Transport
for NSW

# Central Precinct Renewal

## Transport Strategy and Transport Impact Assessment

July 2022

NSW GOVERNMENT

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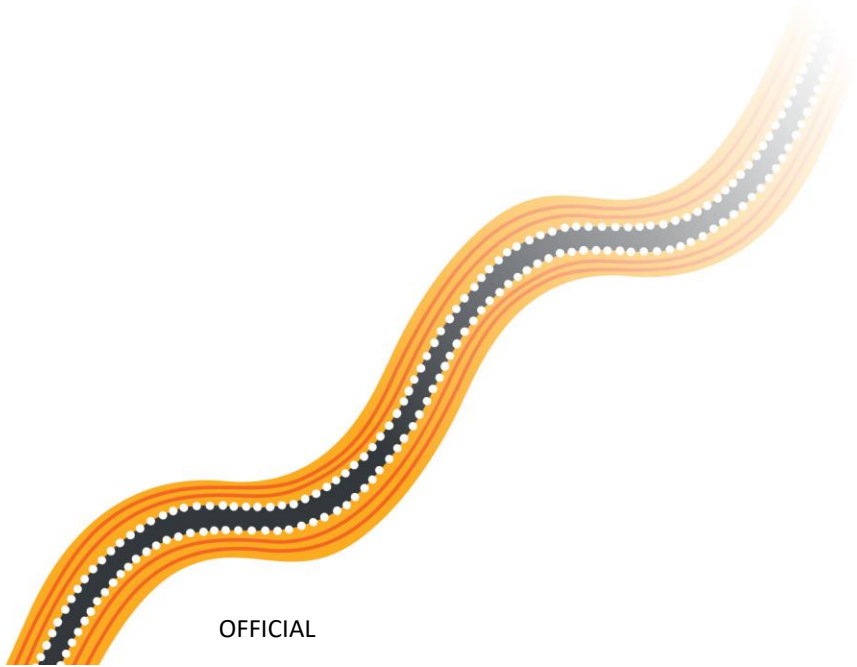
# Acknowledgement of Country

We respectfully acknowledge the Traditional Custodians of the Central Precinct, the Gadigal and recognise the importance of place to Aboriginal people and their continuing connection to Country and culture. We pay our respect to Elders past, present and emerging.



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# Document control

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|---|---|
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# Versions

| Version | Amendment notes |
|---|---|
| 0.1 | Final for CPRP Public Exhibition 2022 |

# Abbreviations

| Abbreviation | Definition |
|---|---|
| ABS | Australian Bureau of Statistics |
| BAU | Business as Usual |
| CBD | Central Business District |
| CFP | Car-Free Precinct |
| CoS | City of Sydney |
| CPRP | Central Precinct Renewal Project |
| CSELR | CBD and South East Light Rail |
| DA | Development application |
| DCP | Development control plan |
| DPE | NSW Department of Planning and Environment |
| GFA | Gross floor area |
| GIS | Geographic Information System |
| GSC | Greater City Commission |
| HTS | Household Travel Survey |
| IWLR | Inner West Light Rail |
| LGA | Local Government Area |
| MTMS | More Trains More Services |
| MVKT | Million Vehicle Kilometres Travelled |
| OGA | Office of Government Architect |
| OSD | Over Station Development |
| SA | Statistical Area |
| SEPP | State Environmental Planning Policy |
| SSDA | State significant development application |
| SSP | State Significant Precinct |
| STFM | Strategic Traffic Forecasting Model |
| STP | Sustainable Transport Preferred |
| TfNSW | Transport for NSW |
| UTS | University of Technology Sydney |

# Definitions

| Term | Definition |
|---|---|
| Amenity | The extent to which a place, experience or service is pleasant, attractive or comfortable. Improved features, facilities or services may contribute to increase amenity. |
| Catchment | Area from which a location or service attracts people |
| Central Precinct | Central Precinct State Significant Precinct |
| Central Sydney | Land identified as Central Sydney under the Sydney Local Environmental Plan 2012 and represents the Metropolitan Centre of Sydney. Central Sydney includes Sydney's Central Business District |
| Character | The combination of the attributes, characteristics and qualities of a place (GANSW, 2021, Draft Urban Design Guide) |
| Community | Particular types of stakeholder and refers to groups of people in particular places who are both affected by our work and experience the outcomes and benefits of our activities |
| Control | A numerical standard that is applied in a prescriptive manner |
| Corridor | A broad, linear geographical area between places |
| Council | The City of Sydney Council |
| Customers | Those who use transport networks and services. They include car drivers, heavy vehicle operators, public transport and point to point passengers, pedestrians, cyclists and freight and goods providers |
| Department | The Department of Planning and Environment |
| Determination | The approval made in accordance with the *Environmental Planning and Assessment (EP&A) Act 1979*. In relation to Central Precinct SSP, a determination will be made by the Minister for Planning and Public Spaces |
| District Plan | means the Eastern City District Plan |
| Gateway | Cities that provide state level services and facilities to support a broad population catchment while also having international connections through their cities airport and/or port. |
| Goods Line | The official name for the partly elevated walkway from Central Station to Darling Harbour following the route of a disused railway line |
| Grand Concourse | Part of Central Station |
| Greater Sydney's Green Grid | The link between parks, open spaces, bushland and walking and cycling paths |
| Interchange | A facility to transfer from one mode of transport or one transport service to another. For example, a station with an adjoining light rail stop |
| Mobility | The ability to move or be moved easily and without constraints |
| Mortuary Station | The building formerly used as a railway station on the Rookwood Cemetery railway line, now disused |
| NABERS | A national rating system that measures the environmental performance of Australian buildings and tenancies |
| Objective | A statement of a desired future outcome, generally expressed in a qualitative manner that enables merit based assessment |

| Term | Definition |
|---|---|
| Place | An intersection of transport infrastructure with social infrastructure and commercial activity. These are the areas within and around transit stops where people live and commute. Places can be created as an outcome of Placemaking |
| Planning instrument | Means any of the following:<br>• strategic plan (comprising regional strategic plans and district strategic plans) and local strategic planning statements<br>• environmental planning instrument (comprising State environmental planning policies and local environmental plans)<br>• development control plan |
| Planning Secretary | The Secretary of the Department of Planning |
| Precinct | Geographical area with boundaries determined by land use and other unique characteristics. For example, an area where there is an agglomeration of warehouses may be termed a freight precinct |
| Principal development standards | Matters addressed in Part 4 of the Standard Instrument |
| Proponent | Transport for NSW |
| Proposal | Proposed amendments to the planning framework |
| Provisions | means a broad term covering objectives and controls |
| Public spaces | means areas that are publicly accessible where people can interact with each other and make social connections |
| Rail network | means the rail infrastructure in NSW |
| Railway corridor | The land within Central Precinct on which a railway is built; comprising all property between property fences, or if no fences, everywhere within 15m from the outermost rails. Under planning legislation rail corridor is defined as land: a) that is owned, leased, managed or controlled by a public authority for the purpose of a railway or rail infrastructure facilities: or b) that is zoned under an environmental planning instrument predominately or solely for development of the purpose of a railway or rail infrastructure facilities |
| Reference Master Plan | A non-statutory document that shows one way in which the precinct may develop in the future in accordance with the proposed amendments to the planning framework<br>Note: Refer to the GANSW Advisory Note v2, dated 12/09/2018 for further guidance |
| Region Plan | The Greater Sydney Region Plan - A Metropolis of Three Cities |
| Rezoning | Amendments to environmental planning instruments, in particular for land use zones and principal development standards such as height of buildings and floor space ratio |
| Shocks and stresses | The acute short-term damaging events or long term trends causing inequity impacting a city's resilience |
| Siding | A short stretch of rail track used to store rolling stock or enable trains on the same line to pass |
| Social procurement | Purchasing decisions based on good social outcomes |
| Standard Instrument | The Standard Instrument—Principal Local Environmental Plan |
| State | The state of New South Wales |

| Term | Definition |
|---|---|
| State-led rezonings | A focus on precincts where there is a strategic imperative for the Department of Planning to lead the process, including places that benefit from current or future city-shaping infrastructure or investment, and where we can create great public spaces in collaboration with councils and communities. These rezonings generally occur under a SEPP |
| State Significant Precinct | The areas with state or regional planning significance because of their social, economic or environmental characteristics |
| Strategic Framework | The document prepared by Transport for NSW for Central Precinct in 2021 that addresses key matters including vision, priorities, public space, strategic connections, design excellence, identify sub-precincts for future detailed planning and also outlines the next steps in the State Significant Precinct process for Central Precinct |
| Strategic plan | The regional strategic plan, district strategic plan or a local strategic planning statement |
| Sub-precinct | The definable areas within Central Precinct SSP due to its unique local character, opportunities and constraints, either current or future. The Western Gateway is a sub-precinct |
| Sydney Metro | A fully-automated, high frequency rail network connecting Sydney |
| Tech Central | The State government initiative as set out in The Sydney Innovation and Technology Precinct Panel Report 2018. Previously known as the Sydney Innovation and Technology Precinct. Tech Central is located south of the Sydney central business district, surrounded by the suburbs of Redfern, Ultimo, Haymarket, Camperdown, Chippendale, Darlington, Surry Hills and Eveleigh |
| Transport for NSW | The statutory authority of the New South Wales Government responsible for managing transport services in New South Wales. |
| Transport interchange | A facility designed for transitioning between different modes, such as a major bus stop or train station |
| Transport modes | The five public transport modes are metro, trains, buses, ferries and light rail. The two active transport modes are walking and cycling |
| Urban renewal | A planned approach to the improvement and rehabilitation of city areas with new infrastructure, new commercial/mixed uses, improved services and renovation or reconstruction of housing and public works |
| Vibrant streets / places | Places that have a high demand for movement as well as place with a need to balance different demands within available road space |

# Executive summary

Located within the heart of Eastern Harbour City, Central Precinct is Australia's busiest transport interchange. The Precinct currently has significant potential in revitalising Central Sydney, with its proximity to the Sydney CBD and the extensive transport connections across Greater Sydney and regional NSW. The Central Precinct Renewal Project (CPRP) will provide a world-class transport interchange experience, effective space for jobs of the future, improved connections with surrounding areas, new and improved public spaces and social infrastructure to support the community.

In July 2019, Central Precinct was declared a nominated State Significant Precinct (SSP) in recognition of its potential to improve public outcomes, boost investment and deliver new jobs. The SSP planning process for Central Precinct will identify a new statutory planning framework for Central Precinct.

Arcadis has been engaged by Transport for NSW to prepare this Transport Strategy and Transport Impact Assessment Report as part of the Central SSP Study for the CPRP. This assessment addresses the study requirements issued by the NSW Department of Planning and Environment to guide preparation of the SSP Study, specifically the requirement to prepare a Transport Strategy and Transport Impact Assessment Report.

Central Precinct has been an important site for transport operations for over 150 years. Today, Central Station is Australia's busiest transport interchanges and is the anchor of the NSW rail network. The broader transport interchange also caters for light rail, bus, coach and point to point (such as taxis) services. The transport interchange will also form part of the Sydney Metro network, which will begin in 2024.

A Place Strategy, Urban Design Framework and a Public Domain Strategy have been prepared as part of the CPRP, which establishes the Reference Master Plan for Central Precinct. The Urban Design Framework and Public Domain Strategy provides a comprehensive urban design vision and strategy to guide future development of Central Precinct and has informed the proposed planning framework of the SSP Study. The Reference Master Plan comprises about:

- 22,000 square metres of publicly accessible open space
- 269,500 square metres of office gross floor area (GFA)
- 22,850 square metres of retail GFA
- 53,600 square metres of hotel GFA
- Approximately 84,900 square metres of residential accommodation GFA, providing for approximately 850 dwellings (assuming 1 dwelling per 100sqm GFA). The Central Precinct SSP Study will include the commitment to deliver 15 per cent of any new residential floor space as affordable housing.
- 47,250 square metres of education/ tech space GFA
- 22,500 square metres of student accommodation GFA
- 14,300 square metres of community/ cultural space GFA.

The key features of the Reference Master Plan, include:

- a network of new and enhanced open spaces linked by green connections
- a new network of circulation that will establish a clear layer of legibility and public use of the place
- an active recreation system that supports health and well-being through its running and cycling loops, fitness stations, distributed play elements, informal sports provision, and additional formal recreation courts.

Figure E-1 provides a summary of the key transport initiatives proposed as part of the Central Precinct Reference Master Plan.

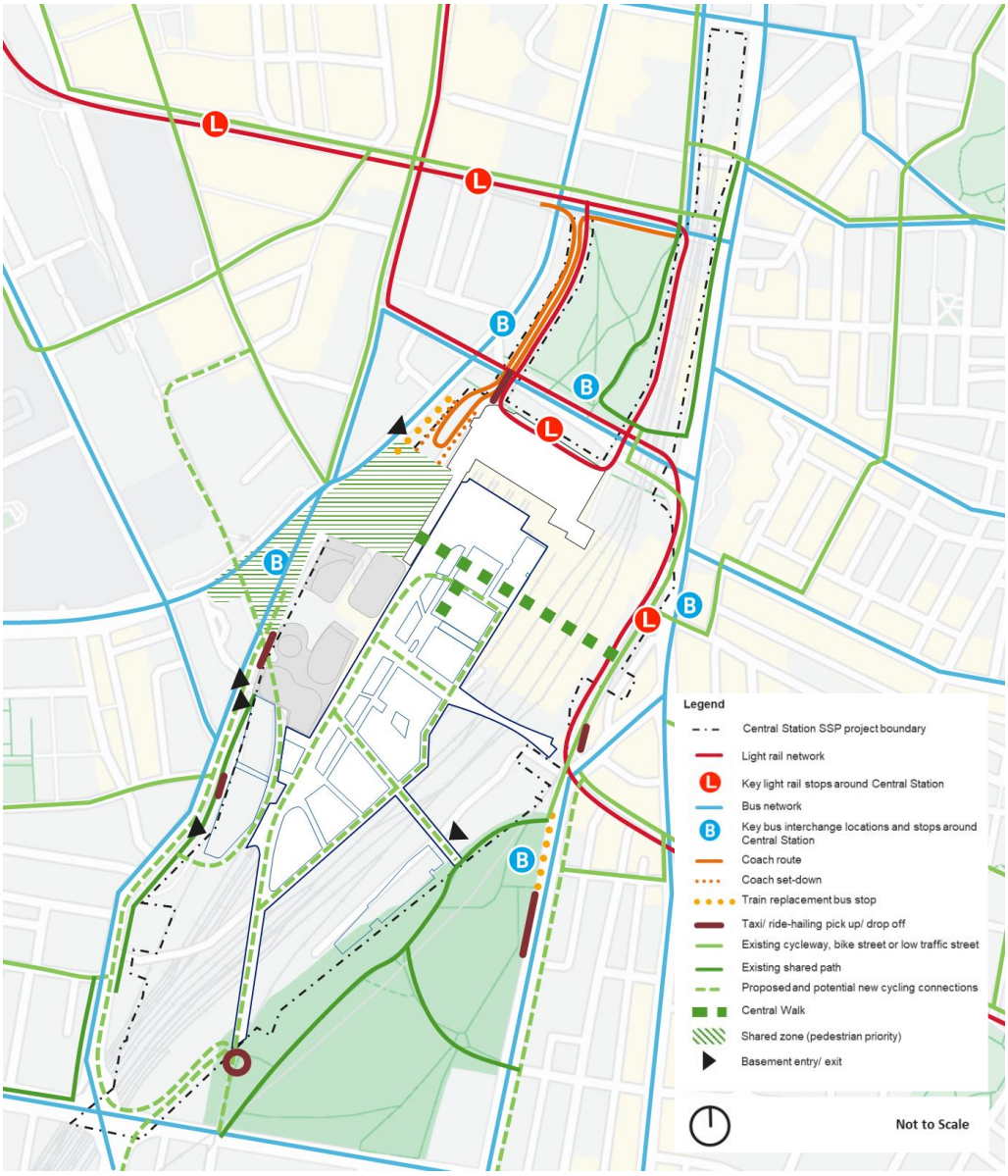



**Figure E-1: Summary of proposed Central Precinct transport initiatives**

The travel demand assessment determined the proposed development of Central Precinct is expected to generate 10,530 trips in the AM peak hour and 8,550 trips in the PM peak hour across all transport modes.

COVID-19 has substantially impacted existing and future demands on the transport network and the travel patterns of people across the Sydney CBD. Transport for NSW is working through revised forecasts to account for these substantial changes in the way people now travel, and are likely to travel in the future, given changing customer needs. These revised forecasts are likely to be released by Transport for NSW later in 2022 and are representative of the changes in the future of travel on the transport system.

Detailed analysis has been completed to assess the impact of the CPRP to support the SSP. The revised demand forecasts will supplement work already completed, with the results of the detailed modelling and analyses to be included in the next iteration of this report that utilise the latest and better representative travel demands. This assessment is based on the existing operation of the transport system, an in-depth appreciation of the current opportunities and constraints and the analysis of the quantum of travel that is likely to be generated by the proposed SSP.

To effectively allocate space on the transport system within and surrounding Central Precinct, as well as accommodate transferring between different transport modes, priority will be given to the more sustainable and efficient modes of transport, such as walking, cycling, and road-based public transport. The following modal hierarchy priority has been adopted for this Transport Strategy and Transport Impact Assessment:

1. Walking
2. Cycling
3. Public transport
4. Drop-off/ pick up (goods and people)
5. Parking.

Prioritising these modes above others supports mode shift from private cars, reduces congestion and improves safety around Central Precinct. The hierarchy is intended to guide the location and accessibility of facilities for different modes of transport in terms of their proximity to the station or stop entrance, while ensuring that the station and broader precinct can operate efficiently and safely.

A suite of initiatives has been proposed to support the development of Central Precinct and mitigate the impacts on the transport network. These include:

- mitigation measures and actions that can be addressed through changes to the Planning Framework
- updates to the Central Precinct master plan
- supporting infrastructure projects that could be delivered as part of the renewal of Central Precinct (but outside the scope/ boundary of the SSP)
- infrastructure projects that fall outside the scope of Central Precinct.

**Critical to the success of all the identified initiatives, and the corresponding success of Central Precinct, will be the ongoing engagement with stakeholders and transport authorities as the project progresses.**

# 1. Introduction

Located within the heart of Eastern Harbour City, Central Precinct is Australia's busiest transport interchange. The precinct currently holds latent potential with all its inherent advantages of location and transport connections to revitalise Central Sydney. Capitalising on Central Precinct's prime location within Tech Central, a New South Wales (NSW) Government commitment to create the biggest technology hub of its kind in Australia, Central Precinct presents the ultimate transformative opportunity to deliver a connected destination for living, creativity and jobs. The Central Precinct Renewal Project (CPRP) will provide a world-class transport interchange experience, effective space for jobs of the future, improved connections with surrounding areas, new and improved public spaces and social infrastructure to support the community.

## 1.1 Tech Central

### 1.1.1 Overview

The NSW Government is committed to working with the local community to develop the biggest innovation district of its kind in Australia. Bringing together six neighbourhoods near the Sydney CBD (Haymarket, Ultimo, Surry Hills, Camperdown, Darlington North Eveleigh and South Eveleigh), Tech Central is a thriving innovation ecosystem that includes world-class universities, a world-leading research hospital, 100 + research institutions, investors and a wide range of tech and innovation companies. The vision for Tech Central is for it to be a place where universities, startups, scaleups, high-tech giants and the community collaborate to solve problems, socialise and spark ideas that change our world. It is also for it to be place where centring First Nations voices, low carbon living, green spaces, places for all people and easy transport and digital connections support resilience, amenity, inclusivity, vitality and growth.

Tech Central is an essential component of the Greater Sydney Region Plan's Eastern Harbour City Innovation Corridor. It aims to leverage the existing rich heritage, culture, activity, innovation and technology, education and health institutions within the precinct as well as the excellent transport links provided by the Central and Redfern Station transport interchanges.

The Central Precinct is located within the Haymarket neighbourhood of Tech Central. Planned to become the CBD for Sydney's 21st century, this neighbourhood is already home to The Quantum Terminal (affordable coworking space in the iconic Central Station Sydney Terminal Building) the Scaleup Hub (affordable and flexible workspace for high-growth technology scaleups) and is soon to be the home of Atlassian's headquarters. It is also in close proximity to a number of important education and research institutions.

The planned urban renewal of the Central Precinct has been identified as a key project to achieving the vision for Tech Central.

### 1.1.2 Background & Context

In August 2018, the NSW Government established the Sydney Innovation and Technology Precinct Panel (the Panel) comprising representatives from various industry, health, education, government agencies and key community members. In December 2018 'The Sydney Innovation and Technology Precinct Panel Report' was produced, setting out the Panel's recommendations for a pathway to delivering a successful innovation and technology district at Tech Central.

In February 2019, the NSW Government adopted the Panel's report and committed to delivering the following:

- 25,000 additional innovation jobs
- 25,000 new STEM and life sciences students
- 200,000 m² for technology companies, and
- 50,000 m² of affordable space for startups and scaleups

In February 2019, the Greater Sydney Commission released a Place Strategy for the area that is now known as Tech Central (Camperdown-Ultimo Collaboration Area Place Strategy, GSC). The Place Strategy, developed collaboratively by a range of stakeholders involved in planning for Tech Central's future, was prepared to inform public and private policy and investment decisions by identifying and recognising the complex, place-specific issues inhibiting growth and change. The strategy identifies shared objectives for the place and sets out priorities and actions to realise the vision for the area under the key themes of Connectivity, Liveability, Productivity, Sustainability and Governance.

Both the Panel Report and Place Strategy recognise the importance of the Central Precinct to Tech Central's future.


In July 2019, Central Precinct was declared a nominated State Significant Precinct (SSP) in recognition of its potential to boost investment and deliver new jobs. The SSP planning process for Central Precinct will identify a new statutory planning framework for Central Precinct. This involves two key stages:

- Stage 1: Development of a draft Strategic Vision which has since evolved into the Central Precinct Strategic Framework
- Stage 2: Preparation of an SSP study with associated technical analysis and community and stakeholder consultation.

In March 2021, the Central Precinct Strategic Framework was adopted, representing the completion of Stage 1 of the planning process to develop a new planning framework for Central Precinct. The Strategic Framework outlines the vision, planning priorities, design principles, and the proposed future character of sub-precincts within Central Precinct.

This is intended to inform and guide further detailed planning and design investigations as part of this SSP Study (Stage 2 of the SSP planning process). This SSP Study intends to amend the planning controls applicable to Central Precinct under the SSP SEPP 2005 to reflect the vision and planning priorities set for the Precinct under the Strategic Framework. Study Requirements were issued in December 2020 to guide the investigations and the proposed new planning controls.

## 1.2 Central Precinct vision

Central Precinct will be a vibrant and exciting place that unites a world-class transport interchange with innovative and diverse businesses and high-quality public spaces. It will embrace design, sustainability and connectivity, celebrate its unique built form and social and cultural heritage and become a centre for the jobs of the future and economic growth.

## 1.3 Case for change

In its current state, Central Station is underperforming as Australia's major transport interchange – it is currently a gap in the heart of Sydney's CBD, lacking connectivity, activation and quality public spaces.

Over the coming years, Central Station will come under increasing pressure as technological innovations progress, investment in transport infrastructure increases and daily passenger movements increase.

Sydney Metro, currently Australia's biggest public transport project, will result in the delivery of a new generation of world-class, fast, safe, and reliable trains enabling faster services across Sydney's rail network. In 2024, Sydney Metro's Central Station will open with daily passenger movements during the week forecast to increase from 270,000 persons to 450,000 persons over the next 30 years.

The renewal of Central Precinct will expand and revitalise Central Station and transform this underutilised part of Sydney from a place that people simply move through to one where they want to visit, work, relax, connect and socialise. Its renewal also presents the potential to deliver on the strategic intent and key policies of regional, district and local strategic plans, providing for a city-shaping opportunity that can deliver economic, social and environmental benefit.
Specifically, it will:

- make a substantial direct and indirect contribution to achieving the Premier's Priorities by facilitating upgrades to Sydney's largest and most significant public transport interchange, improving the level of service for users and visitors, and supporting the creation of new jobs and housing
- implement the recommendations of the NSW State Infrastructure Strategy 2018-2038, in particular the upgrading of the major transport interchange at Central to meet future customer growth
- contribute to key 'Directions' of the Greater Sydney Region Plan, to deliver 'a city supported by infrastructure', help create 'a city of great places', support 'a well-connected city', deliver new 'jobs and skills for the city' and create 'an efficient city'
- implement the outcomes envisaged within the Eastern City District Plan including reinforcing the Harbour CBD's role as the economic powerhouse of Australia and supporting its continued growth as a Global International City

- deliver on the shared objectives and priorities for Tech Central, the future focal point of Sydney's innovation and technology community, which aims to boost innovation, economic development and knowledge intensive jobs while creating an environment that foster collaboration and the exchanging of ideas
- deliver an outcome that responds to the overarching vision and objectives of the Central Sydney Planning Strategy. In particular, it will assist with implementing a number of 'key moves' outlined in the strategy, including to 'ensure development responds to its context', 'ensure infrastructure keeps pace with growth', 'move people more easily', 'protect, enhance and expand Central Sydney's heritage, public places and spaces', and to 'reaffirm commitment to design excellence.'

## 1.4 About this report

The purpose of this assessment is to address the study requirements issued by the NSW Department of Planning and Environment (the Department) to guide preparation of the Central State Significant Precinct Study.

This report provides a transport strategy and impact assessment of the CPRP within Central Precinct itself and adjoining areas.

This report has the following structure:

- **Section 1:** Introduction – Provides an overview of the development of Central Precinct as a state significant precinct
- **Section 2:** Strategic Planning Context – Provides an outline of the NSW Government and City of Sydney transport and land use initiatives that have guided the assessment outlined in this report
- **Section 3:** Existing Transport Conditions – Outlines existing travel patterns and mode shares for the area, as well as the Central Station SSP transport context
- **Section 4:** Transport Planning – Provides details of proposed amendments to the planning framework, including proposed planning provisions and relevant transport initiatives
- **Section 5:** Transport Assessment – Outlines the transport assessment of the Central Station SSP, including applicable mitigation measures
- **Section 6:** Preliminary Construction Staging Approach – Outlines the preliminary construction approach and staging for the proposal
- **Section 7:** Implementation Plan and Strategy – Presents an implementation plan and strategy for the proposal
- **Section 8:** Consultation – Documents the consultation process and how each stakeholder was involved as required by the study requirements
- **Section 9:** Conclusion and Recommendations – Provides a summary of the study outcomes and recommended planning controls to be included for the rezoning (to be included in a broader precinct design guidelines).

### 1.4.1 SSP study requirements

This report addresses 7.1 Transport study requirement issued by the NSW Department of Planning and Environment in October 2020. The relevant study requirements, considerations and consultation requirements, and location of where these have been responded to are outlined in Table 1-1.

**Table 1-1: Study requirements, considerations, and consultation requirements**

| Ref | Requirement or consideration | Summary response | Where addressed |
|---|---|---|---|
| **Study requirement** | | | |
| 10.1 | Prepare a comprehensive transport strategy and transport impact assessment for the Precinct that: | This report identifies existing transport conditions, strategic context and future changes to accommodate the growth of movement within the study area. This report aims to support and inform the proposed planning framework | - |
| | • Identifies the existing situation, including constraints opportunities and key issues; | - | Section 3 |
| | • Reviews the trip generating potential for all proposed modes and purposes, develops mode share targets and measures to achieve these targets; | - | Section 5.2<br>Section 0 |
| | • Provides an understanding of the travel behaviours and patterns (all modes) of future workers, visitors and residents of the proposal through benchmarking, forecast modelling tools and other sources of evidence; | - | Section 3.2 |
| | • Identifies and assesses the impacts resulting from the proposal with an appropriate level of pedestrian and traffic analysis; | - | Section 5 |
| | • Provides details of the proposed transport strategy including, any necessary transport infrastructure and servicing improvements; the proposed approach to pedestrian and bicycle facilities, car parking; and access and egress requirements; and | - | Section 7 |
| | • Informs and supports the preparation of the proposed planning framework including any recommended planning controls or DCP/Design Guideline provisions that would deliver an appropriate planning outcome. | - | Section 9.2 |
| **Study considerations** | | | |
| 10.1 | The Study is to demonstrate consideration of: | - | - |
| | • A “vision and validate” approach to the Precinct and adjacent street network to | - | Section 5.2 |

| Ref | Requirement or consideration | Summary response | Where addressed |
|---|---|---|---|
| | develop a street user hierarchy, including movement and place considerations, for the Precinct | | Section 5.10 |
| | • Inclusion of pedestrian analysis at development and station access/egress points, at intersections with the road network along key desire lines | - | Section 5.4 |
| | • Measures to safeguard future transport infrastructure and traffic changes (for example any planned/future road closures, pedestrianised street sections, one way/two-way traffic operation etc. to the adjacent transport network) | - | Section 7.2 |
| | • The overall interchange function of the Precinct, with priority to pedestrian access, safety, connectivity, wayfinding, and signage | - | Section 4.1 |
| | • Limitation of parking and overall reduction in vehicular traffic | - | Section 5.7<br>Section 5.8.1 |
| | • Access to key destinations and infrastructure in the local area, in particular schools, community facilities and other local services | - | Section 3.1 |
| | • The safety of all road users, in particular pedestrians and cyclists | - | Section 5.9 |
| | • The performance of the existing and future cycling, public transport and road network surrounding the Precinct, including potential improvements | - | Section 5.5<br>Section 5.6<br>Section 5.7 |
| | • Cumulative growth of the surrounding area based on committed and planned developments (such as development of Tech Central and the potential renewal of the area subject to the Pyrmont planning review) and proposed infrastructure (such as WestConnex, Sydney Metro, and associated projects) | - | Section 5.11 |
| | • The role of shared vehicles in managing travel demand and implementation of shared vehicle solutions | - | Section 5.8 |
| | • Potential impacts of construction traffic including a strategic construction approach and potential staging | Staging and potential traffic impacts have been considered at a high level due to the early phases of the CPRP development, | Section 6 |
| | • Access for people with disability, older people, pram users and people travelling with luggage | - | Section 5.4 |

| Ref | Requirement or consideration | Summary response | Where addressed |
|---|---|---|---|
| | • Allowance for potential future infrastructure including rail service upgrades, very fast train, future light rail, relocation of coach services, and changes to bus services | - | Section 5.6 |
| | • Light rail stops, bus stops, bicycle parking areas, kerbside areas for 'kiss and ride' and day and late-night taxis (including secure taxi rank/ Point to Point) | - | Section 5.6<br>Section 5.8.3 |
| | • Integration with the cycle network, including consideration of direct and safe cycle ways along the eastern and western side of Central Station and provision of end of trip facilities | - | Section 5.5 |
| **Consultation** | | | |
| 10.1 | Consultation with the City of Sydney and NSW Treasury should be undertaken. In particular, the City of Sydney should be consulted with, and agreement sought from City of Sydney and DPIE, on the methodology for the study.<br>Specific consultation should be undertaken with the City of Sydney in relation to its forthcoming Sydney 2050 reference document and on key matters such as mode share targets and study methodology. | - | Section 10 and Appendix B |
| **Author** | | | |
| | The study is to be prepared by a suitably qualified transport professional(s) with the necessary experience and expertise to undertake the required works. | • This report was authored by:<br>• Bailey Byrnes – Principal Transport Planner<br>Bachelor of Engineering (Civil)<br>• Anthony Fransos – Principal Transport Planner<br>Bachelor of Science (Engineering)<br>• Wendy Hu - Transport Planner<br>Bachelor of Engineering (Civil) | - |
| **Guidance documents** | | | |
| | The following documents provide guidance for this Study:<br>• Future Transport 2056<br>• City of Sydney Cycling Strategy and Action Plan 2018-2030 | | |

| Ref | Requirement or consideration | Summary response | Where addressed |
|---|---|---|---|
| | • Sydney's Cycling Future 2013<br>• City of Sydney Walking Strategy and Action Plan 2015-2030<br>• Sydney City Centre Access Strategy 2013<br>• NSW Road Planning Framework<br>• The Movement and Place Practitioner's Guide, March 2020<br>• Legible Sydney- Wayfinding Strategy<br>• A City for All Inclusion (Disability) Action Plan 2017-2021 (CoS) | | |

## 1.5 Study area

Central Precinct is located at the south-east edge of Central Sydney (refer to Figure 1-1). Central Precinct is surrounded by several suburbs including, Haymarket to the north, Chippendale to the south and Surry Hills to the south-east. It is located within the City of Sydney local government area (LGA) with an approximate gross site area of 24 hectares of Government owned land. The precinct comprises land bounded by Pitt Street and Regent Street to the west, Cleveland Street to the south, Eddy Avenue, Hay Street and Goulburn Street to the north and Elizabeth Street and Chalmer Street to the east.

Central Precinct has been an important site for transport operations for over 150 years. Today, Central Station is Australia's busiest transport interchanges and is the anchor of the NSW rail network. It provides 24 platforms for suburban and Intercity and Regional train connections as well as a direct link to Sydney Airport. The broader transport interchange also caters for light rail, bus, coach and point to point (such as taxis) services. The transport interchange will also form part of the Sydney Metro network, with new underground platforms to be provided for Sydney Metro services under Platform 13, 15 and 16 at Central Station. Sydney Metro services will begin in 2024. The precinct also comprises several significant heritage items including the state-heritage listed Sydney Terminal Building and the clocktower.


**Figure 1-1: Location plan of Central Precinct**

As part of the Strategic Framework, eight sub-precincts have been defined that reflect and positively respond to the varying character of the surrounding areas. These sub-precincts are:

- Central Station
- Northern Over Station Development
- Western Gateway
- Regent Street Sidings
- Southern Over Station Development
- Prince Alfred Sidings
- Eastern Gateway
- Goulburn Street.

The location of these sub-precincts and relevant boundaries is illustrated in Figure 1-2.

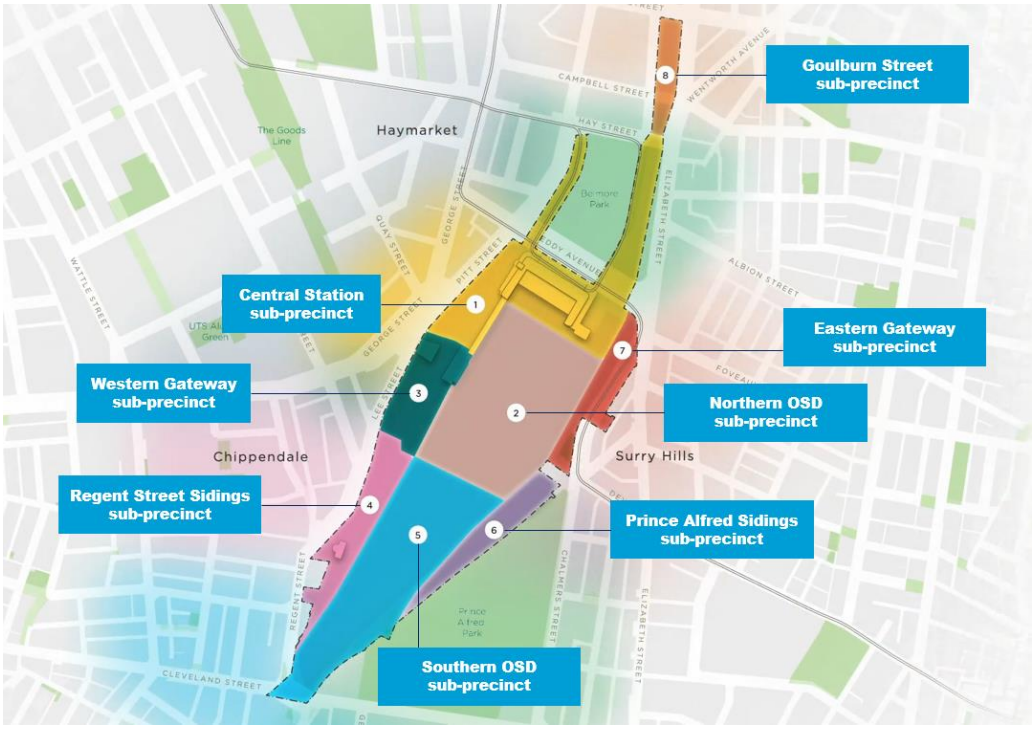



**Figure 1-2: Central Precinct and sub-precincts**

Source: Ethos Urban

### 1.5.1 Planning priorities

To help realise the vision of Central Precinct and the desired local character of the sub-precincts, the following planning priorities have been developed and are grouped into five key themes as outlined in Table 1-2.

**Table 1-2: Central Precinct planning priorities**

| Theme | Planning priorities |
|---|---|
| **Place and destination** | • Unite the city by reconnecting with the surrounding suburbs<br>• Shape a great place that is vibrant, diverse, active, inclusive and has a high level of amenity<br>• Deliver a precinct which responds to its urban context and embeds design excellence Improve existing and providing additional connected public space in the precinct of high environmental amenity and comfort<br>• Protect and celebrate the Precinct's heritage values<br>• Create a people focussed precinct through a focus on public transport, cycling and walkability<br>• Facilitate the Precinct's focus on transport and economic diversity in tourism and across commercial sectors including office, business and retail. |
| **People and community** | • Design public spaces that promote health, equality and well-being<br>• Promote social cohesion by providing spaces for gathering, connection, exchange, opportunity and cultural expression<br>• Honour and celebrate the cultural heritage and identity of the Precinct's past and present Aboriginal community<br>• Create a safe and intuitive precinct that promotes social access and inclusion<br>• Support programs and initiatives that benefit communities and people<br>• Create a precinct that responds to the current and future needs of transport customers, workers, residents and visitors, including those of the broader local community. |
| **Mobility and access** | • Provide a world class, integrated and seamless transport interchange<br>• Maintain the Precinct's role as NSW's main transport interchange<br>• Improve the transport customer experience, including wayfinding, pedestrian flows and interchange between different transport modes<br>• Facilitate and enhancing connections within and towards key locations in southern Central Sydney<br>• Deliver a people focussed precinct that is walkable, well connected, safe and puts people first<br>• Design infrastructure that will adapt to future changes in transport and mobility. |
| **Economy and innovation** | • Advance Sydney's status as a global city<br>• Support the creation of jobs and economic growth including new and emerging industries such as innovation and technology and explore the provision of space for cultural and creative uses and start-ups<br>• Provide an active and diverse commercial hub with a rich network of complementary uses that nurture and support business<br>• Support both the day and night economies of the precinct through diverse complementary uses, promoting liveability and productivity<br>• Foster collaboration between major institutions in the precinct including transport, education, health and business<br>• Create a smart precinct that incorporates digital infrastructure to support research and innovation. |

### 1.5.2 Reference Master Plan

Architectus and Tyrrell Studio have prepared a Place Strategy, Urban Design Framework and a Public Domain Strategy which establishes the Reference Master Plan for Central Precinct. The Urban Design Framework and Public Domain Strategy provides a comprehensive urban design vision and strategy to guide future development of Central Precinct and has informed the proposed planning framework of the SSP Study.

The Reference Master Plan includes:

**Table 1-3 Detailed breakdown of allocation of land within Central Precinct**

| Land allocation | Proposed |
|---|---|
| **Publicly accessible open space comprising:** | **22,000 m²** |
| Central Green – a publicly accessible park located in immediately south of the Sydney Terminal building | 6,000 m² |
| Central Square – a publicly accessible square located at the George Street and Pitt Street junction | 7,000 m² |
| Mortuary Station Gardens – a publicly accessible park (excluding Mortuary Station building) located at Mortuary Station | 4,470 m² |
| Henry Deane Plaza – a publicly accessible plaza located in the Western Gateway sub-precinct | 1,879 m² |
| Eddy Avenue Plaza – a publicly accessible plaza located in the north-eastern portion of the Sydney Terminal building | 1,680 m² |
| Western Terminal Extension Building Rooftop – a publicly accessible space above the Western Terminal Extension Building Rooftop. | 970 m² |
| **Office** | **269,500 m²** |
| **Retail** | **22,850 m²** |
| **Hotel** | **53,600 m²** |
| **Residential accommodation**<br>Provides for approximately 1,082 dwellings (assuming one dwelling per 100 square metres GFA). The Central Precinct SSP Study will include the commitment to deliver 15 per cent of any new residential floor space as affordable housing. | **84,900 m²** |
| **Education / tech space** | **47,250 m²** |
| **Student accommodation** | **22,500 m²** |
| **Community / cultural space** | **14,300 m²** |

The key features of the Indicative Reference Master Plan, include:

- A network of new and enhanced open spaces linked by green connections. This will include:
    - A Central Green (Dune Gardens) at the north of Central Precinct that will create a new civic public realm extension of the Sydney Terminal building and a new vantage point for Central Sydney
    - A new Central Square which will deliver on the vision for a new public square at Central Station, as one of three major public spaces within Central Sydney connected by a people-friendly spine along George Street
    - Mortuary Station Park at Mortuary Station that will be a key public domain interface between Chippendale and the over-station development. that will draw on the story of Rookwood Cemetery and the Victorian Garden context with the established rail heritage of the Goods Line and the rail lines
    - Henry Deane Plaza which will prioritise the pedestrian experience, improving connectivity and pedestrian legibility within the Western Gateway sub-precinct and provide clear direct links to and from the State heritage listed Central Station and its surrounds
    - Eddy Avenue Plaza – will transform into a high-amenity environment with significant greening and an enhanced interface with the Sydney Terminal building.
- A new network of circulation that will establish a clear layer of legibility and public use of the place. This will include:
    - A 15 - 24 metre wide Central Avenue that is laid out in the spirit of other street layouts within Central Sydney and which responds to the position of the Central clocktower, providing new key landmark views to the clocktower. Central Avenue will be a place for people to dwell and to move through quickly. It brings together the threads of character from the wider city and wraps them
    - Three over-rail connections to enhance access and circulation through Central Precinct, as well as provide pedestrian and bicycle cross connections through the precinct
    - The extension of public access along the Goods Line from Mortuary Station Gardens, offering a new connection to Darling Harbour
    - New vertical transportation locations throughout the precinct allowing for seamless vertical connections.
    - An active recreation system supports health and well-being through its running and cycling loops, fitness stations, distributed play elements, informal sports provision, and additional formal recreation courts.
    - a network of fine grain laneways that are open to the sky

A summary of the proposed land allocation for Central Precinct is described in Table 1-4 below.

**Table 1-4 Breakdown of allocation of land within Central Precinct**

| Land allocation | Proposed |
|---|---|
| **Open-air rail corridor** | 101,755 $m^2$ |
| **Developable area** | 119,619 $m^2$ |
| **Public open space** | 19,185 $m^2$/ 16% of developable area |
| **Other publicly accessible open space (Including movement zones, streets and links)** | 41,773 $m^2$/ 35% of developable area |
| **Building area** | 58,661 $m^2$/ 49% of developable area |
| **Central SSP total area** | **23.8 ha** |

The Indicative Reference Master Plan for Central Precinct is illustrated in Figure 1-3 below.

| Sub-precinct | | Total GFA per sub-precinct (sqm)* |
|---|---|---|
| S | Station (terminal building) | 15,800 |
| | | 15,800 |
| A | OSD Block A | 165,400 |
| | A1 | 66,900 |
| | A2 | 48,900 |
| | A3 | 39,400 |
| | A4 | 4,100 |
| | A5 | 3,000 |
| | A6 | 3,100 |
| B | OSD Block B | 88,900 |
| | B1 | 42,700 |
| | B2 | 37,200 |
| | B3 | 4,000 |
| | B4 | 5,000 |
| C | OSD Block C | 109,700 |
| | C1 | 32,700 |
| | C2 | 28,500 |
| | C3 | 42,800 |
| | C4 | 3,400 |
| | C5 | 2,300 |
| D | Regent Street Sidings Block D | 65,000 |
| | D1 | 33,300 |
| | D2 | 31,700 |
| E | Prince Alfred Sidings Block E | 20,900 |
| F | Goulburn St Car Park | 49,200 |
| Total GFA (excluding Western Gateway) | | 514,900 |
| WC | Western Gateway | 275,000 |


**Figure 1-3: Reference Master Plan**

*Source: Architectus and Tyrrell Studio*

## 1.6 Demand assessment yields

Preliminary demand calculations were undertaken during the initial design stages of the CPRP for the purpose of early stakeholder consultation. Revised development yields have been developed due to subsequent master plan updates *Central Precinct Draft SSP Metrics* and architect GFA updates. The latest master plan GFA schedule is summarised in Table 1-5 and the estimated phases of construction provided in Table 1-6.

Individual project areas have been based on the average number of dwellings and proposed GFA for retail and commercial development outlined in Table 1-5 and Table 1-6.

**Table 1-5: Revised Master plan gross floor area schedule**

| Block | Building label | Gross floor area totals ($m^2$) |
|---|---|---|
| Station Precinct | Grand Terminal Building | 16,495 |
| A | A1 | 68,245 |
| | A2 | 48,860 |
| | A3 | 40,105 |
| | A4 | 4,098 |
| | A5 | 2,621 |
| | A6 | 3,164 |
| B | B1 | 42,459 |
| | B2 | 37,112 |
| | B3 | 4,036 |
| | B4 | 4,962 |
| C | C1 | 32,664 |
| | C2 | 28,505 |
| | C3 | 42,790 |
| | C4 | 3,411 |
| | C5 | 2,352 |
| D | D1 | 35,425 |
| | D2 | 31,899 |
| E | E1 | 20,921 |
| F | F1 | 49,167 |
| **Total ($m^2$)** | | **519,291** |

**Table 1-6: Estimated phases and construction dates**

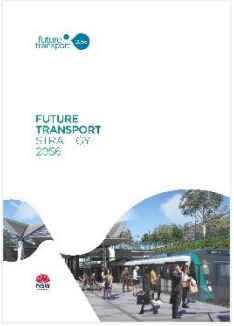
| Stage | Building label | Estimated start date | Estimated completion date |
|---|---|---|---|
| Stage 0 | Terminal Building | 2023 | 2026 |
| | D1 | | |
| | D1 | | |
| | E1 | | |
| | F1 | | |
| Stage 1 | A1 | 2031 | 2033-34 |
| | A2 | | |
| | A3 | | |
| | A4 | | |
| | A5 | | |
| | A6 | | |
| Stage 2 | B1 | 2031 | 2034-35 |
| | B2 | | |
| | B3 | | |
| | B4 | | |
| | C1 | | |
| | C4 | | |
| | C5 | | |
| Stage 3 | C2 | 2033 | 2035-36 |
| | C3 | | |

These figures provide information on the estimated quantity of dwellings for residential units and GFA for retail and commercial developments.

# 2. Strategic planning context

## 2.1 State and regional transport plans

Several State and regional strategic documents and plans provide guidance and direction on the planning and management of transport networks and services around Central Precinct. These plans and their relationship to the CPRP are detailed in the following subsections.



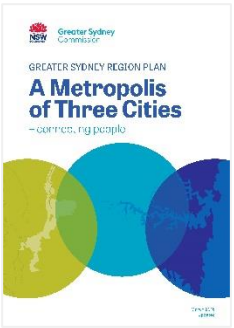

### Future Transport 2056

*Transport for NSW, 2018*

*Future Transport 2056* is the State's overarching transport strategy that outlines how to manage growth and change across Greater Sydney and NSW over a 40-year timeframe. It sets out a vision, strategic directions and customer outcomes with a focus on technology and innovation across the transport system to transform the customer experience, improve communities and boost economic performance.

The CPRP contributes to achieving several key objectives and outcomes including:

- Encouraging active travel (walking and cycling) and using public transport
- Connecting people to jobs, goods and services in our cities and regions
- A fully accessible network that enables barrier-free travel for all
- Supporting more environmentally sustainable travel.



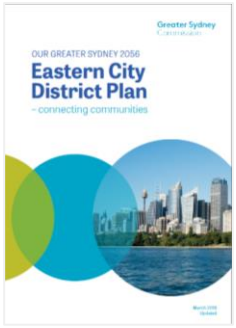

### Greater Sydney Region Plan – A Metropolis of Three Cities

*Greater Sydney Commission, 2018*

The *Greater Sydney Region Plan* establishes a 40-year strategic land use plan for Sydney. Developed in conjunction with *Future Transport 2056* and the State Infrastructure Strategy, it looks to redistribute growth across the greater Sydney area and develop three connected cities (Eastern Harbour City, Central River City and Western Parkland City).

Central Precinct lies in the Eastern Harbour City, where urban renewal is driven by significant rail and transport projects. Potential indicators to deliver the plan that would be relevant to the CPRP include:

- Increased 30-minute access to metropolitan centres and clusters
- Increased use of public resources such as open space and community facilities
- Increased walkable access to local centres
- Increased jobs in metropolitan and strategic centres.




### Eastern City District Plan

*Greater Sydney Commission, 2018*

The *Eastern City District Plan* is a supporting document to the *Greater Sydney Region Plan* that outlines the planning priorities and actions for managing growth and improving quality of life across the Eastern City over the next 20-years.

Central Precinct, through the CPRP, delivers on key actions of the Plan by providing new centres, better places and employment opportunities that are integrated with significant city shaping transport projects.


### South East Sydney Transport Strategy

*Transport for NSW, 2020*

The *South East Sydney Transport Strategy* provides a blueprint for transforming the way people travel to, within and through South East Sydney to 2056. It looks to support future growth and activity through targeted transport investment that enables the redevelopment of government land and the growth of strategic centres through improved and reliable access.

Central Precinct sits on the north of the Southeast Sydney boundary and is a key transport link connecting the area to the Sydney CBD and the broader metropolitan area. As the Southeast grows, Central Precinct will have an ongoing role as a key movement and mobility hub servicing new bus, light rail and potential metro services in future years.


### Central to Eveleigh Urban Transformation Strategy

*NSW Government, 2016*

The *Central to Everleigh Urban Transformation Strategy* sets the foundation for renewing precincts of government-owned land in the Central to Eveleigh area. It focuses on how the area can contribute to a growing Sydney and deliver a broader range of homes, new and higher quality public open space, better connections, and community facilities.

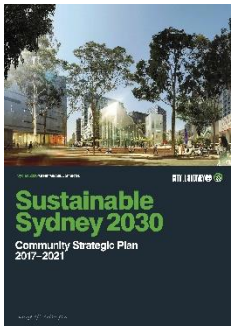
The transformation of Central Precinct supports several key moves identified by the strategy, including:

- create connections across the railway corridor for walking and cycling
- connect the city with surrounding places
- create centres of activity around stations
- integrate new high-density mixed-use buildings with existing neighbourhoods and places.

## 2.2 City plans and strategies

The CPRP has also been influenced by a range of local planning and transport strategies that guide transport planning within the Sydney Central Business District (CBD) and around the Precinct.

These plans and their relationship to the CPRP are detailed in the following subsections.



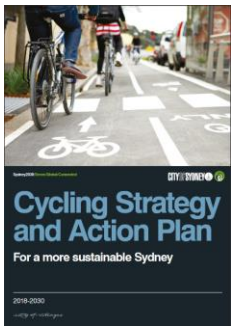

### Sustainable Sydney 2030

*City of Sydney, 2017*

*Sustainable Sydney 2030* identifies the communities' main priorities and aspirations for the future and outlines how these targets and goals will be achieved.

The CPRP supports and enables the following strategic directions from the community strategic plan:

- investment in public transport and walking and cycling infrastructure encourages more people to use these forms of transport to travel to, from and within the city
- public transport, walking and cycling are the first-choice transport modes within the city
- transport services and infrastructure are accessible
- the city and neighbouring areas have a network of accessible, safe, connected pedestrian and cycling paths integrated with green spaces
- businesses in the city encourage their staff to walk and cycle.




### Cycling Strategy and Action Plan 2018-2030

*City of Sydney, 2017*

The *Cycling Strategy and Action Plan* outlines actions and directions to increase bicycle trips and mode share across the Sydney LGA towards the targets identified in *Sustainable Sydney 2030*.

The CPRP supports the strategy and action plan through:

- providing bicycle parking in the public domain where it is needed
- considering and supporting all bike network users, including those on cargo bikes, ebikes, trishaws and mobility scooters, in the design of infrastructure
- deliver public end-of-trip facilities in the city centre, connected to the bicycle network.

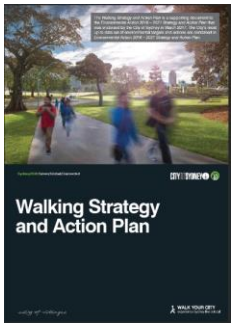

### Sydney's Cycling Future

*Transport for NSW, 2013*

*Sydney's Cycling Future* outlines how the NSW Government will improve the bicycle network and ensure that the needs of cyclists are integrated into the planning of new transport and infrastructure projects. The plan also outlines priority cycleways, and projects to address missing links near major centres across Greater Sydney.

Around Central Precinct, these links include stronger cycling connections:

- east to Bondi Junction
- southeast to the Randwick Education and Health precinct
- south to Green Square and Sydney Airport.




### Walking Strategy and Action Plan 2015-2030

*City of Sydney, 2017*

The *Walking Strategy and Action Plan* outlines the City of Sydney's vision to create a city village network that is an attractive, safe, and interesting place to walk. This document brings together existing actions and targets to a more walkable and effective transport network.

Key points to emerge from the Action Plan that are relevant to Central Precinct include:

- giving priority to people walking
- completing networks and providing new connections through urban renewal areas
- creating an inviting and interesting walking environment through placemaking and activation.

The renewal of Central Precinct has the potential to significantly enhance walkability in the local area.


### Sydney City Centre Access Strategy

*Transport for NSW, 2013*

*Sydney's City Centre Access Strategy* outlines how the NSW Government will manage how people enter, exit, and move within the Sydney CBD over the next 20 years by providing clear direction on how all transport modes will work together to:

- reduce congestion
- provide for future growth
- improve the customer experience.

Around Central Precinct, key outcomes include improving pedestrian and cycling links, increasing public transport access to and capacity in the city centre, and making it easier to transfer between different public transport services.

## 2.3 Relevant policies and guidelines

The following documents have been considered in the assessment and preparation of this transport strategy and transport impact assessment for the CPRP:

- NSW Road Planning Framework
- The Movement and Place Practitioner's Guide
- NSW Planning Guidelines for Walking and Cycling
- NSW Road Safety Strategy 2021-2021
- Legible Sydney Wayfinding Strategy (2019).

## 2.4 Planned infrastructure, service improvements and development

Central Precinct and the surrounding area are subject to several significant infrastructure and large-scale renewal projects that will change how people move within and interact with destinations across Greater Sydney.

This section details the proposed transport network upgrades and significant development proposals that may impact the CPRP. Figure 2-1 shows the planned infrastructure upgrades and their relationship to Central Precinct.

### 2.4.1 Planned transport infrastructure and service improvements

*Sydney Metro and Metro West*

Sydney Metro is Australia's biggest public transport project and will result in the delivery of a new generation of world-class, fast, safe and reliable trains enabling faster services across Sydney's rail network. Once complete, Sydney Metro is expected to:

- have a target capacity of about 40,000 customers per hour, similar to other metro systems worldwide
- increase the capacity of train services entering the Sydney CBD by around 60 per cent, resulting in trains running once every two minutes in each direction at peak times under the city, a level of service never seen before in Sydney.

In 2024, a Sydney Metro station will open within Central Precinct. This will provide connectivity to Tallawong in the north-west (via Chatswood) to Bankstown in the south-west, including access to other new stations at Crows Nest, Victoria Cross (North Sydney), Barangaroo, Martin Place and Pitt Street. Largely due to the opening of the metro station, the number of daily passenger movements using Central Station is forecast to increase from 270,000 persons to 450,000 persons over 30 years.

To cater for this growth, Transport for NSW is investing in substantial upgrade to the existing Central Precinct. Key to this upgrade is Central Walk, which will create a new north south concourse linking the metro and suburban rail platforms and will extend from Railway Square in the west to Chalmers Street and the light rail stop in the east. This will result in a step-change in the quality of Central Precinct's transport environment. This improvement in quality, together with the greater accessibility due to the increased number and frequency of trains, is forecast to also increase the desirability of southern Central Sydney as a place to live, work and play.

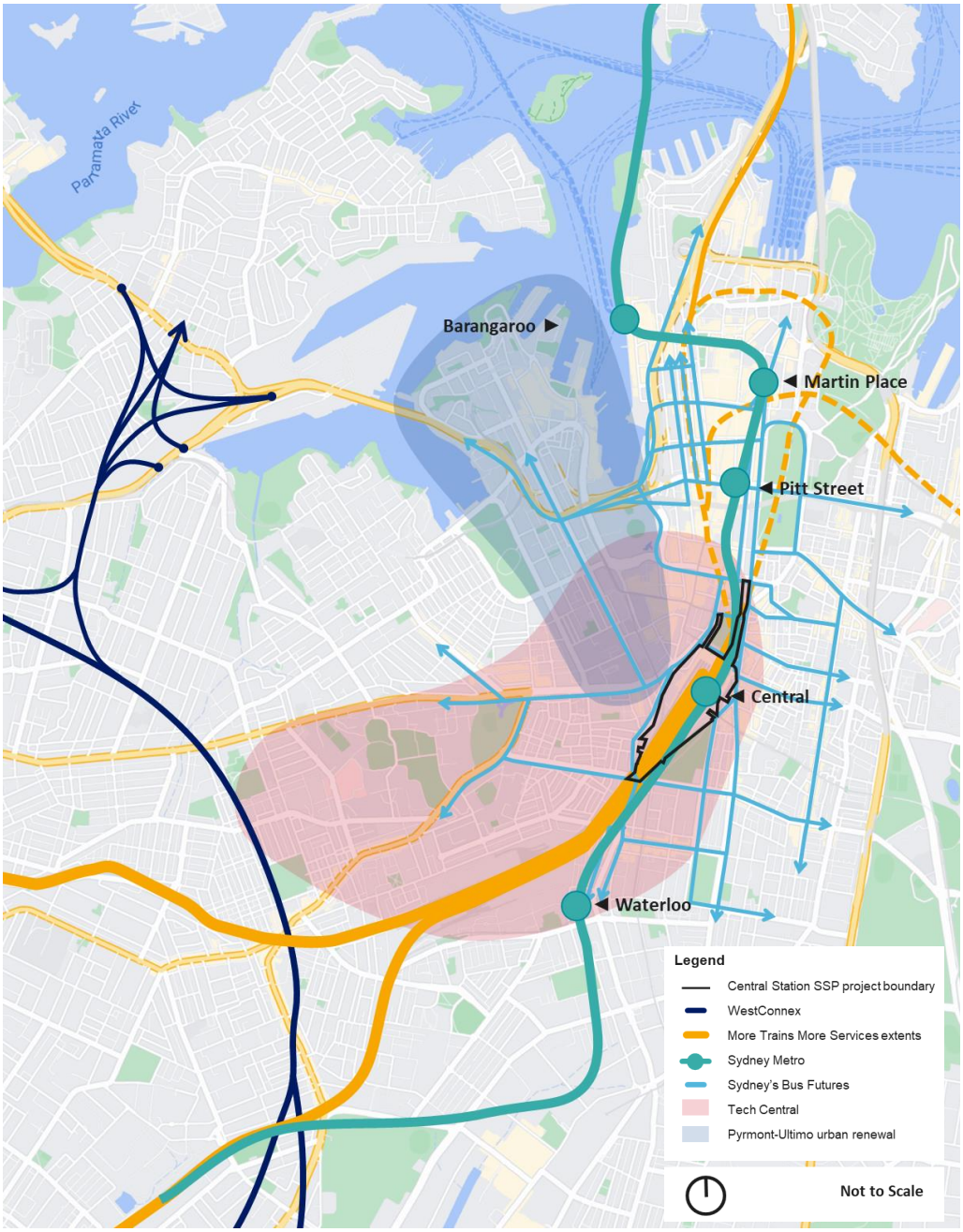



**Figure 2-1: Planned infrastructure upgrades around Central Precinct**

*Fast Rail*

Fast Rail is a vision for improving connectivity in regional NSW and is a key component of the 20-year Economic Vision for Regional NSW (NSW Government, 2018). The strategic planning and delivery for faster rail corridors within regional NSW will increase opportunities for people to live outside Greater Sydney, improving the capacity, frequency of journey times to and from regional centres.

Central Precinct plays a key role in connecting regional centres and destinations with Greater Sydney and will likely be a vital component of any future fast rail strategy. Upgrades to the tracks and signals as part of the Central Precinct project will enable the station to accommodate the expected growth in services across the regional platforms.

*More Trains More Services*

The More Trains More Services (MTMS) program is a significant investment in infrastructure and services to boost operational capacity on Sydney's busiest rail lines. It is designed to deliver more frequent and less crowded train services through new digital systems, infrastructure upgrades and additional trains. For Central Precinct, this will provide additional trains services arriving at and departing from the station during both peak and off-peak periods.

*Sydney's Bus Future*

Sydney's Bus Future is the NSW Government's holistic long-term plan to redesign Sydney's bus network to meet customer needs now and into the future. Designed to attract more customers through a simpler, faster and efficient bus services, Sydney's Bus Future outlines a three-tiered network with rapid mass transit services between major centres, suburban transit delivering targeted, lower demand services, and local transit services which play several different roles across Greater Sydney.

Within the Sydney CBD changes to bus operations would provide progressive improvements to the bus network, creating more direct routes and rationalising bus stops. For passengers transferring from Central Precinct to the bus network, the redesigned system will make it easier to transfer between modes and continue to the end destination.

*WestConnex*

WestConnex is a program of significant infrastructure upgrades that will facilitate improved connections between western Sydney, Sydney Airport and Port Botany and south and south-western Sydney. The program aims to resolve constraints on the M4 Western Motorway and the M5 East Motorway and provide better connectivity between the economic centres across Sydney and improve access into local communities and the Sydney CBD.

The M4-M5 Link is the final component of WestConnex, providing twin tunnels between the M4 East Motorway at Haberfield and the new M5 interchange at St Peters. When complete, the link allows WestConnex to act as the western CBD bypass, improving east-west connectivity to the south of the Sydney CBD and reducing vehicle demands on the arterial road network. The link is expected to reduce traffic volumes around Central Precinct, particularly to the west along Regent Street and to the south along Cleveland Street, allowing these corridors to accommodate alternative transport modes and uses.

### 2.4.2 Significant development

*Tech Central*

To help ensure Sydney's longer terms economic resilience and strengthen its role as Australia's only global city, the NSW Government is investing in the creation of Tech Central. Tech Central stretches from Central Precinct south to Ultimo in the west, Surry Hills in the east and Eveleigh in the south, and is planned to be the future focal point of Sydney's innovation and technology community. It will have a particular focus on fintech, cyber and e-health, digital and deep technology including quantum, blockchain, Artificial Intelligence (AI), robotics, Internet of Things (IOT) and analytics, and creative industries including Virtual Reality (VR) and game design. Capitalising on its size, strategic location and unrivalled accessibility within Greater Sydney, Central Precinct is planned to become the northern anchor of Tech Central. Already, parts of the Sydney Terminus building have been adaptively re-used to house the Sydney Quantum Academy, and Atlassian has announced their plans to locate its global headquarters within Central Precinct.

Figure 2-2 provides an overview of the key destinations within Tech Central and their proximity to Central Precinct.

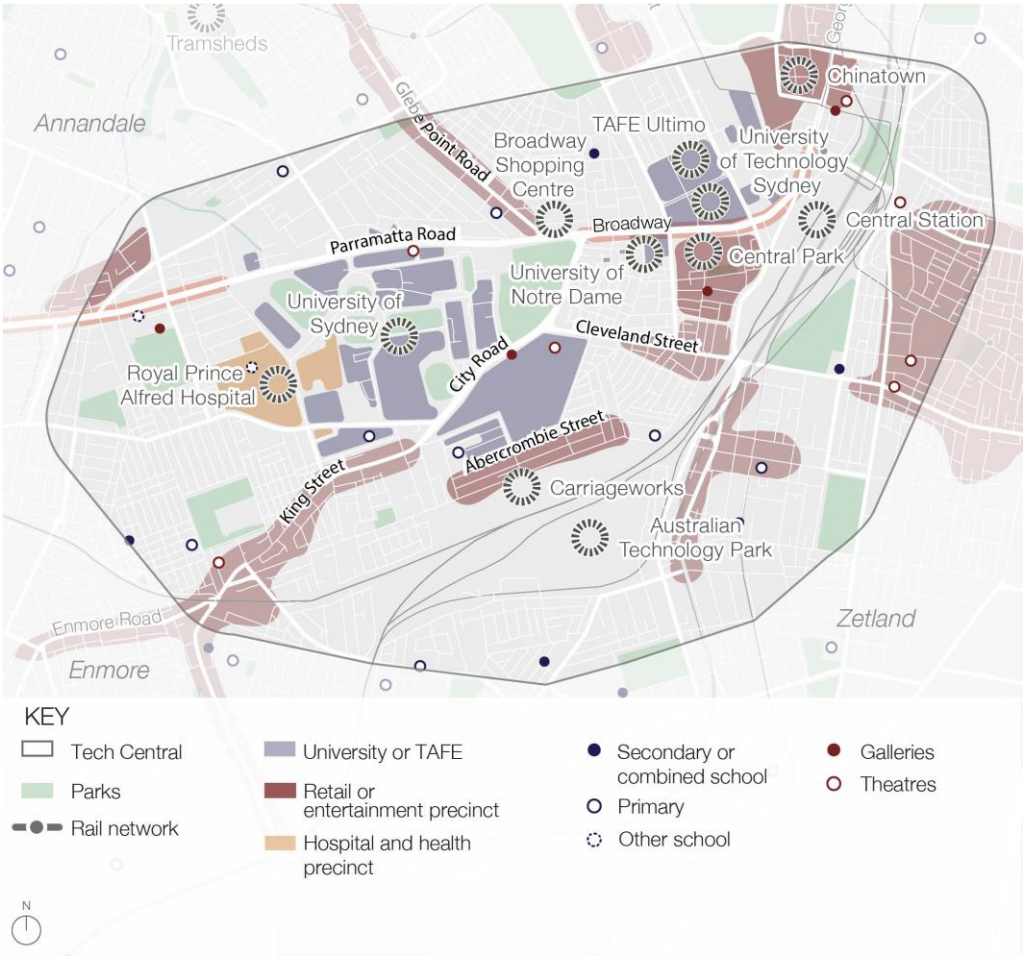



**Figure 2-2: Key destinations within Tech Central**

***Source: Tech Central Camperdown-Ultimo Place-Based Transport Strategy, TfNSW (2021)***

### *Pyrmont-Ultimo urban renewal*

The Pyrmont Peninsula, which extends from Broadway west of Central Precinct to Johnstons Bay, contains a diverse mix of workplaces, innovation hubs and residences within one of the fastest growing hubs in Greater Sydney. The investment in Pyrmont through the new Sydney Metro station, will kickstart the renewal of the area, encouraging further investment to deliver jobs and great public spaces.

The Pyrmont Peninsula Place Strategy (December 2020) provides a 20-year framework that identifies areas that can accommodate future growth and areas for more gradual growth. The peninsula has the potential to accommodate 8,500 additional residents and 23,000 jobs, with the Ultimo Precinct near Central Precinct accounting for a large part of this growth.

Future forecasts of movement through Central Precinct will consider the quantum and type of activity the renewal of Pyrmont Peninsula will generate. This will ensure the analysis of movement to and from the Central Precinct captures key routes and links between the two areas and plans for the anticipated growth across different user types.

# 3. Existing Transport Conditions

## 3.1 Site location and existing land uses

Central Precinct includes 24 hectares of land located to the south of Sydney's CBD, covering a corridor of land running between Central Station and Redfern Station. At the core of Central Precinct lies Central Station transport interchange and associated rail infrastructure.

Central Precinct is located within the City of Sydney LGA and its neighbouring suburbs are Surry Hills, Haymarket, Chippendale, Ultimo and Redfern. It is also close to well-known Sydney attractions such as Broadway, Central Park, World Square, Darling Harbour and the Goods Line.

A locality plan depicting the site and surrounding area is provided in Figure 3-1.

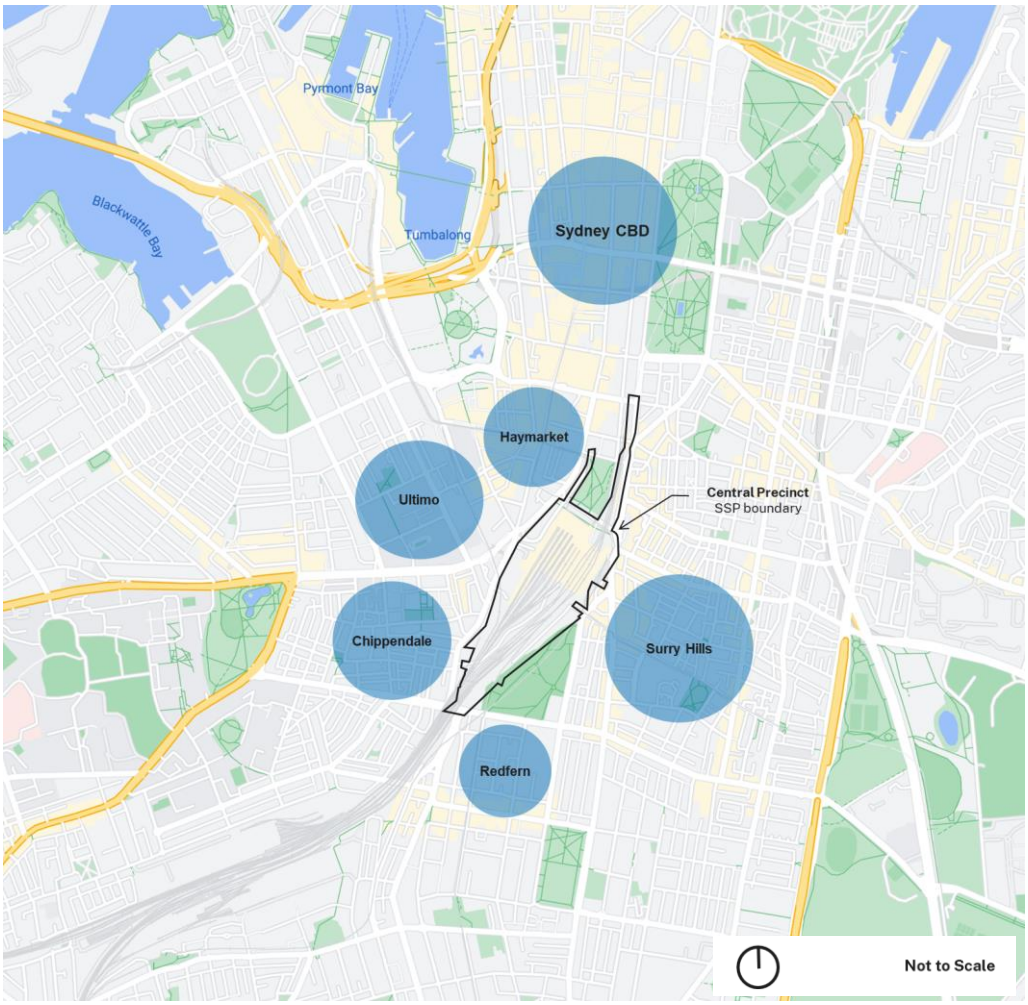



**Figure 3-1: Location plan**

Within Central Precinct, there are currently a relatively small number of businesses, with employment mainly linked to office, retail, and food and beverage land uses, and the operational requirements of managing Central Station. There are accommodation land uses within Central Precinct within the Western Gateway sub-precinct on its western edge, however there is currently no other accommodation or residential uses within the Precinct.

The main public open space for Central Precinct, Henry Dearne Plaza, also lies within the Western Gateway. The broader precinct is adjacent to significant parks and squares, including Belmore Park to the north, Prince Alfred Park to the east and Railway Square to the west.

The surrounding area comprises a wide range of land uses, including offices, higher education, retail, food and beverage outlets, together with cultural, community and leisure uses. There is also a diverse range of residential accommodation, including high rise residential flat buildings to the west and dense smaller scale hostels, boarding houses and residential flat buildings in Haymarket, Chippendale, Surry Hills and Redfern.

## 3.2 Travel patterns and mode share

### 3.2.1 COVID-19 impact

Commuter and recreational travel patterns have substantially changed due to the COVID-19 pandemic commencing in 2020. COVID-19 has resulted in a substantial reduction in overall travel demand and changed travel patterns across Australian cities due to localised lockdowns, and restrictions on interstate and international travel when introduced.

General impacts on travel patterns include:

- a reduction in travel demand caused by the temporary closure of non-essential services and a significant increase in the proportion of employees working from home
- changes in travel mode choice, with a relative increase in road traffic congestion during peak hours and a corresponding decrease in public transport demand. This is due to a reduction in capacity on public transport services to maintain social distancing requirements, and an increased reluctance to commute on public transport
- a flattening of peak hour demand with trips staggered over longer time periods as individuals have more flexibility around work and shopping.

COVID-19 will continue to pose a substantial challenge to accurately predicting future travel patterns. Consequently, the mode share and travel behaviour assessment this report are reflective of pre-COVID-19 conditions.

Revised transport modelling is currently underway to understand COVID and its impacts on transport demands and behaviours. The results of this analysis will be included in the next iteration of this report.

### 3.2.2 Journey to Work mode share

Census 2016 Journey to Work data collected by the Australian Bureau of Statistics (ABS) has been used to assess the current commuter travel behaviour in the area surrounding Central Precinct and characterise the public transport conditions near the site.

Residential travel behaviour was established using the following ABS Level 1 Statistical Area (SA) datasets shown in Table 3-1 with the assessed catchment shown in Figure 3-2.

**Table 3-1 Statistical area datasets**

| Statistical area level 2 name | Statistical area level 1 code |
|---|---|
| Pyrmont – Ultimo | 11703133441 |
| Redfern – Chippendale | 11703133512<br>11703133513<br>11703133515<br>11703133524<br>11703133526<br>11703133528 |
| Surry Hills | 11703133601<br>11703133610<br>11703133616<br>11703133623<br>11703133637<br>11703133638 |
| Sydney – Haymarket – The Rocks | 11703133709<br>11703133711<br>11703133714<br>11703133755<br>11703133758<br>11703133759 |


**Figure 3-2: Travel zone catchment**

The mode splits of journey to work for residents living within the catchment area and workers commuting to the catchment area, are shown in Figure 3-3.

For residents within the catchment area, active transport modes (37 per cent) and public transport (49 per cent) are the predominant forms of transport. Commuters travelling into the catchment area for work largely catch public transport (72 per cent), with driving and/ or being dropped off within the area combining to account for nearly 20 per cent of commuter trips.

This suggests that the local pedestrian network is relatively permeable, with closely located land uses, activities and other attractors typical of inner-city locations. The high proportion of train commuter trips (52 per cent) is likely reflective of the nature of Central Station, and the connectivity it provides across the rail network.

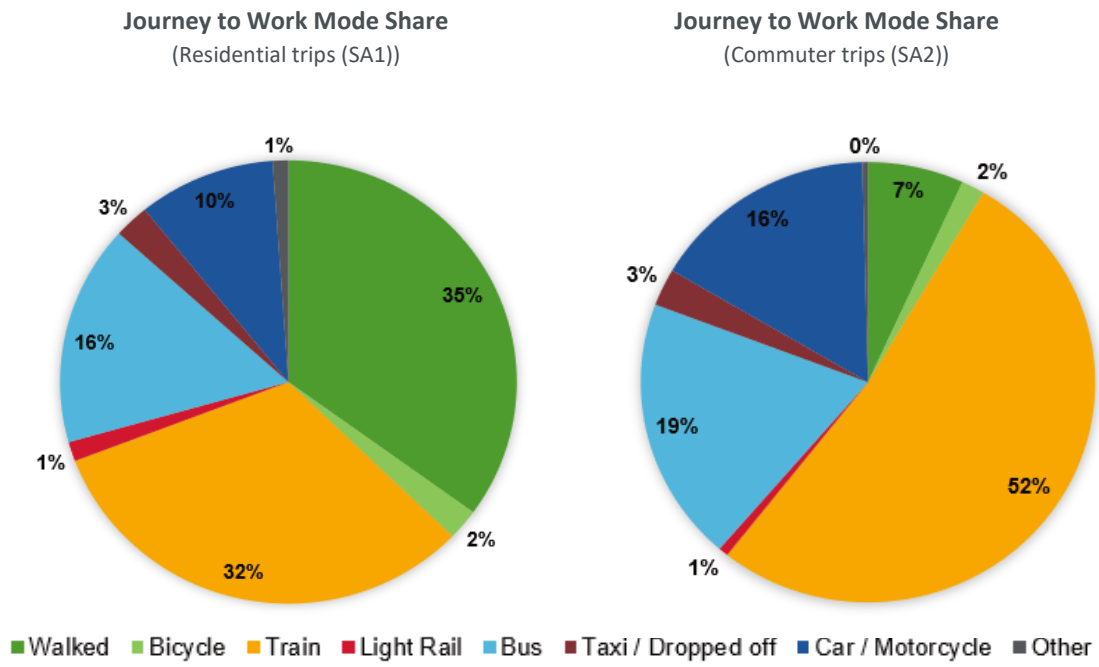



**Figure 3-3 Travel mode distribution for residential trips (left) and commuter trips (right) from and to the catchment area around Central Precinct**
Source: ABS 2016 Census

### 3.2.3 Origins and destinations

An assessment of trip origins and destinations travelling through the Central Precinct and Central Station was completed as part of broader study area investigations. In recognition of the role of Central Station and the breadth of user types travelling through the Precinct, mobile signal data was analysed in preference to ABS Census data to ensure the full spectrum of users, including commuters, students, recreational visitors and tourists were considered.

The analysis, conducted by data analysts, Place Intelligence, used de-identified and privacy compliant mobile signal datasets from 2019 to understand pedestrian movements within and around Central Precinct. This included analysing the patterns of place use and movement within Central Precinct, the surrounding precinct, and the journey origins and destinations across Greater Sydney.

The data was collected by extracting historic and real time mobile phone signals from a data base of human mobility data, focusing on place usage data from 2019 to understand a pre-pandemic baseline. Machine learning was then used to understand how people moved across the precinct (and which mode they used), where they may be coming from, and how long they spent in the area. By evaluating a year's worth of movement data, specific trends were able to be identified of how people travel and interact within Central Precinct.

The broader analysis identified that, of all visitors to Central Precinct over the assessed period, 89 per cent reside in Australia, with most trips taken by those that live in NSW (87 per cent of the national total). Further analysis highlights that 89 per cent of trips through Central Station travel from the greater Sydney Metro area, with the remaining 11 per cent of users residing in regional NSW and the ACT.

Figure 3-4 shows the intensity of user origins by ABS SA boundaries across NSW and the greater Sydney region. When compared against the rail network, trip origins are generally higher in areas where there is access to rail services.

Analysis of user 'last leg' trips, the journey of passengers travelling through Central Station to their final location, was also completed. This considered device location traces as they departed the Central Precinct, and the next location in their journey where the device was stationary for five minutes or more.

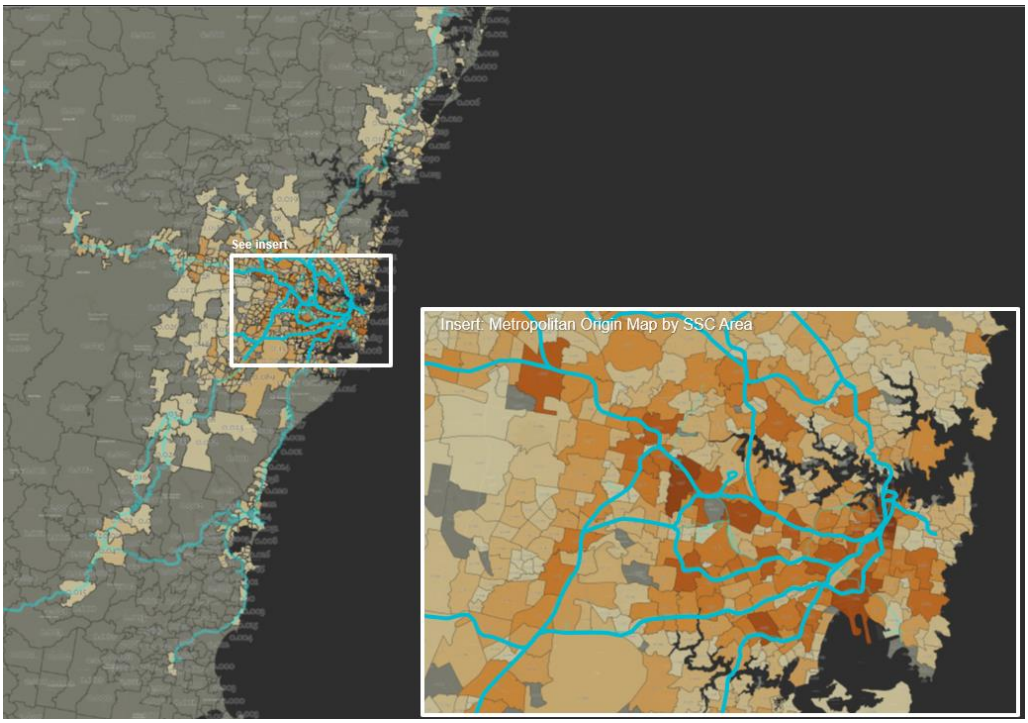



**Figure 3-4 Origin breakdown**

Source: *Central Station Renewal Precinct Data Analysis* report prepared by Place Intelligence for Arcadis, 2021

Figure 3-5 represents the outcomes of this assessment for trips within 1.6 kilometres from Central Precinct. The data identifies a strong movement to the north (towards the Sydney CBD) and west (towards Ultimo) of the station, including directly adjacent to Central Precinct within the Western Gateway.

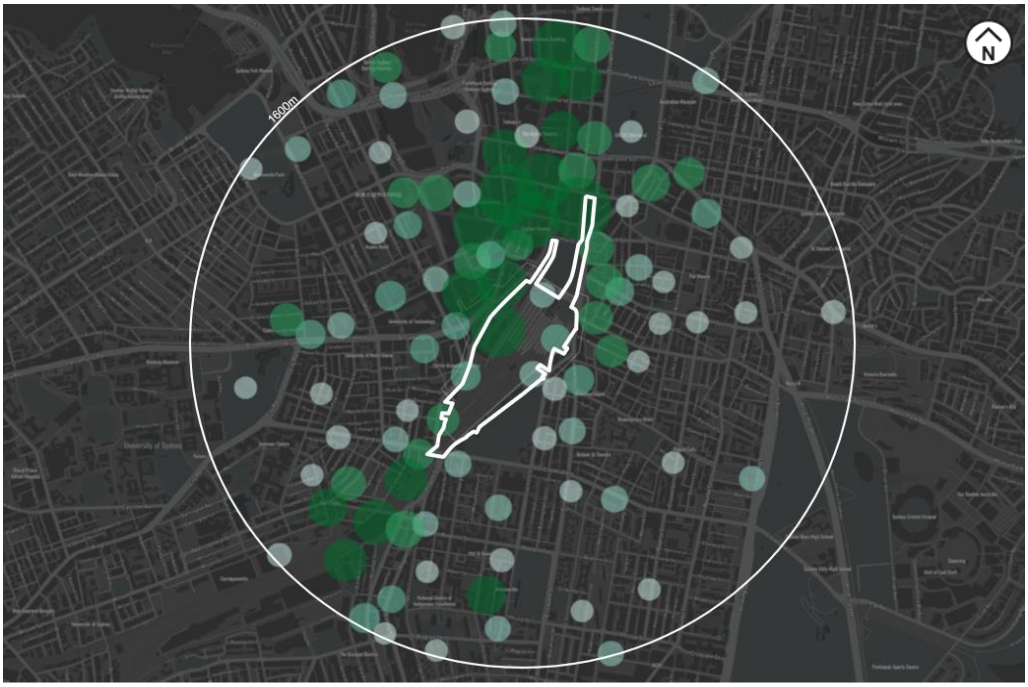



**Figure 3-5 Journey 'Last Leg' destination breakdown**
Source: *Central Station Renewal Precinct Data Analysis* report prepared by Place Intelligence for Arcadis, 2021

### 3.2.4 Trip purpose and length

Using 2018/19 Household Travel Survey (HTS) data, key trip characteristics of the Sydney Inner City catchment area have been compared with the Greater Sydney Metropolitan catchment area. HTS data is derived from a smaller sample size and is more effectively used in the analysis of larger areas. As Central Precinct is located within the City of Sydney LGA, it would tend to reflect the travel patterns of a central Sydney location.

Figure 3-6 compares the distribution of trip purpose recorded for trips occurring across the Sydney LGA and the greater metropolitan Sydney area. Within the Sydney LGA, social and recreational trips accounted for a larger proportion of trips than in metropolitan Sydney, and a much lower proportion of trips serving other passengers (i.e. point to point transport or private vehicle pick-up and drop off activities). There is also a slightly higher proportion of commute and retail orientated trios within the Sydney LGA.

When considering the average length of trips by trip purpose (shown in Figure 3-7), trips within the Sydney LGA are much shorter across all trip types in comparison to the greater Sydney metropolitan area. This is likely due to higher density and proximity of land uses within the Sydney LGA, in addition to the greater availability of public transport, walking and cycling connections for many trips across the inner-city area.

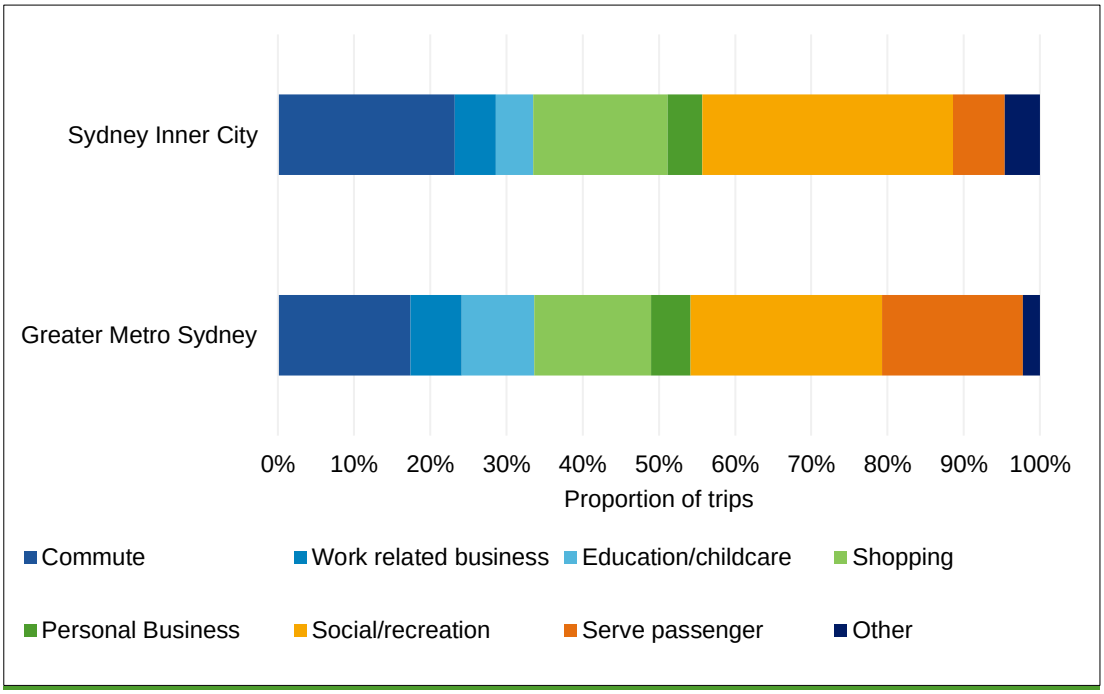



**Figure 3-6: Distribution of trip purpose types (Sydney Inner City vs Greater Metro Sydney)**
Source: Transport for NSW 2018/19 Household Travel Survey (Accessed 2021)

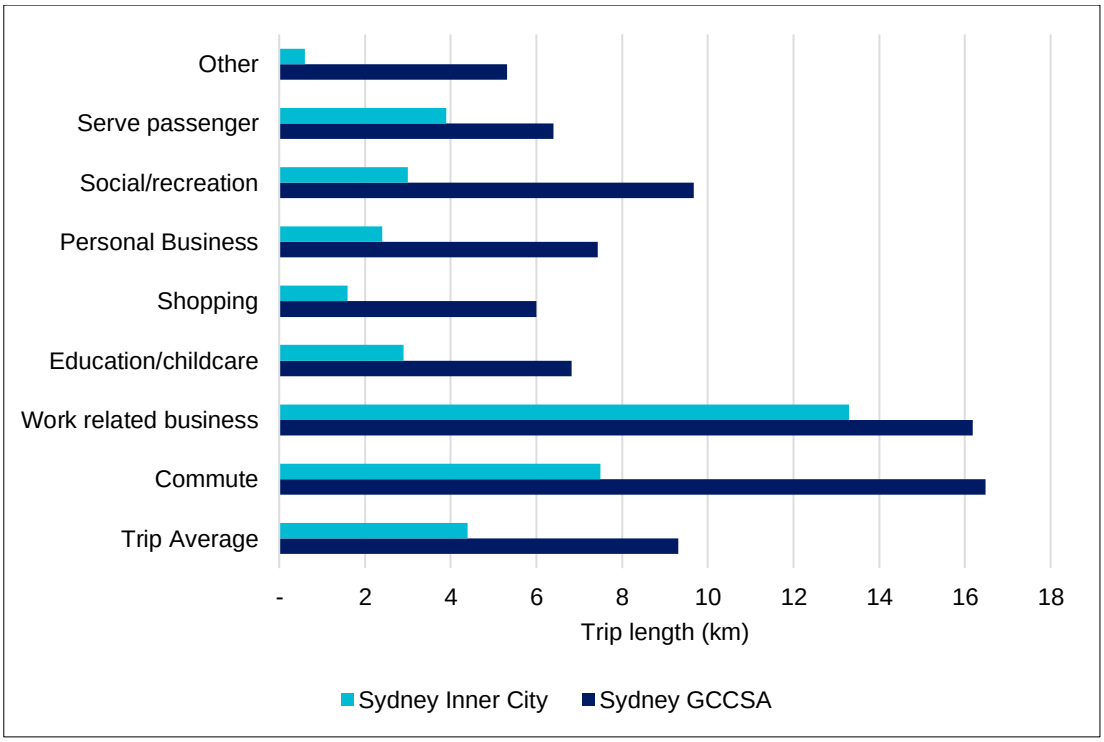



**Figure 3-7: Average length of trips by trip purpose (Sydney Inner City vs Greater Metro Sydney)**
Source: Transport for NSW 2018/19 Household Travel Survey (Accessed 2021)

## 3.3 Walking

The existing structure of the street network surrounding Central Precinct is generally well suited to walking. There is a clear grid pattern of streets and paths that allow direct connections and provides good permeability for pedestrians.

However, the size of Central Precinct and the broader rail corridor presents challenges for pedestrians, with the station acting as a barrier for east-west and north-south movements across the Precinct. Devonshire Tunnel, which links Chalmers Street to the east and Henry Dearne Plaza/ Lee Street to the west, provides the only direct east-west connection across the site between Cleveland Street and Eddy Avenue.

The surrounding road network also prioritises vehicle movement, with pedestrians often waiting for long periods to cross the road and continue their journey. The provision of pedestrian crossing facilities surrounding Central Precinct include:

- a signalised pedestrian crossing across Lee Street, between Henry Deane Plaza and Railway Square
- signalised pedestrian crossings on all approaches of the Lee Street/ Broadway/ Quay Street/ George Street/ Pitt Street intersection
- signalised pedestrian crossings on all approaches of the Eddy Avenue/ Pitt Street/ Rawson Place intersection
- a signalised pedestrian crossing across Eddy Avenue, between Eddy Plaza and Belmore Park
- signalised pedestrian crossings on the eastern and southern legs of the Foveaux Street/ Elizabeth Street intersection
- signalised pedestrian crossings on all approaches of the Chalmers Street/ Randle Street/ Devonshire Street intersection.

Although crossing opportunities are provided at most intersections surrounding Central Precinct, pedestrian crossings to the north and west currently experience high demands during peak periods. With increased public transport patronage and land use changes around Central Precinct, these crossings may need to be upgraded to accommodate growing pedestrian demand across the Precinct.

The area surrounding Central Precinct comprises of medium to high density residential, educational and commercial land uses, which when combined with the inner-city locality, results in a high proportion of walking trips. George Street, Broadway and Harris Street are significant pedestrian movement corridors from the Precinct, connecting the station to the Sydney CBD (George Street), Ultimo and the Pyrmont Peninsula (Harris Street) and the broader Tech Central area (Broadway).

A study of pedestrian movement by data analysts, Place Intelligence, identified an average of 39,000 pedestrian movements across Central Precinct in 2019 during the AM peak hour, and 43,000 pedestrian movements PM peak hour, inclusive of trips made to and from public transport within the study area.

The Place Intelligence analysis identified a strong demand travelling to the north of Central Precinct, as well as to the west towards the Western Gateway and the intersection of Broadway and Harris Street. There was a relatively high desire line travelling east-west across the station along Devonshire Tunnel, and through to Railway Square and beyond to the Goods Line towards Darling Square.

With the high volumes of pedestrians travelling from and to the train station, footpaths and crossings become congested, with pedestrians competing for limited footpath space as they move throughout Central Precinct. There is also limited opportunity to cross east-west through Central Precinct, which funnels movement through Devonshire Tunnel and along Eddy Avenue. The pedestrian network around Central Precinct with key walking corridors and daily pedestrian movements are shown in Figure 3-8.


**Figure 3-8: Existing pedestrian network and flows around Central Station**

## 3.4 Cycling

Central Precinct is located on Sydney's strategic cycleway network, linking the station to a broad catchment across the CBD and surrounding areas. Key destinations include Moore Park to the east, Redfern and Ultimo to the south, and Darling Harbour to the northwest.

However, there are gaps in the existing cycling network, with no direct and accessible route for cyclists coming to or passing by Central Precinct. East-west movement is constrained by the station and broader rail corridor, limiting access between Moore Park and Surry Hills to Darling Harbour and Victoria Park. There are limited crossing opportunities across the Precinct, with cyclists required to dismount and walk-through Devonshire Tunnel or follow the constrained road network around the site.

The surrounding area currently has a shared off-road cycle path through Prince Alfred Park and Belmore Park. There is a separated bi-directional cycle path on Castlereagh Street, connecting to Elizabeth and Liverpool Streets. There is a shared bicycle and pedestrian path on the eastern side of Regent and Cleveland Streets to Railway Square, providing access to Central Precinct, including Henry Deane Plaza. Bicycle parking is available at the Goulburn Street car park operated by the City of Sydney.

At the intersections of Elizabeth Street/ Chalmers Street/ Eddy Avenue/ Foveaux Street and Cleveland Street/ Regent Street cycling counts have more than doubled between 2010 and 2019 (City of Sydney counts, 2020). The number of cyclists on major routes into Sydney has grown 10 per cent per annum on each of the major routes and is expected to grow further into the future, with the creation of new cycle links and the development of the principal bicycle network.

The cycle network and daily cyclist movements surrounding Central Precinct is shown in Figure 3-9.


**Figure 3-9: Existing cycling network and flows around Central Station**

## 3.5 Public transport

Central Precinct is currently the busiest train station within the Sydney Trains rail network, with over 125,000 customers accessing the platforms each day. As Sydney's principal transport interchange, the station connects customers between intercity, regional and suburban services, with light rail and bus services and destinations within the local area. Figure 3-10 outlines the public transport network around Central Precinct.


**Figure 3-10 Existing public transport network around Central Station**

### 3.5.1 Trains

Central Precinct is the key hub of the Sydney metropolitan and NSW regional rail network, serving as a major interchange between suburban, regional, and intercity services with transit and intercity bus services, private coach services, and light rail. As the busiest station on the Sydney Trains network, nearly 2000 services operate to and through the station each day across the 24 platforms.

There are two main platform groups within Central Precinct. The Terminal building accommodates Platforms 1 to 12, which serves intercity and regional services and some suburban services which terminate at Central. The suburban platforms comprise of Platforms 16 to 25, which serve most suburban services as well as accommodate the direct link to Sydney Airport. Of these, Platforms 16 to 23 are located above ground to the east of the main terminal building, with Platforms 24 and 25 located underground further east of the station.

Platforms 13 to 15 are currently closed due to construction works associated with Sydney Metro. The new metro platforms are currently being constructed under these platforms, with Platforms 13 and 14 due to reopen at the completion of the construction works in 2023. Platform 15 will be permanently closed to rail services.

All the platforms are connected by a series of concourses and pedestrian tunnels, which connect to the outside precinct via nine accessways:

- the Northern Entrance, which connects Eddy Avenue to the Northern concourse within Central Precinct
- the Elizabeth Street and Eastern Stair entrances, which connects Elizabeth Street to the Northern and concourses within Central Precinct
- the Chalmers Street and Railway Square entrance, which provides the main east-west connection across the site (Chalmers Street to Lee Street) through the Devonshire Tunnel, and connects to the South Concourse within Central Precinct
- the Forecourt, Pitt Street and East Deck entrances, which connect the upper colonnade and the western forecourt to the Grand Concourse of the Central Precinct terminal building.

As a transport interchange, the complex layout of Central Precinct makes transferring between platforms and modes difficult. The available space in some locations is unable to accommodate existing passenger demands, and navigation through the Precinct is difficult due to a highly complex layout, a lack of sightlines and an often counter-intuitive design.

Passenger demands are also high, with 26,000 exits and 5,800 entries from Central Station in 2019 for the AM peak hour, and a further 9,800 interchange movements within the station between services. The 2019 PM peak hour recorded slightly lower levels of movement, with 7,600 exits, 20,400 entries and 9,200 transfers. The high demand for passengers waiting for services during the peak leads to crowding on some suburban platforms as there is insufficient space to accommodate the waiting demand.

Table 3-2 summarises the entry, exit and transfer movements within Central Station for the 2019 AM and PM peak hours. Figure 3-11 provides an overview of the station access and AM peak hour movements to and from Central Precinct.

**Table 3-2: Summary of Central Station demands - 2019 AM and PM peak hours**

| Station entrance | AM Peak hour | | PM Peak hour | |
|---|---|---|---|---|
| | Exits | Entries | Exits | Entries |
| Eddy Plaza (Northern Entrance) | 6,520 | 720 | 1,780 | 5,350 |
| Elizabeth Street Entrance | 3,920 | 630 | 1,230 | 3,440 |
| Eastern Stairs | 370 | 90 | 110 | 370 |
| Chalmers Street Entrance | 2,890 | 1,290 | 1,970 | 2,840 |
| Devonshire Tunnel West | 8,060 | 2,330 | 2,070 | 6,060 |
| Forecourt Entrance | 2,330 | 390 | 960 | 1,330 |
| Colonnade Entrance West | 1,220 | 200 | 330 | 860 |
| Colonnade Entrance East | 1,060 | 160 | 230 | 710 |
| Transfers between services | 9,840 | | 9,150 | |
| **Total movements** | **42,020** | | **38,790** | |

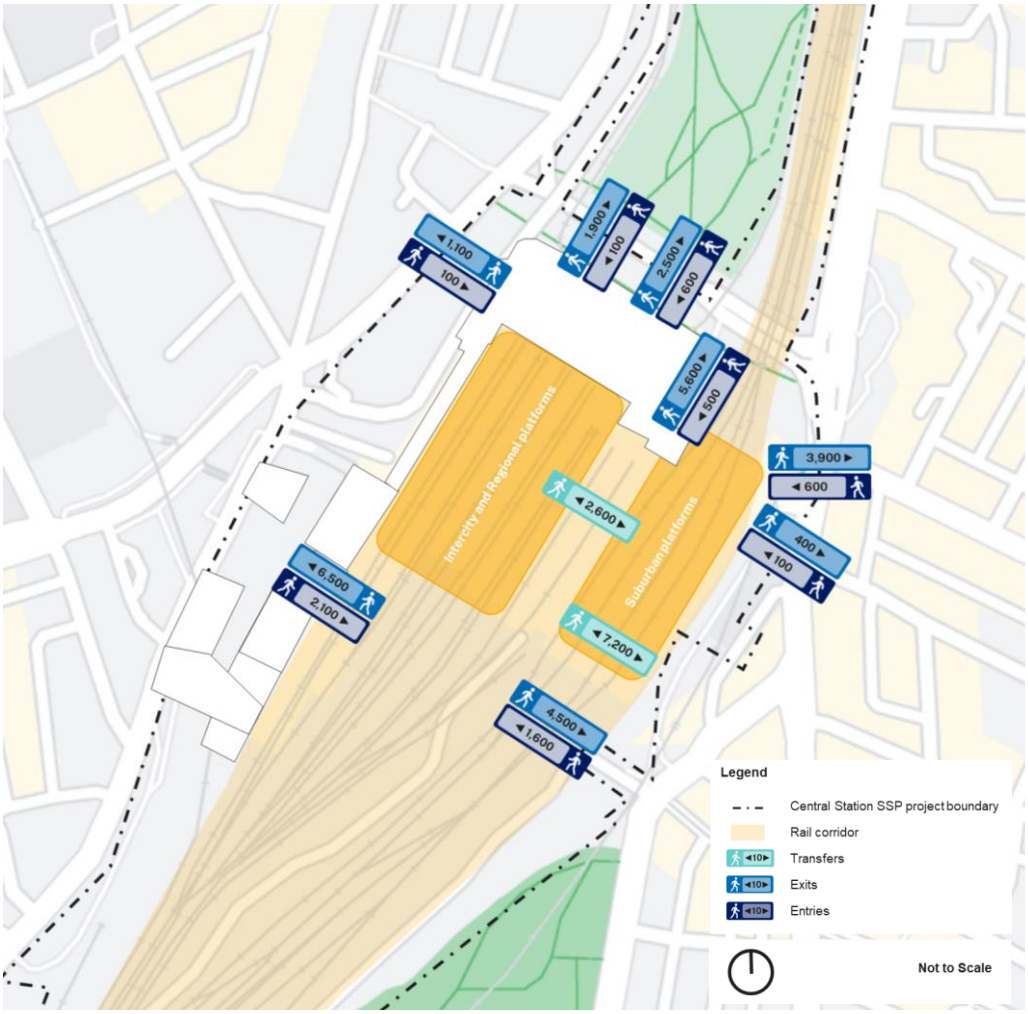



**Figure 3-11: 2019 Peak hour movements to and from Central Precinct**

### 3.5.2 Light rail

Three light rail routes service the Central Precinct: connecting to Dulwich Hill along the Inner West route, and between Circular Quay to Randwick and Kingsford along the CBD and South East route. The Inner West Light Rail (IWLR) consists of 12.7 kilometres of track that connects Central Precinct and Dulwich Hill via 23 light rail stops. Central Precinct serves as one of the start/ end destinations for the service, with the stop located adjacent to the Pitt Street entrances on the Grand Concourse.

During the week, IWLR services generally operate every eight to 13 minutes. During the AM peak (between 8am and 9am) and PM peak (between 5pm and 6pm) periods, the service operates at the minimum eight-minute frequency.

The CBD and South East Light Rail (CSELR) dual route connects Circular Quay to Kingsford and Randwick, passing Central Precinct along Eddy Avenue and Chalmers Street. Opening in late 2019, the CSELR operates at up to 15 services per hour (four-minute frequency), connecting into Central Precinct at the Chalmers Street stop to the east of the station, and the Haymarket stop to the north-west of the station.

Opal data from 4 March to 8 March 2019 has been analysed to determine the typical demand during the AM peak and PM peak periods for the IWLR service under pre-covid conditions. Demands for the CSELR were not evaluated in this assessment as the routes opened late in 2019, and demand had not settled into a 'typical' use setting.

Figure 3-12 identifies the AM peak and PM peak hour demands for the IWLR service at Central Precinct.

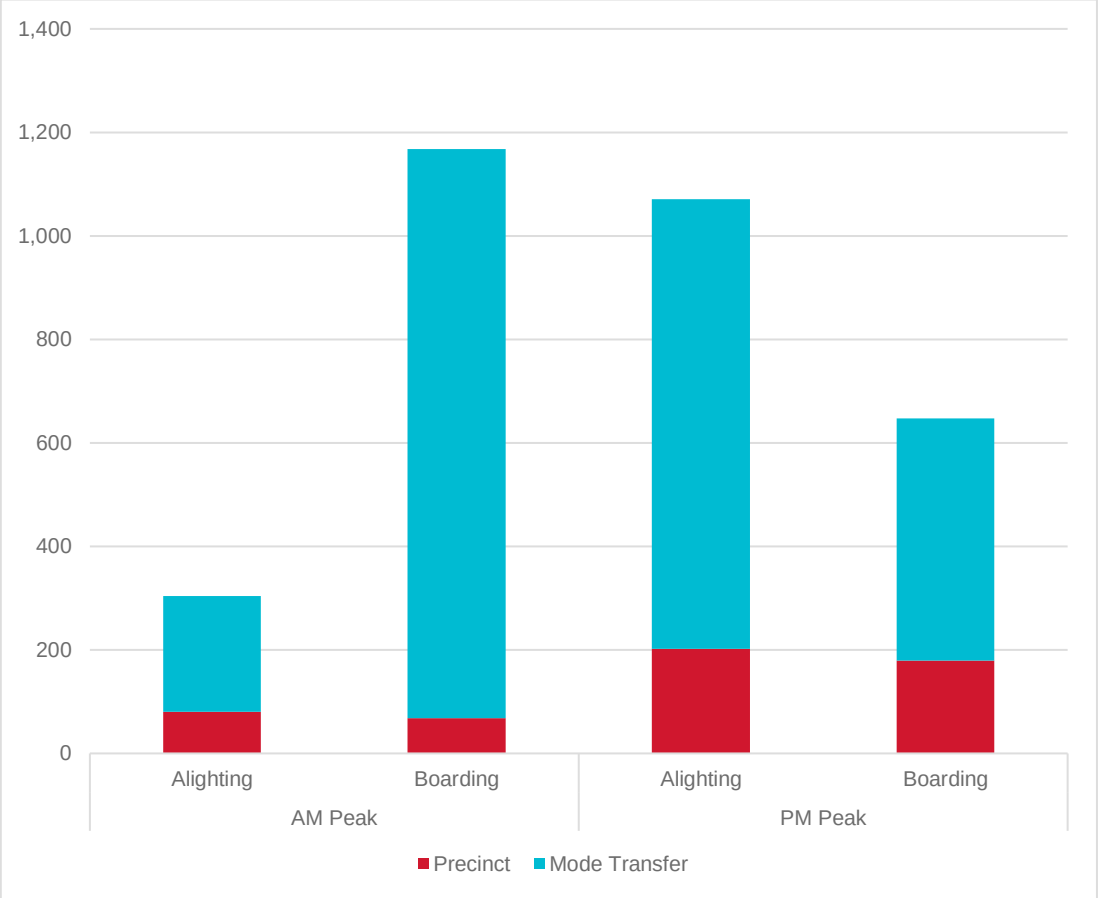



**Figure 3-12: Light rail demand within Central Precinct (March 2019)**

The Opal data identified an average of 1,168 passengers boarding the light rail at Central Precinct in the AM peak hour, and 304 passengers alighting at Central Precinct. In the PM peak hour, the trend was reversed, with 1,071 passengers alighting at Central Precinct and 647 passengers boarding the light rail from the station in the evening peak.

Transfers between train and bus services to the light rail services represents the bulk of demand, accounting for 83 per cent of all movement across the peak hour periods. This is despite the poor connectivity between the light rail stops and the suburban rail lines within Central Precinct, and the long distance between the bus interchange at Railway Square to the west of the station. Transferring between the IWLR and the CSLER is also challenging, given the position of the light rail stops within the broader network.

The integration of the light rail services within the road network has also at times impacted journey times and overall service reliability. While the light rail generally operates within a designated corridor within Central Precinct, services can be delayed due to traffic control signal timing and high pedestrian and traffic volumes.

### 3.5.3 Buses and coaches

*Bus services and demands*

Central Precinct has twelve bus stands assigned to the scheduled bus services, which services 51 routes into and around Sydney. Bus services around the Precinct provide connections between the Greater Sydney area and the CBD as well as facilitating interchange with train and light rail services. Streets around the Precinct count among the busiest bus corridors in Sydney but offer poor bus priority.

Over 50 bus services currently use the bus stands around the station, with 12 services beginning or ending within the Precinct. Of the 75,000 bus customers that use the bus stops in the Precinct each day, nearly 45,000 customers transfer to or from rail services.

The AM peak and PM peak hour activity levels for each stand, together with the peak hour bus volumes along key roads, are presented in Figure 3-13 and Figure 3-14. This is based on analysis of Opal data for March 2019, presented in Table 3-3 below.

**Table 3-3: Summary of Central Station demands - 2019 AM and PM peak hours**

| Station entrance | AM Peak hour | | PM Peak hour | |
|---|---|---|---|---|
| | Alightings | Boardings | Alightings | Boardings |
| Bus Stand A - Eddy Avenue | 370 | 0 | 1360 | 20 |
| Bus Stand B - Eddy Avenue | 60 | 200 | 60 | 60 |
| Bus Stand C - Eddy Avenue | 30 | 640 | 30 | 640 |
| Bus Stand D - Eddy Avenue | 0 | 2210 | 0 | 0 |
| Bus Stand E - Elizabeth Street | 40 | 440 | 40 | 440 |
| Bus Stand G - Chalmers Street | 1030 | 100 | 680 | 40 |
| Bus Stand J - George Street | 1510 | 260 | 1470 | 150 |
| Bus Stand K - Lee Street/ Railway Square | 0 | 190 | 30 | 470 |
| Bus Stand L - George Street/Railway Square | 80 | 570 | 70 | 320 |
| Bus Stand M - George Street/Railway Square | 60 | 1520 | 110 | 1090 |
| Bus Stand N - Lee Street | 410 | 40 | 140 | 10 |
| **Total Movements** | **3,590** | **6,160** | **3,990** | **3,220** |

The analysis revealed that the busiest stands in the AM peak hour are Stand J (George Street northbound) and Stand D (Eddy Avenue eastbound). There is a strong transfer movement across the Precinct, with 76 per cent of passengers arriving to Central Station via train and transferring to a departing bus service.

George Street, between Broadway and Pitt Street, has the highest concentration of bus services in the AM Peak, with 466 buses travelling along the section (233 services in each direction). Eddy Avenue also experiences high bus volumes, with 176 services travelling eastbound and 82 services westbound.

During the PM peak hour, Stand A (Eddy Avenue westbound) and Stand J (George Street northbound) are the busiest stands within Central Precinct, with both stands experiencing high alighting passenger demands. Transfers between trains and buses (in both directions) remains high during the PM peak, accounting for 56 per cent of all bus activity.

Similar to the AM peak, George Street experiences the highest number of bus services in the PM peak hour (211 services in each direction). Eddy Avenue also experiences high bus volumes in the PM peak, with 118 services travelling eastbound and 85 services westbound.

Analysis of service frequency and stand capacity suggests the majority of stands across Central Precinct currently meet service demands. Stands A and C, both located on Eddy Avenue, currently have insufficient space to accommodate bus service demand, with passengers required to board and alight buses wherever the bus can stop, which can be up to 40 metres from the stand.

Bus services around Central Precinct are also impacted by traffic congestion around the Precinct. This can limit the space available for buses to enter and exit the bay, in addition to delays on service journey times.

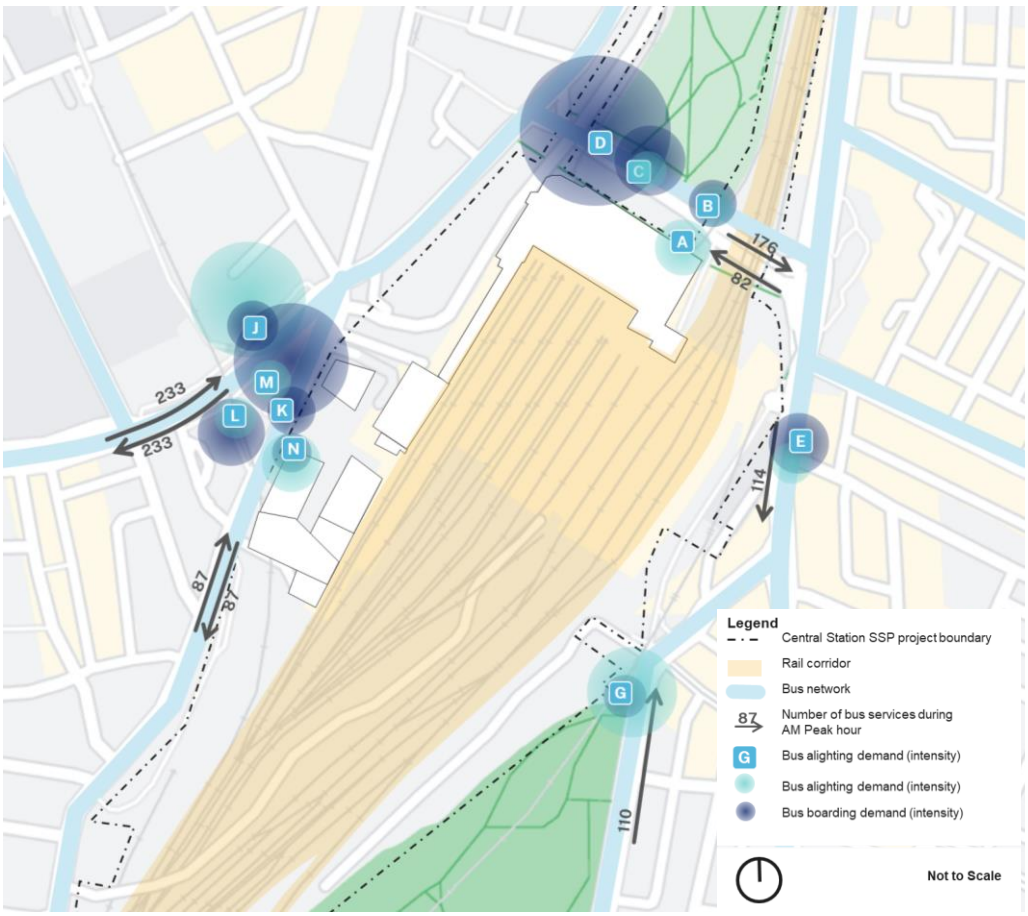



**Figure 3-13: Central Precinct bus stand activity in the AM peak hour (8am – 9pm)**

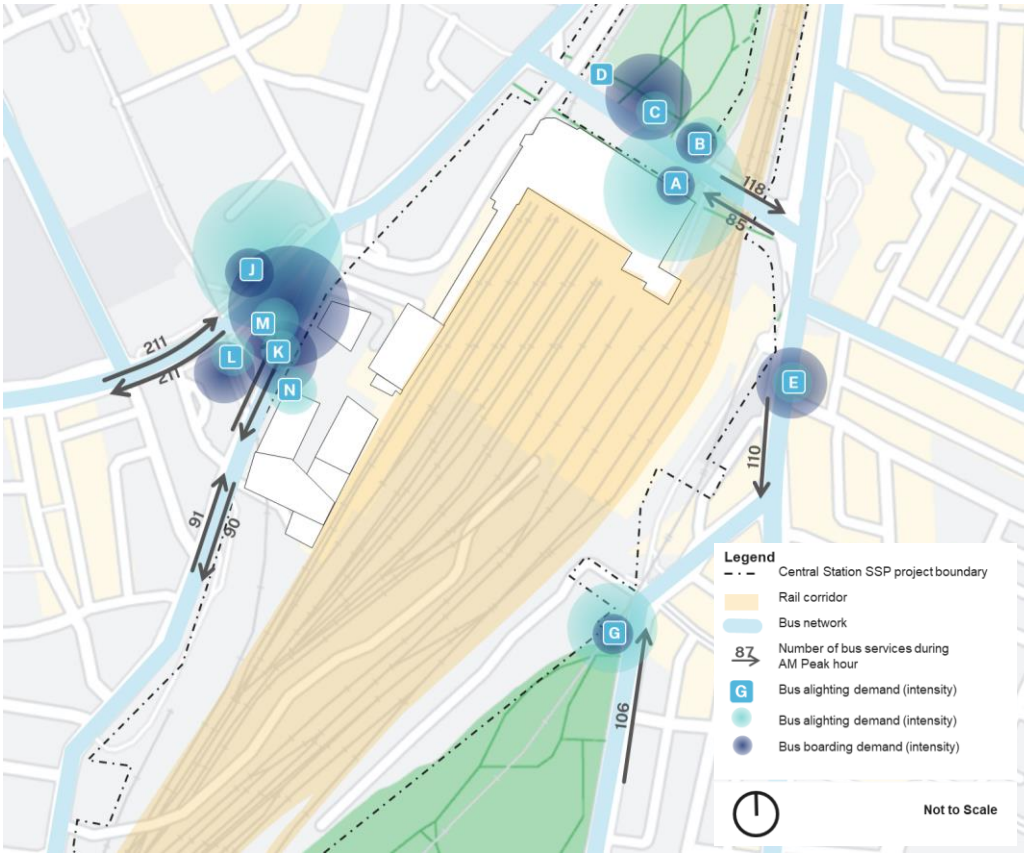



**Figure 3-14: Central Precinct bus stand activity in the PM peak hour (5pm – 6pm)**

*Coach services and frequency*

The Sydney coach terminal is located within Central Precinct, with coach pick-up and set-down locations within the Western Forecourt and along Pitt Street adjacent to the station terminal building. While these stops generally service private, regulated operators with regular, timetabled services, they are also used by tourist, hotel and NSW Trainline coach services on an ad-hoc basis.

The coach service demand in 2019 for Central Precinct is provided in Figure 3-15. Over 100 coach and tourist services operate from Central Precinct each day, with the highest demand occurring during the day, outside of peak bus and station operations The peak demand for coaches across a typical weekday is six services in the evening, between 6pm and 7pm.

Coach services generally operate at consistent frequencies throughout the day, with the operations aligning to the broader period of pedestrian and commuter activity around Central Precinct. Coaches have longer wait times than other vehicles and occupy space in high demand areas like the Western Forecourt for up to 30 minutes. With growing demands on road space around the Precinct, the longer dwell time of coaches creates an inefficient use of highly congested kerb space.

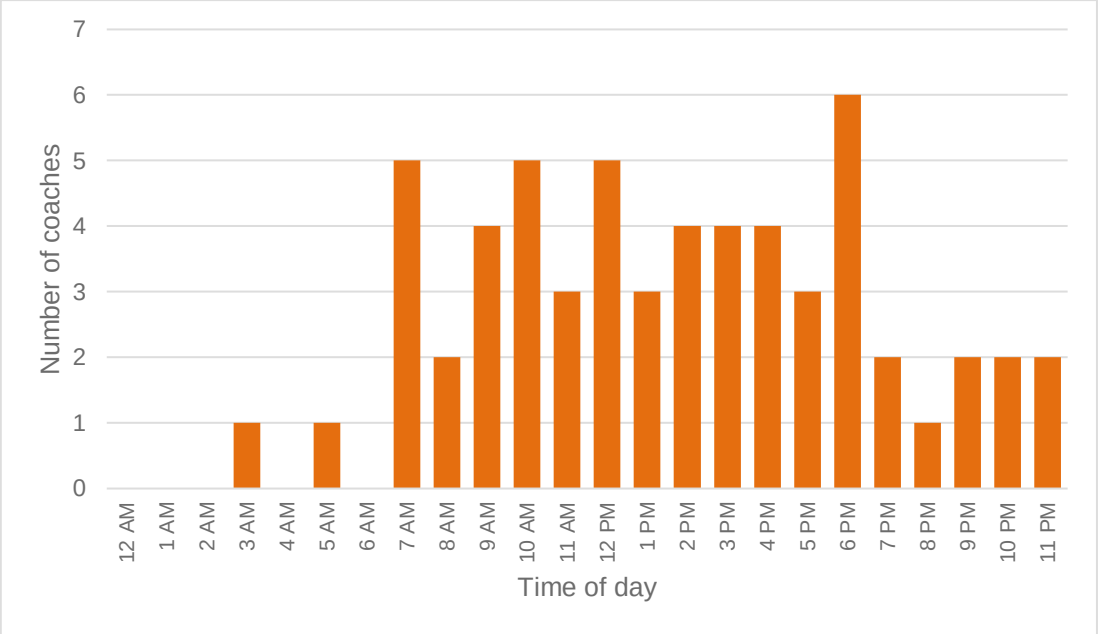



**Figure 3-15: Central Precinct coach demand profile**

*Service layover capacity*

Central Precinct also encompasses the Lee Street bus layover, located directly south of the Western Gateway precinct. The layover functions as a waiting layover for buses and coaches starting at Central Precinct, with buses entering at the northern end of the site and exiting mid-site at the signalised intersection of Regent Street and Lee Street.

Vehicle counts conducted in November 2019 identified a peak demand of 13 buses and coaches (combined) at any one time on-site, well below the layover capacity of 23 vehicles. On averages, buses remain at the layover between five and 15 minutes, with coaches remaining on-site for between 30 minutes and two hours. Figure 3-16 demonstrates the variability in demand within the bus layover facility.

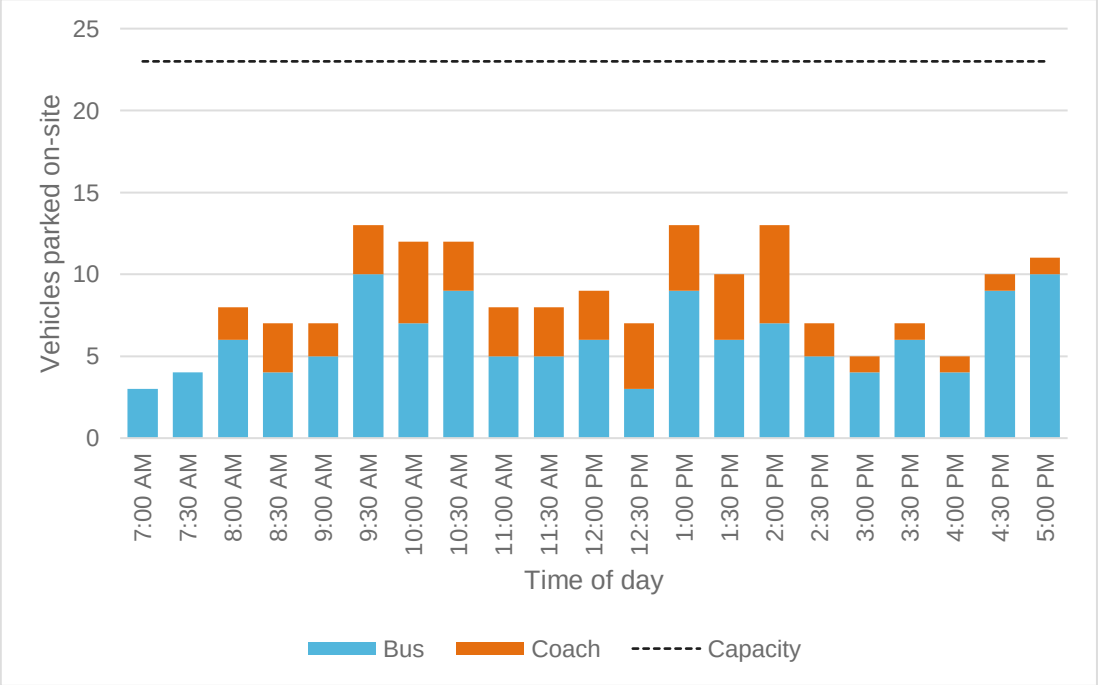



**Figure 3-16: Lee Street layover demand profile**

*Train replacement services*

During rail shutdowns for maintenance, construction, or emergency events, Transport for NSW operates temporary additional bus services to accommodate the displaced passenger demand. At Central Precinct, rail replacement services can operate from the following locations, depending on the direction and scale of movement:

- Within the Western Forecourt from the coach stands
- Along Pitt Street, adjacent to the Central Station Terminal building
- On Chalmers Street, south of Devonshire Street.

Temporary weather protection and static signage is provided for customers of the rail replacement services, including the location of any bus and/ or coach services displaced because of the rail replacement operations.

## 3.6 Road network

Central Precinct is bounded by a network of arterial roads that impede walking and cycling connectivity to and surrounding Central Precinct. Key roads include:

- Elizabeth Street, which runs north-south to the east of Central Precinct and is five lanes wide (two northbound general traffic lanes, two southbound general traffic lanes and a southbound bus lane).
- Eddy Avenue, which generally runs east-west directly north of Central Precinct and accommodates four lanes in each direction (three general traffic lanes and a bus lane). The CSLER also runs along Eddy Avenue, between the traffic lanes and Central Precinct.
- Pitt Street, which runs north-south to the west of Central Precinct and is six lanes wide (three northbound general traffic lanes and three southbound traffic lanes).
- George Street, which generally runs north-south to the west of Central Precinct. South of the Pitt Street/ Lee Street intersection, George Street is eight lanes wide (four northbound general traffic lanes, three southbound general traffic lanes and a southbound bus lane). North of the Pitt Street/Lee Street intersection, George Street narrows to two through lanes and a parking lane in each direction.
- Lee Street, which runs north-south to the west of Central Precinct between Henry Dearne Plaza and Railway Square. Lee Street is five lanes wide (two southbound general traffic lanes, two northbound traffic lanes and a northbound bus lane).
- Cleveland Street, which runs east-west to the south of Central Precinct and is generally four lanes wide (two lanes in each direction, with additional turning lanes at major intersections).

On-street parking around Central Precinct is generally not permitted. The roads adjacent to Central Precinct have a posted speed limit of 40 kilometres per hour, except for Cleveland Street, which currently has a posted speed limit of 50 kilometres per hour.

Figure 3-17 shows the key movement corridors and peak hour volumes in 2019 across Central Precinct.

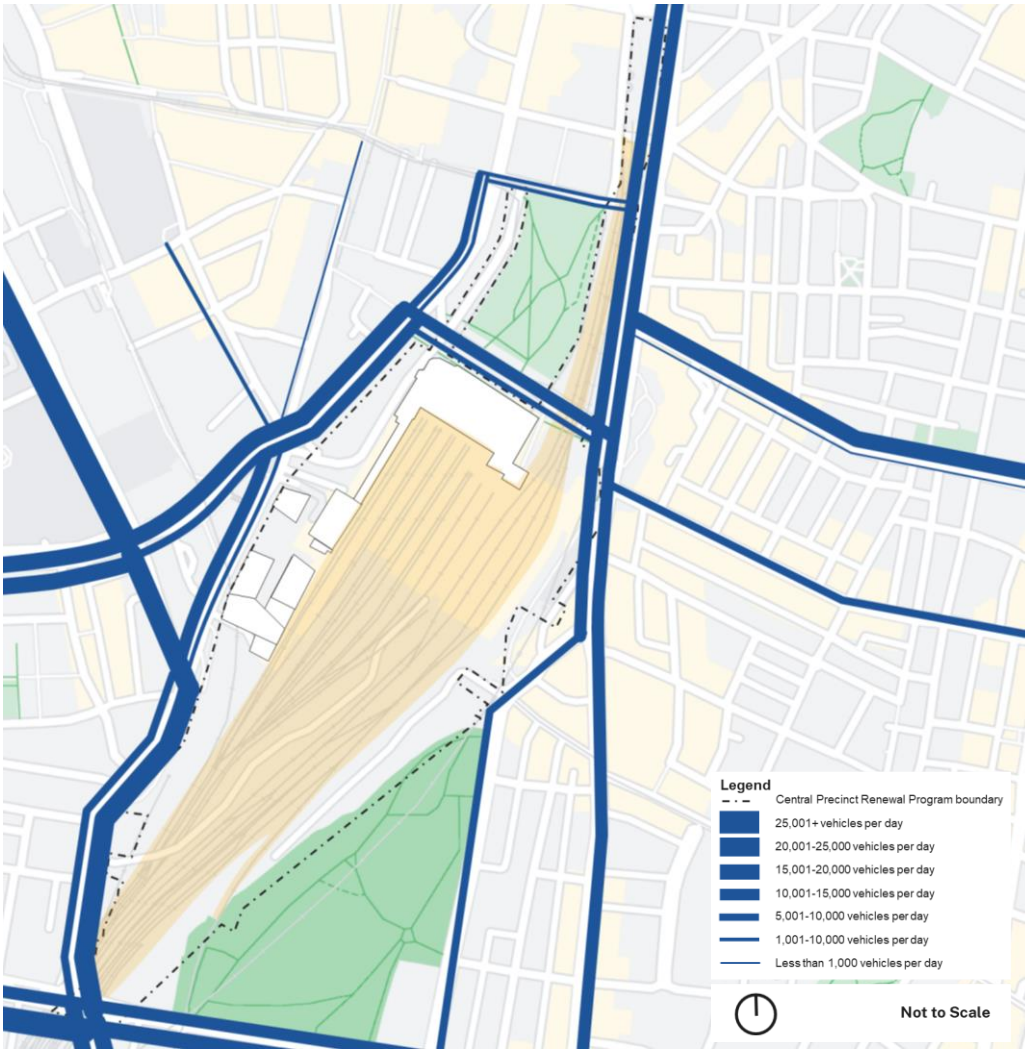



**Figure 3-17: Arterial road network around Central Precinct**

The road network around Central Precinct serves an important traffic function for road based public transport as well as for private and freight vehicles. In 2019, over 88,000 vehicles travelled within the area during the AM peak and PM peak periods, with 42,000 of those vehicles travelling through the Central Precinct.

High traffic volumes occur on Eddy Avenue, creating a barrier to pedestrians accessing Belmore Park and leading to poor pedestrian amenity on Eddy Avenue Colonnade. High traffic volumes are also a barrier to pedestrians attempting to cross Pitt Street and Lee Street and limit the opportunity to provide additional space for the high pedestrian volumes along the Broadway/ George Street corridor.

When considering broader traffic movement, east-west connectivity around the Precinct is limited to Eddy Avenue and Cleveland Street, with Cleveland Street serving as one of the few arterial bypasses around the Sydney CBD. Analysis of the Strategic Traffic Forecasting Model (STFM) highlights that nearly half of all vehicles travelling along Eddy Avenue, Pitt Street and George Street are passing through the Precinct with business elsewhere. This places increased pressure on the streets surrounding Central Precinct and limits its ability to become a desired destination.

## 3.7 Parking, servicing, and access

Vehicular access to Central Precinct is limited, with parking, deliveries and point-to-point activities generally restricted to:

- The Western Forecourt and the Colonnade ramp
- Ambulance Avenue
- Pitt Street loading dock.

Three further access points allow rail operations and construction vehicles to access Central Precinct:

- Chalmers Street service access
- Eddy Avenue metro construction access
- Regent Street rail corridor/ metro construction access.

Parking within Central Precinct is generally limited to short-term public parking within the Western Forecourt, with longer parking permitted for authorised users both within the forecourt and across the broader precinct. No commuter parking spaces are currently provided for use for train commuters travelling to and from Central Precinct.

Public drop-off and pick up facilities, including designated point-to-point facilities, are in the Western Forecourt and at the top end of the Colonnade Ramp above Eddy Avenue. Vehicle activity surveys completed in April 2021 indicate over 1,100 pickup and drop movements (taxis and private vehicles combined) occurring within the Western Forecourt over a 24-hour period.

Central Precinct has a wide range of vehicles that need to access the site on any given day for different activities, including for rail operations, station and precinct deliveries, maintenance, and waste collection. Deliveries and service vehicles are generally accommodated for within the Western Forecourt, Ambulance Avenue and within the Pitt Street loading dock. Currently, around 400 delivery and service vehicles are estimated to be accessing the station each day.

Figure 3-18 identifies the key access points and parking areas around Central Precinct.

The availability of kerbside across the broader precinct places limitations on safely accommodating the high level of passenger drop-off and pick up activity occurring around Central Precinct. Surveys of activity during April 2021 highlighted over 100 instances of drop-off and pick up activities occurring over a 24-hour period within ‘No Stopping’ or ‘Bus Only’ zones, impacting traffic movement and pedestrian safety.

As land uses across the Precinct intensifies, passenger drop-off and point-to-point activity will increase, adding to the existing high demands and access challenges across Central Precinct. The servicing and delivery task associated with the Precinct will grow as the area is developed, with more deliveries, building maintenance activities and waste collection to occur as well as during the construction phases. Managing these demands, as well as ensuring activities don’t interfere with pedestrian and public transport movement, will be critical to ensuring the ongoing success of Central Precinct.


**Figure 3-18: Existing parking and access around Central Precinct**

## 3.8 Summary of key issues and opportunities

The analysis and review of the strategic transport context, existing conditions and behavioural trends have identified a range of issues and matters that need to be addressed to support the growth of Central Precinct.

The following sections provide a summary of the key issues across Central Precinct, and outlines opportunities for these issues to be addressed, either as part of the Central Precinct project, or through another mechanism.

The key identified transport issues and opportunities for Central Precinct is provided in Figure 3-19.


**Figure 3-19: Summary of issues and opportunities**

### 3.8.1 Walking and Cycling

The analysis and review of the existing walking and cycling conditions and context have identified a range of issues for people who walk or cycle through the precinct. These are outlined in Table 3-4.

**Table 3-4 Identified issues and opportunities for walking and cycling within and around Central Precinct**

| Ref | Identified Issues | Opportunities and future actions |
|---|---|---|
| WC1 | The Lee Street and George Street intersection, and the Elizabeth/Foveaux/Chalmers streets intersection experience high pedestrian volumes, creating congestion, inciting unsafe pedestrian behaviours, potential conflicts with other modes and safety risks. | While outside the immediate boundaries of the SSP, the operation of these intersections will need to be reviewed as pedestrian demands increase to ensure movements can be safely accommodated.<br>In the longer term, there may be opportunities to close part of the road network to improve pedestrian connections and expand the public domain. Lee Street has been identified as one location where road reallocation could occur, as shown in Figure 3-19. |
| WC2 | There are limited opportunities for pedestrians to cross the rail corridor between Eddy Avenue to the north, and Cleveland Street to the south. Devonshire Tunnel is the only unpaid east-west connection through Central Station, with 75,000 pedestrian movements each day. | The redevelopment of Central Precinct provides an opportunity for increased permeability over the rail corridor, including direct access into Prince Alfred Park.<br>The extension of Central Walk, with the eastern section currently being constructed as part of Sydney Metro, will alleviate pedestrian demands through Devonshire Tunnel and provide commuters with a direct connection east and west out of the station.<br>These connections are shown in Green in Figure 3-19. |
| WC3 | Cycle routes within Central Precinct, such as Lee Street and Chalmers Street are not well connected to wider bicycle network.<br>Central Station also creates a barrier in the cycling network, restricting east-west and north-south movement. | There will be opportunities as part of Central Precinct to improve north-south cycling connections around the study area, including along Lee Street and/or Regent Street, and east-west across the station along the Devonshire Tunnel alignment.<br>Beyond the study area, potential future improvements include dedicated connections across Cleveland Street towards Redfern, and across Regent Street to Meagher Street and the local bicycle network west of the Precinct. |
| WC4 | There is limited bicycle parking at station entries, and no long-term storage or end of trip facilities | Any upgrades or development around Central Station should include provisions for public end-of-trip facilities across the Precinct, both for future workers, residents, and visitors to Central Precinct, and for commuters travelling to Central Station.<br>Future possible locations for end-of-trip facilities include Railway Square, around Mortuary Station, and underneath the Precinct with access from Devonshire Tunnel. |

### 3.8.2 Public Transport

The analysis and review of the existing public transport conditions and future infrastructure changes have identified a range of issues for people who travel through and interchange at Central Station each day. These are outlined in Table 3-5.

**Table 3-5 Identified issues and opportunities for public transport within and around Central Precinct**

| Ref | Identified Issues | Opportunities and future actions |
|---|---|---|
| PT1 | Current passenger demands add to train loading and unloading times, increasing wait times for trains during busy periods. | Increased frequency and capacity of services will be necessary to accommodate future train patronage growth. Service improvements are currently planned and being progressively rolled out by Transport for NSW as part of ongoing infrastructure upgrades. |
| PT2 | Access between regional and suburban platforms is poor, with interchanging customers walking long distances to reach their next service. | The introduction of Central Walk as the main east-west connection through the station provides a significant improvement to connectivity within the station. The expansion of this link to the west as part of Central Precinct will provide greater opportunity to access major land uses and developments around the Precinct. |
| PT3 | There is poor connectivity between the light rail stops and the bus interchange at Railway Square as well as to the suburban rail lines within Central Station.<br>It is also difficult to transfer between Inner West and CBD and Southeast Light Rail services at Central Station given the position of the light rail stops within the broader road network. | Future improvements within and around Central Station should consider improving connectivity between transport modes, including how passengers move between the different levels of Central Station.<br>Future planning should also support a potential expansion of the light rail network, as outlined in the Central Sydney Planning Strategy. |
| PT4 | Commuters waiting for bus services restrict pedestrian movements along footpath next to the bus stops, including along Eddy Avenue, and at the bus interchange at Railway Square. | There may be opportunities as part of Central Precinct to improve waiting areas for buses, by reallocating road space to support pedestrian activity. Public realm improvements should also include bus shelters, seating, information, or ticketing around the Precinct to optimise overall customer amenity. |
| PT5 | Bus and light rail services are often stopped at traffic lights for long periods of time resulting in increased journey time. | The future road network around Central Precinct should prioritise bus and light rail movements at intersections ahead of through traffic to support and maintain service frequency and reliability. |
| PT6 | The coach terminal at Central Precinct has poor integration with other transport modes and does not provide a clear waiting area for passengers transferring from other transport modes. | The renewal of Western Forecourt provides an opportunity to upgrade existing coach facilities to provide direct access for customers transferring from coach services to the suburban, metro and regional rail lines. |

### 3.8.3 Road Network

The analysis of the existing road network and traffic demands have identified both broader and localised issues that will need to be considered as part of Central Precinct. These are identified in Table 3-6.

**Table 3-6 Identified issues and opportunities for the road network around Central Precinct**

| Ref | Identified Issues | Opportunities and future actions |
|---|---|---|
| RN1 | High northbound traffic volumes on Pitt Street, Lee Street and along the Broadway/George Street corridor restricts pedestrian movements to and from the station.<br>These volumes are a barrier for pedestrians accessing Belmore Park and creates poor pedestrian amenity on Eddy Avenue Colonnade. | Changes to the broader Sydney road network, including the construction and opening of WestConnex, will change how people drive through the CBD, including around Central Precinct.<br>There may be opportunities as part of the renewal of Central Precinct to reallocate road space to provide more space for pedestrians and cyclists. Lee Street has been identified as one location where road reallocation could occur, as shown in Figure 3-19. |
| RN2 | Nearly half of all vehicles travelling along Eddy Avenue, Pitt Street and George Street are passing through the Precinct with business elsewhere, placing additional pressure on local roads. (Source: Strategic Traffic Forecasting Model).<br>High traffic volumes conflict with bicycle movements, impacting on the safety and attractiveness of cycling. | Road reconfiguration and the reallocation of road space to sustainable transport modes may help encourage through vehicle traffic to use alternative roads.<br>Space could be reallocated to cyclists along Regent Street, Lee Street and Eddy Avenue to enable separated facilities to be provided. |
| RN3 | Road safety issues and road crashes in the Precinct with an over representation of pedestrians and cyclists in crash data and high fatal and serious injury crashes. | There is an opportunity to investigate lowering the speed limit around Central Precinct to align with surrounding land uses and support a safe and integrated network. |

### 3.8.4 Parking, loading and site access

The analysis and review of existing parking, access and station operations have highlighted several issues that will need to be managed as activity around Central Precent, including ensuring Central Station continues to operate efficiently as a key transport interchange. These issues and opportunities are presented in Table 3-7.

**Table 3-7 Identified issues and opportunities for parking, loading and site access within and around Central Precinct**

| Ref | Identified Issues | Opportunities and future actions |
|---|---|---|
| PL1 | Existing vehicle and service access points are close to pedestrian access locations.<br>The existing deliveries and servicing of the station occur within the Western Forecourt, impacting amenity and conflicting with pedestrian desire lines. | Future access locations should consider how pedestrians move through the precinct, and be located away from key movement corridors. |

| Ref | Identified Issues | Opportunities and future actions |
|---|---|---|
| PL2 | There is limited kerbside space for kiss and ride – these activities are taking place in unsafe locations around the station, impacting traffic movement and pedestrian safety. | There will be opportunities to reposition kiss and ride locations around Central Precinct, so that both public transport users and surrounding land uses have access to safe and convenient point to point facilities. |
| PL3 | Rail infrastructure and other safety requirements may limit vehicle access above the rail corridor. | There is an opportunity to create a car-free precinct on the proposed deck, enhancing the urban realm and place as a result, by restricting access to emergency vehicles only. Autonomous vehicles could provide supporting accessible services from future collection nodes around Central Precinct. |
| | The freight task associated with the Precinct will grow as the area is developed, with more deliveries, building maintenance activities and waste collection to occur as well as during the construction phases. | There is an opportunity to provide an integrated delivery, distribution, and logistics hub as part of the renewal of the Precinct to consolidate 'last mile' deliveries and waste collection.<br>Such facilities should connect with the integrated logistics hub within Dexus Fraser and Atlassian basement to provide greater flexibility in managing delivery and service vehicle access across the Precinct. |
| | Security requirements will not allow loading and servicing arrangements around the Precinct to occur above or below rail infrastructure. This presents a challenge in servicing the proposed development above the station. | A series of sub-surface tunnels could provide access to future development above the station, connecting through to a centralised loading dock. This will allow for the movement of goods and waste away from the public realm. |

# 4. Proposed transport provisions

## 4.1 Modal hierarchy

The planning of the transport network within and around Central Precinct has been informed by a defined modal hierarchy (shown in Figure 4-1).

In the development of the Reference Master Plan, it was recognised that there is not enough space in the surrounding road network to accommodate all transport modes and their activities.

The modal hierarchy recognises that not all transport modes should be given equal priority when planning for the renewal of a precinct that is home to a major multimodal interchange. To effectively use space and accommodate transferring between different transport modes, priority should be given to the more sustainable and efficient modes of transport, such as walking, cycling, and road-based public transport.

Prioritising these modes above others supports mode shift from private cars, reduces congestion and improves safety around Central Precinct. The hierarchy is intended to guide the location and accessibility of facilities for different modes of transport in terms of their proximity to the station or stop entrance.

The transport initiatives proposed as part of the CPRP build on the proposed modal hierarchy, while ensuring that the station and broader precinct can operate efficiently and safely.

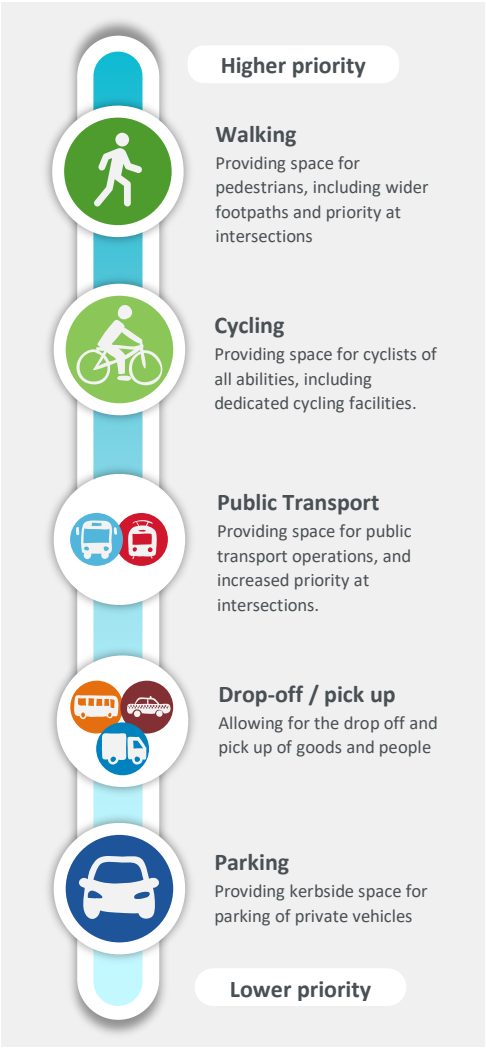



**Figure 4-1: Adopted modal hierarchy**

Source: *Central Precinct Renewal Program Integrated Transport Strategy*, Arcadis

## 4.2 Transport provisions

Central Precinct will be transformed into a world-class interchange that builds upon the significant investment being spent to upgrade and improve the safety, reliability, efficiency and integration of the Sydney transport network. The revitalisation will strengthen the arrival experience and significantly improve the way people move through and interchange between modes.

A summary of the key transport provisions proposed by the CPRP are outlined in Figure 4-2.

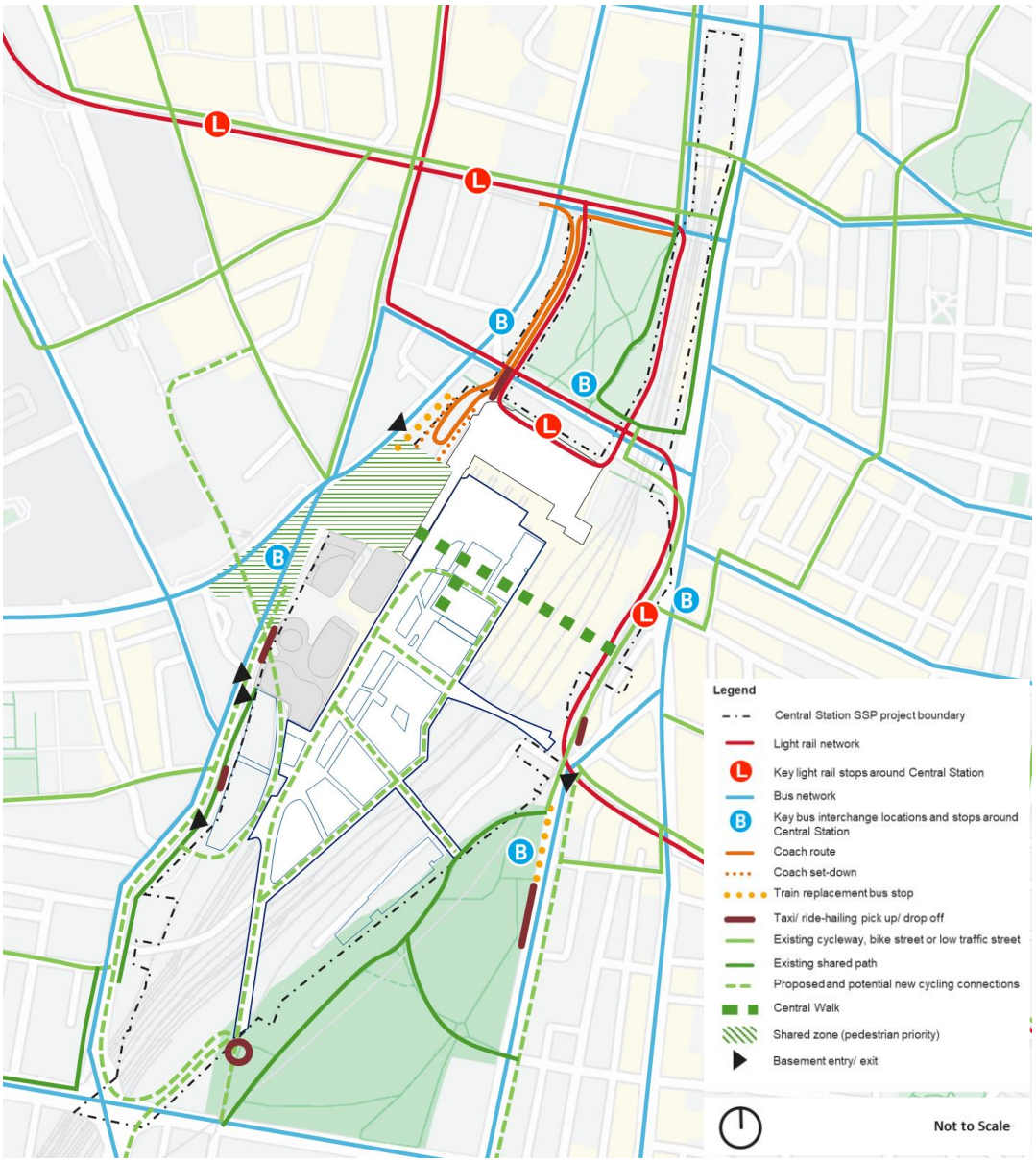



**Figure 4-2: Summary of proposed transport provisions**

### 4.2.1 Public transport changes

Within Central Precinct, connectivity between platforms and the broader precinct will be greatly improved through upgraded concourses and new accessways. The introduction of Central Walk as the main east-west connection through Central Precinct will improve connectivity within the station, providing direct access to the CSELR services on Chalmers Street, and to the major land uses and surrounding developments.

The realignment of the terminal building tracks and platforms allows for a significant increase in train services to the terminal building platforms. This enables additional regional and intercity services to be accommodated, as well as allowing for diversion of some suburban services to the terminal building.

Vertical connectivity within the station will also be improved through the addition of new stairs, escalators and lifts, allowing passengers to move within the station and transfer between modes and services with ease. New access to the deck above the rail corridor via the Grand Concourse provides direct access for regional, intercity and IWLR passengers to the new development. Additional connections to the proposed deck will be provided within Central Walk, allowing all other rail commuters to directly access the future development from the station.

Beyond Central Precinct, an upgraded bus layover facility will also be provided as part of the redevelopment of the existing Lee Street layover site, providing amenities for bus drivers and future electric bus provisions.

Coach access for pick up and drop off will still be accommodated for within the Western Forecourt and along Pitt Street, with the forecourt reconfigured to prioritise coach movements. The Reference Master Plan also considers the design of the Western Forecourt should coach operations be relocated away from Central Precinct, with the pedestrian realm expanded across the forecourt.

Both arrangements are shown in Figure 4 3 and Figure 4 4.

**Figure 4-3: Western Forecourt with coach terminus**

**Figure 4-4: Western Forecourt without the coach terminus**

### 4.2.2 Pedestrian movement and access

The CPRP proposes significant upgrades to the public realm around Central Precinct and new connections across the rail corridor. A 15 to 24-metre wide Central Avenue will provide the primary north-south corridor along the deck, providing a direct connection from the Terminal Building through the site, supporting adjacent open space and opportunities for pedestrians to dwell.

Three over-rail connections will provide for new east-west connections across the rail corridor, linking Devonshire Street with George Street as well as new connections to Prince Alfred Park. This will enhance access and circulation through Central Precinct, as well as provide pedestrian and bicycle connections across it to build a more integrated active movement network.

New vertical connections between street level, the colonnade and the deck will allow pedestrians to move with greater freedom across CPRP. The Goods line extension under George Street will be open to the public, allowing pedestrians to transition between Prince Alfred Park, through Mortuary Station and along the Goods Line towards Darling Harbour.

Central Walk is a new underground concourse that will aid access for passengers to trains, light-rail and the new Sydney Metro platforms. Central Walk will be approximately 19 metres wide and connect Chalmers Street to the east and Lee Street to the west. The eastern section of Central Walk, travelling under the suburban platforms between the Sydney Metro platforms and Chalmers Street, is currently being constructed as part of the Sydney Metro project. The western section (Central Walk West) will be constructed as part of Central Precinct, connecting the eastern section with a new tunnel under the regional rail platforms, and opening onto a new pedestrian plaza adjacent to Lee Street.

### 4.2.3 Cyclist facilities and access

The CPRP provides an opportunity to address connectivity and cyclist amenity issues around the station. The future cycling network will provide improved east-west connectivity across the rail corridor and strengthen north-south connections through Central Precinct to the surrounding areas.

The opening of the Goods Line tunnel enables shared pedestrian and cycling connections from the west towards Mortuary station, and across to Prince Alfred Park. A new link is also being considered along the rail corridor, connecting Redfern to Central Precinct along the rail corridor up to Prince Alfred Sidings. From here, cyclists will be able to travel across the deck to the east and north, or through Prince Alfred Park towards Surry Hills.

End of trip facilities for cyclists will be provided across the CPRP, including at:

- Railway Square
- Around Mortuary Station
- Prince Alfred Park
- Underneath the Precinct with access from Devonshire Tunnel.

Visitor and short-term bicycle parking will also be provided at station entrances and on the deck.

### 4.2.4 Vehicle access and parking

The provision of space to support point-to-point transport is key to providing a safe integrated, multimodal transport hub within the CPRP. The demand for point-to-point facilities is expected to increase around Central Precinct as renewal occurs.

Drop-off and pick up facilities will be provided across the CPRP near key entrances and pedestrian access points, including:

- Along the colonnade ramp on the approach to the Western Forecourt coach terminal
- On the eastern side of Central Precinct around Chalmers Street
- On Pitt Street adjacent to the terminal building
- Towards the southern end of the over station development around Mortuary Station.

A new connection into Prince Alfred Park from Cleveland Street will also provide drop-off and pick up facilities, with an autonomous vehicle shuttle service providing the last-mile connection from this stop, across the railway corridor and onto the deck. This connection will also provide access for emergency vehicles, with additional connections from Lee Street and Regent Street west of the Precinct boundary.

The CPRP will also encourage car-sharing and electric vehicle use, through supporting on-street spaces for these vehicle types, and allocating car spaces within private development to these vehicle types. The broader provision of public and private parking will be discouraged, in reflection of Central Precinct's inner-city location and the availability and accessibility of alternative transport choices.

### 4.2.5 Deliveries and servicing

To accommodate delivery and servicing task for precinct, a series of integrated loading and distribution facilities will be provided as part of Central Precinct to consolidate 'last mile' deliveries and waste collection.

Integrated loading facilities will be provided:

- Underneath the Western Forecourt, with a connection onto Pitt Street
- Underneath the Grand Concourse of the Central Station's terminal building, connecting through to the Western Forecourt facility and out onto Pitt Street
- As part of the Regent Street Sidings development
- As part of the Prince Alfred Sidings development

Future development on the proposed deck above the rail corridor will be serviced through a tunnel network below, connecting the Western Forecourt /Terminal Building and Regent Street Siding facilities. This enables the movement of goods and waste to occur away from the public realm and reduce unexpected interaction between pedestrians and vehicles.

There will also be opportunities to connect the Western Forecourt and Regent Street Sidings loading facilities through to an integrated logistics hub with the Dexus Fraser and Atlassian basements. This will enable greater flexibility and allow for a holistic approach in managing delivery and service vehicle access across Central Precinct.

### 4.2.6 Road network changes

No changes are proposed to the road network surrounding Central Precinct as part of the SSP process. Longer term, there may be opportunities to further enhance the road network to provide a greater balance between the movement of people and goods and creating spaces for people. These opportunities will be further explored in following sections.

# 5. Transport assessment

## 5.1 Assessment overview

This chapter presents the transport assessment of Central Precinct. The forecast additional demands on the transport network have been quantified and the impacts to all transport modes has been assessed. Mitigation measures have been proposed where required to maximise the safety and efficiency of all road and public transport users.

As previously mentioned in this report, COVID-19 has substantially impacted the existing and future demands on the transport network and the travel patterns of people across the Sydney CBD. Transport for NSW is working through revised forecasts to account for these substantial changes in the way people travel now and are likely to travel in the future given the needs of customers. These revised forecasts, known as 'Project Phoenix' forecasts, are likely to be released by Transport for NSW later in 2022 and are better representative of the future of travel on the transport system.

Detailed transport and pedestrian models have been developed to fully assess the impact of the development of Central Precinct to support the SSP. However, the revised demand forecasts are not ready to be input into these models until they are released by Transport for NSW. Therefore, this version of the report includes a high-level transport assessment to support the SSP, with the more detailed modelling and analyses to be included in the next iteration of this report, with the latest and better representative travel demands. This high-level assessment is based on the existing operation of the transport system, an in-depth appreciation of the current opportunities and constraints and the analysis of the quantum of travel that is likely to be generated by the proposed SSP.

Scoping meetings were held with Transport for NSW and City of Sydney to confirm study area, extent and methodology of this assessment on 25 October 2021 and 4 May 2022. In line with the SSP study requirements (identified in Section 2), a 'Vision and Validate' approach has been adopted for this assessment, drawing on an understanding of the aspirations of Central Precinct and what can be done to achieve it.

The vision and the mode share scenarios identified to support this vision have been assessed through the following components:

- Trip mode share targets and validation – as described in Section 5.2
- Development trip generation assessment – as described in Section 5.3
- Pedestrian network and movement assessment – as described in Section 5.4
- Cycling impact assessment– as described in Section 5.5
- Public transport capacity assessment – as described in Section 5.6
- Road network performance assessment – as described in Section 5.7
- Access and parking assessment – as described in Section 5.8
- Safety assessment – as described in Section 5.9
- Movement and place analysis – as described in Section 5.10
- Cumulative impact assessment – as described in Section 5.11.

### 5.1.1 Assessment overview

Transport modelling of Central Precinct has been completed to understand the potential impacts and support the development of infrastructure plans, renewal initiatives and provide key stakeholders with an understanding of the future operation and performance for all transport modes.

The modelling aims to make best use of available pedestrian, traffic and public transport data and modelling software to determine base and future conditions for the project and surrounding area. These conditions were then used to assess the operational performance of the network to understand the resultant impacts created by the future development within the Central Precinct and the surrounding area

An overview of the modelling approach is presented in Figure 5-1.

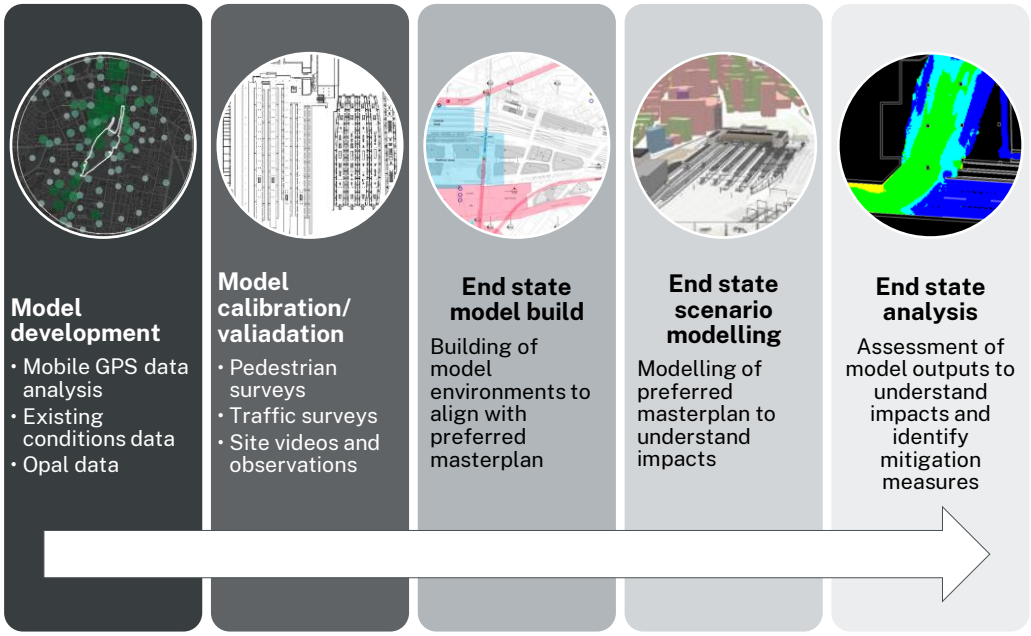



**Figure 5-1: Dynamic modelling overview**

Three levels of transport modelling will be undertaken for the assessment of Central Precinct, namely:

- Internal Station Pedestrian Model, which focuses on pedestrian activity within the rail station
- External Pedestrian-only Model, which considers pedestrian activity within the Over Station Development (OSD)
- Precinct Transport Model, which focuses on all transport models within Central Precinct, but external to the rail station and the future over station development. This model will interface with both pedestrian models.

Figure 5-2 demonstrates how the three models overlap and interact. A summary of the transport models developed for the assessment of Central Precinct are summarised in subsequent sections.

*Precinct transport model*

A multi-modal micro-simulation transport model for the area surrounding Central Precinct is being developed to understand the impacts of Central Precinct on the surrounding road network.

The Precinct Transport Model covers a region broadly defined by the following roads:

- Eddy Avenue to the north
- Regent Street and George Street to the west
- Cleveland Road to the south
- Elizabeth Street and Chalmers Street to the east.

The base year model has been calibrated and validated to weekday commuter peak periods, providing a sound tool which will be used to assess the cumulative transport impacts of known developments, and proposed infrastructure plans and concepts.

This model will be updated to consider the revised demand forecasts currently being prepared by Transport for NSW. The results and detailed analyses from this update will be next iteration of this report, to ensure the implications of the rezoning on the transport network are understood in context of the better representative travel demands.


**Figure 5-2: Investigation area**

*Internal station model*

A pedestrian model was developed in Legion to understand the impact of Central Precinct on pedestrian flows and activity within the station. The internal station model been calibrated and validated to weekday peak periods using intersection counts, travel time surveys, and origin-destination data provided by Place Intelligence (as outlined in Section 3.2.3).

The purpose of the internal station model is to understand and assess the impact of future development associated with the Central Precinct, as well as understand the impact of future internal reconfigurations to improve commuter and passenger access within the station.

The internal model encompasses all publicly accessible areas within the station, with each station entrance acting as a direct interface between the external precinct and over station models.

This model will also be updated to consider the revised demand forecasts currently being prepared by Transport for NSW. The results and detailed analyses from this update will be next iteration of this report.

*Over station model*

PTV Viswalk software was used in producing a pedestrian model of the over station development at Central Station, for the weekday commuter peak periods in the future year 2036.

The purpose of the over station model is to understand and assess the impact of future movements associated with the proposed buildings on the proposed deck, which would have commercial, community and retail uses. Elements assessed include walkways across the deck and new vertical transport connections to the station and street level. The model covers the extent of the proposed deck over the railway lines, assessing the movements between the buildings, the station and the street level to the east and west.

This model will also be updated to consider the revised demand forecasts currently being prepared by Transport for NSW. The results and detailed analyses from this update will be next iteration of this report.

### 5.1.2 Pedestrian, public transport and vehicle demand data

As noted in Section 4.2.1, the COVID-19 pandemic has substantially altered and reduced travel demand across Australia. This impacted traffic and pedestrian data collection activities that would have previously been used to build, calibrate and validate transport models prepared for an assessment of the CPRP. The pandemic also stopped migration, especially international migration, which has been the main driver of population growth in Sydney for decades. Consequently, future growth patterns have changed fundamentally from pre- COVID expectations.

To ensure the prepared models are robust and reflective of current travel patterns, a range of transport data was sourced and collected for the precinct as part of the calibration and validation process. This data included:

- Pedestrian survey data (2019)
- Pedestrian origin-destination data (2019)
- Public transport patronage and interchanging movements (2019)
- Historical classified intersection counts (2017 to 2019)
- Traffic surveys (2021) – classified intersection counts, queue length surveys and travel time data
- SCATS volume data, 2019 and 2021
- Automatic tube counts (2019)
- Vehicle travel time and speed data (2019, 2021)
- Public transport stop scheduling data (2021).

### 5.1.3 Key assumptions

The following assumptions were adopted in undertaking the transport impact assessment:

- Light rail services along Chalmers Street begin operations from December 2019, with demands in 2026 aligning with forecasted volumes identified in the Stop Access and Design Plan: Zone S - Surry Hills report (2018) prepared for the Sydney Light Rail project
- Precinct development assumptions:
    - Atlassian, Toga and Dexus Fraser developments within the Western Forecourt are completed and occupied by 2026
    - The Terminal Building redevelopment is completed and occupied/ operational by 2036
    - Central Walk West will be completed and operational by 2036
    - The proposed over station/ deck developments, Lee Street Siding developments and Prince Alfred Siding developments are completed and operational by 2036
- The person trip generation rates for the development within Central Precinct have been taken from the TRICS trip generation database, based similar land uses and locational characteristics
- The development floor area, and associated land use breakdown, assessed for the trip generation has been taken from the reference master plan land use schedule dated 28 August 2019
- For the AM peak period, inbound pedestrian trip distribution has been based on the distribution of population data for relevant travel zone catchments around Central Precinct. Outbound trips have used the distribution of employment and student demands for the same catchments
- An annual growth rate of three per cent has been applied to both light rail and bus trips for the 2036 future year periods
- Train trips for each of the future years have been taken from the internal station matrices, to ensure interactions between the two sets of matrices align.

## 5.2 Target mode share and validation

### 5.2.1 Overview

Travel mode share is an important part in understanding how future workers and residents are expected to travel to and from Central Precinct. The ABS census data provides insight into existing travel patterns and how transport infrastructure and service availability support the adoption of one mode over others.

For the future state mode share, mode share targets are often adopted to drive policy decisions and actions, so that future travel patterns reflect the desired vision and aspirations of the precinct. However, it is important that the development and selection of these targets are grounded and reflective of the characteristics and planned infrastructure for the area. Without this, the resulting assessment and any mitigation measures identified may not be a true reflection of the future state and limit the overall potential of the precinct.

For the assessment of Central Precinct as part of the dynamic modelling, the target mode share governs how trips and demands are allocated, influencing route selection and the resultant design requirements for pedestrian movement corridors and vertical transport. The target mode share also influences the planning provisions for different transport modes such as vehicles and bicycle parking, and at a broader level, directly impacts on the precinct's ability to deliver on the desired objectives and outcomes of Central Precinct.

In consideration of this, the development of the mode share targets reflects a 'Vision and Validate' approach which looks to manage changing land use and transport demand in line with the vision and aspirations of Central Precinct.

The final mode share adopted for Central Precinct will be used in the assessment to inform the mode share distributions for the future development travel demand forecasts within in the dynamic modelling and allow identification of initiatives and strategies that support the adopted target.

### 5.2.2 Benchmarking

Understanding travel patterns of areas with similar density and transport availability is a useful tool in determining drivers of transport mode choice. The development of mode share targets for the CPRP draws on this benchmarking, which has been used to identify key parameters and requirements needed to drive behaviour change.

Noting the size, scale and availability of public and active transport within Central Precinct is hard to replicate at the neighbourhood level, the benchmarking analysis considered ABS Level 2 Statistical Area (SA2) datasets that held similar location, urban form, transport infrastructure and services, and density to that of Central Precinct. The areas analysed include:

- **Sydney CBD:** represents the SA2 'Sydney - Haymarket - The Rocks' area, located to the north of Central Precinct. The Sydney CBD forms part of the broader statistical area in which Central Precinct is located.
- **Pyrmont – Ultimo:** represents the SA2 of the same name located west of Central Precinct. The Pyrmont – Ultimo area forms the second part of the broader statistical area in which Central Precinct is located, and is earmarked to undergo significant urban regeneration.
- **Redfern – Chippendale** represents the SA2 of the same name located south west of Central Precinct. The area includes the suburbs of Chippendale, Everleigh and Redfern, and encompasses both Redfern Station and the Redfern North Eveleigh Renewal Precinct.
- **Melbourne CBD:** represents the SA2 'Melbourne' area in Victoria, which broadly encompasses the Melbourne CBD and extends from Spencer Street to the west, along Yarra River to the south, Spring Street to the east and Victoria Street to the north.
- **Docklands:** represents the SA2 'Docklands' area, located west of Melbourne in Victoria and extends from Spencer Street along the Melbourne CBD's western boundary to the Yarra River and Moonee Ponds Creek.

The assessment of these areas considered the available residential, employment and 'Journey to Work' mode share data at the ABS Statistical Area 2 level. Due to limitations with the dataset, a finer-grained assessment was not able to be completed.

*Public transport availability*

Table 5-1 provides a comparison of the current and planned public transport infrastructure and services between Central Precinct and the five identified SA2 areas. This demonstrates that Central Precinct will experience public transport and connectivity comparable to the Sydney and Melbourne CBDs, which currently have best accessibility to public transport. Docklands is the only area not to be serviced by more than 20 bus routes or by future Metro services, however, the area is well serviced by Light Rail, providing a comparable provision of public transport services.

**Table 5-1: Comparison of available public transport infrastructure**

| Area | Available Public Transport Infrastructure | | |
|---|---|---|---|
| | Train/ metro | Light rail | Buses |
| Central Precinct | 1 train station<br>1 future metro station<br>12 suburban and 3 regional lines | 5 stops<br>3 routes | >20 routes |
| Sydney CBD | 6 train stations<br>5 future metro stations<br>12 suburban and 3 regional lines | 15 stops<br>3 routes | >20 routes |
| Pyrmont - Ultimo | 1 future metro station | 7 stops<br>3 routes | >20 routes |
| Redfern - Chippendale | 1 train station<br>1 future metro station<br>12 suburban and 3 regional lines | N/A | >20 routes |
| Melbourne CBD | 4 train stations<br>2 future metro stations<br>16 suburban and 5 regional train lines | > 20 Stops<br>> 20 routes | >20 routes |
| Docklands | 1 train station<br>16 suburban and 5 regional train lines | 19 stops<br>6 routes | 6 routes |

*Population and jobs density*

Population and employment density are also drivers of sustainable transport mode share. Table 5-2 provides a comparison of population and jobs density between Central Precinct and the five identified SA2 areas. Central Precinct is expected to have a similar population density to the Redfern-Chippendale SA2 area (133 persons per hectare and 127 persons per hectare, respectively). Sydney CBD and Melbourne CBD record the lowest density (77 persons per hectare and 65 persons per hectare, respectively), which is over 42 per cent less than the planned Central Precinct area. Melbourne CBD has the highest employment density across all study areas (224 persons per hectare).

Considering job density, Central Precinct is expected to have a far greater job density than the assessed study areas, with 1,420 jobs per hectare expected across the precinct. This is more than 10 times the job density within the Sydney CBD (132 jobs per hectare), and seven times the next highest area in Docklands (201 jobs per hectare).

**Table 5-2: Comparison of population and jobs density**

| Area | Size (ha) | Estimated Residential Population (2020) | Population density (persons / ha) | Jobs (2018) | Job density (persons / ha) |
|---|---|---|---|---|---|
| Central Precinct1 | 24 | 3,200 | 134 | 13,333 | 1,432 |
| Sydney CBD | 429 | 33,238 | 77 | 56,759 | 132 |
| Pyrmont – Ultimo | 149 | 24,661 | 165 | 26,759 | 179 |
| Redfern – Chippendale | 216 | 27,363 | 127 | 26,044 | 120 |
| Melbourne CBD | 237 | 53 180 | 224 | 47,569 | 201 |
| Docklands | 244 | 15,803 | 65 | 14,803 | 61 |

1 Taken from Central Renewal Precinct Population and Demographics Preliminary Projections prepared by SGS Economics and Planning (May 2021)

### *Journey to Work trends*

Table 5-3 compares the ABS 2016 Census 'Journey to Work' mode share from the across six main transport modes between the five identified SA2 areas for commuters travelling into the area. This suggests that trains and metro services account for around 55 per cent of commuter trips into the Sydney CBD, Melbourne CBD, and the Docklands SA2 area across Sydney/ Melbourne/ Docklands. Active transport had a slightly higher share outside of the CBD areas, accounting for over 11.6 per cent of trips into the Pyrmont-Ultimo and Redfern-Chippendale areas. These areas also had a higher car trip (including driver, passenger and rideshare trips) mode share, accounting for over a third of all commuter trips.

For the Sydney CBD, which encompasses a portion of Central Precinct, sustainable transport modes accounted for 84 per cent of all trips into SA2 area.

A comparison of distances travelled to work across each of the identified SA2 areas is provided in Table 5-4. The Pyrmont – Ultimo and Redfern – Chippendale SA2 areas have a comparatively high proportion of commuter trips within 2.5 kilometres (10 per cent and 12 per cent, respectively), which may reflect the higher population and job density observed in both areas. Most trips across all areas (92 per cent or higher) are under 50 kilometres in length, suggesting the broader employment catchment falls within the metropolitan area.

**Table 5-3: Comparison of journey to work trends (place of employment)**

| Area | Mode Share | | | | | |
|---|---|---|---|---|---|---|
| | Walking | Cycling | Train/ Metro | Light Rail | Buses | Car |
| Sydney CBD | 6.2% | 1.4% | 55.0% | 0.4% | 21.2% | 15.8% |
| Pyrmont – Ultimo | 9.1% | 2.5% | 36.1% | 3.4% | 14.2% | 34.7% |
| Redfern – Chippendale | 9.6% | 2.9% | 42.7% | 0.1% | 7.5% | 37.1% |
| Melbourne CBD | 5.7% | 3.2% | 54.3% | 12.3% | 2.8% | 21.7% |
| Docklands | 4.8% | 3.3% | 55.1% | 7.7% | 1.2% | 27.9% |

Note: car mode share includes private vehicle trips as the driver, private vehicle trips as the passenger, and point to point trips

**Table 5-4: Comparison of distances travelled to work**

| Area | Distance travelled to work | | | | |
|---|---|---|---|---|---|
| | 0 to 2.5 km | 2.5 to 10 km | 10 to 30 km | 30 to 50 km | 50 km+ |
| Sydney CBD | 5% | 34% | 43% | 11% | 7% |
| Pyrmont - Ultimo | 10% | 36% | 39% | 10% | 6% |
| Redfern - Chippendale | 12% | 34% | 35% | 10% | 8% |
| Melbourne CBD | 7% | 31% | 46% | 12% | 5% |
| Docklands | 6% | 25% | 49% | 14% | 6% |

### Journey from Home trends

Table 5-5 compares the ABS 2016 Census 'Journey to Work' mode share from the across six main transport modes between the five identified SA2 areas for residents within each area. In the Sydney CBD, walking is the predominate travel mode for residents, accounting for 47 per cent of resident trips, with similar levels experienced in both the Melbourne CBD (42 per cent) and the Pyrmont – Ultimo (43 per cent) SA2 areas. Outside of the city CBD areas, car usage is higher with Pyrmont – Ultimo, Redfern – Chippendale and Docklands comprising of over 24 per cent of all trips (which includes driver, passenger and rideshare trips).

For the Sydney CBD, which encompasses a portion of Central Precinct, sustainable transport modes accounted for 86 per cent of all trips from the SA2 area.

A comparison of distances travelled to work from the place of residence within each of the identified SA2 areas is provided in Table 5-6. Notably, all areas have a high proportion (81 per cent or greater) of work locations within 10 kilometres of their residence, which may reflect the higher job density across these areas. Most trips across all areas (97 per cent or higher) are under 50 kilometres in length, suggesting the broader employment catchment falls within the metropolitan area.

**Table 5-5: Comparison of journey to work trends (place of residence)**

| Area | Mode Share | | | | | |
|---|---|---|---|---|---|---|
| | Walking | Cycling | Train/ Metro | Light Rail | Buses | Car |
| Sydney CBD | 47.4% | 0.8% | 24.7% | 0.9% | 12.6% | 13.6% |
| Pyrmont – Ultimo | 42.8% | 2.1% | 13.8% | 2.1% | 13.4% | 25.8% |
| Redfern – Chippendale | 24.1% | 5.2% | 32.0% | 0.4% | 13.8% | 24.5% |
| Melbourne CBD | 41.6% | 1.6% | 14.6% | 28.3% | 2.1% | 11.8% |
| Docklands | 28.1% | 1.4% | 7.7% | 32.8% | 0.9% | 29.2% |

Note: car mode share includes private vehicle trips as the driver, private vehicle trips as the passenger, and point to point trips

**Table 5-6: Comparison of distances travelled to work (place of residence)**

| Area | Distance travelled to work | | | | |
|---|---|---|---|---|---|
| | 0 to 2.5 km | 2.5 to 10 km | 10 to 30 km | 30 to 50 km | 50 km+ |
| Sydney CBD | 60% | 22% | 13% | 2% | 3% |
| Pyrmont - Ultimo | 47% | 36% | 13% | 2% | 2% |
| Redfern - Chippendale | 32% | 52% | 13% | 2% | 1% |
| Melbourne CBD | 65% | 21% | 10% | 1% | 2% |
| Docklands | 47% | 34% | 14% | 2% | 2% |

### 5.2.3 Strategic enablers

In recognition of the 'Vision and Validate' approach to transport planning and infrastructure provision for the CPRP, the development of the target mode share for the precinct will also need to consider the broader aspiration of the precinct, and the strategic enablers that will be in place across the precinct. Three key enablers have been identified that will integrate transport and land use outcomes to support the delivery of the CPRP, and include:

- **SSP Statutory Framework and Design Guidelines**, which set out the precinct planning principles, objectives and performance outcomes for the CPRP through the application of controls and guidelines.
- **Travel demand management strategies and action plans** for the CPRP that support and encourage a mode shift to sustainable transport, discourage car trips for those who have alternative options and reduce the need for long-distance travel.

- **Upgraded transport infrastructure and new services** – a range of transport infrastructure projects and service improvements that facilitate a broad-reaching and effective multi-modal transport network. These projects have been identified in *Future Transport 2056* and supporting plans and strategies as necessary to increase sustainable transport mode shares across Greater Sydney, and include:
    - safe, efficient and reliable light rail and bus services, with frequencies, access and capacities responding to customer demand
    - an extensive, dedicated bicycle network with separated bicycle facilities built on all key roads and streets, to support the needs of cyclists from confident commuters through to occasional recreational riders
    - an expanded Sydney Metro network, including the extension of Sydney Metro West to Malabar/ La Perouse providing fast and reliable transit between the Harbour CBD and the southeast, with connections to services travelling to Central Precinct
    - provision of on-demand transport services, support for autonomous vehicles and the provision of public infrastructure which caters for private non-combustion modes of transport such as electric vehicles and electric bicycles.

These strategic enablers are critical in providing a fine-grained network of transport infrastructure and services to support the aspirations of the CPRP. To encourage a shift towards sustainable transport and create a balanced transport mode share, an integrated, multi-modal network with dedicated walking and bicycle facilities, and provide for connections between train, metro, light rail, and bus services is required.

### 5.2.4 Mode share scenarios

Three potential mode share scenarios have been identified to support the CPRP vision and principles, as summarised in Figure 5-3.

*Scenario 1: Business as usual*

The Business as Usual (BAU) approach assumes there is no significant change to existing travel patterns (as identified in Section 4.2.2), with the mode share generally reflecting 2016 behaviours. There would be limited investment in active transport networks under this scenario; while walking remains popular for local trips, cycling infrastructure within and around Central Precinct remains disconnected with minimal end-of-trip facilities available.

Rail would continue to be the predominant mode, with some existing suburban train commuter trips redistributing to the new Metro station at Central Precinct. There would also be some redistribution of trips between light rail and bus services to reflect the opening of the CBD and South East Light Rail (CSELR) services. There would be limited expansion of bus and light rail services under this scenario, and private vehicle usage (18 per cent) and ride share (one per cent) would remain constant.

The BAU scenario assumes that no additional transport initiatives have been completed except for the following committed and/ or underway projects:

- CBD and South East Light Rail
- More Trains More Services program to increase rail network capacity (in peak periods) on the T8 and T4 Lines
- Sydney Metro City and Southwest
- Sydney Metro West (to Eastern Harbour City CBD).

*Scenario 2: Sustainable transport promoted*

The 'Sustainable Transport Promoted' (STP) scenario redistributes 10 per cent of the private vehicle trips to active and public transport modes. Under this approach, local walking and cycling trips would grow through increased investment in the active transport network around Central Precinct, supported by green travel behaviour programs.

Increased bus and light rail services to Sydney's southeast has improved connectivity between the precinct, Moore Park and Coogee, supporting the shift from private vehicles. The opening of the CSELR services has also seen the redistribution of some trips between light rail and bus along these corridors. Rail demand is also expected to increase due to the new metro connection at Central Precinct, supporting the redistribution of some private vehicle trips and suburban rail trips to the new services. Private vehicles would account for nine per cent of all commuter trips, with ride share demand remaining constant at one per cent.

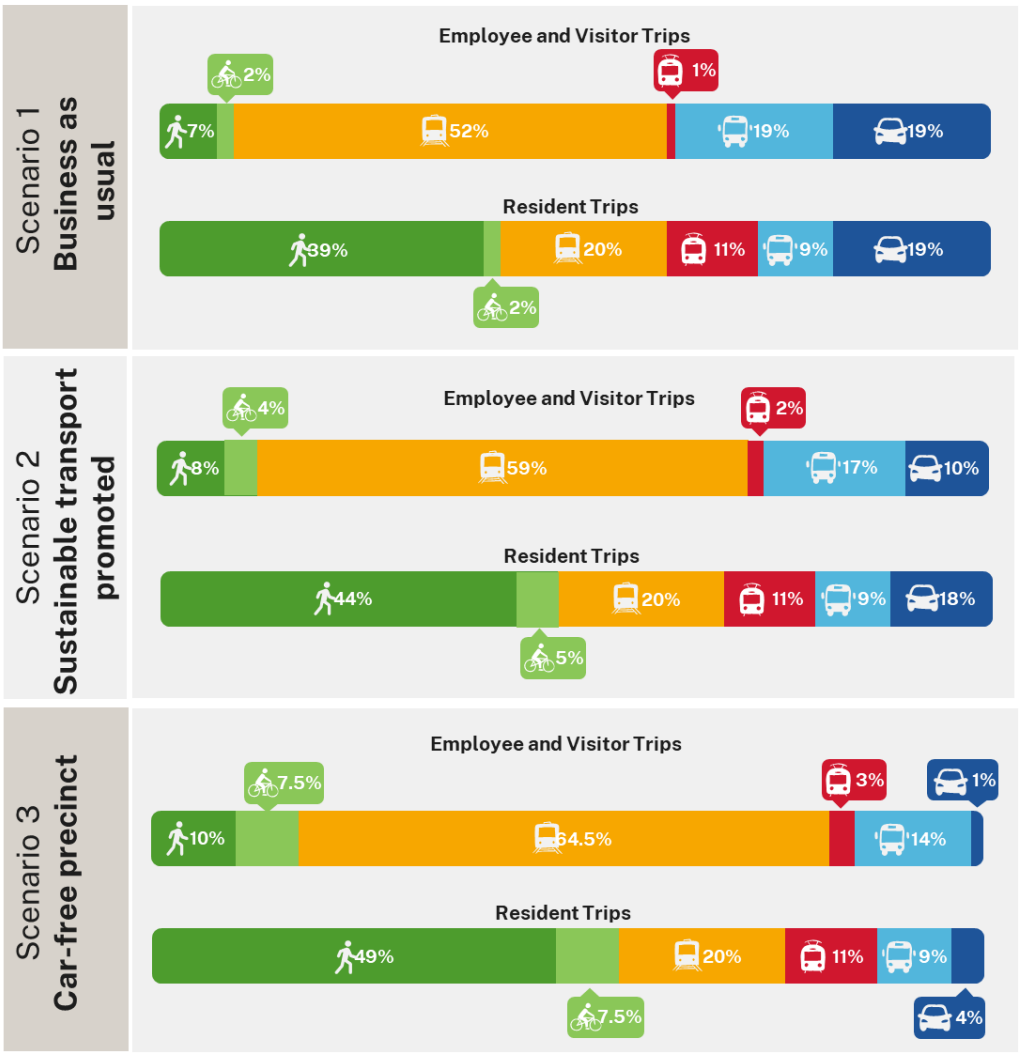



**Figure 5-3: Central Precinct future mode share target scenarios**

The STP scenario assumes that the following transport initiatives have been completed and/ or in operation:

- CSELR
- More Trains More Services program to increase rail network capacity (in peak periods) on the T8 and T4 Lines
- Sydney Metro City and Southwest
- Sydney Metro West (to Eastern Harbour City CBD)
- New rapid bus lines linking strategic centres, employment hubs and the Harbour CBD, including Railway Square to Sutherland Hospital (via Princes Highway) and Harbour CBD to La Perouse (via Green Square and Eastgardens)
- The delivery of the Principal Bicycle Network (PBN) within South East Sydney, a co-designed network linking local centres and strategic centres across Greater Sydney and Central Precinct
- Prioritising pedestrian crossing movements along streets with a high place function by allocating more time, more often to pedestrians and implementing continuous footpath treatments.

*Scenario 3: Car-free precinct*

The Car-Free Precinct (CFP) scenario represents a significant mode-share shift for trips to and from the precinct, with all private vehicle trips redistributed to other modes. Significant investment in active transport networks, reductions in road traffic volumes and speeds, and supporting travel behaviour programs and policies support a high walking and cycling mode share from surrounding precincts, drawing residents to activity and employment.

Further investment in public transport enables the expansion of the bus and light rail network, with on-road public transport given higher priority. New metro lines across Greater Sydney increase the rail catchment, supporting a broader shift away from private vehicles. Across the precinct, an increase in point-to-point and car-share provisions support an increase in ride share activity to two per cent of all trips.

The CFP scenario assumes that the following transport initiatives have been completed and/ or in operation:

- CSELR
- More Trains More Services program to increase rail network capacity (in peak periods) on the T8 and T4 Lines
- Sydney Metro City and Southwest
- Sydney Metro West (to Eastern Harbour City CBD and extended to Malabar/ La Perouse)
- New rapid bus lines linking strategic centres, employment hubs and the Harbour CBD, including Railway Square to Sutherland Hospital (via Princes Highway) and Harbour CBD to La Perouse (via Green Square and Eastgardens)
- The delivery of the Principal Bicycle Network (PBN) within South East Sydney, a co-designed network linking local centres and strategic centres across Greater Sydney and Central Precinct
- Additional point-to-point and car share parking across Central Precinct
- Prioritising pedestrian crossing movements along streets with a high place function by allocating more time, more often to pedestrians and implementing continuous footpath treatments.

### 5.2.5 Mode share scenario assessment

When comparing the availability of public transport infrastructure across the similar urban areas, Central Precinct has access to CBD scale transport provisions across a much smaller area. The precinct has greater accessibility to public transport than the neighbouring areas of Pyrmont-Ultimo and Redfern-Chippendale, with equal or greater number of routes, services and stops across train, light rail and bus modes.

In terms of population and job density, Central Precinct will have a similar population density to Pyrmont-Ultimo and Redfern-Chippendale (134 persons per hectare), which is nearly double that of the Sydney CBD. However, Central Precinct has a much higher concentration of jobs than any of the assessed areas, with 1,432 jobs per hectare expected.

Journey to work trends highlight the attractiveness of rail when travelling into the city, with over half of all commuter trips into the Sydney CBD, Melbourne CBD and Docklands occurring via train and/ or metro services. This is likely to increase the availability and coverage of the rail network. Further out of the city centre, Pyrmont-Ultimo and Redfern-Chippendale experience higher walking and cycling activity. These areas also experience a greater proportion of commuter trips under 2.5 kilometres in comparison to the city, suggesting a higher likelihood of residing closer to work.

For the CPRP, the data suggests a BAU scenario is unlikely to be realistic. Central Precinct has a far greater availability and access to public transport, and its location to south of the Sydney CBD would support a higher active mode in comparison to the broader area. The high density of the Precinct would also increase the attractiveness of walking and cycling as opposed to private vehicle travel, with traffic congestion and parking availability impacting on vehicle travel time. Furthermore, in the absence of changes to travel patterns, Central Precinct and the broader Sydney CBD would be unable to realistically expand road capacity to meet future car-orientated travel demands.

Both STP and CFP scenarios reflect a higher proportion of active and public transport commuter trips that would be supported by the current characteristics of Central Precinct. The STP scenario is an achievable target due to the location, access to train, bus and light rail services, and the expected investment in walking and cycling infrastructure supporting the shift in travel behaviour.

However, for a project the scale and density of the CPRP, even a small proportion of private vehicle trips may lead to increased road congestion and reduced accessibility and amenity for residents, workers and visitors. Given the sustainability and transport aspirations of the project, the STP scenario is likely better suited to a smaller scaled development.

The CFP scenario represents an ambitious target that requires significant change to culture and travel patterns. The underlying characteristics and supporting infrastructure provide a sound base to shift travel behaviour towards sustainable transport modes.

### 5.2.6 Adopted target mode share

The above analysis indicates:

- The concentration of public transport services, population and jobs within Central Precinct is very high in comparison to neighbouring areas and other CBD type locations. Consequently, sustainable transport modes are likely to be more attractive than the mode share distribution identified in **Scenario 1: Business as Usual**. This suggests BAU will not be reflective of likely travel patterns based on existing conditions and planned infrastructure improvements

- **Scenario 2: Sustainable Transport Promoted** is achievable and reflects the increased attractiveness of sustainable transport to the area. While the modal shift identified in this approach might be appropriate for smaller developments, the scale of activity introduced by the CPRP may conflict with the vision and aspirations of the precinct
- **Scenario 3: Car-Free Precinct** may be an ambitious target; however, this approach would enable the realisation of the vision and aspirations of the Central Precinct project. The underlying characteristics of the precinct and expected infrastructure investment could support the desired mode shift with supporting travel behaviour programs and interventions.

It is recommended that the Car-Free Precinct (CFP) mode share target be adopted for the CPRP, as shown in Figure 5.4. These targets inform the mode share distributions used in the CPRP future development travel demand forecasts.

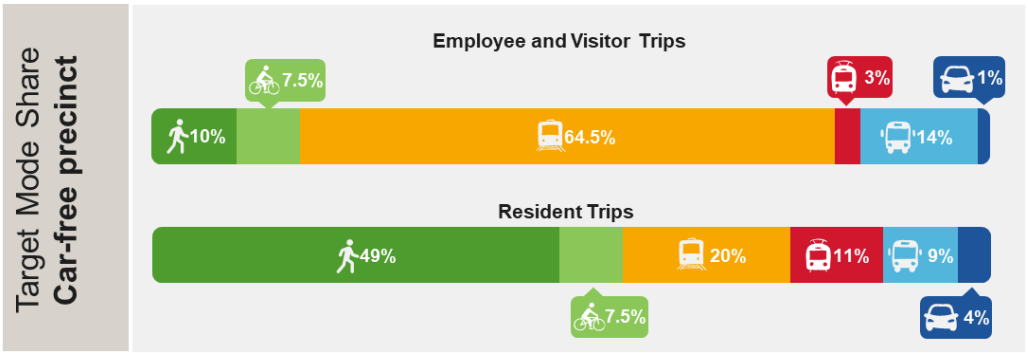



**Figure 5-4: CPRP future mode share targets**

The target mode share is supported by the broader road capacity constraints and spatial constraints around Central Precinct and across the Sydney, In the absence of a wider shift in travel patterns, the precinct and the Sydney CBD would not be able to increase road space to accommodate vehicle demands as they are today.

The adoption of the CFP as a mode share target ensures that non-car-based transport is considered and assessed at the appropriate level in recognition of these capacity constraints.

## 5.3 Demand and trip generation assessment

### 5.3.1 Overview

There are many facets of trip demand across the precinct, including transfers between transport modes, pedestrian and vehicle movements to and from the station, and non-Central Precinct related pedestrian and vehicle movements. In order to understand the complex interactions between public transport services, pedestrians, cyclists and private vehicles, detailed trip matrices were prepared for 2019 in both the AM and PM peak hour periods to determine the scale and direction of movement between each mode.

The development of the 2019 matrices used:

- An assessment of trip origins and destinations travelling through Central Precinct for 2019, completed by data analysts, Place Intelligence
- Opal data for train, bus and light rail movements, including transfer demands between each mode
- Traffic surveys and SCATS data
- Boarding and alighting data for bus travel
- Bus operation data.

To understand the impact of the CPRP, a series of 2036 matrices were prepared using the 2019 matrices as a base, using:

- Public transport demand was scaled up using annual growth rates and compared against outputs from the Public Transport Project Model (PTPM) to ensure the degree of growth was appropriate
- Population growth data across Central Precinct and surrounding areas was used to factor the relevant increases pedestrian only movements
- Vehicle data
- Servicing data
- Future development yields as per the proposed master plan.

A summary of this process is provided in Figure 5-5.

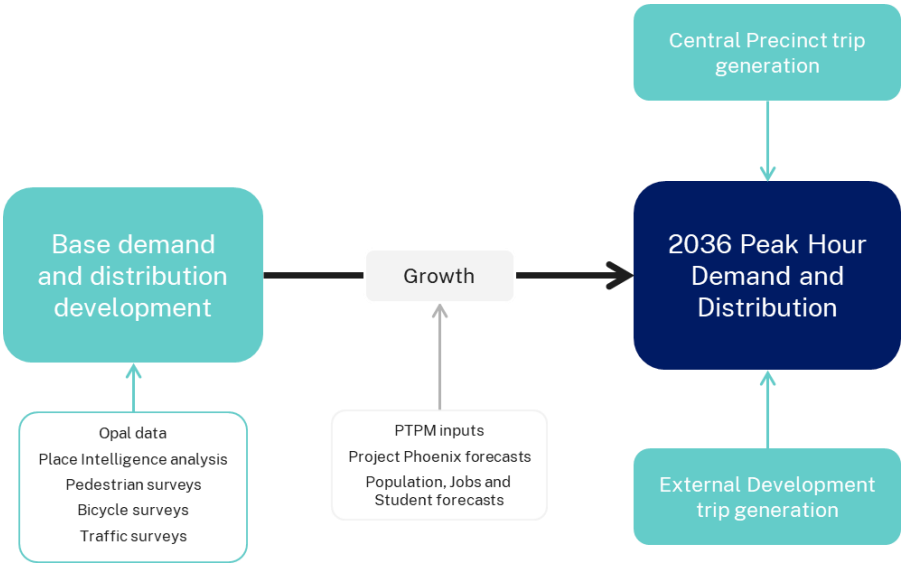



**Figure 5-5: Trip generation demand development**

### 5.3.2 Background demand

The process for forecasting the background demand across Central Precinct (that is, non-development demand) was based on growing the 2019 current matrices using forecast growth rates. This process was carried out for individual platforms within Central Precinct, and for each bus stop and light rail. In general, each stop or platform (or groups of platforms, like the Sydney Terminal platforms) service specific lines and routes that service specific areas.

Within the station, arrivals at each platform were forecast by growing the movements in the current matrices by the forecast growth of population and workers in the areas services by the trains arriving at the platform. Departures from each platform were grown from current matrices by the forecast growth of employment and other activities in areas serviced by trains leaving the platform.

Growth rates were taken from Transport for NSW land use and demographic forecasts. Movements between platforms for interchanges between services were forecast using forecast public transport trip matrices and taking into consideration changes in services, including Sydney Metro, Sydney Metro West, changes to the South Coast Line and other potential changes in operation of the station.

For the bus and light rail demands, annual growth rates aligning with the PTPM were applied to understand the overall demand across the Central Precinct network. From there, each individual service for the precinct was reviewed to ensure frequencies and services aligned with planned changes to the network. For transfers between different modes, the 2019 transfer distribution was maintained, with each movement reviewed individually to ensure the right balance of interaction was achieved.

While strategic models are meant to represent broad areas and their representation of localised areas is weak, the overall results of the forecasting are entirely consistent with public transport modelling.

### 5.3.3 Development demands

A three-step approach was used to develop the AM peak and PM peak hour trip generation for the expected future development within the CPRP. This process involved:

- Reviewing the Reference Master Plan development yields for the various land uses
- Calculating the AM peak and PM peak person trip generation for each of the proposed land uses
- Applying the adopted Target Mode share for the CPRP to understand the quantum of trips to and from Central Precinct for each mode.

Once the overall demands were calculated, the trips for each mode were distributed across the base demand movement matrix.

*Trip generation calculation*

Overall trip generation rates for each land use were obtained from TRICS, a UK database that contains surveys of the vehicle and multimodal trip generation of a wide variety of sites which are classified by land use and various other attributes. These rates have been used in preference to the former Roads and Maritime Services trip generation rates for similar land uses, as TRICS includes broader person trip types, including public transport, walking and cycling trips, as well as private vehicle trips.

The trip rates used for the assessment of the Central Precinct development are provided in Table 5-7.

**Table 5-7: Land use trip generation rates**

| Land Use | Trips per 100 $m^2$ GFA | | | |
|---|---|---|---|---|
| | AM arrival | AM departure | PM arrival | PM departure |
| Community | 2.98 | 0.13 | 0.13 | 2.15 |
| Education | 0.62 | 0.1 | 0.38 | 0.44 |
| Food & beverage | 1.16 | 0.59 | 1.59 | 1.83 |
| Hotel | 0.15 | 0.18 | 0.21 | 0.17 |
| Office | 2.98 | 0.13 | 0.13 | 2.15 |
| Residential | 0.08 | 0.44 | 0.28 | 0.16 |
| Retail | 1.16 | 0.59 | 1.59 | 1.83 |
| Student housing | 0.08 | 0.44 | 0.28 | 0.16 |

*Resultant demands*

The trip generation rates, along with the mode share distributions, were then applied to the development to identify the total number of trips for each building in the AM peak and PM peak periods (for both arrival and departing movements) for each mode. The trip demand generated by the proposed development are summarised in Table 5-8 and Table 5-9.

**Table 5-8: Central Precinct development demand – AM peak hour**

| Area | Mode Share (trips) | | | | | |
|---|---|---|---|---|---|---|
| | Walking | Cycling | Train/ Metro | Light Rail | Buses | Car |
| Community | 58 | 47 | 353 | 23 | 80 | 12 |
| Education | 35 | 28 | 222 | 12 | 50 | 6 |
| Food & beverage | 41 | 34 | 214 | 23 | 55 | 20 |
| Hotel | 18 | 15 | 106 | 8 | 24 | 4 |
| Office | 827 | 626 | 5,257 | 262 | 1,154 | 102 |
| Residential | 248 | 42 | 101 | 59 | 49 | 24 |
| Retail | 21 | 21 | 60 | 20 | 23 | 20 |
| Student housing | 58 | 11 | 25 | 15 | 12 | 7 |
| **Total** | **1,306** | **824** | **6,338** | **422** | **1,447** | **195** |

**Table 5-9: Central Precinct development demand – PM peak hour**

| Area | Mode Share (trips) | | | | | |
|---|---|---|---|---|---|---|
| | Walking | Cycling | Train/ Metro | Light Rail | Buses | Car |
| Community | 45 | 35 | 259 | 18 | 60 | 11 |
| Education | 41 | 32 | 252 | 14 | 56 | 6 |
| Food & beverage | 68 | 57 | 405 | 28 | 94 | 22 |
| Hotel | 20 | 16 | 122 | 8 | 28 | 4 |
| Office | 610 | 465 | 3,857 | 196 | 849 | 80 |
| Residential | 214 | 34 | 88 | 53 | 42 | 21 |
| Retail | 25 | 24 | 108 | 20 | 30 | 20 |
| Student housing | 51 | 10 | 21 | 13 | 11 | 6 |
| **Total** | **1,074** | **673** | **5,112** | **350** | **1,170** | **170** |

### 5.3.4 Demand summary

The demand generation assessment determined the proposed development of Central Precinct is expected to generate 10,532 trips in the AM peak hour and 8,549 trips in the PM peak hour.

Figure 5-6 and Figure 5-7 provide a summary of the overall movements within Central Precinct in 2036 for the AM and PM peak hours.

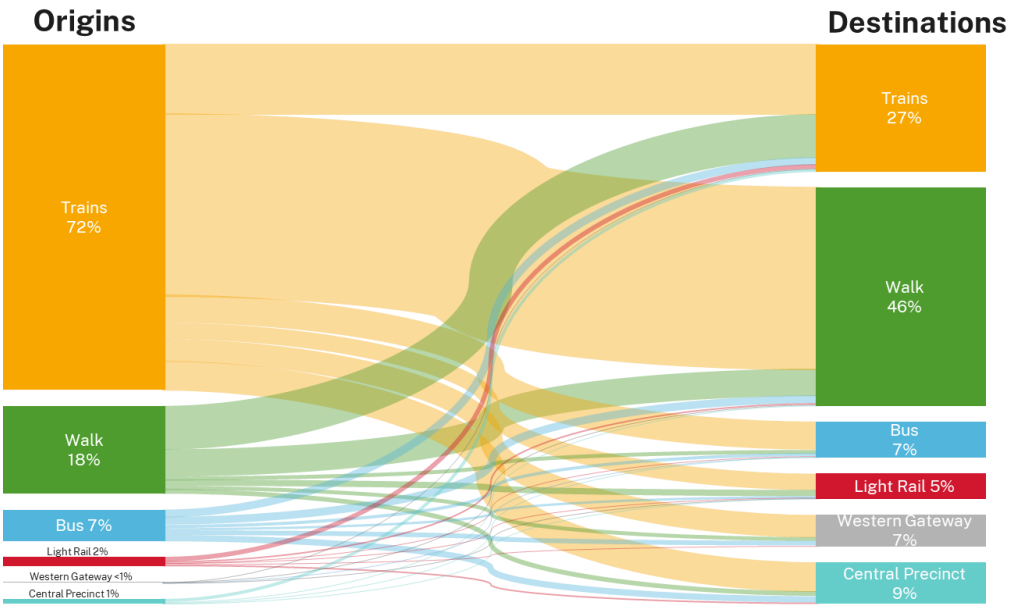



**Figure 5-6: 2036 AM Central Precinct demand**

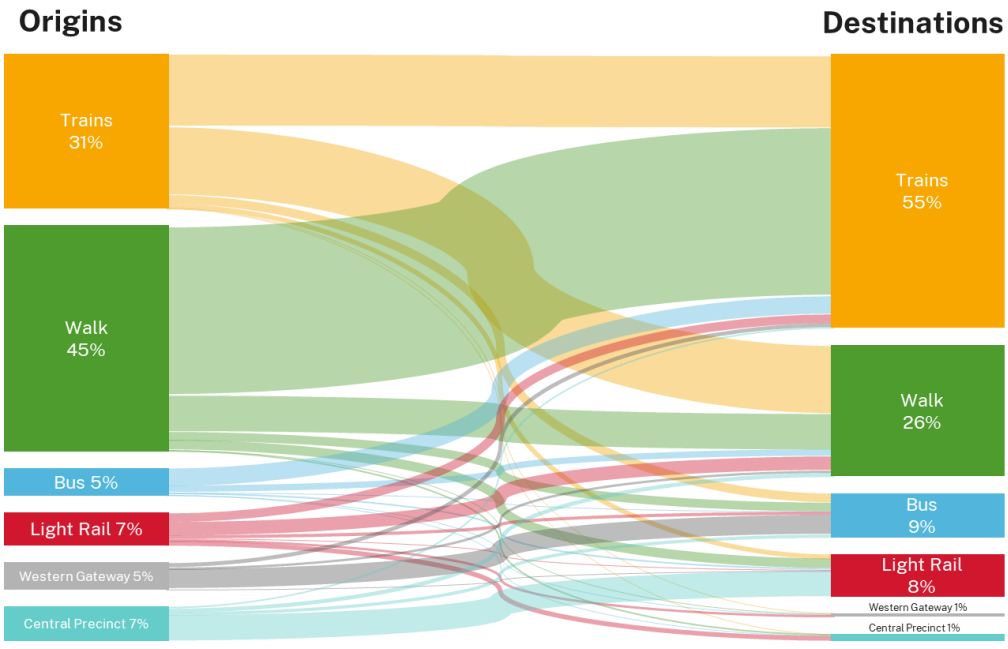



**Figure 5-7: 2036 PM Central Precinct demand**

## 5.4 Pedestrian assessment

The future pedestrian demand around Central Precinct will comprise of train, bus and light rail passenger demand, pedestrians travelling to and from the proposed development, and background pedestrian movement (trips not associated with public transport or surrounding development).

With the high active and public transport target mode share for Central Precinct, there is expected to be a high portion pedestrian movement to and from the proposed development. Table 5-10 provides a summary of pedestrian trips within the study area. For the purposes of assessing the total pedestrian demand from the Central Precinct development, the table considers both public transport activity and transfers within the precinct, as well as walk only trips.

**Table 5-10: Central Precinct and Central Station pedestrian trip generation (2036 AM peak hour)**

| | Walking only trips | Public transport transfer trips | Total pedestrian trips | |
|---|---|---|---|---|
| | | | Pedestrian trips | Proportion (%) |
| Central Precinct development | 1,286 | 1,906 | 3,192 | 4% |
| Central Station | 6,034 | 61,874 | 67,908 | 96% |
| **Total** | 7,320 | 63,780 | 71,100 | 100% |

As identified in Table 5-10, the future development of Central Precinct is forecasted to account for four per cent of all pedestrian movements within the precinct. Given the low proportion, the impact of walking trips generated by Central Precinct development on the study area and surrounding pedestrian network is considered minimal in comparison to the impact of the forecasted growth within the precinct.

Pedestrian demand in 2036 across Central Precinct is expected to increase by 105 per cent on 2019 demand. Given this expected growth, the assessment of pedestrian infrastructure included in this section has been completed to ensure that the planning of the pedestrian environment is consistent with the vision of Central Precinct.

The expected key routes and future distribution of pedestrian trips to/ from Central Precinct during the AM peak period is shown in Figure 5-8.

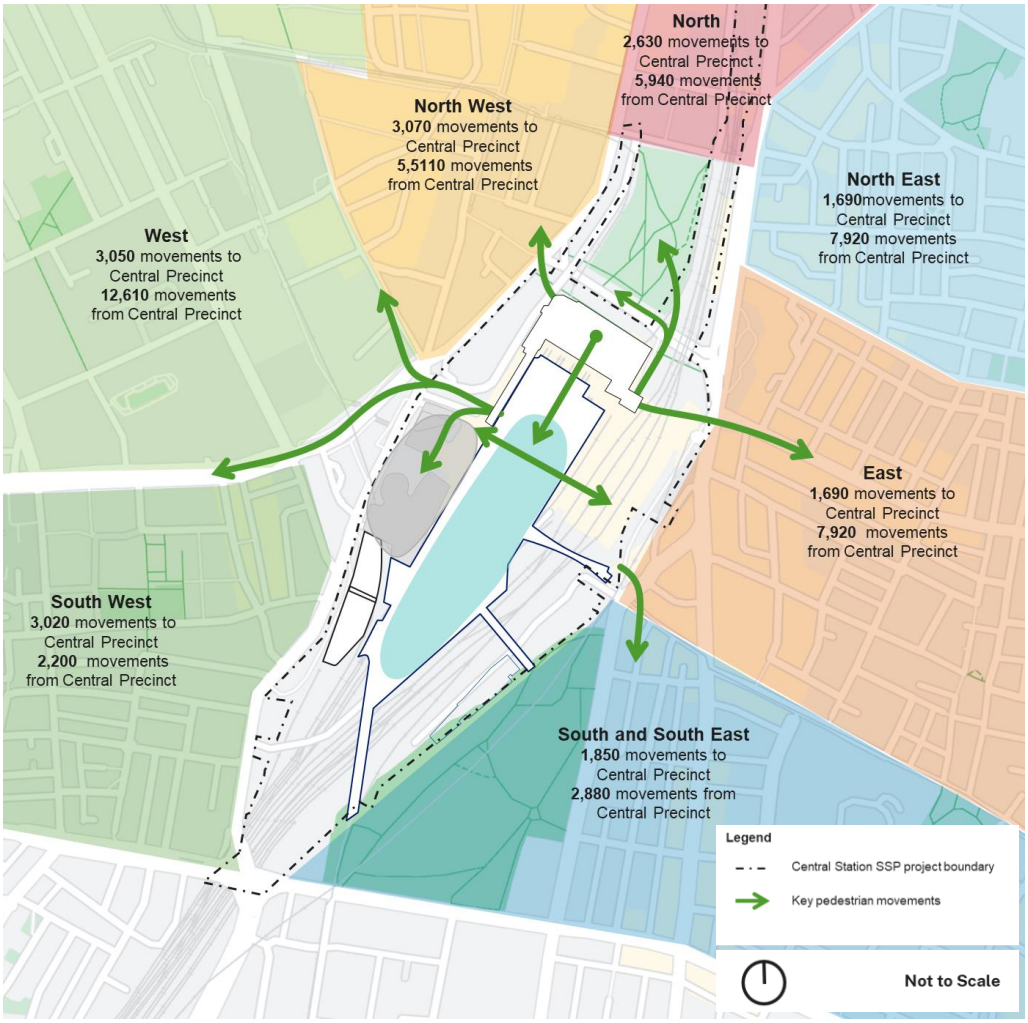



**Figure 5-8: Future key pedestrian routes and movement distribution**

As shown in Figure 5-8, major pedestrian desire lines extend outward of Central Station towards:

- Ultimo and the Railway Square bus interchange, heading across Lee Street and George Street west of Central Station
- Haymarket, across the intersection of Pitt Street and Eddy Avenue
- Belmore Park and the Eddy Avenue bus interchange, crossing at the pedestrian signals on Eddy Avenue
- Surry Hills, crossing at the intersection of Elizabeth Street and Foveaux Street.
- East-west (and west-east) across Central Station.

Detailed analysis has identified that the footpaths and pedestrian crossings around Central Station will remain congested in 2036. The external pedestrian movement corridors identified above expected to increase 50 to 100 per cent above 2019 demands, placing significant pressure at the intersections and limiting their ability to function safely and efficiently.

To accommodate the increase in pedestrian activity at these locations, widened pedestrian crossings and footpaths on the approach and/ or departures to road crossings may be required. Potential future upgrades in the context of public transport stops accessible along the surrounding road network are shown in Figure 5-9.


**Figure 5-9: Future potential pedestrian upgrades around Central Precinct**

Preliminary modelling also identifies that the east-west movement across Central Station will be largely accommodated by the Central Walk West. The additional new connections over the station via the deck, and the existing Devonshire Tunnel alignment, will provide plenty of opportunities for non-station related pedestrian movement to cross the precinct.

The OSD was modelled within the over station model (outlined in Section 5.1.1) with the following connections to the station and surrounding street network. Elevators are provided at all vertical transport connections:

- stairs and escalators to the Grand Concourse
- stairs and escalators to the Central Walk
- stairs to City Square
- escalators to Henry Deane Plaza
- stairs to the Goods Line
- stairs to Mortuary Station
- walkway to Prince Alfred Sidings
- stairs and escalators to Devonshire Street.

Initial model findings indicate that the performance of stairs and ramps connecting to the OSD would generally be level of service (LOS) C or better during commuter peak periods, with LOS D performance expected during periods of peak demand on critical connections such as the escalators to Central Walk.

In addition to elevators provided at all vertical transport connections, escalators are provided at major links to the east, west and within the station. This will ensure that people of all ages and abilities are able to safely access all buildings located on the proposed deck, as well as destinations connected to the deck.

## 5.5 Cyclist assessment

The urban design and renewal of Central Precinct looks to provide a sustainable, connected and customer friendly environment. Because of this, the development at Central Precinct will look to promote and support cycling as much as possible.

At the precinct level, the changes to cycling infrastructure to support activity at Central Station and Central Precinct is significant and would improve the safety and efficiency of trips for all cyclists travelling through the precinct. The overall impact of cycling trips generated by the proposed Central Precinct is considered minimal in comparison to the induced demand across the network. Demand for bicycle parking within Central Precinct is expected to be largely driven by the proposed development, with most spaces allocated to future development rather than for commuter use.

Based on current information, the anticipated cycling trips to and from Central Precinct are summarised in Table 5-11.

**Table 5-11: Future cycling trips – AM and PM peak periods**

| Future cyclist demand forecast | AM peak hour | | PM peak hour | |
|---|---|---|---|---|
| | Trips to precinct | Trips from Precinct | Trips to precinct | Trips from Precinct |
| Station cyclist demand | 506 | 126 | 253 | 379 |
| Future development cyclist demand | 706 | 118 | 130 | 543 |
| **TOTAL** | **1,212** | **244** | **383** | **922** |

The CPRP proposes several cycling connections across Central Precinct, creating new links over the railway line, and extending existing corridors along the boundaries of the precinct. The new and updated cycling links introduced by CPRP, and their connection to the broader cycling network, is shown in Figure 5-10.


**Figure 5-10: Future Cycling network around Central Precinct**

At the precinct level, the changes to cycling infrastructure to support activity at Central Station and Central Precinct is significant, and would improve the safety and efficiency of trips for all cyclists travelling through the precinct. The overall impact of cycling trips generated by the proposed Central Precinct is considered minimal in comparison to the induced demand across the network. Demand for bicycle parking within Central Precinct is expected to be largely driven by the proposed development, with most spaces allocated to future development rather than for commuter use.

The City of Sydney Development Control Plan (DCP) 2012 specifies minimum parking rates and standards for bicycle facilities, for new development within the CBD. Assuming these rates were adopted for Central Precinct , the scale of cycle parking facilities required for the assumed Precinct mix of land use, is presented in Table 5-12.

Table 5-13 summarises the required number of long-term and short-term bicycle parking spaces for Central Precinct by adopting the of Sydney DCP 2012 bicycle parking rates.

The assessment identifies that the adoption of the bicycle parking rates of the Sydney DCP would require the concept master plan to provide approximately 3,338 long-term (staff, student and residential) bicycle parking spaces and 1,062 short-term (visitor) bicycle parking spaces.

**Table 5-12: City of Sydney DCP 2012 bicycle parking rates**

| Land Use | Residents/ Employees (long-term) | Customers/ visitors (short-term) |
|---|---|---|
| Residential | 1 per dwelling | 1 per 10 dwellings |
| Student accommodation[1] | 1 per dwelling | 1 per 10 dwellings |
| Hotel | 1 per 4 staff | 1 per 20 rooms |
| Commercial | 1 per 150 $m^2$ | 1 per 400 $m^2$ |
| Retail | 1 per 250 $m^2$ | 1 per 400 $m^2$ |
| Education | 1 per 10 staff + 1 per 10 students | |
| Community[2] | 1 per 1000 $m^2$ | 1 per 200 $m^2$ |

1 The Residential bicycle parking rate has been adopted to understand the likely bicycle parking requirements of Student Accommodation within the SSP

2 The Residential bicycle parking rate has been adopted to understand the likely bicycle parking requirements of community within the SSP.

**Table 5-13: Central Precinct Development bicycle space requirement**

| Land use | Quantity | Measure | Bicycle parking requirement | |
|---|---|---|---|---|
| | | | Long-term | Short-term |
| Residential | 508 | dwellings | 508 | 51 |
| Student accommodation | 266 | rooms | 266 | 27 |
| Hotel[1] | 578 | staff | 144 | - |
| | 481 | rooms | - | 24 |
| Commercial | 257,464 | $m^2$ | 1,716 | 644 |
| Retail | 22,921 | $m^2$ | 92 | 229 |
| Education | 5,952 | $m^2$ | 595 | - |
| Community | 17,356 | $m^2$ | 17 | 87 |
| | | **Total** | **3,338** | **1,062** |

1 Hotel staff rate assumes 12 staff for every 10 rooms (4 Star hotel standard, World Tourist Organization)

Comparing the of Sydney DCP 2012 bicycle parking rate to the proposed mode share, bicycle parking for long-term users falls slightly short of the 7.5 per cent target of 3,560 trips for residents and workers to the precinct. A higher bicycle parking rate for long-term users within the proposed Planning Framework for Central Precinct would support the adoption of the target mode share.

The Reference Master Plan identifies six locations for future long-term bicycle parking:

- Within Eddy Plaza adjacent to the Terminal building,
- On the deck above Central Station, within:
    - Block A
    - Block B
    - Block C, near the access cross the railway corridor to Prince Alfred Park
- At street level within Block D, near Regent Street
- Underneath Railway Square, adjacent to the Goods Line (outside of the SSP boundary).

Spatial assessments are currently being completed to determine the area required at each of these locations to provide the right quantum of long-term bicycle parking for Central Precinct. End of trip facilities, including showers and lockers, would also be provided at each location consistent with the requirements of the of Sydney DCP 2012.

Further identification of short-term bicycle parking areas across the precinct at convenient locations for visitors will be determined as the precinct master plan is further refined.

## 5.6 Public transport assessment

### 5.6.1 Trains and metro

As Sydney's busiest railway station, demand through Central Station is expected to grow, both in passengers on the suburban and regional rail services, and with the opening of the Sydney Metro platforms.

The location and proximity of the proposed Central Precinct to Central Station is expected to generate high demands, with the direct connection from Central Walk West up to the OSD. Based on the trip generation assessment, the future development of Central Precinct would add 6,580 additional train and/ or metro passenger trips into Central Station during the morning peak hour, and 5,360 additional trips during the evening peak hour.

Table 5-14 provides a summary of train and metro commuter trips within the study area.

The proposed Central Precinct is anticipated to comprise eight per cent of all train and metro trips through Central Station in 2036, with many of these movements directed into new vertical connections up to the proposed OSD. Overall, passenger trips through Central Station are expected to increase by 95 per cent on 2019 demands, in part due to overall growth across the network and due to the opening of the Sydney Metro platforms.

**Table 5-14: Train and Metro trip generation (2023 AM and PM peak hours)**

| | AM peak hour | | PM peak hour | |
|---|---|---|---|---|
| | Trips | Percentage | Trips | Percentage |
| Central Precinct development | 6,576 | 8% | 5,362 | 8% |
| Non-development trips (including transfers between train services) | 74,624 | 92% | 64,118 | 92% |
| **Total** | **81,200** | **100%** | **69,480** | **100%** |

A summary of the key movements within Central Station and its connections to Central Precinct in the 2036 AM peak hour are provided in Figure 5-11.

The introduction of Sydney Metro would increase the capacity of the rail network in Sydney, providing an additional capacity of 40,000 customers per hour in one direction (*Sydney Metro City and Southwest Final Business Case Summary*, October 2016). The More Trains More Services program will also provide increased capacity by increasing the number of services through targeted infrastructure upgrades and the addition of new train fleet into the rail network.

These additional train services, as well as additional capacity introduced by Sydney Metro is considered sufficient to cater for the forecast demand associated with Central Precinct, as well as the cumulative demand from future developments across Tech Central and the Ultimo-Pyrmont area.

Within the station, the addition of new platform access points to Central Walk, as well as the extension of Central Walk to the western edge of the precinct will provide improved access and circulation within Central Station for commuters.

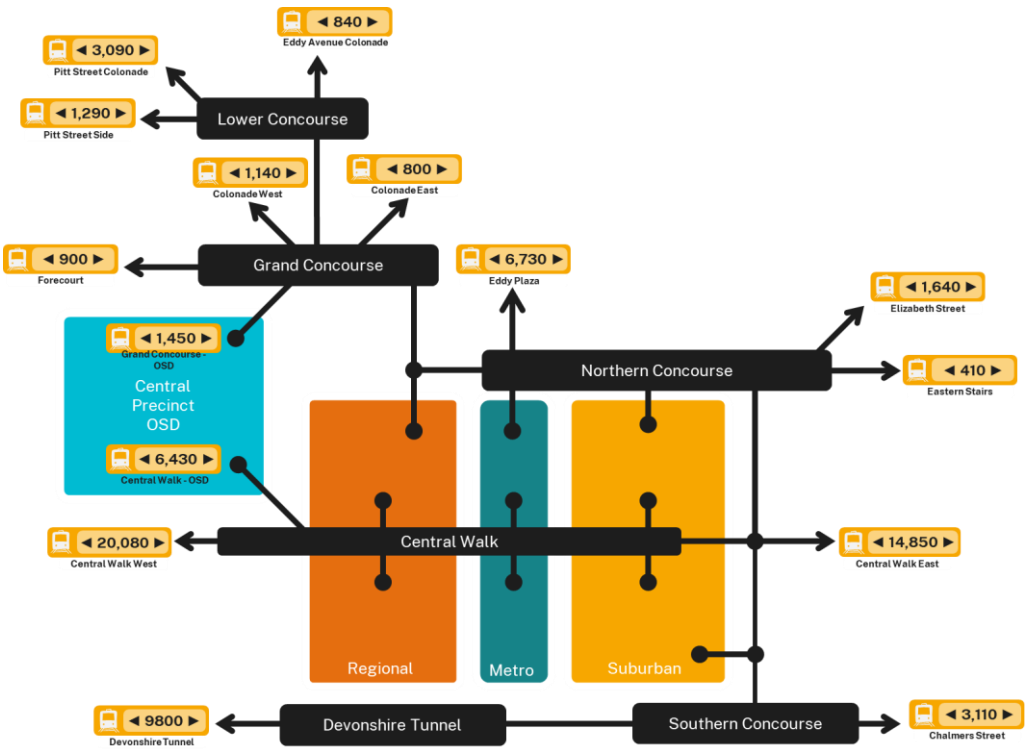



**Figure 5-11: 2036 Central Station 2036 AM peak hour passenger movement summary**

Preliminary results from the internal station modelling indicates that the concourse areas, including the completed Central Walk interchange link, are of a comfortable level of service (LOS - overall LOS C or better with very localised patches of LOS D). Passenger transfers between Metro, suburban and regional rail services are improved through the addition of Central Walk and new escalator and lift vertical connections to the platforms.

Central Station's gatelines are set to provide fluid access to and from all the access points of the train station in 2036. Some minor congestion is expected at the Eddy Avenue gateline, which is not impacted by the development of CPRP.

The additional train and metro passenger demand created by the proposed Central Precinct development does not any significant detrimental impact on the performance of the station platforms or concourses within a scenario where Central Walk West has been built.

### 5.6.2 Light rail

The opening of the CSELR line from the Sydney CBD to Kingsford and Randwick in 2020 has expanded the availability of light rail services to Central Precinct. It has also changed travel patterns along the south-east corridor to Central Station, with those travelling towards Moore Park and the University of NSW able to use the direct light rail services.

Central Precinct will also increase light rail trips through the precinct, with passengers able to choose different stops based on their ultimate destination above the station or within new development at street level. Based on the trip generation assessment, the future development of Central Precinct would add 880 additional light rail trips to the network during the morning peak hour, and 380 additional trips during the evening peak hour.

Table 5-15 provides a summary of light rail trips within the study area in the 2036 AM and PM peak hours.

**Table 5-15: Light rail trip generation (2036 AM and PM peak hours)**

| | AM peak hour | | PM peak hour | |
|---|---|---|---|---|
| | Trips | Percentage | Trips | Percentage |
| Central Precinct development | 879 | 12% | 384 | 5% |
| Non-development light rail trips (including transfers between services) | 6,331 | 88% | 7,316 | 95% |
| **Total** | **7,210** | **100%** | **7,700** | **100%** |

When considering the potential capacity across the light rail network around Central Precinct, the three routes have the combined potential of accommodating over 21,000 trips during the peak hour (assuming a four-minute service frequency). This suggests that there is sufficient capacity on the existing light rail network to accommodate the anticipated uplift in demand associated with Central Precinct and background growth.

Light rail passengers travelling to and from the OSD within Central Precinct will be able to access vertical connections from Devonshire Street for CSELR services to and from the southeast. Passengers travelling to and from the Sydney CBD on CSELR services will be able to access the OSD from the Rawson Place stop, passing through the Terminal Building to use the internal vertical connections. IWLR passengers will have direct access from the light rail stop to the Grand Concourse, and up to the OSD.

The additional light rail passenger demand created by the proposed Central Precinct development does not any significant detrimental impact on the performance of the light rail stops or connections to the OSD above.

### 5.6.3 Buses and coaches

In 2036, Central Precinct will continue to function as a major bus interchange, facilitating connections between bus, train, metro and light rail services as well as providing direct access to the area. The introduction of the CSELR and Sydney Metro services are expected to change travel patterns and bus demand, as trips migrate to new routes away from existing bus services. Overall, background bus demand is expected to experience moderate growth to 2036.

The future development of Central Precinct will increase bus trips through the precinct. Based on the trip generation assessment, the future development of Central Precinct would add 1,030 additional bus trips to the network during the morning peak hour, and 1,160 additional trips during the evening peak hour.

Table 5-16 provides a summary of bus trips within the study area in the 2036 AM and PM peak hours.

**Table 5-16: Bus trip generation (2036 AM and PM peak hours)**

| | AM peak hour | | PM peak hour | |
|---|---|---|---|---|
| | Trips | Percentage | Trips | Percentage |
| Central Precinct development | 1,027 | 8% | 1,159 | 12% |
| Non-development bus trips (including transfers between services) | 11,353 | 92% | 8,851 | 88% |
| **Total** | **12,380** | **100%** | **10,010** | **100%** |

Overall, demand for bus services in 2036 is expected to increase 28 per cent on 2019 demands. Preliminary details on bus service changes across the precinct suggest there will be sufficient to cater for the forecast demand associated with Central Precinct. However, given the expected scale of change across the bus network to 2036 as a result of the CSELR and Sydney Metro services, bus capacity will need to be further evaluated as information becomes available.

Preliminary modelling suggests there is likely to be increased pedestrian congestion at some bus stands around Railway Square and on Eddy Avenue. Bus Stands in these locations are located within key pedestrian movement corridors, with alighting, waiting and boarding activities at times conflicting with through pedestrian movement.

The future high pedestrian demands across the precinct is also expected to impact on bus service frequency and reliability. Competing demands of bus journeys and pedestrians crossing at key road intersections will likely lead to delays for on-road public transport services. Further modelling is currently being undertaken to understand the degree of impact, with the results and assessment to be incorporated into a future revision of this report.

The redevelopment of the Lee Street bus layover site as part of CPRP incorporates an upgraded bus-layover facility that will cater for future changes to bus services and operations. The upgraded facility will provide a minimum of 13 bus bays to accommodate layover activities, as well as provide amenities for bus drivers and support the adoption and integration of a future electric bus fleet.

Access into the redeveloped bus layover site will one-way, with the entry point currently proposed to be located north of the Regent Street and Lee Street intersection, and the exit point to the south of the intersection. In the event Lee Street is closed to through traffic, it is recommended that the entry and exit points be switched over. This would allow buses travelling southbound along Regent Street to turn left into the site after the intersection and allow buses leaving the layover the opportunity to turn north at the signalised intersection of Lee Street and Regent Street. This removes the need for northbound buses to travel around the site to reconnect with bus routes at Railway Square.

The development of Central Precinct is not forecasted to generate a demand for coach services. Coach services and facilities will be improved as part of the CPRP, with an upgraded managed and dynamic coach layover pick-up, and drop-off facility in the revitalised Western Forecourt. This facility will have direct access for customers transferring from coach services to the suburban, metro and regional rail lines.

## 5.7 Road network assessment

The road network in 2036 is expected to be similar to traffic conditions in 2019, with heavy traffic conditions through the study area during commuter peaks. In the AM peak, there is a strong west to east traffic movement through Central Precinct via Eddy Avenue, with the intersections surrounding Central Station impacted by turn movement capacity and efficiency. Traffic queues are expected to form along Eddy Avenue, Pitt Street, George Street and Lee Street for northbound and eastbound traffic.

The PM peak is also expected to experience high levels of congestion in key locations on the periphery of Central Precinct. The intersections of Regent Street and Cleveland Street to the south of the precinct, and Elizabeth Street and Eddy Avenue, are all likely to have queueing on the northern approaches.

Recognising the limitations of the surrounding road network, Central Precinct has been designed to control the access and desirability of vehicles travelling to the site. This will be achieved through:

- A target mode share (as outlined in Section 5.2) that prioritises active and sustainable transport modes, with supporting measures to ensure the mode share is achieved
- Reduced car parking requirements for new development within Central Precinct (as outlined in Section 5.8.1)
- Integrated loading facilities to consolidate deliveries and servicing demand, with arrival demand management to control when vehicles access the site (as outlined in Section 5.8.2)
- Increasing the number of designated point-to-point locations around Central Precinct to align with key movement corridors and providing an autonomous vehicle route on the deck to cater for last-mile drop-off and pick up activities (as outlined in Section 5.8.3).

The resultant traffic demand from the above introduces 460 traffic movements (comprising of point to point, deliveries and service vehicles, and parked vehicles) in the AM peak hour, and 420 movements in the PM peak hour travelling to and from Central Precinct. These trips will be distributed across the site, distributing the impact from the slight increase in vehicle traffic associated with the new development around the precinct.

A summary of the generated traffic movements and key external traffic patterns around Central Precinct in the 2036 AM peak hour are provided in Figure 5-12.

While the resulting traffic generation is expected to be able to be absorbed in future traffic patterns, it is likely that key traffic bottlenecks will remain. Pedestrian activity is also expected to increase, creating competing demands for signal time between pedestrians and road traffic. Effective planning and management of these demands should prioritise walking and cycling to support mode shift and reduce congestion, as outlined in Section 4.1.

Localised improvements may be possible through the completion of projects external to CPRP, including WestConnex and other road projects that provide alternative traffic routes through the precinct. Further traffic modelling is currently being completed to understand the cumulative impact of the external road projects.


**Figure 5-12: 2036 Road network conflict**

## 5.8 Access and parking assessment

### 5.8.1 Car parking

Car parking demand for the Central Precinct was assessed using the following two approaches:

- By applying the maximum parking rates outlined in the City of Sydney LEP 2012 and adopting a Category A classification for residential land uses and Category D for non-residential land uses. The rates used in this assessment are outlined in Table 5-17.
- From first principles, using the preferred car mode share targets for the CPRP as outlined in Section 6.2.

Table 5-18 compares the maximum parking demand identified using the identified approaches.

**Table 5-17: Maximum car parking requirements – City of Sydney LEP 2012**

| Land use | | Rate[1] |
|---|---|---|
| Residential | 1 bed dwelling | 0.3 spaces / dwelling |
| | 2 bed dwelling | 0.7 spaces / dwelling |
| | 3 bed dwelling | 1 spaces / dwelling |
| Student accommodation | | 0.2 spaces per room |
| Hotel | | 0.2 spaces per room |
| Commercial | | 0.65 spaces per 100/ $m^2$ |
| Retail | | 0.65 spaces per 100/ $m^2$ |
| Education | | 1 space / 200 $m^2$ GFA |
| Community2 | | 1 space / 30 $m^2$ GFA |

1 The City of Sydney LEP uses a calculation method to determine the number of parking spaces for commercial and retail land uses that considers the Gross and Total site area. For this assessment, these calculations have been translated into an equivalent parking rate per 100 $m^2$ of GFA.

2 The Entertainment rate has been adopted to understand the likely parking requirements of community uses within the SSP

**Table 5-18: Central Precinct car parking requirement comparison.**

| Land use | Quantity | Measure | Car parking maximum | |
|---|---|---|---|---|
| | | | LEP | Target mode share |
| Residential | 152 | 1 bed dwelling | 46 | 68 |
| | 279 | 2 bed dwelling | 195 | |
| | 76 | 3 bed dwelling | 77 | |
| Student accommodation | 266 | rooms | 53 | 141 |
| Hotel | 481 | rooms | 96 | 0 |
| Commercial | 473,800 | $m^2$ | 1,674 | |
| Retail | 36,830 | $m^2$ | 149 | |
| Education | 53,780 | $m^2$ | 236 | |
| Community | 6,460 | $m^2$ | 579 | |
| **Maximum total parking spaces** | | | **3,105** | **208** |

The assessment identifies that that the adoption of the maximum car parking rates of LEP 2012 would require a maximum of 3,105 spaces for the CPRP. If parking were to be supplied in line with the target mode share for the precinct, a total of 208 parking spaces would be required for residential uses.

The Reference Master Plan currently proposes 377 parking spaces across the precinct, located within the Regent Street Sidings site on the western boundary, and the Prince Alfred Sidings site on the eastern boundary. This provision is higher than the target mode share provision identified above, and has been designed in consideration of the available space for each of the sites.

It is recognised that the City of Sydney LEP 2012 parking rates represent the maximum number of parking spaces that could be provided across the site, the adoption of a similar quantum of parking would potentially introduce over 3,000 vehicle trips to and from the precinct during the peak hour. Noting the current constraints across the road network, it is unlikely surrounding streets would be able to accommodate an increase to this scale.

When considering mechanisms to promote sustainable transport behaviour, restrictions on private vehicle parking reduce the likelihood of trips by car. Mechanisms such as introducing paid parking, time-restricted parking, and reducing the available parking supply, all have been proven as a deterrent in choosing private vehicles for travel. However, the use of any mechanism must be balanced to ensure the broad range of mobility needs are considered and provided for.

An adoption of lower maximum rates beyond the City of Sydney LEP 2012 requirements, would support a shift away from private vehicles, whilst allowing for and providing access for those who need it. Given the Precinct's location on top of Sydney's largest transport hub, lower parking rates would reduce reliance of future residents and employees on private vehicles while alternative means of travel are available.

It is recommended that the proposed planning framework for Central Precinct include maximum parking requirements that are in closer alignment with the target mode share. Recommended parking rates are provided in Table 5-19.

**Table 5-19: Proposed maximum car parking rates for Central Precinct SSP**

| Land use | | Maximum parking rate |
|---|---|---|
| Residential | 1 bed dwelling | 0.3 spaces/ dwelling |
| | 2 bed dwelling | 0.7 spaces/ dwelling |
| | 3 bed dwelling | 1 spaces/ dwelling |
| Student accommodation | | 0.1 spaces per room |
| Hotel | | 0.1 spaces per room |
| Commercial | | 1 space per 2000 $m^2$ GFA |
| Retail | | 1 space per 2000 $m^2$ GFA |
| Education | | 1 space per 2000 $m^2$ GFA |
| Community | | 1 space per 2000 $m^2$ GFA |

*Car share*

The provision of car share spaces would support broader precinct push for reduced reliance on private vehicles. Car share spaces contribute to reducing the reliance on car ownership, allowing trips that require the use of a vehicle to occur as needed. There is also potential for car-sharing parking provisions to be included onsite or on off-street spaces in another location managed by the City of Sydney. This would enable wider access to the service by residents of Central Precinct and the broader community.

The City of Sydney DCP 2012 requires a minimum of one car share space per 50 off-street car spaces. Adoption of this rate for the reference master plan, eight car share spaces would be required across the precinct.

Noting the potential to reduce the maximum parking rates and the scale of trips associated with the precinct, it is recommended that the proposed planning framework for Central Precinct include a minimum requirement of one car share space per 25 off-street car spaces to be provided.

*Motorcycle parking spaces*

The City of Sydney DCP requires a minimum of one motorcycle space per 12 off-street car spaces. Based on the preferred master plan, the provision of 377 off-street car spaces would result in a requirement for 34 motorcycle parking spaces.

It is recommended that the proposed planning framework for Central Precinct include the City of Sydney DCP rate of one motorcycle space for every 12 car parking spaces.

### 5.8.2 Service vehicle requirements

Service vehicle requirements for Central Precinct have been assessed using two approaches:

- By applying the maximum parking rates outlined in the City of Sydney DCP. The rates used in this assessment are outlined in Table 5-20.
- Using a logistics spreadsheet model to determine the daily delivery and servicing trips associated with the precinct with a consolidated basement arrangement (including station operations).

The logistics spreadsheet model was developed with support and direction from the Transport for NSW Freight Branch to evaluate key parameters of vehicles entering, accessing, and exiting the loading and servicing areas within a managed dock system. It provides an assessment of potential queue lengths when entering the dock access point, potential delays in accessing a dock for unloading and loading of goods, and the storage requirements needed to support a last-mile delivery service when Central Precinct from the loading dock.

Key parameters integrated within the model include:

- The master plan floor area and land use breakdown
- Daily delivery trip rates for each land use, including servicing demands associated with station activites
- The distribution of trips per vehicle type for each land use (light vehicles, medium rigid vehicles and heavy rigid vehicles)
- Vehicle arrival temporal profiles
- The distribution of time spent on site by trip type (service and delivery) and type of vehicle

- Access requirements into the loading facility (such as control gates and other mechanisms that might delay vehicles arriving to the loading dock).

The adoption of the logistics spreadsheet model as an assessment tool for the loading and servicing areas allowed for a holistic analysis of potential impacts on accesses points, recognising the variability of arrival times and delivery activities throughout the day. It also enabled the demands associated operations of Central Station to be evaluated alongside future development demands, to ensure long-term station operations are provided for.

**Table 5-20: Service vehicle requirements – City of Sydney LEP 2012**

| Land Use | Rate |
|---|---|
| Residential | • 1 space for the first 50 dwellings or serviced apartments; plus<br>• 0.5 spaces for every 50 dwellings/ serviced apartments or part thereafter. |
| Commercial | • 1 space per 3,300 $m^2$ GFA, or part thereof, for the first 50,000 $m^2$; plus<br>• 1 space per 6,600 $m^2$, or part thereof, for additional floor area over 50,000sqm and under 100,000 $m^2$; plus<br>• 1 space per 13,200 $m^2$, or part thereof, for additional floor area over 100,000 $m^2$. |
| Hotel | • 1 space per 50 hotel bedrooms, or part thereof, up to 100 bedrooms; then<br>• 1 space per 100 hotel bedrooms; plus<br>• 1 space per 400 $m^2$ of reception, lounge, bar and restaurant area GFA, or part thereof, for the first 2,000 $m^2$; then<br>• 1 space per 8000 $m^2$ of reception, lounge, bar and restaurant area GFA thereafter. |
| Retail | • 1 space per 350 $m^2$ GFA, or part thereof, up to 2,000 $m^2$; then<br>• 1 space per 800 $m^2$ GFA thereafter. |

**Table 5-21: Central Precinct service vehicle requirements comparison**

| Land use | Quantity ($m^2$) | Measure | Service vehicle requirements | |
|---|---|---|---|---|
| | | | DCP | Logistics model |
| Residential | 2,082 | Dwellings or student apartments | 22 | 106 |
| Commercial[1] | 534,040 | $m^2$ GFA | 13 | |
| Hotel | 2,280 | rooms | 57 | |
| Retail | 36,830 | $m^2$ GFA | 28 | |
| Station operations | 16,000 | $m^2$ GFA | - | |
| **Total spaces required** | | | **120** | **106** |

1 For the purposes of this assessment, the Commercial GFA floor area calculation includes Education and Community floor areas.

The assessment identifies that that the adoption of the service vehicle rates of the City of Sydney DCP 2012 would require at least 120 spaces for loading to be provided for CPRP. The logistics model identified 106 spaces would be required as a minimum to support the Precinct.

The Reference Master Plan currently proposes 197 loading and service vehicles across the precinct, with the breakdown of vehicle types for each dock presented in Table 5-21.

Table 5-22 outlines the proposed breakdown of loading bay spaces within the Reference Master Plan. This includes approximately 80 spaces within the Western Forecourt dock to accommodate servicing and delivery demands associated with the operation of Central Station and the rail corridor.

The logistics model was developed to evaluate how an integrated loading dock facility would operate in the context of Central Precinct , identify the likely demand for vehicles over a typical day, and the resulting spatial requirements to support delivery and loading services.

**Table 5-22: Central Precinct loading facility space allocation**

| | Light vehicles | Small rigid vehicles (SRV) | Medium rigid vehicles (MRV) | Total |
|---|---|---|---|---|
| Terminal Building dock | | 5 | 4 | **9** |
| Western Forecourt dock | 124 | 13 | 12 | **149** |
| Regent Street Sidings dock | 22 | 8 | 9 | **39** |
| Prince Alfred Sidings | - | - | - | **0** |
| **Total** | **146** | **26** | **25** | **197** |

The delivery and freight task associated with the future development is expected to require nearly 2,000 vehicles to visit the precinct on a typical day, with 1,200 movements associated with Central Precinct (as derived from the logistics model, shown in Figure 5-13). The peak arrival period for Central Precinct is between 9am and 10am, in which a total of 126 vehicles accessing the precinct.

Comparing the results of the loading facility assessment, the logistics model highlights a slightly lower requirement for the total number of spaces across Central Precinct. This suggests that a lower quantum of loading spaces could be provided onsite without comprising operations of Central Precinct, and there are opportunities through the adoption of an integrated loading dock management system to optimise and smooth out loading demand and reduce the frequency of vehicles crossing over footpaths around Central Station during peak periods.

To ensure the frequent servicing of developments above the station has minimal impact on pedestrian amenity, Central Precinct proposes the adoption of integrated loading and distribution facilities as opposed to traditional loading docks. These facilities would accommodate deliveries, service vehicles and waste collection away from the public realm and allow for the consolidation of goods for delivery across the precinct to their destination. This approach allows for the security screening of goods and the consolidation of goods movement in a centralised location, and improved street and deck amenity through the minimisation of the unloading of vehicles in the public realm.

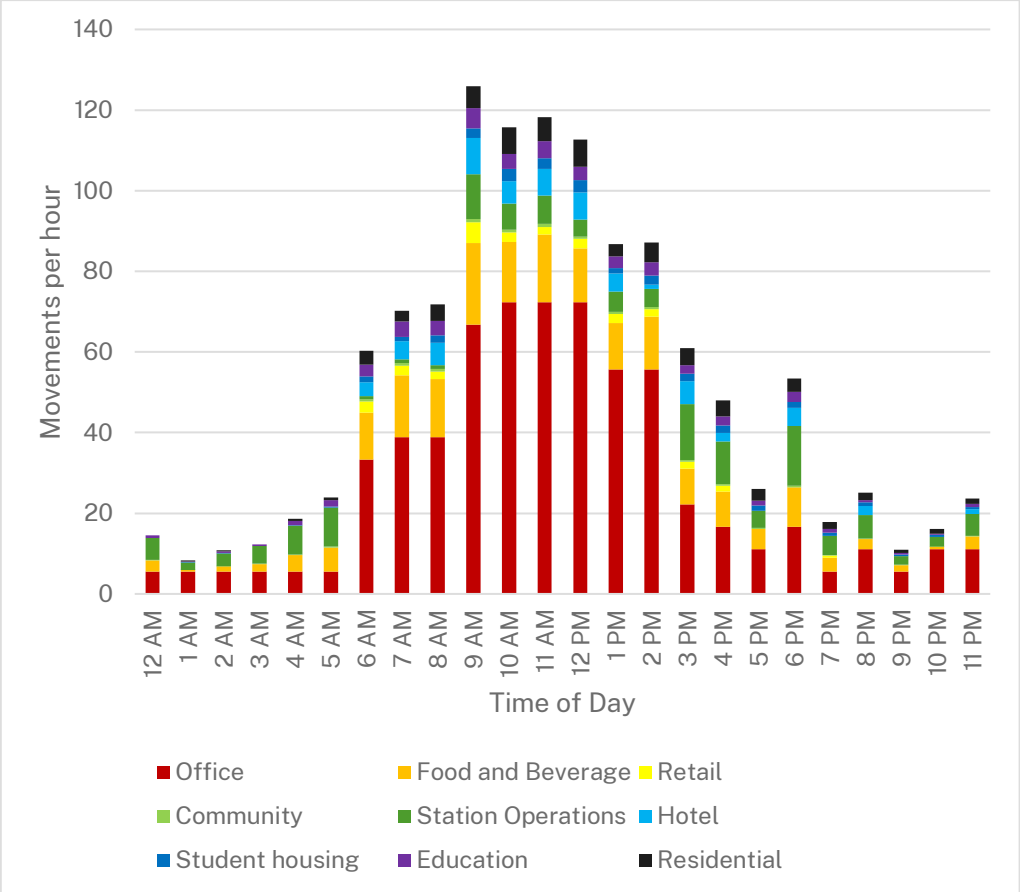



**Figure 5-13: Daily service vehicle arrival profile (land use)**

The loading docks and distribution facilities would be further supported through a dock and logistics management system. This would incorporate an online booking system, which requires drivers to book timeslots to access the site and loading bays, and an internal logistics distribution system, which would allow for incoming goods to be processed and distributed to tenants within Central Precinct.

A managed approach improves the efficiency of loading and servicing, levelling the peak periods expected throughout the day. This reduces the potential for queuing into the docks, the need for on-street parking, and reduction unsafe conditions within the loading dock during these peak periods. A managed system may also allow for the reduction in the number of loading bays throughout the precinct, where overflow deliveries from the peak period could be accommodated during other time periods.

### 5.8.3 Point-to-point

Point to point activity around Central Precinct is expected to increase as travel demands and land uses across the study area intensifies. Central Precinct proposes to expand the provision of point-to-point facilities across the precinct, with the Reference Master Plan identifying the following locations for drop-off and pick up areas:

- Within the revitalised Western Forecourt precinct,
- On Lee Street adjacent to the Western Gateway Precinct
- On Regent Street around Mortuary Station
- On Chalmers Street to the east of Central Station

- Within Prince Alfred Park, with a new vehicle access point from the intersection of Cleveland Street and George Street. This will be supported by an autonomous vehicle service onto the deck above the station, providing a last mile connection for point-to-point users.

A summary of the locations of the proposed point-to-point facilities and their proximity to Central Station is provided in Figure 5-14.

Based on the trip generation assessment, the future development of Central Precinct would add 260 traffic movements in the AM peak hour, and 220 movements in the PM peak hour travelling to and from Central Precinct. These trips will be distributed across the point-to-point facilities around Central Precinct, distributing the impact from the minimal increase in vehicle traffic associated with the new development around the precinct.

The increased provision of point-to-point facilities around Central Precinct is expected to accommodate future demand associated with the proposed development. These facilities will also support growth in passenger drop-off and pick-up activities for the surrounding area.

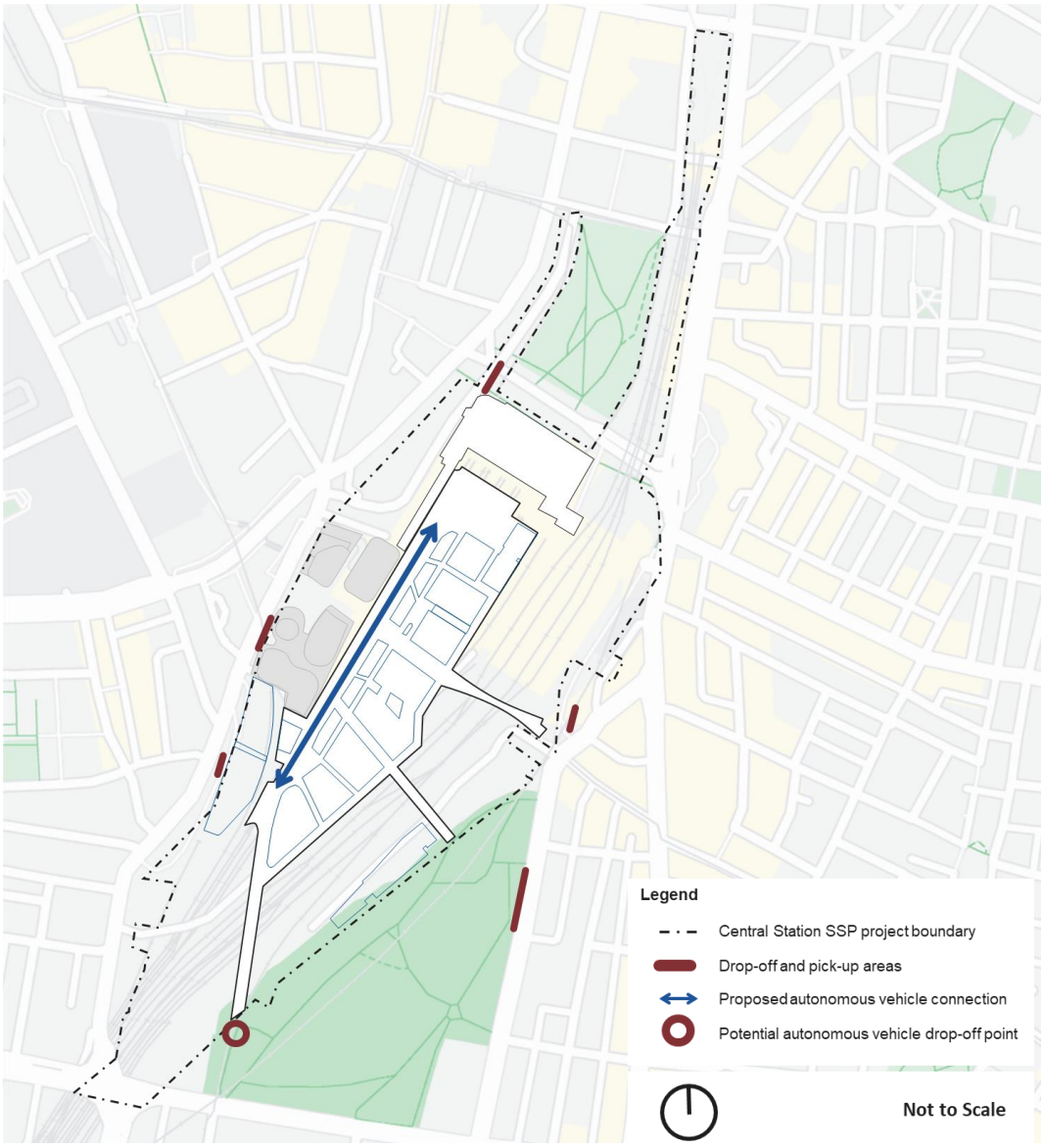



**Figure 5-14: Proposed point-to-point facilities around Central Precinct**

### 5.8.4 Site access

The proposed vehicle access locations, as well as existing access points to be retained, are shown in Figure 5-15. Central Precinct is expected to accommodate a range of vehicle sizes, including light vehicles, small trucks and large vans (SRVs), medium sized trucks (MRVs), buses and coaches, as well as larger service and emergency vehicles.

Vehicle demands and types for each access point are presented in Table 5-23.

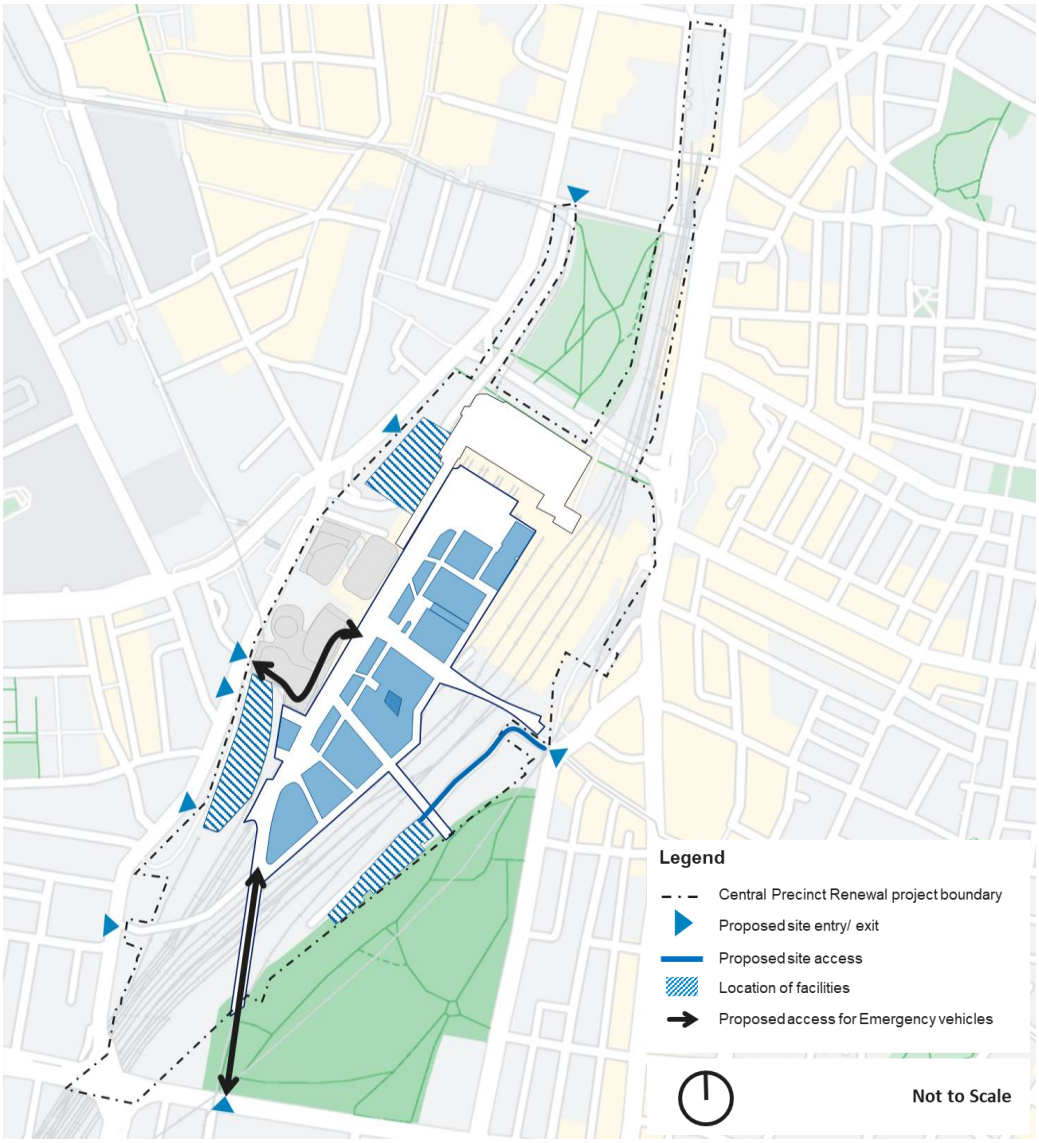



**Figure 5-15: Proposed vehicle access to Central Precinct**

**Table 5-23: Vehicle demand and type summary**

| Vehicle access point | Peak hour demand | Vehicle type | | | | |
|---|---|---|---|---|---|---|
| Western Forecourt | 60 | | |  |  |  |
| Western Forecourt and Terminal Building dock access (off Pitt Street) | 50 |  | | | | |
| Regent Street Sidings access | 80 |  |  |  | | |
| George Street | 40 |  | | |  | |
| Prince Alfred Sidings (off Chalmers Street) | 10 |  | | | |  |

Access to Central Precinct has, where possible, been positioned away from key pedestrian movement corridors to reduce delays and the potential of conflict between vehicles and pedestrians. They are also positioned around site boundary to further redistribute demand, and all access points are generally proposed as left-in/ left-out to minimise impacts to the road network.

In consideration of the assessment above and those outlined in previous sections, the proposed site access points are anticipated to have a negligible impact on surrounding transport operations, provided all are designed ensure sufficient sight lines and widths for all expected vehicle types. Accesses would be designed in accordance with AS 2890 and relevant Transport for NSW and City of Sydney guidelines, and undergo further investigation and design reiteration as part of any future Development Application process.

## 5.9 Safety assessment

### 5.9.1 Crash severity

This safety assessment of the road network within Central Precinct is informed by analysis of crash data supplied by Transport for NSW for the purpose of this study, which includes all crashes recorded within a five-year period between 1 January 2015 and 31 December 2019.

During this period, a total of 187 crashes occurred within the Precinct, of which 84 per cent resulted in some degree of injury to at least one of the parties involved.

The degrees of injury are defined as follows:

- Fatal injury – resulting in at least one person dying within 30 days from injuries sustained in the crash
- Serious injury – resulting in at least one person being admitted for a hospital stay
- Moderate injury – resulting in attendance of at least one person to an emergency department of a hospital, but not subsequently admitted for a hospital stay
- Minor/ other injury – resulting in injury for at least one person, without any record of hospital stay or emergency department attendance
- Non-casualty (towaway) – not resulting in injury to any parties.

Table 5-24 provides a summary of injury crashes and numbers of people injured.

**Table 5-24: Crashes by severity**

| Crash severity | Number of crashes | Percentage of crashes | Number of people injured |
|---|---|---|---|
| Fatal injury | 0 | 0% | 0 |
| Serious injury | 30 | 16% | 30 |
| Moderate injury | 63 | 34% | 72 |
| Minor/ other injury | 64 | 34% | 76 |
| **Total injury crashes** | **157** | **84%** | **178** |
| Non-casualty (towaway) | 30 | 16% | 0 |
| **Total crashes** | **187** | **100%** | **178** |

### 5.9.2 Crash locations

The road network around Central Precinct services a mix of movement types, including vehicles, cyclists and pedestrians travelling in all directions. With intersections being the point of conflict for differing desire lines, most of the crashes recorded around Central Precinct occurred at intersections, accounting for 70 per cent of all crashes. Non-intersections crashes account for 30 per cent of all crashes.

Table 5-25 shows the physical location of all crashes recorded around Central Precinct during the five-year period. It is evident that crashes are primarily concentrated along high pedestrian activity areas, such as on Eddy Avenue, along Chalmers Street near the station access in the east, and along Regent and Lee Streets. Most of the 19 total crashes recorded along the Great Western Highway within the crash data boundary are attributed to the Pitt Street/ Lee Street/ Great Western Highway intersection, where very high incidences of accidents have been recorded.

**Table 5-25: Crashes by location type**

| Crash location type | Number of crashes | Percentage of crashes |
|---|---|---|
| Non-intersection crashes | 56 | 30% |
| One-way street | 9 | 5% |
| Two-way undivided | 36 | 19% |
| Divided road | 11 | 6% |
| Intersection crashes | 130 | 70% |
| T-intersection | 60 | 32% |
| X-intersection | 47 | 25% |
| Y-intersection | 1 | <1% |
| Multiple intersections | 22 | 12% |
| Other crash location | 1 | <1% |
| **Total** | **187** | **100%** |

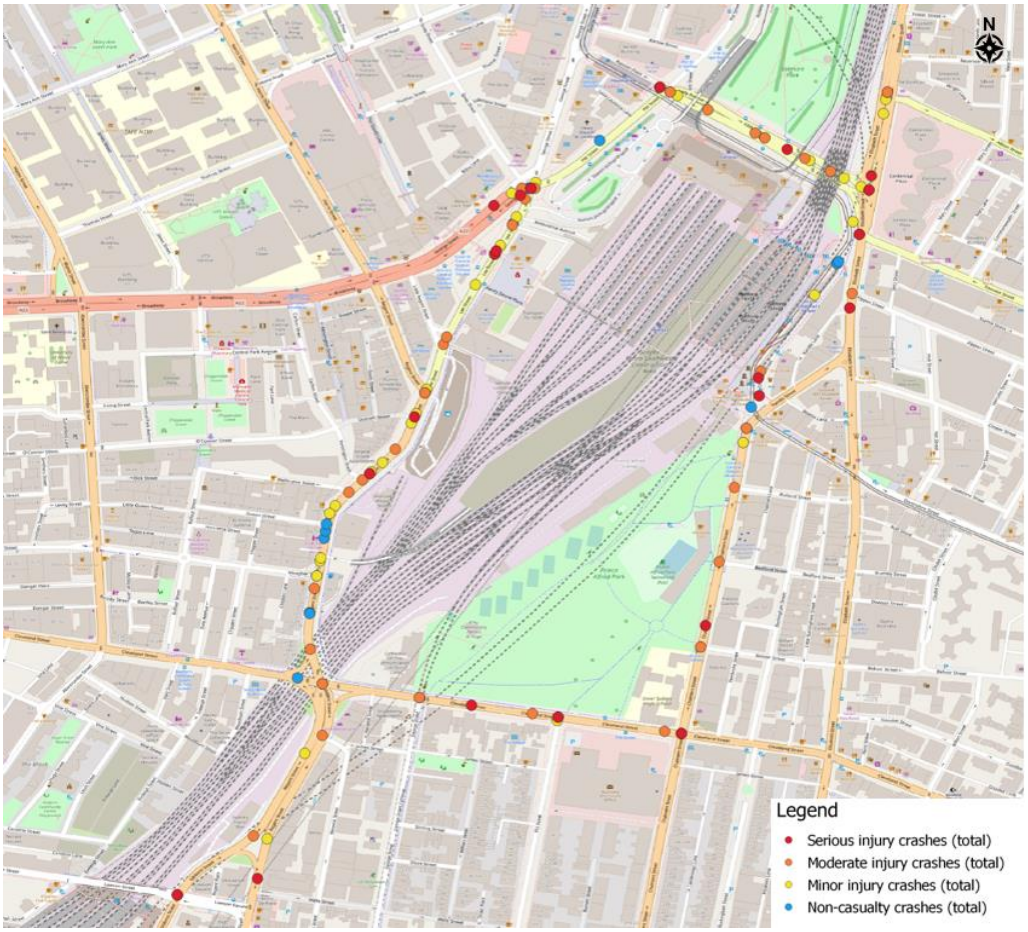



**Figure 5-16: Crash locations around Central Precinct**

Table 5-26 provides a summary of the streets on which crashes have occurred. An analysis of crash locations around Central Precinct indicates that 42 per cent of crashes occurred to roads directly adjoining the station to the west of the Precinct, primarily along Regent Street and Lee Street. Of the recorded crashes, 22 per cent occurred directly east of the Precinct, primarily on Elizabeth Street and Chalmers Street. 17 per cent of crashes occurred on Cleveland Street, and 13 per cent occurred on Eddy Avenue. Overall, 84 per cent of crashes that occurred around Central Precinct resulted in injury.

Table 5-27 provides an overview of the severity of crashes recorded for pedestrians and cyclists.

Of the 187 crashes recorded around the Precinct, 52 crashes involved pedestrians and 25 crashed involved cyclists.

Compared to crashes involving only vehicles, the incidence of serious or moderate injuries are higher when vulnerable road users such as pedestrians or cyclists are involved, with 27 per cent of all crashes involving pedestrians resulting in serious injury that required hospital admission, and 48 per cent resulting in moderate injury that required attendance to a hospital's emergency department. When considering crashes involving cyclists, 15 per cent resulted in serious injury, and 52 per cent resulted in moderate injury.

**Table 5-26: Crashes by location**

| Street name | Number of crashes | Percentage of crashes | Casualty crashes | Percentage of crashes resulting in injury |
|---|---|---|---|---|
| **West** | | | | |
| Regent Street | 41 | 22% | 30 | 73% |
| Lee Street | 21 | 11% | 19 | 90% |
| Great Western Highway at Pitt/ Lee Street | 19 | 10% | 16 | 84% |
| Pitt Street | 3 | 2% | 2 | 67% |
| **East** | | | | |
| Elizabeth Street | 21 | 11% | 19 | 90% |
| Chalmers Street | 17 | 9% | 14 | 82% |
| Randle Street | 1 | 1% | 1 | 100% |
| **South** | | | | |
| Cleveland Street | 31 | 17% | 27 | 87% |
| **North** | | | | |
| Eddy Avenue | 23 | 12% | 21 | 91% |
| **Other** | | | | |
| Gibbons Street | 7 | 4% | 6 | 86% |
| Rawson Place | 2 | 1% | 1 | 50% |
| George Street | 1 | 1% | 1 | 100% |
| **Total** | **187** | **100%** | **157** | **84%** |

**Table 5-27: Pedestrian and cyclist crashes by severity**

| Crash severity | Pedestrian crashes | Pedestrian crash proportion | Cyclist crashes | Cyclist crash proportion |
|---|---|---|---|---|
| Fatal injury | 0 | 0% | 0 | 0% |
| Serious injury | 14 | 27% | 4 | 15% |
| Moderate injury | 25 | 48% | 13 | 52% |
| Minor/ other injury | 13 | 25% | 8 | 32% |
| **Total crashes** | **52** | **100%** | **25** | **100%** |

During the five-year period, two crashes were recorded between a pedestrian and a cyclist, both of which resulted in moderate injury. However, it should be noted that there is a potential gap in the data, as any minor injury crashes that didn't result in emergency department or hospital admission would not have been reported.

Figure 5-17 and Figure 5-18 show the physical locations of pedestrian and cyclist crashes, respectively.

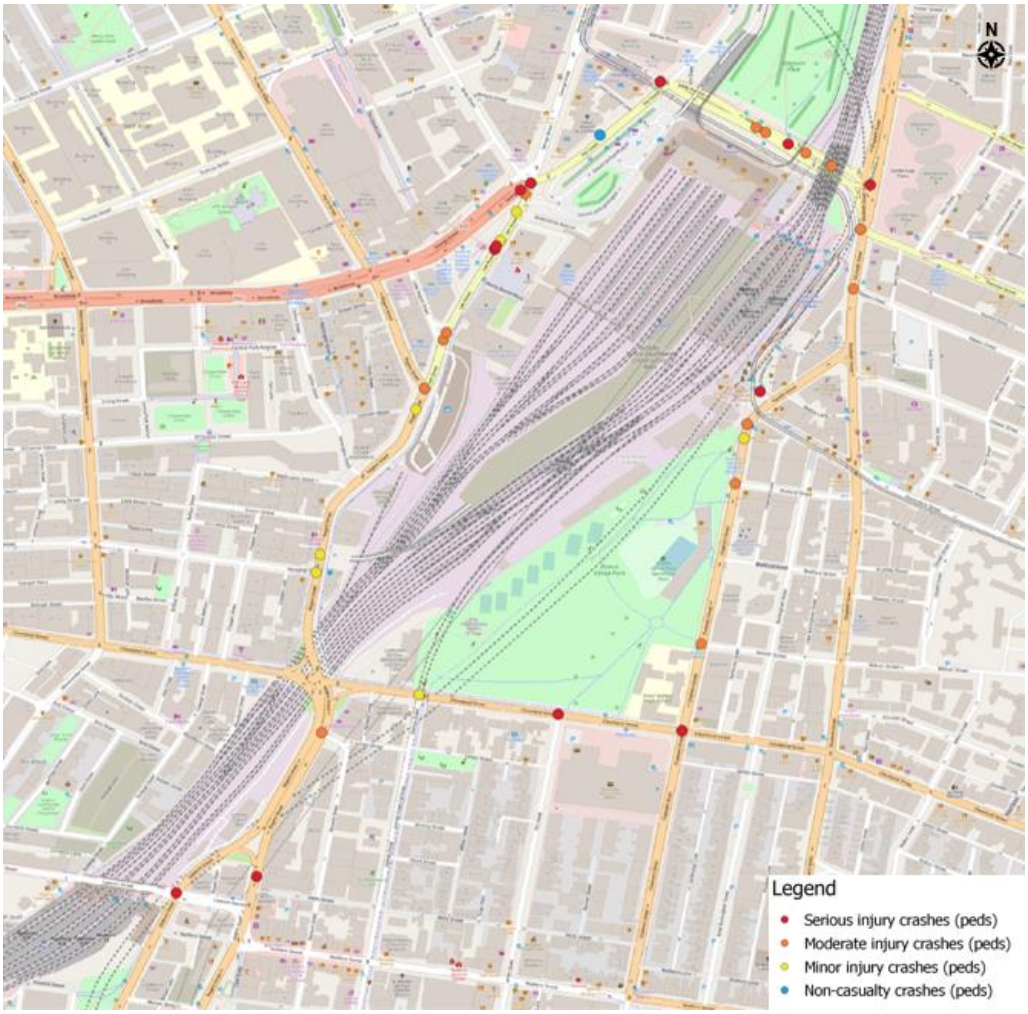



**Figure 5-17: Locations of pedestrian crashes around Central Precinct**

Pedestrian crashes are concentrated primarily around the station accesses on Eddy Avenue, Chalmers Street and Lee Street, with a greater concentration of incidents at the traffic signals at the intersection between Lee Street and Pitt Street. Cyclist crashes have been recorded primarily along movement corridors such as Lee Street, Regent Street, Cleveland Street and Chalmers Street near the station access.

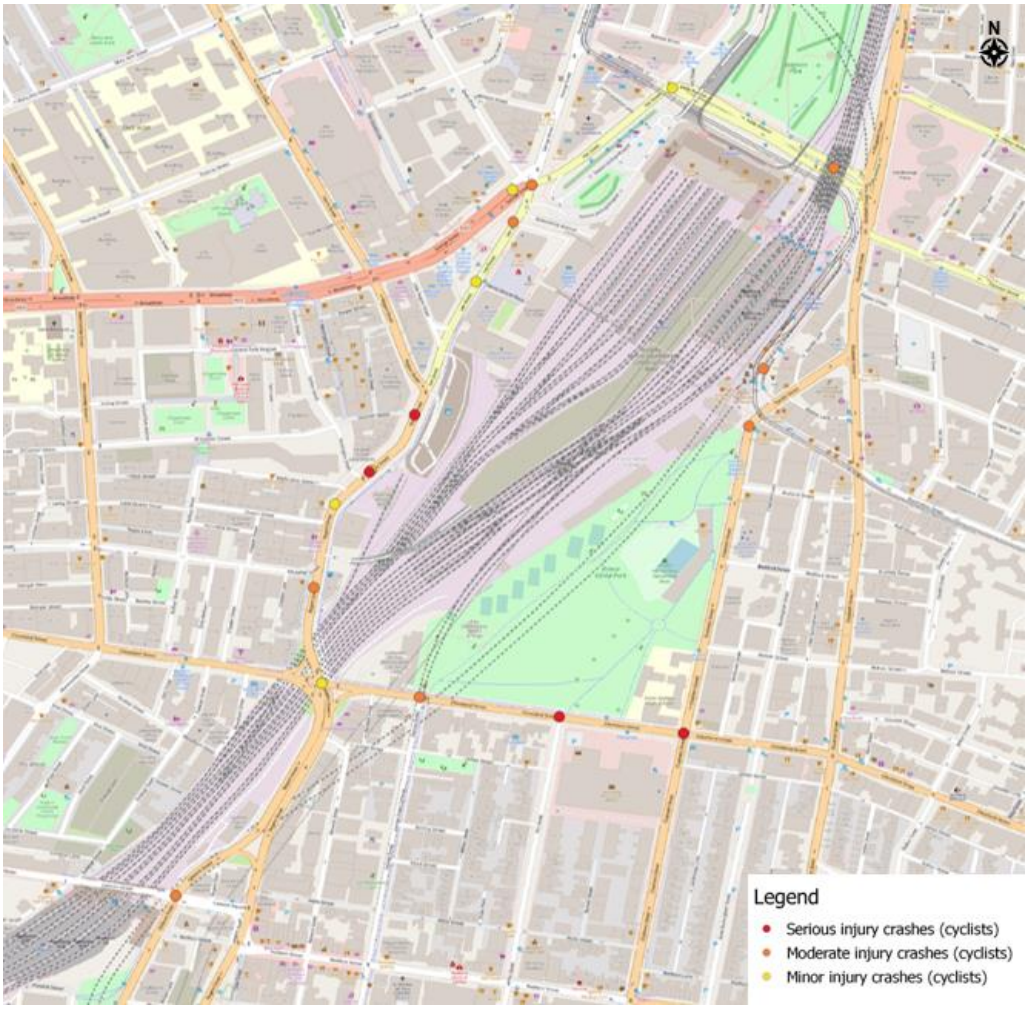



**Figure 5-18: Locations of cyclist crashes around Central Precinct**

### 5.9.3 Road safety performance

The road safety performance for the road network surrounding Central Station were assessed by estimating the crash rates that would occur per 100 million vehicle kilometres travelled (MVKT) on various road sections. This is an industry-accepted measure of crash exposure that is used to compare the frequency of crashes across different roads with varying levels of traffic demand.

The following data was used as input to perform crash data analysis by MVKT:

- Number of crashes recorded over a five-year period (1 January 2015 and 31 December 2019)
- As there are no permanent midblock count stations located along the network, traffic surveys (classified intersection counts) conducted on Tuesday 30 March 2021 were used to perform a high-level estimate of annual daily traffic expected on various road sections.

As the crash data extends back to 2015, it includes incidents recorded on roads that have undergone significant upgrade works to enable the implementation of the light rail. This includes but is not limited to the closure of Chalmers Street and changes to Eddy Avenue and Rawson Place.

Table 5-28 provides an overview of estimated crashes that would occur per 100 MVKT travelled on the road network surrounding Central Station, providing a platform for comparison of the relative incident rate on the road sections.

**Table 5-28: Estimated crashes per 100 MVKT**

| ID | Road section | Crashes per 100 MVKT | Casualty crashes per 100 MVKT |
|---|---|---|---|
| 1 | Regent Street | 501 | 367 |
| 2 | Lee Street | 340 | 307 |
| 3 | Great Western Highway | 335 | 282 |
| 4 | Pitt Street | 21 | 14 |
| 5 | Eddy Avenue | 189 | 173 |
| 6 | Elizabeth Street | 96 | 86 |
| 7 | Randle Street | 32 | 32 |
| 8 | Chalmers Street | 100 | 83 |
| 9 | Cleveland Street | 97 | 85 |

Figure 5-19 and Figure 5-20 present a visualisation of the estimated crashes along the road network per 100 MVKT.

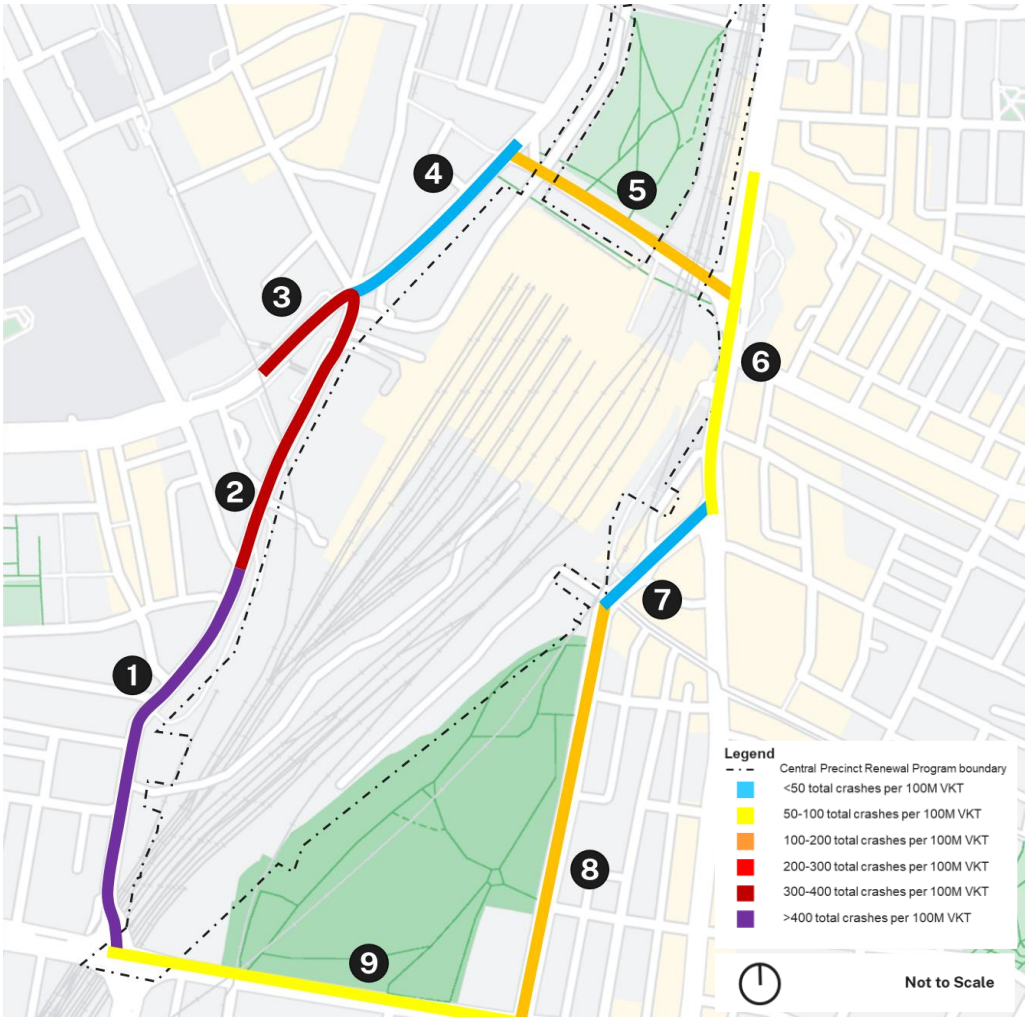



**Figure 5-19: Estimated crash frequency by 100 MVKT**


**Figure 5-20: Estimated casualty crash frequency by 100 MVKT**

## 5.10 Movement and place analysis

Movement and Place is a place-based approach to the planning, design, delivery, and operation of transport networks. It provides a framework to understand the function of streets in the context of their value to the community and recognises the impact between streets and the spaces they adjoin. The framework is a tool that enables the balancing of the movement of people and goods with maintaining and enhancing the amenity and quality of places.

### 5.10.1 Understanding place

To understand places around Central Precinct, the *Practitioner's Guide* to *Movement and Place* (GANSW, 2020) outlines the framework for what qualifies places and future placemaking in the Precinct. The Guide offers three lenses through which places can be defined, consisting of physical form, the activities that happen within them and their shared meaning to people. The combination of these three factors contributes to creating place intensity.

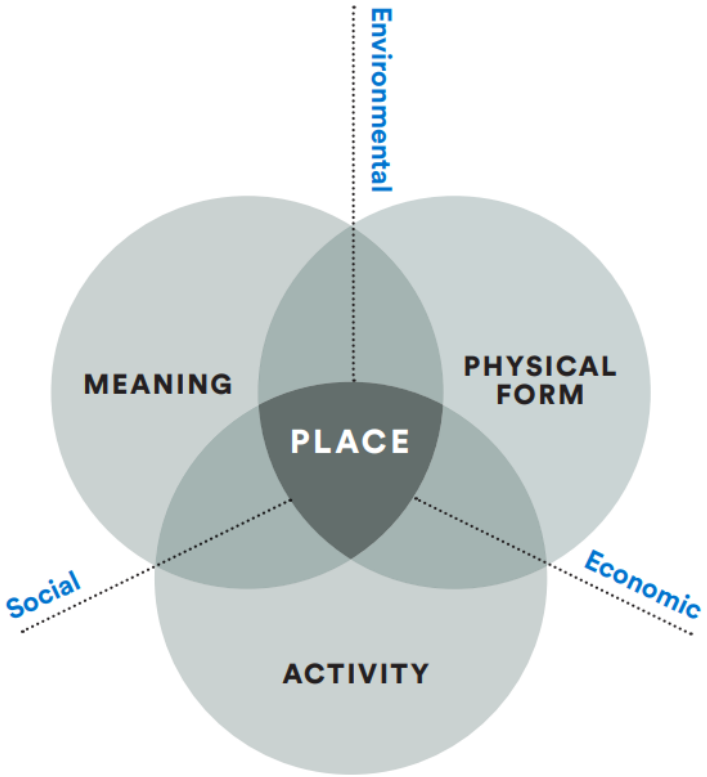



**Figure 5-21: The synthesis of place through meaning, physical form, and activity**

Physical form is a combination of the layout of buildings, movement networks and open spaces; the way in which the land is subdivided and configured to form lots; and the type, function and use of the built form.

Activity is the type, diversity or intensity of the ways a place is used or enjoyed.

The meaning of a place reflects how they are commonly valued by the local people and communities. It is an aspect of the place that is typically built over time and usage.

### 5.10.2 Current places

Sydney's Central Station is Australia's busiest transport interchange, located at the southern edge of Central Sydney. The Precinct extends to the suburbs of Haymarket, Chippendale and Surry Hills.

The station provides transport services for a wide cross-section of customers, including residents and employees of the CBD, students commuting to schools and universities located near the station or connected to it through the transport interchange, visitors to the food and retail businesses nearby as well as travellers arriving in Sydney via the Sydney Kingsford Smith Airport.

The following represent locations of medium to high place intensity in the Precinct:

- educational facilities:
    - University of Technology Sydney
    - TAFE NSW, Ultimo campus
    - Inner Sydney High School

- parks:
    - Belmore Park
    - Prince Alfred Park
    - Chippendale Green (Central Park)
- food and retail areas:
    - Central Park Mall and surrounds
    - Capitol Theatre
    - Restaurants located in Surry Hills to the east
    - Restaurants and retail located in Haymarket to the north-west.

Despite the concentration of land uses and areas with high place value around the station, Central Station itself currently functions as a place for transit, with few areas that attract visits or invite people to dwell.

While there exists the physical form for store fronts located along the southern side of Eddy Avenue underneath the sandstone arches, they receive little activity, and many of the lots are currently unoccupied. Similarly, while there are some food retail businesses located within the Central Food Market at the north-east corner of the unpaid area of the Grand Concourse for station commuters, the area does not hold sufficient meaning to the community for it to be considered high place value.

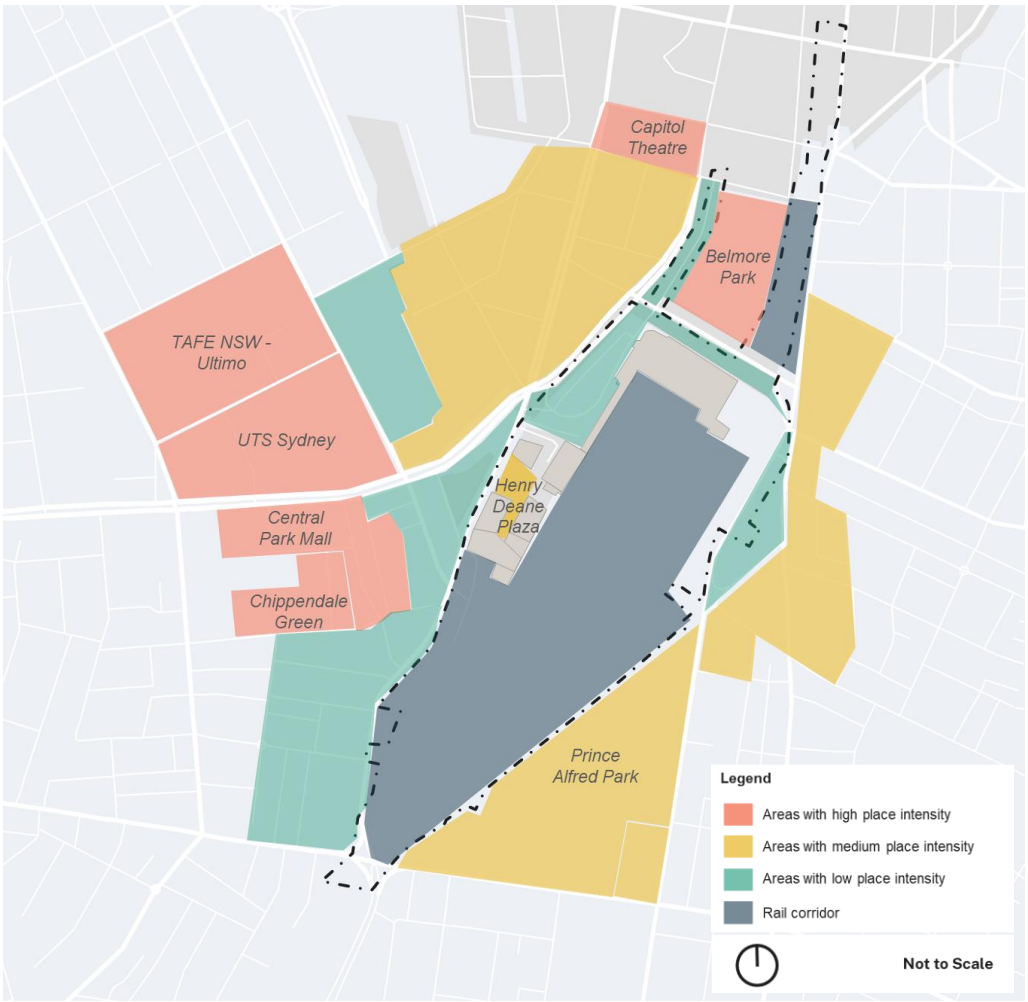



**Figure 5-22: Current place intensity around Central Station**

### 5.10.3 Future places

With the initiatives the Central Precinct Renewal Program proposes in revitalising the station and surrounds as well as developments currently underway in adjoining areas, many new open spaces and future places are planned.

The future Central Precinct offers a new deck over the railway tracks that would be home to commercial buildings, retail, hotels and community-serving facilities.

Figure 5-23 shows the indicative locations of place intensity proposed in the renewal of the Precinct.

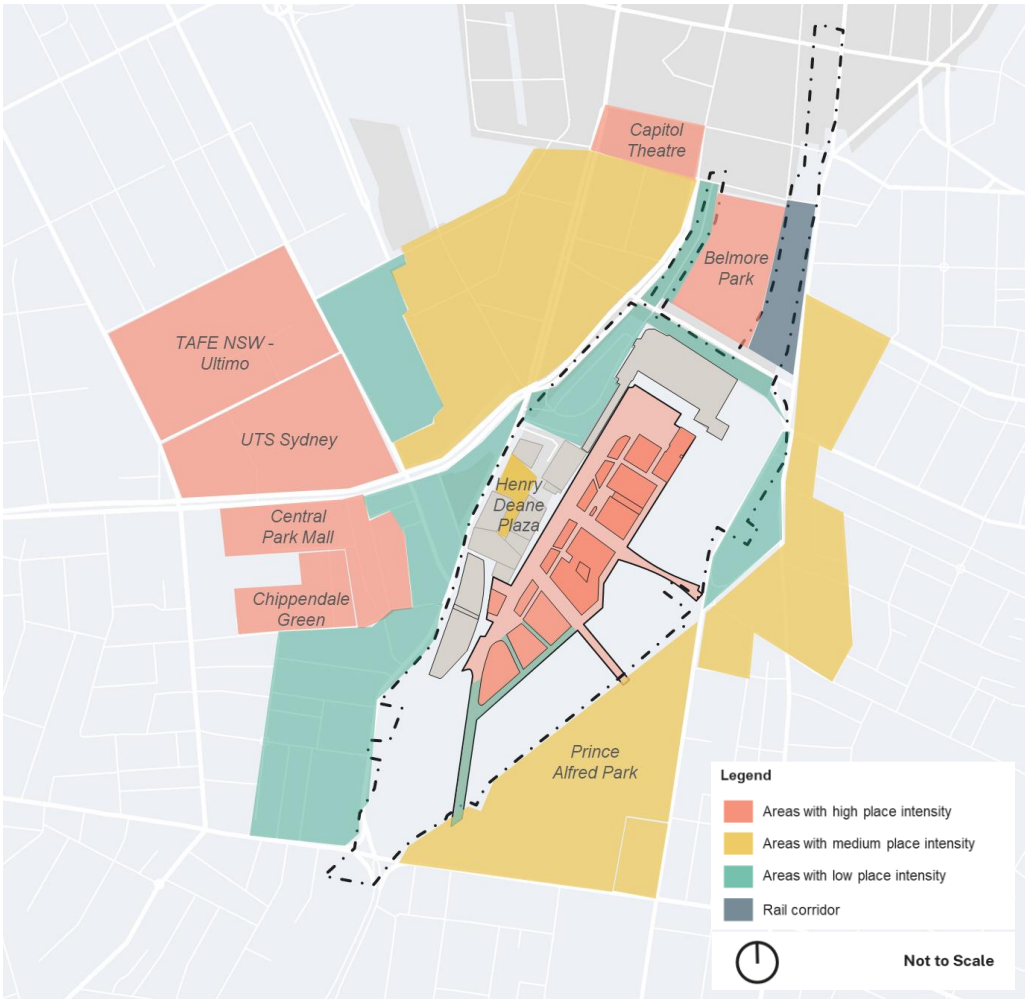



**Figure 5-23: Future place intensity around Central Station**

The value of a place is synthesised through the interactions between physical form, activity and meaning, which are intrinsically linked to the functionality of areas and the interactions visitors have with them.

The proposed developments on the deck would contribute the physical form and activity of a commercial area, with retail and hotels supporting employees, business visitors and tourists. With proposed community facilities and retail that would attract local Sydney residents, the revitalisation of the Precinct and development of the deck presents an opportunity to greatly enhance the value of the place to both visitors and residents of Sydney.

The Precinct will leverage off the intensity of activity that will be provided by commercial developments both on the deck and by Tech Central, which will be an ecosystem of universities, start-ups and tech. Multiple new open areas and green spaces to be located both on the deck and at the street level near these developments will become meeting points that invite activity from employees, retail visitors and the general public.

### 5.10.4 Understanding movement

The *Practitioner's Guide* to *Movement and Place* (Government Architect NSW, 2020) additionally outlines the framework for understanding movement in relation to and from, within and through a place, and classifies it into three distinct groups.

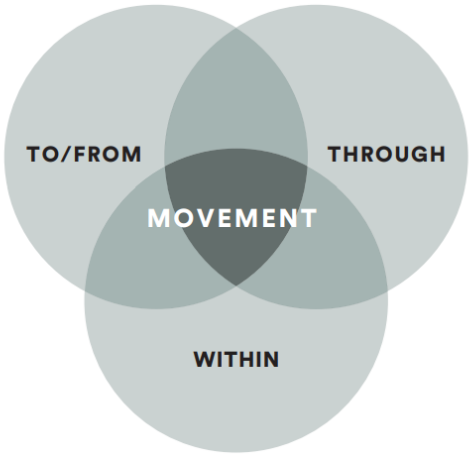



**Figure 5-24: Three types of movement in relation to a place**

Movement through a place does not engage with the area but can impact on it such as in contributing to through vehicle traffic, congestion, noise and pollution reducing amenity. Movement to and from a place interacts with it and connects it to other destinations, and movement within a place is contained within the Precinct.

Viewing the concept of movement through this lens enables an understanding of the complementary relationship between movement and place. The connections within, to and from the Precinct are critical to enabling the intensity of activity that is required to create a high-quality place.

### 5.10.5 Existing movement

Existing movements that travel through Central Precinct consists primarily of vehicular traffic on major roads that do not have a destination in the Precinct. These movements contribute to congestion on the surrounding road network and compete with active and public transport modes for priority at traffic signals. High pedestrian and cyclist movements also travel through the Precinct, crossing between the eastern and western sides of the station via Eddy Avenue and Devonshire Tunnel.

As a major multi-modal transport interchange, movements to and from the Precinct make up the greatest proportion of travel demand. Existing train and bus services connect Central Station to the suburban and intercity network, with frequent all stops and limited services in all directions. Light rail provides a connection to both inner west suburbs and

Movements within the Precinct consist primarily of transfers between modes, such as between heavy rail, light rail and buses.

### 5.10.6 Future movement

Future movements in Central Precinct will include new links to the OSD, as well as through the station. New major connections will include:

- Central Walk, linking the metro and suburban rail platforms, and will extend from Railway Square in the west to Chalmers Street and the light rail stop in the east
- Connections to the OSD, including:
    - Stairs and escalators to the Grand Concourse
    - Stairs and escalators to Central Walk
    - Stairs to City Square
    - Escalators to Henry Deane Plaza
    - Stairs to the Goods Line
    - Stairs to Mortuary Station
    - Walkway to Prince Alfred Sidings
    - Stairs and escalators to Devonshire Street.

These new links will provide more direct connections over and under the railway tracks, that will enable people to travel across the Precinct more easily in all directions. With a greater number of attractors within the Precinct, higher off-peak movements within the Precinct can be expected, contributed by employees of the OSD.

### 5.10.7 Existing movement and place classification

The designation of corridor classifications was initially undertaken based on speed limits, public transport services, and placemaking elements on every road.

Based on the classification highlighted in the legend, Figure 5-25 exhibits the current street environment/ corridor classification for roads and streets within and surrounding the Central Precinct.

Of the roads surrounding the Precinct, sections of Elizabeth Street, George Street and Broadway are considered main streets. In addition to facilitating high movements of pedestrians, public transport and private vehicles, these streets reflect high place value contributed by food and retail businesses, commercial buildings, educational institutions.

Other major streets adjoining the Precinct include Eddy Avenue and Chalmers Street, which are important transport interchanges and movements corridors located at the station accesses, and function as meeting places for customers of the station.

Roads such as Lee Street, Chalmers Street south of Randle Street and sections of Elizabeth Street function primarily as movement corridors for private vehicles and buses.

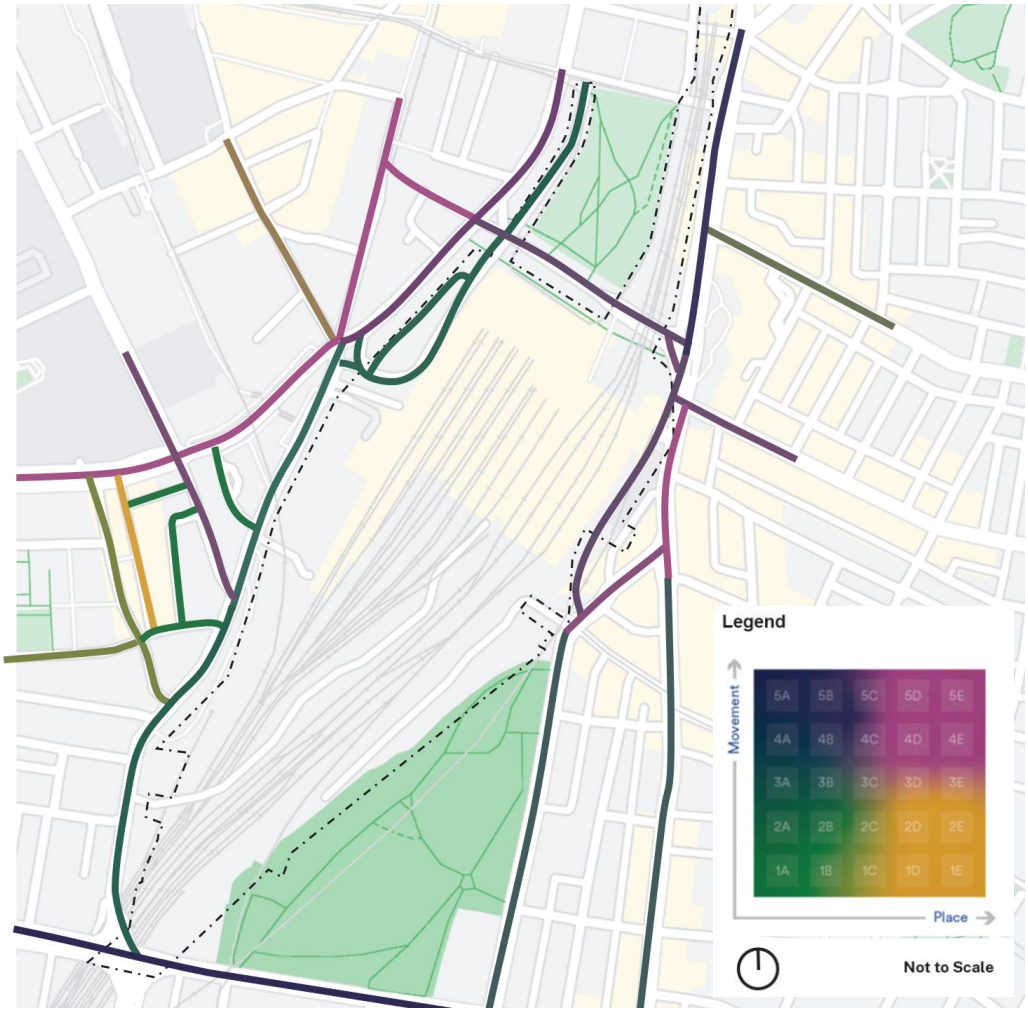



**Figure 5-25: Existing street environments**

### 5.10.8 Future movement and place classification

Due to the extent of the Central Precinct SSP works, few changes are expected to the streets surrounding the station. However, the addition of the OSD provides new areas of high place value through the addition of restaurants and retail, and buildings with commercial, educational and community uses on the deck. Figure 5-26provides an overview of future street classifications under the SSP.

The OSD would be structured so the primary movement corridor would run through the middle of the development, allowing the most direct movements to and from buildings and connecting to Central Walk below the deck. Open green space with seating will be provided around the northern section and western corridor of the deck, and will function primarily as meeting and leisure areas for visitors and employees of the OSD, and as a secondary walkway across the deck.

Outcomes of Central Precinct will enable the activation of existing storefronts along Eddy Avenue, of which many are currently vacant. This can be expected to help improve the place value of the street by attracting visitors under the historic sandstone arches.

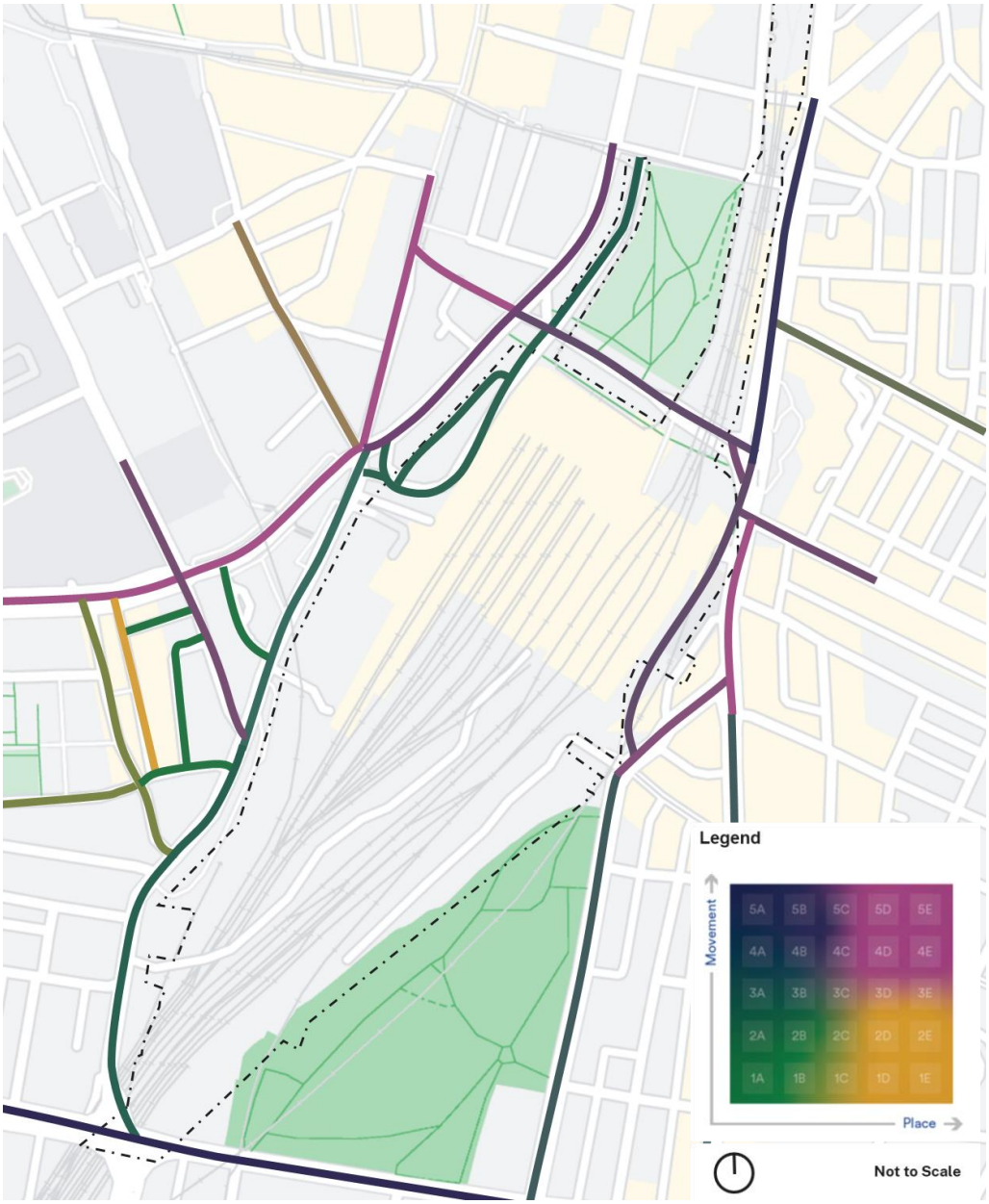



**Figure 5-26: Future street environments around Central Precinct**

## 5.11 Cumulative impact assessment

There is the potential for cumulative transport impacts from the project and other proposed developments surrounding the project. Section 2.4 identified key infrastructure, service and development projects that have the potential to have a cumulative impact with Central Precinct. These projects include:

- Sydney Metro and Metro West
- Fast Rail
- More Trains More Services
- Sydney's Bus Future
- WestConnex

- Tech Central
- Pyrmont urban renewal.

A qualitative assessment of associated potential cumulative impacts during operation is provided below. This is based on the most current publicly available information at the time of this assessment.

### 5.11.1 Sydney Metro and Metro West

Sydney Metro will introduce a new Metro Station within Central Precinct. Opening in 2024, the new link will connect Chatswood in the north to Bankstown in the south-west, including access to other new stations at Crow's Nest, Victoria Cross (North Sydney), Barangaroo, Martin Place and Pitt Street.

Within Central Precinct, Sydney Metro is expected to add 11,600 additional movements through Central Station in the AM peak hour in 2036, either through transferring to suburban or regional rail services, or entering/ exiting the station to the surrounding precinct. Travel patterns beyond study area are also expected to occur, with reduced patronage on North Shore line, as well as reduce demand for buses travelling from North Sydney.

The assessment for Central Precinct has considered both the increase in passenger movements, and the likely changes to travel patterns and how journeys to Central Station may change over the next 20 years. Demand forecasts have included demands associated with the new Metro platforms, as well as demands to bus stands within the precinct.

Preliminary demand forecasting and modelling of pedestrian movements through the station suggest Sydney Metro will reduce passengers using Platforms 16 and 18 and increase demand through Central Walk East. External to the station, no clear change in pedestrian movements attributed to Sydney Metro, due to the quantum of activity across the study area.

Overall, Sydney Metro is a positive contributor to the vision of Central Precinct, with the project acting as a driver for improved pedestrian connections within Central Station and in the surrounding area. While new Metro services will add additional movements into the station, the expanded catchment enabled by the new network will support the adopted mode share targets.

### 5.11.2 Fast Rail

Fast rail looks to deliver faster rail corridors within regional NSW, improving the capacity, frequency of journey times to and from regional centres. Due to existing network constraints, the main interface hub with the regional fast rail network is expected to be outside of the Sydney CBD, with Central Station likely to play a key role in facilitating transfers between the fast rail hub and the broader suburban and regional rail network.

With the Fast Rail initiative in early stages of planning, the assessment of Central Precinct has not included adjustments to demands or travel patterns linked specifically to Fast Rail. However, changes introduced by the Central Precinct project, including track and signal upgrades, have been included in future forecasts of services to both regional and suburban platforms, and in the subsequent modelling of Central Station and surrounding precinct.

### 5.11.3 More Trains More Services

The More Trains More Services program will provide additional capacity on Sydney's railway lines through new systems, infrastructure upgrades and additional trains. At Central Station, this includes additional services in the AM and PM peak hours along the T2, T4 and South Coast, and T8 lines.

The increase in service reliability and frequency resulting from the More Trains More Services program is expected to see reduced wait times and a leveling of demand across peak and non-peak services. The assessment for Central Precinct has considered the increased frequency of services, with future service capacity and frequency aligning with the assumptions of the More Trains More Services.

Preliminary demand forecasting and modelling of pedestrian movements through the station indicate the More Trains More Services will have a positive impact on passenger activity within Central Precinct. Increasing capacity and frequency of train services reduces waiting time on platforms, allowing for increased passenger capacity through the rail network. The extension of Central Walk West as part of Central Precinct ensures Central Station can accommodate the increased demand attributed to the cumulative impact of More Trains More Services and the proposed development of Central Precinct.

Overall, More Trains More Services is a positive contributor to the vision of Central Precinct, enabling a higher frequency and reliability of train services across the suburban network. This supports the future growth of the network, and ensures demand associated with the proposed Central Precinct development can be accommodated within the rail network.

### 5.11.4 Sydney's Bus Future

Sydney's Bus Future is a long-term plan to introduce new rapid bus routes across the Greater Sydney area, as well as simplify the existing bus network through rationalisation of bus stops and creating more direct bus routes. Around Central Precinct, Eddy Avenue and Railway Square will remain key interchange locations for buses, with Broadway, Regent Street, Eddy Avenue, Elizabeth Street and Chalmers Street all forming part of the planned city centre key bus corridors.

Given the interchange role Central Precinct plays in connecting bus services with multiple modes of transport and the high demand for bus services, there are no current plans to remove bus stands. The assessment for considered both the increase in demand within the bus network, how future occupants of Central Precinct may travel via bus to the precinct, and accessibility from each bus stand to the OSD and other key developments.

As noted in Section 5.6.3, preliminary precinct modelling identified that there is likely to be increased congestion around bus stands throughout the precinct, due to the position of key bus interchanges within high activity pedestrian movement corridors. While Sydney's Bus Future is a positive contributor to the vision of Central Precinct, the increased activity around bus stands will require further mitigation, when considering the background activity of both pedestrians and bus users, and the demand attributed to the development of Central Precinct.

There are opportunities in conjunction with the CPRP program to improve access to bus stands within Central Precinct, including along Eddy Avenue and Railway Square. This may include priority bus spines, with continuous bus lanes second from the kerb and dedicated off-line stopping bays.

### 5.11.5 WestConnex

WestConnex is a staged upgrade of the motorway network west and south of Sydney, connecting western Sydney, Sydney Airport and Port Botany and south and south-western Sydney. Once complete, WestConnex will act as the western CBD bypass, improving east-west connectivity to the south of the Sydney CBD and reducing vehicle demands on the arterial road network.

Around Central Precinct, WestConnex is expected to reduce through traffic, with traffic volumes decreasing to the west along Regent Street and to the south along Cleveland Street. The transport precinct modelling for Central Precinct will include any changes in demand introduced by WestConnex, to ensure the model and the resulting assessment is reflective of expected future traffic patterns. This report will be updated to reflect the outcomes of the modelling once complete, with further commentary and assessment of the impact of WestConnex on Central Precinct to be provided at that time.

### 5.11.6 Tech Central

Tech Central is the future focal point of Sydney's innovation and technology community. Extending from Central Precinct at its northern point, to Ultimo in the west, Surry Hills in the east and Eveleigh in the south, the area is expected to undergo significant transformation with new commercial and education development.

Given Central Precinct's location, the assessment of the proposed future development has considered and included the expected demand associated with Tech Central. The Western Gateway precinct, which forms a part of Central Precinct and Tech Central but not directly included in the SSP, has been included in the demand forecasting, pedestrian modelling and other transport mode assessments for Central Precinct.

Beyond the study area, Tech Central has also influenced travel patterns and movements to and from Central Station. Population and employment projections for Tech Central, together with the areas to the east, north and west of Central Station, have been used to identify how pedestrian movements may change over time, and then integrated into the demand forecast calculations and subsequent modelling of the precinct.

The preliminary modelling identifies the Western Gateway as a key destination for pedestrians, accounting for 7,300 trips within the precinct during the AM peak hour, with 4,700 of those to and from Central Station. The broader Tech Central area increases trips to the southwest, with high pedestrian demands travelling along the George Street/ Broadway corridor.

When considered in conjunction with Central Precinct, the key movement corridors and pedestrian activity for both the Western Gateway and Tech Precinct are generally located away from activity associated with Central Precinct during peak periods. In off-peak periods, the complementary land-uses across Central Precinct, the Western Gateway and the broader Tech Precinct will create trips between destinations across the three zones. The pedestrian network for Central Precinct and the Western Gateway have been design with this in mind, allowing pedestrians to move efficiently between the two without moving onto the external network.

The inclusion of Central Precinct within Tech Central is both reflective and supportive of Central Precinct's vision. The proposed development of Central Precinct, alongside the Western Gateway, form part of Tech Centrals northern anchor. While the trip generation for both Central Precinct and the Western Gateway is significant, the directionality of movement during peak periods ensures the cumulative demands associated with both planned and proposed development can be safely accommodated.

### 5.11.7 Pyrmont urban renewal

The Pyrmont urban renewal area, located west of Central Precinct extending from Broadway to Johnstons Bay, will grow to accommodate 8,500 additional residents and 23,000 jobs over the next 20 years. The Ultimo Precinct, located adjacent to Central Precinct, will account for a significant portion of this growth.

The urban renewal of Pyrmont has had a direct influence into demand generation and trip distribution across Central Precinct. Similar to Tech Central, future population, employment and student data for Pyrmont and Ultimo have been used to understand likely changes in movements to and from Central Precinct, and the key corridors and connections between the two areas. This has been used as inputs into the pedestrian trip generation forecasts, with the precinct model allowing for a detailed analysis of pedestrian connections across Lee Street and George Street towards Ultimo.

As identified in Section 5.4, there are significant pedestrian demands crossing both Lee Street and George Street towards Ultimo. The introduction of Central Walk West is likely to encourage more pedestrian movement at street level, bypassing the existing Devonshire Tunnel alignment and extension underneath George Street towards the Goods Line. Improving pedestrian connectivity across this corridor will be key in providing a clear link between the Pyrmont urban renewal area, and the future development at Central Precinct.

## 5.12 Summary of impacts

### 5.12.1 Overall

The overall assessment of transport impacts due to the Central Precinct proposal has shown that:

- The additional pedestrian and broader transport demand generated by Central Precinct is high, in recognition of the precinct's scale. However, majority of growth in demand and activity is attributed to trips through Central Station, rather than the proposed development.
- The adopted mode share for Central Precinct is ambitious, however, it is both reflective of the vision and aspirations of the Central Precinct project, and the characteristics of the precinct and expected infrastructure investment.
- Travel plans will be required to support the adopted mode share. These should include information programs for sustainable transport, active transport initiatives, flexible working hours and proactive cooperation between agencies should be delivered and monitored by future developers of Central Precinct to encourage workers, visitors and residents to choose alternatives to driving.
- Broader capacity enhancements realised through the More Trains More Services program, Sydney's Bus Futures and other infrastructure investment initiatives are necessary to accommodate the growth in transport demand, both with and without the development of Central Precinct.
- Noting the importance of Central Station as a major transport interchange, there is potential for Central Precinct to impact on transport operations. The planning and implementation of Central Precinct should minimise any negative impact on operations created by the development of Central Precinct and enhance safety and operational efficiency of the interchange where possible.

### 5.12.2 Walking and cycling

The assessment of walking and cycling impacts due to the Central Precinct proposal has shown:

- The majority of pedestrian and cyclist demand generated within Central Precinct would be due to Central Station, and not the proposed development.
- Additional infrastructure improvements are required to support the expected increase in pedestrian movement towards:
    - Ultimo and the Railway Square bus interchange, including improving access across Lee Street and George Street west of Central Station.
    - Haymarket, across the intersection of Pitt Street and Eddy Avenue
    - Belmore Park and the Eddy Avenue bus interchange, crossing at the pedestrian signals on Eddy Avenue
    - Surrey Hills, crossing at the intersection of Elizabeth Street and Foveaux Street.
- Increased footpath widths on George Street towards Broadway should be investigated given this route forms a major pedestrian desire line
- Infrastructure works to support the above pedestrian desire lines should consider the reallocation of road space in line with the road user hierarchy identified in Section 4.1.
- The expansion of Central Walk towards Lee Street safely accommodates east-west movement across Central Station and is further supported by new connections over the station and the existing Devonshire Tunnel.
- Cycling infrastructure to support Central Station would significantly improve access to Central Precinct,
- The proposed planning framework for Central Precinct should include bicycle parking rates that are in closer alignment with the 7.5 per cent cyclist target mode share for the Central Precinct.
- Further modelling of pedestrian movements will be completed to align with the revised forecasts, with this report to be updated with the detailed findings.

### 5.12.3 Public transport

The assessment of public transport impacts due to the Central Precinct have identified:

- the additional passenger generated by the development of Central Precinct through Central Station is expected to account for eight per cent of all future movement through the station.
- the increase in services due to More Trains More Services, together with the introduction of Sydney Metro services into Central Precinct is considered sufficient to cater for the forecast demand associated with Central Precinct, as well as the cumulative demand from future developments across Tech Central and the Ultimo-Pyrmont area.
- the additional light rail demand generated by Central Precinct, together with the anticipated background growth, can be accommodated by existing light rail services.
- the additional bus trip demand generated by Central Precinct, together with the anticipated background growth, can be accommodated by the future bus network and servicing levels.

- increased pedestrian congestion at some bus stands around Railway Square and on Eddy Avenue may conflict with traversing pedestrian movements. Additional space for both waiting passengers and moving pedestrians should be considered in these locations.
- further modelling of public transport activity be completed to align with the revised demand forecasts, with this report to be updated with the detailed findings.

### 5.12.4 Road network

The assessment of road network impacts due to the Central Precinct proposal have identified:

- the road network is constrained and congested and hence future car mode share for Central Precinct should be restricted.
- the anticipated traffic impact of a limited private vehicle scenario (including delivery and service vehicle demand) would have a negligible impact to the wider road network.
- pedestrian activity associated with Central Precinct and Central Station is likely to create additional strain on the road network A future road network around Central Precinct due to pedestrian crossings competing against road traffic for signal time.
- there may be opportunities to reallocate road space to support the growth in pedestrian activity around Central Precinct, including along Eddy Avenue to the north, and on Lee and George Streets to the west.
- further modelling of the road network movements will be completed to align with the revised demand forecasts and the cumulative impact created by WestConnex on the broader road network. This report to be updated with the detailed findings.

### 5.12.5 Parking, loading and site access

The assessment of access, parking and loading impacts due to the Central Precinct proposal have identified:

- high levels of accessibility and non-car options available to future residents, workers and visitors to Central Precinct minimises the need for parking provision.
- the proposed planning framework for Central Precinct include maximum parking requirements that are in closer alignment with the target mode share.
- the proposed planning framework for Central Precinct include a minimum requirement of one car share space per 25 off-street car spaces to be provided.
- access onto the deck over the station could be provided via an autonomous shuttle from a connection through Prince Alfred Park from Cleveland Street. This would provide ‘last mile’ access to the Central Avenue, ensuring the public realm and developments within Central Precinct are accessible for all ages and abilities, while also maintaining security provisions above the rail corridor.
- the introduction of integrated distribution facilities for Central Precinct would accommodate deliveries, service vehicles and waste collection away from the public realm and allow for the consolidation of goods for delivery across the precinct to their destination.
- the adoption of integrated loading management system to manage loading and servicing activities across Central Precinct will smoothen vehicle demand peaks and reduce the frequency of vehicles crossing over footpaths around Central Station during peak periods.
- a Delivery and Servicing Management Plan should be prepared for the precinct and each dock as appropriate to identify and confirm the servicing strategy for the precinct (including the station and rail infrastructure as appropriate).

- provision of point-to-point locations surrounding the precinct would minimise traffic and amenity impacts around the station precinct.
- vehicular access to Central Precinct has been positioned away from key pedestrian movement corridors to reduce delays and the potential of conflict between vehicles and pedestrians.

# 6. Preliminary construction approach and staging

## 6.1 Overview

There is currently no formal construction program for Central Precinct. However, potential construction activities and key stages have been identified that allow for the identification of likely transport impacts and mitigation measures.

- **Stage 0 – Preliminary and independent works** comprise of elements of Central Precinct that can either be completed independently of the OSD, or are required as part of the early works and construction staging process. These are expected to occur between 2023 and 2026.
    - **Part A Enablement Works** – would include the redevelopment of the Terminal building and Regent Street sidings site (including the Lee Street bus layover). The southern loading dock is expected to be constructed as part of the sidings site development.
    - **Part B - Central Walk West and Platform enabling works** includes the construction of Central Walk West, and alterations to the regional platforms of Central Station to enable the future construction of the OSD. The northern loading docks, located under the Western Forecourt, is expected to be constructed during this phase.
    - **Part C - Redevelopment of Goulburn Street and Prince Alfred Sidings** includes the redevelopment of the Goulburn Street and Prince Alfred Sidings sites, including associated loading facilities.
- **Stage 1 – Over Station Development Block A buildings** is the first stage of the OSD and includes the buildings on the northern section of the site. This will also include the connection from Central Walk up to the OSD, a portion of the OSD public domain, and the connection over the suburban rail lines to Chalmers Street.

  This is expected to occur from 2031 to 2033-34.
- **Stage 2 Over Station Development Block B and partial Block C buildings** is the second stage of the OSD construction and includes buildings and public domain in the central section of the OSD, including the land bridge connection to Prince Alfred Sidings.

  This is expected to occur from 2031 to 2034-35.
- **Phase 3 Over Station Development buildings C1-5** is the final stage of OSD construction and includes all buildings in Block C to the south of the precinct. This stage will also likely include the construction of the remaining land bridge connecting to Prince Alfred Park to the south.

  The final phase is expected to be completed in 2036.

These impacts would likely be experienced at various times throughout the construction phase, as works progress and depending on the activity being undertaken.

The key construction activities and potential timeframes for the upgrades to Central Station and the construction of Central Precinct are outlined in Figure 6-1.

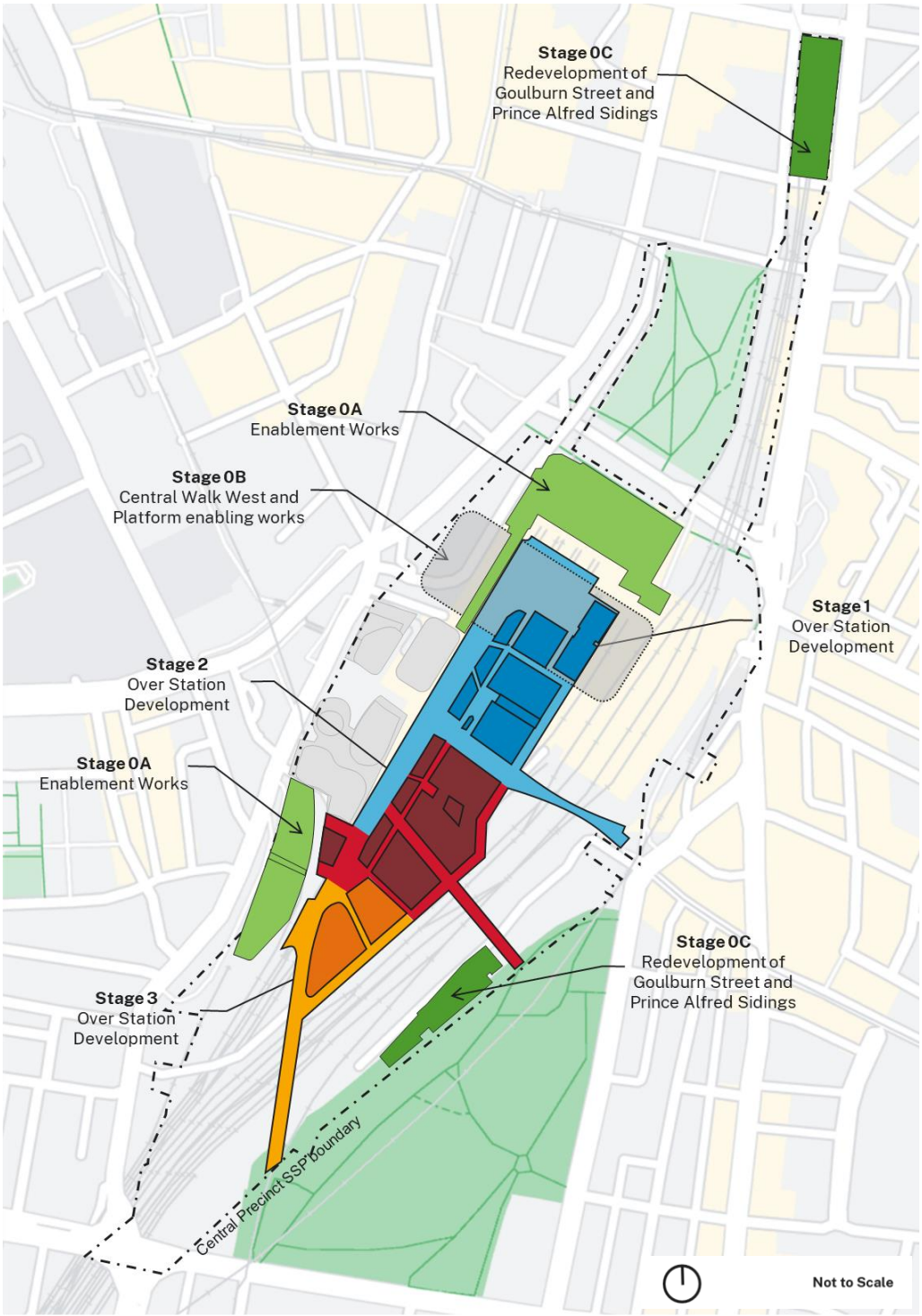



**Figure 6-1: CPRP construction staging and potential timeframes**

## 6.2 Construction traffic routes

Access to Central Precinct for construction vehicles will be dependent on the location of the works.

Site hoarding will be established to separate work zones from adjacent footpaths and pedestrian pathways to maintain the safety of pedestrians in the area. Traffic controllers will be present at the vehicle crossover points to manage interactions with pedestrians and other road users.

Construction vehicles will travel to and from the site via the arterial road network including the Western Distributor, Victoria Road and the City West Link before arriving at the site via Pitt Street, Regent Street and/ or Chalmers Street. Construction vehicles are expected to depart via Regent Street and Broadway when accessing the site from the west, and Chalmers Street when accessing the site from the east.

The potential construction traffic routes are shown in Figure 6-2.


**Figure 6-2: Likely construction traffic access routes**

## 6.3 Construction traffic impacts

The following provides an overview of the likely construction traffic impacts on different road users. They are not indicative of the final impact of construction on access and movement.

### 6.3.1 Pedestrians and cyclists

Construction and related vehicle activity is expected to have a high impact pedestrian and cyclist movements surrounding the site. The movement of construction traffic (including heavy vehicles and worker vehicles) may cause interruptions, particularly when entering and exiting the site during construction.

Where practical, construction site access should be located away from key pedestrian movement corridors (including across the intersection of Elizabeth and Foveaux Streets and adjacent to the Eddy Avenue pedestrian crossing). Where this cannot be achieved, delivery activities and other vehicle movements should be limited to occur outside of peak station activity (outside 7am to 9am, and 4pm to 6pm).Alternative temporary cycling routes to the east or west of the precinct may be required as construction progresses, to reduce any negative impact from construction traffic on cyclists.

### 6.3.2 Commuters and rail users

During construction, some existing pedestrian paths and station access points may need to be closed to facilitate construction. Alternative routes through and out of Central Station would need to be provided with appropriate wayfinding. Sufficient width along these routes would need to be provided to accommodate forecasted pedestrian flows, with timing of closures to be outside peak travel periods.

### 6.3.3 On-road public transport

As outlined in Section 4.5, there are over 50 bus and three light rail services that operate in the vicinity of Central Precinct. Depending on the location of works, there are several services that may pass adjacent or through potential construction zones. This includes along Chalmers Street to the east, Eddy Avenue to the north, and Pitt Street, George Street, Regent Street and Lee Street along the western boundary. Eddy Avenue, George Street and Lee Street carry a sizable number of buses each day, especially during the morning and afternoon peak periods. Construction vehicle arrival and departure times from sites within Central Precinct will need to be adequately managed to avoid increased congestion for the public transport network in the surrounding area and reduce flow on impacts to services across the Sydney CBD.

### 6.3.4 Station operations

During construction of Central Precinct, servicing, deliveries, and maintenance activities will need to occur to ensure Central Station continues to operate at appropriate levels. Temporary loading dock facilities will be required to support ongoing operational activities, with sufficient vehicle spaces to align with vehicle demand. A logistics demand management system may be required to balance available space across the loading areas during construction of the precinct. Emergency vehicles will travel along the arterial road network around Central Precinct as their route of choice so that they reach their destination as soon as possible. Construction traffic management across the precinct must ensure emergency vehicles have priority when passing through and around the construction site.

## 6.4 Construction traffic management principles

A Construction Traffic Management Plan (CTMP) would be prepared for each stage of construction for Central Precinct and be submitted to the appropriate authorities for approval ahead of adoption and implementation. The CTMP would outline the guidelines, general requirements and specific procedures to be used for any works that may have an impact on traffic operation and be prepared in accordance with City of Sydney's requirements.

The primary objectives of the CTMPs will be to:

- Maximise public safety
- Minimise disruption to pedestrians, cyclists and motorists
- Ensure construction traffic accesses the arterial network as soon as practicable on route to, and immediately after leaving, the construction site
- Ensure buses and light rail services run on time with no disruption to routes and stops, where possible
- Minimise changes to traffic operation and kerbside access
- Minimise construction traffic generation during network peak periods
- Maintain access to properties and businesses
- Work collaboratively with other stakeholders and other major projects to mitigate traffic and transport impacts.

## 6.5 Mitigation measures

The adoption of mitigation measures during construction of Central Precinct will ensure construction activities have limited impact on road users, station and public transport operations and the broader road network in general. The traffic, transport and access-related mitigation measures during the construction phase include the following:

- Deliveries will be pre-booked and planned to ensure a consistent and minimal number of trucks arriving at site at any one time
- Vehicles entering, exiting, and driving around the site should be required to give way to pedestrians and vehicles already on the road
- Where possible, vehicles will enter and exit the site in a forward direction. They must wait until a suitable gap in traffic allows them to assist trucks to enter or exit the site
- Neighbouring properties will be notified of construction works and timing
- Materials will be delivered, and spoil removed outside of peak public transport activity within the standard construction hours
- No on-site parking will be provided to encourage the use of public transport to the construction site.
- Traffic controllers will be used to manage traffic on the public street(s) to allow trucks to enter or leave construction sites throughout Central Precinct.

One or more CTMPs would need to be prepared as part of the detailed design stage for each phase of Central Precinct's development. These CTMPs would investigate in greater detail specific impacts of construction activities, and outline specific mitigation measures for approval by the relevant road and/or planning authority.

# 7. Implementation plan and strategy

## 7.1 Approach to management and mitigation

This section provides an overview of the proposed measures to mitigate the impacts of the proposed development of Central Precinct, both during operation and construction.

Some of the issues identified in this transport assessment are expected to occur without the development of Central Precinct. While these may not be directly attributed to the proposed development, the success of the CPRP is intertwined with delivering on the broader capacity and infrastructure projects. In considering and identifying mitigation initiatives, a holistic view of the transport network has been adopted to delivering on the vision of a fully integrated transport network to support the CPRP.

A suite of initiatives has been proposed to support the development of the site and mitigate the impacts on the transport network. These include:

- Mitigation measures and actions that can be addressed through changes to the Planning Framework
- Updates to the Central Precinct master plan
- Supporting infrastructure projects that could be delivered as part of the renewal of Central Precinct (but outside the scope/ boundary of the SSP)
- Infrastructure projects that fall outside the scope of Central Precinct.

Critical to the success of all the identified initiatives, and the corresponding success of Central Precinct, will be the ongoing engagement with stakeholders and transport authorities as the project progresses.

## 7.2 Proposed mitigation measures and provisions

Table 7-1 provides a summary of the proposed mitigation measured identified in response to this transport assessment of the development of Central Precinct, including:

- Identifying the impact or issue as identified in the Transport Assessment
- Outlining the proposed mitigation measure required to address the issue
- Recommending the relevant mechanism to be used for the identified mitigation measure.

The mitigation measures have been developed in alignment with the overall Central Precinct vision and objectives outlined in Section 1.2. Further detail on specific initiatives and solutions to address issues and impacts arising from Central Precinct will be included in these report following the completion of the revised pedestrian and transport modelling.

**Table 7-1: Central Precinct proposed mitigation measures and mechanisms**

| Ref | Impact/ issue | Mitigation measure | Mechanism |
|---|---|---|---|
| Overall | | | |
| A1 | Broader public transport capacity improvements are required to ensure Central Station can accommodate future growth. | Broader capacity enhancements realised through the More Trains More Services program, Sydney's Bus Futures and other infrastructure investment initiatives | Support and implementation of existing/ planned initiatives. These infrastructure projects fall outside the scope of Central Precinct. |
| A2 | There is potential for Central Precinct to impact of transport operations, both during standard operations and under unplanned/ planned distributions | Include objectives within the SSP Framework to ensure that the planning and implementation of CPRP minimise any negative impact on operations created by the development of Central Precinct and enhance safety and operational efficiency of the interchange where possible. | Objectives have been included within the within the design guide of the SSP Framework.. |
| Walking and Cycling | | | |
| B1 | Pedestrian congestion impacting performance of the:<br>• intersection of George Street, Lee Street and Pitt Street<br>• intersection of Pitt Street and Eddy Avene<br>• midblock pedestrian crossing on Eddy Avenue, adjacent to Eddy Plaza<br>• intersection of Elizabeth Street and Foveaux Street<br>• intersection of Broadway and Harris Street. | Investigate and implement the following intiatives:<br>• reprioritising road space on Lee Street to provide additional space for pedestrians<br>• improve pedestrian capacity across the intersection of Pitt Street and Eddy Avenue<br>• improve pedestrian capacity along and across Eddy Avenue<br>• improve pedestrian capacity across the intersection of Elizabeth Street and Foveaux Street<br>• improve pedestrian capacity across the intersection of Broadway and Harris Street. | Investigate potential solutions and seek funding through transport funding initiatives as part of and/ or outside of CPRP. |
| B2 | Congestion on footpaths adjacent to Central Station | Provide wider footpaths along George Street, Eddy Avenue, Broadway, Pitt Street and Quay Street through road space reallocation to support growing pedestrian movements. | Work with the City of Sydney and investigate potential solutions and seek funding through transport funding initiatives as part of and/ or outside of CPRP. |

| Ref | Impact/ issue | Mitigation measure | Mechanism |
|---|---|---|---|
| B3 | The bicycle parking rates specified in City of Sydney DCP 2012 may not achieve target mode share. | Enhance bicycle parking rates support the adoption of a 7.5 per cent cyclist mode for Central Precinct. | Enhanced bicycle parking rates have been included within the design guide of the SSP Framework.. |
| B4 | A minimum of 1,062 visitor cycling spaces across Central Precinct are required to achieve the target mode share. | Provision of visible and secure bicycle parking in the public domain for visitors to Central Precinct. | Visitor bicycle parking rates have been included within the design guide of the SSP Framework., with nomination of preferred locations at a high level |
| **Public Transport** | | | |
| C1 | Increased pedestrian congestion at some bus stands around Railway Square and on Eddy Avenue may conflict with traversing pedestrian movements. | Reallocate road space to accommodate both waiting passengers and moving pedestrians on Eddy Avenue and at Railway Square. | Investigate potential solutions and seek funding through transport funding initiatives as part of and/or outside of CPRP. |
| C2 | High pedestrian demands moving through the precinct create delays and impacts service frequency and reliability of road-based public transport. | Prioritise bus light rail movements at intersections around the Precinct ahead of through traffic to support and maintain service frequency and reliability. | Investigate potential solutions and seek funding through transport funding initiatives as part of and/ or outside of CPRP. |
| C3 | Ensuring regional connectivity for customers accessing Sydney CBD. | Support potential investigations by others into opportunities for a coach terminal facility outside of the Precinct to a location that provides transfer to the public transport network and direct access to the freeway network. | Support and implementation of future investigations. This falls outside the scope of Central Precinct. |
| **Road Network** | | | |
| D1 | The road network around Central Precinct is congested, with limited capacity for additional vehicle demands. | Investigate opportunities to maintain network efficiency and redirecting through traffic to routes that bypass the city centre. | Support and implementation of future investigations. This falls outside the scope of Central Precinct. |
| D2 | High pedestrian demands moving through the precinct create delays and impacts the efficiency of the road network. | Reallocate road space in accordance with road space hierarchy. | Investigate potential solutions and seek funding through transport funding initiatives as part of and/or outside of CPRP. |

| Ref | Impact/ issue | Mitigation measure | Mechanism |
|---|---|---|---|
| **Access, Parking and Loading** | | | |
| E1 | The car parking rates specified in City of Sydney LEP 2012 may not support the reduced private vehicle mode share. | Reduce car parking rates support the adoption of a 'car-free precinct' for Central Precinct. | Updated car parking rates have been included within the statutory instrument of the SSP Framework. |
| E2 | The car share rates specified in City of Sydney DCP 2012 may not support the reduced private vehicle mode share. | Enhance car share rates support the adoption of a 'car-free precinct' for Central Precinct. | Enhanced car share rates have been included within the design guide of the SSP Framework. |
| E3 | Loading and servicing of the precinct will require enhanced management approaches to limit the impact on the surrounding network. | Adoption of integrated loading management system to manage loading and servicing activities across Central Precinct. | Loading and servicing requirements have been included within the design guide of the SSP Framework. |
| | | Adoption of one or more integrated distribution facilities for Central Precinct accommodate deliveries, service vehicles and waste collection away from the public realm and allow for the consolidation of goods for delivery across the precinct to their destination. | |
| | | Preparation of a Delivery and Servicing Management Plan for the precinct and each dock as appropriate to identify and confirm the servicing strategy for the precinct (including the station and rail infrastructure as appropriate). | |
| **Construction Traffic Management** | | | |
| F1 | Potential for Central precinct construction activities to impact on the operations of Central Station, the surrounding transport interface and pedestrian movement through the precinct. | Preparation of a Construction Traffic Management plan for the precinct and each stage as appropriate to identify and confirm the interim servicing strategy for the station and outline how pedestrian access will be maintained throughout construction activities. | Construction traffic management requirements have been included within the design guide of the SSP Framework. |

# 8. Consultation

As part of the preliminary CPRP works, key stakeholders have been engaged to share information, understand needs and aspirations, and seek feedback for the project.

The stakeholder engagement methodology generally undertaken is summarised as follows:

- Providing an overview of the Central Precinct project, and the key transport elements proposed as part of the works
- Enabling a discussion of the overarching principles used to develop the transport elements of Central Precinct project, and how they align and interact with broader strategic direction both the State Government and City of Sydney
- Outlining the approach of the transport assessment, how pedestrian and transport modelling will be used to assess impacts of the development, and how future trip generation was calculated
- Identification of key assumptions used to inform travel patterns, growth, transport network changes and mode share development
- Discussions on supporting projects and initiatives that either support or could be supported by Central Precinct, and what elements should be included in the transport assessment.

Table 8-1 provides an overview of the outcomes of the consultation with key stakeholders.

**Table 8-1: Stakeholder engagement summary**

| Stakeholder | Date of consultation | Outcomes |
|---|---|---|
| Transport for NSW | 2019-2022 | • Multiple sessions with internal TfNSW stakeholders and SMEs |
| City of Sydney | 25 October 2021<br><br>4 May 2022 | • TfNSW to ensure linkages are clearly defined.<br>• TfNSW to provide clarity in documentation around criteria of need for precinct development.<br>• Documentation should be clear on what is included within SSP works and what is a supporting project/ opportunity.<br>• Discussed preferred pathway to SSP release / feedback period for the Transport technical workstream.<br>• Discussed preferred pathway to SSP release / feedback period for the Transport technical workstream. |

| Stakeholder | Date of consultation | Outcomes |
|---|---|---|
| NSW Department of Planning, Industry and Environment | 9 March 2022<br><br>23 May 2022 | • TfNSW provided a short update and presentation on the Transport Impact Assessment being prepared to address the Study Requirements.<br>• TfNSW noted the report forecasting requires updating to include implications of COVID. Key implication is that while transport usage will continue to grow, it is at a decreased rate compared to before COVID. Research shows changed working behaviors and altered trip patterns. Due to this, final Transport Report is delayed to May to allow for the changed forecasting to be incorporated.<br>• CoS asked about the study boundaries selected, including pedestrian study boundary and GSC asked about discussing Active Transport, especially post COVID uptake in cycling and ease of east-west movements. |
| Greater Sydney Commission | 31 January 2022 | • No issues raised |

# 9. Conclusion and recommendations

The following recommendations are provided to support the advancement of the CPRP. Recommendations are provided for the ongoing master plan and design development of the CPRP and the development of planning controls. In addition to these recommendations, a line-of-sight table has also been provided as **Appendix A.**

The recommendations were determined through consultation with service providers and suitably qualified professionals to achieve CPRP design outcomes and further address the Study Requirements. Recommendations are derived by a detailed assessment of the CPRP transport demands, the supporting initiatives required and the impact to surrounding transport network this shall have.

## 9.1 Design and master plan recommendations

Future work and recommendations for the CPRP design development include:

- Continue engagement with stakeholders and transport authorities across the development, planning and implementation of CPRP
- Update the Reference Master Plan to show the locations of secure bicycle parking in the public domain for visitors to Central Precinct.

## 9.2 Planning framework recommendations

In addition to the above, further recommendations for the support and development of planning controls, DCPs or guidelines for the CPRP include:

- include objectives within the SSP Framework to ensure that the planning and implementation of CPRP minimise any negative impact on operations created by the development of Central Precinct and enhance safety and operational efficiency of the interchange where possible.
- enhance bicycle parking rates to support the adoption of a 7.5 per cent cyclist mode for Central Precinct as suggested in Table 9-1.

**Table 9-1: Proposed bicycle parking rates for Central Precinct SSP**

| Land Use | Residents/ employees (long-term) | Customers/ visitors (short-term) |
|---|---|---|
| Residential | 1 per dwelling | 1 per 10 dwellings |
| Student accommodation | 1 per dwelling | 1 per 10 dwellings |
| Hotel | 1 per 4 staff | 1 per 20 rooms |
| Commercial | 1 per 150 $m^2$ | 1 per 400 $m^2$ |
| Retail | 1 per 150 $m^2$ | 1 per 400 $m^2$ |
| Education | 1 per 10 staff plus<br>1 per 10 students | N/A |
| Community | 1 per 150 $m^2$ | 1 per 200 $m^2$ |

- reduce car parking rates for the non-OSD development to support the adoption of a 'car-free precinct' for Central Precinct as suggested in Table 9-2.

**Table 9-2 Proposed maximum car parking rates for Central Precinct SSP**

| Land use | | Rate |
|---|---|---|
| Residential | 1 bed dwelling | 0.3 spaces/ dwelling |
| | 2 bed dwelling | 0.7 spaces/ dwelling |
| | 3 bed dwelling | 1 spaces/ dwelling |
| Student accommodation | | 0.1 spaces per room |
| Hotel | | 0.1 spaces per room |
| Commercial | | 1 space per 2000 $m^2$ GFA |
| Retail | | 1 space per 2000 $m^2$ GFA |
| Education | | 1 space per 2000 $m^2$ GFA |
| Community | | 1 space per 2000 $m^2$ GFA |

- restrict car parking associated with future development from being located on the OSD'
- enhance car share rates to support the adoption of a 'car-free precinct' for Central Precinct by requiring a minimum of one car share space per 25 off-street car spaces.
- adoption of a minimum rate for motorcycle spaces of one space for every 12 car parking spaces.
- adopt the proposed rates identified in Table 9-3 for loading provisions for Central Precinct, unless otherwise supported by the adoption and implementation of a loading management system as part of a precinct wide Delivery and Servicing Management Plan

**Table 9-3 Proposed loading space rates for Central Precinct SSP**

| Land Use | Rate |
|---|---|
| Residential | • 1 space for the first 50 dwellings or serviced apartments; plus<br>• 0.5 spaces for every 50 dwellings/ serviced apartments or part thereafter. |
| Commercial | • 1 space per 3,300 $m^2$ GFA, or part thereof, for the first 50,000 $m^2$; plus<br>• 1 space per 6,600 $m^2$, or part thereof, for additional floor area over 50,000sqm and under 100,000 $m^2$; plus<br>• 1 space per 13,200 $m^2$, or part thereof, for additional floor area over 100,000 $m^2$. |
| Hotel | • 1 space per 50 hotel bedrooms, or part thereof, up to 100 bedrooms; then<br>• 1 space per 100 hotel bedrooms; plus<br>• 1 space per 400 $m^2$ of reception, lounge, bar and restaurant area GFA, or part thereof, for the first 2,000 $m^2$; then<br>• 1 space per 8000 $m^2$ of reception, lounge, bar and restaurant area GFA thereafter. |
| Retail | • 1 space per 350 $m^2$ GFA, or part thereof, up to 2,000 $m^2$; then<br>• 1 space per 800 $m^2$ GFA thereafter. |

- preparation of a Delivery and Servicing Management Plan for the precinct and each dock as appropriate to identify and confirm the servicing strategy for the precinct (including the station and rail infrastructure as appropriate).
- adoption of one or more integrated distribution facilities for Central Precinct accommodate deliveries, service vehicles and waste collection away from the public realm and allow for the consolidation of goods for delivery across the precinct to their destination.
- preparation of a Construction Traffic Management plan for the precinct and each stage as appropriate to identify and confirm the interim servicing strategy for the station and outline how pedestrian access will be maintained throughout construction activities.

## 9.3 Supporting initiatives outside the scope of CPRP

The following initiatives are recommended for support and further development, however, fall outside the scope of CPRP and may require alternative funding mechanisms and delivery approaches:

- broader capacity enhancements realised through the More Trains More Services program, Sydney's Bus Futures and other infrastructure investment initiatives
- investigate and implement the following initiatives:
    - reprioritising road space on Lee Street to provide additional space for pedestrians
    - improve pedestrian capacity across the intersection of Pitt Street and Eddy Avenue
    - improve pedestrian capacity along and across Eddy Avenue
    - improve pedestrian capacity across the intersection of Elizabeth Street and Foveaux Street
    - improve pedestrian capacity across the intersection of Broadway and Harris Street
- provide wider footpaths along George Street, Eddy Avenue, Broadway, Pitt Street and Quay Streets through road space reallocation to support growing pedestrian movements.
- reallocate road space to accommodate both waiting passengers and moving pedestrians on Eddy Avenue and at Railway Square.
- prioritise bus and light rail movements at intersections around the Precinct ahead of through traffic to support and maintain service frequency and reliability of public transport services
- support potential investigations by others into opportunities for a coach terminal facility outside of the Precinct to a location that provides transfer to the public transport network and direct access to the freeway network
- reallocate road space in accordance with modal hierarchy.

In conclusion, the proposed master plan has been reviewed and assessed by suitably qualified professionals and consider that the proposed outcomes satisfy the above recommendations.

This assessment will be updated with detailed modelling of the transport and pedestrian networks to provide additional information on the impact assessment, based on the revised demand forecasts that will be released by Transport for NSW later in 2022.

# Appendix A – Line of sight table

| Issue | Aspirations | Solutions |
|---|---|---|
| Broader public transport capacity improvements are required to ensure Central Station can accommodate future growth. | Provide a world-class transport interchange with turn-up and go services | Broader capacity enhancements realised through the MTMS program, Sydney's Bus Futures and other infrastructure investment initiatives<br>Support and advocacy – falls outside scope of CPRP |
| There is potential for Central Precinct to impact of transport operations, both during standard operations and under unplanned/planed distributions | Ensuring that during operation (including degraded modes – planned and unplanned) disruption to transport modes will be minimised. | Include objectives within the SSP Framework to ensure that the planning and implementation of CPRP minimise any negative impact on operations created by the development of Central Precinct. |
| Pedestrian congestion impacting performance of the intersection of George Street, Lee Street and Pitt Street | Provide a safe, efficient pedestrian network with convenient movement and minimal conflict through the Precinct. | Reprioritise road space on Lee Street to provide additional space for pedestrians.<br>To be delivered as part of CPRP and/or through alternative funding programs |
| Pedestrian congestion impacting performance of the intersection of Pitt Street and Eddy Avenue | Provide a safe, efficient pedestrian network with convenient movement and minimal conflict through the Precinct | Investigate and implement improvements to provide additional pedestrian capacity across the intersection of Pitt Street and Eddy Avenue.<br>To be delivered as part of CPRP and/or through alternative funding programs |
| Pedestrian congestion impacting performance of the midblock pedestrian crossing on Eddy Avenue, adjacent to Eddy Plaza | Provide a safe, efficient pedestrian network with convenient movement and minimal conflict through the Precinct. | Investigate and implement improvements to provide additional pedestrian capacity along and across Eddy Avenue.<br>To be delivered as part of CPRP and/or through alternative funding programs |

| Issue | Aspirations | Solutions |
|---|---|---|
| Pedestrian congestion impacting performance of the intersection of Elizabeth Street and Foveaux Street | Provide a safe, efficient pedestrian network with convenient movement and minimal conflict through the Precinct. | Investigate and implement improvements to provide additional pedestrian capacity across the intersection of Elizabeth Street and Foveaux Street<br>To be delivered as part of CPRP and/or through alternative funding programs |
| Pedestrian congestion impacting performance of the intersection of Broadway and Harris Street | Provide a safe, efficient pedestrian network with convenient movement and minimal conflict through the Precinct. | Investigate and implement improvements to provide additional pedestrian capacity across the intersection of Broadway and Harris Street.<br>Support and advocacy – falls outside scope of CPRP |
| Congestion on footpaths adjacent to Central Station | Provide a safe, efficient pedestrian network with convenient movement and minimal conflict through the Precinct. | Provide wider footpaths along George Street, Eddy Avenue, Broadway, Pitt Street and Quay Street through road space reallocation to support growing pedestrian movements.<br>To be delivered as part of CPRP and/or through alternative funding programs |
| The bicycle parking rates specified in City of Sydney DCP 2012 may not achieve target mode share | Provide a dedicated scalable facility for bike storage, as well as end-of-trip facilities and bike parking at multiple access locations. | Inclusion of enhanced rates in the SSP Framework. |
| Visitor cycling spaces are currently not identified in the Central Precinct Master plan | Provide a dedicated scalable facility for bike storage, as well as end-of-trip facilities and bike parking at multiple access locations. | Provision of visible and secure bicycle parking in the public domain for visitors to Central Precinct.<br>Update the Central Precinct master plan. |
| Increased pedestrian congestion at some bus stands around Railway Square and on Eddy Avenue may conflict with traversing pedestrian movements. | Ensure safe efficient and convenient customer interchange between buses and other transport modes across Central Precinct | Reallocate road space to accommodate both waiting passengers and moving pedestrians on Eddy Avenue and at Railway Square.<br>To be delivered as part of CPRP and/or through alternative funding programs |

| Issue | Aspirations | Solutions |
|---|---|---|
| High pedestrian demands moving through the precinct create delays and impacts service frequency and reliability of road-based public transport | Ensure the surrounding road network balances the movement needs of on-road transport services and convenience and connectivity for pedestrians | Prioritise bus light rail movements at intersections around the Precinct ahead of through traffic to support and maintain service frequency and reliability.<br>To be delivered as part of CPRP and/or through alternative funding programs |
| Ensuring regional connectivity for customers accessing Sydney CBD | Provide a world-class transport interchange with turn-up and go services | Support potential investigations by others into opportunities for a coach terminal facility outside of the Precinct to a location that provides transfer to the public transport network and direct access to the freeway network.<br>Support and advocacy – falls outside scope of CPRP |
| The road network around Central Precinct is congested, with limited capacity for additional vehicle demands. | Facilitate an external road network, that balances the need to move people and goods with the need to create and enhance places for people. | Investigate opportunities to maintain network efficiency and redirecting through traffic to routes that bypass the city centre.<br>Support and advocacy – falls outside scope of CPRP |
| High pedestrian demands moving through the precinct create delays and impacts the efficiency of the road network. | Ensure the surrounding road network balances the movement needs of the precinct with improved convenience, amenity and connectivity for pedestrians | Reallocate road space in accordance with road space hierarchy.<br>To be delivered as part of CPRP and/or through alternative funding programs |
| The car parking rates specified in City of Sydney LEP 2012 may not support the reduced private vehicle mode share | Reduce/minimise the need for vehicular access to the development through appropriate design and private vehicle parking provisions | Inclusion of updated car parking rates in the SSP Framework. |
| The car share rates specified in City of Sydney LEP 2012 may not support the reduced private vehicle mode share | Provide a dedicated scalable facility for bike storage, as well as end-of-trip facilities and bike parking at multiple access locations. | Inclusion of enhanced car share rates in the SSP Framework. |
| Loading and servicing of the precinct will require enhanced management approaches to limit the impact on the surrounding network | Support safe integrated, multimodal transport and supporting infrastructure access across the Precinct, placing transport functionality (including interchange, freight and servicing) at the forefront of Precinct outcomes. | Inclusion of loading and servicing requirements in the SSP Framework. |

| Issue | Aspirations | Solutions |
|---|---|---|
| Potential for Central precinct construction activities to impact on the operations of Central Station, the surrounding transport interface and pedestrian movement through the precinct. | Ensuring that during operation (including degraded modes – planned and unplanned) disruption to transport modes will be minimised. | Inclusion of construction traffic management requirements in the SSP Framework. |

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