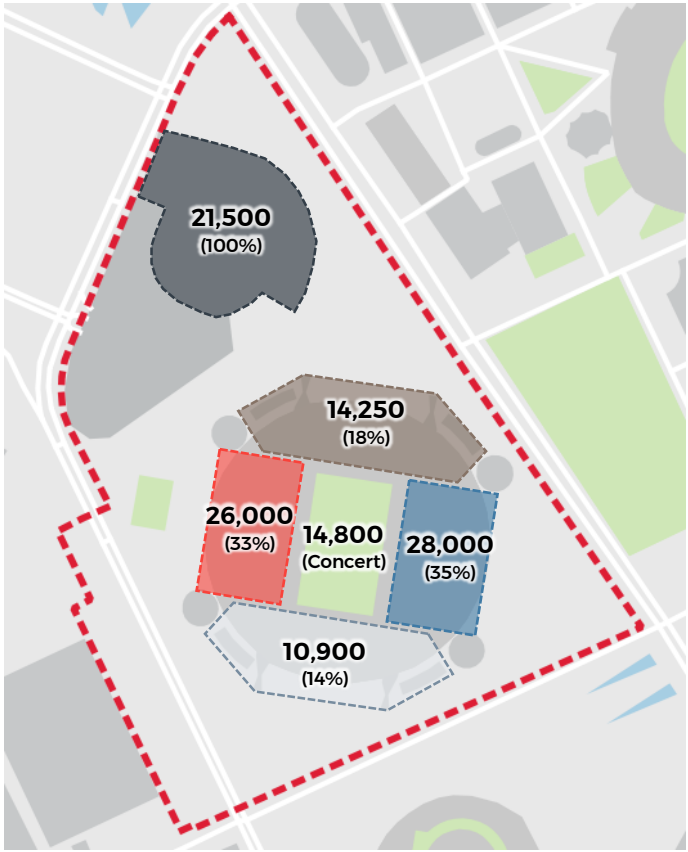


Figure 5.4: Venue capacity split

Event spectator profile

Event access and egress profiles differ by event type, time of day and day of week, though for a typical event:

- Spectators arrive up to 2 hours prior to the event, with some arriving early to access retail and entertainment.
- Spectators exit the venue or precinct within 1 hour.

Subsequently, the intensity of demand is significantly greater during event egress compared to the event access.

In addition to the venue demand, the proposed developments in the Stadia Precinct will also generate pedestrian movements. A large proportion of this development is education, commercial and hotels.

For the commercial and education developments, the peak pedestrian activity would be during the typical commuter peaks. Hence the PM peak period may overlap with the event access for a weekday evening major event.

Figure 5.5 summarises the pedestrian profile for another stadium precinct with commercial development.

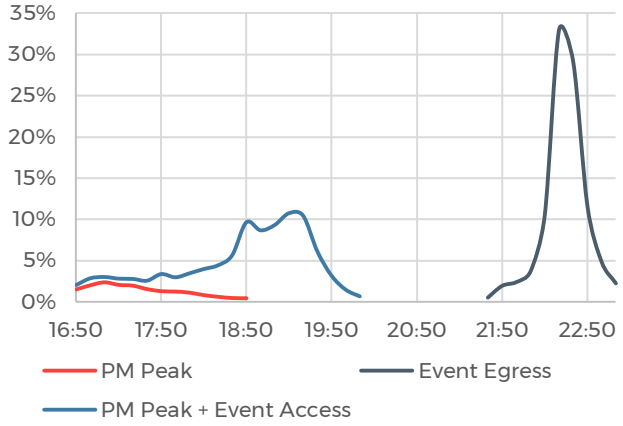


Figure 5.5: Example Profile: Stadium with Development

with kick-off at 7:50pm and final siren at 10:20pm.

From this profile it is evident:

- PM commuter peak subsides as event access ramps up
- Event egress profile is significantly more onerous on pedestrian infrastructure

Consequently, if the egress scenario is adopted as the assessment scenario, the precinct would be able to accommodate the additional development pedestrian demand during the event access.

Regarding the proposed hotel and accommodation, it is envisaged that a proportion of users would be event customers, and hence captured in the event profile. This includes spectators staying at nearby hotels, or accessing facilities prior to and after the event.

Hence, it is assumed the remaining proportion of non-event hotel and accommodation trips would be relatively small compared to event egress demands.

Based on these considerations, the event egress is adopted as the 'worst-case' scenario for the Stadia Precinct from a pedestrian volume perspective.

Assessment scenarios

Based on the aforementioned venue capacities and the spectator profile, three major event egress scenarios have been adopted for this assessment (Table 5.1).

Table 5.1: Assessment scenarios

Egress scenario	Mode	Spectators
Stadium Australia	Sport	83,500
Stadium Australia	Concert	98,300
Stadium Australia and Qudos Bank Arena	Concert	120,000

5.3 Event pedestrian assessment

Egress spectator destinations

In addition to the venue scenarios adopted for this assessment (Table 5.1). The assessment has been undertaken for two transport mode split scenarios :

- Major event mode split (as per Figure 3.14), referred to as the base scenario
- Major event mode split - future stretch target (as per Figure 3.15), referred to as the sensitivity scenario.

As discussed in Section 2.8, the base scenario retains the existing public transport mode share of approximately 70%, with majority accommodated by the two rail modes (60%), and the remainder by special event buses.

Compared to the existing scenario, the event buses will however be consolidated at the Plaza Terminal. Hence all event bus demand is redirected towards Boulevard North.

Based on the mode share, the destination split in Table 5.2 has been adopted for the base scenario.

Table 5.2: Egress distribution by destination – base

Destination	Future with SMW
Urban Forest	8%
Boulevard North	15%
Town Centre	36%
Boulevard South	41%

The sensitivity has been included to assess walkway requirements if the addition of SMW and PLR2 results in an increased public transport mode share.

For this sensitivity scenario, the destination split in Table 5.3 has been adopted.

Table 5.3: Egress distribution by destination – sensitivity

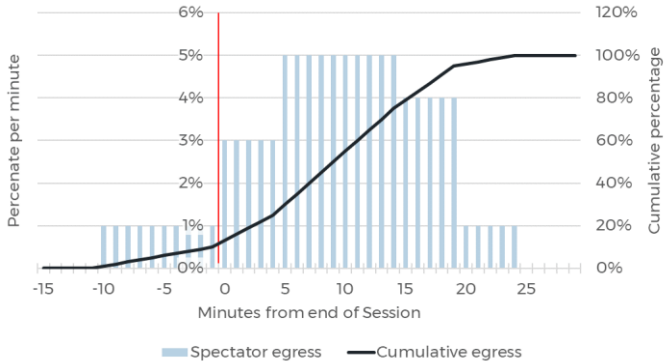
Destination	Future with SMW and PLR
Urban Forest	8%
Boulevard North	9%
Town Centre	35%
Boulevard South	48%

In the sensitivity scenario, distribution to:

- Urban Forest is unchanged as it provides connectivity to P1 carpark and point-to-point services on Pondage Link
- Boulevard North decreases due to the reduction in customer demand for special event buses and P5 carpark
- Town Centre stays consistent overall as increased flows to T7 and potential PLR2 are offset by decrease in access to P5 carpark
- Boulevard South increases significantly due to the increased mode share for SMW.

Egress spectator profile

The assumed exit profile from the stadium has been adopted from the event egress profile provided in the *Review of Pedestrian Flow During Major Events at Olympic Park* (Arup, 2011). The profile assumes 10 per cent of the people leave prior to the end of the event and 100 per cent of the spectators have exited the stadium within 25 minutes of the end of the event as illustrated in Figure 5.6.



Source of underlying data: Review of Pedestrian Flow During Major Events at Olympic Park (Arup, 2011)

Figure 5.6: Stadium Australia exit profile

5.3 Event pedestrian assessment

Venue ingress and egress distribution

Although stadium ingress (event access) was not assessed, the ingress gate distributions (Figure 5.7) were used to inform the egress distribution.

The ingress gate distribution has been determined based on the number of tickets scanned at each stadium access point.

Conversely, the egress distribution is difficult to accurately quantify as customers are not tracked or counted at their exit location.

Hence, as a proxy for egress distribution, the split in Figure 5.8 has been determined based on the closest exit gate for each respective entry gate location from Figure 5.7.

It is assumed in concert mode, the infield spectators depart via the ramp and subsequently share the same exit gate as those from the upper levels.

For the purposes of this assessment, it is assumed that the destination distribution is consistent across all exit gates.

In reality there may be some internal redistribution, i.e. spectators may use the internal concourse to access a exit gate closer to their end destination, this has not been considered in the pedestrian analysis. As a result, the methodology reflects a conservative approach.

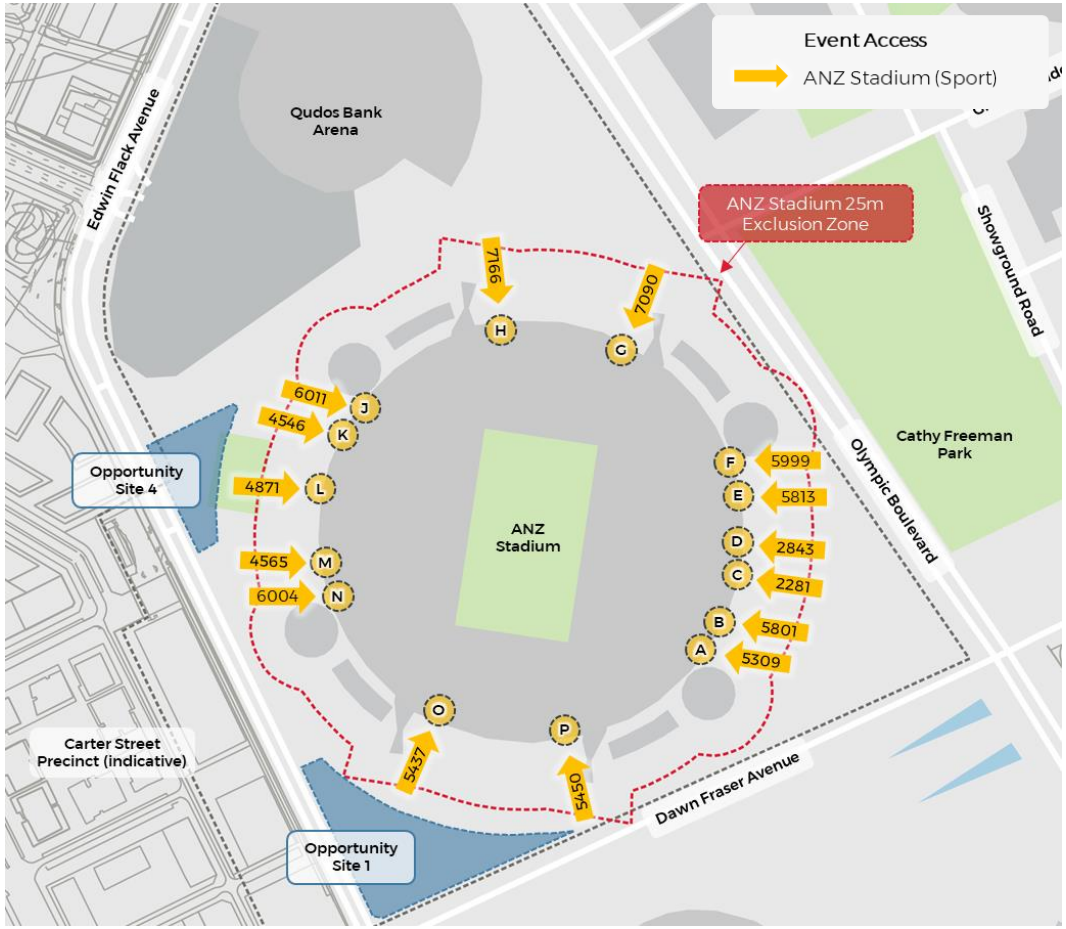


Figure 5.7: Stadium entry gate demand distribution

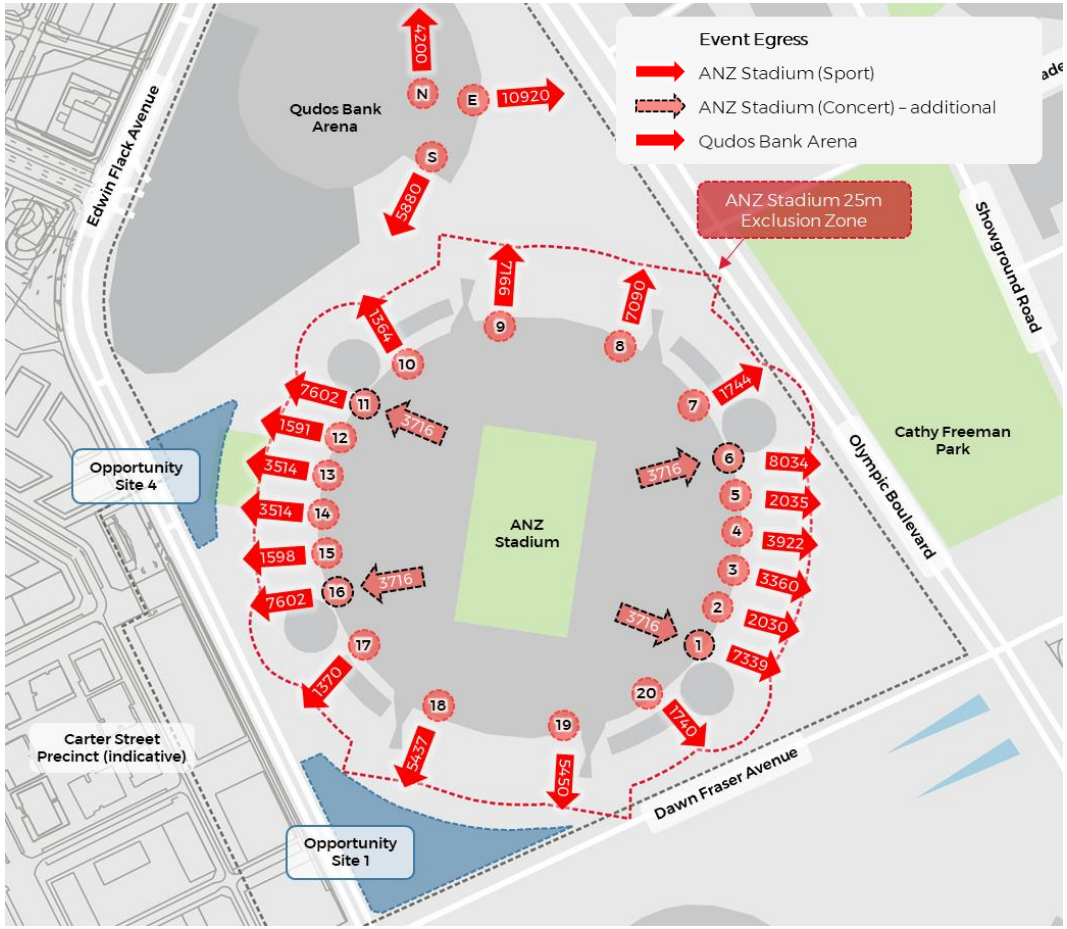


Figure 5.8: Stadium exit gate demand distribution

5.3 Event pedestrian assessment

Target pedestrian level of service

Pedestrian levels of service are based on pedestrian flows per unit of width per minute (for walkways and stairways), or density (based on pedestrian queuing areas). Pedestrian level of service (LoS) standards range from:

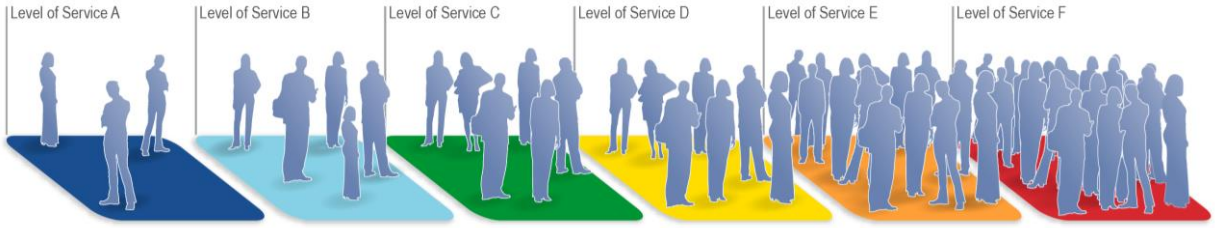
- LoS A (very good)
- LoS C (typically adopted for transport facilities)
- LoS F (very poor or beyond capacity).

The LoS definitions are provided in Figure 5.9.

For this study a pedestrian LoS D, 50 people per metre per minute (PMM), has been adopted as the target LoS.

LoS D is considered acceptable and best-practise for event precincts globally as:

- Customers accept a lower pedestrian level of service than commuters (LoS C) due to the one-off nature of the experience and awareness of attending an event with large crowds
- LoS D retains customer safety and but does not result in the over design of the urban realm.
- LoS D provides a level of contingency for crowd management operations in the event of adverse conditions, including incidents or delays in transport services.



	LoS A	LoS B	LoS C	LoS D	LoS E	LoS F
Walkway – High Demand Environment						
Average Flow (p/m/m)	23 or less	23 - 33	33 - 49	49 - 66	66 - 82	Variable
Average Density (m^2/p)	3.3 or more	2.3 - 3.3	1.4 - 2.3	0.9 - 1.4	0.5 - 0.9	0.5 or less
Average Speed (m/s)	1.32 or more	1.26 - 1.32	1.14 - 1.26	1.12 - 1.14	0.63 - 1.12	0.63 or less

Adapted from Fruin (1971); Bowman, Fruin and Zegeer (1989); London Underground: Station Planning Standards & Guidelines (2012)

Figure 5.9: Fruin Pedestrian Level of Service criteria

5.3 Event pedestrian assessment

Base scenario

The pedestrian movement has been assessed at key screenlines throughout the precinct (Figure 5.10).

These results have been converted to a spatial requirement based on the target LoS D (50 PMM). The clear width requirements are summarised in Table 5.4.

Table 5.4: Minimum walkway widths

Location	Stadium Loading Scenario (m)		
	Sport	Concert	Concert + Arena
Screenline 1	30	35	47
Screenline 2	18	22	22
Screenline 3	13	15	15
Screenline 4	13	16	16
Screenline 5	22	25	25
Urban Forest	7	8	9
Boulevard North	12	14	17
Boulevard Central	34	39	55
Town Centre	30	36	43
Boulevard South	35	41	50

These widths represent the clear width requirement available for use by pedestrians. This means obstructions such as street furniture, landscaping or event overlay are in addition to the clear width requirement.

Based on the assessment, the combined pedestrian movement along the proposed opportunity sites (screenlines 2-5) can be accommodated within the 25-metre exclusion zone during simultaneous events.

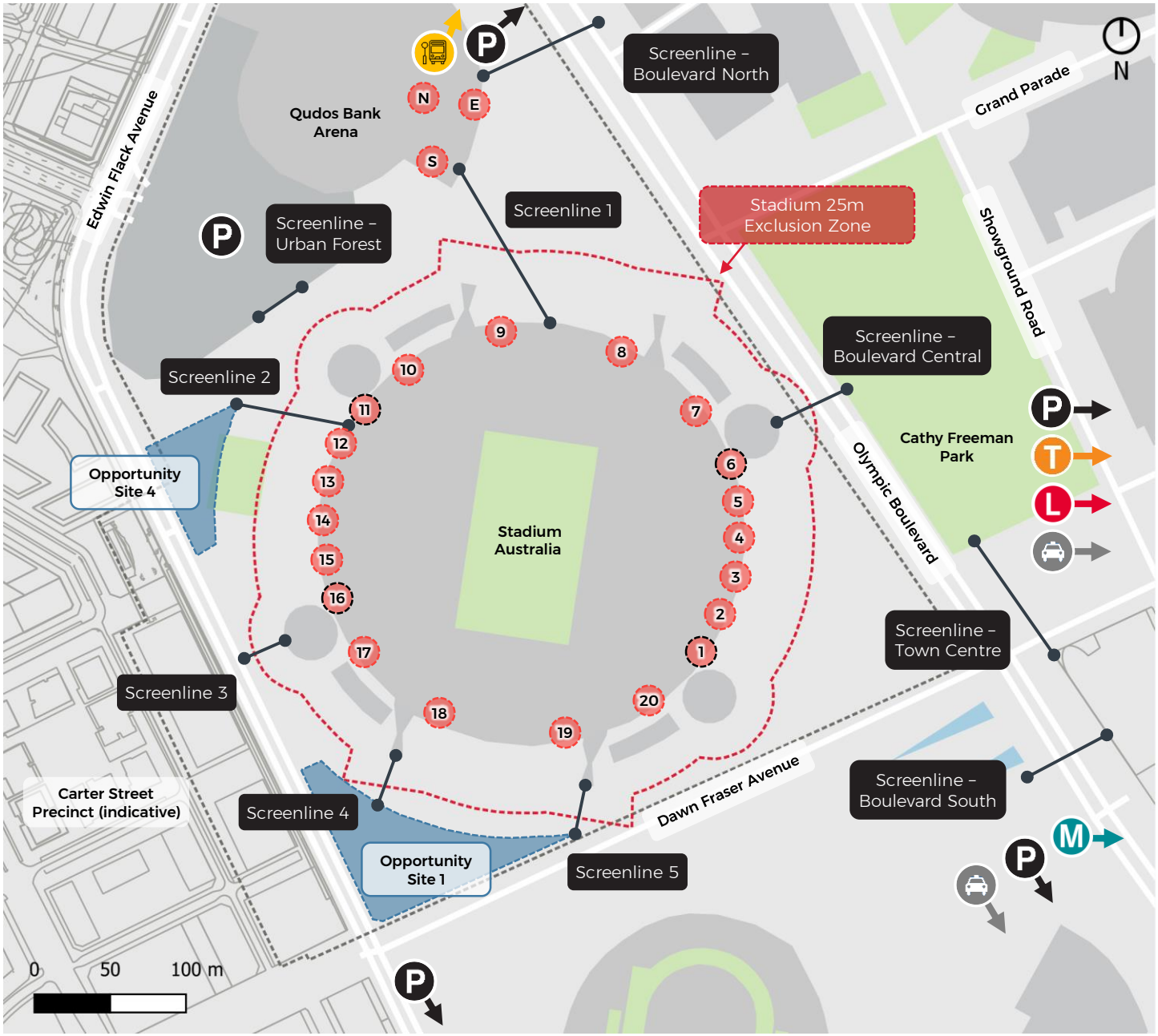


Figure 5.10: Pedestrian assessment screenlines within or near the boundary of Stadia Precinct

5.3 Event pedestrian assessment

Sensitivity scenario

Based on the sensitivity assessment, the subsequent clear width requirements are summarised in Table 5.5.

Table 5.5: Comparison of minimum walkway widths

Location	Concert + Arena Scenario (m)		
	Base	Sensitivity	Change
Screenline 1	47	45	-2
Screenline 2	22	21	-1
Screenline 3	15	16	+1
Screenline 4	16	16	-
Screenline 5	25	26	+1
Urban Forest	9	9	-
Boulevard North	17	10	-6
Boulevard Central	55	56	+1
Town Centre	43	42	-1
Boulevard South	50	57	+7

As highlighted in Figure 5.11, the key changes in walkway width requirements include:

- Reduction at Boulevard North towards event buses
- Increase on Boulevard North towards SMW.

Based on the sensitivity assessment, the 25-metre exclusion zone continues to accommodate the combined pedestrian movement along screenlines 2-4. At screenline 5, Opportunity site 1 is set back from the exclusion zone, hence there is sufficient width for event customers and movement is not hindered.

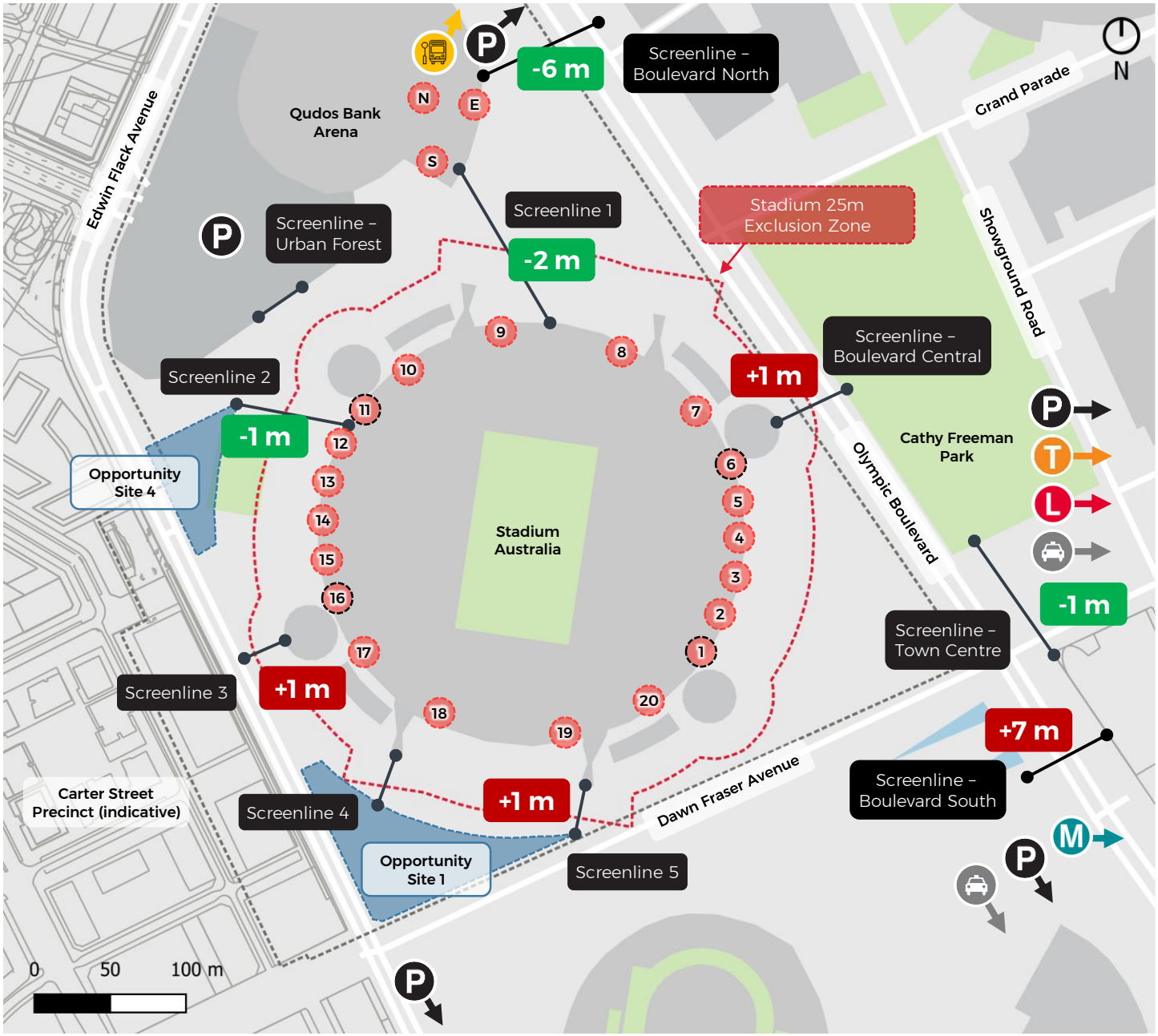


Figure 5.11: Comparison of pedestrian assessment screenlines within or near the boundary of Stadia Precinct

5.3 Event pedestrian assessment

Positioning the Metro Station within the Central Precinct

The positioning of the Metro station within the central precinct were first scoped by SOPA in March 2018. The key considerations which drove its location included:

- Station box could be “slid” south to avoid conflicts with Abattoir Heritage precinct and staged on undeveloped block to south
- Ability to have station box beneath street reducing impact on planned development parcels
- Relates to the Central Precinct rather than Olympic Boulevard
- Open space required to be associated with station for queuing for large event crowds
- Requirement to maintain access at all times to high density residential on Figtree Drive
- Creates open space from Abattoir precinct in a corridor
- Integration with second LRT stop on Yulang. Achieves integration and flexibility for events
- Does not require the relocation of proposed traffic signal on Olympic Boulevard
- Serves population to the east and north

The station requirements for the Metro Station within the Central Precinct

The key event functional requirements which influenced the location of the Metro station included:

- Replicates the event loading of Olympic Park station splitting crowds by direction
- Utilise the open space, park and streets to queue crowds (i.e. not development sites)
- Does not sterilise space for event use only by incorporating spectator queuing requirements into the landscape
- Crowds can be dispersed into the Central Precinct retail area during delays
- Reduced crowd management is required until turn into east-west new street
- Event crowds can access and dwell within Central Precinct in close proximity to Metro station on arrival
- Requires the closure of a small number of streets in the Central precinct during events
- Requires turning crowds at 90 degrees off Olympic Boulevard into plaza

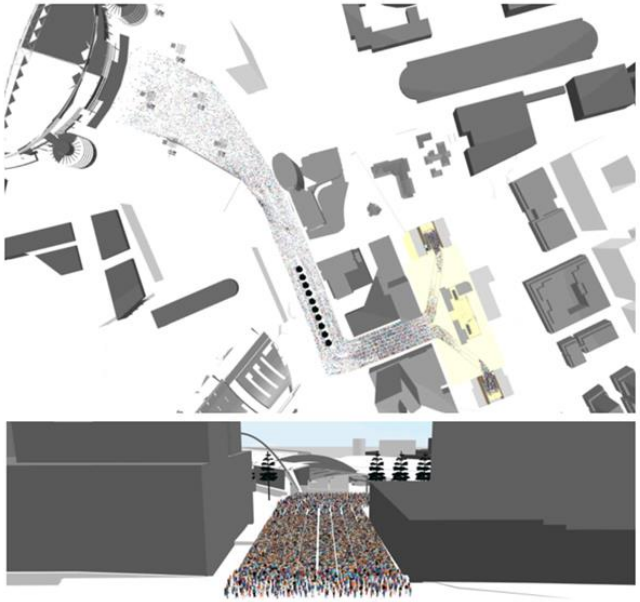


Figure 5.12: Precinct event pedestrian modelling undertaken by Sydney Metro for reference design

Photo 5.1: Olympic Park Station crowds during a State of Origin match

Photo 5.2: Event crowds exiting Wembley Stadium towards Wembley Park Tube station during Euro 2020

5.3 Event pedestrian assessment

Requirement for a 40 metre plaza

The requirement for a 40 metre plaza originated in March 2018 following the demand analysis for the Metro station undertaken by SOPA in coordination with Sydney Metro. The estimated event demand of 26, 275 to Metro and 23,820 to T7 Sydney Trains as outlined in Section 4.4.

The second analysis which reinforced this requirement was the pedestrian modelling undertaken by SOPA for the Stadium Red Zone study in October 2018. This analysis identified a width requirement for Southern Olympic Boulevard of 48 metres which included movements to P3 and P4 car parks (6m) in addition to the demand to the Metro station. This study also noted that a similar width is required for access to the T7 Olympic Park Sydney Trains station as the train demand is evenly split between the two stations.

The third pedestrian analysis was undertaken by Sydney Metro in May 2019. This dynamic modelling confirmed the width requirement of 42 metres on the approach to the station.

Planning assumptions to determine event spatial requirements

The key pedestrian planning assumptions used to determine the spatial requirements for event loading of the Metro station developed by SOPA in coordination with Sydney Metro in September 2019 were::

- 26,275 crowd (who arrive at the station over a 10-20 minute period based on where you are seating in the venue
- Approx. 1,000 passengers per Metro train
- Approx. 26 Metro train loads
- Peak queuing requirement for 21 trains. 5 train loads of passengers already in station or loaded
- 2 trains loaded
- 2 train loads on two side platforms
- 1 train load of passengers in station moving between surface and platform
- The resultant peak queuing requirement on the surface is for 21,000 passengers
- 21,000 x 0.5 sqm / person = 10,500m required – event best practice LoS D for queuing
- Minimal queueing extent on Olympic Boulevard is as at Herb Elliott Avenue to facilitate precinct circulation. Maximum queuing point is Dawn Fraser Avenue
- 8m stand-off zone at front of station event entrances for emergency evacuation of station

Event passenger queuing requirements on approach to the Metro Station

The key spatial requirements for event queuing in the approach to the Metro station were developed SOPA in coordination with Sydney Metro in September 2019. This operation requires the closure of Olympic Boulevard to traffic north of Figtree Drive and the relocation of the Aquatic Bus Terminal to the northern end of Olympic Boulevard.

The key requirements can be seen in Figure 5.13 And outlined below:

- Station Loading - 1,000sqm (2,000 pax = 2 train loads)
- Pre-loading West – 2,000sqm (4,000 pax = 4 train loads)
- Pre-loading East – 2,000sqm (4,000 pax = 4 train loads)
- Eastern footpath of Olympic Boulevard – 1,200sqm (2,400 pax = 2.4 train loads)
- Southbound carriageway of Olympic Boulevard – 2,000sqm (4,000 pax = 4 train loads)
- Northbound carriageway of Olympic Boulevard – 2,000sqm (4,000 pax = 4 train loads)
- Grand total of space required – 10,200 sqm (20,400 pax)
- Pre-loading safety corridor = 2 metres (located either in the centre of queuing or on the edge of the Western Plaza

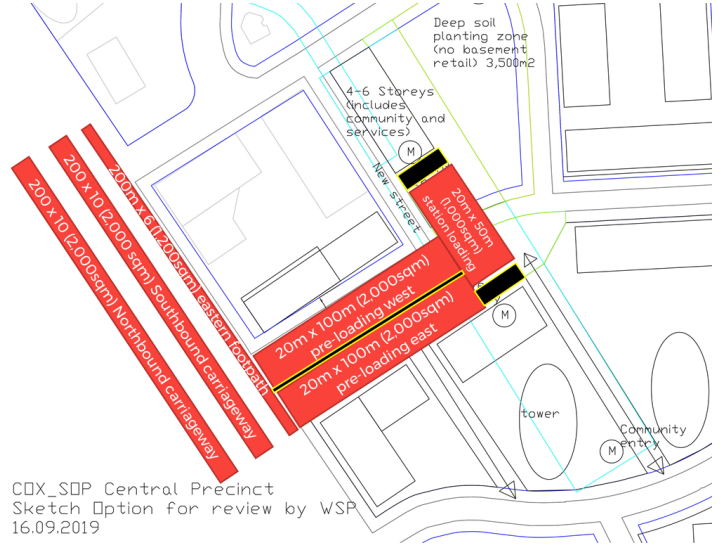


Figure 5.13: Spatial requirements for event loading of Metro station (SOPA, 2019)

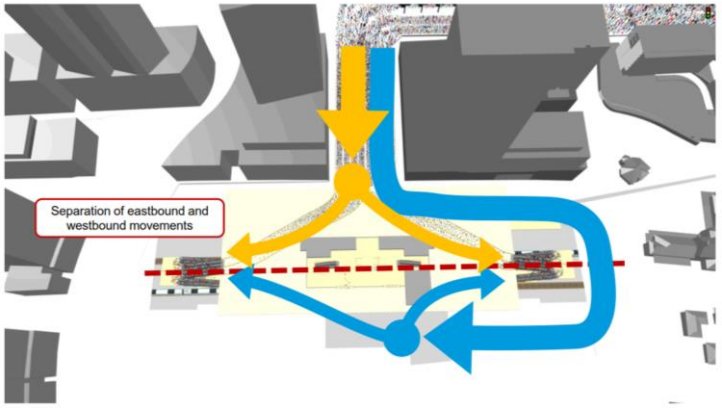


Figure 5.14: Sydney Metro Reference Design event loading pedestrian modelling (Sydney Metro, 2019)

Relevant planning controls

Transport Strategy Review

6.1 Parking controls

The 1995 Master Plan Transport Strategy for the redevelopment of Homebush Bay to host the Sydney 2000 Olympics established a maximum of 10,000 public parking spaces across SOP. These are now provided in a number of structured and at grade car parks. The limit was set primarily by the limited capacity of the surrounding arterial road network to accommodate departing vehicles.

Striking the right balance of car parking provision was an important feature of previous Transport Strategies, which aimed to attract developers to the site whilst also balancing the amount of traffic generated by developments. With the planning approval and management of public parking in the control of SOPA, a suitable level of car parking was to be provided that would not impact the achievement of mode share targets or impact the viability of businesses and venues at SOP.

Higher use of non-car transport modes will only be attained with a right combination of public transport service provision and a controlled parking supply. With the step change in public transport provision at Sydney Olympic Park with the introduction of Sydney Metro and potentially Parramatta Light Rail Stage 2, there is an expectation that parking rates at Sydney Olympic Park are adjusted to be more aligned with those of other centres within Greater Sydney which have similar provisions of public transport.

This transport strategy has adopted new parking rates which are tighter than those currently in SOP Master Plan 2030 (2018 Review) and have been informed by more recent rates developed for the Parramatta Road Urban Transformation (Homebush Precinct), Chatswood (Willoughby Council) and the Carter Street Precinct.

Car parking provision rates

Under the amended SOP Master Plan, all new private development would be required to provide car parking in accord with the parking rates outlined in Table 6.1. This Transport Strategy supports the incorporation of these rates into the next 5-year review of the SOP Master Plan 2030.

Consistency in the supply of parking with other major competing retail centres is a valid consideration. Transport for NSW should be leading the delivery of consistency parking policy for major centres across Greater Sydney to ensure equitable and sustainable parking supply is provided.

Off-street parking

The key design objectives for off-street parking within the Central Precinct include:

- Locate car parks underground where possible
- Design and locate car park entries away from main streets to minimize visual impact and improve street capacity
- Retain the existing off street public car parking facilities of P8 for use primarily for non-event purposes to support local businesses and residents
- Construct new basement public car parking in the Central Precinct to serve the 'day-to-day' needs of residents and visitors.
- The future use of off-street parking to accommodate demand for free parking in lieu of on-street parking should be further considered as demand increases for both parking and other kerbside uses. This should consider issues such as capacity, commercial returns and agreements with private operators, major event needs, provision of public transport. It should also consider the needs of place making and other users such as pedestrians and deliveries.

This Transport Strategy recommends that car sharing schemes and facilities are promoted and facilitated within SOP. This would include the provision of dedicated car-sharing spaces in proximity of residential land uses, which could be located either on-street, or within basement car parks of larger developments.

The facilitation of car sharing schemes within SOP would assist in reducing car ownership, and supporting the reduced car parking provisions outlined in Table 6.1.

6.1 Parking controls

Provide car parking for non-residential developments at the rates in Table 6.1 Maximum Vehicle Parking Rates – Non-Residential.

Car sharing is strongly encouraged. The Sydney Olympic Park Authority should work closely with proponents and local councils to identify opportunities to provide car sharing spaces for new developments where possible.

Provide accessible parking at the rate prescribed in SOPA Access Guidelines.

Table 6.1: Maximum parking rates – Non-residential for the Central Precinct

Land use	SOP Master Plan 2030 (2018 Review) parking rates	Proposed parking rates (Maximum)	Comments
Office and commercial	1 space/80 m^2	1 space/110 m^2	In line with Willoughby City Council (Chatswood)
Restaurants	1 space/50 m^2	1 space/70 m^2	Parramatta Road Urban Transformation (Homebush Precinct)
Club	1 space/50 m^2 1 space/2 staff	1 space/70 m^2 1 space/2 staff	In line with restaurants
Hotels, serviced apartments and boarding houses	1 space/accommodation 1 space/2 staff	1 space/accommodation 1 space/2 staff	No change – In line with Willoughby City Council (Chatswood)
Education			
Schools	1 space/2 staff	1 space/2 staff	No change
Tertiary	1 space/2 staff	1 space/2 staff	No change
Childcare	1 spaces/4 children and suitable drop-off 1 space/2 staff	1 spaces/4 children and suitable drop-off 1 space/2 staff	No Change
Retail			
Supermarkets	4 spaces/100 m^2	4 spaces/100 m^2	No Change
Local Retail	1 space/50 m^2	1 space/70 m^2	Parramatta Road Urban Transformation (Homebush Precinct)
Themed Retail	1 space/50 m^2	1 space/70 m^2	Parramatta Road Urban Transformation (Homebush Precinct)

6.1 Parking controls

Provide car parking for residential developments at the maximum rates in Table 6.2 Maximum Vehicle Parking Rates – Residential uses.

Table 6.2: Maximum parking rates - Residential uses for the Central Precinct

Land use	SOP Master Plan 2030 (2018 Review) parking rates	Proposed parking rates (Maximum)	Comments
Residential			
Studio	N/A	0 space/dwelling	Carter Street Precinct Development Framework 2020 (Alternative rates)
1 bedroom	1 space/dwelling	0.6 space/dwelling	Carter Street Precinct Development Framework 2020 (Alternative rates)
2 bedrooms	1.2 spaces/dwelling	0.9 space/dwelling	Carter Street Precinct Development Framework 2020 (Alternative rates) Parramatta Road Urban Transformation (Homebush Precinct)
3 bedrooms	1.5 spaces/dwelling	1.2 spaces/dwelling	Parramatta Road Urban Transformation (Homebush Precinct)
4 bedrooms	2 spaces/dwelling	1.4 spaces/dwelling	Carter Street Precinct Development Framework 2020 (Alternative rates)
Visitors	0.25 space/dwelling	0.2 space/dwelling	Carter Street Precinct Development Framework 2020 (Alternative rates)

Bicycle parking provision rates

Bike parking facilities are to comply with AS 2890.3 – 2015 Parking Facilities – Bicycle Parking.

Change rooms, showers and lockers must be provided for people walking, running or cycling to work on all employment generating development. Locate facilities close to bike parking facilities to encourage sustainable transport options.

Locate basement Bike parking as close to ground level car park entries as possible.

Provide secure, conveniently located bike parking facilities at the minimum specified in Table 6.3 Minimum Bicycle Parking Rates.

Table 6.3: Minimum bicycle parking rates - for the Central Precinct

Land use	SOP Master Plan 2030 (2018 Review) minimum bicycle parking rates	Proposed bicycle parking rates (Minimum)
Commercial	1 space per 150 m2 GFA 1 visitor space per 75 m2 GFA	No change
Residential		
Studio	N/A	1 space/dwelling
1 bedroom	1 space/dwelling	No change
2 bedrooms	1.2 spaces/dwelling	No change
3 bedrooms	1.5 spaces/dwelling	No change
4 bedrooms	2 spaces/dwelling	No change
Visitors	0.25 space/dwelling	No change
Education	1 staff space/100 full time students	No change
	1 student space/10 full time students	No change

6.1 Parking controls

On-street parking

The key design objectives for on-street parking within the Central Precinct include:

- provide on-street parking to serve community and local retail uses, as well as the 'day to day' needs, of the Central Precinct
- Dynamically manage and allocate the kerbside to use it more productively and achieve the vision for the place.
- Move from general parking to pick up/drop off for people and goods to improve kerbside productivity and access to local places.
- Prioritise access for all ages and abilities to our local places, supported by funding for local infrastructure
- ensure parking provision acknowledges the different customers / users, the location-specific demands and be consistent and easy to follow.
- better use of existing parking supply is encouraged, and the use of smart parking can reduce unnecessary traffic circulation.
- Move towards a consistent approach with the established Town Centre around the T7 station which will likely incorporate more off-street public parking and minimal on-street parking
- On-street parking is prioritised for loading activities, mobility parking and short stay use.
- On street parking is restricted to one side of shared streets to prioritise more space for walking, cycling, outdoor dining, street furniture and tree cover.
- On-street parking is utilised as a traffic calming feature and a buffer to traffic for pedestrians
- On-street parking should be dynamic in its use and provide different functions at different times of the day.

- The use of smart parking, signage, apps and convenient payment systems are all components of progressive "Places" whereby existing assets are better utilised and monitored. This will also introduce flexibility for place managers to better collect data automatically to monitor parking hot spots and manage supply (and potentially pricing) accordingly.
- Provision should be prioritised for car share schemes and potentially electric vehicle charging locations in the short to medium term as the technology is gradually taken up.
- Smart parking together with smart driver directional signage should be considered in the context of a "site-wide" network and should incorporate on-street, off-street and event specific parking management.
- The integration of existing digital parking systems is supported however SOPA should not be constrained by existing technologies and should be aware of the "site-wide" network implications before procuring specific software or apps.

Expectations of parking management and supply are sensitive issue with businesses and expectations are always high for unlimited parking supply at zero cost. This is an unsustainable perception and managing the expectations of the community needs to be tackled head on. It is acknowledged that this is easier stated in planning documents but more difficult when it comes to implementation and operations.

Improved education of the local community of the careful management of on-street parking is required. SOPA is in the unique position that businesses have bought into a high-quality precinct within Sydney with clear suitability goals and progressive approach. It is acknowledged they need to be taken on a journey but with a good evidence base and a flexible approach SOPA can better manage parking into the future in line with sustainable economic, environmental and social outcomes.

The next 5-year review of SOP Master Plan 2030 should investigate the collection of government revenue associated with on-street and off-street parking. This is an important consideration and a legitimate source of revenue for government as well as being a demand management tool. It can also be used positively to support other precinct initiatives such as shuttle buses or walking and cycling initiatives.

6.2 Transport strategies and infrastructure

Event access and closures

The key changes to event access and road closures to realise the future operation of the Central Precinct and ensure that residents and businesses are not regularly impacted include:

- Relocation of the Aquatic event bus terminal to the northern end of Olympic Boulevard in a combined facility
- Closure of Olympic Boulevard north of Figtree Drive for major events
- Closure of Olympic Boulevard north of Dawn Fraser Avenue for minor events
- Ensuring regular bus routes are not diverted during major events

Whilst this strategy has adjusted parking rates for private development, it is recommended that a revision of public parking rates associated with staging events at Sydney Olympic Park and included in venue agreements be reviewed at the next 5-year revision of the SOP Master Plan 2030.. This review should consider the stretch target of 80% of event patrons by non-car modes as outlined in Section 4.5 including the introduction of Metro and light rail services and a modification of the 22 year old event bus network.

Evidence of car parking occupancies during events suggest a reduction from 10,000 spaces to 6,000 spaces could be appropriate.

Work place travel plans

All non-residential developments in the Central Precinct will be required to prepare and implement a Work Place Travel Plan outlining how the development will comply with the transport strategies and relevant mode share target for utilisation of public transport and minimisation of car travel during peak commuter periods.

The Work Place Travel Plans are to comply with Sydney Olympic Park Authority's Travel Plan Guidelines. These guidelines require that a Work Place Travel Plan form part of a development application. Part of any consent will include the implementation of a Detailed Travel Plan as part of the operation of any approval at Sydney Olympic Park. The Travel Plan is also subject to annual review.

Future mode shares

SOP Master Plan 2030 (2018 Review) proposed increasing the trip mode share to public transport during peak commuter periods to 40 per cent. It targeted a specific bicycle/pedestrian mode share split of 8 percent.

Through the introduction of the following initiatives it is proposed that trip mode share target to public transport be increased to 60 per cent in line with other high density centres such as Chatswood. The key initiatives include:

- Sydney Metro West
- T9 Northern Line integration with Sydney Metro West at North Strathfield
- Continued operation of the T7 Olympic Park Line to Lidcombe. The T1 Western Line will also experience relief in terms of congestion as a result of the introduction of Sydney Metro West
- Proposed Parramatta Light Rail Stage 2
- Introduction of feeder bus services to the Metro. This can be further enhance through use of the bridge across the Parramatta Rover identified as part of PLR Stage 2.
- Introduction of a bus interchange with Metro and intersection improvements on Figtree Drive at Australia Avenue and Olympic Boulevard
- Maintaining the requirement for work place travel plans
- Reducing parking provision through the application of reduced maximum parking rates in line with other adjacent centres with similar levels of public transport.
- Maintaining the rates for bicycle parking provision as outlined in SOP Master Plan 2030 (2018 Review).
- Continual development of the shared path network to adjacent developments and suburbs.
- Provision of end of trip facilities within developments.
- Improving the streetscape and lowering speed limits to make walking and cycling safer both within the Central Precinct and with connection to other precincts.
- Increasing the amount of self containment of jobs within the precinct.

6.3 Travel demand management

Travel demand management measures will be important to reduce the number of private vehicle trips to be generated by the proposed SOP Master Plan 2030 (2018 Review). Travel demand management was first identified as a measure in the 2002 Master Plan. Budget allocations for a workplace travel plan officer to assist in delivering travel demand management programs were incorporated into the Sydney Olympic Park Infrastructure Contributions Plan 2030.

This Transport Strategy calls for a longer term view of travel behaviour and, in particular, requires consideration of principles of transport sustainability. All of Sydney's regional and sub-regional centres will come under increased pressure from car travel. Local and State governments recognise this and are adopting a range of policies to encourage increased use of public transport through parking levies, controls on parking supply and investment in public transport projects.

SOPA working with TfNSW and the local business association will be important stakeholders in maximising the outcomes of local travel demand management measures. SOPA should continue to engage with TfNSW to promote and incorporate best practices as part of future travel demand management throughout the park.

Continued growth in non-car mode shares would be required to enable the development yields proposed by the SOP Master Plan 2030 (2018 Review). Factors which would assist in managing the increased levels of demand include:

- Increased public transport patronage through the introduction of Sydney Metro. Public transport patronage will continue to the associated increase in feeder public transport services
- Increased 'internal containment' of trips. This refers to the proportion of trips which start and end within SOP. This would increase due to the increasing population both living and working in SOP.
- Increased walking and cycling trips. This would be driven primarily by the increase in internally contained, short-distance trips within SOP.
- Limiting parking supply. Limiting parking supply (in combination with increasing public transport provision) and increasing road congestion will continue to reduce the appeal of car transport and increase the relative benefits of public transport use.

Car sharing policy

In high density areas, with mixed and diverse uses, car sharing programmes can limit the need of individuals to own private vehicles.

SOPA should seek to implement a structured car sharing policy, similar to that of the City of Sydney. This policy outline criteria and community consultation requirements for the implementation of car sharing parking spaces throughout the LGA. By providing a clear policy, it is possible to not only ensure suitable competition across the park but placement of spaces is in line with aspiration and demand.

By implementing a robust policy, SOPA will seek to:

- Increase social inclusion resulting in more household accessing vehicles who may otherwise been unable to.
- Reduce pressure on kerbside space by reducing the need to own a private vehicle.
- Reduce net traffic and greenhouse emissions for the park.

6.3 Travel demand management

Workplace travel demand management

The original Transport Strategy for SOP Master Plan 2030 identified a need for all businesses to develop and implement Workplace Travel Plans, and recommended that a position be created for a Workplace Travel Plan Project Officer. Budget was subsequently allocated for an implementation plan. Such implementation plans will incorporate specific and measurable goals regarding vehicles used per worker, and ways in which flexible work arrangements can be encouraged. In the time since the original Transport Strategy was developed, no Workplace Travel Plan Project Officer has been appointed but despite this there has been a significant positive change in commuter travel behaviour. This has been due to the lobbying efforts of both SOPA and the local business association.

For businesses within Sydney Olympic Park, a workplace travel plan will be of vital importance to maximise the benefits of the existing and future networks. For example, unlike many similar centres, substantial amount of sustainable infrastructure already connects and crosses the park including state recognised cycle routes, train and bus services. In to the future this will be further enhanced through the provision of Sydney Metro and Parramatta Light Rail services. Equally, as we transition from COVID-19 and more employers look at workplace return, the importance of providing flexible, safe and sustainable modal choices will be greater than ever.

The key outcomes which workplace travel planning can achieve were outlined in the Baseline Transport Strategy and remain valid:

- travel plans will directly assist SOPA in achieving their sustainability objectives
- travels plans will maximise the accessibility of SOP by all modes and maximise the use of all available transport services and infrastructure
- The introduction of Sydney Metro will address and enhance the perception of SOP as an accessible location for business amongst developers
- SOPA has a clear opportunity through the Development Application (DA) process to encourage and assist incoming developers and tenants develop and implement meaningful travel plans that support staff as they relocate to SOP from other workplaces
- to further promote a mode shift and offer ongoing support to business, SOPA will consider establishing a Transport Management Association (TMA) like Macquarie Connect
- It is strongly recommended that SOPA develops and implements its own travel plan thereby providing a key example within SOP of travel plan implementation and demonstrating the organization's own commitment to its vision and mission goals.

In addition, since the baseline and subsequent reviews of the masterplan have taken place, the NSW Government has been actively promoting travel choices through the My Sydney program. SOPA should seek to engage more widely with this arm of government to promote and incorporate best practices as part of future travel demand management throughout the park.

Summary

Transport Strategy Review

7 Summary

The introduction of Sydney Metro will not change the land use yields of those outlined in SOP Master Plan 2030 (2018 Review) within the Central Precinct. It will however bring a step-change in transport accessibility to the precinct with strategic turn up and go connections with the Eastern Harbour City and Central River City.

Sydney Metro West will also extend the 30-minute catchment of workplaces and trip origins beyond the current extent within the Olympic Peninsula to Westmead in the west, the Eastern harbour CBD in the east and Meadowbank in the north.

The redesign of the Central Precinct incorporating the Metro station will increase the travel choices of residents, workers, students and visitors and will positively influence future travel behaviours reducing the reliance on the private vehicle. Travel behaviours similar to other centres such as Chatswood are now achievable and will address the perception of poor public transport accessibility.

Fifteen minute walking catchments from the Central precinct allow pedestrian to access the entire urban core of Sydney Olympic Park and some sections of the Carter Street Precinct and the Parklands. The 15-minute catchment for cycling encompasses the entire Olympic Peninsula, east to Concord, west to Silverwater and south to Lidcombe.

Upgrades to intersections at either end of Figtree Drive will facilitate future access for feeder bus services to the new bus interchange with Metro.

Based upon the principles of Movement and Place, the introduction of a network of pedestrian only spaces, laneways, shared streets, local streets and main streets with reduced speed limits and limited on street parking will support the safe movement of pedestrians and cyclists.

The establishment of tighter parking supply controls in line with the introduction of Sydney Metro will be a key influence in driving more sustainable travel behaviours.