PARRAMATTA CBD PEDESTRIAN STRATEGY

DRAFT

CITY OF PARRAMATTA

Final Draft - Parramatta CBD Pedestrian Strategy

80016067

Prepared for
City of Parramatta
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Executive Summary

The Vision

City of Parramatta's vision is to be Sydney's Central City, sustainable, liveable, and productive – inspired by our communities.

At its core, we are planning for **the walkable heart of a vibrant and healthy city. Our streets will encourage all residents, workers, students, shoppers and visitors to make safe, accessible and simple pedestrian journeys to jobs, to schools, as well as to recreational, cultural, and retail districts. Pedestrians will be able enjoy the streets as public spaces to meet, wait, watch and play. Those on foot or using a mobility aid will be prioritised and therefore safer in the CBD, enjoying stronger community connections and opportunities to be healthy and active. The economy will benefit through increased numbers of pedestrians on the street choosing to shop and linger**.

In preparing this strategy the City of Parramatta has taken into consideration the movement of residents, visitors, students, workers and visitors. We acknowledge that people using our streets will move about in various ways, some on foot and some with the support of mobility aids such as walking sticks or walking frames, scooters or wheelchairs. The City of Parramatta recognises and seeks to create a CBD that is inclusive and engaging of all people. The terms walkability and walking, as used in this document, are considered all-encompassing and descriptive of inclusive pedestrian movements, unless specifically stated. The intention, objectives and actions of this pedestrian strategy will create streets that welcome, encourage and support all people to move throughout the city as pedestrians.

The City of Parramatta, in partnership with the NSW Government, are planning for and delivering a CBD that will enhance the walking experience of our great city. As the CBD undergoes significant redevelopment, the Pedestrian Strategy aims to guide Council in planning for streets and city areas that are accessible, safe and prioritised for pedestrians. Drawing on best practice, walkable city centres and the unique character and opportunities of Parramatta, the key objectives for pedestrian movement in the CBD are outlined below:

> Prioritise the time, safety and amenity of pedestrians

> Enhance and activate spaces and streets, supporting the CBD's economy

> Capitalise on the transformation of the CBD to benefit pedestrians

> Improve the current and future pedestrian network

> Grow walking mode share and support the use of public transport

> An ongoing commitment to promote walking

Recognising the benefits

As a signatory to the International Charter for Walking, Council recognises the many benefits of encouraging people to choose to walk more:

Economic	Environmental	Social
• Local business growth • Travel time savings • Low commuter costs • Reduced traffic congestion • Reduced demand for parking	• Reduced emissions and noise pollution • Improved street environment • Reduced heat island effect	• Improved mental and physical health • Support equity and accessibility • Social inclusion • Improved safety • Better personal security

The current pedestrian experience

Parramatta CBD was planned to be walkable. A compact, legible Georgian street grid is complemented by relatively flat terrain and a network of laneways and arcades. The principal pair of pedestrian streets within the CBD are Church Street and George Street; they connect major transport, employment, recreational, cultural, service and retail destinations. The CBD is bordered with public open spaces like Parramatta Park, Prince Alfred Square and the city's parks, stitched together by the Parramatta River foreshore that flows through the heart of the city.

However, of all the trips within the local government area, only 15% are by walking, and within the CBD, just over 10% of residents walk to their place of employment. By comparison, almost half of all trips in the City of Sydney, and a quarter in the City of Melbourne are by foot.

Harnessing opportunities and challenges

The CBD is currently subject to significant public and private investment that is transforming the buildings, streets and very fabric of the city. This growth will be the catalyst to transform our streets into places that are safe, active, and accessible for people at all times of the day and week. The construction of new civic infrastructure, streets and buildings will be disruptive to movement in the CBD, however this must be managed carefully to maintain the safety and accessibility of the pedestrian network. The change will be significant, as demonstrated in the diagrams opposite. The current "peak hour" for pedestrians in the city is in the middle of the day with a total of just over 80,000 movements (**Figure A**). This lunchtime peak has been strategically modelled out to 2056, and the substantial growth in volumes is shown in **Figure B**. The redevelopment of the CBD will present opportunities and challenges for pedestrian movements as travel demands increase, along with the resident and worker populations.

Pedestrian actions

To address the pedestrian opportunities and issues, meet the future pedestrian demand and achieve the strategic pedestrian objectives, a range of actions for pedestrians are detailed in the Pedestrian Strategy. These actions are grouped to align with Transport for NSW's *Sydney's Walking Future*:

> **Infrastructure and operations actions:** For traffic calming, pedestrian priority, improved perceptions of safety and direct paths of travel.

> **Policy and development actions:** To ensure new developments contribute to pedestrian improvements.

> **Behaviour change actions:** To provide residents, workers, students and visitors with the information, knowledge and confidence to choose to walk on foot or using a mobility aid for short trips

The top 5

The five priority actions (there are 50 in total) are outlined below, and represent the five elements that will potentially have the greatest impact on pedestrian amenity, priority and safety in the CBD.

IO1: Implement 40 kilometre per hour (and advocate for 30 kilometre per hour) speed zones throughout CBD

IO2: Undertake an audit of all footpaths and upgrade and provide new infrastructure which is accessible for all users

PD1: Apply the movement and place functions to the CBD with consideration of all transport modes

PD3: Amend DCP for permeable city blocks, active street frontages and high quality pedestrian infrastructure

BC1: Require developers to prepare Green Travel Plans with clear pedestrian objectives and actions

Figure A Current pedestrian volumes - Thursday PM Peak

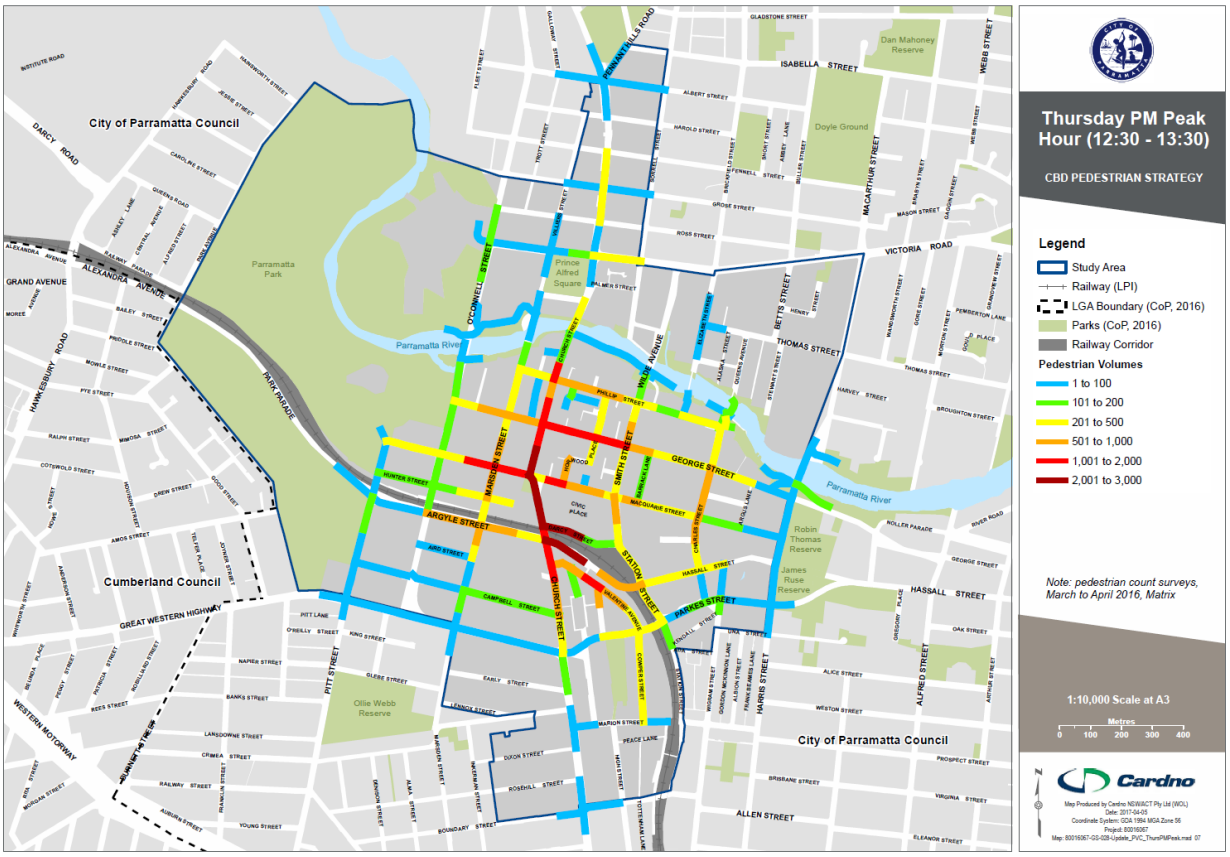
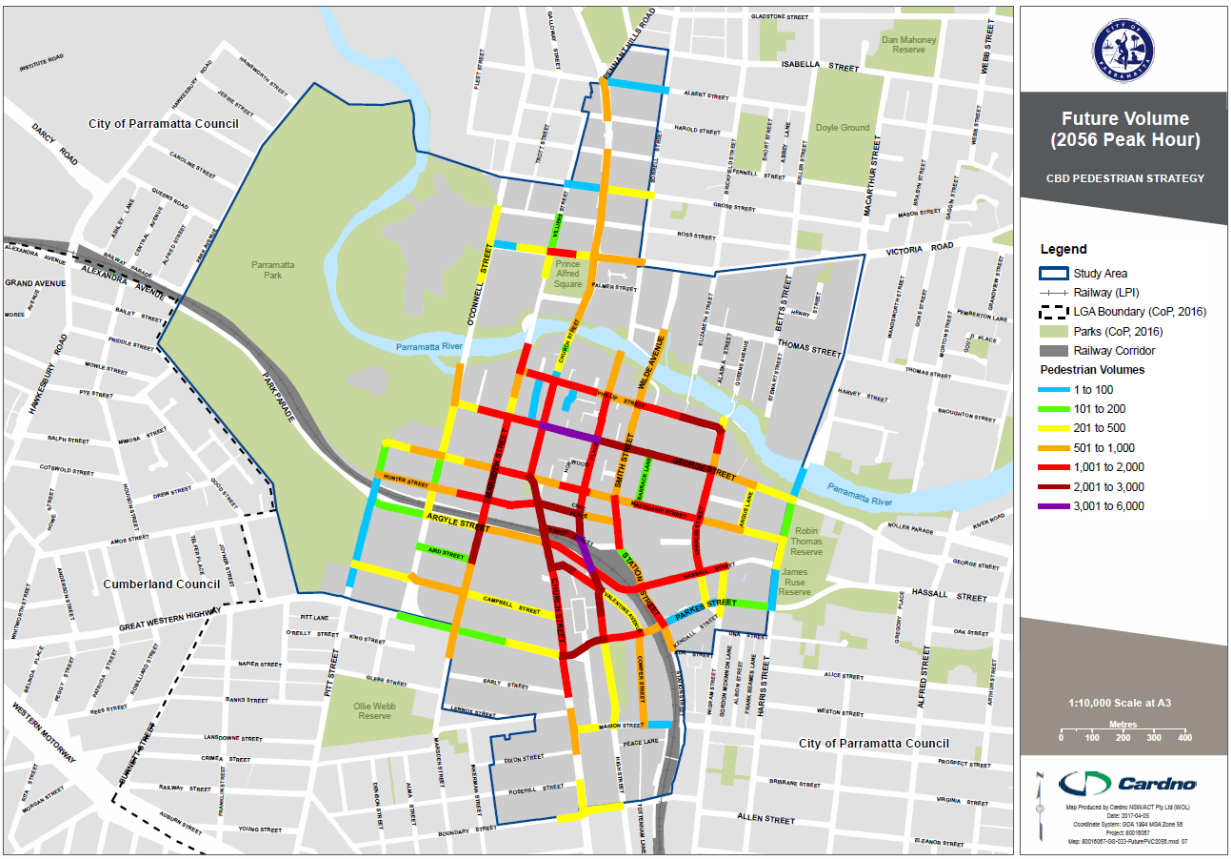
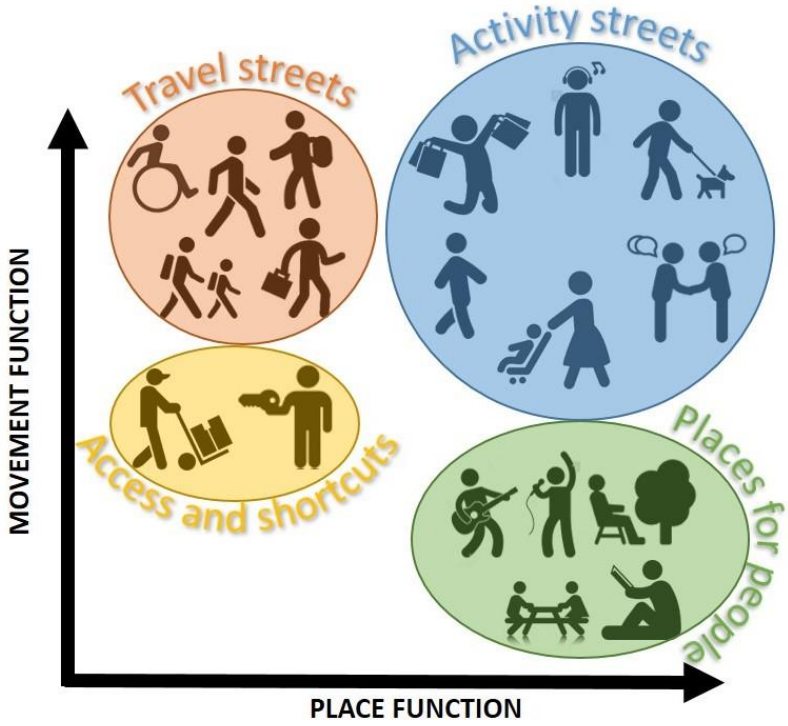


Figure B Future pedestrian volumes 2056 - Thursday PM Peak 12:30-13:30



The pedestrian network

Streets support a wide range of functions in city centres. Of these functions, 'place' and 'movement' are considered the most important for assessing a street's character and role within a network. A street's movement function supports through movement as part of a trip between an origin and a destination. A street's place function acknowledges that streets can be end destinations themselves. Activities such as shopping, sitting, eating and meeting people can occur on or adjacent to the street.



Streets across the CBD were considered for their pedestrian movement and place needs and categories of streets were then proposed to support both functions:

> **Travel streets** (primarily movement);

> **Activity streets** (balance between movement and place);

> **Places for people** (primarily place); and

> **Access and shortcuts** (minor, with movement and servicing).

Monitoring progress

Implementation of the Pedestrian Strategy will require commitment, collaboration and fortitude from all stakeholders. The recommendations are ambitious and will require all stakeholders to work towards prioritising pedestrian movements and space throughout the CBD.

The implementation, monitoring and review of the Pedestrian Strategy actions, and reporting on achievement against its objectives will be a crucial part in creating a pedestrian friendly CBD. The Pedestrian Strategy's monitoring and reporting framework proposes a range of indicators such as travel time, mode share, measuring satisfaction and the length of footpath network to track the implementation of the actions for promoting pedestrian movement and the progressive achievement of the strategic pedestrian objectives.

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1 Introduction

1.1 Purpose of the Pedestrian Strategy

The City of Parramatta has identified the need to plan and prepare for an attractive, safe and walkable centre as the CBD undergoes significant redevelopment and growth. This Pedestrian Strategy provides clear direction for improvements in policy, infrastructure and travel behaviour so that Council's vision for a healthy, liveable and sustainable city can be realised.

In preparing this strategy the City of Parramatta has taken into consideration the movement of residents, visitors, students, workers and visitors. We acknowledge that people using our streets will move about in various ways, some on foot and some with the support of mobility aids such as walking sticks or walking frames, scooters or wheelchairs. The City of Parramatta recognises and seeks to create a CBD that is inclusive and engaging of all people. The terms walkability and walking, as used in this document, are considered all-encompassing and descriptive of inclusive pedestrian movements, unless specifically stated. The intention, objectives and actions of this pedestrian strategy will create streets that welcome, encourage and support all people to move throughout the city as pedestrians.

A more walkable CBD will be a more vibrant place; it will attract different types of people throughout the day and as short trips in the CBD shift from motor vehicles to active transport, the CBD will be a safe place where people want to meet and dwell and the local economy will benefit.

Walking is a component of all trips, including those made by public transport or private vehicle. Improving walkability will support access via all modes and contribute to an integrated transport network.

Cardno was appointed by the City of Parramatta (Council) to develop the Pedestrian Strategy for the Parramatta CBD.

1.2 Pedestrian Strategy drivers

Parramatta is acknowledged in state government strategies as the "premier regional city with a growing role as Sydney's second CBD" and a part of the extended "Global Economic Corridor" which stretches from the Sydney CBD via Macquarie Park and Chatswood.

Parramatta's CBD (the CBD) is already experiencing a large volume of public and private investment and development, with significantly more planned over the next 40 years. This commercial, residential; cultural, recreational and public transport investment will drive growth in more workers, residents and visitors in the centre. CBD blocks will transform, land uses become denser and public spaces will be revitalised with activity at all times of the day and week. As the development occurs, new trips to, from and within the CBD need to be catered for.

1.2.1 Commitment to the International Charter for Walking

Council is a signatory to the International Charter for Walking. The Charter was developed by international organisation Walk21, and endorsed by the NSW Premier's Council for Active Living, the Western Sydney Local Health District (WSLHD) and the Western Sydney Regional Organisation of Councils (WSROC). It aims to promote the development of healthy, sustainable and efficient communities where people can safely choose to walk as a way of travel. The Charter details eight strategic principles for creating a culture where people can choose to walk:

1. Increased inclusive mobility
2. Well designed and managed spaces and places for people
3. Improved integration of networks
4. Supportive land-use and spatial planning
5. Reduced road danger
6. Less crime and fear of crime

7. More supportive authorities
8. A culture of walking

These eight principles are directly relevant for the Pedestrian Strategy and they are reflected in its strategic walking objectives and recommended actions.

1.3 Benefits of a walkable city centre

Walkable city centres provide a wide range of economic, social and environmental advantages for the CBD and the people who access it. City centres with a high proportion of trips made on foot benefit from reduced traffic congestion, pleasant street environments, more activity and less demand for parking spaces. A list of walking benefits is presented in **Table 1-1**.

Traffic congestion comes at a high cost for cities. Currently traffic congestion costs Sydney businesses $5 billion each year and is projected to increase to nearly $8 billion by the end of the decade. Increasing the proportion of walking trips in a city centre will reduce the amount of traffic congestion and as cities grow, investing in walking infrastructure is a cost-effective way of supporting a larger population without adding to street congestion.

Table 1-1 Benefits of walkable city centres

Economic	
Local business opportunities	Growth in foot traffic will increase the number of people passing shop fronts and businesses. Pedestrians visit non-grocery shops more often, and spend more in total over a month, than people who drive.
Reduction in travel time	More people choosing to walk in a city centre will reduce the number of vehicles on the road, this should alleviate traffic hence lower the travel times for the vehicles that need to be there, for example buses and delivery vehicles.
Lower commuter cost	Walking is free. There are no travel cost associated with walking unlike public transport or private vehicle usage.
Reduced traffic congestion	When people choose to walk and use public transport instead of driving, there will be less traffic. Walking as a mode of transport is also more space efficient in a city centre and it is more convenient for people to access places.
Reduced demand for parking	More walking trips will lead to a reduced demand of parking in the city centre. Previous car parking can be converted to higher value land uses.
Environmental	
Reduced noise pollution	With more vehicles driving comes more noise, therefore a reduction in vehicles in the city centre will lower noise pollution, increasing pedestrian health and amenity.
Reduced emissions pollution	Less vehicles on the road means less gases are being released into the atmosphere. Reducing the number of vehicles will also decrease traffic congestion so vehicles will spend less time idling.
Improved street environment	Walking environments support parks, landscaping and street furniture for pedestrians. These can create a pleasant atmosphere within a city compared to a congested road network where the majority of street space is taken up by vehicle lanes and parking.
Reduced heat island effect	The heat island effect, where metropolitan areas are significantly warmer than rural areas, is exacerbated by dark surfaces such as asphalt used on vehicles lanes. If fewer lanes are required for traffic, more street trees can be included on footpaths and there will be a contribution to a lower heat island effect.
Social	
Supports equitability and accessibility	Walking is a mode of transport that can be available to everyone.
More social inclusion	Walking facilitates more social interactions between people in the city than use of private motor vehicles where people often travel alone.
Improved safety	The more people who walk, the safer it is for pedestrians. Vehicle drivers in city streets will expect to give way to people on foot and drive with caution when interacting with high pedestrian volumes.
Better personal security	More people choosing to walk means increased on-street activity and people on the street will provide surveillance of the street which discourages anti-social behaviour and crime.

Improves physical and mental health	Walking is good for people's health. The Heart Foundation notes that regular physical activity reduces the risk of heart disease and stroke, manages weight, blood pressure and cholesterol, prevents and controls diabetes, reduces risk of some cancers, maintains bone density and improves balance and coordination. It also helps to manage anxiety and stress and contributes to feelings of strength, energy and happiness.
Less stressful	Active transport modes are a less stressful way to travel than public transport and private vehicles. Commuting stress can largely be attributed to unexpected delays; this unpredictability and variability in travel time is prevalent when driving and using public transport. Walking trip times are more reliable.
Sense of community	Seeing more on foot and spending time on city streets enhances social connections, creates a vibrant atmosphere and contributes to a sense of community.
Opportunities for diverse land use	High volumes of passing pedestrian traffic provides opportunities for varied businesses.

1.4 The Parramatta CBD

The CBD is located in the heart of the Parramatta local government area. It is a major employment, retail and services centre servicing Western Sydney and is home to, or adjacent to major health, education and sporting facilities.

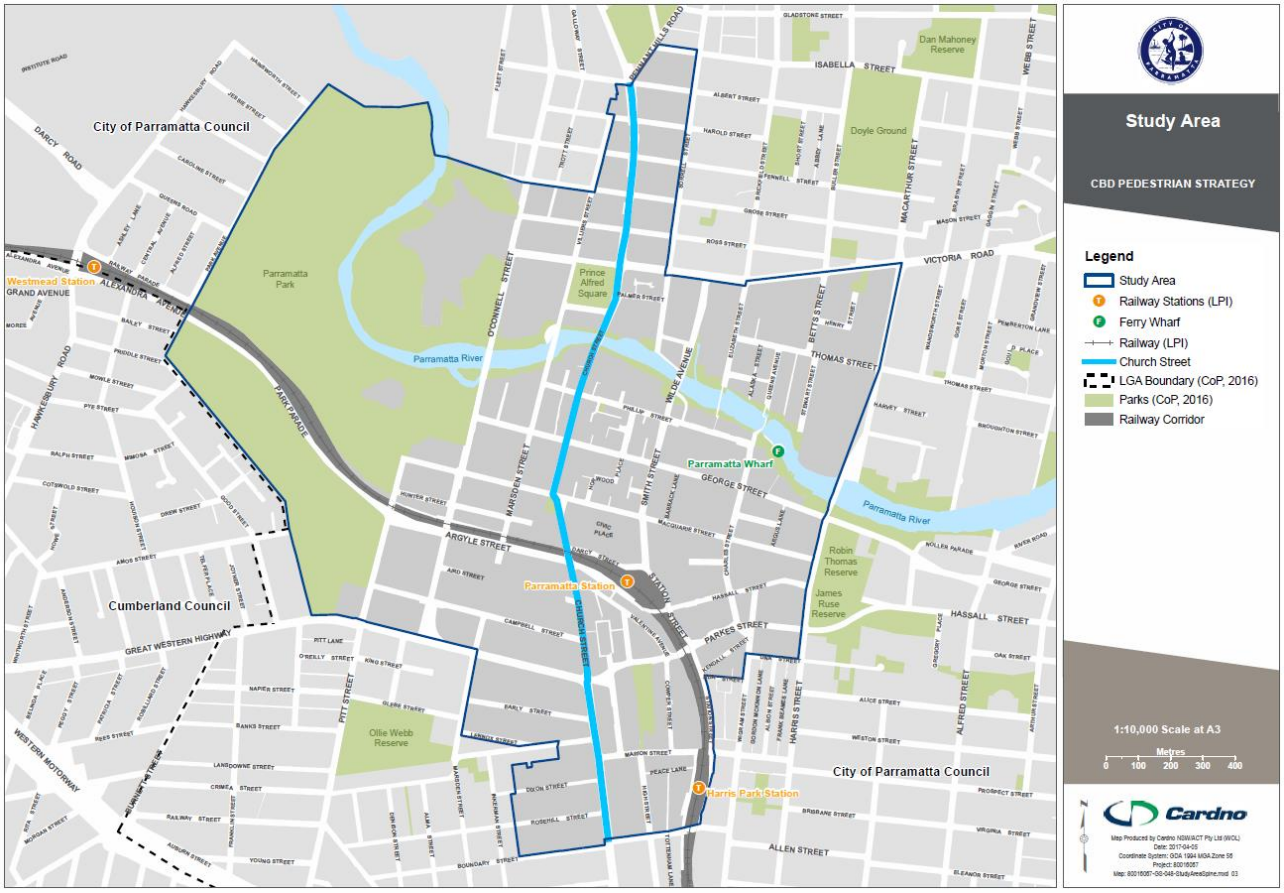
The CBD, as defined for the Pedestrian Strategy, covers the study area of two strategic documents, the Parramatta City Centre Planning Framework and the Pedestrian Amenity Zone outlined in the Parramatta Integrated Transport Plan. The study area is shown on **Figure 1-1**.

1.4.1 Relationship to surrounding area

While the focus of the Pedestrian Strategy is planning for and encouraging the growth of pedestrian movements in the CBD study area, there are a number of significant developments planned for precincts close to the CBD, many of which are within walking distance. The Pedestrian Strategy notes these developments and identifies regional gateway points at which people choosing to walk to the CBD will be likely to enter. Additionally, the Pedestrian Strategy acknowledges and recommends connections to the Parramatta Ways Green Grid network which currently surrounds the CBD. Developing the Parramatta Ways network and connecting it to the CBD will be part of an integrated approach to supporting regional walking trips to the CBD.

Expanding the study area of the Pedestrian Strategy in future revisions, or developing a pedestrian strategy for the entire Parramatta LGA, would help to plan for these longer walking trips from the surrounding precincts as they develop.

Figure 1-1 Study area



2 Strategic context

Parramatta is acknowledged in state government strategies as the “premier regional city with a growing role as Sydney’s second CBD”. With the residential population in the next 20 years set to triple, and 30,000 new jobs created, travel behaviours must evolve to support visions for a liveable city.

2.1 Redevelopment of Parramatta’s CBD

A major driver for the Pedestrian Strategy is the significant redevelopment already underway in the CBD and surrounding areas. This transformation, which will consolidate Parramatta’s role as Sydney’s 2nd CBD, involves:

> A large volume of public and private development;

> Around 30,000 more jobs by 2036;

> Significant growth in CBD residential developments and adjacent precincts within walking distance;

> New transport initiatives like the Parramatta Light Rail;

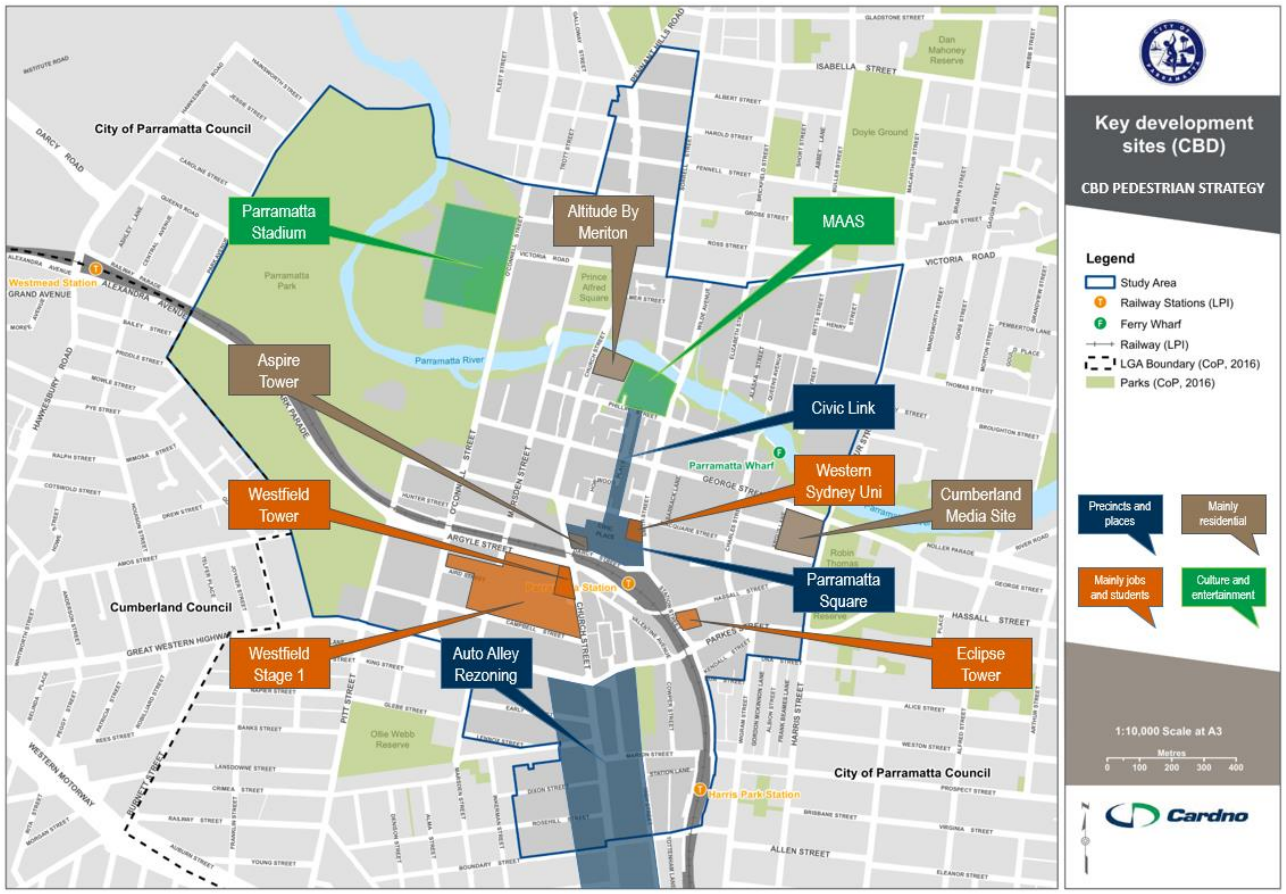
> Significant investment in cultural and social infrastructure and new CBD spaces; and

> Investigation of new parking options.

Key development sites in the CBD

A number of major redevelopments are already planned and underway throughout the CBD. These are driven by Council, State Government and private developers and will contribute more people and activity in the CBD in the short to medium term. Growth in the night-time and weekend economy can be expected to occur as the residential developments are populated and cultural and sporting attractions open. Specific city-changing developments and investment within the CBD are shown on **Figure 2-1** and described below.

Figure 2-1 Key development sites within the CBD



Development of Parramatta Square
240,000sqm of mixed-use development and new Council facilities. The precinct will include a Western Sydney University Campus which will be able to enrol students for 2017.

Underway

Creation of the car-free Civic Link
A pedestrian link connecting the train station and Parramatta Square to the River and linking to lanes and arcades.

In planning

Relocation of the Museum of Applied Arts & Sciences (MAAS)
Opening in 2022 and able to exhibit 40% more than the current MAAS.

In planning

Rezoning of Auto Alley to mixed use
Up to 26,000 jobs could be created, with a further 2,600 residents.

In planning

New Parramatta Stadium
New 30,000 seat stadium, to be completed by 2019.

In planning

Parramatta Light Rail
New light rail route connecting Westmead and Camellia with the Parramatta CBD and Carlingford. Further route to Strathfield via Sydney Olympic Park still in planning.

In planning

Growth precincts – Westmead to Sydney Olympic Park

As well as the development occurring within the CBD, there are a number of key residential, commercial and education developments adjacent to, or located close to the CBD, will also affect travel demand. These developments include:

> Westmead Health Precinct – 13,000 more jobs, increasing to 25,000 and 4,000 more students increasing to 6,000 by 2030;

> Parramatta Road – up to 40,000 new homes along Parramatta Road between the Sydney CBD and Parramatta in the next 30 years, with Granville nominated as one of the key sites;

> Camellia – Establish new town centre with increase in residents and higher job density;

> Sydney Olympic Park – 18,000 more homes and around 500,000 square metres for new commercial, retail, community uses and sporting venues. 6,000 new dwellings will be delivered by 2030;

> Parramatta North heritage precinct – approximately 7,000 new residents over the next ten years;

> Rydalmere Education Precinct – increase in students from 13,000 to 30,000 over the next 20 years;

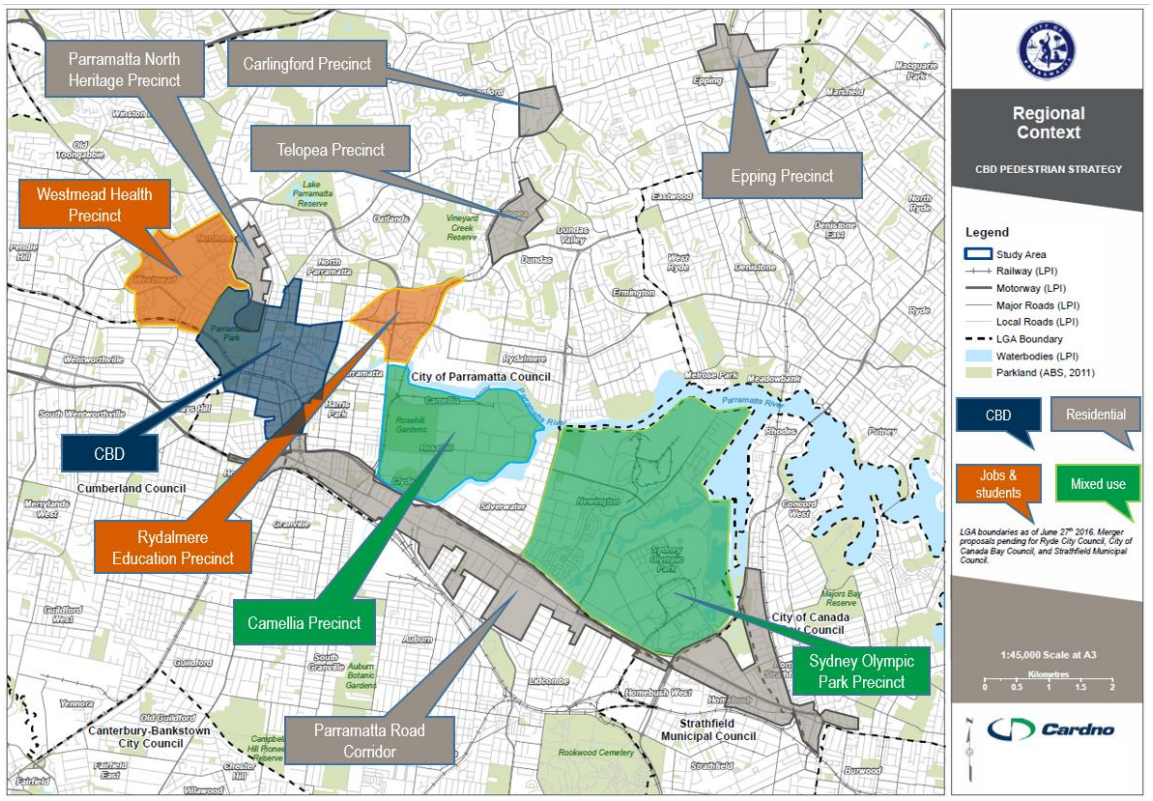
> Epping Precinct – 247 hectares have been rezoned to accommodate 3,750 new dwellings;

> Carlingford Precinct – 2,700 new dwellings are planned to accommodate population growth; and

> Telopea Precinct – approximately 3,500 to 4,500 new dwellings are planned for the precinct.

The major development planned around the CBD are shown on **Figure 2-2**.

Figure 2-2 Growth precincts adjacent to the CBD



Relevance for the Pedestrian Strategy

The significant amount of public and private investment and development in the CBD will lead to a growth in pedestrian demand. The Pedestrian Strategy must identify this growth and set objectives and plan actions to accommodate it.

2.2 State Government plans and strategies

This Pedestrian Strategy aligns with the State Government's vision for integrated transport. A complete review of strategic documents is provided in **Appendix A**.

State Infrastructure Strategy

The NSW State Infrastructure Strategy (2012) presents a vision for 2032 and makes recommendations for infrastructure investment over the next 20 years, including infrastructure provision in the Parramatta area to establish its role as Sydney's second CBD. The key recommendations outlined in the Strategy include a $1 billion investment to improve public transport between Parramatta and the Greater Sydney area.

A Plan for Growing Sydney

A Plan for Growing Sydney (2014) identifies opportunities for improving the Parramatta transport network, in particular public transport, and walking and cycling connections that extend from Westmead to Rydalmere through the Parramatta CBD. The Plan references a proposed active transport network referred to as the "Green Grid", which aims to provide convenient links between the Parramatta CBD and surrounding recreational and open spaces. The Parramatta Ways project will bring this to life.

The Long Term Transport Master Plan

The NSW Long Term Transport Master Plan (2012) identifies strategies and actions for integrated transport across the state over the next 20 years. Short-term actions identified for the Parramatta area will support a growth in active transport mode share in the CBD, including improved pedestrian and cycle connections through the CBD and to regional destinations, improved amenity around the Parramatta transport interchange, and alignment of the bus network with light rail network proposals.

Parramatta Strategic Framework

The Parramatta Strategic Framework (2016) identifies six key urban values to develop the character of Parramatta: Resilient, Connected, Vibrant, Inclusive, Respectful and Prosperous. Key principles directly relevant to the Pedestrian Strategy include optimising the 'spine and shoulders' structure of the CBD as a walkable and active city centre, and utilising that spine for high intensity retail with residential and commercial above.

Sydney's Walking Future

The NSW Government is focused on supporting walking for short trips, understanding that increased walking will benefit the community's health, the environment, and relieve pressure on local road networks. Sydney's Walking Future (2013) identifies Parramatta as a major activity centre as part of the Connecting Communities Program which aims to encourage people to walk at these centres, prioritising the development of pedestrian infrastructure within a two kilometre catchment of major centres and interchanges.

Relevance for the Pedestrian Strategy
The State Government plans, policies and strategies demonstrate strong support for the development of Parramatta as Sydney's second major employment centre, facilitating the location of desirable jobs and important services closer to where people live. The State Government is committed to sustainable transport and wants to create a culture of walking, improve liveability and connect communities with safe walking infrastructure.

2.3 City of Parramatta plans and strategies

Parramatta CBD Planning Strategy

The Parramatta CBD Planning Strategy (2015) sets the visions, principles, actions and implementation plan to guide a new planning framework for the Parramatta CBD.

The Strategy's vision states: Parramatta will be Australia's next great city, defined by landmark buildings and high quality public spaces with strong connections to regional transport. It will respect its heritage, be an exemplar in design excellence and ensure its streets are well activated. The Strategy aims to create a liveable, active and highly desirable city.

The Strategy sets out the following jobs and population targets for 2036:

> Jobs – increase 27,000 from 49,000 (2011) to 76,000 (2036)

> Dwellings – increase 7,500 from 3,800 (2011) to 11,300 (2036)

The Strategy commits Council to investigating the required regional and local transport infrastructure upgrades required to facilitate the growth of the CBD across public domain improvements, including new CBD spaces and street upgrades and access and transport improvements, including light rail.

Integrated Transport Plan for the Parramatta CBD

The Integrated Transport Plan for Parramatta City Centre (2010) responds to the Parramatta City Centre Plan (2007) which sets the planning framework for an additional 30,000 jobs and 20,000 residents by 2031.

It aims to manage the existing and future sustainable transport needs of the CBD as it works to move away from reliance on car use to public and active transport. The sustainable transport objectives for the CBD are:

> Promote and support walking, cycling and sustainable travel change;

> Support and facilitate public transport use; and

> Manage traffic to minimise its adverse impacts especially car commuters and through traffic.

Four key elements of the Plan support an enhanced walking experience in Parramatta:

1. Ongoing lobbying for improved public transport. Recent commitments have demonstrated the effectiveness of this element;
2. Creation of a Pedestrian and Cycle Amenity Zone, delivering improvements through new facilities and lower speed limits;
3. Support of City and Regional Ring Roads to ensure traffic uses appropriate routes, remove through traffic from the CBD and improve conditions for pedestrians and cyclists in the CBD; and
4. Relocating car parking to the CBD periphery.

The Pedestrian Amenity Zone is proposed to include: 40 kilometre per hour speed limit, additional crossing infrastructure, conversion of one-way streets to two-way, completion of the riverside shared path, reductions to pedestrian-vehicle conflicts at driveways and widening of footpath space.

An updated Integrated Transport Plan is being prepared to support the CBD Planning Proposal.

Parramatta Strategic Transport Study

The Draft Parramatta Strategic Transport Study (2017), aims to inform Council of the transport infrastructure requirements from implementing the Parramatta CBD Planning Strategy. The Study undertook a review of existing public transport services and infrastructure, travel patterns, parking yields and land use scenarios, and prepared a series of travel demand recommendations for consideration by Council. Significant extra demand on all transport modes has been identified and is the subject of further investigation.

Parramatta City Centre Lanes Strategy

Recognising that lanes provide significant benefits to the walkability and experience of city centres, the Parramatta City Centre Lanes Strategy (2010) identifies lanes throughout the CBD to include in a lane improvement pilot program.

The Strategy notes that the CBD's primary street network provides large CBD blocks of up to 250 metres in the east-west direction. Over time lanes have developed to provide servicing, access to car parks and through the development of shopping arcades.

The Strategy's Lanes Framework Plan recommends 23 new lanes and retention of the existing 57 lanes in the short-term. For each new, retained or removed (long term) lane, the Lanes Framework Plan sets out the type, strategic purpose, timing, owner, feasibility and action required for each lane.

Parramatta Safety Plan

The Parramatta Safety Plan (2014) aims to implement initiatives that improve the safety of the local community and visitors, and also promotes both the CBD and wider LGA as a pleasant and safe place to live, work and play.

The Plan has developed five strategic objectives, which oversee a program of proposed actions in response to the issues identified. Of relevance to the CBD and the Pedestrian Strategy is Objective 2:

2. Build a safe and more prosperous Parramatta CBD for people, businesses and organisations

The proposed actions grouped under the five objectives range from the implementation of facility and infrastructure upgrades, to launching community initiatives and cooperation with government and private organisations.

Parramatta Ways

The Parramatta Ways Report (2017) sets out the opportunities to connect green spaces across the Local Government Area (LGA) with community facilities, transport nodes and neighbourhood destinations via safe and enjoyable walking routes with the aim to reshape Parramatta as a liveable, walkable city. Parramatta Ways will deliver the NSW Government's vision for the Green Grid, becoming Australia's largest interconnected open space, bushland, and urban walking network.

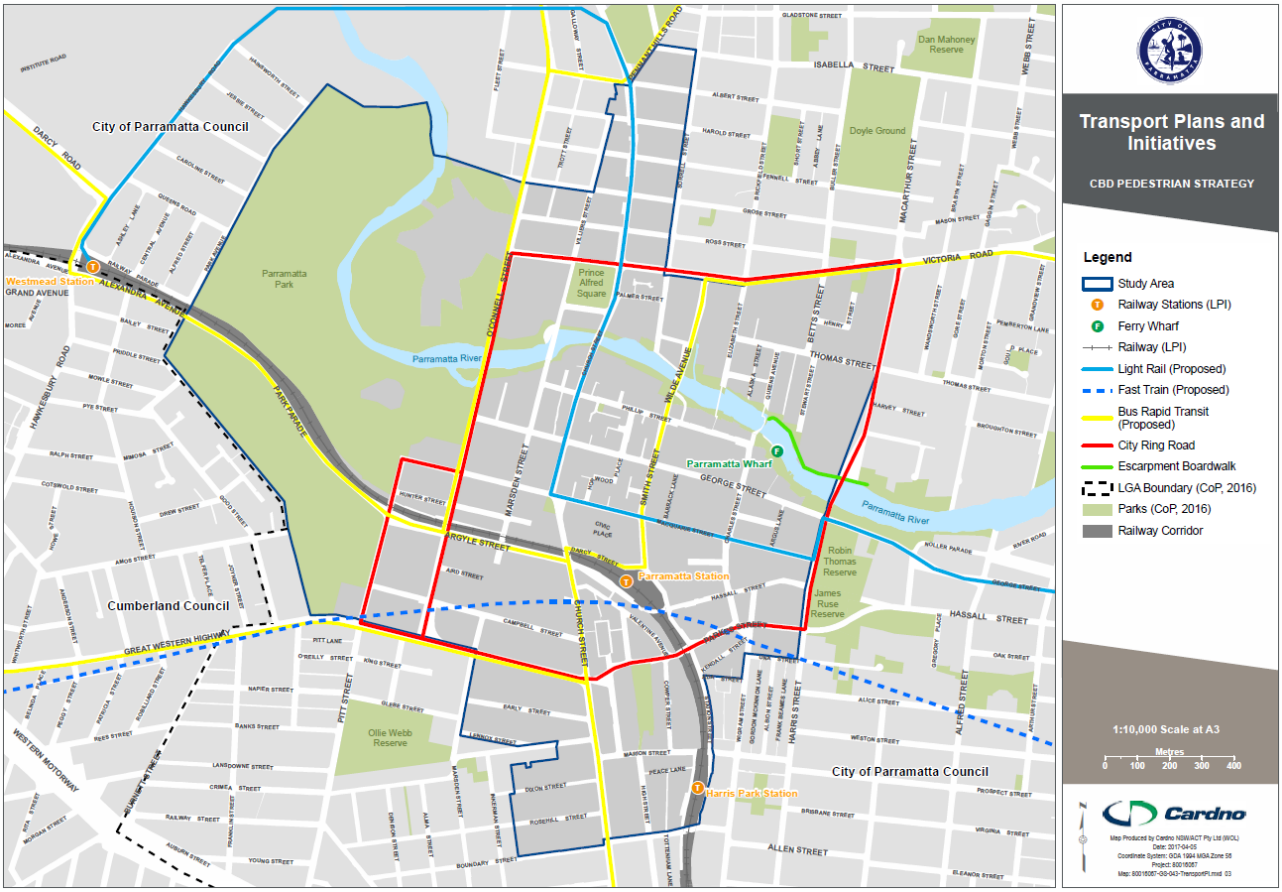
Whilst the focus of the project is on streets outside of the CBD, Parramatta Ways provides direct connectivity to the CBD.

Relevance for the Pedestrian Strategy
City of Parramatta is planning for a sustainable transport system that will support the growth and transformation of the CBD. Council's strategic plans are focused on the need to promote active and public transport modes and reduce the current reliance on the private motor vehicle to support the "creation of a pedestrian friendly city". The Pedestrian Strategy needs to align with existing transport strategies and influence and inform future planning of the CBD's transport networks.

2.4 Transport plans and initiatives

The NSW Government and City of Parramatta are planning for a sustainable transport system that will support the growth and transformation of the CBD. Council's strategic transport plans recognise the need to promote active and public transport modes and reduce the current reliance on the private motor vehicle. These projects are shown on **Figure 2-3** and described in the following sections.

Figure 2-3 Transport plans and initiatives



Parramatta Light Rail

As part of Parramatta's path to become Sydney's second CBD, a new light rail service is being designed to provide frequent and reliable public transport that connects housing, employment, education precincts. The proposed light rail service is 12 kilometres long and will include:

> Stage 1 connecting the Westmead Health precinct to the Parramatta CBD and Carlingford via; and

> Stage 2 from Camellia to Strathfield via Sydney Olympic Park is being developed in conjunction with Sydney Metro West.

Fast train link

Options for fast train link between the new Badgerys Creek airport, the Parramatta CBD and the Sydney CBD will be investigated. The Federal Government has indicated funding for the project with plans for provision of a new line by the time the airport opens in 2026. The proposed service would consist of entirely new and separated infrastructure, generally constructed in tunnels between Parramatta CBD and Sydney CBD. It will provide a 15 minute trip between Parramatta CBD and Sydney CBD and 25 minutes between Parramatta CBD and the proposed Western Sydney Airport.

Based on the potential for train services at 5 minute headways in each direction and assuming half a train capacity of 600 (1,200 full capacity) people either boarding or alighting each service at Parramatta, there could be in the order of 14,400 people movements to or from the fast train station in an anticipated peak period. Given it would offer a parallel route connection to the Sydney CBD, some of these volumes would not be new trips. Pedestrian issues to consider will be access points to the station and the distribution of pedestrian flows.

Western Sydney Rail Upgrade Program

The Western Line is the most heavily used and least reliable line on Sydney's heavy rail network. The Western Sydney Rail Upgrade Program is a major works program dealing with the upgrade and

modernisation of the network. The Western Line will have upgraded signalling and an advanced train control system will be introduced. This program will unblock 12 major bottlenecks in the network and deliver more and faster services. Improvements in capacity to the Western line will facilitate increased services and more comfortable and reliable train journeys which will encourage additional train passenger trips to Parramatta.

Ferry service upgrades

Transport for NSW is planning to renew its ferry fleet that will access the Parramatta ferry wharf. Still in early planning with little available detail, the new ferry fleet could have more capacity and may be able to access the ferry wharf more often than the current service.

Bus Rapid Transit

Transport for NSW will investigate Bus Rapid Transit (BRT) on Victoria Road between Parramatta and the Sydney CBD and along Parramatta Road. BRT services to the Parramatta CBD would increase the reliability and frequency of bus trips, this would likely lead to an increase in bus patronage and people accessing CBD bus stops.

The City and Regional Ring Roads

Council identified that eight strategic road corridors converge in Parramatta, causing excessive congestion. Two ring roads, one regional and one around the Parramatta CBD, are proposed to improve traffic flow and support growth. A series of intersection upgrades along the regional ring road on the M4, James Ruse Drive and Cumberland Highway were identified to create a free flowing arterial ring road and to result in key traffic and economic benefits. The city ring road consists of Victoria Road, O'Connell Street/Pitt Street, Great Western Highway/Parkes Street and Harris Street/Macarthur Street.

Parramatta River Cycleway upgrades

Council is planning to complete missing links in the Parramatta Valley Cycleway (PVC) and upgrade sections. A master plan for the PVC is being implemented stage by stage. As part of the upgrades a boardwalk is planned for the section on the northern side of the river to the east of the CBD. The Escarpment Boardwalk will be a critical section of the Cycleway which, when completed, will allow continuous connection between the University of Western Sydney at Rydalmere past the CBD to Parramatta Park. Planned for the northern side of the river, the boardwalk will support regional walking and cycling trips to the CBD.

CBD Pedestrian and Cycle Amenity Zone

The Integrated Transport Plan for Parramatta City Centre (2010) supports the "creation of a pedestrian friendly city". Council has begun to deliver this vision with the $5 million facelift of Church Street which reopened at the end of 2014. A key recommendation of the Plan was the implementation of a Pedestrian Amenity Zone across the CBD. The Pedestrian Amenity Zone is proposed to include: 40 kilometre per hour speed limit, additional crossing infrastructure, conversion of one-way streets to two-way, completion of the riverside shared path, reductions to pedestrian-vehicle conflicts at driveways and widening of footpath space.

Sydney Metro West

The NSW Government has recently announced a new underground metro linking Parramatta CBD and Sydney CBD.

The new service is projected to be able to move about 40,000 people an hour in each direction and relieve pressure on the existing T1 Western Line, and is expected to be operational in the second half of the 2020s.

Relevance for the Pedestrian Strategy
The plans to improve the transport networks that access the CBD will support growth in public transport patronage, reduce the need to drive to the CBD, provide new cycling connectivity and remove through traffic from CBD streets. New and improved transport services will generate new pedestrian demand and will require high quality walking access to interchange between services and to access destinations across

the CBD. The Pedestrian Strategy will help to ensure that the start and end of public transport trips within the CBD are convenient, legible and safe.

2.5 Potential future transport technology and proposals

This section considers the potential impacts of the following future technologies on the Parramatta CBD:

> Autonomous vehicles; and

> Information Technology Impacts on Transport Networks.

Autonomous vehicles

The emergence of autonomous vehicle technology has the potential to produce both positive and negative consequences. Autonomous vehicles could be for private use only or potentially as hire for ride services. This has the potential to increase the efficiency of the road network, with vehicle trips optimised to reduce road network demands and avoid areas of high pedestrian activity where possible.

Autonomous vehicles are more likely to avoid crashes, especially with pedestrians. A risk of private ownership is that, to avoid parking fees, vehicles will be sent to other locations or back to the home point to park for free. This could potentially double demands on the road network, reducing pedestrian amenity.

Road user pricing reforms are anticipated to mitigate some of this impact. In the context of Parramatta, there is potential that congestion charging could be required in the long term to regulate vehicle demands in the CBD and maintain an amenable environment for pedestrians.

Autonomous vehicles will choose the best route based on real time traffic conditions and could encourage users to walk to meet the vehicle at an optimal location away from vehicle congested areas.

Information Technology (IT)

The development and integration of IT and transport data is providing the opportunity to better utilise existing transport resources. Smart phone trip planning applications are well used to plan public transport trips. Existing applications allow private vehicle owners to offer transport services to the general public at a lower rate than traditional taxi services. Uber currently operates in Australia with Lyft and Shofer likely competitors.

Car sharing services such as GoGet provide people with access to cars on a half hourly basis, reducing the need to own a car or a second car. These services are useful for reducing parking demand and encouraging sustainable transport choices. All costs are paid at the time of use, versus private vehicle ownership where operating costs like registration, insurance, and servicing are paid on an advance or annual basis.

It is reasonable to expect there will be a convergence in transport applications whereby multi-modal trip planning is completely integrated. Additionally, public transport services may be able to be modified on demand, based on user origin and destination, resulting in continually tailored routes and stops.

Relevance for the Pedestrian Strategy

It is unlikely that these services will be quite as convenient as private vehicle ownership, however as less people buy private vehicles for personal use only, more walking trips are likely to be undertaken and increasing demands will be placed on the pedestrian network. Walking is highly likely to remain a fundamental form of transport and its priority at the top of the transport mode hierarchy maintained given the positive benefits and minimal impacts.

When autonomous vehicles start to emerge as commonplace, reviews will need to be conducted to assess the impact and need for policy, controls and legislation to mitigate any negative impacts.

3 Walking in the CBD

3.1 Mode share

The current travel behaviour of residents, and visitors, to the Parramatta area was analysed using the following data sets:

> Parramatta CBD – defined by travel zone data obtained from the NSW Bureau of Transport Statistics (BTS);

> Parramatta Suburb – defined by Census data from the Australian Bureau of Statistics (ABS); and

> Parramatta LGA – defined by Household Travel Survey (HTS) data obtained from the NSW BTS.

3.1.1 Walking trips

Across the Parramatta LGA, the walking mode share for all Journey to Work trips has remained at approximately 11.9% since 2001, with an increase to 12.9% observed in 2006 before a slight decrease to 12.3% in 2011.

Across the Parramatta LGA, 15% of all residents' trips (including commuting and non-commuting purposes) were undertaken by walking, compared to 49% of resident trips in the City of Sydney LGA, as shown on **Figure 3-1** and **Figure 3-2**.

Figure 3-1 Walking trips City of Sydney LGA

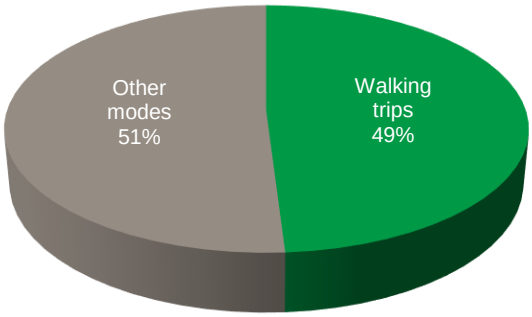
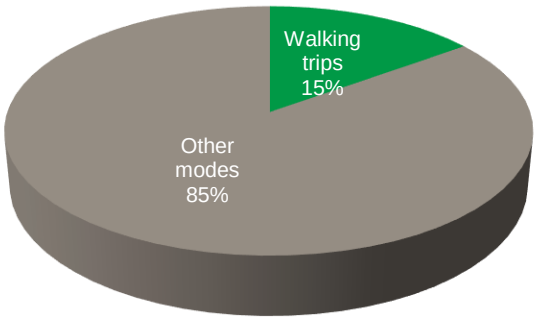


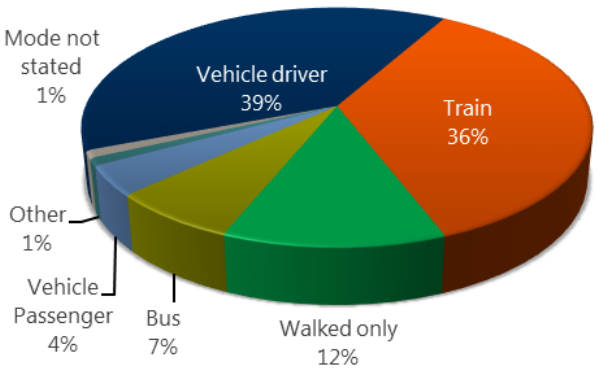
Figure 3-2 Walking trips Parramatta LGA



3.1.2 Commuter trips

Of the 8,432 Parramatta CBD residents who were recorded as being employed, just over one-tenth choose to travel to work by walking. This is compared to 51% of inner Sydney CBD residents who walk to work and 4.1% of Greater Metropolitan Sydney residents. The preferred mode of travel for Parramatta CBD residents is split equally between private vehicles (as either a driver or passenger) and public transport (train and bus), with each attracting 43% of the total mode share. Journey to Work (JTW) mode share for residents is shown on **Figure 3-3**.

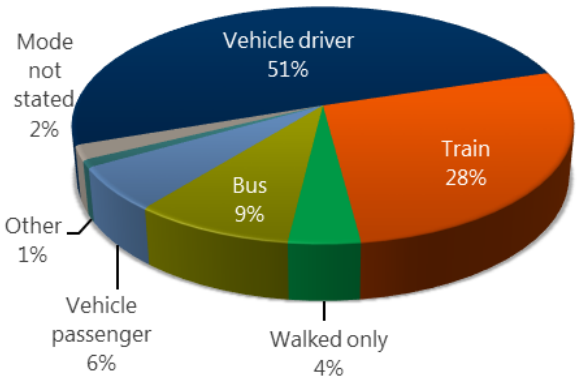
Figure 3-3 Commuter trip mode share (residents) - 2011



Source: Bureau of Transport Statistics JTW Explorer

Of the 43,337 people who were recorded as working in Parramatta, 4% travel to work by walking. This is compared to 6% of inner Sydney CBD workers who walk to work and 4.1% of Greater Metropolitan Sydney workers. The majority of workers travel by private vehicle (as either a driver or passenger) with 57% of the total mode share. Public transport attracts a total of 37%, split 28% and 9% each for train and bus respectively. JTW mode share for people who work in the Parramatta CBD is shown on **Figure 3-4**.

Figure 3-4 Commuter trip mode share (workers) - 2011

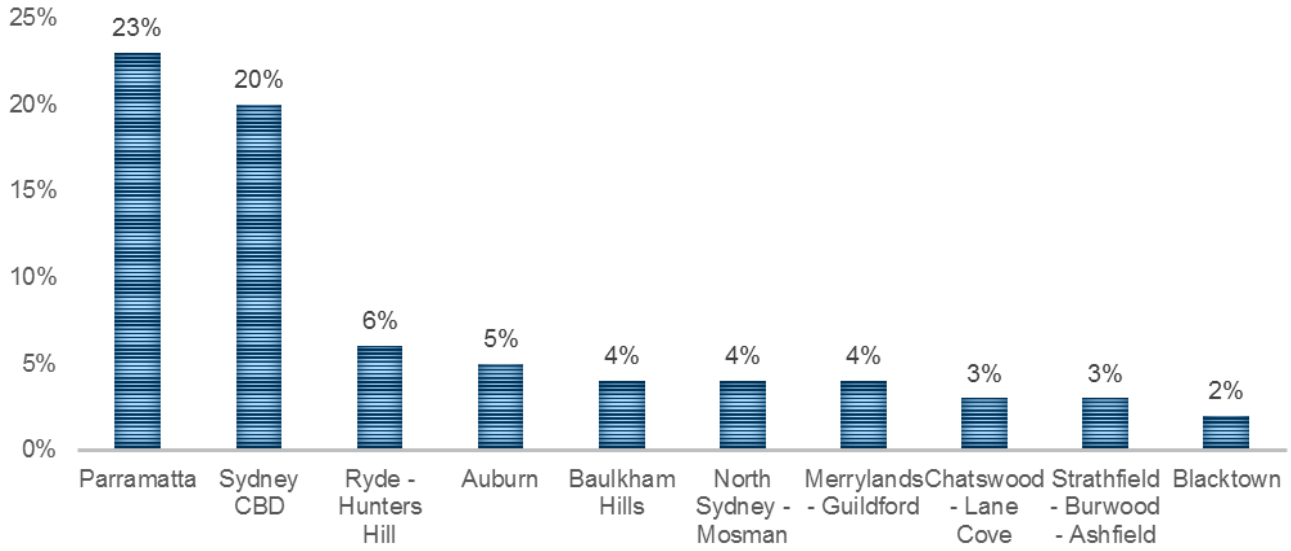


Source: Bureau of Transport Statistics JTW Explorer

3.1.3 Commuter origins and destinations

Figure 3-5 shows the top ten employment destinations for Parramatta residents in 2011. Of the 8,432 recorded as being employed residents, the highest proportion travel to Parramatta with 13%, followed by the Sydney CBD with 8%. People who live and work within the same area present a strong opportunity to change to active transport.

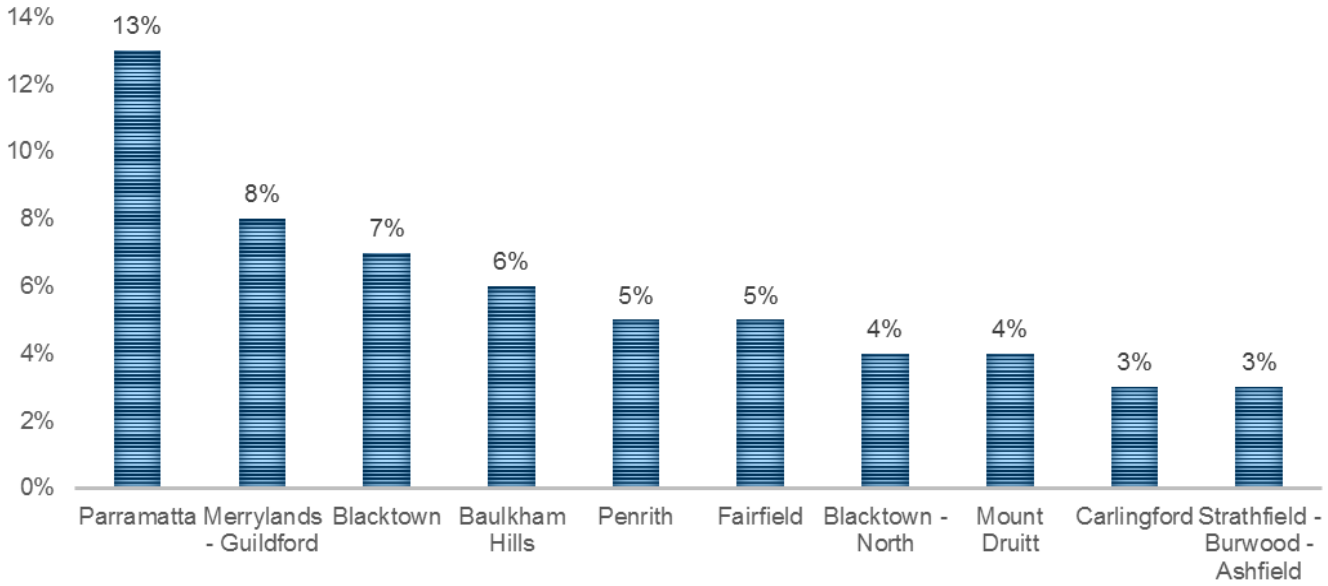
Figure 3-5 Top ten employment destinations for Parramatta residents – 2011



Source: Bureau of Transport Statistics JTW Explorer - 2011

Figure 3-6 shows the top ten places of residence for Parramatta workers. Of the 43,337 recorded as working in the Parramatta CBD, the highest proportion originate from Parramatta, with 23% followed by the Merrylands and Guildford areas with 20%.

Figure 3-6 Top ten places of residence for Parramatta workers - 2011

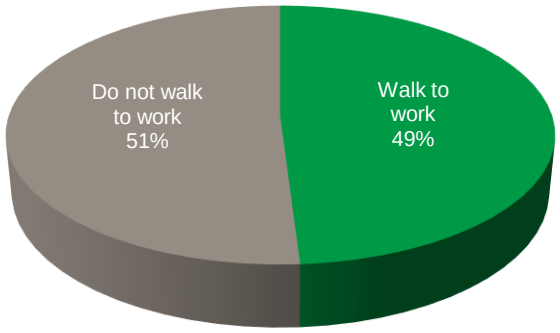


Source: Bureau of Transport Statistics JTW Explorer - 2011

3.1.4 Commuter walking trips within the LGA

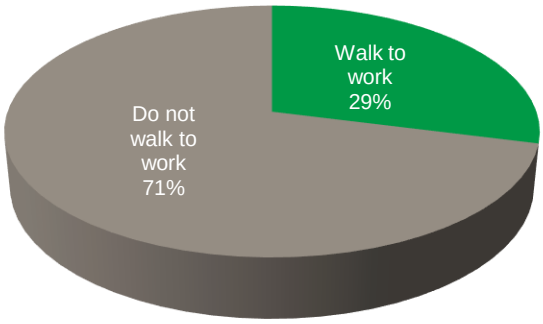
Of the CBD residents employed in the Parramatta LGA, almost half walk to work. Of the Parramatta LGA residents who work in the CBD, 29% travel there on foot. The contrast in mode share is shown on **Figure 3-7** and **Figure 3-8**.

Figure 3-7 CBD residents commuting on foot to the Parramatta LGA



Source: Bureau of Transport Statistics JTW Explorer - 2011

Figure 3-8 Parramatta LGA residents commuting on foot to the CBD

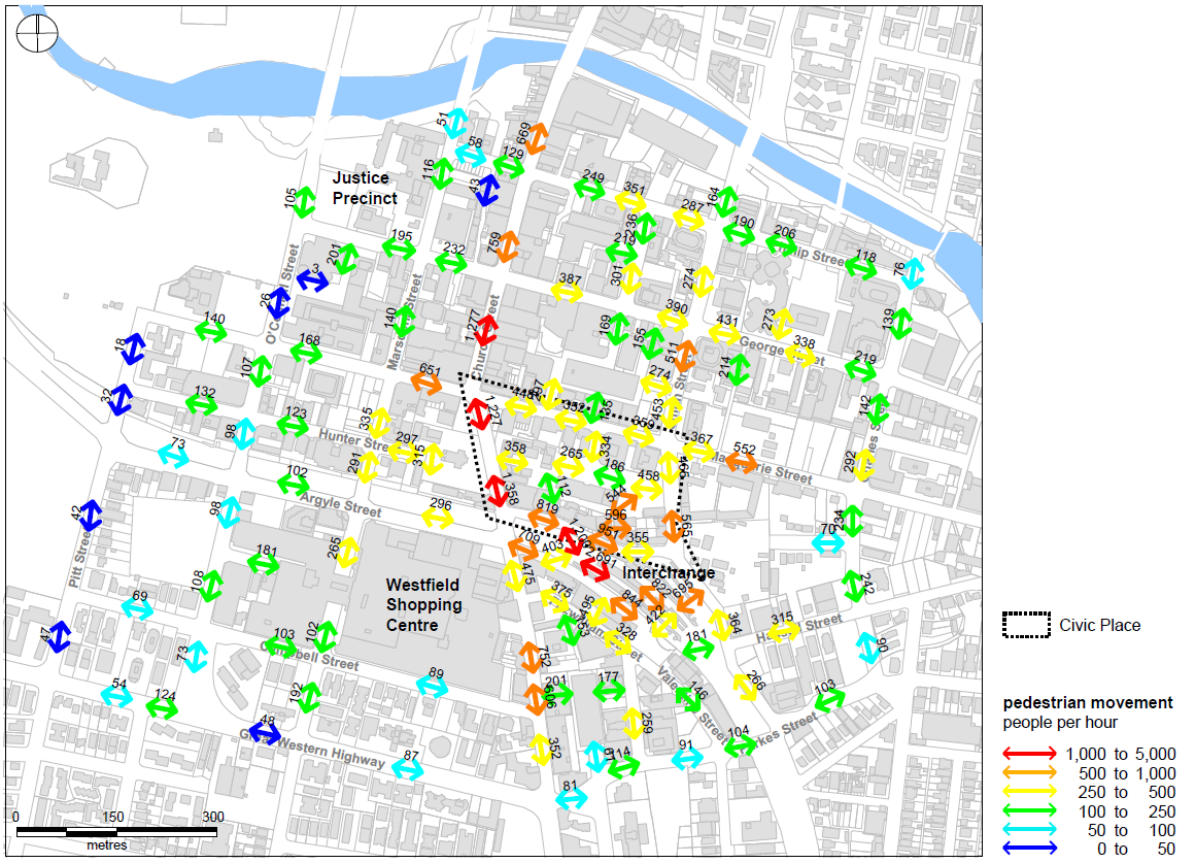


Source: Bureau of Transport Statistics JTW Explorer - 2011

3.1.5 Growth in pedestrian volumes

Average weekday pedestrian volumes over the past 10 years show an increase in walking trips within the CBD. Between 2006 and 2016, pedestrian volumes have increased in a number of locations. These include Darcy Street, George Street between Smith Street and Church Street, Macquarie Street between Horwood Place and O'Connell Street, and Argyle Street south of the Parramatta Transport Interchange. Average weekday pedestrian volumes for 2006 and 2016 are shown on **Figure 3-9** and **0**.

Figure 3-9 Average weekday pedestrian volume 2006



Source: Space Syntax Central Parramatta Study 2006

Figure 3-10 Average weekday pedestrian volume 2016

3.1.6 Summary

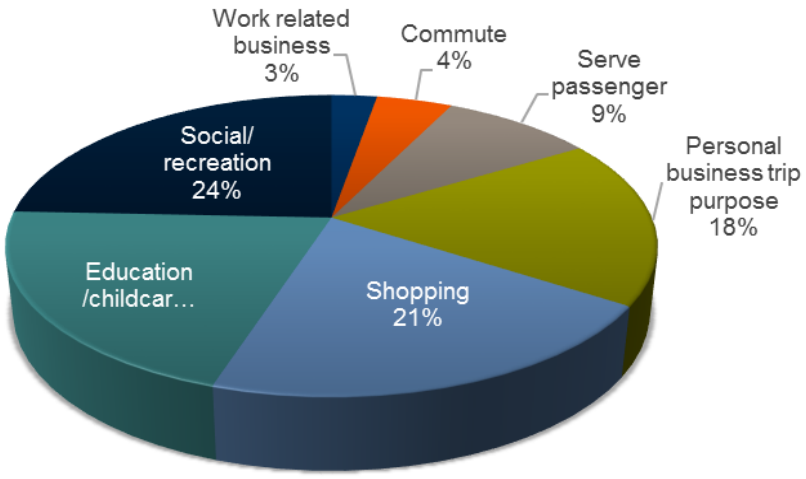
Walking mode share for commuting trips from Parramatta (suburb) has remained steady over the past 15 years at around 12%. This will need to significantly increase as the number of residents in the CBD grows. The opportunities presented by the mix of commercial and residential developments planned for the CBD means that more people will be able to live and work in the area. Walking trips to the CBD from surrounding precincts should be encouraged with clear routes, lighting and sign posting.

Compared to the Sydney CBD, Parramatta's proportion of walking mode share for all trips is currently low. With more, and a greater mix of, local destinations and improved infrastructure and information, walking will be a viable choice as people stay local for shopping, recreation and services.

3.2 Trip purpose

The proportion of walking mode share also differs depending on the purpose of the trip. In the Parramatta LGA, 81% of all trips taken are not considered to be commuting trips. Commuting trips make up only 19% of daily trips. Of the non-commuting trips, walking comprises approximately a quarter of the trips taken for shopping, education/childcare and social/recreation. It comprises only 3% of the total mode share for work related business trips. In comparison, 5% of commuting trips are undertaken by walking. **Figure 3-11** below presents the variations in walking mode share by trip purpose for the Parramatta LGA.

Figure 3-11 Walking mode share in the Parramatta LGA based on trip purpose



Source: Bureau of Transport Statistics Household Travel Survey

3.2.2 Summary

While some types of trips have a walking mode share around 20%, there is opportunity to grow mode share for commuting and work related business. With the average trip length across all trip types and modes by Parramatta LGA residents at eight kilometres, there will be some trips that are too long to consider walking as the primary mode. Residents should be encouraged to consider walking more for local trips across all purposes.

3.3 Vehicle ownership

An analysis of car ownership in the suburb of Parramatta was undertaken using historical data from the past three national censuses as obtained from the Australian Bureau of Statistics (ABS). The distribution of vehicle ownership is based on the number of vehicles in each household.

From 2001 to 2011, there has been a general increase in vehicle ownership in the Parramatta suburb, with an 8% increase in households owning one vehicle (to 53% in 2011), and 3% increase for two vehicles (to 17% in 2011) respectively. The proportion of households with no ownership of a private vehicle peaked in 2006 at 25% and recorded a slight decrease in 2011 to 24%, whilst the proportion of households owning three or more vehicles has remained constant at 4% over the ten year period. There has been a significant

increase observed in the overall reporting of vehicle ownership by Parramatta households, with only 2% not stating their ownership status in 2011 compared to 16% in 2001.

The observed trend of increasing car ownership in the Parramatta suburb has direct implications for the long term future of the CBD, with higher ownership figures likely to drive demand for appropriate parking facilities in the CBD area. Particular focus should be given by Council to supporting and promoting sustainable initiatives that increase the mode share for walking, particularly for shorter trips to, from and within the CBD. These include prioritising pedestrian movements over those of private vehicles throughout the CBD, supporting car share programs, and increasing public transport access to and from the CBD.

3.4 The walking experience

Parramatta's CBD is a compact CBD based on a strong grid network of streets and fine grain blocks. It is supported by over 55 laneways and arcades for permeable access and more direct routes. Beyond the significant commercial, retail and services, the CBD and adjacent areas support a range of culturally and socially important destinations that support the City's diversity and vibrancy. Parramatta has a relatively flat topography, providing a high level of accessibility and helping to make walking an easy choice.

While Parramatta Park and Parramatta River border the CBD and could be considered barriers to access on the western side, they also present very pleasant walking routes to and around the CBD and attract pedestrian activity. Parramatta Park is used both recreationally but also as an important walking commuting route between Westmead and the CBD and the east-west alignment of the Parramatta River provides access from residential and employment areas on either side of the CBD.

3.4.1 Footpaths and crossings

The CBD has an extensive footpath network, almost every block has footpaths on both sides of the road. Many of the CBD's major intersections are signalised, allowing pedestrians safe crossing while vehicles wait. Pedestrians have highest priority at a number of scramble signalised intersections as well, sometimes with longer movement times than vehicles. There are a few zebra crossings in the CBD, on Church Street, Phillip Street, Darcy Street and Fitzwilliam Street.

3.4.2 Laneways

Laneways and arcades are an important part of the pedestrian network in the Parramatta CBD. They allow pedestrians to shorten their journey with more direct access to destinations and are often associated with access to car parking. While they don't have dedicated footpath infrastructure, lanes have lower volumes of vehicle traffic which supports safe pedestrian connectivity.

3.4.3 Major routes

A major north-south spine through the CBD runs along Church Street, providing pedestrian connection to major destinations such as the train station, Westfield, the Eat Street restaurant precinct and the Riverside Theatre. It has low traffic volumes due to single and one-way traffic lane configurations and pedestrianised blocks, which along with widened footpaths, emphasises its pedestrian priority.

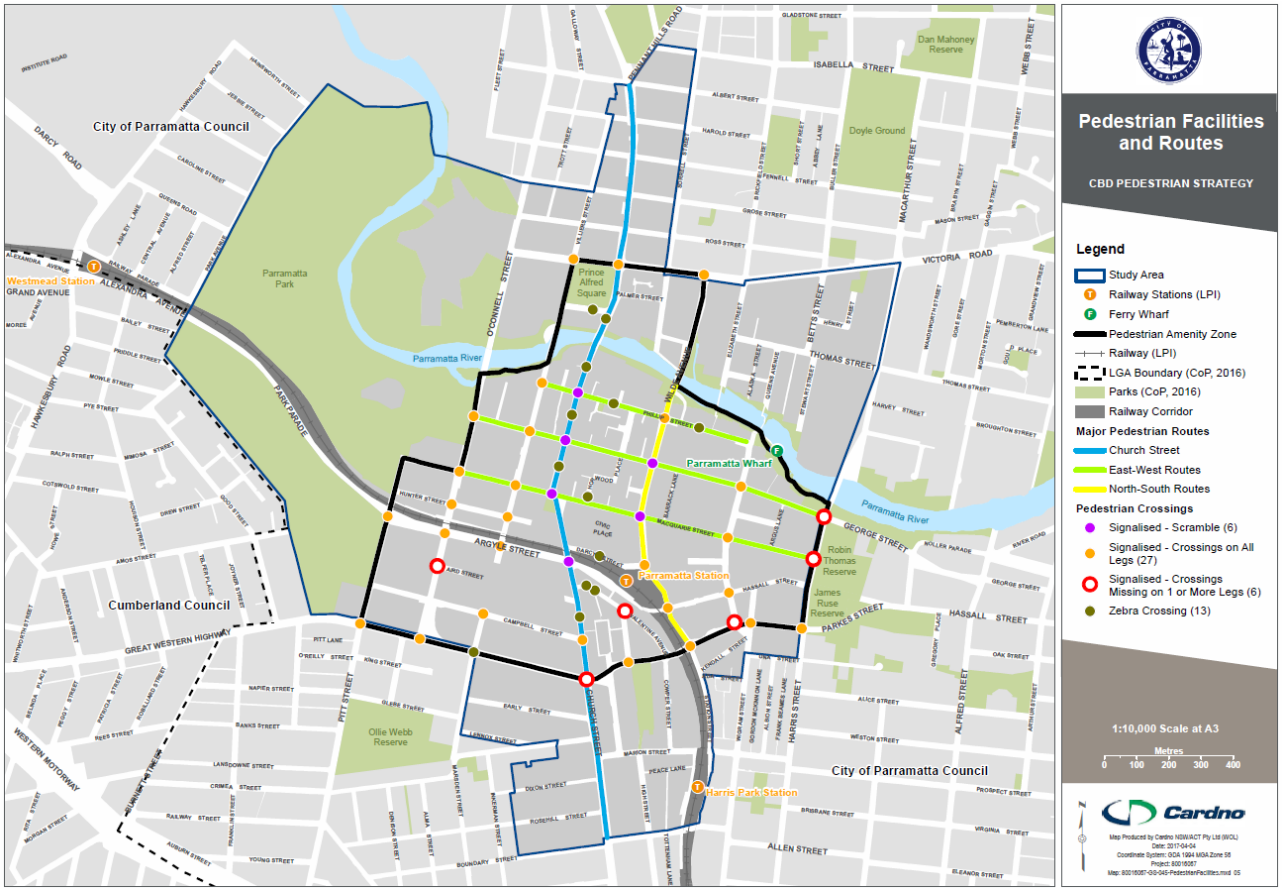
Smith Street provides another key north-south pedestrian route through the CBD. Smith Street connects the train station with commercial buildings and the schools in the east of the CBD. Wide footpaths run along the entire length of the street on both sides, and crossing legs are provided at all four signalised intersections, with scramble facilities available at two of these intersections (with George and Macquarie Streets). Smith Street has limited active street frontages, the majority of the blocks along it are occupied by commercial office building with no public access. North-south pedestrian routes are shown on **Figure 3-12**.

There are several key east-west pedestrian routes through the CBD available for pedestrians, also shown on **Figure 3-12**. To the north of the rail corridor, Macquarie Street and George Street provide one-way vehicular access through the CBD, and pedestrian links to key land uses including connecting commuters to employment centres, school children to the schools to the east of Smith Street and retailers.

Further north, Phillip Street provides connections to destinations along the Parramatta River foreshore. Footpaths from Phillip Street provide access to the foreshore and link to key destinations including the Parramatta ferry wharf and the southern river foreshore (currently under redevelopment), and the Parramatta Cycleway along the river which is used for recreational walks.

The current pedestrian volumes on streets throughout the CBD are presented and discussed in **Section 6.2**.

Figure 3-12 Pedestrian facilities and major routes



3.5 Current land uses

The CBD has a diverse range of public and private land uses. Precincts throughout the CBD are focused on different services and spaces.

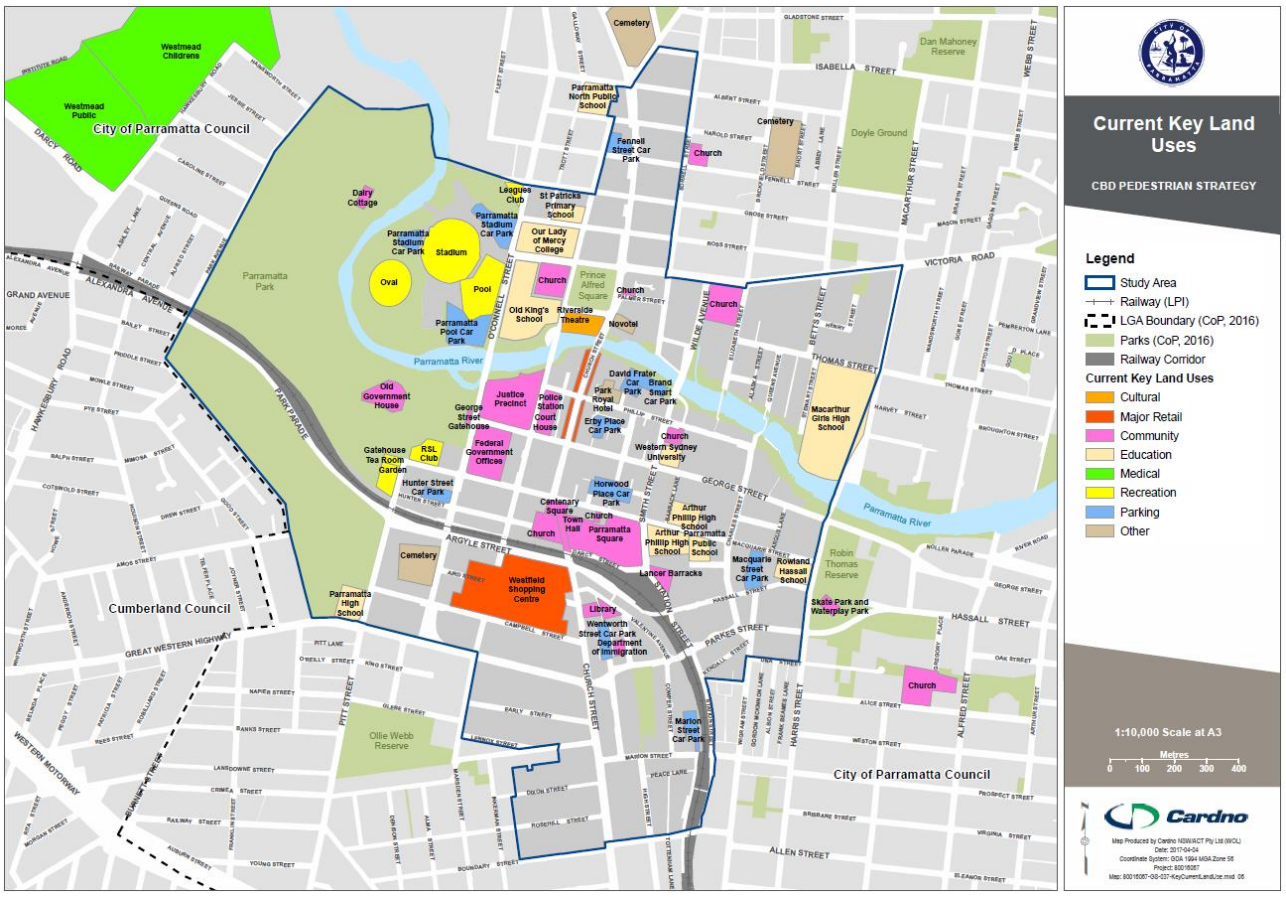
Church Street connects key CBD precincts and destinations including the Parramatta train station, the Justice Precinct, the Town Hall, Council Chambers and the Westfield Shopping Centre. Church Street has densely active street frontages including Eat Street, the block to the south of the Parramatta River with many restaurants and cafes.

The core CBD blocks, to the north-east of the train station are focused on commercial office buildings with some retail at ground level. Schools are also located in this precinct. Parramatta Park to the west of the CBD provides significant passive recreational space and connection to the Parramatta River. Other green space is provided along the river foreshore.

The Westfield Shopping Centre is a major retail destination for visitors from across Sydney. The centre includes extensive car parks and has limited access points from the street network. It does however have direct underground pedestrian access from the train station.

The current key land uses throughout the CBD are shown on **Figure 3-13**.

Figure 3-13 Current key land uses



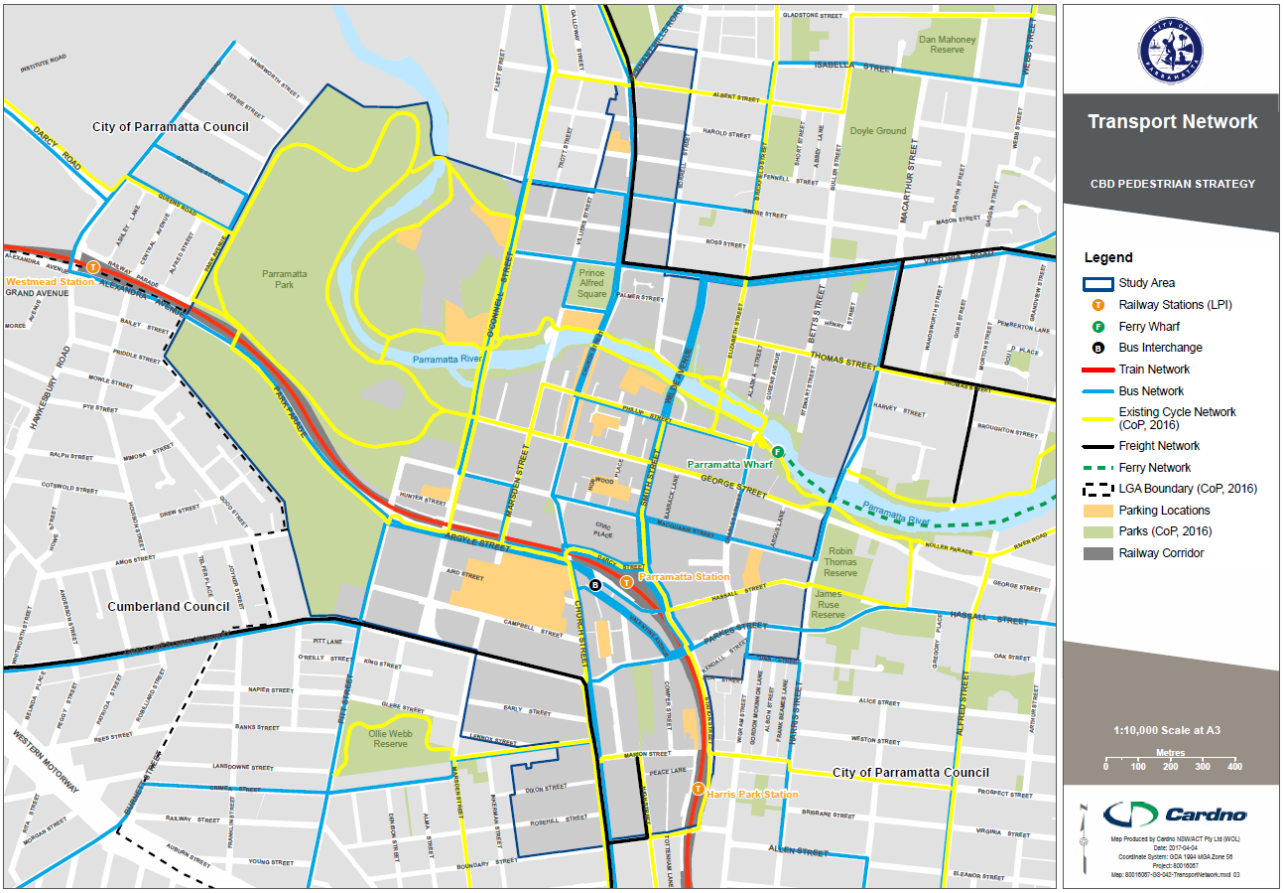
3.6 Integration with other transport modes

The CBD is well serviced by a combination of different transport modes, including public transport options such as trains, buses and ferries, which provide access to most of the wider Sydney Metropolitan area, including the Sydney CBD, in addition to the North-west and South-west growth centres. Options for private transport include the provision of both on-street and off-street parking for use by the public, and these are located throughout the CBD area.

Good pedestrian connections are vital to the function of the wider transport network, as all trips involve walking as a component of the door-to-door journey, both when accessing and leaving private and public transport. In the CBD, footpaths are available to most transit stops, providing links between key land uses in the CBD with nearby transit stops and major interchanges.

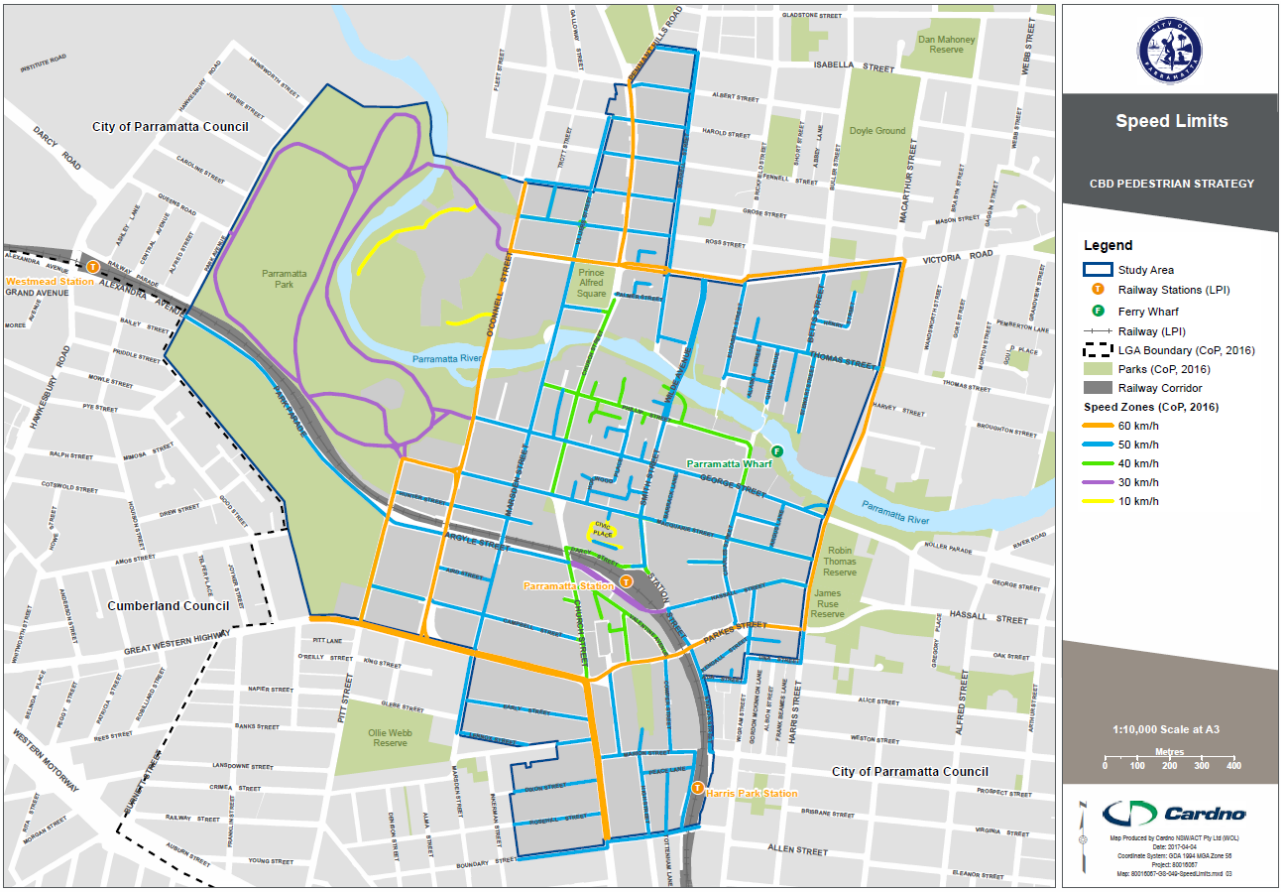
The CBD transport networks are shown on **Figure 3-14** and described in the following sections.

Figure 3-14 CBD transport networks



Speed limits in the CBD vary between 10 and 60 kilometres per hour, depending on the location. The majority of streets in the CBD have a speed limit of 50 kilometres per hour, key pedestrian streets such as Church Street and Darcy Street have speed limits of 40 kilometres per hour. CBD speed limits are shown on **Figure 3-15**.

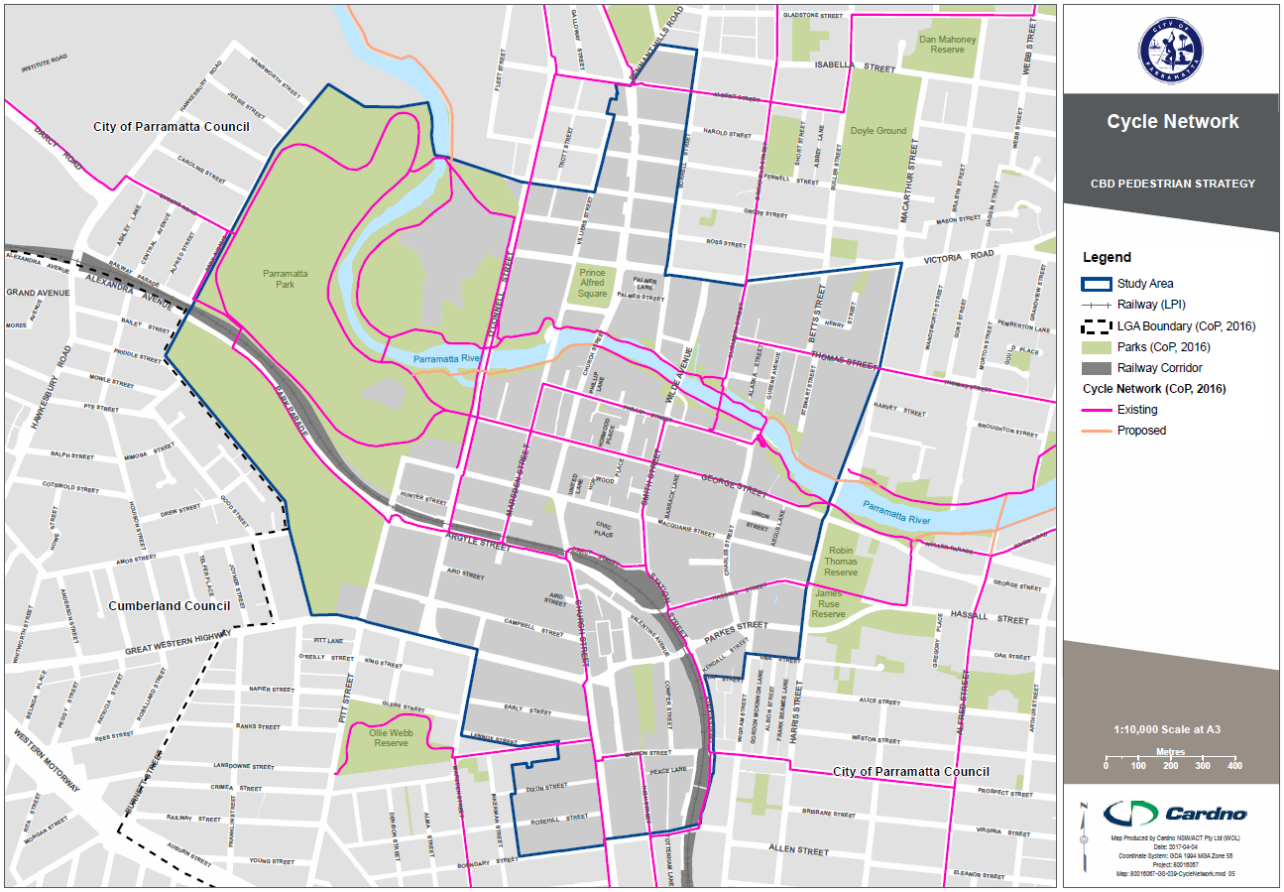
Figure 3-15 CBD speed limits



3.6.2 Cycling

Pedestrians and cyclists often share the same desire lines (the shortest or easiest route to navigate) and corridors as each other. Parramatta's existing cycle network provides connections to the CBD from each direction but there is a lack of separated cycling facilities within the CBD. The existing routes incorporate a combination of primarily on-road (mixed traffic) and some off-road facilities. Clear through routes are provided from the east to west, however direct north-south connections are lacking. Existing and proposed cycling routes are shown on **Figure 3-16**.

Figure 3-16 Existing and proposed cycling routes



Two key on-road routes proceed directly through the CBD and run from east to west along Macquarie and George Streets. The link along George Street connects from the west through Parramatta Park and proceeds to the east towards Alfred Street.

From the north, two routes provide connections to the CBD; the first is an off-street facility along O'Connell Street, with an on-road facility along Elizabeth Street connecting to a shared path bridge across the Parramatta River, and connecting to Phillip Street.

From the south, two on-road routes provide links to the east-west route along Macquarie Street via Station Street, and Wigram Street continuing along Charles Street. Another off-road route approaches from the south-west along Pitt Street, before continuing east along Argyle Street and connecting to the Westfield Shopping Centre and Parramatta Transport Interchange.

A recreational shared path facility called the Parramatta River Cycleway is provided on both sides of the Parramatta River foreshore, beginning at the Parramatta ferry wharf and proceeding west towards Church Street. West of Church Street, the path continues on-road along Market Street, before returning to an off-road environment and proceeding through Parramatta Park. The Parramatta River Cycleway connects to Sydney Olympic Park in the east and Westmead in the west.

Along with the cycleway, there are only a few other routes in the CBD where pedestrians and bicycles currently interact. There are some shared paths for use by both bicycles and pedestrians, generally located on the periphery of the CBD; along Pitt Street, the railway line near Harris Park Station and Harris Street. The northern side of Argyle Street between Church Street and Pitt Street is also a shared path.

There are a number of regional routes for cyclists. The M4 cycleway, the T-way from the north west, and the Parramatta Valley Cycleway from the east provide east-west links. From the south, shared paths on the western side of Church Street, Station Street, and Pitt Street provide a connection to the CBD.

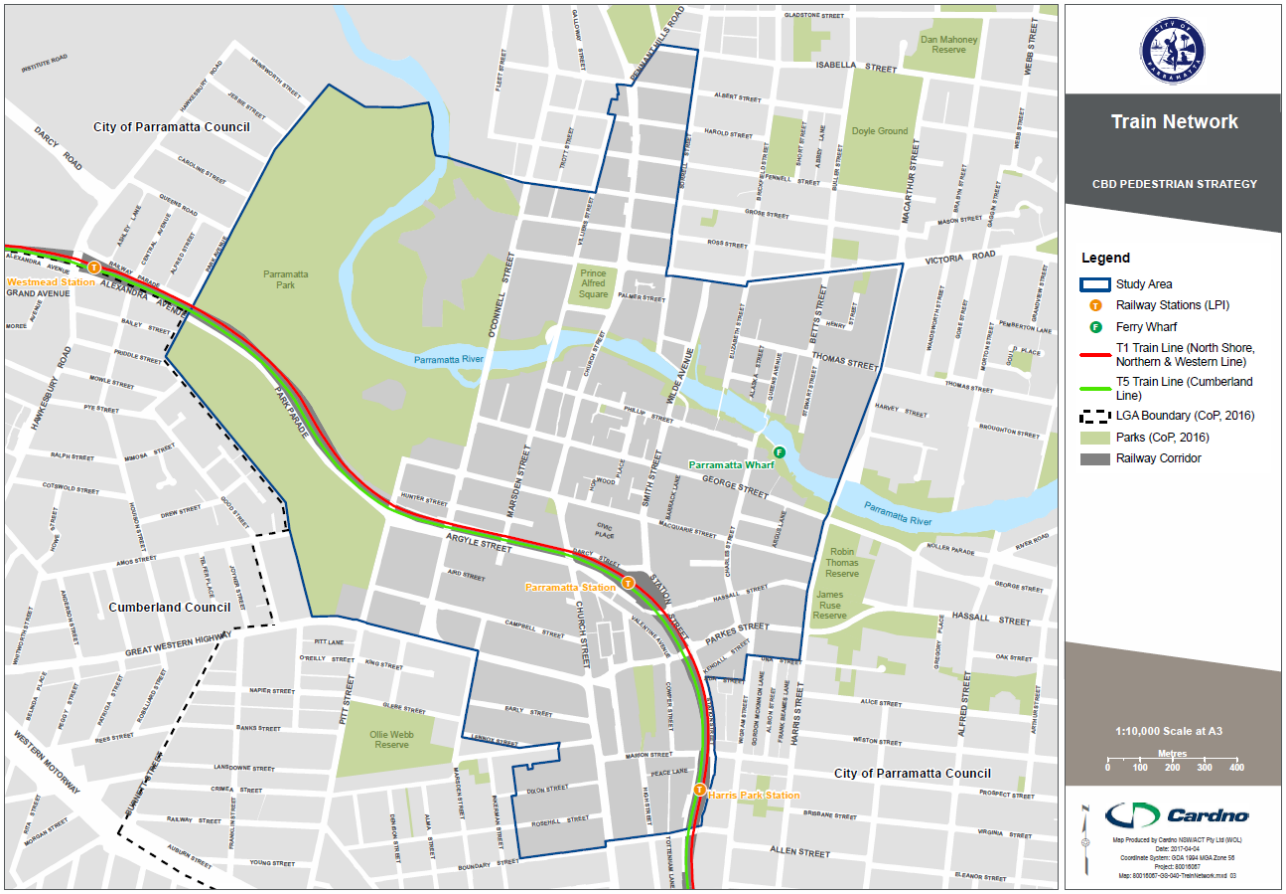
Separation of pedestrians and bicycles should be encouraged as the CBD develops and population grows. Cyclists should be provided with their own dedicated facilities to encourage people travelling longer than two

kilometres to consider cycling rather than driving. The existing shared paths should be assessed for their appropriateness into the future. As demand from both pedestrians and cycling grows, separation is recommended to reduce conflict and perception of safety.

3.6.3 Trains

Parramatta Station is located within the Parramatta Transport Interchange, directly opposite the Westfield Shopping Centre on the eastern side. The station is a major pedestrian trip generator, and provides access to trains operated by Sydney Trains and NSW Trainlink along the T1 Western Line towards Emu Plains, Richmond or Berowra, the Blue Mountains line towards Bathurst, and the T5 Cumberland Line towards Schofields and Campbelltown. The train network is shown on **Figure 3-17**.

Figure 3-17 Parramatta CBD train network



Footpath connections are available on all surrounding streets, including Darcy, Station, Church and Argyle Streets. To access the station from the northern side, an entrance is provided on Darcy Street. This street is designated as a high pedestrian area with a 40 kilometre per hour speed limit, and users must cross at a zebra crossing to access stairs and lifts connecting to the station concourse. Another entrance point is available further to the east on Station Street; users may also opt to proceed along Church Street and access the station from the southern entrance portals.

To access the station from the southern side, multiple access points are available to users via Church, Argyle and Fitzwilliam Streets. These entrances are located along the eastern area of the Westfield Shopping Centre, and connect to an underground pedestrian link providing access to the station concourse. Above-ground links to the station are also available from the northern side of the Argyle Street bus interchange, with access available via a signalised pedestrian crossing along the mid-block.

The rail corridor is wholly elevated above street level as it passes through the CBD; this elevated segment begins at Harris Park Station located to the south-east of the CBD, and continues through to Parramatta Park located to the west. This has an impact on the connectivity of the CBD, as pedestrian access to each side of the rail corridor is restricted to locations where street underpasses are provided. Excluding the Parramatta Transport Interchange, there are six road underpasses in the CBD area which pedestrians can

use to cross the rail corridor and access the northern and southern precincts. Wide footpaths are provided along all six, and additional lighting is provided only along the link off the Station Street / Hassall Street intersection. Along the remaining five underpasses, the areas are relatively dark, even during the daytime.

In 2014, the following passenger usage counts were recorded by Sydney Trains:

> Parramatta Station recorded 34,960 In movements over 24 hours. Of these, 7,790 occurred in the AM peak, and 14,960 in the PM peak.

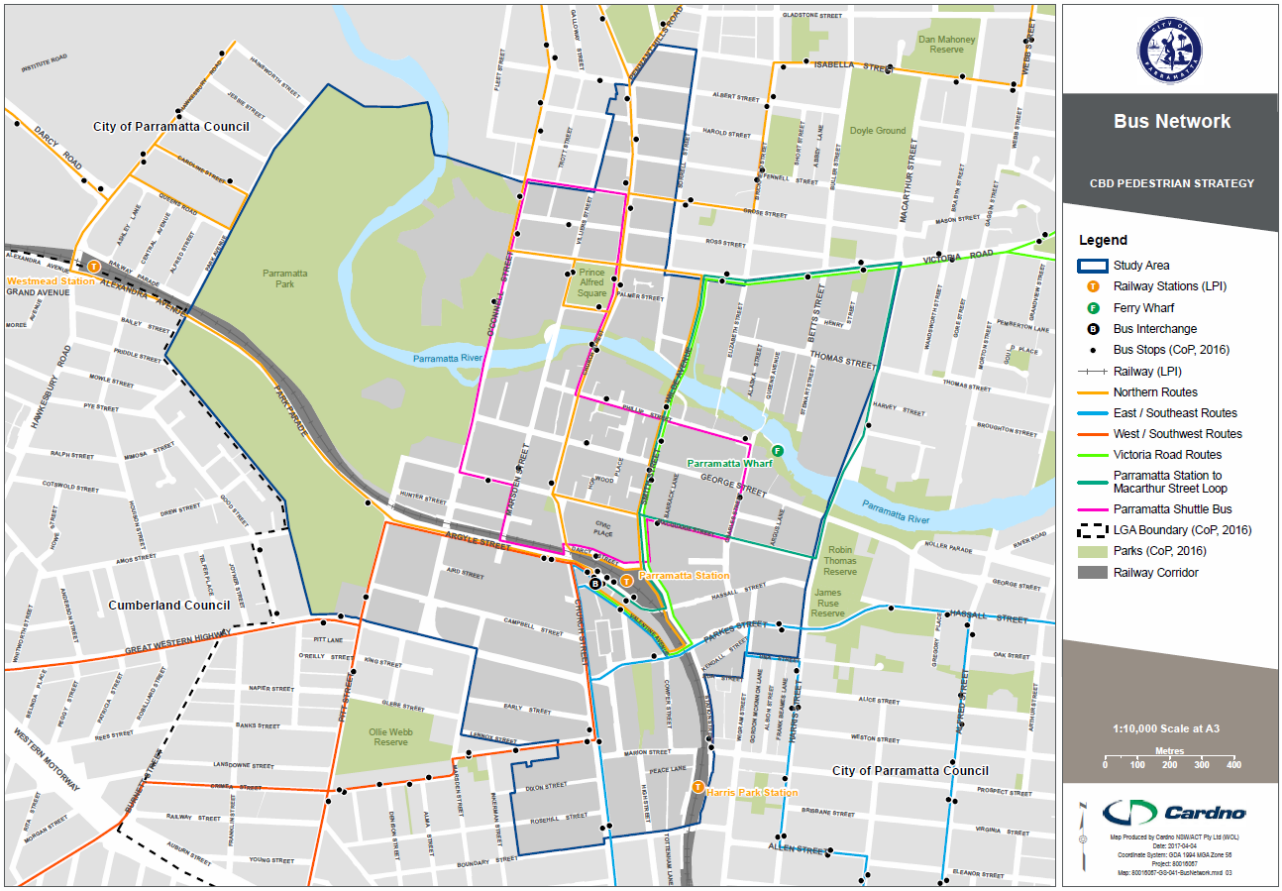
> Parramatta Station recorded 34,960 Out movements over 24 hours. Of these, 13,700 occurred in the AM peak, and 8,660 in the PM peak.

Demand for train services will grow as more jobs are provided in the CBD. Free flowing entry and exit to and from the train station, clear wayfinding to major destinations and multiple entry points will be important to enhancing the walking component of the public transport experience.

3.6.4 Buses

Buses servicing the CBD provide connections to most areas in Metropolitan Sydney, including the north-west and south-west precincts, as well as the Sydney CBD, inner west and northern areas. Bus services are shown on **Figure 3-18**.

Figure 3-18 CBD bus network



Most bus activity is concentrated around the Parramatta Transport Interchange, with all buses utilising layover areas located off Station Street and shared with passenger stands along Argyle Street.

Transport for NSW Opal data for the Parramatta Transport Interchange from Thursday 17th March and Saturday 19th March 2016 recorded the following:

> 9,173 tap-ons and 10,189 tap-offs were recorded at the stops with east/northbound services for the whole of Thursday;

> 10,479 tap-ons and 7,581 tap-offs were recorded at the stops with west/southbound services for the whole of Thursday;

> 3,926 tap-ons and 3,770 tap-offs were recorded at the stops with east/northbound services for the whole of Saturday; and

> 3,854 tap-ons and 3,507 tap-offs were recorded at the stops with west/southbound services for the whole of Saturday.

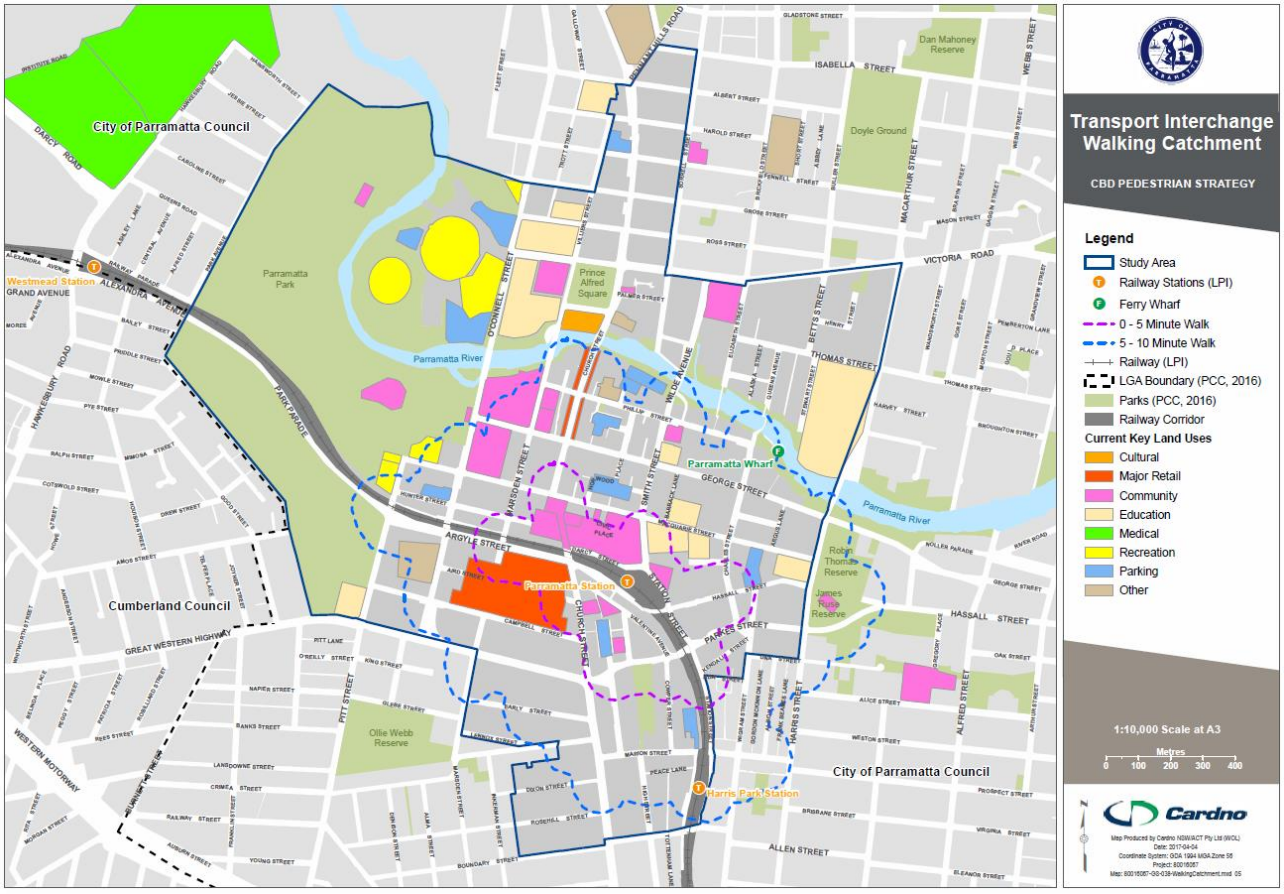
Outside of the interchange, there are nine bus stops located within the CBD, and these are primarily concentrated along the key inbound and outbound corridors including Smith Street/Wilde Avenue, Church and Argyle Streets.

A free shuttle bus currently operates within and around the CBD boundary, and includes stops at Parramatta train station and ferry wharf, the Westfield Shopping Centre, and along streets including O'Connell, Church and Phillip Streets.

The bus interchange is a key pedestrian trip generator, and footpath links are provided along all surrounding streets. Pedestrian access to the bus interchange should be direct, safe and legible. Clear wayfinding will support visitor bus access and appropriate footpath widths are required to cater for the peak afternoon demand which sees a burst of activity as schools finish for the day. Bus stops in other parts of the CBD should be weather protected, located outside of the pedestrian clear zone and easily identified.

The Parramatta Transport Interchange is well located close to the centre of the CBD. All key land uses south of the Parramatta River are within a five or ten minute walk of the interchange as shown on **Figure 3-19**.

Figure 3-19 Transport interchange walking catchments



3.6.5 Ferries

The CBD is currently serviced by ferries along the F3 Parramatta River Line, providing connections to wharfs along the Parramatta River corridor, Darling Harbour and Circular Quay. The Parramatta wharf is situated towards the north-east of the CBD, and is integrated with the southern shared pedestrian and bicycle

foreshore path. Access to the street network is available via Phillip and Charles Street, with footpath access provided on both sides. A bus stop serviced by the Parramatta Free Shuttle bus is also available on Phillip Street.

Ferry services arrive and depart the wharf approximately once every hour; in the 2014/15 financial year, 2,336,109 passengers travelled along the F3 Parramatta River Line. The most recent data obtained in May 2015 showed 1,523 entries and 1,469 exits were recorded at Parramatta wharf. Ferry load factors are generally higher on weekends compared to weekdays; during a typical Monday to Friday period in May 2015, the load factor was observed to be 7% in the off-peak, increasing to 11% on Saturday and 27% on Sunday.

Like the train station and the bus interchange, the ferry wharf should be supported by clear wayfinding to major destinations and appropriate path widths. The ferry caters for many visitors who are unfamiliar with the CBD and so will need highly legible routes and reassurance that they are heading in the right direction.

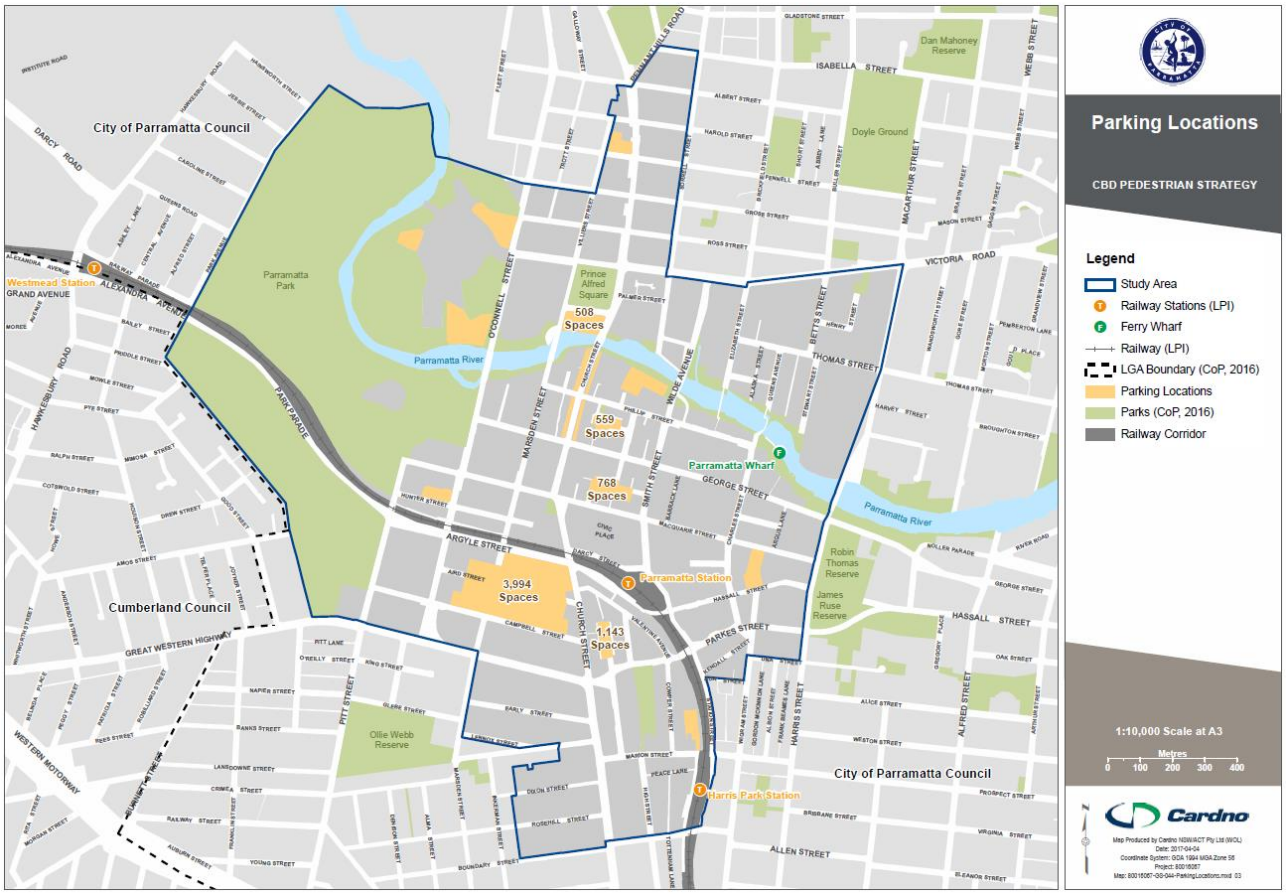
3.6.6 Vehicles and parking

Private vehicular access is generally available throughout the CBD, with the exception of areas including the Church Street pedestrian zone and the bus stands and layovers in the Parramatta Transport Interchange. Footpath links are available along most streets in the CBD, with movements somewhat regulated by the movement of vehicles, particularly along smaller laneways and at intersections.

The CBD streets discourage through vehicular movements, vehicles are encouraged to use the city ring road for a faster route from north to south and from east to west. This reduces the volume of traffic in the centre of the CBD, particularly along Church Street. The reduced traffic means that pedestrian movements can be prioritised at some intersections and it improves amenity for people on foot as they are not confronted by large volumes of vehicles and queuing.

Parking in the CBD is available both on-street and via a number of off-street facilities available for use by the public. Currently, there are a total of 5,744 parking bays available in the wider Parramatta area, including 3,994 off-street (excluding the Westfield Shopping Centre) and 1,750 on-street spaces. Multi-storey parking locations are shown on **Figure 3-20**.

Figure 3-20 CBD multi-storey parking locations



Footpath links are available to off-street parking facilities; access is generally gained via smaller laneways where vehicular entry and exit points are also located. Car park access points are generally not provided along the major active CBD street frontages. There is a general lack of directional wayfinding, and lighting provisions are poor, yielding to safety and security concerns. There are no major freight routes that access the CBD although servicing is essential for all businesses.

3.7 Walking opportunities and issues

The strategic plans, planned redevelopment of the CBD and review of the current pedestrian experience present issues and opportunities to be addressed as part of the Pedestrian Strategy.

Opportunities and Issues Summary

The existing characteristics and planned transformation of Parramatta's CBD presents significant opportunities to create a compact, vibrant, accessible and walkable centre which supports a high proportion of walking trips. The transformation is already occurring and represents a key driver in the development and delivery of this Pedestrian Strategy. Implementing plans to prioritise pedestrians as city blocks are developed minimises construction impacts from future retrofitting and requires developers to contribute to the space, connections and infrastructure needed to create a more walkable CBD. Many of the existing issues will be addressed by new developments designed to make walking an easy choice.

3.7.1 Walking opportunities

The investment in the CBD provides opportunities to support and promote walking as the major transport mode for trips within the CBD. Some of the opportunities include:

Small CBD blocks in the city core and an easily navigable grid network – the grid structure of the CBD can define strong pedestrian connections that link current and future developments and key land uses, and facilitates the efficient movement of pedestrians.

Strong lane and arcade network – Can provide an environment that is more conducive to pedestrian activities by implementing initiatives that emphasise pedestrian priority and restrict vehicle access. Maximising the use of these spaces for new retail, commercial and entertainment purposes also assist with activation of the wider CBD.

Range of trip purposes including shopping, education, cultural and heritage visits and services as well as commuting – Different trip purposes will generate trips at different times of the day, and initiatives aimed at improving pedestrian facilities should consider the needs of all potential users.

Five to ten minute walk from the train station to most CBD locations – Nearby access to transit stops is highly advantageous in encouraging walking as a viable option to access public transport services and CBD destinations.

New public transport services reduce the need to drive to Parramatta – Initiatives including additional train, bus and ferry services, in addition to projects such as the Parramatta Light Rail will improve public transport coverage and encourage visitors to use public transport when accessing the CBD.

Planned increases in residential, cultural land uses leads to growth in night time and weekend activity – the activation and growth of these new areas can assist with improving the perception of, and actual personal safety and security throughout the CBD.

Proposed car-free link through Horwood Place – This creates a new north-south pedestrian route through the CBD, aligned with redevelopment sites and linking key land uses throughout the CBD, including the redeveloped river foreshore, transport interchange and future Parramatta Square.

Access to Parramatta River – the construction of new pedestrian links to the Parramatta River foreshore will assist with improving pedestrian accessibility to heritage areas and new cultural and entertainment precincts and land uses.

Relatively flat landscape – Parramatta's generally flat topography makes walking trips easy for people of all fitness levels.

3.7.2 Walking issues

Some of the issues that affect the walking experience in the CBD include:

Personal security – Different issues associated with personal security have been identified by Council. These include:

> In the CBD, indecent assaults and fraud are the key crimes that have increased. 23.3% of indecent assaults and 3% of fraud cases reported in the Parramatta LGA occurred in outdoor and public spaces;

> Lack of passive surveillance at off-street car parks, with reported increases in theft from motor cars; and

> Moving through the CBD at night time between the main entertainment / restaurant area and the train station and bus interchange; and

> Negative perceptions of people who may have physical or mental health issues, and utilise nearby social and government services.

Dark walking routes – Some parts of the CBD are poorly lit. This affects perceptions of personal security and discourage people from choosing to walk if travelling after dark. Reported crimes that occur at night include alcohol and non-alcohol related assaults, malicious damage and indecent assault, usually during weekend periods from Friday to Sunday, and primarily along the café/restaurant precinct along Church Street. Visitors have reported feeling unsafe when leaving these areas to access the transport interchange, as well as in car parks where sight lines and lighting is reduced.

Heavy traffic on outer CBD roads – there are eight key corridors which converge on the CBD and result in increased traffic congestion, reducing efficiency and pedestrian amenity while accessing the CBD.

Lack of night time economy - There are areas in the CBD that are old and not activated with points of visual interest and lighting to facilitate passive surveillance; this also impacts on the feeling of being unsafe.

Delay at intersections – There are currently six intersections that have pedestrian scramble facilities available, however most intersections prioritise vehicular movements and the majority of CBD streets have posted speed limits of 50 kilometres per hour.

Lack of residential land uses in the CBD – this can lead to a less sustained level of activity in the CBD outside of typical Monday to Friday work hours as workers leave the CBD at the end of the day and it is not viable for businesses to remain open.

The railway line forms a barrier – this has an impact on the free movement of pedestrians throughout the CBD as access between the northern and southern precincts is restricted to seven corridors, with one solely for pedestrian use only (the underpass of the Parramatta Transport Interchange).

Blank facades – Some CBD blocks, in particular around the Westfield Shopping Centre, have blank facades, limiting the pedestrian activity and experience in these areas. A lack of ground floor retail away from the CBD decreases opportunities for street activity as well.

Large CBD blocks – The larger CBD blocks, away from Church Street, require longer walking distances for pedestrians accessing some destinations than if blocks were smaller or through site links were provided.

4 Walkable city centres

Cities around the world have taken innovative approaches to planning and developing walking focused CBDs which place people, and their journeys on foot, above all other transport modes in the core areas. These cities and their strategies to prioritise pedestrians provide guidance for development of Parramatta's walkable city centre. The following sections summarise ideas, theories and practices in a set of walkable city principles to help guide the development of the walking experience in Parramatta and present examples from great walking cities.

4.1 Walkable city principles

Genuinely walkable city centres are more than wide footpaths and frequent road crossings. They support direct and safe journeys and provide public places to enjoy spending time in. These city streets provide frequent connections, pedestrian-only links and priority for people on foot. They have a diverse mix of land uses, people coming and going at different times of the day and night and they are attractive and interesting places to rest and wait, sheltered from weather elements.

Across Australia and the world, researchers, practitioners and city officials have investigated the principles and characteristics that make CBDs great places to be a person on foot. **Table 4-1** presents a summary of walkable city centre principles that are relevant for Parramatta as it transforms into Sydney's second CBD. The table provides detail for each principle and the research, theory or reference that it aligns with. The table also demonstrates which walkable cities have embraced each principle. Summaries of example walkable cities which are referenced are provided in **Section 4.2**.

Table 4-1 Walkable city centre principles

Principle	Characteristics	Reference
Amenity	> High quality pedestrian infrastructure is provided throughout the CBD. > Walking is a pleasant experience with seats, shelter, and landscaping. > Demand is catered for. Reallocate road space proportionally to the volume of demand, pedestrian demand on city centre streets can be many times more than the vehicle demand. > Footpath space is planned and allocated for different uses: – Pedestrian zones – for movement. – Kerb zones – for street furniture, signage, utility poles. – Business zones – for outdoor dining, building frontages. > Wayfinding lets people know where they are and how they can get to their destination on foot.	> International Charter for Walking > Streetfighter, Janette Sadik-Khan > Jan Gehl's 10 Principles of Sustainable Transport > Livability in Transportation Guidebook, U.S. Department of Transportation > Copenhagen Walking Strategy: More People Walk More > Liveable Green Network, City of Sydney > Walkable city examples: Arlington, Newark, Austin, Florence, Melbourne
Connectivity and destinations	> Walking routes connecting CBD destinations are direct and legible. > The CBD is linked to open spaces and recreational routes. > Walking routes integrate with public transport interchanges, stops, stations and wharves and support the beginning and end of trips made by other modes.	> International Charter for Walking > Copenhagen Walking Strategy: More People Walk More > Jan Gehl's 10 Principles of Sustainable Transport > Walkable city examples: Jersey City, Madison, Barcelona, Portland
Accessibility	> Streets are Disability Discrimination Act (DDA) compliant throughout the CBD. > All people have equitable access to public transport.	> International Charter for Walking

Principle	Characteristics	Reference
	> Public spaces cater for inclusive mobility.	> Copenhagen Walking Strategy: More People Walk More > Walkable city examples: Jersey City
Partnering	> Integrated State and Council planning for transport infrastructure and major developments to deliver a consistent and optimum CBD walking environment. > Working with retailers and building owners to encourage and support shop façade improvements and activation of streets.	> Livability in Transportation Guidebook, U.S. Department of Transportation > Walkable city examples: Arlington, Pittsburgh
Vibrancy	> Plan a diverse mix of land uses close to each other so that people can walk to the majority of everyday services and facilities and reduce dependence on motor vehicles. > Support street art and events, the night time and weekend economy and creative use of the city streets. > Encourage walking, so more people use the city streets. > Footpath design can create opportunities for things to do and see along the way.	> International Charter for Walking > Jan Gehl's 10 Principles of Sustainable Transport > Copenhagen Walking Strategy: More People Walk More > Walkable city examples: Arlington, Pittsburgh, Munich, Barcelona, Paris, Melbourne
Define Link and Place	> Streets functions of link and place are defined and supported. > Right-size streets by matching land use and transportation contexts appropriately on existing streets.	> Streetfighter, Janette Sadik-Khan > NSW Roads Plan (Draft) > Walkable city examples: Melbourne, Munich
Pedestrian priority	> Pedestrian movements are prioritised over vehicles in the CBD: – Reduce waiting time – Reduce crossing distance – Increase crossing opportunity – Increase footpath space	> Livability in Transportation Guidebook, U.S. Department of Transportation > Streetfighter, Janette Sadik-Khan > Walkable city examples: Arlington, Bendigo, Jersey City, Barcelona, Portland, Edinburgh, Munich, Florence, Paris
Safety and security	> People choose to walk – day and night. Streets have passive and active surveillance, good lighting and they have pedestrian activity even at night time. > Slower vehicle speeds, driver awareness and safe crossings reduce the number and severity of crashes involving pedestrians. > The needs of all pedestrians are considered especially vulnerable road users such as children, the elderly and mobility impaired.	> International Charter for Walking > Copenhagen Walking Strategy: More People Walk More > Walkable city examples: Arlington, Newark, Austin, Edinburgh, Paris, Barcelona
Communicate and promote walking and its benefits	> Walking has a positive image. > Walking and walking safety is supported and encouraged. > People are aware of the benefits of walking and are informed about how to choose to walk.	> International Charter for Walking > Copenhagen Walking Strategy: More People Walk More > Walkable city examples: Newark, Portland, Austin, Edinburgh

4.2 Great walking cities

The snapshots below present ideas and approaches from walking focused cities which are relevant in size and regional significance to Parramatta.

Characteristics of Walking Cities Summary

The strategies used in each of these cities demonstrates that incremental changes can transform a city from one which prioritises cars, to one which prioritises the pedestrian experience. The focus on pedestrian priority, safety and amenity by each city demonstrates their alignment with the walkable city principles set out in **Section 4.1**. These principles have informed the walking objectives of this Pedestrian Strategy which aim to support the transformation of the CBD into a walkable city centre. A number of the actions adopted in these cities are highly relevant for the Parramatta CBD and have influenced the recommended actions for walking proposed in **Section 8**. In particular:

> installation of permanent pedestrian counters (Arlington)

> improvement of street lighting (Newark);

> collaboration with schools to meet students' walking needs (Austin);

> introduction of traffic calming measures and reduced speed limits (Barcelona, Edinburgh, Paris);

> creation of a mobile website with walking information (Edinburgh);

> trialling of road closures (Pittsburgh); and

> use of walking routes for events (Melbourne).

Details of each city's support for walking is presented in **Appendix B**.

Bendigo, Victoria	
Relevant for	Pedestrian mall with vehicle restriction times, wide footpaths and weather protection.

Walkable features

> The Hargreaves Street Pedestrian Mall runs for one block through the city's retail centre. Access to the area is restricted for vehicles between 10:00AM and 6:00PM, however outside of these times, the area acts as a shared zone, with alternate paving treatments denoting pedestrian priority at all times.

> Most footpaths are wide, lined by street trees with weather protection provided by shop awnings.

> The intersection of Hargreaves Street and Bull Street was converted into a shared zone to complement the adjacent Hargreaves Mall. Works included the installation of rumble strips, a mid-block crossing, street furniture, and footpath widening and kerb removal. The works resulted in a decrease in average vehicle speeds from 40 to 27 kilometres per hour.

Melbourne, Victoria	
Relevant for	Pedestrian access to light rail in a city centre and activation of city centre laneways

Walkable features

> The city centre is structured in a grid layout, with equal sized blocks approximately 240 metres long and 115 metres wide.

> The Bourke Street Mall is a 200 metre pedestrianised section of Bourke Street in the city centre, with access only available to trams. Street furniture and trees have been installed, and space is available for recreation or public events.

> Many laneways in the city centre have been converted to shared zones or pedestrian only zones. These laneways are interesting and activated places for people to visit and pass through.

> Melbourne has the highest proportion of street furniture in the world and the number of cafes has increased from 50 in 1990 to over 600.

Arlington, Virginia	
Relevant for	Implementing a broad program of initiatives aimed at improving pedestrian priority in the city.

Walkable features

> WALKArlington: art, furniture and wayfinding, improved infrastructure including improved footpaths and crossings.
> Beacons to provide signalised warnings to approaching vehicles at zebra crossings.
> Pedestrian signal countdown timers at 50 intersections.
> New developments must provide “pro-pedestrian zoning” initiatives which requires retail land uses to be located at ground floor level along key pedestrian routes.
> Permanent pedestrian and bicycle movement counters.
> Widened footpaths, new shared and bike paths, and pedestrian refuges and traffic calming measures.

Austin, Texas	
Relevant for	Safety for pedestrians crossing roads, low-cost measures to reduce vehicle speeds and shorten crossing distances and promotion of walking to city residents,

Walkable features

> Pedestrian Hybrid Beacons (PHB) have been installed at 39 pedestrian crossings across the city as a series of warning lights activated by pedestrians.
> A low-cost kerb extension solution, where the extension surface was painted with colourful polka dots, with traffic bollards reinforcing the area for use by pedestrians only.
> GIS software was used to conduct a full audit of the existing pedestrian infrastructure in the city and beyond.
> The Safe Routes to School program aims to educate school children about staying safe while using the road network as a pedestrian or cyclist.

Barcelona, Catalonia	
Relevant for	Reduced traffic speeds, support for a signature pedestrian mall and using shared zones as a strategy to prioritise pedestrian movements over the needs of vehicles.

Walkable features

> The Las Ramblas pedestrian mall runs through the city, connecting the coast with Catalunya. The mall has one active traffic lane running in each direction, with stalls, retailers and restaurants set up on a pedestrian boulevard running down the middle.
> A 30 kilometre per hour speed limit applies to all vehicles travelling through the city centre.
> Most streets in the city centre are designated as pedestrian zones; whilst vehicles are permitted to use these streets, surfaces are paved, with line marking and signage in place to reinforce pedestrian priority.
> The pedestrian zones are generally connected to one another, and provide uninterrupted access to pedestrians travelling through the city.
> Most minor streets in the city centre that are not designated pedestrian zones are generally narrow and designated as one-way only.

Edinburgh, Lothian	
Relevant for	Speed reductions in the city centre, creating pedestrian-only zones where popular land uses are located, and integrating active transport routes with public transport services.

Walkable features

> All streets in the city centre had the traffic speed limit reduced to 20 miles per hour (32 kilometres per hour) in January 2015.
> Multiple car-free zones located throughout the city. These areas are characterised by alternating surface treatments and warning signage restricting vehicular access, except for deliveries and emergency vehicles.
> Rose Street is a pedestrianised laneway which provides access to retailers, cafes and restaurants.
> A smartphone application (WalkIt Edinburgh) is available to residents and visitors, and provides walking trip options, journey times and routes to assist with navigating around the city.

Florence, Tuscany	
Relevant for	Restricting vehicle access to the city centre and implementing shared zones due to narrow footpath widths.

Walkable features

> The city was declared the most polluted in Italy. This, combined with high pedestrian related injuries and fatalities resulted in the introduction of pedestrian zones in 2009, beginning with the circuit around the Duomo cathedral.

> City centre access is permanently restricted to all vehicles except those of residents, taxis and buses. Entry points to the restricted areas are marked by signage and signals, with compliance to the restrictions enforced by cameras.

> Streets and footpaths in the city are generally very narrow, requiring pedestrians to regularly step onto the road and share space with vehicles.

> Pedestrian zones are characterised by alternating paving treatments, with signage and line marking reinforcing pedestrian priority.

Jersey City, New Jersey	
Relevant for	Providing an integrated transport solution that combines multiple public transport options with walking and cycling networks.

Walkable features

> The majority of the transit stops are fully accessible for mobility impaired passengers, and are linked to the surrounding pedestrian network.

> A pedestrian walkway along the Hudson River shoreline links Jersey City with the major Hoboken transit terminal, businesses and recreational land uses.

> A pedestrian only zone along a section of Newark Avenue, directly opposite the Grove Street PATH train station.

> Proposal to construct a pedestrian bridge across the Hudson River from Jersey City to Manhattan, to provide an alternative means of commuting for residents and helping to resolve capacity constraints on the PATH train network and NJ/NY ferry service.

Madison, Wisconsin	
Relevant for	Reducing vehicle space on city streets to provide wider footpaths

Walkable features

> The city centre is primarily a grid layout, with diagonal connections to the Wisconsin State Capitol Building.

> State Street, an east-west running road link, was converted to a shared pedestrian mall in 1974. An original four traffic lanes were reduced to two and reserved for public transport and emergency vehicles to be shared with pedestrians and cyclists.

> The Southwest Commuter Path is a shared path that was converted from a disused railway line.

> The University of Wisconsin, Madison is accessible through multiple pedestrian malls including the Bascom and East Campus Mall.

> Intersection upgrades, including signal upgrades such as beacon fixtures and countdown timers.

Munich, Bavaria	
Relevant for	Developing pedestrian malls and precincts within the city centre, connecting them directly to public transport services and prioritising city street space for pedestrians over vehicles.

Walkable features

> Multiple pedestrian malls located throughout the city, and these are connected to key pedestrian and bicycle routes along streets which are open to private vehicles.

> The Kaufingerstraße pedestrian only mall runs for approximately one kilometre between Marienplatz and Karlsplatz; it accommodates street events, retailers and historical sites aimed at tourists.

> The Viktualienmarkt is a pedestrian and bicycle only precinct, which accommodates the local food market. It comprises a number of streets permanently closed to vehicles, and is characterised by alternating paver treatments to emphasise pedestrian and bicycle access only.

> Where streets in the city centre are open to traffic, lane widths are generally narrower, with most of the space reserved for footpaths and pedestrian use.

Newark, New Jersey	
Relevant for	Implementing initiatives that aim to improve pedestrian safety and minimise the risk of crashes resulting in injuries or fatalities.

Walkable features

> The City of Newark Pedestrian and Bicycle Safety Action Plan aims to reduce pedestrian fatalities to zero by 2025.

> The Be Street Smart NJ awareness program targets the behaviour of both pedestrians and vehicle drivers.

> Addition of trees and vegetation, improved street lighting, and installing integrated bus stops at safer locations.

> New kerb ramps, crossings, improved signalised and mid-block crossings, pedestrian refuges, as well as road treatments for vehicles including speed humps, rumble strips and centre medians.

Paris, Île-de-France	
Relevant for	Allocating more space to pedestrians through changes to existing footpaths and reprioritisation of road space.

Walkable features

> The Pedestrian Paris Initiative (PPI) implements facilities and policies that favour pedestrians and walking as a viable mode of transportation.

> Almost 40% of the city has a posted traffic speed limit of 20 miles per hour (32 kilometres per hour) to ensure greater safety for pedestrians and cyclists.

> Changes to the road rules require drivers to give way to pedestrians or cyclists if they are crossing a road at any point.

> Expressways running along the bank of the Seine River were removed in favour of a mixed pedestrian and bicycle zone, combined with cafes and recreational space.

> “Mixing Zones” reduce the traffic speed limit to 12 miles per hour (20 kilometres per hour) and pedestrians and cyclists are permitted to use the road space, regardless of whether footpaths are provided.

Pittsburgh, Pennsylvania	
Relevant for	Retailer-led improvements to street facades and shop fronts to encourage shoppers and urban renewal of riverfront areas and trialling car-free zones.

Walkable features

> The Streetface Program provides funding grants to businesses and building owners to conduct improvement works to facades to create a space that is more appealing to potential customers.

> The Storefront Renovation Program (SRP) provides joint funding from government departments to businesses with the aim of improving the physical appearance of storefronts.

> Car-free days have been trialled, and have become a yearly occurrence in the Strip District, the key shopping and market district in Pittsburgh. Activities and events are held in the closed thoroughfares (Penn Avenue), and visitors are likely to remain in the area longer compared to when the streets are open to traffic.

Portland, Oregon	
Relevant for	Small blocks in the city centre, engaging with residents and visitors through providing useful, up-to-date resources (such as maps) for journey planning, and encouraging community involvement in pedestrian initiatives and strategies.

Walkable features

> Compact grid layout, with blocks that are generally no longer than 80 metres in any direction.

> Nine bridges connect the eastern and western city precincts, and pedestrian access is available along seven of these bridges.

> The Tilikum Crossing Bridge opened in September 2015, accommodates only pedestrians, bicycles and public transport vehicles.

> A city map outlines the current pedestrian and bicycle network across the city including shared zones, land uses and the expected typical traffic volumes (low or moderate) on routes.

> Neighbourhood Greenways are designated streets where traffic volumes and speeds are reduced through calming devices and surface treatments.

5 Strategic walking objectives and indicators

5.1 Vision

City of Parramatta's vision is to be Sydney's Central City, sustainable, liveable, and productive – inspired by our communities. Parramatta's CBD will be the walkable heart of a vibrant and healthy city. The CBD's growth will be the stimulus to transform the streets into places that are accessible for all people, and that foster their safety, activity and diversity at all times of the day and week.

Street design will support and encourage residents, workers, students, shoppers and visitors to make safe, accessible and simple walking journeys to jobs, to schools, as well as to recreational, cultural and retail districts. They will enjoy the streets as public spaces to meet, wait and watch. People will be prioritised and therefore safer in the CBD, they will enjoy stronger community connections, opportunities to be healthy and active, and the CBD's economy will benefit from increased numbers of people choosing to walk, shop and linger.

5.2 Strategic walking objectives

The strategic walking objectives developed for the CBD are presented in **Table 5-1**. These objectives align with State and Council strategies, address the CBD's walking issues and opportunities and draw on the walkable city principles. Each strategic walking objective is accompanied by a statement describing what the objective aims to achieve.

Table 5-1 Strategic walking objectives

#	Objective	Statement
1	Prioritise the time, safety and amenity of pedestrians	People, rather than vehicles, are prioritised within the CBD. It is faster, more comfortable and convenient to walk than drive between destinations in the CBD. Pedestrians feel safe, and are safe during their journey. Through traffic is diverted to the City Ring Road, and traffic speeds within the CBD are calmed.
2	Enhance and activate spaces and streets, supporting the CBD's economy	People are attracted to walking in the CBD across the day and evening through quality design and activation, supporting Parramatta's economy and local businesses with increased numbers of people who will visit, shop, meet and eat. Increased numbers of pedestrians on the street contribute to a sense of community, and contribute to the revitalisation and appreciation of streets and lanes within the CBD.
3	Capitalise on the transformation of the CBD to benefit pedestrians	Increasing density will require a greater percentage of recreational and transport trips to consist of, or incorporate walking. The public and private investment into the fabric of Parramatta will be focused to ensure best-practice outcomes for pedestrians and the walking network. The redevelopment of CBD blocks contribute to a permeable and connected network for all residents, workers and visitors.
4	Understand and improve the current and future pedestrian network	A high quality pedestrian environment is provided that is accessible for all people, and is at the heart of a walkable LGA and the Parramatta Ways network. Current and future pedestrian demand is monitored and catered for that builds on the existing street character and lanes network.
5	Grow walking mode share and support public transport	Walking in the CBD feels safe, regardless of the location or time of day and is the mode of choice. Access to and from existing and proposed public transport is comfortable, legible and direct. Council works with partners to deliver integrated door-to-door transport experiences for people travelling to, through and from Parramatta. Residents, workers and visitors include walking as part of their day, contributing to their health, well-being and sense of community.
6	Promote walking	As the population grows, new and existing residents, workers and visitors are encouraged and supported to choose walking as their preferred mode. They know it is healthy, safe, easy and free. The walking network is accurately identified, sign-posted and effectively communicated to ensure walking will be the default/straightforward/easy choice. A self-reinforcing culture of walking is established in Parramatta.

5.3 Walking indicators

To assess progress towards achieving the strategic walking objectives, a series of measurable walking indicators are proposed, as summarised in **Table 5-2**. At least one transport indicator is provided for each strategic walking objective. It will be important to monitor progress against these indicators through regular data collection, action should be taken if improvement does not occur over time. More detail on the approach to measuring each indicator, data collection and timeframes is provided in **Section 9**.

Table 5-2 Strategic walking indicators

#	Objective	Indicator
1	Prioritise the time, safety and amenity of pedestrians	Time taken to undertake different walking trips in the CBD
		Number of crashes involving pedestrians in the CBD, proportionate to the resident and worker population
		Number of reported crimes against pedestrians
		Number of trips through the CBD by private motor vehicles
		Street lighting levels
		Volume of footpath congestion at key intersections
		Number of missing pedestrian crossing legs at signalised intersections
		Satisfaction levels of pedestrians
2	Enhance and activate spaces and streets, supporting the CBD's economy	Café and restaurant opening hours
		Business owner satisfaction with pedestrian traffic
		Number of people in the CBD in the evening and on the weekend
		Proportion of empty shopfronts
		Number of street based events in the CBD and number of participating stalls
3	Capitalise on the transformation of the CBD to benefit pedestrians	Kilometres and type of footpath and laneway networks in the CBD
		Number of through site links in the CBD
4	Understand and improve the current and future pedestrian network	Number of complaints received about walking infrastructure and pedestrian safety
		Compliance with the Disability Discrimination Act
		Satisfaction of mobility-impaired and vision-impaired people
		Number of people walking, cycling and driving in the CBD
5	Grow walking mode share and support public transport	Walking mode share
		People's satisfaction with the walking environment in the CBD
		Demand for parking spaces
6	Promote walking	Number of Council led or supported events and promotions for walking
		Number of participants in walking events and activities

6 Current and future pedestrian demand

Cardno developed a spreadsheet based static pedestrian model for the CBD study area to identify pedestrian flows in the network peak hour in future design years.

The base CBD pedestrian demand model builds off the current peak hour period, identified from March and April 2016 surveys. The current peak period is on a Thursday between 12:30pm to 1:30pm; 81,701 pedestrian movements were recorded at count locations. A summary of the results of the pedestrian demand modelling results follows, the complete approach, assumptions and results provided in **Appendix C**.

6.1 Current peak hours

The peak hour on each day was determined through analysing the 15 minute interval data from every site across the CBD and calculating the hours with the most midblock movements recorded. The pedestrian movements during these peak hours were mapped to identify the areas of the observed highest pedestrian demand throughout the CBD. The pedestrian volume peak hours for the CBD were determined to be:

> Thursday AM peak hour: 08:15-09:15.

> Thursday PM peak hour: 12:30-13:30.

> Friday PM peak hour: 18:30-19:30.

> Saturday AM peak hour: 11:15-12:15.

The number of pedestrian movements counted during each of these peak hours across the count locations are shown in **Table 6-1**.

Table 6-1 Pedestrian movements during peak hours

Day	AM Peak	AM Peak Hour	PM Peak	PM Peak Hour
Thursday	69,733	8:15-9:15	81,400	12:30-13:30
Friday	n/a	n/a	28,991*	18:30-19:30
Saturday	45,295	11:15-12:15	22,362*	17:15-18:15

**13 count locations only*

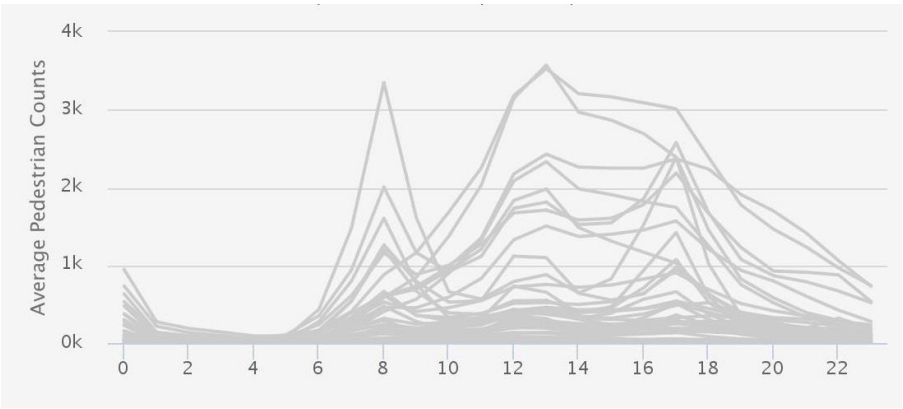
The Friday peak hour counts were affected by a Wanderers games at the Parramatta Stadium on Friday evening. Control sites were tested the following week to factor the impact of the football crowd but the start time of 7:40pm may have led to a later than normal peak hour at the 13 key CBD sites.

6.1.2 Lunch time peak hour

The busiest hour recorded across the pedestrian survey days was found to be on Thursday 12:30-13:30. The high volumes of pedestrians at lunch time are likely to be a combination of people who work in the CBD making lunch time trips, shoppers and people visiting for business or services. Higher than the morning or evening commuter peak periods, the lunch time peak hour includes walking trips by people who might have arrived at work in the morning by car but who choose to walk make their short trips at lunch time on foot.

The National Association of City Transportation Officials in the US notes that pedestrian peak hours often fall near lunchtime. The Melbourne CBD also experiences a lunch time peak period higher than the commuting peak periods as shown in Monash University's analysis of data from the CBD's permanent pedestrian counters over a five year period. This is presented on **Figure 6-1**.

Figure 6-1 Melbourne CBD pedestrian volumes across the day



Source: Monash University (http://monash.edu/research/city-science/pedsafety/)

6.2 Pedestrian volumes through the CBD

In general, pedestrian volumes through the CBD are heavier in the centre around the train station, bus interchange and Church Street, becoming lighter towards the CBD periphery. The pedestrian flows through the CBD in each of the assessed peak hours are presented in flow diagrams on the following figures:

> Thursday AM peak hour: 08:15-09:15 - **Figure 6-2**.

> Thursday PM peak hour: 12:30-13:30 - **Figure 6-3**.

> Friday PM peak hour: 18:30-19:30 - **Figure 6-4**.

> Saturday AM peak hour: 11:15-12:15 - **Figure 6-5**.

Pedestrian volumes are heavier south of the river where there is more diversity of land uses and more major destinations. During the Wanderers game during the Friday PM Peak Church Street pedestrian volumes north of the river were higher than during other peak periods; the sporting event at Parramatta Stadium, north of the river, having a clear impact on the distribution of pedestrians and extending the flows north.

Pedestrian volumes in specific parts of the CBD are discussed in the following sections.

6.2.1 Train station

The train station and bus interchange are key pedestrian trip generators in the CBD. All of the peak hour analysis demonstrated high pedestrian demand around the train station and bus interchange and along Darcy to Church Street. There was less pedestrian activity generated from the eastern end of the train station which connects to Smith Street.

6.2.2 Church Street

Church Street is a busy pedestrian street, with different parts of it busy at different times. The pedestrianised section of Church Street below Macquarie Street was busy in every peak hour, while the sections north and south, to Eat Street and Westfield were busier at lunchtime and on Saturday late morning than they were on Thursday morning as commuters were arriving to the CBD.

6.2.3 CBD East

There was a lot of pedestrian activity in the Thursday AM peak hour on Macquarie Street, Smith Street and Charles Street around the schools and commercial office blocks. This area was not as busy in the lunchtime peak on Thursday. Streets east of Charles Street were relatively quiet across every peak hour compared to other parts of the CBD.

6.2.4 CBD West

The Thursday PM peak hour has the most pedestrian activity in the CBD west with Macquarie Street accommodating more than 1,000 movements in the hour close to Church Street and George Street (west)

and Marsden Street near Macquarie Street also busy. Like the east, this part of the CBD was very quiet during the Saturday morning peak hour compared to the Church Street corridor.

6.2.5 CBD North

North of the river, pedestrian activity is reduced but more consistent between the weekday and weekend peak hours. Pedestrian activity is moderate around Victoria Street near Church Street and on Church Street around Grose Street. In the Thursday AM peak there is moderate pedestrian activity along Church Street until Pennant Hills Road. Streets around Parramatta Stadium were quiet in the Thursday and Saturday peak hours.

6.2.6 River foreshore

Across the peak hours the pedestrian activity was generally quiet compared to the CBD streets. Exceptions are the Macarthur Street Bridge and the Parramatta River Cycleway west of the bridge and access to the river from Phillip Street.

Figure 6-2 Current volumes - Thursday AM Peak

Figure 6-3 Current volumes - Thursday PM Peak

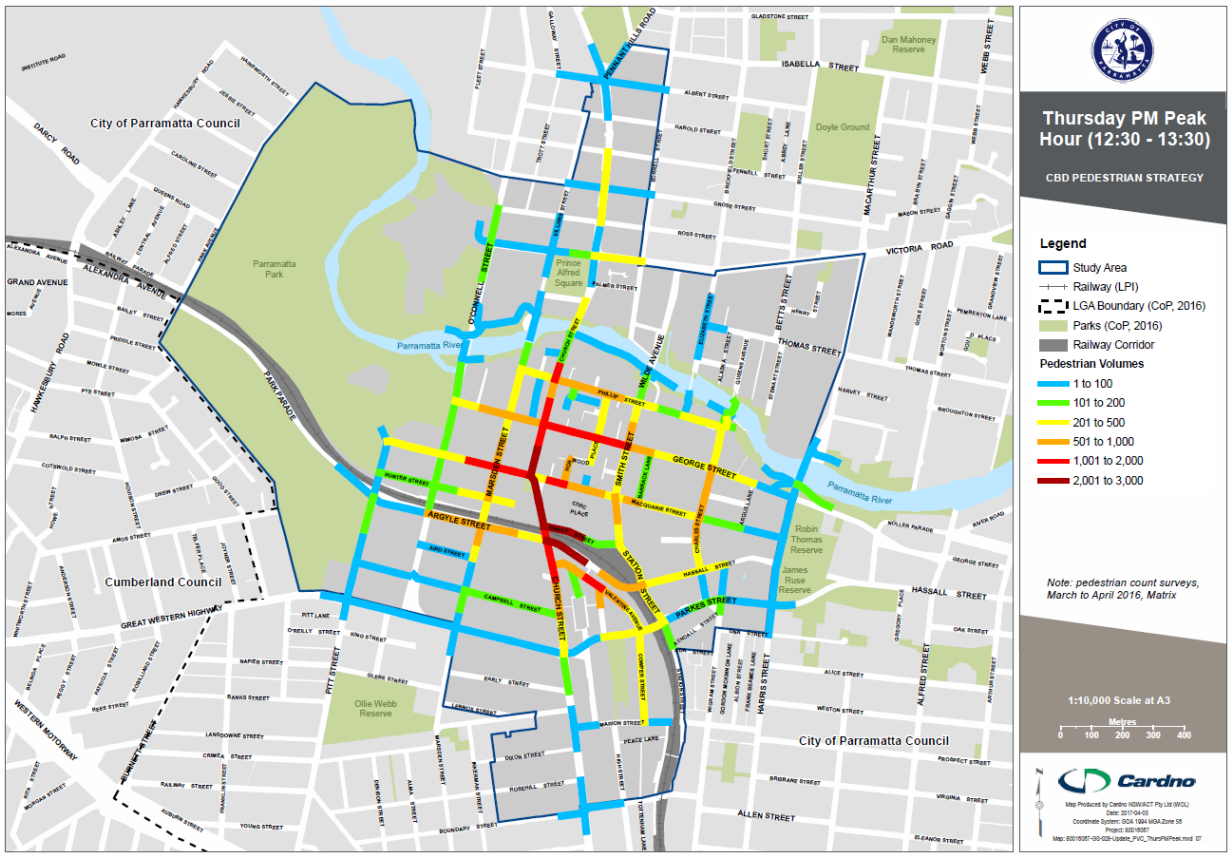


Figure 6-4 Current volumes - Friday PM Peak

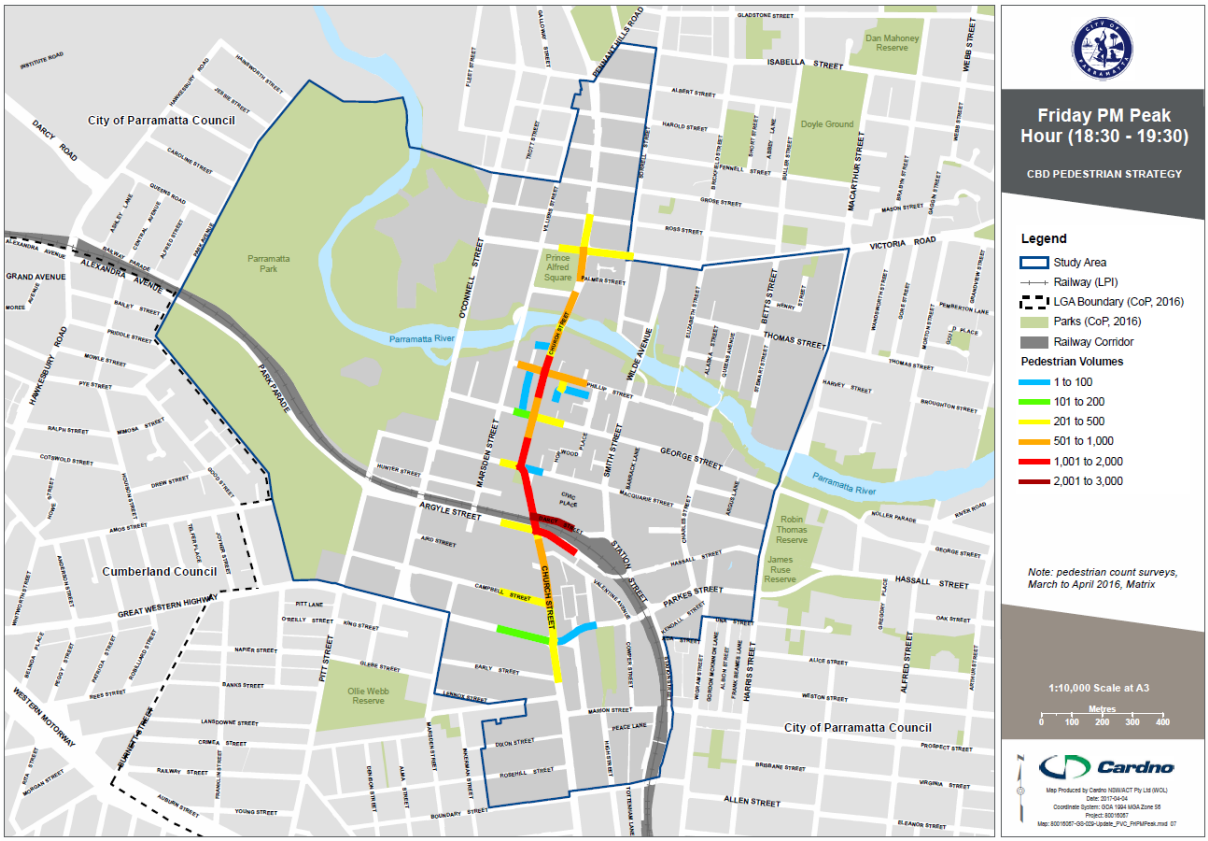
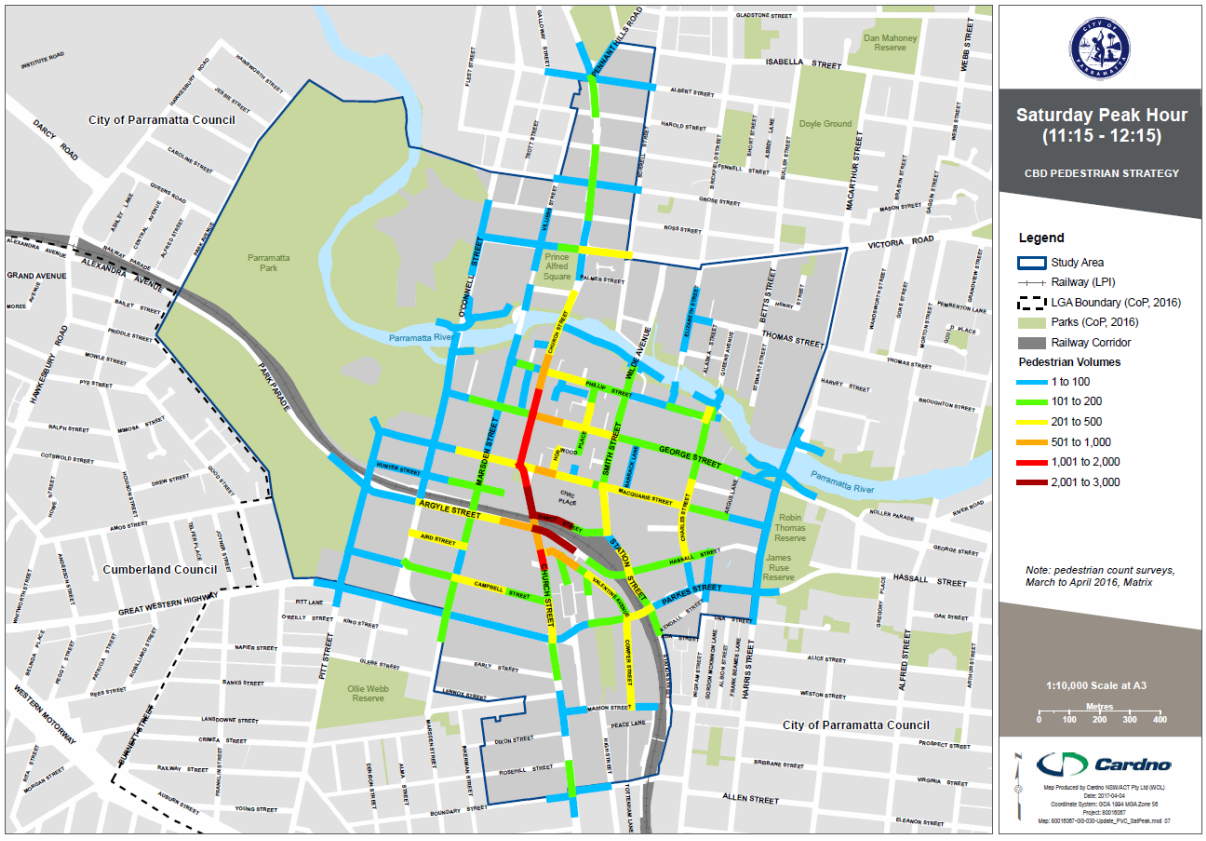


Figure 6-5 Current volumes - Saturday AM Peak



6.3 Pedestrian modelling

Cardno developed a spreadsheet based static pedestrian model for the CBD study area. The project scope of works was to identify pedestrian flows in the network peak hour in future design years.

The base CBD pedestrian demand model builds off the existing identified peak hour period identified during the March and April 2016 surveys which was on a Thursday between 12:30pm to 1:30pm where 81,701 pedestrian movements at count locations were recorded.

The methodology applied to the model draws guidance from relevant components of the approach detailed in the National Cooperative Highway Research Program, Report 684, Enhancing Internal Trip Capture Estimation for Mixed-Use Developments (2011).

The research report identifies the effects of proximity between interacting land uses to identify walking trip generation.

In order to model the potential future pedestrian demands in the CBD study area, a comprehensive understanding of existing demands is required. In establishing the existing dynamics of the CBD, the following key data was collated and/ or assumed/ estimated to build the model including:

> Study area blocks;

> Pedestrian network links (Pedestrian paths);

> Origin – Destination Routes (Paths uses to travel between blocks);

> Existing residential population by block;

> Existing worker population by block;

> Maximum walking distance assumption; and

> Propensity to travel.

Each of these factors are discussed in more detail in **Appendix C**.

6.4 Future pedestrian demand

Demand on the pedestrian network in the 2056 modelled design year indicate that volumes will remain high along Church Street, however Horwood Place/Civic link will provide a key alternative parallel route to attract and redistribute a significant portion of the pedestrian flows. This is expected to be a particularly useful and direct route to the River foreshore area where the MAAS is anticipated to attract some one million visitors per annum.

During lunch time peaks, George Street and Macquarie Street volumes are anticipated to increase and these streets will remain some of the busier east-west links. In the peak period, George Street could accommodate between 3,000 – 6,000 pedestrians (1,500 – 3,000 per street side) during a peak hour, this being the highest modelled demands on the street level pedestrian network.

The development of Parramatta Square is expected to become a key convergence point for pedestrian movement through the CBD. The square will provide a new east-west link aligning with Hunter Street which could attract east-west volumes from Macquarie Street through the square. The proposed north-south link will align with Horwood Place which will undergo urban renewal. The north-south link is anticipated to draw some volumes from parallel routes along Church Street and Smith Street.

Church Street, south of the railway line, is expected to become a key pedestrian route, as the most direct connection to the CBD from “Auto Alley”. Volumes at street level surrounding the Westfield Shopping Centre are anticipated to remain moderate, with most movement associated with Westfield accommodated within the development.

As with most CBD environments, volumes are likely to remain substantially lower around the periphery of the CBD near undeveloped land and park land. Similar low proportions can be observed at the interface of the Sydney CBD and the botanical gardens and the same again in Melbourne.

The current pedestrian demand is shown on **Figure 6-6** future pedestrian demand is shown for 2026, 2036 and 2056 on **Figure 6-7**, **Figure 6-8** and **Figure 6-9**.

Figure 6-6 Current pedestrian volumes - Thursday PM Peak

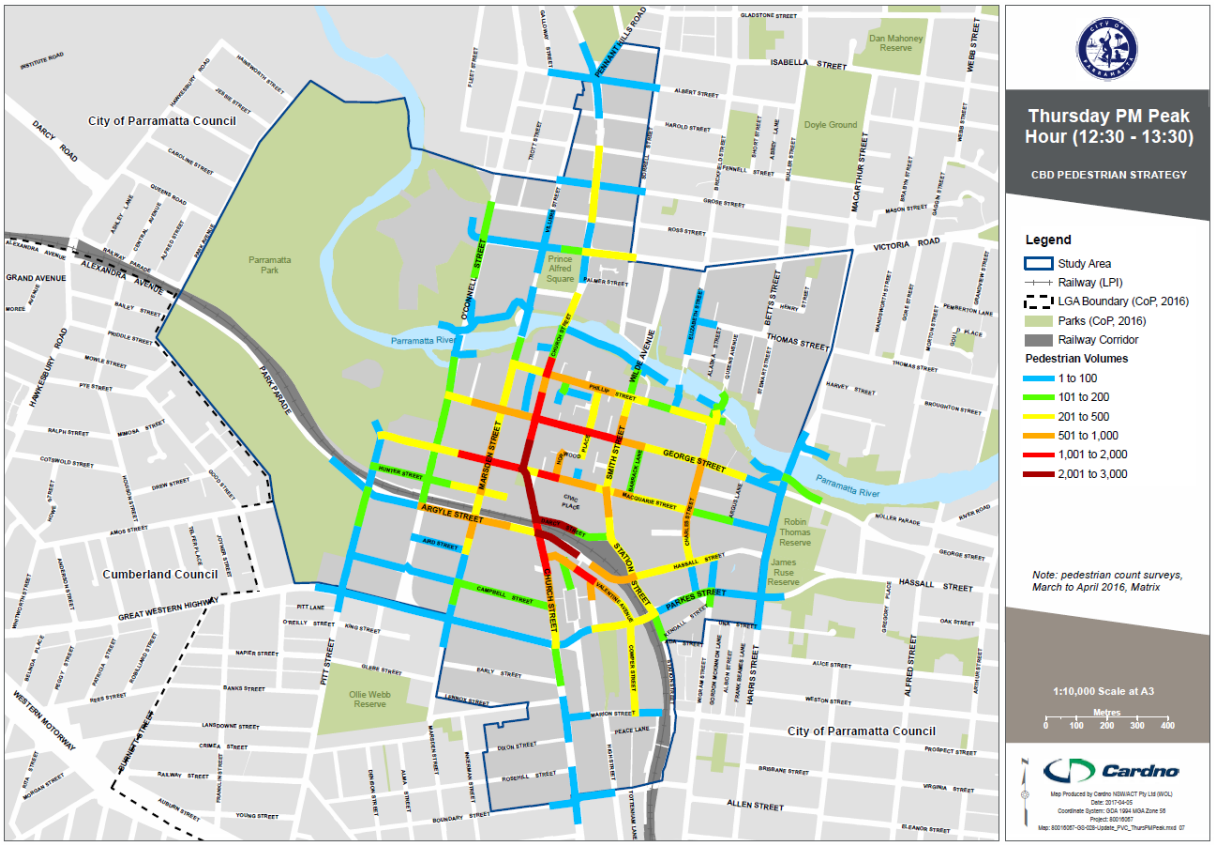


Figure 6-7 Future pedestrian volumes 2026 - Thursday PM Peak 12:30-13:30

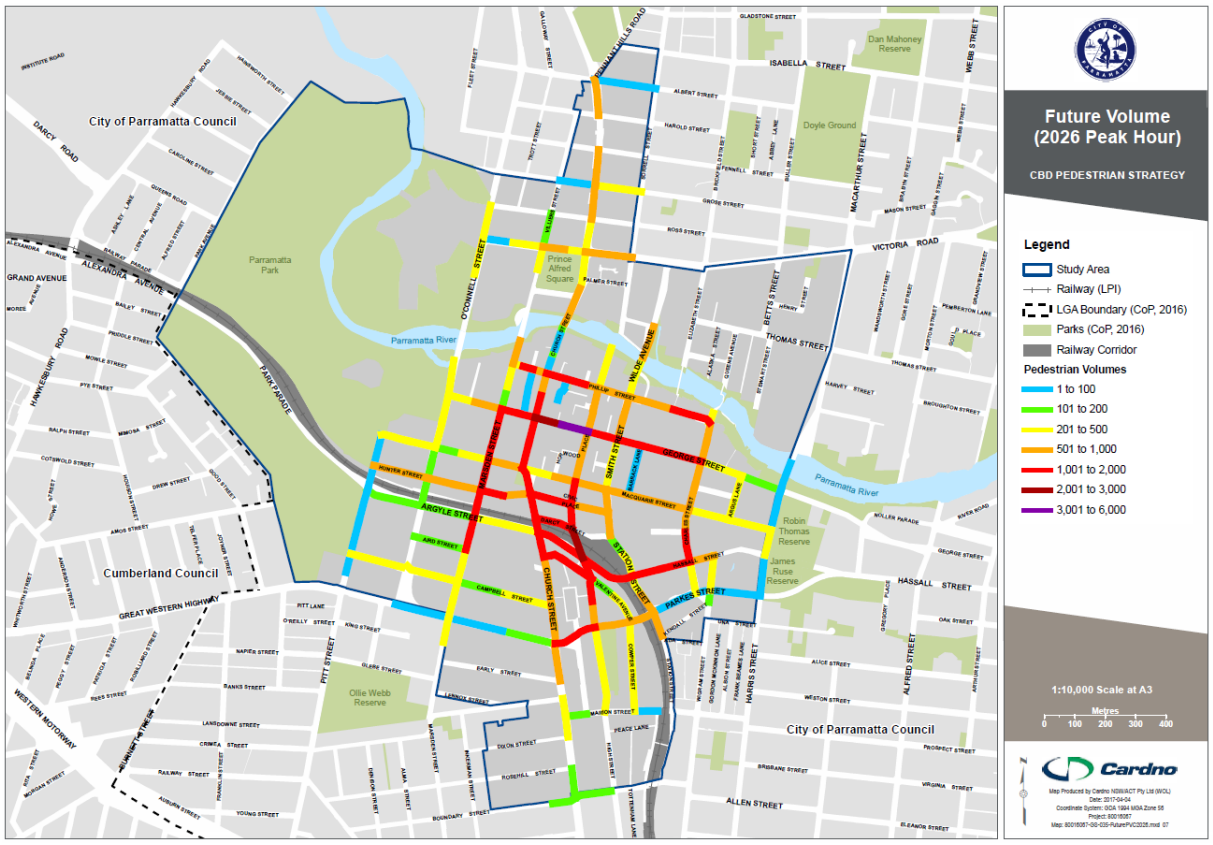


Figure 6-8 Future pedestrian volumes 2036 - Thursday PM Peak 12:30-13:30

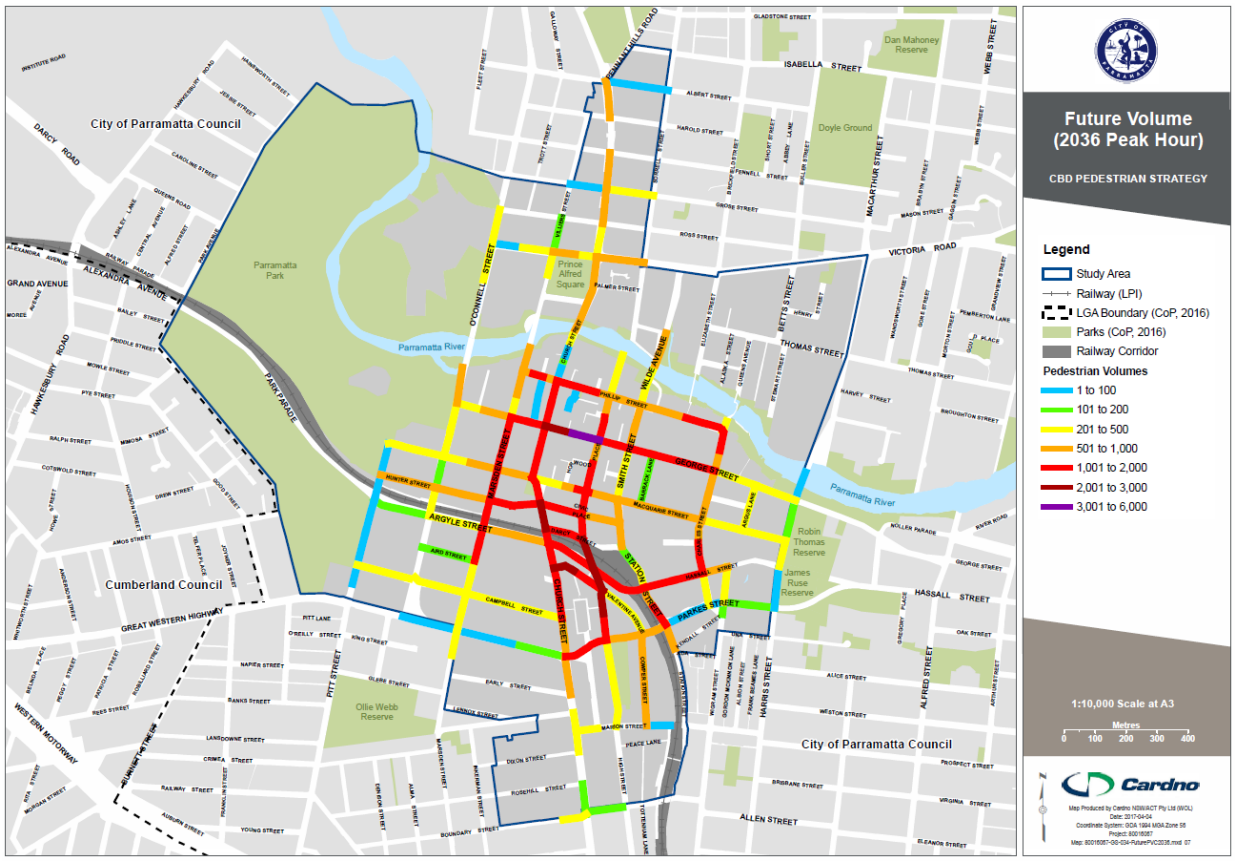
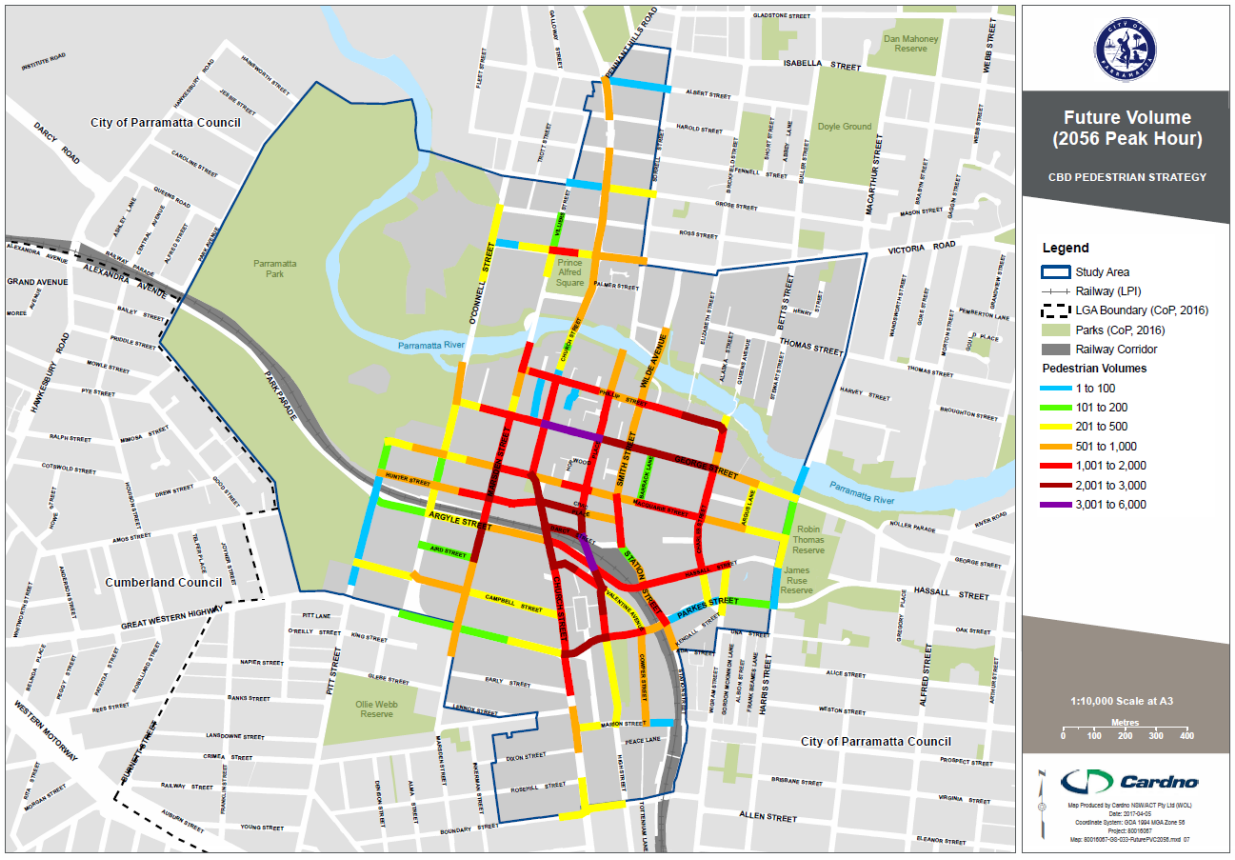


Figure 6-9 Future pedestrian volumes 2056 - Thursday PM Peak 12:30-13:30



6.5 Path width considerations

Guidance and consideration for the recommendation of path widths and assessment of Level of Service has been sought from:

> Pedestrian Comfort Guidance for London, Transport for London (TfL), 2010

> Pedestrian planning and design, John Fruin, 1971

> Public Domain Guidelines, City of Parramatta, 2016

> Guide to Road Design Part 6A Pedestrian and Cyclist Paths, Austroads, 2009

These documents and information provide a comprehensive base to recommend appropriate paths widths and assess their suitability based on environmental context and pedestrian volumes. Of these, Fruin and TfL use a pedestrian density versus capacity calculation to determine the pedestrian level of service (Fruin) or comfort level (Transport for London). A brief summary and comparison follows, more detailed descriptions are provided in **Appendix E**.

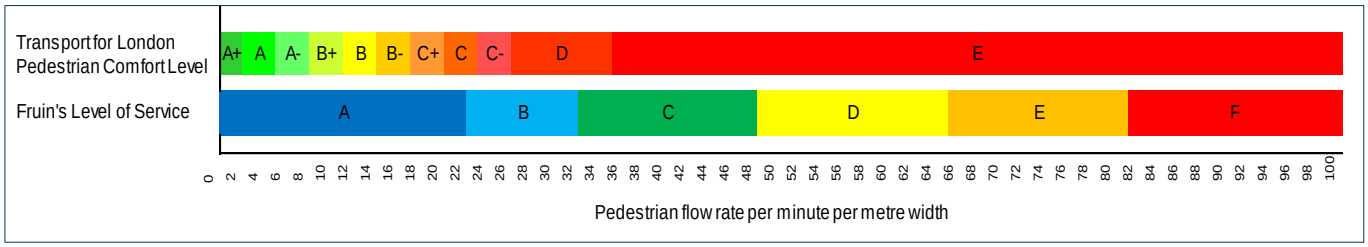
6.5.1 Level of Service versus Pedestrian Comfort Levels

Fruin's Level of Service (LoS) is a series of density and flow rate bands that correspond to levels of service between A (highest) and F (lowest), depending on location. It was developed by John J Fruin PhD in the 1970's, and is the accepted industry standard in Australia and many other international jurisdictions for analysing pedestrian congestion.

TfL have a comprehensive set of criteria that assesses pedestrian LoS based on Pedestrian Comfort Levels (PCL). The PCL aims to improve the planning and design of the pedestrian environment by providing a consistent approach for assessing and reviewing comfort on footpaths and crossings.

A comparison of TfL's PCL and Fruin's Level of Service is shown in **Figure 6-1**. TfL's desirable comfort ratings, A+ to C- fall into Fruin's LoS A and B only.

Figure 6-1 Pedestrian service rating comparison



Following a comparative analysis of both methods, PCL was determined to be more suitable for calculating clear path of travel recommendations in the Parramatta CBD as it provides a more nuanced assessment.

6.5.2 Clear path of travel

The TfL Pedestrian Comfort Guidance proposes typical clear path of travel widths (termed footway width in their guidance), outlined in **Table 6-2**. These path of travel recommendations allow for relatively unconstrained movement along paths based on the volume and width recommendations.

Table 6-2 Transport for London total footway width recommendations

Category	Low	Medium	High
Pedestrians per hour	<600	600 – 1,200	>1,200
Total width (metres)	2.9	3.3 – 4.2	5.3
Clear width (metres)	2.0	2.2	3.3

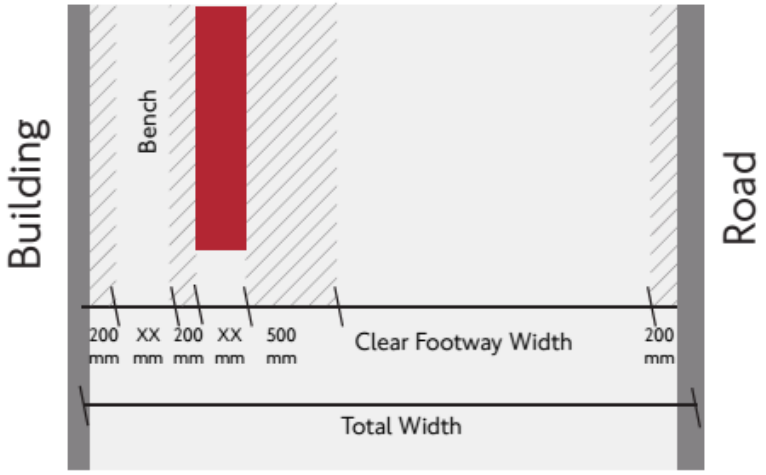
Within these total footway widths, TfL also allow for path buffer allowances. Buffer zones acknowledge and accommodate the way in which people generally walk, which is to leave a space between themselves and street furniture, walls and doorways. Buffers zones include areas adjacent to building frontages, fences, kerbs and other street furniture and installations.

Guidance sought from TfL indicate that 0.2 metre buffers be applied to building facades, kerbs, dining areas, bike parking, rows of poles and 0.5 metre be provided in front of street benches. For a two metre wide footpath located with a building on one side and a row of benches on the other, the clear path of travel width would be 1.3 metres (two metres minus 0.2 metres on the building side and minus 0.5 metres on the bench side).

Minor obstructions such as single street poles, while creating a pinch point, generally have a negligible impact on pedestrian capacity on footpaths. Installations such as bus stops and ATMs require further consideration as they can significantly impede the capacity of a footpath due to queuing customers.

An example of TfL's approach to providing buffer zones on either side of a clear path of travel is provided in **Figure 6-10.**

Figure 6-10 London clear footway width (clear path of travel width)



Source: Pedestrian Comfort Guidelines for London, Transport for London, 2010

6.6 Pedestrian Comfort Level in lunch time peak

Using the forecast pedestrian volumes to 2056, an assessment was made using TfL's Pedestrian Comfort Level to assess what clear path of travel width would be required to have a "high street feel" or rating of "B" during this lunch time peak that allows for some restriction on movement, but without feeling uncomfortable and wanting to seek an alternative route.

Two scenarios were assessed; 1.8 metre clear path of travel width and a 2.2 metre clear path of travel width. The PCL across the CBD for 2056 based on these widths is shown in **Figure 6-11** and **Figure 6-12**. A 1.8 metre clear path of travel is likely to be very uncomfortable for pedestrians in the Inner CBD (approximately bounded by the River, Charles St, Marsden St and Parkes St). There will be additional pressure on George St and Church St.

It is recognised that in the AM and PM peaks space is likely to be more restrictive as there will be larger volumes of walking commuters, but this is more likely to be in single directions and therefore have less impact on comfort levels.

6.6.1 Recommendation

Based on this analysis, clear path of travel width requirements for two wheelchairs to pass and buffer zone considerations, it is recommended that the minimum clear path of travel designed for Parramatta is 2.2 metres wide within the Inner CBD identified in **Figure 6-13**. George St and Church St will be subject to detailed investigation to increase this width beyond 2.2 metres where possible. On streets in the CBD outside of these areas, the minimum clear path of travel width will be 1.8 metres. These minimum clear path of travel width recommendations do not include buffer zones. It is recommended at the detailed design stage that buffer zones of 0.2 metres – 0.5 metres are included in the total path width against building facades, seating and kerbs to acknowledge the way in which people walk.

Figure 6-11 Pedestrian Comfort Levels 1.8 metre footpaths 2056

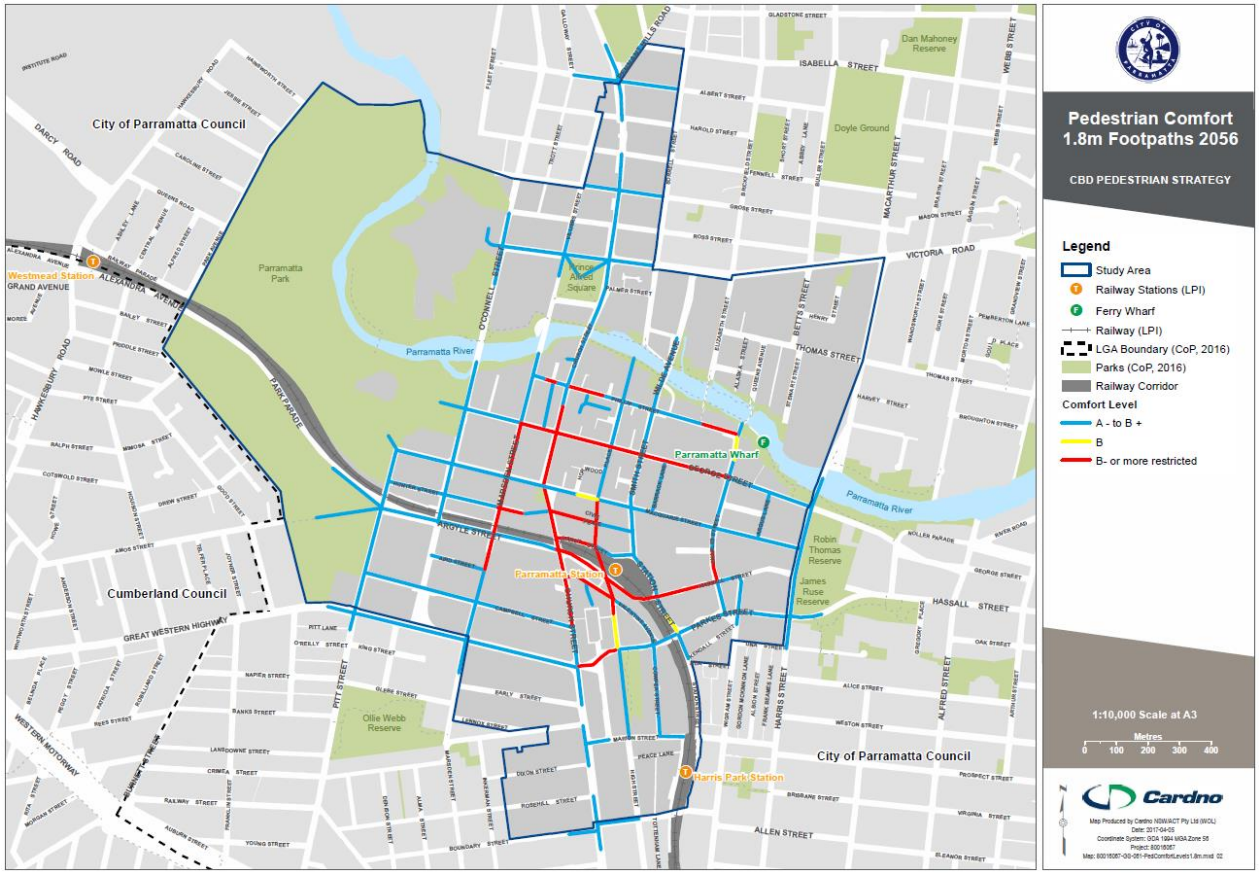


Figure 6-12 Pedestrian Comfort Levels 2.2 metre footpaths 2056

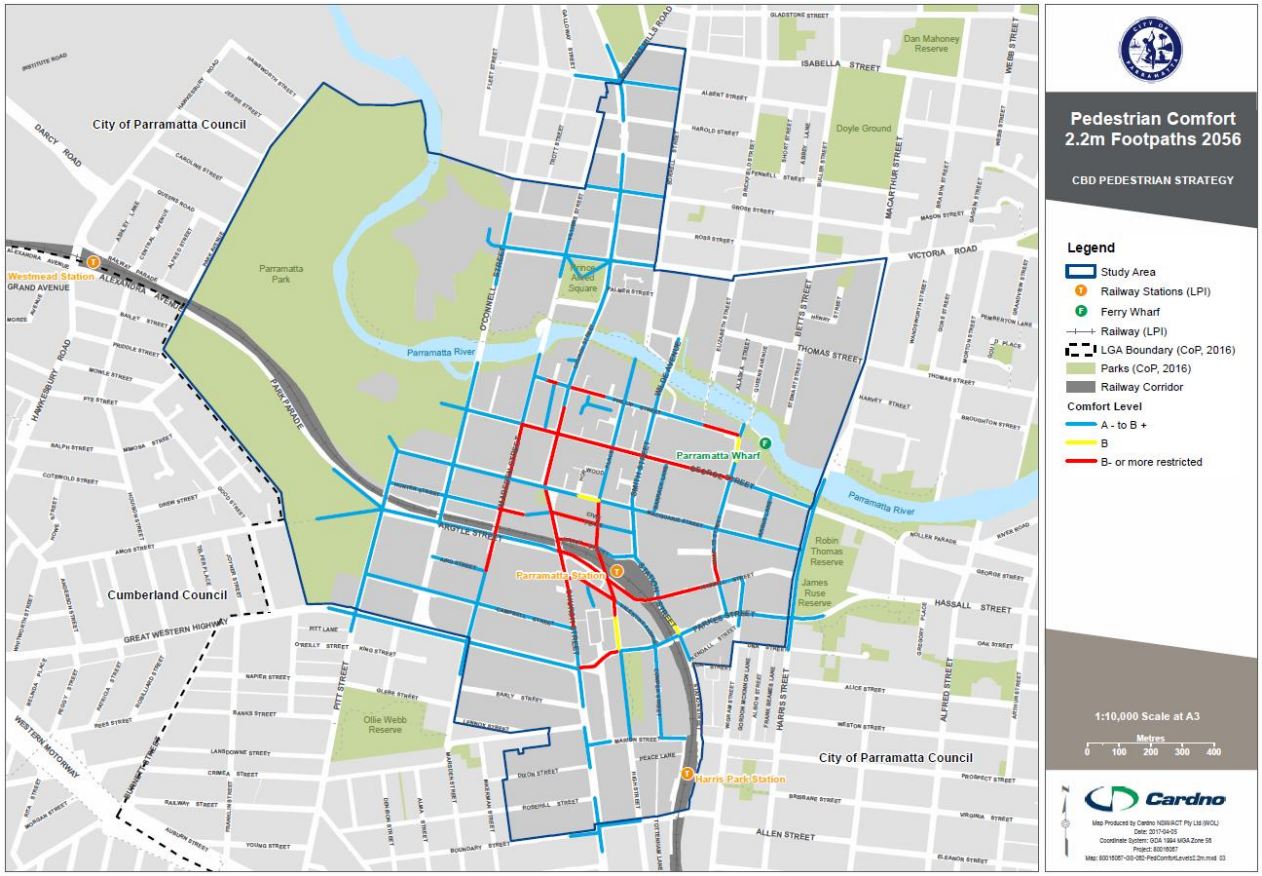
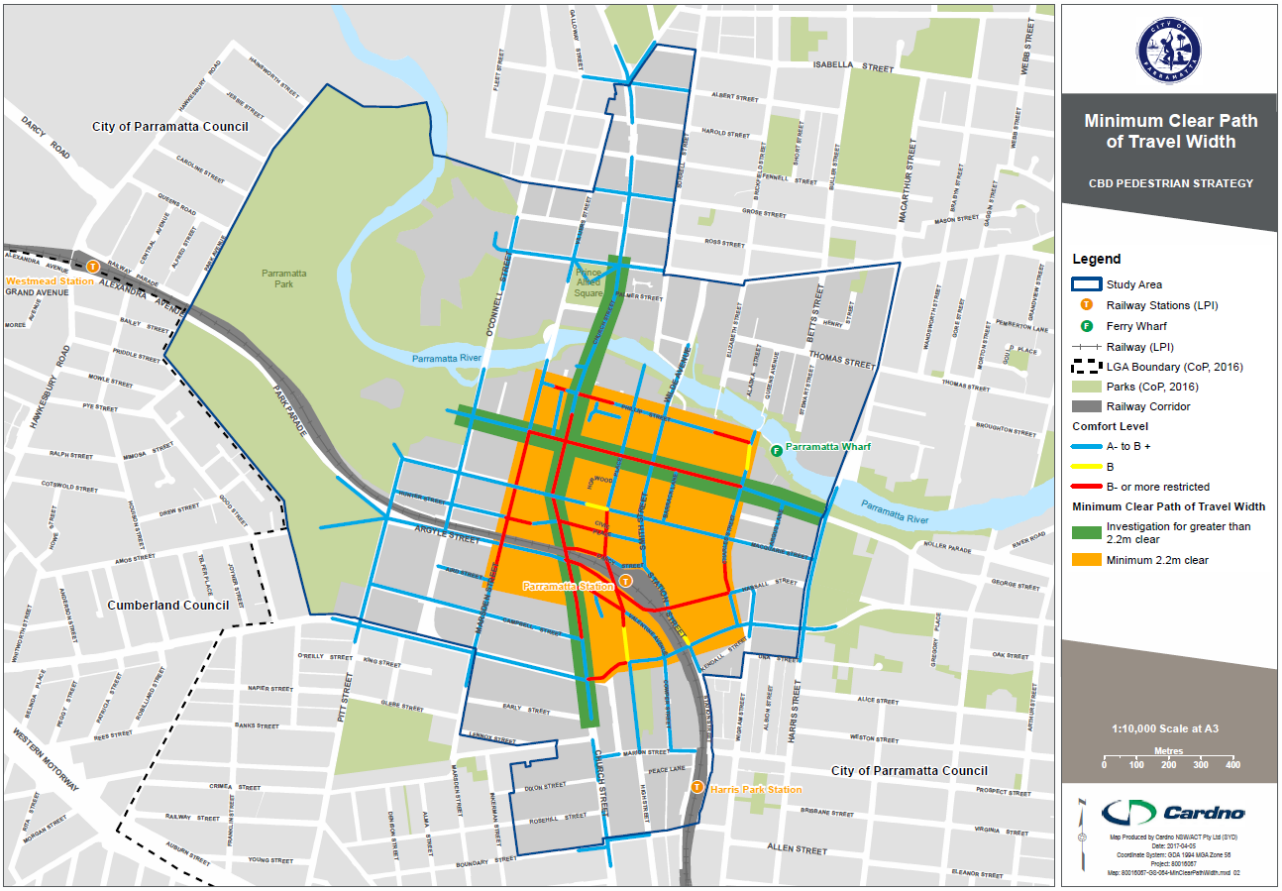


Figure 6-13 Minimum clear path of travel width



6.7 Street corner queue space

Queue space is often integrated into general walkway areas, reducing the capacity of the footpath network. Pedestrian networks generally experience the greatest queueing at intersection corners, often where space is most limited as corners are rounded to facilitate vehicle movements.

Kerb buildouts can assist to provide additional space for pedestrian queueing and assist to reserve walkway space for pedestrians moving around corners.

It is recommend that corner buildings are designed to provide additional space at the intersection commensurate with the street hierarchy and that addresses all four corners of the intersection. The amount of queuing space required will depend upon the volume of pedestrians and delay experienced by people queuing to cross the road. It is generally accepted that queueing to a Fruin LoS C, >0.65 – 0.93sq.m per person is acceptable. This allows for people to both queue and move through the queue. If there is not sufficient space at a street corner, pedestrians will generally queue further away from the crossing point which can increase the time required to facilitate pedestrian crossing movements at intersections.

7 The pedestrian network

7.1 Function of streets

Streets support a wide range of functions in city centres. They are places for people and they also support movement, access to buildings and spaces, parking and provide space for utilities, drainage, signage and street lighting. Of these functions, 'place' and 'movement' are considered the most important for assessing a street's character and role within a network. Movement is also sometimes referred to as 'link'. Professor Peter Jones from the University College of London notes in Link and Place: A New Approach to Street Planning and Design (2009) that the purpose of the movement function is to *save* time while the purpose of the place function is to *spend* time. An ideal street supports both to some degree.

A street's movement function supports through movement as part of a trip. The street is part of a route connecting someone or something from their origin to their destination in a seamless journey. A street's place function acknowledges that streets can be end destinations themselves. Activities such as shopping, sitting, eating and meeting people can occur on or adjacent to the street.

The function of streets can apply to all transport modes. Movement addresses the movement of people, vehicles and goods by walking, bike, transit and in private vehicles. While place is typically associated with people, it also includes parking and picking up and setting down transit customers. Movement and place are often looked at on a two-dimension chart, with different types of streets sitting along the spectrums of each.

In busy centres with a range of land uses and travel demands, a single street can support both movement and place functions. Main Streets in cities often have a high place function as well as a medium to high movement function but a motorway would have a very low place function and high movement function.

A street's functions can change along its length, as the land uses and travel demands along it change. It can even change across a day or week as people use the street for different purposes at different times. Furthermore, and importantly as the CBD transforms, street functions can transition over time. As CBD blocks are redeveloped they can be designed to address the movement and place functions of their surrounding streets.

7.2 Categories of CBD streets

To apply the movement and place street functions specifically for the Pedestrian Strategy, streets across the CBD are considered in terms of the movement and place needs of pedestrians and categories of streets are proposed to address this.

The following categories of streets were identified and applied across the CBD with consideration of their current function, pedestrian demand and land uses. The categories of streets for the Parramatta CBD are:

> Travel streets (primarily movement)

> Activity streets (balance between movement and place)

> Places for people (primarily place)

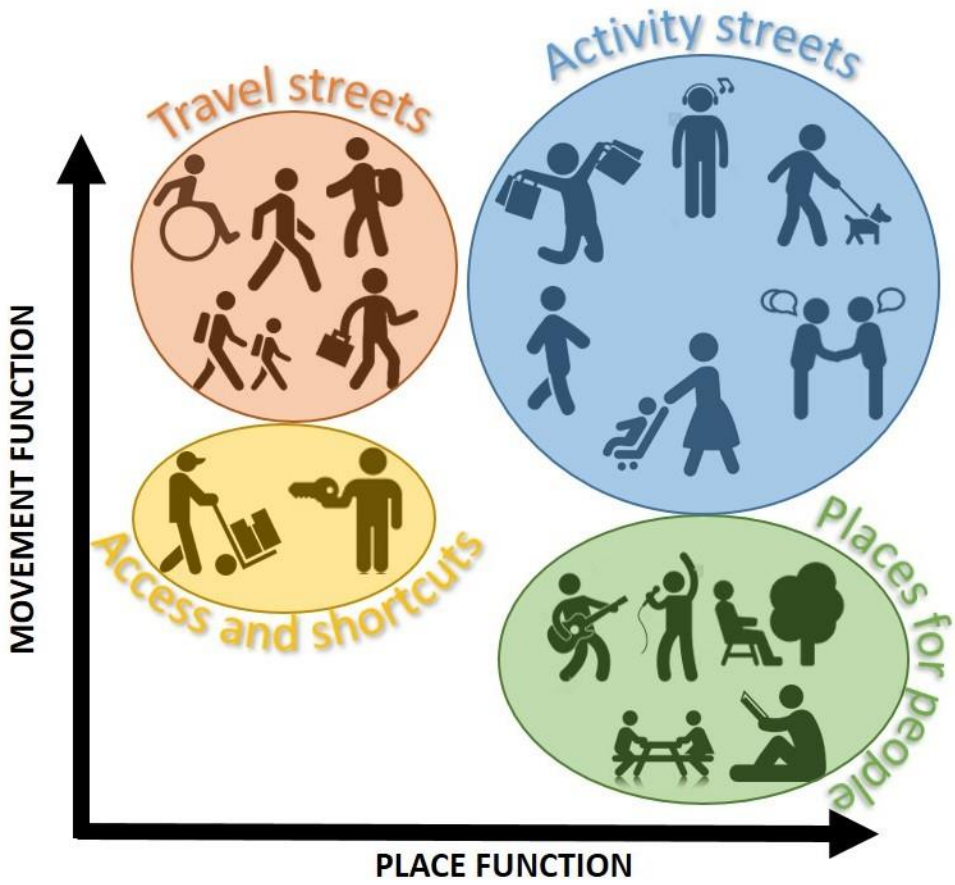
> Access and shortcuts (minor, with movement and servicing)

These categories are shown on a chart with movement and place axes on **Figure 7-1**.

Some streets will have sections nominated as one category and other sections nominated as another. Similarly, some street sections do not fall neatly into on category only. In these cases the primary category is applied. Regardless of their category, all streets in the CBD should be safe, accessible and well-lit for pedestrians.

Each category of street is described in the following sections along with its desirable characteristics. The application of the categories of streets to the CBD is shown on **Figure 7-2**. While many of the streets are nominated as a particular category now, the street hierarchy is evolving and the future fabric of the city will affect how streets behave, look and feel. The desirable characteristics for streets should be considered as CBD blocks are redeveloped.

Figure 7-1 CBD street categories



7.2.2 Travel streets

Travel Streets in the CBD provide great connectivity between major destinations including public transport and large workplaces. Routes are legible, direct and intuitive and desire lines are accommodated with uninterrupted paths.

Movement is prioritised on these streets; people know where they want to go and they want to get there fast. Travel Streets in the centre of the CBD are busy streets with many pedestrians. They are often subject to one directional flows in peak hours; away from the train station in the morning and towards it in the evening. These Travel Streets need wide, clear footpaths to accommodate the high pedestrian demand.

Travel Streets towards the edges of the CBD have lower pedestrian volumes. As there may be fewer landmarks and pedestrian activity on these outer streets, people on foot will want reassurance from wayfinding signage that they are heading in the right direction.

Travel Streets should have active street frontages along their length but outdoor café seating should not obstruct the path of pedestrians. The main entrances to key destinations will also front onto Travel Streets. They should have safe and controlled pedestrian crossings at intersections with major roads and direct and unobstructed visual lines along the length of the connection.

The desirable characteristics of Travel Streets for the CBD are presented in **Table 7-1**.

Table 7-1 Travel Streets - desirable characteristics

Criteria	Travel Street characteristic
Minimum footpath width	High pedestrian volumes - 4 metres Medium volumes – 3 metres Low pedestrian volumes – 3 metres
Minimum clear path of travel	High volumes – 2.2 metres Medium – 1.8 metres Low volumes – 1.8 metres
Pedestrian crossings	Controlled and at road intersections. Pedestrian priority through extended green signal time on streets with high pedestrian volumes. Pedestrian refuges on streets with low vehicle volumes Kerb buildouts to provide more waiting space at intersections and better visibility for pedestrians about to cross and approaching drivers (high pedestrian volumes only)
Amenity, street furniture and landscaping	Continuous weather protection along high and medium volume streets Wayfinding signage Seating on each block Bus stops with shelters that aren't located in the pedestrian clear zone Landscaping and trees along the carriageway edge of the footpath along roads with high traffic volumes to act as a buffer Water bubblers
Connectivity and access	Access between major CBD destinations such large commercial offices Access to civic spaces Access to major public transport Access to recreational areas and parks Connects residential to other land uses
Street frontages	Front entrances and lobbies Shops and services
Business use of street space	Minimal and not located in the pedestrian clear zone
Examples of streets	Smith Street Fitzwilliam Street Marsden Street Charles Street Argyle Street

7.2.3 Activity Streets

Activity Streets in the CBD are many things to many people. They have activity at all times of the day, varied destinations along their length and a range of different people there for different reasons. The buildings along Activity Streets have active frontages day and night, providing good surveillance of people on the street. The Activity Streets are what people most associate with an image of a CBD street.

There is a lot to do on these streets and so they are busy places with lots of people walking, shopping and meeting. Land uses vary in size and type along Activity Streets, there may be small bars, services like the post office or the entrance to a shopping arcade. They are often also important routes to key destinations in the CBD.

Activity Streets need wide footpaths that can accommodate street furniture for sitting and waiting, a clear pedestrian zone for those people on their way somewhere and business furniture like outdoor café seating. Activity Streets need many crossing opportunities for pedestrians as there is so much to see and do on both sides of the street, people will want to cross often.

The desirable characteristics of Activity Streets for the CBD are presented in **Table 7-2**.

Table 7-2 Activity Streets - desirable characteristics

Criteria	Activity Street characteristic
Minimum footpath width	5 metres (includes space for outdoor dining)
Minimum clear path of travel	2.2 metres
Pedestrian crossings	At mid-blocks as well as road intersections Pedestrian priority through raised zebra crossings and extended green signal time. Kerb buildouts to shorten crossing distance and provide better visibility for pedestrians about to cross and approaching drivers Reduced, calmed or removed vehicle presence
Amenity, street furniture and landscaping	Continuous weather protection Wayfinding signage Frequent seating Water bubblers Trees and attractive landscaping
Connectivity and access	Access between major CBD destinations such large commercial offices and Westfield Access to civic spaces Access to major public transport
Street frontages	Restaurants, cafes and bars Shops and services Open retail frontages Front entrances and lobbies
Business use of street space	Outdoor seating for restaurants, cafes and bars
Example streets	Church Street between Campbell Street and Grose Street George Street Macquarie Street between Marsden Street and Smith Street

7.2.4 Places for People

Places for People are where you can take a break in the CBD. The people on these streets are in less of a rush to get where they are going, often the street is actually their destination. Places for People should have fewer motor vehicles, more landscaping, interesting things to look at, and benches, tables and spaces to meet friends, have lunch, walk the dog and read.

Places for People should prioritise pedestrians above other transport modes, recognising that they are social locations in the CBD where people are not necessarily moving on but spending time. Places for People have more trees and shade than other parts of the CBD, they are cooler in summer but also provide some access to sun on winter days.

There should be high levels of active and passive surveillance in Places for People and activity at all times of the day so that anti-social behaviour is discouraged. Places for People are attractive outdoor areas which can be used for diverse community activities like markets, performances, art classes and study groups. Places for People could be used by different people at different times. While midday might draw a lunchtime office crowd, night-time could see skateboarders wanting to practice their skills. Street furniture materials and design should acknowledge the different types of uses it might be subject to.

The desirable characteristics of Places for People for the CBD are presented in **Table 7-3**.

Table 7-3 Places for People - desirable characteristics

Criteria	Places for People characteristic
Minimum footpath width	4 metres
Minimum clear path of travel	2.2 metres
Pedestrian crossings	Controlled where they intersect with motor vehicles: signalised or zebra crossings Kerb buildouts to shorten crossing distance and provide better visibility for pedestrians about to cross and approaching drivers Minimal, calmed or removed vehicle presence
Amenity, street furniture and landscaping	Wayfinding signage Range of seating and tables Varied spaces Trees, grass and attractive landscaping Water bubblers
Connectivity and access	Connects to Travel Streets and Activity Streets
Street frontages	Restaurants, cafes and bars Entrances to heritage and cultural buildings Civic space Green space
Business use of street space	Outdoor seating for restaurants, cafes and bars Markets Performances and one-off events
Example streets	Civic Link Church Street between Darcy Street and Macquarie Street (either side of the through movements) Parramatta River foreshore

7.2.5 Access and Shortcuts

Access and Shortcuts in the CBD support the higher order Travel Streets. They provide access to building servicing and car parks. Some of them allow faster routes to your destination than walking on the busier Travel Streets and Activity Streets as they can provide through site links to shorten your walking distance. Access and Shortcuts have lower volumes of pedestrians as they typically provide access to only a few destinations compared to the major CBD streets. Space may be shared with low speed vehicles including cars accessing car parks and service and delivery vehicles. While Access and Shortcuts have less active street frontage and pedestrian priority, they still require good lighting, passive surveillance and legible routes.

The characteristics of Access and Shortcuts for the CBD are presented in **Table 7-4**.

Table 7-4 Access and Shortcuts - desirable characteristics

Criteria	Access and Shortcuts characteristic
Footpath width	Varies, or a shared zone
Clear pedestrian zone	Varies, or a shared zone
Pedestrian crossings	Generally uncontrolled informal crossings at entrances to laneways Shared zone if used by both vehicles and pedestrians
Relationship to buildings and public spaces	Access to destinations
Amenity, street furniture and landscaping	Minimal street furniture Wayfinding signage
Connectivity and access	Servicing access to buildings Arcades Car parks Civic spaces
Street frontages	Servicing access to buildings Secondary entrances to buildings
Business use of street space	Servicing access to buildings Driveways
Example streets	Lanes to access car parks throughout the CBD

7.2.6 Other considerations

Other transport modes are considered in the categories of streets only in terms of the relationship and impact on the pedestrian experience but the designation of street functions for pedestrians will not necessarily apply for other modes. Should an overarching street network plan be developed for the CBD that references movement and place functions, the categories of streets designated in the Pedestrian Strategy should be referenced for pedestrian requirements.

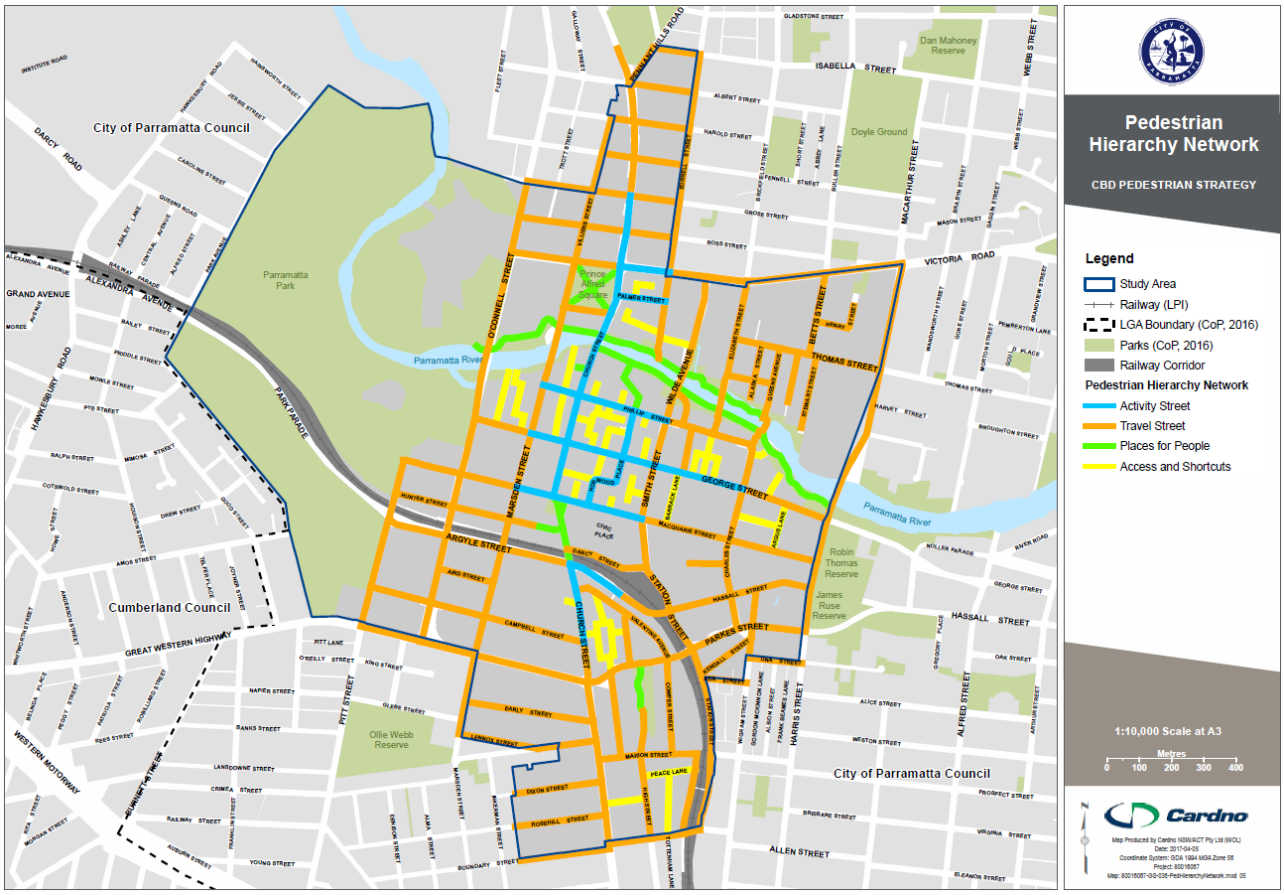
There are also a number of other considerations that must be layered onto the movement and place functions of the designated categories of street. These include consideration of the environment, heritage, existing and future development, the introduction of the light rail and traffic volumes.

These considerations must be considered by Council, along with the movement and place functions in the future definition of the CBD streets. This Pedestrian Strategy's acknowledgement that city streets do much more for people than just move them from A to B is one of the important steps in creating a vibrant, diverse and attractive CBD that people want to spend time in.

7.3 Current pedestrian network

The categories of streets applied to the current pedestrian network are presented on **Figure 7-2**. It is anticipated that as the city changes, the network will evolve as it is subject to further investigation.

Figure 7-2 Current pedestrian network - categories of streets



7.4 Regional connections

In addition to the nominated categories of streets within the CBD, regional connections from surrounding areas should be recognised and supported. These connections are considered in two ways, CBD entry points and connecting to Parramatta Ways. To access the CBD, the key entry points and corridors should include:

> To the north-west, an entry point at the corner of Pitt and Macquarie Streets, accessed via Railway Parade at Westmead Station and through Parramatta Park on the northern side of the rail corridor;

> To the north; **three entry points** with corridor links as follows:

- Corner of O'Connell and George Streets, accessed via Fleet, Fennell and O'Connell streets;
- Corner of Pennant Hills Road and Church Street, accessed via Church Street north of the intersection; and
- Corner of Buller Street and Victoria Road, accessed via Buller Street north of the intersection.

> To the east, **four entry points** with corridor links as follows:

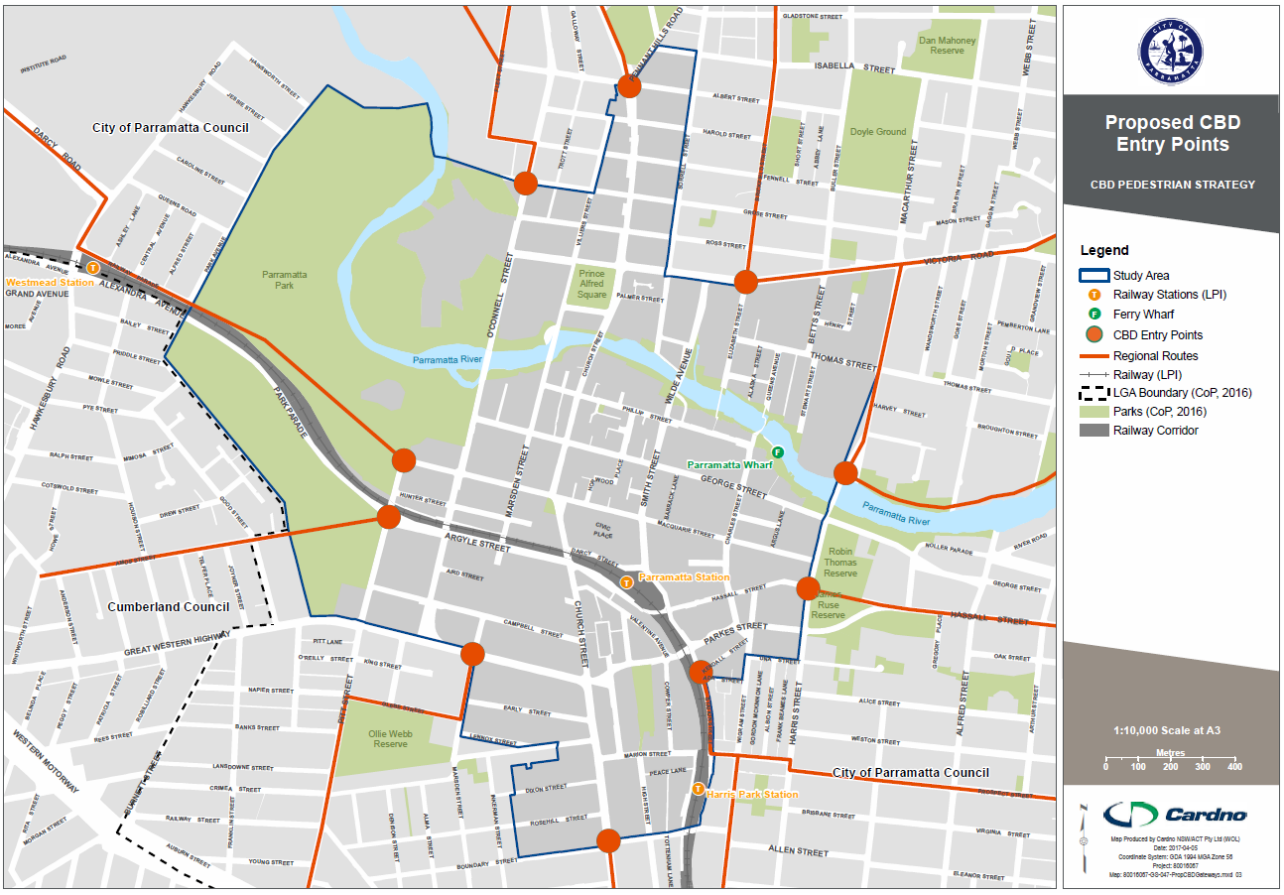
- Corner of Buller Street and Victoria Road, accessed via Victoria Road east of the intersection;
- At Macarthur Street north of the Parramatta River, with access via the Parramatta Valley Cycleway to the east;
- Corner of Hassall and Harris Streets, accessed via Hassall Street east of the intersection; and
- Corner of Station Street East and Kendall Street, accessed via Crown and Marion Streets.

> To the south, **three entry points** with corridor links as follows:
  - Corner of Station Street East and Kendall Street, accessed via Wigram and Station Street East;
  - Corner of Church and Boundary Streets, accessed via Church Street south of the intersection; and
  - Corner of Great Western Highway and Marsden Street, accessed via Marsden, Crimea and Pitt Streets.

> To the west; a gateway at the corner of Pitt and Argyle Streets, accessed via Amos Street and through Parramatta Park.

The proposed CBD entry points are shown on **Figure 7-3**. Infrastructure to support the entry points is recommended as one of the Infrastructure and Operations actions in **Section 8.2**.

Figure 7-3 Proposed CBD entry points



8 Actions for walking

8.1 Summary of actions for walking

To address the walking issues and opportunities, align with the walkable city centre principles and achieve the strategic walking objectives, a range of actions for walking are recommended. These actions are presented in three groups:

> Infrastructure and operations actions (**Table 8-1**).

> Policy and development actions (**Table 8-2**).

> Behaviour change actions (**Table 8-3**).

More detail on each of the actions including the relevant Pedestrian Strategy objective/s, the rationale and the implementation approach is provided in **Sections 8.2, 8.3** and **8.4**.

Table 8-1 Infrastructure and operations actions

#	Infrastructure and operations actions	Timeframe
IO1	The Integrated Transport Plan is to implement 40 kilometre per hour (and advocate for 30 kilometre per hour) speed zones throughout CBD	Short term
IO2	Undertake an audit of all footpaths to identify and prioritise infrastructure upgrades	Short term
IO3	Implement traffic calming measures on city streets to support IO1	Medium term
IO4	New driveways should not be planned on main streets	Medium term
IO5	Review and improve street and public place lighting throughout CBD. Develop a CBD lighting strategy that supports safety, amenity, activity and economic development in the CBD.	Short term
IO6	Continue the implementation of the Pedestrian Amenity Zone	Ongoing
IO7	Review count down timers at intersections on key movement streets	Short term
IO8	Provide additional crossing legs at signalised intersections	Medium term
IO9	Update the Wayfinding Strategy with changes to the CBD's key destinations and routes	Short term
IO10	Trial temporary pedestrian improvements – road closures, widened walkways, shorter crossings, extra seating	Short term
IO11	Develop key CBD entry points for access to the CBD from surrounding areas	Medium term
IO12	Assess crashes involving pedestrians throughout the CBD and undertake Road Safety Audits at crash cluster locations to determine issues and solutions.	Ongoing
IO13	Rubbish and graffiti to be removed quickly	Ongoing
IO14	Create spaces that can be used for formal and informal meetings throughout the CBD.	Medium term
IO15	Work with Urban Designers to define the future street network hierarchy	Short term
IO16	Implement a minimum width for clear path of travel on both sides of all streets	Ongoing
IO17	All zebra crossings throughout the CBD should be raised	Medium term
IO18	Provide shared zones in lanes used by both pedestrians and vehicles	Long term
IO19	Investigate the provision of midblock road crossings in locations where blocks are over 200m in length	Short term
IO20	Provide shading/shelter (weather protection) along key routes and at key intersections	Ongoing
IO21	Investigate auto pedestrian phase signals	Short term
IO22	Place green landscaping between vehicles and pedestrians along roads with high vehicle volumes	Ongoing
IO23	Repair street lighting as soon as issues are identified	Ongoing

#	Infrastructure and operations actions	Timeframe
IO24	Enhance connections to the green spaces and recreation areas surrounding the CBD	Ongoing
IO25	Install water bubblers	Ongoing
IO26	Understand and provide for pedestrian storage at intersections	Medium term
IO27	Update Parramatta River Walk and investigate other opportunities for themed walks	Short term
IO28	Identify opportunities to declutter the streetscape and improve sight lines	Short term
IO29	Manage pedestrians effectively during construction activity	Ongoing

Table 8-2 Policy and development actions

#	Policy and development actions	Timeframe
PD1	Plan movement and place functions for CBD streets considering all transport modes	Short term
PD2	Develop pedestrian design guidelines for new developments	Short term
PD3	Amend DCP for permeable city blocks, active street frontages and high quality pedestrian infrastructure	Short term
PD4	Amend Public Domain Guidelines to reflect the street network hierarchy for pedestrian infrastructure	Short term
PD5	Work collaboratively with shop and café owners to allocate footpath space for seating, signage and other business users	Ongoing
PD6	Run competitions and award business owners for beautiful shop fronts and facades. Promote interesting, attractive and unique shopping precincts	Ongoing
PD7	Encourage pop-up shops in empty retail spaces.	Ongoing
PD8	Advocate for free bus and light rail within the CBD	Short term
PD9	Install permanent pedestrian counters	Short term
PD10	Coordinate with State Government to prepare pedestrian accessibility plans for public transport stations, stops and wharves throughout the CBD	Ongoing
PD11	Review and update Parramatta City Centre Lanes Strategy	Short term

Table 8-3 Behaviour change actions

#	Behaviour change actions	Timeframe
BC1	Require developers to prepare Green Travel Plans with clear pedestrian objectives and actions	Ongoing
BC2	Implement the education, communication and behaviour change toolkit	Short term
BC3	Keep pedestrians informed about construction impacts in the CBD	Ongoing
BC4	Create an online presence with Parramatta Walking information. Discover, times, routes, items of interest	Short term
BC5	Work with schools to understand and cater for their students' needs	Short term
BC6	Plan events and art alongside pedestrian routes	Ongoing
BC7	Promote the walking access to new city destinations as they are developed	Ongoing
BC8	Promote Walk to Work days with events and campaigns	Ongoing
BC9	Encourage organisations to promote and support employee walking trips	TBC
BC10	Identify, signpost and promote a city circuit walk	Short term
BC11	Promote CBD destinations through walking tours	Ongoing

8.2 Infrastructure and operations actions

Each of the infrastructure and operations actions for walking are presented below.

Action IO1	Implement 40 kilometre per hour (and advocate for 30 kilometre per hour) speed zones throughout CBD
Relevant objective/s	1. Prioritise the time, safety and amenity of pedestrians
Rationale	The NSW Speed Zoning Guidelines note that 40 kilometre per hour speed zones are used in high pedestrian activity areas. Reducing vehicle speeds within the CBD will reduce the likelihood and severity of crashes, including those involving pedestrians. Vehicle drivers will be reminded that they are in a busy pedestrian environment. Reduced vehicle speeds in the CBD will also help to discourage through traffic as the low speed environment will be a disincentive to travel through the CBD.
Implementation	Investigate the impact on traffic using microsimulation modelling.
Reference	NSW Speed Zoning Guidelines

Action IO2	Undertake an audit of all footpaths to identify and prioritise infrastructure upgrades
Relevant objective/s	1. Prioritise the time, safety and amenity of pedestrians 4. Improve the current and future pedestrian network
Rationale	A comprehensive audit of the CBD's footpath network will identify issues affecting pedestrian safety, amenity and accessibility. The audit will assess the network against a high standard of infrastructure and can be used to prioritise upgrade works to areas where they are needed most. The program of proposed prioritised works can be submitted for consideration of funding eligibility by RMS.
Implementation	Develop a framework outlining the scope of the footpath audits (including reference to relevant standards and minimum footpath widths). Audits can be undertaken using mobile hardware (i.e. tablet computers) and linked to a GIS database, which allows for the fast-tracking of data collection on-site and simplifies the analysis and mapping of the audit results. The key deliverables should include a list of costed and prioritised works. The audit can be incorporated as part of a Pedestrian Access and Mobility Plan (PAMP) developed for the CBD area.
Reference	How to prepare a Pedestrian Access and Mobility Plan (PAMP) – RMS Integrated Transport Plan for Parramatta City Centre – 2009/10 – 2014/15 Public Domain Guidelines (Parramatta City Council UDU) – January 2016

Action IO3	Implement traffic calming measures on city streets to support IO1
Relevant objective/s	1. Prioritise the time, safety and amenity of pedestrians
Rationale	Traffic calming measures aim to mitigate the risks associated with conflicts between vehicles and pedestrians, particularly in environments characterised by higher pedestrian densities, such as within CBD and local traffic areas. This is achieved primarily by implementing initiatives that seek to alter the behaviour of vehicle drivers, such as through the regulation of speed or route selection so as to shift the focus to improving priority and amenity for pedestrians. The Austroads Guide to Local Area Traffic Management advocate for the implementation of different traffic calming measures in local areas, with the key outcomes including improvements in traffic safety and security, as well as improved liveability and reduced impacts on the urban domain, characterised by improved accessibility to land uses and the links between these for pedestrians and cyclists.
Implementation	Various mitigation measures are available for implementation; each fulfils a different role in the wider pedestrian network. Particular measures to consider in the context of the CBD include narrowing of road lanes, reduction of speed limits and designation of shared zones.
Reference	Austroads Guide to Traffic Management Part 8: Local Area Traffic Management

	Integrated Transport Plan for Parramatta City Centre – 2009/10 – 2014/15

Action IO4	New driveways should not be planned on main streets
Relevant objective/s	1. Prioritise the time, safety and amenity of pedestrians
Rationale	The presence of vehicular access and egress points to car parking in the CBD is undesirable along high pedestrian volume streets as the associated vehicular movements, present a continual interruption to the free flow of pedestrians. The risk of conflict between vehicles and pedestrians is also increased, particularly if sightlines are poor due to the positioning of building features such as walls, or if there is confusion as to which user group has priority.
Implementation	Where possible, driveways should not be planned on main streets; it is instead desirable to locate access and egress points along minor streets or laneways, away from high pedestrian volumes. The Council Public Domain Guidelines provide standards regarding the design of driveways, and include recommendations on surface treatments that communicate pedestrian priority.
Reference	Australian Standards AS2890.1 – 2004 Public Domain Guidelines (Parramatta City Council UDU) – January 2016

Action IO5	Review and improve street and public place lighting throughout CBD. Develop a CBD lighting strategy that supports safety, amenity, activity and economic development in the CBD.
Relevant objective/s	1. Prioritise the time, safety and amenity of pedestrians 2. Enhance and activate spaces and streets, supporting the CBD's economy
Rationale	Effective and attractive lighting along streets and within public spaces acts to support a pleasant evening experience for pedestrians and it also promotes pedestrian safety and sense of personal security. Streets throughout the CBD should be well-lit, and users should be able to clearly see the direction of the path, and any obstructions.
Implementation	The choice of light fixtures should take into consideration the illumination levels, measured as lux levels. Recommended lux levels are provided by Australian Standards AS1158, and these depend on the role of the area under consideration, and the anticipated volumes of traffic (vehicular or pedestrian) in the area. Consideration should also be given to the impact on the appearance of the public domain (with the aim to reduce unnecessary clutter) as well as ease of access for periodic maintenance. An audit of the existing lux levels should be undertaken within the Parramatta CBD, identifying areas of poor or non-existent lighting facilities. This should guide the development of a lighting strategy and implementation plan, with focus on ensuring the provision of attractive and high-quality facilities across the CBD.
Reference	Australian Standards AS1158.3.1 – 2005 Public Domain Guidelines (Parramatta City Council UDU) – January 2016

Action IO6	Continue the implementation of the Pedestrian Amenity Zone
Relevant objective/s	1. Prioritise the time, safety and amenity of pedestrians
Rationale	The Pedestrian Amenity Zone was first developed in 2007 as part of the Parramatta City Centre Plan, and aimed to prioritise works that reduced traffic speeds in the CBD whilst also improving pedestrian and cyclist road safety and accessibility. The key recommendations of the Zone included the reduction of the vehicle speed limit to 40 kilometres per hour for the entire CBD, in addition to new or improved pedestrian facilities throughout and outside the CBD areas, encompassing signals, crossings and access paths. A review of the progress of the Pedestrian Amenity Zone indicated that most of the recommendations remained outstanding, including the designation of the 40 kilometre per hour CBD speed limits.
Implementation	The recommendations of the Pedestrian Amenity Zone should be implemented where possible; either as a standalone program of works or incorporated as part of other scheduled

Action IO6	Continue the implementation of the Pedestrian Amenity Zone
	programs. Particular focus should be given to expanding the 40 kilometre per hour CBD speed limits and completing the upgrades to controlled crossings in the CBD area.
Reference	Parramatta City Council Pedestrian and Cyclist Amenity Zone – 2007

Action IO7	Implement count down timers at intersections on key movement streets
Relevant objective/s	1. Prioritise the time, safety and amenity of pedestrians
Rationale	Transport for NSW's Centre for Road Safety has undertaken a trial of pedestrian count down timers at specific signalised intersections in the Sydney CBD, Chatswood and Parramatta. In Parramatta, these are located at the intersections of Campbell Street and Marsden Street, and Parkes Street and Station Street. The aim of the countdown timers is to provide an additional level of mitigation to the risk of pedestrian and vehicle conflict, through allowing for pedestrians to make a better judgement of the safety risks associated with a crossing movement when given the exact amount of time left to complete a crossing. Transport for NSW has completed the trial, and concluded that the timers perform best when located at intersections where pedestrians are the only users on the road when given green light authority, such as scramble crossings.
Implementation	Transport for NSW has already identified a further five intersections in the Parramatta CBD that are earmarked for the upgrade to include count down timers following the success of the trial; these include: ▪ George and Church Streets ▪ Macquarie and Church Streets ▪ Church and Phillip Streets ▪ Smith and George Streets ▪ Smith and Macquarie Streets Through analysis of CBD crash data and pedestrian volumes, additional locations can be identified that would benefit further from the installation of the countdown timers.
Reference	Transport for NSW Centre for Road Safety – Pedestrian countdown timers

Action IO8	Provide additional crossing legs at signalised intersections
Relevant objective/s	1. Prioritise the time, safety and amenity of pedestrians
Rationale	The Austroads Guide to Traffic Management recommends that marked pedestrian crossing facilities are provided across all approaches at a signalised intersection. The provision of crossing legs facilitate the safe and efficient movement of pedestrians, and assist with direct lines of travel through the CBD. Missing crossing legs will act as a hindrance to pedestrian movements, and could discourage walking at these locations or instigate dangerous crossing attempts.
Implementation	The majority of intersections in the CBD have signalised crossing legs provided on all approaches. Consideration should be given to providing facilities at the following locations where links are missing in the CBD walking network, in line with the objectives of the Integrated Transport Plan for Parramatta City Centre: ▪ George Street and Macarthur Street ▪ Church Street / Great Western Highway / Parkes Street ▪ Great Western Highway and Marsden Street ▪ Aird Street and O'Connell Street
Reference	Austroads Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings Integrated Transport Plan for Parramatta City Centre – 2009/10 – 2014/15

Action IO9	Update the Wayfinding Strategy with changes to the CBD's key destinations and routes
Relevant objective/s	4. Improve the current and future pedestrian network 6. Promote walking
Rationale	A successful wayfinding strategy implemented across the CBD communicates correct and concise information to visitors by way of promoting an intuitive and familiar environment to allow for ease of journey planning and navigation. Visitors to the CBD will be more inclined to walk to their destination when effective journey time and map information is provided at convenient locations.
Implementation	The revised wayfinding strategy should consider appropriate design elements and their place in the urban domain. The development of a consistent brand is important, and should be incorporated as part of a communications strategy to ensure awareness is maximised among visitors. Wayfinding should direct people to access: ▪ Public transport ▪ Civic space ▪ Public administration buildings ▪ Arts and cultural destinations ▪ Eating and retail destinations like Eat Street and arcades ▪ Active and passive recreation spaces, parks and reserves Liaison with Transport for NSW is encouraged to ensure a consistent rollout of the design at transport interchanges and stops. Consistency should be maintained with Transport for NSW's new wayfinding guidelines when providing information on access to public transport services; in particular mode identifiers T, B, F and L representing train, bus, ferry and light rail modes respectively. Include walking times and clear information on wayfinding signage. Signage should also be provided in multiple languages to acknowledge and support Parramatta's culturally and linguistically diverse communities.
Reference	Transport for NSW – Wayfinding Program Parramatta Preliminary Wayfinding Strategy – 2008

Action IO10	Trial temporary pedestrian improvements – road closures, widened walkways, shorter crossings, extra seating
Relevant objective/s	1. Prioritise the time, safety and amenity of pedestrians
Rationale	Additional and improved pedestrian facilities in the CBD assist with developing more pedestrian friendly spaces, as well as move people through the CBD more efficiently and safely. Measures such as widened walkways help encourage walking in the CBD by providing enhanced facilities that promote efficient walking journeys, as well as emphasise pedestrian priority in an area where reduced vehicle speeds and volumes is desirable and crucial to the future liveability of the area. Shorter crossings aim to improve pedestrian safety by improving sight distances for pedestrians through minimising the effective road width for approaching vehicles. Features such as additional seating and pop up spaces assist with precinct activation through creating and promoting points of interest and encouraging enjoyment of public spaces. The trial treatments must be accessible for all. The temporary nature of the changes means that any opposition to the plans can be reassured that if not successful, the street can be restored to its original condition. Cities as varied as New York, London, Austin and Bondi Junction has successfully trialled street improvements.
Implementation	Path widening can be targeted along key pedestrian routes characterised by congestion. Consider temporary installation of interesting improvements to encourage people to think differently about the street layout. Kerbside car parking could be converted to outdoor café seating, kerb extensions could be painted onto a road to reduce traffic speeds or a street could be converted to 'no through road' with a pocket park installed at the end. These improvements should be designed outside of the clear path of travel.
Reference	Integrated Transport Plan for Parramatta City Centre – 2009/10 – 2014/15 Complete Streets

Action IO11	Develop key CBD entry points for access to the CBD from surrounding areas
Relevant objective/s	4. Improve the current and future pedestrian network
Rationale	The role of key CBD entry points is to provide direct pedestrian connections to the CBD from surrounding areas to support walking trips and increase mode share. There are several areas within two kilometres of the CBD earmarked for growth and redevelopment, they represent an excellent opportunity to encourage people to travel to the CBD on foot rather than drive for such a short trip
Implementation	Key CBD entry points should connect to the CBD from major desire lines to maximise efficiency in navigation and travel time. When arriving at a gateway, a pedestrian should have clear wayfinding signage directing them to major destinations throughout the CBD. Routes connecting to the entry points should have clear sightlines, reassurance wayfinding signage, good lighting and the opportunity for active and passive surveillance. The locations of the key CBD entry points are shown on **Table 7-3**.
Reference	NA

Action IO12	Assess crashes involving pedestrians throughout the CBD and undertake Road Safety Audits at crash cluster locations to determine issues and solutions.
Relevant objective/s	1. Prioritise the time, safety and amenity of pedestrians
Rationale	The identification of crash black spots in the CBD allows for the targeting of mitigation measures to locations where they are needed most. A Road Safety Audit can then identify deficiencies with the existing infrastructure at these locations and propose recommendations to mitigate the risks of conflict between vehicles and pedestrians.
Implementation	Undertake analysis and mapping of historical crash data for the CBD area to identify key crash locations. Undertake a Road Safety Audit at these locations, and adopt the recommendations.
Reference	Crash data for Parramatta CBD – Transport for NSW Centre for Road Safety

Action IO13	Rubbish and graffiti to be removed quickly
Relevant objective/s	2. Enhance and activate spaces and streets, supporting the CBD's economy
Rationale	The presence of rubbish and graffiti along CBD streets creates a negative perception of the area among visitors, and communicates a sense of neglect for the public domain. This can impact on the attractiveness of the area and success of activation strategies. Excessive rubbish and graffiti can also affect perceptions of personal security by discouraging visitors from spending time in the area.
Implementation	Ensuring the timely removal of rubbish should be incorporated into regular council maintenance schedules. The key actions from the Parramatta Safety Plan should be implemented: Continuing to implement a fast graffiti removal system Identify graffiti hot spots from historical data, and implement preventative measures Communicate the availability of vandalism and graffiti reporting tools to be used by the public
Reference	Parramatta Safety Plan 2014 – 2018 – Parramatta City Council

Action IO14	Create spaces that can be used for formal and informal meetings throughout the CBD
Relevant objective/s	2. Enhance and activate spaces and streets, supporting the CBD's economy
Rationale	The provision of pedestrian spaces for purposes other than transport and connectivity are vital to of the vibrancy of the CBD. Opportunities should be provided in the public domain for visitors to stay and engage with elements including outdoor public space, activities and events for social interaction and recreation. Design elements including open spaces, public art, as well as revitalised laneways in the CBD provide variety in the points of interest throughout the public domain, and support the growth of the local economy.
Implementation	The planned precinct works including Parramatta Square, Parramatta Riverbank and the Horwood Place Civic Link will provide opportunities to incorporate elements such as open spaces, seating and natural shading. These will encourage visitors and promote use of the space for both formal community events, as well as for informal social interaction and meetings.
Reference	Parramatta City Centre Public Domain Framework Plan – 2012 Public Domain Guidelines (Parramatta City Council UDU) – January 2016

Action IO15	Work with Urban Designers to define the future street network hierarchy
Relevant objective/s	1. Prioritise the time, safety and amenity of pedestrians 2. Enhance and activate spaces and streets, supporting the CBD's economy 3. Capitalise on the transformation of the CBD to benefit pedestrians 4. Improve the current and future pedestrian network
Rationale	Two of the most important street functions are movement and place. The street hierarchy and categories of streets for the CBD acknowledge both functions and seek to identify the streets that have predominantly one of the functions and those that have both.
Implementation	As the CBD transforms, consider the balance between the different functions that each street needs to perform and plan accordingly to support the functions with the desirable characteristics set out in the Pedestrian Strategy. Organise a multi-disciplinary approach to planning the CBD streets with consideration of movement and place needs as well as environment, heritage and urban design factors.
Reference	Parramatta City Centre Public Domain Framework Plan – 2012 Department for Transport, Manual for Streets Link and Place: A new approach to street planning and design – 2009

Action IO16	Implement a minimum width for clear path of travel on both sides of all streets
Relevant objective/s	1. Prioritise the time, safety and amenity of pedestrians 4. Improve the current and future pedestrian network
Rationale	Pedestrians need a clear path of travel when they are moving along a footpath. A mandatory minimum clear path of travel width will ensure that street furniture, outdoor dining areas and other obstructions do not hinder pedestrian movement.
Implementation	As streets and CBD blocks are redeveloped, ensure that street furniture, outdoor dining seating, signage and utilities are designed to be located outside of a minimum clear path width; > 2.2 metres excluding buffer zones for the core part of the CBD (shown on **Figure 6-11**) and > 1.8 metres excluding buffer zones for outer areas (shown on **Figure 6-12**). George Street and Church Street require more detailed assessment to determine the minimum clear path width. Update the Public Domain Guidelines, Outdoor Dining Policy and the Development Control Plan (DCP) to reflect this design standard.
Reference	**Appendix D** – Review of Pedestrian Considerations in the DCP 2011.

Action IO17	All zebra crossings throughout the CBD should be raised
Relevant objective/s	1. Prioritise the time, safety and amenity of pedestrians
Rationale	Zebra crossings provide pedestrians with prioritised road crossing opportunities, vehicles must give way to pedestrians who are walking across a zebra crossing and also slow down. Raised crossings also provide a more accessible crossing facility for people who are using wheelchairs or prams. Raised zebra crossings are more visible to motorists and have the added effect of slowing traffic. Where a speed hump could be confused for a zebra crossing, barriers or landscaping should be provided along the footpath to prevent pedestrians from crossing, noting that speed humps should not be located along a pedestrian desire line.
Implementation	Replace all zebra crossings with raised zebra crossings, designed to AustRoads Standards.
Reference	AustRoads Standards Pedestrian Infrastructure AS1742.10 RMS Technical Direction TDT 2001/04a – May 2011

Action IO18	Provide shared zones in lanes used by both pedestrians and vehicles
Relevant objective/s	1. Prioritise the time, safety and amenity of pedestrians 2. Enhance and activate spaces and streets, supporting the CBD's economy
Rationale	Shared zones are characterised as sections of the road network that can be used by both vehicles and pedestrians, with the latter's movements receiving priority. The main objective is to prioritise pedestrian movements and improve their walking experience. Shared zones are usually identifiable by all, or a combination of regulatory signage indicating a reduced speed environment, alternate surface treatments or raised thresholds and removed kerbs. Shared zones best benefit environments where pedestrian volumes are generally higher than those of vehicles, where the space for walking is limited due to narrow footpaths, and where the provision of a shared facility will provide an appealing point of interest within the local precinct.
Implementation	Shared zones provide an excellent opportunity to activate the laneway networks in the CBD. RMS provides guidance on the design of shared zones, and these follow two different categories (Category 1 and 2). Category 1 shared zones are implemented as part of new or recent developments, and include surface treatments that extend across the entire area. They do not incorporate kerbs, thus providing a continuous and uninterrupted walking environment for pedestrians. It is recommended that where CBD blocks are being redeveloped, all incorporated laneways are designed to Category 1 standards. Category 2 shared zones are implemented on existing roads, and only require a combination of surface treatments and traffic calming devices on entry to and exit from the designated zone. Where existing kerbs are provided, approval from RMS is required to retain these as part of the designation. It is recommended that, in the short-term, existing laneways can be designed to Category 2 standards, with potential for conversion to Category 1 in the longer-term. There may be some cases where the laneway does not meet RMS requirements and implementation of a shared zone is not possible.
Reference	RMS Technical Direction TTD 2-14/003 – July 2014

Action IO19	Investigate the provision of midblock road crossings in locations where blocks are over 200m in length
Relevant objective/s	1. Prioritise the time, safety and amenity of pedestrians 4. Improve the current and future pedestrian network
Rationale	Mid-block crossings enhance access along streets, encouraging walking to access key land uses in the CBD. Extended blocks that provide no designated crossing facility can discourage walking in the area, unnecessarily increase trip times and lengths for pedestrians, and increase the risk of jaywalking and potential conflicts with vehicles, particularly if popular land uses or transport services are located on each side of a road corridor. Depending on the layout of the subject road corridor, mid-block crossings can be designed as zebra crossings, signalised facilities and/or incorporate kerb extensions and refuges.

Action IO19	Investigate the provision of midblock road crossings in locations where blocks are over 200m in length
Implementation	It is recommended that in the CBD, all blocks that are longer than 200 metres in length must have a formalised crossing facility at the mid-block. The type of facility to be provided (signalised, zebra, refuge) is at the discretion of Council. The facility should be designed such that the crossing length is minimised where possible, appropriate surface treatments are selected and applied, adequate sight distances are available to crossing pedestrians and approaching vehicles, and the width of the crossing is no less than three metres.
Reference	Austroads Guide to Road Design Part 4: Intersections and Crossings

Action IO20	Provide shading/shelter (weather protection) along key routes and at key intersections
Relevant objective/s	1. Prioritise the time, safety and amenity of pedestrians
Rationale	Continuous weather protection on CBD streets is desirable to encourage people to continue to take walking trips, even in poor weather. Shade from trees makes walking a more pleasant experience in summer months.
Implementation	Street trees are recommended initiative to be implemented across the CBD to provide shade on warm days and provide a pleasant walking and rest environment for pedestrians. In addition, they would act as a buffer to reduce the impact of wind tunnels in the CBD and would cool streets, reducing the Urban Heat Island effect. Awnings are preferred along high volume routes across the CBD to improve the comfort level of pedestrians when there is rain. They are not required for laneways; retractable awning are preferred if awnings are to be provided. Transparent awnings should be used where possible to allow for light exposure along the footpath. Awnings may not be feasible at some locations. The application of awnings should be considered on a site by site basis and with detailed design work undertaken by urban designers.
Reference	**Appendix E** – Pedestrian Design Guidelines

Action IO21	Install auto pedestrian phase signals
Relevant objective/s	1. Prioritise the time, safety and amenity of pedestrians
Rationale	Automatic pedestrian signal phases involve a modification made to the existing signal network which results in the activation of the green walking phase for pedestrians in parallel with the adjacent traffic intersection leg, without the need for a pedestrian to manually press the activation button. This initiative is beneficial particularly in dense urban environments as it enhances the movement of pedestrians through the area by activating the green signal at every available opportunity, thus reducing the presence of crowding at key intersections. The initiative has been successfully trailed in the Melbourne CBD, with the focus now on expanding the changes to the surrounding inner suburban areas over a four year period from 2014 to 2017.
Implementation	The pedestrian signals in the CBD are operated by Roads and Maritime Services. It is recommended that Council undertakes discussions with them to ensure the automatic activation function is programmed into each CBD intersection.
Reference	City of Melbourne Walking Plan 2014 – 2017

Action IO22	Place green landscaping between vehicles and pedestrians along roads with high vehicle volumes
Relevant objective/s	1. Prioritise the time, safety and amenity of pedestrians 4. Improve the current and future pedestrian network
Rationale	Landscaping on streets with high vehicles volumes will help to provide a physical and visual buffer between pedestrians and vehicles, enhancing the pedestrian experiences on these streets. It will also discourage pedestrians from attempting to cross the road at uncontrolled

	midblock locations. In addition, landscaping could act as a buffer to reduce the impact of wind tunnels in the CBD and would cool streets, reducing the Urban Heat Island effect.
Implementation	Plan greenery and landscaping on streets with higher traffic volumes, such as Smith Street, Church Street south of The Great Western Highway, Parkes Street and The Great Western Highway. Include those streets that make up the city ring road. The greenery and landscaping should be provided at the edge of the kerb line and not impose on the pedestrian clear zone. Access from cars parked along the street must still be provided to the footpath.
Reference	NA

Action IO23	Repair street lighting as soon as issues are identified
Relevant objective/s	1. Prioritise the time, safety and amenity of pedestrians
Rationale	Fixing poor quality and broken street lights across the CBD will contribute to improving perceptions of personal security.
Implementation	As soon as a lighting issue is raised with Council by a community member, or identified through Council asset reviews, ensure it is addressed immediately. Include information on Council's website letting people know how they can report poor quality and broken street lights. Ensure all new lights are provided in accordance with latest design standards.
Reference	NA

Action IO24	Enhance connections to the green spaces and recreation areas surrounding the CBD
Relevant objective/s	4. Improve the current and future pedestrian network
Rationale	The CBD is surrounded by high quality open public space and recreational areas including Parramatta Park, Parramatta River, Queens Wharf Reserve and Stewart Street Reserve. The growing population will need direct and safe access to these areas from their homes and workplaces in the CBD. This is especially important where these public spaces and recreational areas are accessed by crossing the ring road network.
Implementation	Review the access to each of the public open spaces surrounding the CBD and audit these routes for: safe road crossings (also able to accommodate bicycles), good quality lighting, wayfinding signage, benches and water bubblers. Provide missing infrastructure.
Reference	Parramatta Open Space Plan – 2003

Action IO25	Install water bubblers
Relevant objective/s	1. Prioritise the time, safety and amenity of pedestrians
Rationale	Water bubblers are a desirable characteristic for Travel Streets, Activity Streets, and Places for People in the CBD. Providing water bubblers will increase convenience and amenity for pedestrians in the CBD, and encourage sustainable practices such as carrying a water bottle rather than buying a plastic bottle.
Implementation	Install water bubblers on key Activity Streets, Travel Streets, and Places for People in the CBD. Consider partnering with Sydney Water to assist with funding.
Reference	VicHealth, Provision of drinking water fountains in public areas A local government action guide – September 2016

Action IO26	Understand and provide for pedestrian storage at intersections
Relevant objective/s	1. Prioritise the time, safety and amenity of pedestrians
Rationale	Intersections in the CBD should provide sufficient capacity to safely store pedestrians. This is particularly important close to construction sites, where path widths may be impacted.
Implementation	Review capacity at intersections within the CBD, with particular focus on intersections close to construction sites. Ensure intersections comply with minimum path width standards.

Reference	NA

Action IO27	Update Parramatta River Walk and investigate other opportunities for themed walks
Relevant objective/s	2. Enhance and activate spaces and streets, supporting the CBD's economy 4. Improve the current and future pedestrian network 6. Promote walking
Rationale	The Parramatta River Walk and other themed walks offer the chance to support the walking economy in the CBD, by enhancing the amenity and attractiveness of the walking experience for locals and visitors. This could include a walking loop which includes the river foreshore, Parramatta Park, and Parramatta Stadium. Opportunities to use these walking routes for events, as has been done in Melbourne, should also be investigated.
Implementation	Review the existing Parramatta Walk to determine whether it can be enhanced, and whether other similar themed walks could be developed in and around the Parramatta CBD.
Reference	City of Melbourne Walking Plan 2014 – 2017

Action IO28	Identify opportunities to declutter the streetscape and improve sight lines
Relevant objective/s	1. Prioritise the time, safety and amenity of pedestrians 4. Improve the current and future pedestrian network
Rationale	Pedestrians may not feel important if they have to walk around street clutter such as signage, street furniture and other small barriers. Street clutter may also impede sight lines which are important to pedestrian safety and amenity.
Implementation	Review existing street furniture and remove excessive clutter. All street signage and furniture should be placed outside of the minimum clear path of travel on CBD streets, set out in **Section 6.5**. Ensure all new arcades and lanes have a clear line of sight.
Reference	NA

Action IO29	Manage pedestrians effectively during construction activity
Relevant objective/s	1. Prioritise the time, safety and amenity of pedestrians
Rationale	Pedestrians may encounter multiple construction sites whilst travelling within the CBD. Consideration must be given to pedestrian safety and amenity during the ongoing development of the CBD, to support walking trips during construction periods.
Implementation	Construction Traffic Management Plans must include clear provisions for pedestrians where construction activity impedes footpath access. Footpath closures must be managed effectively to ensure that alternative, direct, and safe access is provided. This includes accessibility for people with mobility impairments, such as Disability Discrimination Act compliant grades and widths. Desire lines should be maintained, and detours minimised. Crossing opportunities and connectivity to nearby streets should also be retained.
Reference	NA

8.3 Policy and development actions

Each of the policy and development actions for walking are presented below.

Action PD1	Plan movement and place functions for CBD streets considering all transport modes
Relevant objective/s	2. Enhance and activate spaces and streets, supporting the CBD's economy 4. Improve the current and future pedestrian network
Rationale	The identified street hierarchy for the CBD in the Pedestrian Strategy only considers the movement and place functions for pedestrians. For an integrated approach to street planning and design, a street hierarchy network should be developed which considers all transport modes together. This would allow a holistic view of the movement and place functions of each street.
Implementation	As part of the new Integrated Transport Plan, consider developing an approach to planning movement and place street functions which considers all transport modes. This could result in revisions to some of the recommendations for pedestrian infrastructure as the streets need to accommodate and be designed for all modes. If available, the new Integrated Transport Plan should also align with the draft NSW Road Planning Framework.
Reference	Link and Place: A new approach to street planning and design – 2009

Action PD2	Develop pedestrian design guidelines for new developments
Relevant objective/s	3. Capitalise on the transformation of the CBD to benefit pedestrians 4. Improve the current and future pedestrian network
Rationale	As CBD blocks are redeveloped they should prioritise pedestrian safety and movements. A set of pedestrian design guidelines will help to ensure sites across the CBD accommodate and support walking trips.
Implementation	**Appendix E** includes a set of that address the following key pedestrian design requirements for new developments in the CBD: ▪ Footpaths; ▪ Access and egress points, and associated pedestrian crossings; ▪ Building frontages, facades and accessibility; ▪ Personal safety, security and CPTED principles; ▪ Weather protection; ▪ Through site links; and ▪ Construction impacts. Compliance with these pedestrian design guidelines should be mandatory for all new developments in the CBD.
Reference	**Appendix E** – Pedestrian Design Guidelines

Action PD3	Amend DCP for permeable city blocks, active street frontages and high quality pedestrian infrastructure
Relevant objective/s	3. Capitalise on the transformation of the CBD to benefit pedestrians 4. Improve the current and future pedestrian network
Rationale	The Parramatta Development Control Plan 2011 (DCP) sets out Council's expectation for the development throughout the local government area. It is an important tool for shaping the design and layout of new developments and supports the planning controls in the Local Environmental Plan. Updating the DCP's Special Precincts Section 2 – The City Centre to reflect the required pedestrian footpath widths and pedestrian clear zones required to accommodate future pedestrian flows. Recommended updates to the DCP are proposed in **Appendix D**.
Implementation	Make the proposed amendments to the DCP set out in **Appendix D**.
Reference	Parramatta Development Control Plan – 2011 **Appendix D**– Review of Pedestrian Considerations in the DCP 2011

Action PD4	Amend Public Domain Guidelines to reflect the street network hierarchy for pedestrian infrastructure
Relevant objective/s	3. Capitalise on the transformation of the CBD to benefit pedestrians 4. Improve the current and future pedestrian network
Rationale	The Public Domain Guidelines should reflect the proposed pedestrian network hierarchy's desirable characteristics for pedestrian infrastructure
Implementation	Review and revise the Public Domain Guidelines to acknowledge the movement and place functions of streets for all transport modes and update the guidelines to reflect the desirable street characteristics for pedestrians including minimum footpath width, minimum clear pedestrian zone and wayfinding signage. Consider amendments to weather protection, street furniture, and landscaping and street frontages guidelines where appropriate.
Reference	Public Domain Guidelines (Parramatta City Council UDU) – January 2016

Action PD5	Work collaboratively with shop and café owners to allocate footpath space for seating, signage and other business users
Relevant objective/s	2. Enhance and activate spaces and streets, supporting the CBD's economy
Rationale	Outdoor dining is an important feature of activated and populated city streets. It does however need to be balanced with allowing enough clear space on footpaths to support through movement of pedestrians. Council's current Outdoor Dining Policy sets out clear instructions on the positioning and space required for outdoor dining furniture. There is opportunity to review the policy to ensure a flexible approach to on-street dining.
Implementation	Consult with the food industry in the CBD on potential changes to the Outdoor Dining Policy to allow flexible spaces that still support through movements without conflict. One area of change could be the requirement that all outdoor dining furniture must be located away from the building. Changing the policy to allow tables and chairs up against the building in some locations will allow varied use of footpath space and make streets more interest and less uniform. Business seating and signage should be positioned outside of the clear path of travel.
Reference	Parramatta City Council's Outdoor Dining Policy City of Sydney Outdoor Café Policy

Action PD6	Run competitions and award business owners for beautiful shop fronts and facades. Promote interesting, attractive and unique shopping precincts
Relevant objective/s	2. Enhance and activate spaces and street, supporting the CBD's economy
Rationale	Incentivising street facing businesses to create attractive and inviting shop fronts and spaces will enhance the pedestrian experience and attract more people to the CBD street on foot because it is an enjoyable and interesting place to be.
Implementation	Reward and acknowledge businesses which have inviting, attractive and unique shop fronts through an annual competition and promoting those that are recently opened. Provide rewards for individual businesses but also for small precincts to encourage groups of businesses to work together to beautify their section of the streetscape. This will encourage competition and collaboration. Promote the businesses and the interesting, attractive and unique shopping precincts through business awards, the Walk Parramatta app and Council's other media channels.
Reference	NA

Action PD7	Encourage pop-up shops in empty retail spaces
Relevant objective/s	2. Enhance and activate spaces and streets supporting the CBD's economy
Rationale	Empty shopfronts are unattractive and boring, encouraging popup shops in empty retail spaces will reactivate the street, engage pedestrians and encourage other businesses to consider moving there permanently because of increased activity.
Implementation	Incentivise retail space owners and real estate agents to allow popup shops in empty shopfronts throughout the CBD. These popup shops and events organised around them. Consider sponsoring artists and designers to hold exhibitions and popup galleries in these spaces as well.
Reference	NA

Action PD8	Advocate for free bus and light rail within the CBD
Relevant objective/s	3. Capitalise on the transformation of the CBD to benefit pedestrians 5. Grow walking mode share and support public transport
Rationale	Free public transport in the CBD will encourage people to make trips within the CBD without their car. It will also encourage people travelling into the CBD to leave their car at a public transport stop.
Implementation	Consult with Yarra Trams on the success of the free public transport offering in the Melbourne CBD. Commence discussions with transport providers to consider providing bus and light rail trips within the CBD at no cost.
Reference	Yarra Trams (http://www.yarratrams.com.au/media-centre/news/articles/2014/free-cbd-tram-zone-from-1-january-2015/)

Action PD9	Install permanent pedestrian counts
Relevant objective/s	5. Grow walking mode share and support public transport
Rationale	Collecting regular and high quality pedestrian data will help to track the growth in pedestrian volumes, the changing role of CBD streets and the successful implementation of the Pedestrian Strategy.
Implementation	Install high quality pedestrian counters at key locations throughout the CBD. This could include along Church Street, Macquarie Street, George Street, and Smith Street, in new areas like Civic Link and Parramatta Square and at access points to public transport. Provide updates to the data on an attractive and accessible website to keep community members informed about their city's data. This data can be used to demonstrate the need for improvements, advocate for policies and for prioritising upgrade works.
Reference	City of Melbourne: http://www.pedestrian.melbourne.vic.gov.au/

Action PD10	Coordinate with State Government to prepare pedestrian accessibility plans for public transport stations, stops and wharves throughout the CBD
Relevant objective/s	4. Improve the current and future pedestrian network 5. Grow walking mode share and support public transport
Rationale	Auditing and upgrading the pedestrian network to ensure accessibility to public transport will support the growth of walking to at the beginning and end of trips. Pedestrian accessibility plans improve the network as it will address any gaps in the network and also infrastructure is not at current standards which needs to be updated.
Implementation	Undertake pedestrian accessibility plans across the city and specifically around public transport interchanges include bus stops, the train station and ferry terminal.
Reference	Sydney's Walking Future – 2013

Action PD11	Review and update Parramatta City Centre Lanes Strategy
Relevant objective/s	2. Enhance and activate spaces and street, supporting the CBD's economy 4. Improve the current and future pedestrian network
Rationale	Revisit the 2010 Parramatta City Centre Lanes Strategy and review the status of the lane improvement pilot program. The Lanes Strategy provides an important framework to transform existing service lanes into shared spaces which provide missing links in the pedestrian network, as well as attractive spaces for a variety of small businesses and cultural activities.
Implementation	Review all actions from the Lane's Framework Plan to assess the impact they have had in activating the lanes and improving the CBD's pedestrian network.
Reference	Parramatta City Centre Lanes Strategy – 2010

8.4 Behaviour change actions

Each of the behaviour change actions for walking are presented below.

Action BC1	Require developers to prepare Green Travel Plans with clear pedestrian objectives and actions
Relevant objective/s	3. Capitalise on the transformation of the CBD to benefit pedestrians 6. Promote walking
Rationale	A Green Travel Plan (GTP) is an important tool used in delivering accessible and sustainable communities and workplaces. As well as the need for developments to be well connected, with facilities that promote safe with easy access to public transport, and local destinations, steps need to be taken to ensure that future mode choice is reflective of sustainable travel behaviour. GTPs aim to increase active transport and public transport mode share of all trips, promote higher car occupancies and reduce the number of overall trips due to trip containment.
Implementation	GTP's should be a requirement for all new residential and workplace developments in the CBD. They should set objectives, propose a mode share target and list actions for supporting walking, cycling and public transport choices. GTPs should include the requirement to provide Travel Guide Information Packages to all residents and employees of the new developments. These should include maps which clearly identify the pedestrian pathways and the estimate distance and travel time between the destinations. Specific inclusions for walking in GTPs are proposed in the Walking Guidelines for Green Travel Plans in **Appendix F**.
Reference	**Appendix F** – Walking Guidelines for Green Travel Plans.

Action BC2	Implement the education, communication and behaviour change toolkit
Relevant objective/s	6. Promote walking
Rationale	Changing habits and educating people about sustainable transport choices is an important component of growing walking mode share. Along with infrastructure improvements, investment in information and promotion can help to achieve transport behaviour change.
Implementation	Invest in targeting education, information and promotions towards people who can convert short private vehicle trips to walking. Specifically target new residents and workers in the CBD and work closely with organisations to support their employees and students to choose to walk. Specific ideas on targeting workers and residents in the CBD are set out in the Education, Communication and Behaviour Change Toolkit in **Appendix G**.
Reference	**Appendix G** – Approach to behaviour change communication

Action BC3	Keep pedestrians informed about construction impacts in the CBD
Relevant objective/s	1. Prioritise the time, safety and amenity of pedestrians
Rationale	Construction has negative impacts on the surrounding environment and can disrupt and hinder pedestrian movements in the area. It is important that during construction there is clear

	communication on what routes are closed, how people can still access destinations and what the path detours are. There should be no loss of pedestrian safety and amenity during construction periods in the CBD, and people should still be encouraged to walk.
Implementation	Measures should be implemented to minimise confusion and support and prioritise pedestrians through the CBD when construction is underway. Signage should warn pedestrians of upcoming construction works in the area and the detours should be clearly signposted on attractive maps with enough warning that pedestrians do not need to double back to reach their destination. Pedestrians should be kept informed about the length of the construction period and when facilities will be open and accessible again.
Reference	NA

Action BC4	Create an online presence with Parramatta Walking information
Relevant objective/s	6. Promote walking
Rationale	An attractive mobile friendly website with easily accessed walking information will support visitors and new residents and workers to explore the CBD and surrounds while they are out and about. Promoting walking times, nearby attractions and different routes will help to familiarise people and give them confidence to choose to walk.
Implementation	Develop and promote a user friendly app which is updated regularly with walking information and ideas. The app could let people know what attractions, public transport and food and drink options there are within a five minute or ten minute walk of their current location. Work closely with mapping providers such as Google Maps to supply updates on changes to pedestrian routes and current construction activity. It could also be used to let people know of changes to the walking environment such as construction works and when events will be on in the city. The website could even be used to track kilometres walked and calories burned, or used as a loyalty program by local businesses.
Reference	NA

Action BC5	Work with schools to understand and cater for their students' needs
Relevant objective/s	1. Prioritise the time, safety and amenity of pedestrians 5. Grow walking mode share and support public transport
Rationale	Parents are often concerned that children are less aware of their surroundings and less familiar with road rules and so might be reluctant to let them walk to school. It is important to understand the existing and perceived barriers and opportunities related to walking to school.
Implementation	Obtain community feedback from schools and parents in Parramatta about the barriers to walking and the specific walking facilities that need to improve around their schools. Receive comment on ideas related to walking buses and safe school routes and plan and implement with the school community as a key stakeholder.
Reference	NSW Health Active Travel Charter for Children: http://www.preventivehealth.net.au/childrens-active-travel.html NSW Department of Education Live Life Well @ School: https://www.healthykids.nsw.gov.au/teachers-childcare/live-life-well-@-school.aspx Walk Safely to School Day: http://www.walk.com.au/wstsd/

Action BC6	Plan events and art alongside pedestrian routes
Relevant objective/s	2. Enhance and activate spaces and streets supporting the CBD's economy
Rationale	Markets, outdoor concerts and street art provide entertainment and engage pedestrians. Events such as Parramatta Farmer Markets and Parramatta Lanes festival attract high volumes of people to the streets and create a vibrant and activated environment throughout the pedestrian network. Placing street art and statues along the CBD streets also provides interest and small attractions which will engage people as they walk along the street.

Implementation	Continue to host a range of community events in the CBD to support local businesses and increase use of streets as public spaces. Encourage schools and artists to take ownership of a part of the city streets. Both permanent and temporary installations should be encouraged so that people continue to be surprised, engaged and experience the city streets in new ways.
Reference	Parramatta Lanes Festival Parramatta Events: http://www.parracity.nsw.gov.au/play/whats_on/events_calendar

Action BC7	Promote the walking access to new city destinations as they are developed
Relevant objective/s	3. Capitalise on the transformation of the CBD to benefit pedestrians
Rationale	When new developments are completed, their open status and the walking access to them should be promoted and encouraged. Marketing the access to new developments will encourage walking to the new destinations. This is particularly important if a route or access has been closed or obstructed during construction.
Implementation	Promote walking access early on in the opening of the development as once a routine travel behaviour has been established it will be difficult to change. Consider holding lunchtime events, walking tours and distributing flyers to demonstrate access to the new destination.
Reference	NA

Action BC8	Promote Walk to work day with events and campaigns
Relevant objective/s	6. Promote walking
Rationale	People who walk before or during work are generally healthier, more productive and less likely to be sick or absent. Walk to work day and similar events encourage employees to reconsider their daily travel patterns and try walking to walk. This can be the whole journey if they live within a short walking distant or by incorporating more walking into their daily commute through getting off the bus or train a stop early and walking the rest of the journey.
Implementation	All workplaces should promote and encourage employees to participate in Walk to Work day or similar events. Incentives such as prizes for longest distance walked and free breakfast for employees who participated can help to increase involvement.
Reference	Diabetes Australia Walk to Work day: http://www.walk.com.au/wtw/homepage.asp NSW Ministry of Health Get Healthy at Work: http://www.gethealthyatwork.com.au/

Action BC9	Encourage organisations to promote and support employee walking trips
Relevant objective/s	5. Grow walking mode share and support public transport 6. Promote walking
Rationale	It is important for companies to recognise the importance of walking for their employees and promote employees to take walking breaks. It has shown to improve productivity in the workplace.
Implementation	Promotional material should be displayed around the offices which encourage walking.
Reference	NSW Ministry of Health Get Healthy at Work: http://www.gethealthyatwork.com.au/

Action BC10	Identify signpost and promote a city circuit walk
Relevant objective/s	1. Prioritise the time, safety and amenity of pedestrians 6. Promote walking
Rationale	Promoting a city circuit is a way to encourage office workers, hotel visitors and residents to walk around the city. The circuit should include information on the route, time, distance, calories burned, and any attractions along the way. Routes that are 30 minute, 45 minute or 60 minute walk around the city are suitable for office workers in their lunch break.

	The circuit route should be planned away from intersections where pedestrians will experience delay and an incorporate green space and interesting outlooks. Clear signage detailing walk times will encourage people to participate in the walk as it eliminates the fears of getting lost walking and also the ambiguity of not knowing how long the walk will be.
Implementation	Clear wayfinding should be established for a city circuit route. These signs should include times until next attraction, destination or facility. This circuit should be promoted through Council's media channels and to organisations with employees. There could be an event at lunch-time for the opening of the circuit that will encourage workers and visitors to get involved.
Reference	NA

Action BC11	Promote CBD destinations through walking tours
Relevant objective/s	2. Enhance and activate spaces and streets, supporting the CBD's economy 6. Promote walking
Rationale	Walking tours which highlight destinations and attractions within the CBD can help simulate and encourage people to explore by foot. These tours will help support local businesses and promote different parts of the city.
Implementation	Plan and implement walking tours that introduce visitors to the CBD's attractions. This could include coffee tours, street art tours and wine bar tours.
Reference	NA

8.5 Implementation of the walking actions

All interventions to improve walking in the CBD should be considered as part of a holistic spatial master plan. Adopting this approach means that pedestrian needs will be considered relative to other needs as well as the various other impacts that affect street functionality and comfort. The majority of the Pedestrian Strategy's actions require financial support and implementation will be subject to funding, integration with other CBD works and stakeholder priorities. Implementation will require consideration of:

> **Budget:** Prepare a cost estimate for each action and identify potential funding sources from within and external to Council.

> **Timeframes:** Develop a program to align with redevelopment and funding.

> **Stakeholders:** Identify and engage with the relevant stakeholders on each action.

9 Monitoring and reporting framework

The implementation, monitoring and review of the Pedestrian Strategy actions and reporting against its objectives is a crucial part in creating a walkable CBD. The following sections set out the:

> Approach to reviewing the walking actions implementation plan;

> Measuring performance against the walking indicators;

> Measuring the economic benefits of a walkable CBD; and

> Regular reviews and updates to the Pedestrian Strategy.

9.1 Review of walking actions implementation plan

The walking action implementation plan should be reviewed quarterly to track progress against implementation. Prepare an Annual Progress Review Report to review and provide feedback on progress against the strategic walking objectives, implementation of the actions for walking, and achievement against the walking indicators. These actions could be incorporated into Council's Integrated Planning and Reporting Framework to formalise the monitoring and reporting process.

9.2 Measuring performance against the walking indicators

To assess progress towards achieving the strategic walking objectives, a series of measurable walking indicators are proposed. **Table 9-1** sets out each indicator, the data type to be measured and the timeframe for monitoring the indicator.

Table 9-1 Measuring performance against the walking indicators

#	Objective	Indicator	Data type	Monitoring
1	Prioritise the time, safety and amenity of pedestrians	Time taken to undertaken different walking trips in the CBD	Trip time measurement between destinations	Ongoing
		Number of crashes involving pedestrians in the CBD, proportionate to the resident and worker population	RMS crash data	Annual
		Number of reported crimes against pedestrians	Bureau of Crime Statistics and Research: CBD reported crime statistics	Ongoing
		Number of trips through the CBD by private motor vehicles	Origin-destination vehicle surveys	Ongoing
		Street lighting levels	Lux level measurements	Annual
		Volume of footpath congestion at key intersections	Level of Service assessment using pedestrian counts	Annual
		Number of missing pedestrian crossing legs at signalised intersections	Audit of intersection crossing legs	Annual
		Satisfaction levels of pedestrians	Questions included in Council's annual satisfaction survey	Annual
2	Enhance and activate spaces and streets,	Café and restaurant opening hours	Survey of opening hours	Ongoing
		Business owner satisfaction with pedestrian traffic	Survey of convenience store, restaurant and café owners	Annual

#	Objective	Indicator	Data type	Monitoring
	supporting the CBD's economy	Number of people in the CBD in the evening and on the weekend	Pedestrian counts Pedestrian counters	Annual
		Proportion of empty shopfronts	Audit of street facing retail spaces	Annual
		Number of street based events in the CBD and number of participating stalls	Record number of events and stall holders.	Annual
3	Capitalise on the transformation of the CBD to benefit pedestrians	Kilometres and type of footpath and laneway networks in the CBD	Measurement of length of footpath network	Annual
		Number of through site links in the CBD	Audit of number through site links	Annual
4	Improve the current and future pedestrian network	Number of complaints received about walking infrastructure and pedestrian safety	Council footpath maintenance complaints register Number of complaints to Council about pedestrian safety issues	Ongoing
		Compliance with the Disability Discrimination Act	Audit of the footpath network	Annual
		Satisfaction of mobility-impaired and vision-impaired people	Questions included in Council's annual satisfaction survey	Annual
5	Grow walking mode share and support public transport	Walking mode share	Journey to Work, Household Travel Survey	Annual
		People's satisfaction with the walking environment in the CBD	Questions included in Council's annual satisfaction survey	Annual
		Demand for parking spaces	Parking survey	Ongoing
6	Promote walking	Number of Council led or supported events and promotions for walking	Records of number and content of events and activities to promote walking	Ongoing
		Number of participants in walking events and activities	Attendance and registration records	Ongoing

9.3 Economic benefits evaluation strategy

In addition to monitoring against the walking indicators presented in **Section 9.2**, it will be useful for Council to track the economic benefits associated with a walkable CBD that attracts and supports walking trips. A proposed methodology for tracking the walkable economy is provided in **Appendix H**. The Strategy sets out the types of economic benefits and the methods for collecting information for evaluation. The types of economic benefits include:

> Financial or commercial gain to businesses;
  – Retail and commercial sales of goods and services
  – Commercial footprint and number of establishments
  – Commercial property values
  – The 24 hour economy
> Benefits to pedestrians and society;
> Increased Council rates collections;
> Equity issues; and
> Safety aspects.

9.4 Tracking population growth

As the CBD's residential and worker population grows through the planning and delivery of new developments, tracking the locations of population growth will help to inform future pedestrian modelling and implementation of the Pedestrian Strategy actions. Geospatial Information Systems (GIS) could be used to collect population data at specific development sites across the CBD. This will provide accurate information to use in forecasting population growth, pedestrian modelling, and planning infrastructure staging and communication activities.

9.5 Review of the Pedestrian Strategy

To ensure the Pedestrian Strategy remains current as the CBD continues to transform, it should be reviewed every three to five years. The review of the Pedestrian Strategy should include:

- Review of the study area boundary and need to expand it;
- Updated pedestrian counts using a similar methodology;
- Updated pedestrian modelling based on the most recent residential and worker population forecasts;
- Updated mapping to include new destinations, lanes, streets and public spaces;
- Review of Strategic Walking Objectives;
- Review of the application of the categories of streets;
- Consideration of recent changes in the CBD and to transport networks;
- Reporting against the walking indicators; and
- Stakeholder consultation.

The review of the Pedestrian Strategy is an opportunity to refine and focus the approach to a walkable CBD as more certainty around the timing and future development in the CBD occurs. The review should consider:

> What is the complete transport network including all public transport routes and services. How do they connect to key destinations?

> How do people feel about walking in the CBD? Has this changed?

> Are there information gaps?

> What actions have been implemented? What difference have they made?

> What elements are not succeeding or have not been implemented, and why?

> What new innovations could be developed to help improve the use of sustainable modes?

10 Summary

As the Parramatta CBD transforms into Sydney's Central City, more people will need to travel to, from and within the CBD for a range of different trips. This will create an opportunity to improve the vibrancy of streets, make short walking trips easy and safe and create direct connections between the different precincts through development of an amenable and attractive pedestrian network. Changing the CBD's blocks and streets to support walking can be the driver for changing the travel choices that people make. A CBD where walking movements are prioritised and a relatively compact CBD footprint will help the city minimise transport-generated pollution and promote health benefits for its workers, visitors and residents.

This Pedestrian Strategy aligns with Council and State Government vision for integrated and sustainable transport choices. It will support Council's aim to promote active and public transport modes and reduce the current reliance on the private motor vehicle. The Pedestrian Strategy:

> Sets out the development context;

> Presents the current and future pedestrian demand;

> Proposes strategic walking objectives and indicators for measuring success;

> Plans a proposed street hierarchy that acknowledges the shared street functions of movement and place; and

> Proposes over 40 actions for walking to improve the pedestrian experience, now and as the CBD transforms.

Implementation of the Pedestrian Strategy will require commitment, collaboration and fortitude. The recommendations are ambitious and will require acceptance that pedestrian movements and space are to be more important than private vehicles throughout the CBD.

10.1 Next steps

The next steps for implementing the Pedestrian Strategy should include:

> Setting a mode share target for walking;

> Prioritise the recommended walking actions to align with other Council works, available budget and the redevelopment of city blocks;

> Use the new information within the CBD Pedestrian Strategy to organise a multi-disciplinary approach to planning the CBD streets, that incorporates the principles of movement and place in the current design framework;

> Review the Parramatta Light Rail alignment through the CBD and the implications for the pedestrian network on an ongoing basis, and identify opportunities to improve access for all pedestrians; and

> Continue to engage with stakeholders on the recommended walking actions that will need their involvement.

APPENDIX

A

ACTIONS LIST AND STRATEGIC BACKGROUND REVIEW

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A

ACTIONS LIST AND STRATEGIC BACKGROUND REVIEW

Contents

1 Actions List

1.1 Summary of actions for walking

To address the walking issues and opportunities, align with the walkable city centre principles and achieve the strategic walking objectives, a range of actions for walking are recommended. These actions are presented in three groups:

> Infrastructure and operations actions (**Table 1-1**).

> Policy and development actions (**Table 1-2**).

> Behaviour change actions (**Table 1-3**).

Timeframes and responsibilities have been included for each action.

Table 1-1 Infrastructure and operations actions

#	Infrastructure and operations actions	Timeframe	Responsibility
IO1	The Integrated Transport Plan is to implement 40 kilometre per hour (and advocate for 30 kilometre per hour) speed zones throughout CBD	Short term	City Strategy
IO2	Undertake an audit of all footpaths to identify and prioritise infrastructure upgrades	Short term	Place Services Urban Design
IO3	Implement traffic calming measures on city streets to support IO1	Medium term	Traffic and Transport
IO4	New driveways should not be planned on main streets	Medium term	Traffic and Transport Place Services
IO5	Review and improve street and public place lighting throughout CBD. Develop a CBD lighting strategy that supports safety, amenity, activity and economic development in the CBD.	Short term	City Strategy
IO6	Continue the implementation of the Pedestrian Amenity Zone	Ongoing	Traffic and Transport
IO7	Review count down timers at intersections on key movement streets	Short term	Traffic and Transport City Strategy
IO8	Provide additional crossing legs at signalised intersections	Medium term	Traffic and Transport
IO9	Update the Wayfinding Strategy with changes to the CBD's key destinations and routes	Short term	City Marketing & Identity
IO10	Trial temporary pedestrian improvements – road closures, widened walkways, shorter crossings, extra seating	Short term	Traffic and Transport City Strategy Place Services
IO11	Develop key CBD entry points for access to the CBD from surrounding areas	Medium term	Parramatta Ways
IO12	Assess crashes involving pedestrians throughout the CBD and undertake Road Safety Audits at crash cluster locations to determine issues and solutions.	Ongoing	Traffic and Transport
IO13	Rubbish and graffiti to be removed quickly	Ongoing	City Services
IO14	Create spaces that can be used for formal and informal meetings throughout the CBD.	Medium term	Place Services
IO15	Work with Urban Designers to define the future street network hierarchy	Short term	City Strategy
IO16	Implement a minimum width for clear path of travel on both sides of all streets	Ongoing	Place Services Traffic and Transport

#	Infrastructure and operations actions	Timeframe	Responsibility
IO17	All zebra crossings throughout the CBD should be raised	Medium term	Traffic and Transport
IO18	Provide shared zones in lanes used by both pedestrians and vehicles	Long term	Traffic and Transport
IO19	Investigate the provision of midblock road crossings in locations where blocks are over 200m in length	Short term	Traffic and Transport City Strategy
IO20	Provide shading/shelter (weather protection) along key routes and at key intersections	Ongoing	Development Services
IO21	Investigate auto pedestrian phase signals	Short term	Traffic and Transport
IO22	Place green landscaping between vehicles and pedestrians along roads with high vehicle volumes	Ongoing	City Strategy
IO23	Repair street lighting as soon as issues are identified	Ongoing	City Services
IO24	Enhance connections to the green spaces and recreation areas surrounding the CBD	Ongoing	Parramatta Ways City Strategy
IO25	Install water bubblers	Ongoing	Place Services
IO26	Understand and provide for pedestrian storage at intersections	Medium term	Traffic and Transport
IO27	Update Parramatta River Walk and investigate other opportunities for themed walks	Short term	Recreation Planning City Strategy City Marketing & Identity
IO28	Identify opportunities to declutter the streetscape and improve sight lines	Short term	Place Services Urban Design
IO29	Manage pedestrians effectively during construction activity	Ongoing	Traffic and Transport

Table 1-2 Policy and development actions

#	Policy and development actions	Timeframe	Responsibility
PD1	Plan movement and place functions for CBD streets considering all transport modes	Short term	City Strategy
PD2	Develop pedestrian design guidelines for new developments	Short term	City Strategy
PD3	Amend DCP for permeable city blocks, active street frontages and high quality pedestrian infrastructure	Short term	City Strategy
PD4	Amend Public Domain Guidelines to reflect the street network hierarchy for pedestrian infrastructure	Short term	City Strategy
PD5	Work collaboratively with shop and café owners to allocate footpath space for seating, signage and other business users	Ongoing	Place Services ASPM
PD6	Run competitions and award business owners for beautiful shop fronts and facades. Promote interesting, attractive and unique shopping precincts	Ongoing	Place Services
PD7	Encourage pop-up shops in empty retail spaces.	Ongoing	Place Services
PD8	Advocate for free bus and light rail within the CBD	Short term	City Strategy
PD9	Install permanent pedestrian counters	Short term	Future City
PD10	Coordinate with State Government to prepare pedestrian accessibility plans for public transport stations, stops and wharves throughout the CBD	Ongoing	City Strategy
PD11	Review and update Parramatta City Centre Lanes Strategy	Short term	Place Services City Strategy

Table 1-3 Behaviour change actions

#	Behaviour change actions	Timeframe	Responsibility
BC1	Require developers to prepare Green Travel Plans with clear pedestrian objectives and actions	Ongoing	Development Services
BC2	Implement the education, communication and behaviour change toolkit	Short term	City Strategy
BC3	Keep pedestrians informed about construction impacts in the CBD	Ongoing	City Marketing & Identity
BC4	Create an online presence with Parramatta Walking information. Discover, times, routes, items of interest	Short term	City Marketing & Identity
BC5	Work with schools to understand and cater for their students' needs	Short term	City Strategy Community Capacity Building
BC6	Plan events and art alongside pedestrian routes	Ongoing	City Marketing & Identity
BC7	Promote the walking access to new city destinations as they are developed	Ongoing	City Marketing & Identity
BC8	Promote Walk to Work days with events and campaigns	Ongoing	Sustainability Team
BC9	Encourage organisations to promote and support employee walking trips	TBC	TBC
BC10	Identify, signpost and promote a city circuit walk	Short term	City Marketing & Identity City Strategy
BC11	Promote CBD destinations through walking tours	Ongoing	City Marketing & Identity

2 State Government Strategic Context Review

2.1 State Priorities – NSW Making it Happen

State Priorities – NSW Making it Happen	
Organisation	NSW Government
Date published	September, 2015
Summary of document	> State Priorities – NSW Making it Happen presents the policy goals of the NSW Government and Premier through the development of 30 short and long-term priorities to be accomplished both during and following the current term of government. The priorities cover different policy areas and government ministries, and of the 30 total priorities: – 12 are personal priorities of NSW Premier Mike Baird – 18 are overall State Priorities. > The key priorities of relevance to the Greater Parramatta area include, of the Premier's priorities: – Creating 150,000 new jobs by 2019 – Building infrastructure – including the Parramatta Light Rail and Westmead Hospital redevelopment – Faster housing approvals, with the outcome of 90% of all housing development applications determined within a 40 day period. > Of the State priorities: – Accelerating major project assessment, through halving the time taken to assess planning applications for State Significant Developments (SSD) – Increasing housing supply across NSW by delivering more than 50,000 approvals each year. – Ensuring on-time running for public transport, through maintaining or improving reliability indicators for public transport services over the next four years. – Improving road travel reliability, by ensuring 90% of peak travel on key road routes is on time. – Reducing road fatalities by at least 30% on 2011 levels by 2021.

2.2 A Plan for Growing Sydney

A Plan for Growing Sydney	
Organisation	NSW Government
Date published	December, 2014
Summary of document	> A Plan for Growing Sydney (2014) prepared by the NSW Department of Planning and Environment, presents the latest version of the NSW Government's vision for Greater Sydney to the year 2031. The Plan identifies the economic, lifestyle and cultural goals for Sydney and sets a vision of Sydney as a strong global city and a great place to live. To achieve this vision, the goals include: – Goal 1: A competitive economy with world-class services and transport. – Goal 2: A city of housing choice, with homes that meet our needs and lifestyles. – Goal 3: A great place to live with communities that are strong, healthy and well connected. – Goal 4: A sustainable and resilient city that protects the natural environment and has a balanced approach to the use of land and resources. > The Plan has designated Parramatta as Sydney's second CBD, and has outlined a series of key directions and actions which will support the city's development into a major commercial, residential, health and education centre, and complement the four goals. These include: – Growing Parramatta as Sydney's second CBD by connecting and integrating the CBD with Westmead, North Parramatta, Rydalmere and Camellia. – Grow the specialised health and education precincts and Westmead and Rydalmere. – Renew North Parramatta as a vibrant and mixed-use precinct. > Opportunities for improving the Parramatta transport network have been identified in the Plan, in particular, improvements to public transport, and walking and cycling connections that

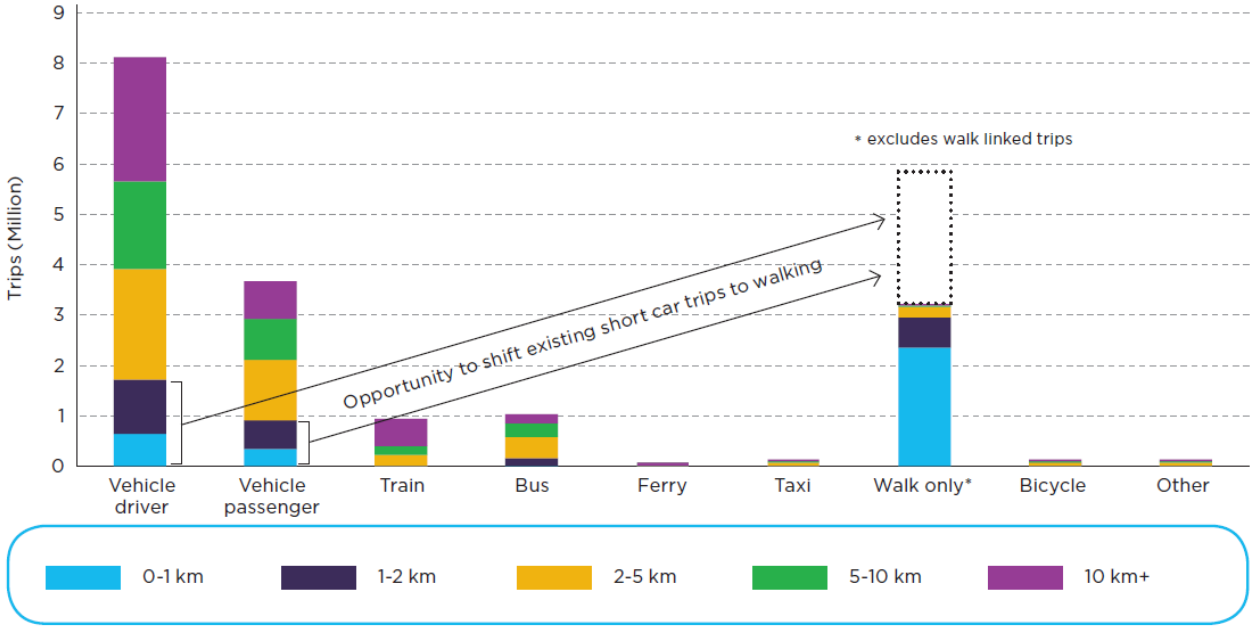
A Plan for Growing Sydney	
	extend from Westmead to Rydalmere through the Parramatta CBD, with potential to designate a Parramatta City Ring Road. > The Plan recommends the delivery of new housing within already established urban areas in Parramatta so as to facilitate the use of already existing transport infrastructure; the co-location of these new dwellings allows for the establishment of new communities that are well connected with key commercial, health and education land uses. > From Goal 3, the Plan aims to create healthy built environments across Greater Sydney, through city and suburb design that supports physical activity and provides equitable access to healthy lifestyle options. Actions in the design of the built environment to meet this objective include: – Creating mixed-use facilities that encourage the adoption of daily activities by users. – Providing separated footpaths and cycleways that are well connected and provide convenient access to destinations – Providing appropriate facilities at transport interchanges and workplaces that encourage walking and cycling to public transport services and employment destinations. – Developing and maintaining attractive public spaces with good public domain design that incorporates measures such as landscaping, lighting and traffic calming measures to support pedestrian movements. > The Plan references a proposed active transport network developed by the Government Architect's Office, referred to as the "Green Grid." This network aims to provide convenient links between recreational and open spaces surrounding Parramatta with the major residential and commercial land uses in the CBD. Parramatta was selected as the trial location for the Green Grid, with plans to deliver a similar strategy for Greater Sydney. Linking open spaces to encourage walking and cycling for recreation.

2.3 NSW Long Term Transport Master Plan

NSW Long Term Transport Master Plan	
Organisation	NSW Government
Date published	December 2012
Summary of document	> The NSW Long Term Transport Master Plan (LTTMP) identifies strategies and actions for integrated transport across the state over the next 20 years. It provides a framework to identify challenges and to prioritise actions to meet population demands on the transport system to 2031. > A key focus of the LTTMP is to increase walking and cycling, and integrate active transport with public transport modes. This will involve extending and improving walking and cycling networks, delivering improved signage and new transport interchanges that act as community activity hubs. > Key active transport actions identified in the LTTMP include separating pedestrians and cyclists where feasible, and improving pedestrian facilities. > The LTTMP identifies Parramatta as the largest employment centre in Western Sydney with 47,000 existing jobs, with an additional 49,000 jobs forecast to be created in the CBD by 2031. > Key constraint points in the Parramatta CBD that restrict movement include Parramatta River, Parramatta Park, the major arterial road corridors and the Western Railway Line. > The LTTMP has identified the following short-term actions for the Parramatta area with the aim of increasing the public and active transport mode share: – Enhance bus priority measurements for residents living within a 30 minute catchment from the Parramatta CBD. – Plan a major upgrade of the Parramatta transport interchange to accommodate more buses, improve local amenity and create a more appealing precinct. – Collaborative with Parramatta City Council on city centre improvements and light rail, with emphasis on reducing car parking spaces, improving pedestrian amenity, and aligning the bus network with light rail network proposals. – Improve pedestrian and cycle connections through the Parramatta CBD, including links to regional destinations including Westmead and Sydney Olympic Park. > The medium and long term actions outlined for the Parramatta area include:

NSW Long Term Transport Master Plan	
	– Improve public transport links between Parramatta, Sydney CBD, North Sydney and Macquarie Park. – Improve the frequency of public transport services to the Parramatta CBD. > The LTTMP identifies a large proportion of driving trips undertaken across Sydney are less than two kilometres long – this presents an opportunity to shift these to walking trips. Improve road connections to and around Parramatta Road.
Key maps / figures	> **Figure 2-1** Mode share splits broken down by distance travelled

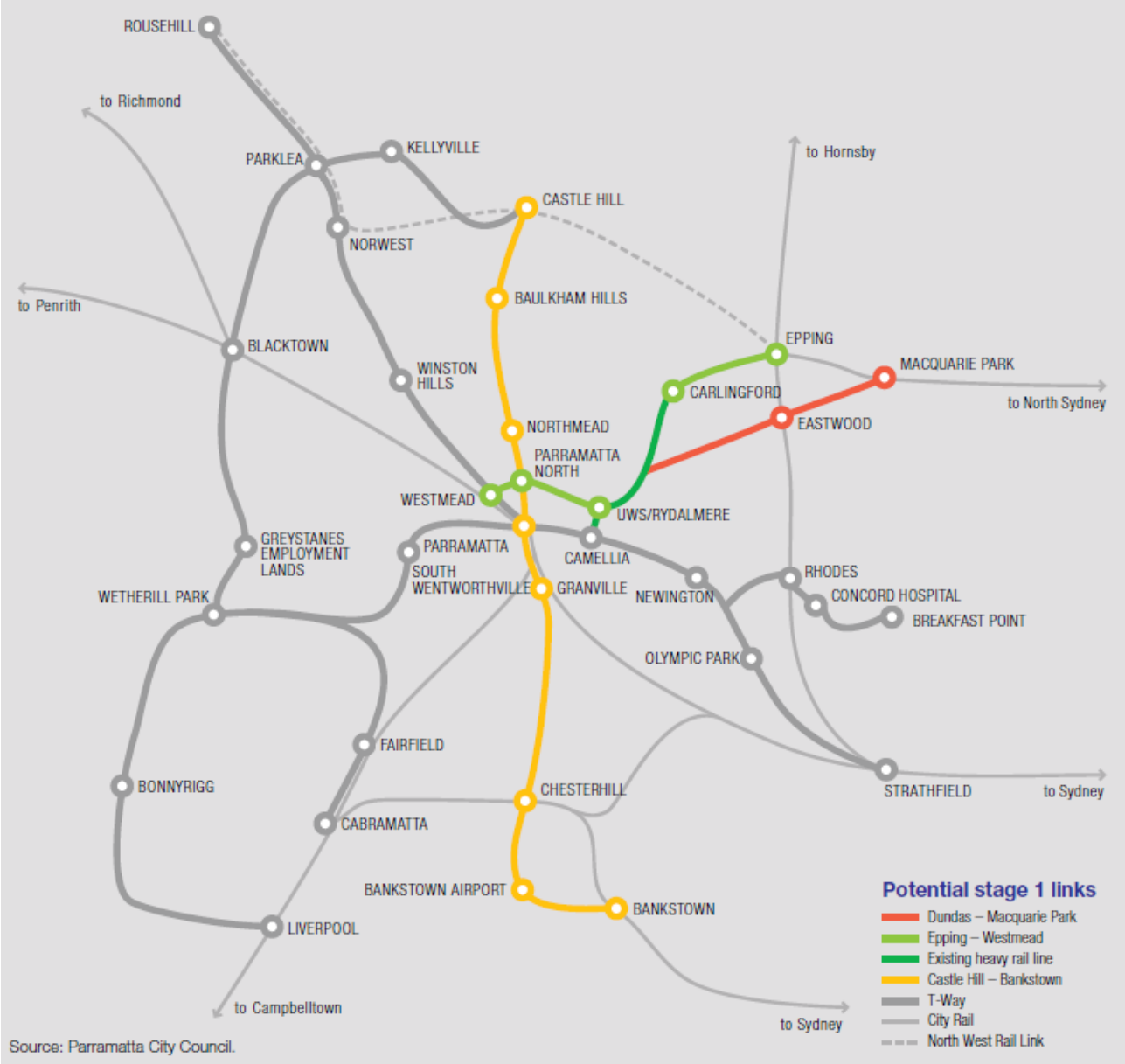
Figure 2-1 Mode share split broken down by distance travelled



2.4 State Infrastructure Strategy – NSW Government

State Infrastructure Strategy	
Organisation	NSW Government
Date published	2012, with an update published in 2014
Summary of document	> The NSW State Infrastructure Strategy, first prepared and published in 2012, and updated in 2014 by Infrastructure NSW presents a vision for NSW in 2031 and makes recommendations for infrastructure investment over the next 20 years, grouped by short, medium and long-term priorities. The 2014 update to the Strategy provides details of the Restart NSW Fund, the proposed funding strategy for infrastructure projects, and identifies additional priorities for transport infrastructure. > The Strategy focuses heavily on providing recommendations on infrastructure provision in the Parramatta area to ensure its successful growth and establish its role as Sydney's second CBD. The key recommendations outlined in the Strategy for the Parramatta area include: – A $1 billion investment (includes a new $600 million investment and $400 million already committed in the 2014 budget) to improve public transport between Parramatta and other centres in the Greater Sydney area, with key projects including the Parramatta Light Rail, and undertaking infrastructure upgrades on the Western Line to reduce travel time between the Parramatta and Sydney CBD's to a maximum of 20 minutes. – A new cultural precinct in North Parramatta focusing on the former King's School site, river side and the Powerhouse Museum to be relocated from the Sydney CBD. – Fix road pinch points in the Parramatta Centre – with works completed between 2012 and 2017. – Invest $400 million in the development and construction of a transit way from Parramatta to Epping and Macquarie Park. > With regards to the Parramatta Light Rail, The Strategy has recommended considering a holistic solution with light rail options, particularly with opportunities for urban renewal in the CBD and engaging with developers to implement a potential value capture scheme that will reduce the required capital investment and improve the project's affordability
Key maps / figures	**Figure 2-2** Parramatta Light Rail corridor options

Figure 2-2 Parramatta Light Rail Corridor Options



3 Parramatta Strategic Context

3.1 Parramatta CBD Planning Strategy

Parramatta CBD Planning Strategy	
Organisation	Parramatta City Council
Date published	April, 2015
Summary of document	The Parramatta CBD Planning Strategy sets the visions, principles, actions and implementation plan to guide a new planning framework for the Parramatta CBD. The Strategy's vision states: Parramatta will be Australia's next great city, defined by landmark buildings and high quality public spaces with strong connections to regional transport. It will respect its heritage, be an exemplar in design excellence and ensure its streets are well activated. The vision is supported by ten principles, of which four are directly relevant to the aims of the Pedestrian Strategy: > P1: Achieve world's best practice in the planning and development of cities. > P4: Create a liveable, active and highly desirable city. > P6: Improve the quality of urban design and the public domain. > P10: Improve access to the regional transport network. The Strategy sets out the following jobs and population targets for 2036: Jobs – increase 27,000 from 49,000 (2011) to 76,000 (2036) Dwellings – increase 7,500 from 3,500 (2011) to 11,300 (2036) Developing the CBD as a '24 hour' living city environment is sought after, as well as enhancing Parramatta as a vibrant commercial and business centre. To achieve a balance between business and residential land uses, high density residential will be permitted in the CBD commercial core (shown in blue in **Figure 3-2**), as long as it is accompanied by office space development. The Strategy commits Council to investigating the required regional and local transport infrastructure upgrades required to facilitate the growth of the CBD including A4.1.1 Public domain improvements, including new city spaces and street upgrades and A4.1.5 Access and Transport Improvements, including light rail. > By 2041 the worker population will increase by 34,000 from 49,000 (2011) to 83,000 (69%) > The Strategy proposes extending the city boundary further than the Planning Proposal boundary.
Key maps / figures	**Figure 3-1** Planning proposal boundary map. The planning proposal boundary is also the new boundary of the Pedestrian Strategy data collection (although the focus remains on the Pedestrian Amenity Zone from the Integrated Transport Plan). **Figure 3-2** Proposed commercial core sites.

Figure 3-1 Planning proposal boundary

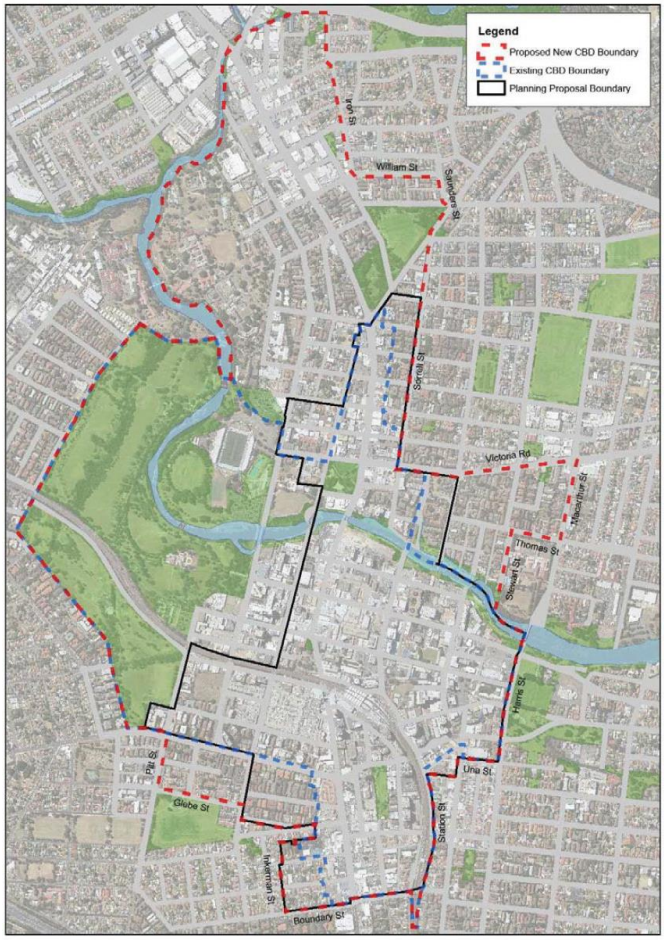
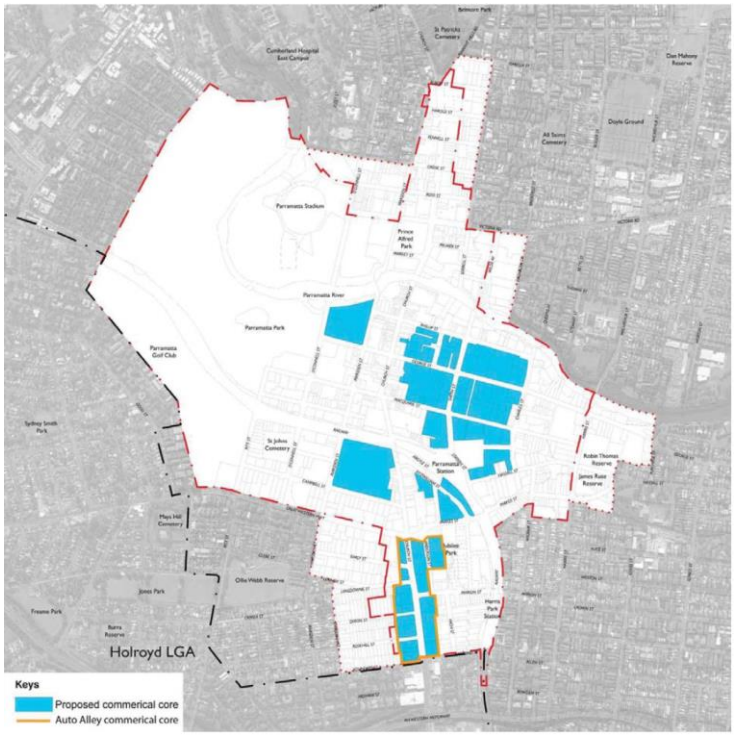


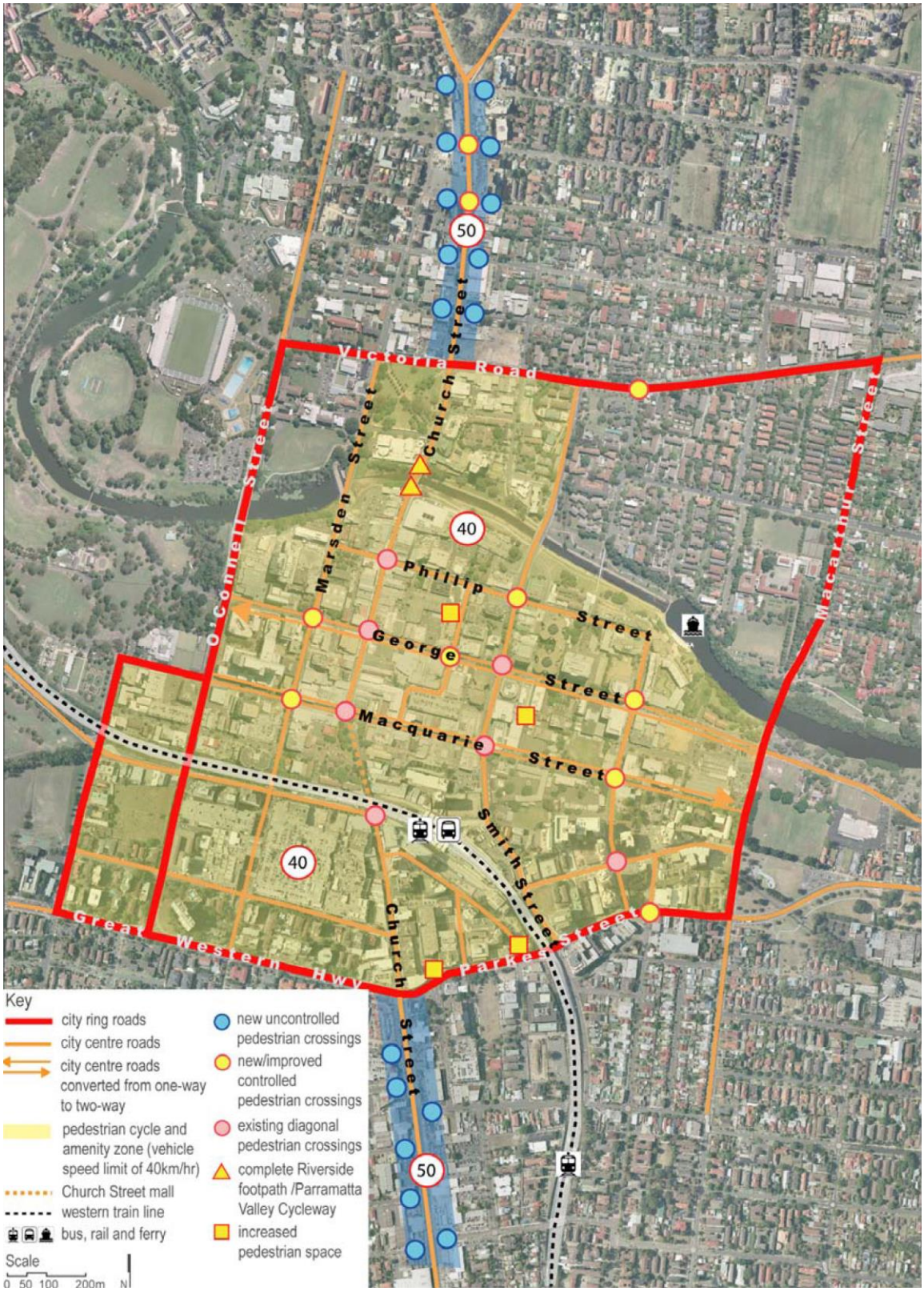
Figure 3-2 Proposed commercial core sites



3.2 Integrated Transport Plan for Parramatta City Centre

Integrated Transport Plan for Parramatta City Centre	
Organisation	Parramatta City Council
Date published	May, 2010
Summary of document	> The Integrated Transport Plan responds to the Parramatta City Centre Plan (2007) which sets the planning framework for an additional 30,000 jobs and 20,000 residents by 2031. > It aims to manage the existing and future sustainable transport needs of the city centre as the city works to move away from reliance on car use to public and active transport. The sustainable transport objectives for the city are: – Promote and support walking, cycling and sustainable travel change. – Support and facilitate public transport use. – Manage traffic to minimise its adverse impacts especially car commuters and through traffic. > The Integrated Transport Plan acknowledges that a range of soft and hard tools are needed to limit growth in car use which will add to traffic congestion and reduce environmental impacts. > Four key elements of the Plan will all support an enhanced walking experience in Parramatta: – Ongoing lobbying for improved public transport. Recent commitments have demonstrated the effectiveness of this element. – Creation of a Pedestrian and Cycle Amenity Zone, delivering improvements through new facilities and lower speed limits. – Support of City and Regional Ring Roads to ensure traffic uses appropriate routes, remove through traffic from the CBD and improve conditions for pedestrians and cyclists in the city centre. – Relocating car parking to the city centre periphery. > The Integrated Transport Plan also recommends development of a Pedestrian Access and Mobility Plan to improve pedestrian safety and amenity and installation of visitor and community information kiosks. > Other elements of the Integrated Transport Plan, related to walking include improving interchange between public transport modes, pedestrian access to public transport along direct and safe routes. > Actions in the plan are prioritised as either, High (1-2 years), Medium (3-4 years) or Low priority (5 + years) > The Pedestrian Amenity Zone is proposed to include: 40km/h speed limit, additional crossing infrastructure, conversion of one-way streets to two-way, completion of the riverside shared path, reductions to pedestrian-vehicle conflicts at driveways and widening of footpath space.
Key maps / figures	**Figure 3-3** Pedestrian Amenity Zone

Figure 3-3 Pedestrian Amenity Zone



3.3 Parramatta CBD Strategic Transport Study

Parramatta City Centre Lanes Inventory	
Organisation	AECOM
Date published	January, 2016
Summary of document	> The Parramatta CBD Strategic Transport Study, prepared by AECOM, aimed to inform Council of the transport infrastructure requirements in the Parramatta CBD as a result of implementation of the Parramatta CBD Planning Strategy. The Study undertook a review of existing public transport services and infrastructure, travel patterns, parking yields and land use scenarios, completed an assessment of different scenarios incorporating different land use layouts, and prepared a series of travel demand recommendations for consideration by Council so as to facilitate the sustainable growth of the area as Sydney's second CBD. > An analysis of Journey to work data showed that walking represented 4% of all trips by workers in the Parramatta CBD, while walking trips were undertaken by 11% of local residents. > The Study has observed the CBD to have a relatively flat landscape, and identified this as an opportunity to recommend initiatives that encourage both walking and cycling. The CBD area itself is located fully within a recommended two kilometre walking radius of the city centre (the location of chosen to be the Parramatta Town Hall). > The key destinations in the Parramatta CBD observed to accommodate a high volume of pedestrian movements include: − Westfield Parramatta shopping centre − Parramatta transport interchange − Parramatta wharf − Parramatta North Public, Our Lady of Mercy College, Arthur Philip High and Rowland Hassall Schools − Pirtek Stadium − Riverside Theatres; and − The Church Street food and beverage precinct. > The study references the following observed issues as highlighted in the Integrated Transport Plan: − The Westfield shopping centre has an impact on pedestrian accessibility − Parramatta Park presents a barrier to pedestrian movements to Westmead − The CBD is not well connected with the Parramatta River shoreline. > The Study incorporated the results of strategic modelling to ascertain the impacts of different land use scenarios for the Parramatta CBD on transport demand. Four models were analysed which tested: − The proposed planning controls, − Floor Space Ratio's (FSR's) equivalent to that proposed, but with additional residential space in place of commercial areas. − A "Stress" sensitivity test that analysed an additional increase in FSR's, and − Another "Stress" test that analysed similar FSR increases, but with additional residential space in place of commercial areas. > The results of the modelling indicated that, in 2036: − .A total of 88,000 trips would be generated by the CBD over the 2 hour peak AM period, assuming no change in the planning controls − The Proposed planning controls and associated FSR's which incorporate residential land uses into the Parramatta CBD were determined to have the least impact on transport demand, with the "Stress" models that did not incorporate residential areas in the CBD generated the highest demand. − The number of walking trips would increase to the following maximum volumes: 3,610 trips to the CBD (up from 2,310), 2,100 trips from the CBD (up from 1,550) and 8,070 trips within the CBD (up from 5,880) > Common observations in all models included − Trips origins were generally dispersed, and decrease as proximity with the Parramatta CBD increased. > The key recommendation resulting from the Study was to develop a Travel Demand Management Strategy that focuses on managing the anticipated future travel demand, through

Parramatta City Centre Lanes Inventory	
	encouraging uptake of sustainable modes such as active and public transport. Recommendations pertaining to active transport included: – Developing key design principles that integrates walking and cycling network facilities during the planning and delivery of new developments. – Developing a highly permeable and safe pedestrian network throughout the CBD. – Connecting a CBD cycle network with transport interchanges and regional connections to surrounding precincts – Delivering quality pedestrian and cycling infrastructure, such as shelters and seating, and bicycle storage, lockers and showers. – Free bicycles for use by local residents and employees throughout the CBD area. – Developing mobile phone applications that include journey planners, and active and public transport route maps.

3.4 Parramatta Community Strategic Plan 2038

Parramatta Community Strategic Plan 2038	
Organisation	Parramatta City Council
Date published	June, 2013
Summary of document	> The Parramatta Community Strategic Plan 2038, prepared by Parramatta City Council, presents the 25 year vision for the Parramatta LGA, through the development of six strategic objectives that will provide the guidance for, and the basis of assessment for the progress made in the shaping of the city. The six strategic objectives are: – Economy: Encouraging economic growth in the city by adding employment and generating wealth for Western Sydney. – Environment: Aiming to be an eco-efficient city that manages the City's growth to improve and protect the environment. – Connectivity: To be a city that has fast, reliable transport and digital networks that connect people to information, services, each other and where they need to go. – People and Neighbourhoods: To be a world-class city that attracts a diverse group of people. – Culture and Sport: A place that celebrates cultural and sporting heritage, and uses its energy and cultural richness to grow and improve quality of life. – Leadership and Governance: To be recognised as a great city, centre of excellence and the capital of Western Sydney with inspirational leadership and good governance. > The key actions underlying the six strategic objectives include: – To increase the number of people working in Parramatta by allowing local businesses to grow. – To develop land and property assets to promote and accommodate jobs growth, and increase land values. – To plan for vibrant streets and precincts in the Parramatta CBD and local centres that will attract new people and businesses. > Progress in the "Connectivity" objective of the Plan will be directly measured by the number of people walking and cycling at a local level, and those utilising public transport at a broader regional level.

3.5 Parramatta City Centre Planning Framework Study

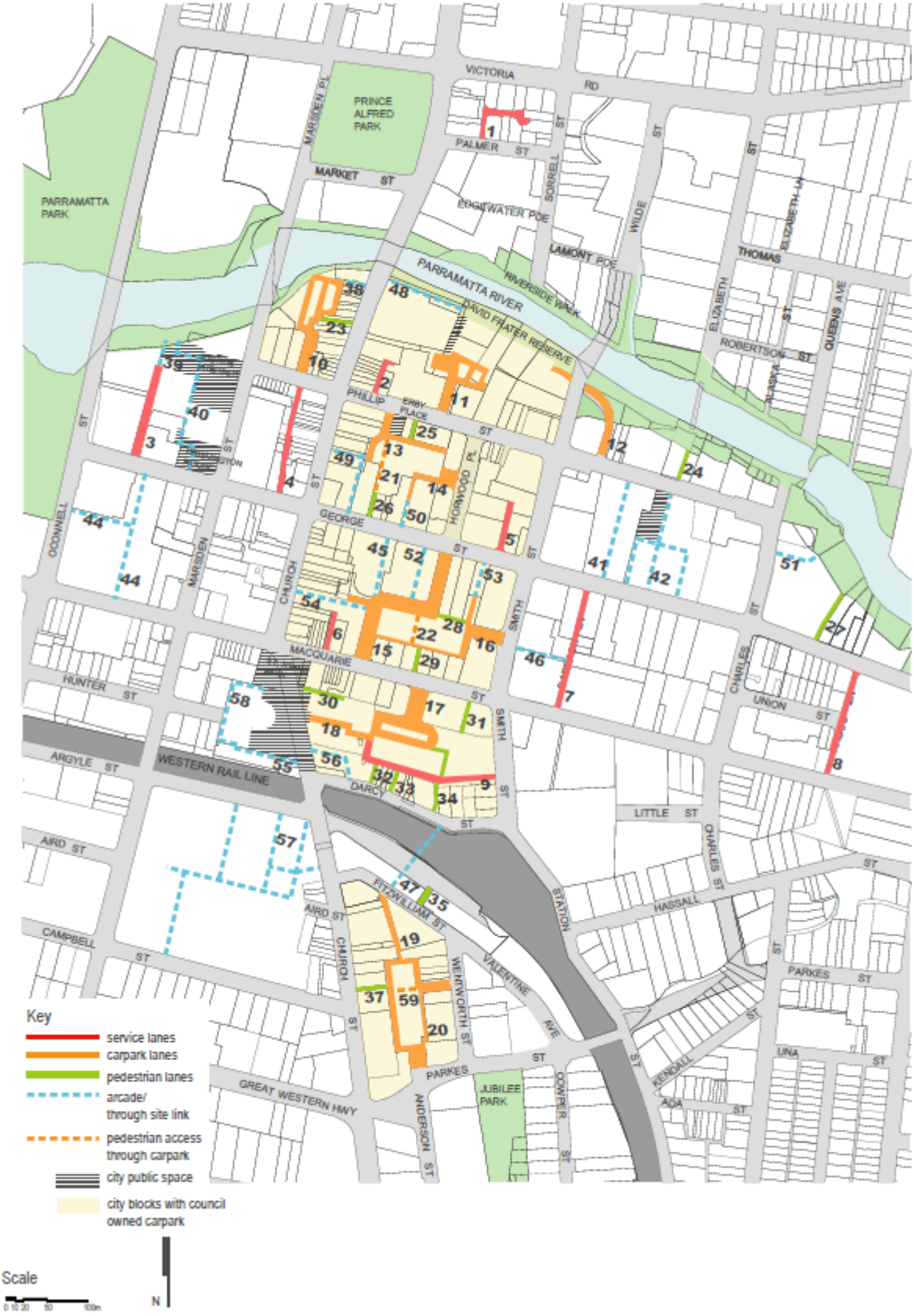
Parramatta City Centre Planning Framework Study	
Organisation	Architectus
Date published	September, 2014
Summary of document	> The Parramatta City Centre Planning Framework Study was prepared by Architectus in September 2014, with recommendations adopted by Parramatta City Council. The Study reviews the current planning framework that controls development in the Parramatta CBD area, and presents a number of case scenarios for different planning frameworks, following the identification of opportunities, constraints and market conditions that can have an impact on development in the CBD area. > An economic analysis was conducted as part of the study; the key recommendations outlined include: − Improving transport links to new potential labour markets, both in the CBD and greater Parramatta area. Council's advocacy of transport improvements was highlighted as a priority so as to encourage the growth of employment opportunities in the centre. Emphasis was given to maximising transport capacity and reducing congestion by advocating for sustainable transport modes in the centre, including mass transit, walking and cycling. − Excluding residential developments from the city centre, and prioritising employment opportunities instead. − Encouraging Council to capitalise on value uplift created by new developments, and allocating the additional funds to invest in improvements that provide benefit to the public. Examples include improvements to the public domain, active and public transport, affordable housing and public art. − Expanding the potential area for employment growth to include the areas in Greater Parramatta, such as Auto Alley, Westmead, Rydalmere and Camellia. > The key recommendations of the Study adopted by Parramatta City Council include: − Expansion of the City Centre boundary to include North Parramatta, and residential precincts to the east, and south-west (adjacent to Auto Alley) precincts − A potential increase in the Floor Space Ratio for the city centre to 10:1, with the surrounding North Parramatta, Auto Alley and eastern precincts to be designated as transitional 3:1 and 6:1 ratios. − An expansion of the commercial core to include the Auto Alley, and the Justice precinct towards the east of the city centre. − Adoption of a Value Uplift Sharing scheme is to operate only for residential developments, and excludes employment uses. > Council has identified and adopted recommendations pertaining to the retention of solar access for public areas in the city centre as part of the recommended planning framework. Eight key areas were identified, an increase from three previously identified in the Parramatta Local Environment Plan (LEP). > During the mid-winter period from 12pm – 2pm, solar access must be available at Parramatta Square, Jubilee Park, and the eastern verge of Church Street extending from the Parramatta River to Macquarie Street, the southern corridor of the Parramatta River and the southern half of Prince Alfred Park.

3.6 Parramatta City Centre Lanes Strategy

Parramatta City Centre Lanes Strategy	
Organisation	Parramatta City Council
Date published	July, 2010
Summary of document	> Recognising that lanes provide significant benefits to the walkability and experience of city centres, the Lanes Strategy identifies lanes throughout the CBD to include in a pilot lane improvement program. > The Lanes Strategy notes that the CBD's primary street network provides large city blocks of up to 250 metres in the east-west direction. Over time lanes have developed to provide servicing, access to car parks and through the development of shopping arcades. The 2007 DCP proposed further provision of lanes to extend and rationalise connections for access and sight lines. > The Lanes Strategy includes a summary of the existing lanes strategy, a review of relevant strategic planning and urban design documents, presentation of principles for lanes in the CBD, the Framework Plan and six actions for improving lanes. > In 2009 there were 57 lanes in Parramatta including privately owned arcades and through site links, used by both vehicles and pedestrians. > The lanes are not characterised with distinctive paving or design. > Issues associated with laneways in the CBD include: – Lack of legibility and permeability due to requirement to pass through several different access ways to use many through-block connections – Separate lanes are often misaligned and may have different character and amenity – Many lanes developed as service lanes and so don't have active street frontages, sometimes even black walls or car parks with few interesting features and little surveillance. – Many lanes have a run-down appearance and a lack of quality lighting. > Parramatta's lane network needs to be: functional, safe, comprehensive and coherent, pedestrian friendly, lively and vibrant, unified and good looking, unique and interesting, appropriate to Parramatta's current needs, sustainable. The Lanes Strategy includes eight principles to achieve these laneway qualities. > The Lanes Framework Plan recommends 23 new lanes and retention of the existing 57 lanes in the short-term. In the long term the Framework Plan identifies 16 existing lanes that will be subsumed or replaced as blocks are redeveloped or become unnecessary when car parks are relocated. For each new, retained or removed (long term) lane, Framework Plan sets out the type, strategic purpose, timing, owner, feasibility and action required for each lane. > The Lanes Strategy also presents six implementation actions: – Implement the Framework Plan. – Ensure lanes are well lit and clean. – Start activating lanes immediately. – Name and sign lanes. – Include lanes in the Parramatta Public Domain Guidelines. – Initiate pilot programs for lanes. > Benefits of laneways include reductions in walking distances, increases in pedestrian space, providing a choice of routes, increasing street and lane types, providing respite from busy street, providing additional space for activated street frontages and supporting back of house access to reduce the number of driveways on the major streets. > 50% of lanes are located in the four city blocks between the train station and the river: Civic Place, Horwood Place, Erby Place and Riverbank. All of these blocks are set for substantial redevelopment. 2/3 of lanes are located in the six blocks where Council owns car parking. As car parking shifts to the city periphery these blocks will be redeveloped. Existing and improved permeability must be provided as part of the redevelopment. A 1/3 of the lanes are closed at night-time and on weekends as they are arcades and through site links and half are unnamed.
Key maps / figures	**Figure 3-4** Parramatta City Centre Lanes 2009 **Figure 3-5** Existing Parramatta City Centre Pedestrian Network 2009

Figure 3-4 Parramatta City Centre Lanes 2009

Figure 3-5 Existing Parramatta City Centre Pedestrian Network 2009



3.7 Parramatta City Centre Lanes Inventory

Parramatta City Centre Lanes Inventory	
Organisation	Parramatta City Council
Date published	November, 2009
Summary of document	The Lanes Inventory is a record of the lanes and other access ways that contributed to the CBD's pedestrian network in 2009. The inventory for each lane records: > Photos > Design and operation features such as width, type of lane, traffic role, pavement, time of day access, lighting and adjoining built fabric. > Heritage significance and special characteristics The inventory contributed to the map of existing lanes, provided as part of the Parramatta City Centre Lanes Strategy. The inventory includes: > Nine service lanes (all named) > 11 carpark lanes (five with names, six without) > Two pedestrian links through carparks (both unnamed) > 15 pedestrian lanes (one named, rest unnamed) > 11 through site links (three named, eight unnamed) > 10 arcades (all named) The Lanes Inventory also includes a snapshot of CBD lane networks in the Sydney CBD and the Melbourne CBD. IT describes lanes as minor street, mostly smaller and narrower than local streets. Pedestrians using them tend to walk down the middle and so can see ahead more clearly and they notice building elements such as windows, architecture and awnings more as they are narrower than typical streets. Lanes are flexible spaces which can be shared by several different street users including servicing and delivery, pedestrians and cyclists. In Parramatta there are two catergorised, those shared between vehicles and pedestrians and those that are pedestrian only. There are more north-south lanes than east-west, this helps to break up the long east-west city block sides. The Lanes Inventory notes that: > The lanes network is much finer than the street network. > There is a large extent of unbuilt land occupied by carparks which erodes the city's form. > There is a great diversity of building footprints. > There is a lack of small public spaces.

3.8 Parramatta Ways

Parramatta City Centre Lanes Inventory	
Organisation	Parramatta City Council
Date published	November, 2009
Summary of document	The Draft Parramatta Ways Report (2016) sets out the opportunities to connect green spaces across the Local Government Area (LGA) with community facilities and neighbourhood destinations via safe and enjoyable walking routes with the aim to reshape Parramatta as a liveable, walkable city. The Parramatta Ways project, which will deliver Sydney's Green Grid in the LGA, proposes 51 kilometres of new footpath, 28,000 new trees and connection to all of Parramatta's nature trails. The focus on the project is outside of the CBD, connecting the 39 local centres through the area to each other, green open space and public transport. The Parramatta Ways connects with the CBD along the Parramatta River Corridor to the north, through Parramatta Park to the west, Parkes Street to Ollie Webb Reserve to the south and Harris Street / Macarthur Street to the east. Parramatta Ways presented a wayfinding strategy to direct visitors and locals to destinations across the network. It also includes designs for 'fast fact' posts to inform walkers about their environment. The CBD's walking network should connect to the Parramatta Ways so that people choosing to travel on this network have direct access to CBD destinations.

3.9 Western Sydney Regional and City Ring Roads

Roads to Deliver NSW 2021 in Western Sydney – Western Sydney Regional and City Ring Roads	
Organisation	Parramatta City Council
Date published	October, 2012
Summary of document	The pamphlet identifies the eight strategic road corridors that converge on Parramatta, causing excessive congestion. The document identifies that a series of intersection upgrades along M4, James Ruse Drive and Cumberland Highway will create a free flowing arterial road and result in key traffic and economic benefits including: > Improving cross-regional traffic flows and reducing journey times/network efficiency; and > Reduces accidents by separating intersections and pedestrians. The proposal of establishing a Regional Ring Road around Parramatta CBD and Westmead looks to meet goals set out in NSW 2021, including: > **Goal 7** - Reducing travel times by improving the efficiency of road networks during peak times > **Goal 10** - Improving road safety by targeting black spots The Regional Ring Road is also complemented by the Parramatta City Ring Road, which aims to improve traffic flow around the CBD by providing a complete bypass network, whilst also providing improved access to the CBD. The City Ring Road runs along Victoria Road, Macarthur Street, Parkes Street, Great Western Highway and O'Connell Street.
Key maps / figures	**Figure 3-6** Proposed Upgrades of the Regional Ring Road, and connections to the City Ring Road.

Figure 3-6 Proposed Upgrades of the Regional Ring Road.

STAGE 1 HIGH

1	Extend right turn lane from James Ruse Dr to Grand Ave reduces congestion on James Ruse Dr	<$1 m
2	Camellia Link Road (under James Ruse Dr to Unwin St) provides a direct connection to the M4	$5 m
3	Grade separate James Ruse Dr from Grand Ave/Hassall St to remove delay to James Ruse Dr traffic	$60 m
	TOTAL	**$66 m**

STAGE 2 MEDIUM

4	Widen Windsor Rd bridge over Cumberland Hwy	$20 m
5	Increase access to the M4 from Woodville Rd and Church St	$4 m
6	Lower the Cumberland Hwy between Windsor Rd and Redbank Rd	$100 m
	TOTAL	**$124 m**

STAGE 3 LOW

7	New off-ramp from M4 to Great Western Hwy	$20 m
8	Reduce access from Smith St to Cumberland Hwy and new pedestrian bridge	$3 m
9	Grade separate Great Western Hwy/Cumberland Hwy and Cumberland Hwy/M4	$60 m
10	New ramps between James Ruse Dr and Victoria Rd	$40 m
11	New on-ramp from James Ruse Dr to M4	$20 m
12	Improve right turn from Kissing Point Rd to James Ruse Dr	$1 m
13	Improved turning capacity along Cumberland Hwy at Old Windsor Rd/Hart Dr	$4 m
14	Close Wentworth St, new pedestrian bridge & modify Darcy St	$7 m
	TOTAL	**$155 m**
	PROJECT TOTAL	**$345 m**

Western Sydney Regional Ring Road in context

> Proposed Regional Ring Road with complementary City Ring Road.

> The arrows show key road connections between proposed Ring Roads.

> The numbers refer to proposed improvement schemes 1-14. Colours indicate priority status: green - high, yellow – medium, red - low.

Regional Ring Road

City Ring Road

3.10 Car Parking Strategy Review Workshop – Parramatta City Council

Car Parking Strategy Review Workshop	
Organisation	Parramatta City Council
Date published	February, 2016
Summary of document	> The Parramatta City Council Car Parking Strategy Review was a workshop that was conducted in February 2016. The aims of the workshop were to present an overview of the current car parking strategy and council resolutions pertaining to car parking supply in the Parramatta area, as well as present and evaluate a plan for future car parking supplies across a short, medium and long-term timeframe. > Consideration was given to influencing factors such as the delivery of new infrastructure and development projects and opportunities, technological advances in car parking management and pricing strategies. > Council is currently responsible for 5,744 parking bays (1,750 on-street and 3,994 off-street bays) generating a total revenue of $13.3 million. > In the short-term, the proposed changes to car park facilities include: – Completion and opening of the redeveloped Macquarie Street car park – Closure of Horwood Place and the associated car park for redevelopment – Upgrade of the Fennel Street car park to include new smart technologies, and potentially including an automated robotic system – Opening of an underground car park below Parramatta Square. > The review presented options for the introduction of smart technologies in car parks, which ranged from digital signage indicating available bays to smart occupancy meters and robotic facilities, which automatically transport each vehicle from the entry point to a predetermined space. > Robotic technologies require an additional 20% capital investment, however occupies 45% less land space, and opportunities are available to retro-fit commercial and retail developments. > The introduction of the Parramatta Light Rail in the medium-term presents opportunities to migrate off-street spaces beyond the CBD area; an additional 2,000 spaces are proposed at the light rail stops outside of the CBD, with no net gain within, however a finalised position was yet to be determined by Council. > In the medium-term, the proposed changes to car park facilities include: – Upgrade of the Erby Place and Marion Street car parks to include new smart technology – Closure of the Riverside (Brandsmart) site for redevelopment – Opening of Park & Ride facilities at light rail stops outside of the Parramatta CBD. > In the long-term, the Wentworth and Hunter Street car parks are proposed to be upgraded to include new smart technologies. > Following the implementation of all proposed works, the overall parking yield is expected to increase to a total of 6,847 spaces, however this includes the 2,000 free Park & Ride spaces at the light rail stops outside of the CBD boundary. > Assuming no changes to parking rates are implemented, the change in parking yields corresponds to an expected decline of $1.9 million in parking revenue for the Council. > A revised pricing strategy is proposed to both the on-street and off-street parking facilities; the key suggestions include: > Increasing the 15 minute free parking limit to 30 minutes, with a subsequent increase in the hourly rate for on-street metered parking, and daily rate for off-street facilities

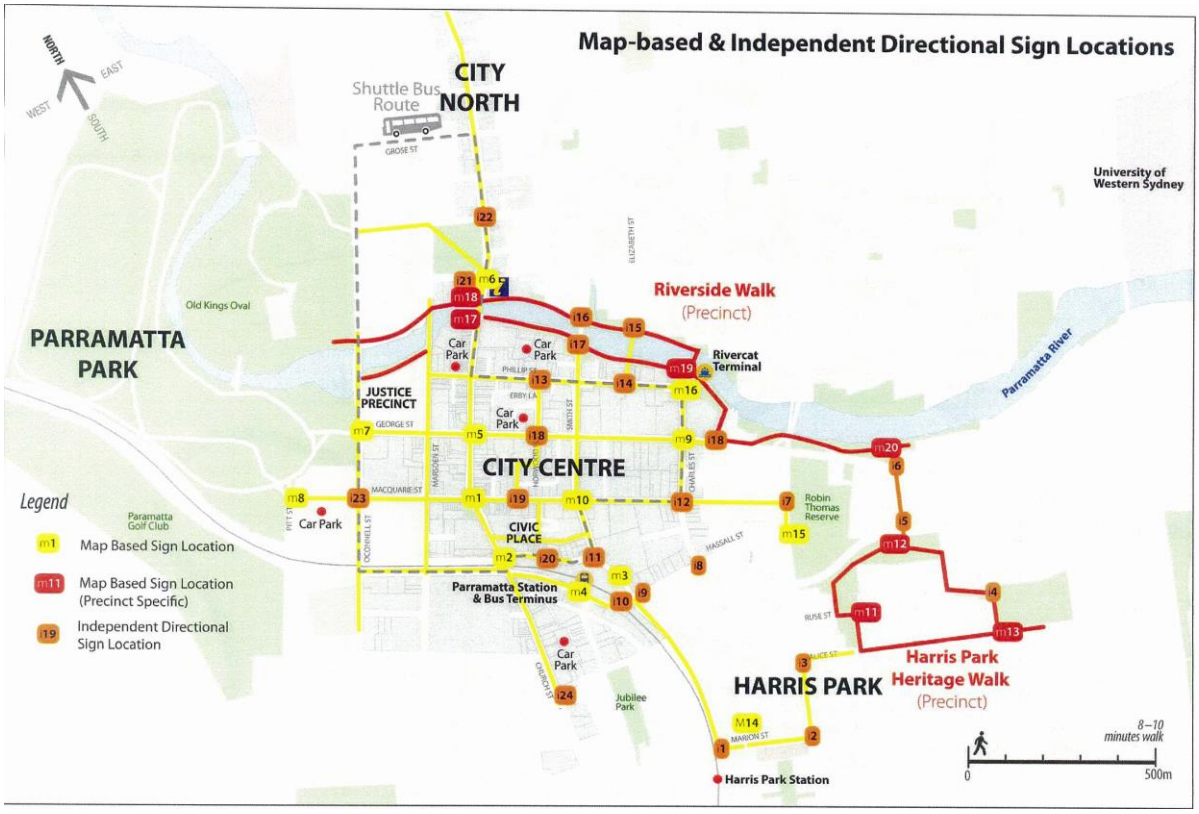
3.11 Parramatta Parking Strategy: Implementation Plan

Parramatta Parking Strategy: Implementation Plan	
Organisation	Parramatta City Council
Date published	November, 2015
Summary of document	> The Parramatta Parking Strategy: Implementation Plan presents a review and assessment of the proposed plan by Parramatta City Council to undertake closures and redevelopments of off-street car parking sites over a 15 year period as the city grows and projects such as the proposed Parramatta Light Rail are delivered. > The proposed changes to parking yields over the course of the proposed program of works includes an increase in the total number of car park spaces (both on-street and off-street) from 5,744 to 6,783, and a decrease in parking revenue from $13.4 million to $10.8 million (assuming no change are made to the current car parking pricing scheme). > Two approaches were identified by Council, and included in the subsequent assessment process. The “conservative” and “progressive approaches each propose different management strategies regarding the supply and pricing of on-street and off-street parking. The Study references parking “levers”, which are areas of facility provision and policy that fall within the jurisdiction of council, and > The “conservative” approach proposes no change to on-street parking rates, an increase of 23% in off-street car parking rates, the removal of 15 minute free parking, and increasing the supply of on-street metered parking bays by 10-20%. This approach yields an increase in the total number of spaces by 454 on the base case to 7,237, and an increase in revenue by $4 million to $14.8 million. > The “progressive” approach proposes an increase in on-street and off-street parking rates by 43% and 100% respectively. The approach proposes the removal of 15 minute free parking, and increasing the number of on-street metered parking by around 10-20%. This approach yields an increase in the total number of spaces by 454 to 7,237, with an increase in annual revenue of $11.9 million to $22.7 million. > The Study recommends the adoption of smart technologies in new and redeveloped off-street car parks to allow for a more efficient use of the facilities. New technologies include “robotic stacking” car parks, which can accommodate up to 60% less space than a conventional car park, with the additional space available for a more profitable land use.

3.12 Visitor Wayfinding Strategy and Signage Project – Stage 1 Part 2 Preliminary Wayfinding Strategy

Visitor Wayfinding Strategy and Signage Project – Stage 1 Part 2 Preliminary Wayfinding Strategy	
Organisation	J.A. Grant and Associates
Date published	June, 2008
Summary of document	The Preliminary Wayfinding Strategy proposed a signage area for the Parramatta CBD to direct pedestrians to major origins and destinations such as Civic Place, the Justice Precinct, Parramatta Station and bus terminal, Information Centre, Riverside Theatre, Rivercat terminal, Town Hall, Westfield Mall, Parramatta Swimming Centre, Parramatta Park, Parramatta Stadium, Westmead, Parramatta Leagues Club and car parks around the city centre. The Strategy states that many of the major origins and destinations are within a few hundred metres of each other but it measures the distances ‘as the crow flies’, rather than along the footpath network. The Strategy proposes production of a Master Map of the CBD that can be printed and distributed to inform visitors of locations for major destinations, walking routes, an a ‘walk-time grid’. It also proposes map based panel signs (20), wall mounted directional signs, arrival signs for historic sites (3) and independent directional signs (24). The Strategy, developed in 2008 and so does not take into account the changes to the CBD in the past eight years or the proposed growth in employment and jobs or the new light rail route. As blocks are redeveloped the walking routes presented on the wayfinding may no longer be the fastest routes to major destinations.
Key maps / figures	**Figure 3-7** Proposed locations for map-based and directional signage

Figure 3-7 Proposed locations for map-based and directional signage



3.13 Public Domain Guidelines – Parramatta City Council

Public Domain Guidelines – Parramatta City Council	
Organisation	Parramatta City Council – Urban Design Unit
Date published	January 2016
Summary of document	> The Parramatta City Council Public Domain Guidelines were prepared with the aim of providing a standardised design and materials palette with regards to assets under Council's ownership. The key objectives of the guidelines are to: − Establish a clear and consistent public domain image − Provide clarity in design and construction requirements − Facilitate asset management, maintenance and repairs through reducing the number of different design elements − Provide equitable access − Reinforce the streetscape hierarchy − Promote pedestrian priority. > The guidelines provide design considerations with regards to the provision of public domain infrastructure; the key considerations include: − A path of travel (POT) to be kept clear with minimum width of 1.8 metres, with crossfalls of no more than 2.5%. Where higher pedestrian volumes are anticipated, a wider POT may be required on advice from Council. − New and upgraded intersections are to be designed for pedestrian priority where possible, with consideration given to providing facilities such as kerb extensions, raised thresholds, zebra crossings, pedestrian signals and minimum kerb radii. − Kerb ramps must be aligned with the path of travel, and Tactile Ground Surface Indicators (TGSI) must be separated from the ramp where possible. Where it is not possible, discrete TGSI should be provided across the full width of the ramp. − Street trees are to be provided, with the size and species used dependent on the proposed location. − Bus stops must be designed to be fully accessible, with elements including TGSI, a separate boarding area, positioning of shelters and clear space for through pedestrian movements. > Guidelines have also been developed for each of the key centres within the Parramatta City Council LGA. The centre-specific guidelines outline requirements for different routes and pavement treatments that are dependent on the route type (e.g. footpath, laneway, pedestrian mall) as well as for kerb and gutter, service pit lids and TGSI.

3.14 Urban Design Strategy – Horwood Place - Draft

Urban Design Strategy – Horwood Place - Draft	
Organisation	Ruker and Associates
Date published	November, 2007
Summary of document	The Urban Design Strategy for Horwood Place defines the urban direction for individual sites for the future Civic Link. The strategy identifies that opportunities exist to cater for the numerous and well-used north-south and east-west pedestrian routes, and whilst the existing pedestrian movements are easy to navigate, they are not necessarily direct given the movements occur along laneways, through buildings, along pedestrian access ways and along the footpaths. The key pedestrian principles outlined include: > To increase pedestrian permeability through the block; > Increase through block links and formalise pedestrian ways; and > Plan to ensure all lots have loading dock access from the rear concealed as far as possible within the building so as to reduce the visual and physical impacts at street level.

3.15 Horwood Place and Riverbank Transport Study

Horwood Place and Riverbank Transport Study	
Organisation	Arup
Date published	August, 2009
Summary of document	The Transport Study was undertaken for Horwood Place and the Parramatta Riverbank analysing the existing and future traffic, access, parking and servicing arrangements and pedestrian demand. The pedestrian and traffic networks were analysed against the two future scenarios outlined in the Parramatta City Centre LEP. Key findings from the study include: > The key intersections operate at level of service E and F in the future indicating that the driving speed and manoeuvrability is restricted, causing delays and extended queue lengths; > The traffic network may be unable to cope with the proposed traffic generated by the Riverbank and Horwood Place developments and the developments will result in major traffic congestions around Riverbank and Horwood Place; > Key recommendations including: – Limit the amount of parking available for commercial precincts from 1 car space per 100m2 to 1 car space per 200 m2 of GFA; – Reduce the amount of public parking within the Riverbank and Civic Place while maintain loading and public transport facilities; – Signalised intersections at the Horwood Place intersections with Phillip Street, George Street and Macquarie Street; – Extend United Lane through to George Street to improve servicing to the Church Street businesses; and – Access to the car parks on Horwood Place be from laneways.

3.16 Parramatta Safety Plan (2014-2018)

Parramatta Safety Plan (2014 – 2018)	
Organisation	Parramatta City Council
Date published	November, 2014
Summary of document	The Parramatta Safety Plan was developed by Council with the aim of implementing initiatives that improve the safety of the local community and visitors, and also promotes both the CBD and wider LGA as a pleasant and safe place to live, work and play. The Plan is developed for implementation over a four year timeframe. During that time, steering committees are proposed to be set up to oversee the delivery of the actions, the progress made, and providing feedback on their success. The Plan has identified the key safety challenges facing the LGA through a review of current and historical crime data which shows the trends for different offences over the previous years. Following on from a period of community consultations it was noted that, in the CBD, the key issues that were observed as negatively affecting local residents and businesses were: ▪ Anti-social behaviour, particularly around the Parramatta Transport Interchange ▪ Loitering in the Church Street Mall ▪ Feeling of being unsafe in the CBD at night, particularly around carparks and along the Parramatta River ▪ Lack of general activation, and areas appearing worn and disused. ▪ Harassment of pedestrians by street hawkers; and ▪ A lack of public toilets. The Plan has developed five strategic objectives, which oversee a program of proposed actions in response to the issues identified. The five strategic objectives are: 1. Partner to achieve success 2. Build a safe and more prosperous Parramatta CBD for people, businesses and organisations

Parramatta Safety Plan (2014 – 2018)	
	3. Improve safety and quality of life for residents in our neighbourhoods 4. Improve perceptions of safety and vitality of the Parramatta LGA; and 5. Protect Council's people and assets The proposed actions grouped into these five objectives range from the implementation of facility and infrastructure upgrades, to launching community initiatives and cooperation with government and private organisations. Of particular relevance to the CBD is Strategic Objective 2. The key actions addressing this objective include: ▪ Building vibrant and active public spaces for all ▪ Supporting the responsible service and consumption of alcohol ▪ Minimising crime and anti-social behaviour, particularly along the Church Street Mall ▪ Improving safety during use of transport services; and − Supporting vulnerable people who want to use the CBD.

APPENDIX

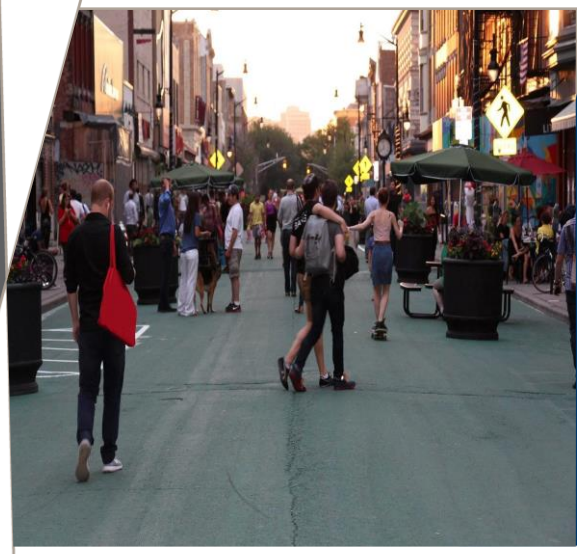
B

BEST PRACTICES WALKABLE CITIES

Parramatta CBD Pedestrian Strategy

Best practice walkable city centre examples

80016067



Prepared for
City of Parramatta Council

30 March 2017

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Document History

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Draft	12 April 2016	Bahman Mehrpour	Larissa Miller

Table of Contents

1 Best practice city examples

Many cities around the world have developed reputations for great walkable centres and CBDs. Some of these cities have had walkable characteristics for a long time, but many have made determined efforts to increase the mode share and enjoyment of walking as a transport mode in their centres.

A range of walkable city centres were examined for the policies, plans and implemented actions that have contributed to improving the pedestrian amenity, safety and priority. The review considered cities in the US, Europe and Australia that:

> Have walkable city centres; and/or

> Are of a similar population to the Parramatta local government area; and/or

> Have a role as a neighbouring city to the region's biggest city (similar to Parramatta's relationship to the Sydney CBD).

Snapshots of each walkable city centre are described in the following sections.

1.1 United States

Arlington, Virginia	
Population	224,906
City type	Example of a neighbouring city to the region's biggest city
Relevant for	Implementing solutions aimed at improving pedestrian priority in the city.

Arlington

Arlington is a city county located in the state of Virginia, immediately to the west of the Washington D.C CBD but separated by the Potomac River. It is the second largest city in the Washington Metropolitan area and is considered to be fully developed.

Walkable features

> WALKArlington is a county program which aims to encourage walking across the city by providing facilities such as art, furniture and wayfinding, improved infrastructure including improved footpaths and crossings, and integrating these with an education and awareness program.

> Permanent pedestrian and bicycle movement counters have been implemented, with the result data being used to gain a more comprehensive picture of active transport trips made in the city.

> Beacons have been installed to provide signalised warnings to approaching vehicles at zebra crossings.

> Pedestrian signal countdown timers have been installed at 50 intersections.

> The city is serviced by Washington Metro trains at two stations within the city area. New residential and retail land uses were developed around the station precincts following the introduction of train services.

Beacon signal system at zebra crossings

> The city's new developments must provide "pro-pedestrian zoning" initiatives which requires retail land uses to be located at ground floor level along key pedestrian routes.

> Active transport facilities include widened footpaths, new shared and bike paths, and pedestrian refuges. These were implemented prior to the rollout of the WALKArlington program.

> Arlington has made key changes to the road network such as traffic calming measures (including landscaping, narrowed streets and clearly designated crossings) to provide safe street environments for all people and vehicles.

Jersey City, New Jersey	
Population	257,342
City type	Example of a neighbouring city to the region's biggest city
Relevant for	Providing an integrated transport solution that combines multiple public transport options with walking and cycling networks.

Jersey City

Jersey City (NJ) is located between New York City and Newark, and separated from the two cities by two rivers (the Hudson River to the east, and Newark Bay to the west).

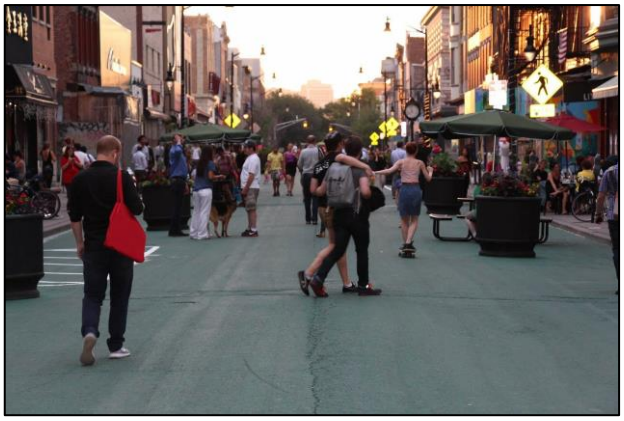
The city is relatively dense, and has been influenced by its neighbouring cities with regards to development and economic growth, particularly in the downtown area. There are however, smaller and quieter "village" areas surrounding the city which have also been maintained.

Walkable features

> The city is well serviced by multiple transit options that connect to the city, including the Hudson Bergen Light Rail, New York PATH, NJ Transit and the NY/NJ waterway. The majority of the transit stops are fully accessible for mobility impaired passengers, and are linked to the surrounding pedestrian network within the city centre.

> A pedestrian walkway was constructed in 2009 along the Hudson River shoreline which links Jersey City with the major Hoboken transit terminal, as well as businesses and recreational land uses along the route.

> Following a trial, a pedestrian only zone was implemented along a section of Newark Avenue, directly opposite the Grove Street PATH train station. The street zone is off limits to vehicles, except for garbage trucks, emergency and construction vehicles.



Newark Avenue pedestrian plaza

> There is a proposal to construct a pedestrian bridge across the Hudson River from Jersey City to Manhattan, to provide an alternative means of commuting for residents and helping to resolve capacity constraints on the PATH train network and NJ/NY ferry service.

> A $3 million USD grant was awarded to the city to finance infrastructure aimed at improving pedestrian safety; the works primarily involved intersection upgrades, pedestrian countdown signals and bicycle lanes.

Newark, New Jersey	
Population	278,427
City type	Example of a neighbouring city to the region's biggest city
Relevant for	Implementing initiatives that aim to improve pedestrian safety and minimise the risk of crashes resulting in injuries or fatalities.

Newark

Newark is the largest city in the State of New Jersey, and is located to the west of Jersey City, separated by Newark Bay.

The city is dense and is characterised by its extensive transport network combining road, rail, air and sea services. Growth and development in the city is largely being driven by the transport, telecommunications and manufacturing sectors.

Walkable features

> Pedestrian safety was a major concern in the city; 23% of all traffic related fatalities recorded involve pedestrians, and the State of New Jersey has recorded the 14th highest number of pedestrian fatalities out of the 50 states. The Be Street Smart NJ program was launched as an awareness program, targeting the behaviour of both pedestrians and vehicle drivers through various media outlets and accompanied by volunteers.

> The City of Newark Pedestrian and Bicycle Safety Action Plan, released in February 2016, aims to address the high rate of pedestrian incidents and fatalities. The Plan aims to reduce pedestrian fatalities to zero by 2025.

> The scope of works completed and identified in the Plan primarily focus on improving pedestrian safety, with works including new kerb ramps, crossings, improved signalised and mid-block crossings, pedestrian refuges, as well as road treatments for vehicles including speed humps, rumble strips and centre medians.

Warning signage at pedestrian crossings

> Red light cameras were installed at 19 locations with a high frequency of reported crashes. The cameras resulted in a minimum 83% reduction of the total number of crashes over five years.

> Works to improve pedestrian amenity have also been completed, and include the addition of trees and vegetation, improved street lighting, and installing integrated bus stops at safer locations.

Madison, Wisconsin	
Population	243,344
City type	Good example of a walkable city
Relevant for	Reducing vehicle space on city streets to provide wider footpaths

Madison

Madison is the capital city of the state of Wisconsin, and is located along a peninsula that straddles two lakes (Lake Mendota and Lake Monona).

The city is primarily suburban city, characterised by a combination of separate houses and medium-rise apartments and offices.

Walkable features

> The city centre is primarily in a grid layout, with diagonal connections linking to the Wisconsin State Capitol Building.

> A facility inventory was developed for the footpath network across the wider Madison area to identify current gaps. An action plan for filling the gaps was developed and prioritised according to level of usage and proximity to key land uses.

> State Street is an east-west running road link extending from the University of Wisconsin, Madison to the Wisconsin State Capitol that was converted to a shared pedestrian mall in 1974. An original four traffic lanes were reduced to two and reserved for public transport and emergency vehicles to be shared with pedestrians and cyclists. The additional space was used to construct wider footpaths along the entire one kilometre street length. Trees and street furniture have also been installed along the street.

> The Southwest Commuter Path is a shared path that was converted from a disused railway line. The path is 5.6 miles long (9 km) and extends from Monona Bay, through the city centre, before proceeding south-west towards the suburban areas of the city. At the Monona Bay end, connections are available to the Bay side and Capital City Trail proceeding along the bay shoreline.

State Street pedestrian mall

> The University of Wisconsin, Madison is accessible through multiple pedestrian malls including the Bascom and East Campus Mall. Where these intersect with trafficked roads, pedestrian activated signals at zebra crossings are provided.

> The Transportation Improvement Program (TIP) is a list of works completed and planned for the Madison area, with projections given for works anticipated over the next five years. The Program is updated annually to reflect changes in the status of proposed works. The key works completed with respect to pedestrian facilities have included:

- Footpath widening and upgrades
- Streetscape enhancements and landscaping
- Intersection upgrades, including signal upgrades such as beacon fixtures and countdown timers

Pittsburgh, Pennsylvania	
Population	305,841
City type	Good example of a walkable city
Relevant for	Retailer-led improvements to street facades and shop fronts to encourage shoppers and I urban renewal of riverfront areas and trialling car-free zones.

Pittsburgh

The Pittsburgh city centre is situated between the Allegheny and Monongahela Rivers. Bridge links are provided across the rivers connecting to the northern and southern precincts.

Walkable features

> The Pittsburgh Urban Redevelopment Authority (URA) is undertaking multiple urban renewal projects that target pedestrian movement and amenity in the Pittsburgh city centre; these include:

- The Streetface Program, which provides funding grants to businesses and building owners to conduct improvement works to facades to create a space that is more appealing to potential customers. The business or building must be located in a pedestrian oriented area (such as a shopping or high-impact business district) in order to receive the grant. The East Carson Street Precinct observed a 200% increase in housing investment, and 60% in commercial investment since around 200 storefronts undertook works as part of the program.
- The Storefront Renovation Program (SRP) provides joint funding from government departments to businesses with the aim of improving the physical appearance of storefronts. The buildings must be located in the city in order to receive the grant.

Car-free zone in the strip district

- The South Shore Riverfront Park Project, which is a $10.5 million USD urban renewal precinct at the site of a disused steel mill along the Mononghahela River, with proposed mixed use and residential complexes and recreational space, and a new multi-modal hub with connections to pedestrian and bike route networks. The project is currently under construction.
- Car-free days have been trialled, and have become a yearly occurrence in the Strip District, the key shopping and market district in Pittsburgh. Activities and events are held in the closed thoroughfares (Penn Avenue), and visitors are likely to remain in the area longer compared to when the streets are open to traffic.

Portland, Oregon	
Population	609,456
City type	Good example of a walkable city
Relevant for	Small blocks in the city centre, engaging with residents and visitors through providing useful, up-to-date resources (such as maps) for journey planning, and encouraging community involvement in pedestrian initiatives and strategies.

Portland

Portland is the largest city in the state of Oregon, and is located on the southern side of the Columbia River and the border between Washington State and Oregon. The city centre is separated into two areas by the Willamette River, and is generally high density, extending out to low density residential to the east, and parkland to the west.

Walkable features

> The city is structured in a compact grid layout, with blocks that are generally no longer than 80 metres in any direction, allowing for easier and more direct navigation by foot to destinations around the city.

> Nine bridges connect the eastern and western city precincts, and pedestrian access is available along seven of these bridges.

> The Tilikum Crossing Bridge opened in September 2015, and was designed to accommodate only pedestrians and public transport vehicles, including a light rail line connecting to the wider network.

> The Portland Bureau of Transportation has developed a map outlining the current pedestrian and bicycle network across the city. The map identifies locations including shared zones with the expected typical traffic volumes (low or moderate), routes where stairs are present, difficult roads and intersections, connections to the light rail and bus networks, and key points of interest including retailers, recreational and community land uses.

> Neighbourhood Greenways are designated streets where traffic volumes and speeds are reduced through calming devices and surface treatments, with pedestrian and bicycle movements prioritised. The measures have been introduced on the eastern side of the city.

Tilikum bridge opening day

> A trial was conducted in December 2012 where the Portland Entertainment District in the Old Town was closed to vehicles on Friday and weekend nights from 10pm to 3am to assist pedestrians leaving venues safely. The strategy was adopted and expanded to surrounding streets following an observed decrease in crime and pedestrian incidents.

> Portland residents interested in pedestrian initiatives are invited to join the Pedestrian Advisory Committee (PAC), and engage in providing reviews and recommendations on proposals for pedestrian strategies and facility delivery around the city.

> Residents and visitors are able to submit feedback to the Bureau of Transportation with regards to all pedestrian facility types, including safety concerns and suggestions for new works.

Austin, Texas	
Population	926,426
City type	Good example of a walkable city
Relevant for	Safety for pedestrians crossing roads, low-cost measures to reduce vehicle speeds and shorten crossing distances and promotion of walking to city residents,

Austin

Austin is the capital city of the State of Texas, and is bisected by the Colorado River. The CBD is located immediately to the north of the river, with the southern side comprising primarily of low-density residential land uses.

The northern side of the river is more heavily developed, and includes the University of Texas, Austin and the Texas Capitol.

Walkable features

> The city is structured in a grid layout, with square blocks of 110 metres in each direction, allowing for easier and more direct navigation by foot to destinations around the city.

> Pedestrian Hybrid Beacons (PHB) have been installed at 39 pedestrian crossings across the city. The PHB's comprise of a series of warning lights activated by pedestrians for the attention of approaching drivers to stop and give way. The criteria used to determine the location to install a PHB includes the difficulty encountered by a pedestrian whilst crossing and safety history at that location.

> A low-cost kerb extension solution was implemented at a key intersection, where the extension surface was painted with colourful polka dots, with traffic bollards reinforcing the area for use by pedestrians only. This solution reduced costs by eliminating the need to physically build the kerb out.

> GIS software was used to conduct a full audit of the existing pedestrian infrastructure in the city and beyond. The audits allowed for the development of a prioritised plan for the delivery of new facilities, including completing gaps in the footpath network (known as the Sidewalk Program).

> The majority of the city centre has footpaths provided on both sides. Where they were not provided, improvement works have been identified at the highest priority.

> Pedestrian counts have been adopted to determine pedestrian transportation needs across the city, and target improvement works at prioritised locations.

Polka dot kerb extension

> The city targets pedestrian safety through traffic enforcement, with fines issued for key behaviours linked to pedestrian crashes including speeding and failing to stop at red lights or STOP signs.

> The city is participating in the Walk Texas! Program, an initiative that aims to promote awareness about the health benefits and opportunities associated with walking. The initiative was developed by health agencies and the University of Texas, Austin.

> The Neighbourhood Partnering Program is an initiative of the City Government, and involves the delivery of improvement projects across the city through a fund sharing program between the City and neighbourhood organisations. Many projects comprise of public space, pedestrian and bicycle facility improvements.

> The Safe Routes to School program aims to educate school children about staying safe while using the road network as a pedestrian or cyclist. The program includes crossing guards who are stationed at key intersections near schools.

> The city has adopted the Swedish "Vision Zero" approach to user safety, with the aim of reducing deaths to zero by 2025. Safety solutions have been identified by balancing land use and transport planning, with education, culture change and reinforcement.

1.2 Europe

Edinburgh, Lothian	
Population	489,000
City type	Good example of a walkable city
Relevant for	Speed reductions in the city centre, creating pedestrian-only zones where popular land uses are located, and integrating active transport routes with public transport services.

Edinburgh

Edinburgh is the capital city of Scotland, and is located towards the south-east of the country. The city centre is separated into two precincts (Old Town and New Town) by the Edinburgh Waverley transport interchange on the UK National Rail network.

The wider Edinburgh area is situated along the coast of the North Sea, with the city centre located approximately three kilometres inland. Land uses in the city are generally high density residential and mixed use, together with multiple green spaces and recreational areas.

Walkable features

> There are multiple transit options available in the city centre, and all within easy pedestrian access. Light rail and bus services run along Princes Street which is the main thoroughfare.

> Access to buses is widely available throughout the city, with services operating along most streets.

> All streets in the city centre had the traffic speed limit reduced to 20 mph (32 km/hr) in January 2015. The aims of the initiative included reducing the risk and severity of crashes involving pedestrians, ensuring ease of crossing roads, and encouraging and maintaining pedestrian and cyclist activity.

> Approximately £500,000 was committed in January 2015 to undertake upgrade works at pedestrian crossings including providing upgraded signals and pedestrian refuges at key locations.

Rose Street pedestrian mall

> There are multiple car-free zones located throughout the city. These areas are characterised by alternating surface treatments and warning signage restricting vehicular access, except for deliveries and emergency vehicles.

> Rose Street is a pedestrianised laneway which provides access to retailers, cafes and restaurants.

> A smartphone application (WalkIt Edinburgh) is available to residents and visitors, and provides walking trip options, journey times and routes to assist with navigating around the city.

Munich, Bavaria	
Population	1.39 million
City type	Good example of a walkable city
Relevant for	Developing pedestrian malls and precincts within the city centre, connecting them directly to public transport services and prioritising city street space for pedestrians over vehicles.

Munich

Munich is located in the south-east of Germany, and is the capital of the state of Bavaria. The city is bisected by the Isar River, and land uses in the city and inner suburban areas are characterised by medium to high-density buildings and parklands.

Walkable features

> The city centre is in a generally circular layout, and the U-Bahn underground train runs along the perimeter, offering access at five different locations, with three of these located at the entrance to pedestrian malls.

> Trams also operate above ground along the perimeter of the city centre, providing access to destinations not covered by the U-Bahn and S-Bahn.

> There are multiple pedestrian malls located throughout the city, and these are connected to key pedestrian and bicycle routes along streets which are open to private vehicles.

> The Kaufingerstraße pedestrian only mall runs for approximately one kilometre between Marienplatz and Karlsplatz; it accommodates street events, retailers and historical sites aimed at tourists. The mall attracts approximately 11,900 visitors in the busiest hour, and the S-Bahn commuter train runs beneath this mall, with stops located at each end.

Kaufingerstraße pedestrian mall

> The Viktualienmarkt is a pedestrian and bicycle only precinct located in the city centre, and accommodates the local food market. It comprises of a number of streets permanently closed to vehicles, and is characterised by alternating paver treatments to emphasise pedestrian and bicycle access only.Where streets in the city centre are open to traffic, lane widths are generally narrower, with most of the space reserved for footpaths and pedestrian use.

Barcelona, Catalonia	
Population	1.6 million
City type	Good example of a walkable city
Relevant for	Reduced traffic speeds, support for a signature pedestrian mall and using shared zones as a strategy to prioritise pedestrian movements over the needs of vehicles.

Barcelona

Barcelona is a coastal city located in the north-east of Spain. It is the capital of the Catalonia region and overlooks the Balearic Sea.

The city is highly developed with high-density land uses located throughout the greater city area, with some parklands located to the north and south.

Walkable features

> The Las Ramblas pedestrian mall runs through the city, connecting the coast with Catalunya. The mall has one active traffic lane running in each direction, with stalls, retailers and restaurants set up on a pedestrian boulevard running down the middle.

> The city centre layout is irregular, with roads and pedestrian zones structured in various alignments. However this reverts to a compact grid layout outside of the CBD boundary, with block dimensions of approximately 140 metres in each direction.

> A 30km/hr speed limit applies to all vehicles travelling through the city centre.

> Most streets in the city centre are designated as pedestrian zones; whilst vehicles are permitted to use these streets, surfaces are paved, with line marking and signage in place to reinforce pedestrian priority.

> The pedestrian zones are all connected to one another, and provide uninterrupted access to pedestrians travelling through the city.

Las Ramblas pedestrian mall

> Four underground subway lines (Lines 1, 2, 3 and 4) run under the main road corridors in the city and provide access to 10 stations at different locations. Most stations are easily accessible for pedestrians via the network of shared zones.

> Most minor streets in the city centre that are not designated pedestrian zones are generally narrow and designated as one-way only.

Florence, Tuscany	
Population	361,379
City type	Good example of a walkable city
Relevant for	Restricting vehicle access to the city centre and implementing shared zones due to narrow footpath widths.

Florence

Florence is a city located inland in Italy, and is the capital city of the Tuscany region. The city is bisected by the Arno River, with the city centre located on the northern side.

On the northern side, the city is heavily developed, however on the southern side, development is sparser, with more green space retained.

Walkable features

> The city was declared the most polluted city in Italy. This, combined with high pedestrian related injuries and fatalities resulted in the introduction of pedestrian zones in 2009, beginning with the circuit around the Duomo cathedral. More streets have been, and still are being progressively converted to pedestrian zones, with limited vehicle access.

> A restricted traffic zone (referred to as the ZTL) applies to the wider Florence area, the times at which the restrictions apply are dependent on location. The exception to this is the city centre, where access is permanently restricted to all vehicles except those of residents, taxis and buses.

> Entry points to the restricted areas are marked by signage and signals, with compliance to the restrictions enforced by cameras.

> Streets and footpaths in the city are generally very narrow, requiring pedestrians to regularly step onto the road and share space with vehicles.

Pedestrian zone at the Duomo Cathedral

> Pedestrian zones are characterised by alternating paving treatments, with signage and line marking reinforcing pedestrian priority.

> Transit options are limited within the city; buses are restricted in using most streets due to their narrow width. The main train station is located to the north-west of the city.

Paris, Île-de-France	
Population	2.2 million
City type	Good example of a walkable city
Relevant for	Allocating more space to pedestrians through changes to existing footpaths and reprioritisation of road space.

Paris

Paris is the capital city of France, and is located inland, but bisected by the Seine River.

Most of the city is heavily developed into high density land uses, with some green space areas located in the outer areas.

Walkable features

> The Pedestrian Paris Initiative (PPI) is a program that was launched in 2012 with the aim of implementing facilities and policies that favour pedestrians and walking as a viable mode of transportation.

> A key initiative of the PPI is the clearing of footpath space by removing obstructions and limiting use of space for recreational activities by residents or businesses. These uses were relocated to areas formerly occupied by parking.

> Almost 40% of the city has a posted traffic speed limit of 20 mph (32 km/hr) to ensure greater safety for pedestrians and cyclists, and reduce the severity of crashes involving these users.

> Changes to the road rules, introduced in January 2011, require drivers to give way to pedestrians or cyclists if they are crossing a road at any point (however the rule does not apply if a crossing is available less than 50 metres away.

> A €40 million project was approved in 2012 where road expressways running along the bank of the Seine River were removed in favour of a mixed pedestrian and bicycle zone, combined with cafes and recreational space.

Converted expressway along the Seine

> "Mixing Zones" have been introduced, which reduce the traffic speed limit to 12 mph (20km/hr) and pedestrians and cyclists are permitted to use the road space, regardless of whether footpaths are provided or not. Drivers must give way at all times, and the areas are denoted by dashed pavement markings and signage upon entry. The zones have primarily been installed in the city centre, as well as some precincts in the east.

1.3 Australia

Bendigo, Victoria	
Population	146,424
City type	Good example of a walkable city
Relevant for	Pedestrian mall with vehicle restriction times, wide footpaths and weather protection.

Bendigo

Bendigo is a regional city in Victoria, and is located approximately 150 kilometres inland and north-west of Melbourne. Land uses in the city centre are primarily retail and commercial areas in the north-east, with low-density residential in the south-west.

Walkable features

> The Hargreaves Street Pedestrian Mall runs for one block through the city's retail centre. Access to the area is restricted for vehicles between 10:00AM and 6:00PM, however outside of these times, the area acts as a shared zone, with alternate paving treatments denoting pedestrian priority at all times.

> Trees and street furniture are provided in the Mall, and space is available for recreation or public events.

> Most footpaths are wide, lined by street trees with weather protection provided by shop awnings.

> The intersection of Hargreaves Street and Bull Street was converted into a shared zone to complement the adjacent Hargreaves Mall. Works included the installation of rumble strips, a mid-block crossing, street furniture, and footpath widening and kerb removal. The works resulted in a decrease in average vehicle speeds from 40 km/hr to 27 km/hr.

Hargreaves Street pedestrian mall

> Pedestrian zebra crossings are widespread throughout the city, with traffic signals installed at busier and more complex intersections.

Melbourne, Victoria	
Population	4.08 million
City type	Good example of a walkable city centre with activated laneways
Relevant for	Pedestrian access to light rail in a city centre and activation of city centre laneways

Melbourne

Melbourne is the second largest city in Australia by population, and is the capital of Victoria. It is located in the southern region of the state, and overlooks Port Phillip Bay.

The city centre is located primarily north of the Yarra River, which separates it from the Southbank precinct.

Walkable features

> The city centre is structured in a grid layout, with equal sized blocks approximately 240 metres long and 115 metres wide.

> Access to the public transport system is widely available throughout the city. Bus and tram services operate above ground, and the City Circle Loop offers train services along the perimeter of the city boundary.

> Tram stops across the city are being progressively upgraded to “Super Stops”, which offer raised platforms with ramp access for wheelchairs, tactiles, flashing lights, shelter and real-time information screens.

> The Bourke Street Mall is a 200 metre pedestrianised section of Bourke Street in the city centre, with access only available to trams. The mall is located adjacent to major retail and dining establishments, including the Emporium Shopping Centre. Street furniture and trees have been installed, and space is available for recreation or public events.

Bourke Street Mall

> A proposal to convert Swanston Street to a pedestrian only zone has been put forward; currently access is limited along some block segments, and reserved solely for trams.

> Many laneways in the city centre have been converted to shared zones or pedestrian only zones. In both cases, contrasting surface treatments have been utilised, and appropriate signage installed. These laneways are interesting and activated places for people to visit and pass through.

> Melbourne has the highest proportion of street furniture in the world and the number of cafes has increased from 50 in 1990 to over 600.

APPENDIX

C

PEDESTRIAN APPROACH AND MODELLING ASSUMPTIONS

Pedestrian modelling approach and assumptions

1.1 Pedestrian counts

Pedestrian counts were undertaken in March – April 2016 to identify the parts of the CBD with the highest current pedestrian demand and to provide base line data for strategic modelling of future pedestrian demand.

Video cameras were set up in 56 locations across the CBD to record pedestrian movements in 15 minute intervals. The locations are shown on **Figure 1**.

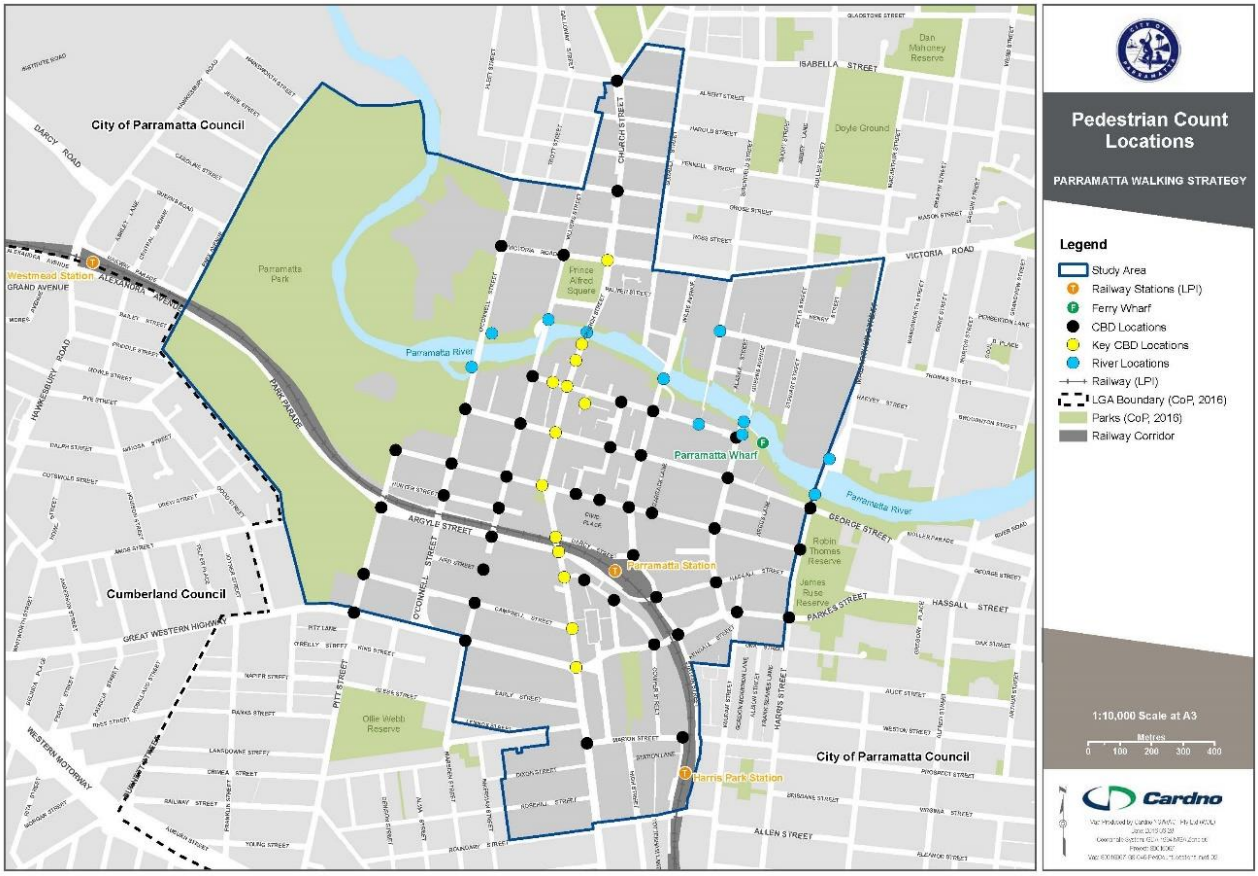
The days and times recorded were:

> 56 CBD locations, shown in black on **Figure 1.**
  - Thursday 0600-2100
  - Saturday 0800-1400

> 13 key CBD locations, shown circled in yellow on **Figure 1.**
  - Friday 1500-2300
  - Saturday 1400-2400

> 11 river locations, shown circled in blue on **Figure 1.**
  - Sunday and Tuesday 0600-1800
  - Thursday 0600-2000
  - Saturday 0600-2400

Figure 1 Pedestrian count locations



1.2 Pedestrian modelling approach

Cardno developed a spreadsheet based static pedestrian model for the CBD study area. The project scope of works was to identify pedestrian flows in the network peak hour in future design years.

The base CBD pedestrian demand model builds off the existing peak hour period identified during March and April 2016 surveys which was on a Thursday between 12:30pm to 1:30pm where 81,701 pedestrian movements at count locations were recorded.

The methodology applied to the model draws guidance from relevant components of the approach detailed in the National Cooperative Highway Research Program, Report 684, *Enhancing Internal Trip Capture Estimation for Mixed-Use Developments*.

The research report identifies the effects of proximity between interacting land uses to identify walking trip generation.

In order to model the potential future pedestrian demands in the CBD study area, a comprehensive understanding of existing demands is required. In establishing the existing dynamics of the CBD, the following key data was collated and/ or assumed/ estimated to build the model including:

> Study area blocks;

> Pedestrian network links (Pedestrian paths);

> Origin – Destination Routes (Paths uses to travel between blocks);

> Existing residential population by block;

> Existing worker population by block;

> Maximum walking distance assumption; and

> Propensity to travel.

Each of these factors are discussed in more detail in the following sections.

1.2.1 Study area blocks

The study area was modelled with 77 blocks surrounded by publically accessible pedestrian paths, generally adjacent to carriageways. Some street blocks are separated by lanes, however the land use data provided by Council was aggregated to whole block areas. The 77 blocks are shown in Error! Reference source not found..

1.2.2 Pedestrian links

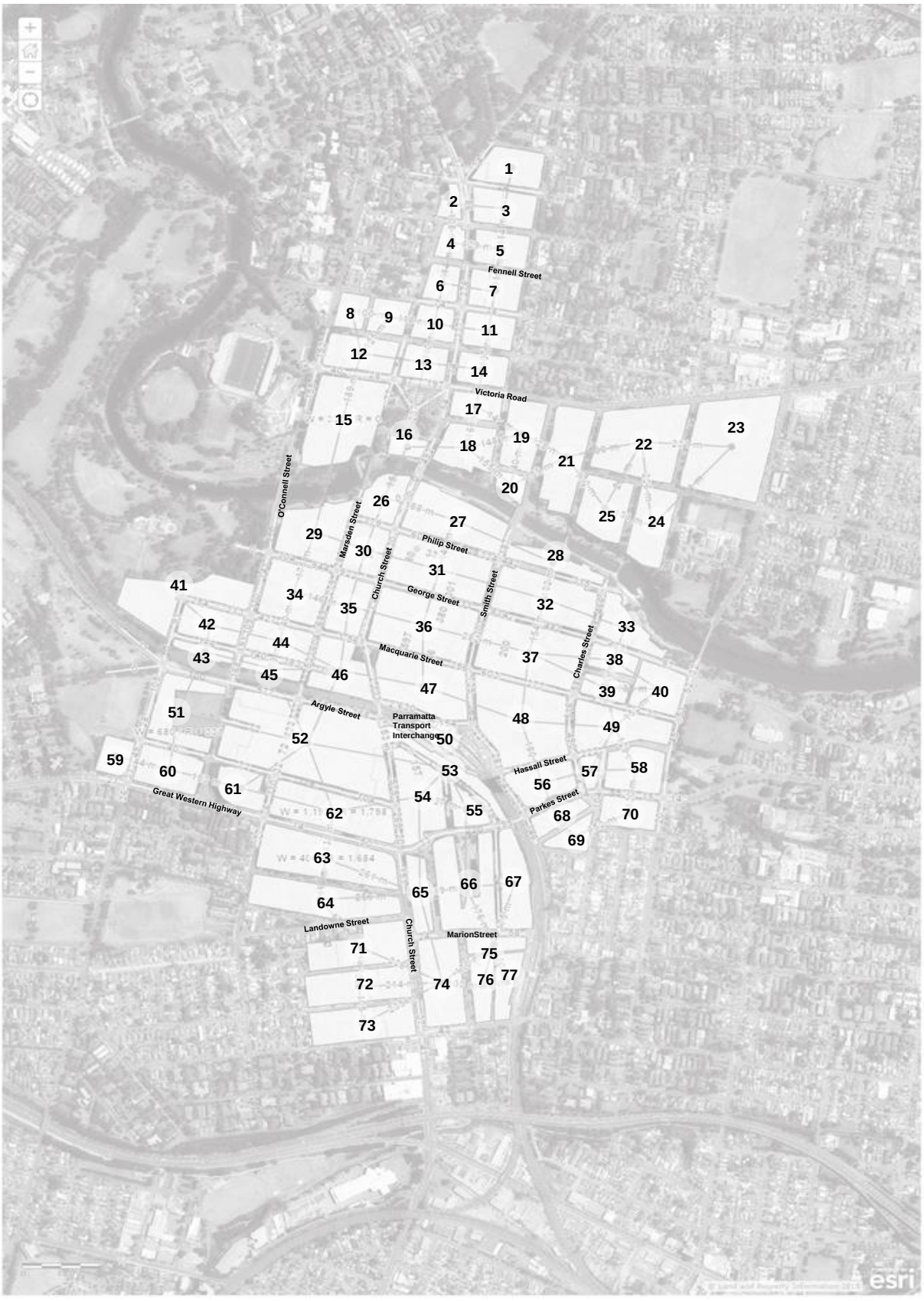
The pedestrian network has been modelled along existing key links with volumes modelled at survey locations only. Each link represents the pedestrian network between intersection points or nodes. The links generally correspond to the road network, however some additional pedestrian links create extra options for pedestrians. The links each have a length which correspond directly to the 'true' length of the path. In the base case model, each link began with an equal co-efficient of attractiveness which was adjusted through several iterations to calibrate against observed demands.

Future links were modelled by manually redistributing volumes from nearby parallel links where a proportion of pedestrians could reasonably be expected use alternative routes due to amenity changes which are difficult to account for in the model.

1.2.3 Origin - Destination routes

GIS software was used to calculate trip distance between each of the 77 origin and destination blocks. Initial route assignment was determined by calculating the shortest walking distance along pedestrian links between all origin-destination pairs. The linear distance co-efficient applied to each of these links increased or decreased the 'effective' length and thereby allowed for redistribution of pedestrians through the network.

Figure 2 Modelled street blocks in Parramatta CBD study area



1.2.4 Existing residential population

Existing residential population was derived by the number of existing dwellings and population data provided by Council as outlined in **Section** Error! Reference source not found..

1.2.5 Existing employment population

Current employment population was derived by linking several sources of data to arrive at an existing figure. This included review of the following:

> Existing employment land use floor area.

> BTS forecast employment 2016.

> Forecast ID employment type breakdowns.

> Parramatta CBD Planning Strategy employment and commercial floor space data.

> Parramatta CBD Planning Framework: Economic analysis, SGS Economics and Planning; employment forecasts and worker to floor area densities.

> Google Streetview and Nearmap review and measurement to estimate of retail and food and drink land uses by block.

Initial worker population estimates have been derived from Council provided employment floor areas and the assumption of an average worker density of 20sq.m per worker. The background document review was used to estimate the employment land uses into three general categories: Retail, Restaurant and Office/ Other.

The need to distinguish employment land uses is because due to the different trip generation rates for residents and workers within the three key categories of employment land use. For this purpose, the ratio of visitors to residents and employees is also important to establish the overall trip production. In the pedestrian model during the peak modelled period, the following base pedestrian trip generation rates derived from ITE have been adopted per resident/ employee as outlined in **Table 1-1**.

Table 1-1 Adopted pedestrian trip generation rates

Land Use	Adopted pedestrian trip generation rate at lunch period, per employee/resident [1]	Low rate	High rate
Residential	0.32	To be updated	To be updated
Office	1.0	To be updated	To be updated
Retail	7.2	To be updated	To be updated
Restaurant (Food and drink)	6.5	To be updated	To be updated

[1] Urban Land Institute, Shared Parking

1.2.6 Maximum walking distance assumption

A linear walking distance function has been incorporated into the model through a scaling matrix. This allows the flexibility to adjust the walking distance that accounts for the majority of walking trips. An average walking trip of 800 metres was assumed for this model (representing an absolute maximum distance of 1,600m), which most closely matched observed volumes. The linear decline in this function assumes a constant reduction in pedestrian willingness to make a trip from 100% at 0 metre distance, to 0% above 1,600m. Therefore, where the minimum calculated trip distance exceeds 1600 metres between any two origin-destination pairs, that trip is excluded from the ultimate demand.

1.2.7 Propensity to travel

Propensity to travel is the mathematical representation of the relationship of pedestrian generation and attraction between the different land uses and their respective populations.

The base level of propensity to travel adopted during the peak period between land uses is based on application of **Table 1-2**, extracted from NCHRP *Report 684*.

Table 1-2 Base trip attraction rates PM (Lunch) Peak

Step 1		To			
		Residential	Office	Retail	Restaurant
From	Residential	0%	2%	1%	20%
	Office	1%	0%	28%	63%
	Retail	14%	29%	0%	13%
	Restaurant	4%	31%	14%	0%
Step 2		From			
To	Residential	0%	0%	2%	5%
	Office	3%	0%	4%	14%
	Retail	17%	32%	0%	8%
	Restaurant	20%	23%	50%	0%

NCHRP Report 684, Enhancing Internal Trip Capture Estimation for Mixed-Use Developments

An assessment is made in a number of steps.

1. An assessment is first made of land use populations to travel 'from' a location to another land use.
2. The second step assesses land use populations that can be travelled 'to', from other pedestrian generating land uses.
3. Two different values will be calculated. The greater calculated value represents the full potent of trips to be made, irrespective of the receiving land uses ability to absorb pedestrian trips. The lesser value adopted which will be the feasible level of pedestrian trips that can occur between land uses. For example a small café could not accommodate 3,000 office workers in a peak hour, and the model would redistribute the excess pedestrian demand to other CBD blocks.

1.2.8 Future population

1.2.8.1 Future residential population

Future residential populations have been estimated using the following steps:

> Assessing proposed planning controls to allow higher intensity developments and multiplying the allowable full floor area by 67% as a factor of the maximum floor area likely feasibly be constructed;

> Excluding CBD blocks that are unlikely accommodate any future development due to heritage or other constraints, or where residential land uses are not planned; and

> Assessing population growth forecasts to determine the likely number of residents living in the study area in the future and distributing this uniformly across city blocks.

The design year 2056 was modelled first and the design years 2026 and 2036 represent reduced factors of 2056.

1.2.8.2 Future worker population

Future worker populations have been estimated using the following steps:

> Assessing proposed planning controls to allow higher intensity developments and multiplying the allowable full floor area by 67% as a factor of the maximum floor area likely feasibly be constructed;

> Excluding CBD blocks that are unlikely accommodate any future development due to heritage or other constraints, or where employment land uses are not planned; and

> Reviewing employment forecasts and separating into three categories, retail, restaurant and office/ other.

As with the residential population, the design year 2056 for employment land uses was modelled first with design years 2026 and 2036 represented as reduced factors.

1.3 Modelling calibration and iterations

Unscaled modelling volumes calculated far exceed observed values as the modelling base case does not account for constraints other than distance and link co-efficient, and calculates propensity to travel pairwise across the network for every origin-destination pair. To account for this, the existing condition model is factored down so that the sum of the modelled demands match the sum of the existing surveyed demands.

The scaled volumes of pedestrians at each survey location were compared to the observed values at each survey location. Link coefficients were adjusted over several iterations to increase the attractiveness of a link (reducing the 'effective' distance) when modelled values were lower than observed and conversely adjusted to be less attractive (increasing the 'effective' distance) where modelled volumes were higher than existing observed volumes.

This process required several iterations, with adjustment of link coefficients affecting both trip generation and route choice.

1.3.1 Limitations of the model

The calibration method used combines a range of fine-grained real-life effects into a single link-based factor. This creates some limitations in the model as described below:

> All trips are assumed to be made within the model environment. That is, trips can be completed only within the defined pedestrian network and between included zones. This means that trip generation may be exaggerated along corridors with few alternatives. The model works best where the network provides multiple potential routes (i.e. the centre of the CBD).

> Trip generation is assumed to be constant and related directly to theoretical values for land use categories. However, due to the coarseness of the land-use categories provided, trip generation rates are likely to be applicable only in the aggregate. Low-generation retail such as showroom retail will be over-estimated in the model, with link-based distance adjustments required to reduce trip propagation through the network. This model outcome is considered to be reflective of the reduced distance showroom retail shoppers are willing to walk, but could influence the accuracy of the model for future scenarios if showroom retail were to be redeveloped into other high-generation uses.

APPENDIX

D

REVIEW OF PEDESTRIAN CONSIDERATIONS IN THE DCP

Parramatta 2011 Development Control Plan – The review of pedestrian consideration in the DCP

1 Introduction

Sections relevant to pedestrian movement in the PCC 2011 DCP have been reviewed to consider their appropriateness for future planning of the CBD and where they are not, further considerations are outlined or recommendations are made. Relevant sections of the DCP reviewed are:

Section 3 Development Principles, general application to the LGA.

Section 4 Special Precincts, of relevance, 4.3 Strategic Precincts, 4.3.3 Parramatta City Centre.

Sections of the DCP identified as relevant to pedestrian movement include:

Section 3.6.3, Accessibility and Connectivity provides guidance on how pedestrian movement should be provided through development sites where applicable, usually larger development sites.

Section 4.3.3.3 Public Domain and Pedestrian Amenity discusses site links and lanes, active frontages, pedestrian overpasses and underpasses, awnings and courtyards and squares.

- Part a) Site Links and Lanes
- Part b) Active Frontages
- Part c) Pedestrian overpasses and underpasses
- Part d) Awnings

Section 4.3.3.5 Access and Parking outlines some pedestrian considerations in

- Part a) Vehicle Footpath Crossings
- Part b) Pedestrian Access and Mobility

Each of these DCP sections are reviewed in the following sections of this Appendix.

2 Review summary

2.1 Accessibility and Connectivity (Section 3.6.3)

A review of the entire section is outlined in **Table 2-1** as follows:

Table 2-1 Parramatta DCP review: 3.6.3 Accessibility and Connectivity

Clause number	DCP text	Cardno discussion/ consideration
Preamble	In some areas of Parramatta topography and/or the street pattern limit the ability of pedestrians to walk to neighbourhood facilities, raising the dependence on cars, lowering opportunities for social interaction and reducing the safety and vitality of the public realm. New development, particularly on large sites, can provide opportunities for the creation of new pedestrian links through sites to improve the accessibility and connectivity within neighbourhoods.	The impact of topography in the CBD is lower than other locations of the local government area. The CBD will and should form the preeminent example for the LGA and regionally. The preamble is especially relevant to the CBD given the proposed development in the coming years where redevelopment will provide ample opportunity to provide new and additional pedestrian links creating an opportunity for a city to explore.
Objective 01	To improve pedestrian access and connectivity between housing, open space networks, community facilities, public transport, local activity centres and schools.	There is the potential to expand the statement to specifically nominate commercial/ office developments and better integrated retail facilities as opposed to stand-alone shopping centres.
Objective 02	To encourage pedestrian through-site links that are designed to promote safety and amenity.	A great general objective that can generate a number of design principles.
Design Principle 01	Pedestrian links should be provided where possible through development sites to improve connectivity between housing, open space networks, community facilities, public transport, local activity centres and schools.	This is generally easier to achieve on larger sites. Council should adopt the proposed pedestrian network identified in this Pedestrian Strategy.
Design Principle 02	Through-site links should be arranged on the site to enable casual surveillance from buildings on the site and from the street or public domain.	Urban design consideration that should be promoted
Design Principle 03	Through-site links should be integrated with the circulation system of the site so that they perform a role for circulation within as well as through the site.	Agreed subject to prevailing volumes and conflicts. It is anticipated this would rarely cause issues but may need investigation in busier locations
Design Principle 04	Through-site links are to be landscaped and appropriate lighting levels provided and maintained.	Urban design consideration. Minimum lighting levels could be specified in Design Controls with consideration of impacts on artistic installations.
Design Principle 05	Public, communal and private areas are to be clearly delineated within the site.	Urban design consideration.
Design Principle 06	Pedestrian and cycle links should be provided on sites adjacent to waterways to	Public access should be available to all waterways where topographic or environmental constraints do not exist.

	improve accessibility to these natural systems.	
Design Principle 07	Existing through-site pedestrian links are to be retained by all types of development, except where alternative access can be provided at Council's satisfaction.	This provides the opportunity to improve through connections and is supported.
Design Control C1	Pedestrian through-site links are to have a minimum width of 3 metres and are to be constructed to an appropriate standard, using materials and finishes acceptable to Council	The design control should nominate if the required width is clear width or street furniture can be installed in the width e.g. related to likely demand.

2.2 Public Domain and Pedestrian Amenity (Section 4.3.3.3 Part a)

A review of the Part a) is outlined in **Table 2-2** as follows:

Table 2-2 Public Domain and Pedestrian Amenity, Part a) Site Links and Lanes

Clause number	DCP text	Cardno discussion/ consideration
Preamble	Site links provide access connections between the long sides of street blocks for pedestrian and vehicular access at street level. These links provide an important function in the form of lanes, shared zones, arcades and pedestrian ways.	It is important to define how to permeate street blocks avoiding long sections of block which can increase walking distance and therefore time and amenity.
Objective 01	To improve access in the city centre by providing new lanes and site links and enhancing existing links as redevelopment occurs.	Good general objective.
Objective 02	To contribute to the legibility of the pedestrian network.	Good general objective.
Objective 03	To ensure that site links have active frontages.	Good general objective.
Objective 04	To provide for pedestrian amenity and safety.	Good general objective.
Objective 05	To encourage removal of vehicular entries from primary street frontages.	While this is a good outcome for users of the main street network, it may transfer the vehicle/ pedestrian conflict to lane ways, which could decrease pedestrian amenity.
Objective 06	To retain and further develop lanes and small spaces as useful and interesting pedestrian connections as well as for service access.	A good objective to capture the essence of successful urban form in larger CBD's with a fine grain network of routes.
Objective 07	To implement Council's City Centre Lanes Policy. (Available on Council's web site).	It is good to reference external documents to limit the requirement to update the DCP particularly, maintain added flexibility to the DCP. In this instance where specific laneways are identified in the future.

Control 01	Through site links, arcades, shared ways and laneways are to be provided as shown in Figure 4.3.3.3.2.	The figure appears outdated. No links are identified at Civic Place for example.
Control 02	The design and finish of new site links is to be provided in accordance with Council's Public Domain Guidelines.	Urban design consideration.
Control 03	Site links for pedestrians and shared pedestrian and vehicular lanes are to: have a minimum of 40% of active ground floor frontage; be legible and direct throughways; provide public access at all business trading times when the link is through a development and at all times for lanes.	Developers should be encouraged to provide through access at all times to maintain a consistent pedestrian network availability at all times.
Control 04	Pedestrian site links are to have a minimum width of 3 metres non-leasable space clear of all obstructions (including columns, stairs and escalators)	The control should define that the 3.0 metre link cannot be separated through the site, i.e. two parallel 1.5 metre wide links.
Control 05	Internal arcades will not be approved in preference to activation of an existing or required lane or site link	Open site links provide the opportunity for all time access which will more often be an optimal outcome.
Control 06	Building address to lanes and site links shall create visual interest such as landscaping, awnings, paved finishes and good lighting	Urban design considerations. Minimum lighting levels should be stated.
Control 07	Shared lanes and vehicular lanes are to have a minimum width of 6m clear of all obstructions.	There is some ambiguity around "all obstructions" and it is not clear if this includes kerbs and gutters.
Control 08	To provide interest in these spaces, public art installations are encouraged in lanes.	A benefit to developers for providing this should be identified.

2.2.2 Active frontages

This section is noted as also encouraging the activation of the street level nominating minimum activation levels. Consideration should be given to flexible design that could facilitate alternative use options for an interim period when active frontages may not be economically feasible and the design requirement could distort optimal outcomes. It is noted that a suitable selection of use examples are provided, however an option could be included, for example "Other active frontage use subject to Council approval".

2.2.3 Pedestrian overpasses and underpasses

Section 4.3.3.3 part c) generally does not support the implementation of pedestrian overpasses and underpasses. This policy should remain as it encourages access at street level reducing cost to provide DDA compliant access throughout the CBD.

2.2.4 Awnings

Section 4.3.3.3 part d) identifies awnings and beneficial for rain and sun protection. Consideration should be given to the provision of allowing some natural light through, especially for colder periods where sunshine is desired. Control 06 identifies that a 1.8 metre clear path of travel be provided along building edges in lanes. This contradicts Lane Sections and Plans recommendations in the Public Domain Guidelines. Additionally, an extra 0.2 metre buffer is

recommended as identified in the Transport for London Pedestrian Comfort Guidance Document along building edges to ensure full use of the 1.8 metre clear path width.

2.2.5 Vehicle Footpath Crossings

The preamble of the section states that conflicts with pedestrians and vehicles should be minimised, with an objective "To make vehicle access to buildings more compatible with pedestrian movements…."

The five design controls for Location of Vehicle Access explicitly provide designers guidance of how to provide acceptable outcomes.

Consideration should be given to the least busy pedestrian link as to where to provide vehicle access rather than prescribe a preference for vehicle access via laneways which could have higher pedestrian volumes than adjacent streets.

2.2.6 Pedestrian Access and Mobility

The location of Pedestrian Access and Mobility as the final section of 4.3.3.3 seems out of order given the fundamental consideration of Pedestrian Access. The objectives and controls provide a good foundation for and amenable interface between the public and privately owned domains.

APPENDIX

E

PEDESTRIAN DESIGN GUIDELINES

Pedestrian Design Guidelines – for new developments

1 Introduction

These Pedestrian Design Guidelines (The Guidelines) provide direction on the design elements of new developments that can have an effect on the walking experience in the CBD. The aim is to ensure pedestrians are safe and prioritised, destinations are easily accessible and streets are well activated.

1.1 Principles of design

The key purpose of these Guidelines is to encourage the redevelopment of CBD blocks in a way which:

> Creates an area that people enjoy and feel comfortable being in;

> Supports pedestrian safety and minimises interaction with vehicles;

> Provides easy and convenient connections to the surrounding footpath network and is supportive of a strong pedestrian presence;

> Applies good urban design practice by ensuring uniformity with the structure and local character of the public domain; and

> Complies with the latest standards, guidelines and technical directions for pedestrian safety and amenity.

Application of these Guidelines will assist in the achievement of the strategic walking objectives developed for the Pedestrian Strategy. Of particular relevance is Objective 3, outlined below:

Objective 3: Capitalise on the transformation of the CBD

Increasing density will require a greater percentage of recreational and transport trips to consist of, or incorporate walking. The public and private investment into the fabric of Parramatta will be focused to ensure best-practice outcomes for pedestrians and the walking network. The redevelopment of CBD blocks contribute to a permeable and connected network for all residents, workers and visitors.

Guidance has been sought through research of best practice examples in similar urban areas, to understand applications of innovative solutions that seek to create enjoyable spaces at the building – public domain interface and prioritise pedestrians, and (where possible) are suitable and similar to Council's own design objectives for the CBD.

2 Pedestrian Design Guidelines

These Guidelines outline the desirable characteristics of pedestrian facilities, within and surrounding new developments that demonstrate good design practice, and support the objectives of the walkable CBD. The recommendations are targeted towards seven design elements which address the interface between the development site and the adjoining public domain. These include:

> Footpaths;

> Driveways and associated pedestrian crossings;

> Building frontages and accessibility;

> Personal safety and amenity

> Weather protection;

> Through site links; and

> Construction impacts

The research and best practice which informed the development of the key design requirements are discussed in **Section 4**.

3 Key design requirements

A summary of the key pedestrian design requirements for new developments is provided in the following sections.

3.1 Footpaths

New developments should aim to prioritise pedestrian access and movements where possible above other modes. Footpaths along the adjoining site boundaries should be designed with the needs of pedestrians in mind, including widths that accurately reflect the anticipated passing volumes, as well as compliance with minimum standards for comfortable access for mobility impaired users. Links should be intuitive and facilitate easy navigation by users, providing fast connections to the subject site, and destinations beyond.

3.1.1 Pedestrian clear path of travel

The clear path of travel refers to the footpath space that is designated solely for the purposes of facilitating through movement by pedestrians. In similar CBD contexts, consideration is given to the anticipated volume of pedestrians passing the subject site, and new developments should consider the impact of providing new land uses, and the associated increase in the number of walking trips.

3.1.2 CBD – footpath requirements

The clear path of travel requirements for the CBD are set out in **Table 3-1**. These must be provided along all frontages of a new development. In addition to these clear path of travel widths, clearance buffers are required against building facades, kerbs and street furniture.

The recommended clear path of travel is based on achieving a Fruin Level of Service A on all CBD streets and on providing a comfortable passing width for two wheelchairs, whichever width is larger. 0.2 metre buffers should be provided along building facades, kerb lines and general street furniture, with the exception of seats, where a 0.5 metre allowance should be made along its front.

See **Figure 6-13** (**Section 6.6**) in the Parramatta CBD Pedestrian Strategy for details of where the Inner CBD and Outer CBD clear path of travel widths apply.

Table 3-1 Clear path of travel requirements

CBD location	Clear path of travel
Outer CBD	1.8 metres
Inner CBD	2.2 metres
George Street and Church Street	Detailed investigation required

3.2 Driveways and crossings

Access and egress points located along footpaths introduce a potential risk of conflict between the vehicle and pedestrian user groups. Good design incorporates mitigation measures that reinforce pedestrian priority and visibility at these locations and aim to improve the walking experience, whilst drawing awareness to vehicle drivers of the transition as they leave the conventional road network environment.

Table 3-2 presents the driveway and crossing design requirements for the CBD.

Table 3-2 Driveway and crossing requirements

Design consideration	Design requirement
Driveways and crossings	New development requirement: ▪ The requirements of the Public Domain Guidelines (February 2016) are adopted; these are: – Driveways are considered a component of the footpath, and thus pedestrian movements are prioritised – The use of smaller sized pavers than those of the footpath, to emphasise pedestrian priority, but indicate caution for the change in the walking environment. – Tactile Ground Surface Indicators (TGSI) to be installed on both approaches to the driveway for the width of the clear path of travel. – Truncations are to be provided at building corners such that pedestrians have clear sight lines of approaching vehicles at a distance of 2.0 metres away from the conflict point, and vehicle drivers at a distance of 2.5 metres accordingly. ▪ Where possible, access and egress points are located away from busy pedestrian corridors, with potential for consolidating driveways that connect to the same site.

3.3 Building frontages and accessibility

Building frontages act as the key interface between the private component of places and the adjoining public domain. A well designed building frontage provides features that are appealing to visitors, is visually permeable and thus provides opportunities for active and passive surveillance, and is integrated with the local character of the surrounding streetscape.

Building frontages provide the first point of interaction for a visitor to a land use; designing to maximise pedestrian accessibility is highly desirable, as it promotes the interaction between people and places, and the amenity of both the adjoining streetscape, and the facilities of the development.

Table 3-3 presents the building frontage design requirements for the CBD.

Table 3-3 Building frontage and accessibility requirements

Design consideration	Design requirement
Building frontages and accessibility	New development requirement: ▪ A minimum of 70% of the building frontage is visually permeable; ▪ Consider providing one entrance point is to be provided for a development for each street where a frontage is provided; and ▪ Frontages to open public spaces, including squares, parks and the river foreshore are highly desirable.

3.4 Personal safety and amenity

New developments should incorporate elements that contribute to an improvement in both the perception of, and actual safety of its visitors, in addition to pedestrians that will use the adjoining facilities such as footpaths or crossings. A well designed site incorporates measures that draw on the principles of Crime Prevention Through Environmental Design (CPTED), with elements to consider including lighting, passive and active surveillance.

Table 3-4 presents the personal safety and amenity design requirements for the CBD.

Table 3-4 Personal safety and amenity design requirements

Design consideration	Design requirement
Personal safety and amenity	New development requirement: ▪ High quality CCTV and LED lighting is incorporated along the adjacent footpaths and any through site links; ▪ Promote “outward-looking” development and not “inward-looking” designs with blank walls; ▪ Initiatives that increase passive surveillance, particularly along laneways are incorporated; and ▪ Measures are implemented that target crime and anti-social behaviour.

3.5 Weather protection

The incorporation of weather protection measures, both artificial and natural, promote walking through urban centres by ensuring the comfort of users in protection from the elements. Facilities such as awnings provide protection from rain and winds, whilst trees and vegetation act to provide shade from the sun during warmer weather.

Table 3-5 presents the weather protection design requirements for the CBD.

Table 3-5 Weather protection design requirements

Design consideration	Design requirement
Weather protection	New development requirement: ▪ Awnings are required along the main CBD streets, however they are not required for laneways. ▪ Awnings must be cantilevered from the building face; no posts are allowed along the footpath as they restrict sight lines along the path of travel. ▪ Retractable awnings are preferred along laneways if they are to be provided. ▪ Awnings must be set back 600mm from the edge of the road carriageway, on streets with no trees. ▪ Sufficient clearances must be provided where street trees are provided along the footpath.

3.6 Through site links

The presence of through site links in new developments provide an excellent opportunity for activation of the site. The presence of new facilities such as new laneways, and both above ground or underground links facilitates the more efficient movement of pedestrians by minimising the need for these users to walk the length of the subject site to access nearby land uses or transport links.

Table 3-6 presents the through site link design requirements for the Parramatta CBD.

Table 3-6 Through site link design requirements

Design Consideration	Design Requirement
Through site links	New development requirement: ▪ It is recommended that, for new developments, investigations be conducted to provide through site links where possible. Where it is achievable, the recommendations outlined in the Parramatta DCP 2011 must be adopted.

3.7 Construction impacts

The development of a proposed site must also consider the temporary needs of all users who may be impacted by works and traffic movements that are associated with construction processes. The preparation of a Construction Traffic Management Plan (CTMP) is recommended as part of the submission of a Development Application (DA). Within the CTMP, consideration must be given to ensure that existing pedestrian access points and connections around the site are maintained at all times with minimal disruption.

Table 3-7 below presents the requirements for managing construction impacts in the Parramatta CBD.

Table 3-7 Construction impact management requirements

Design Consideration	Management requirements
Construction impacts	New development requirement: It is required that a Construction Traffic Management Plan be prepared and submitted with the DA package. The CTMP must include, of relevance to pedestrian facilities: ▪ Location and details of the proposed development, including construction works and associated hours of construction; and ▪ Impacts on existing pedestrian infrastructure, including footpaths and street furniture, and the proposed mitigation measures including temporary deviations of the footpath.

4 Research and best practice

The Parramatta CBD is a major urban centre that is earmarked for significant growth over the next 40 years. Serving as the gateway to Western Sydney, it is proposed to be Sydney's second CBD, providing a strategic regional centre of new commercial, residential and cultural developments within the "Global Economic Corridor".

In determining the requirements outlined in these Guidelines, consideration was given to other global cities and their best practice approaches to promoting the walking experience, with focus on facilities that promote pedestrian connectivity, access, safety and amenity around commercial developments. Investigations were conducted on the current infrastructure requirements for the Parramatta CBD, in addition to the Sydney, Melbourne and London CBD's for comparison.

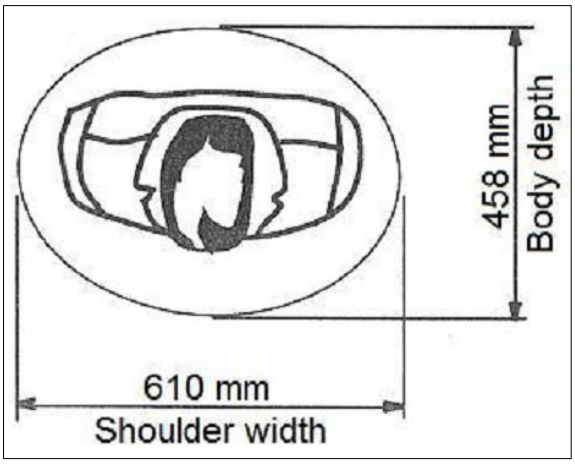
Summaries of the research of best practice for each of the seven facility components affecting the walking environment are presented in the sections below. These guided the development of the design requirements for the CBD, which are outlined in **Section 3** of this Appendix.

4.1 Footpaths

4.1.1 Spatial considerations

At a fundamental level, path width requirement is dictated by the space pedestrians require to pass at a reasonable level of comfort. The space nominated in AustRoads for average pedestrians is nominated as 610 millimetres wide and 458 millimetres deep as illustrated in **Figure 4-1** below.

Figure 4-1 Average pedestrian body ellipse

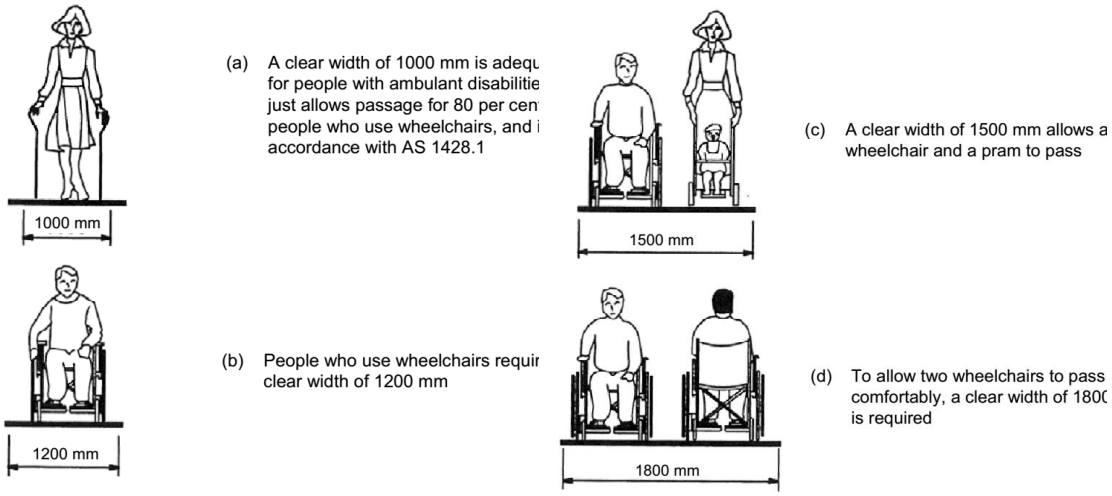


Source: Guide to Road Design Part 6A: Pedestrian and Cycle Paths, Austroads, 2009

Realistically, pedestrians are likely to desire greater clearances when passing in opposite directions as opposed to companions walking together in the same direction.

AustRoads nominates dimensions for path users with increased space requirements including people with ambulant disabilities, wheelchair users and people with prams as reproduced in **Figure 4-2**.

Figure 4-2 Other spatial considerations for footpaths



Source: Guide to Road Design Part 6A Pedestrian and Cyclist Paths, Austroads, 2009

Guidance for the consideration of footpaths in the study area has been sought from *Guide to Road Design, Part 6A: Pedestrian and Cyclist Paths, Austroads, 2009, Section 7.5*

4.1.2 Footpath width

Guidance for the width of footpaths has been reproduced from *Austroads* in **Figure 4-3** and **Figure 4-2**.

Figure 4-3 AustRoads footpath width recommendations for footpaths

Situation	Desired width (m)	Comments
General low demand	1.2 to 1.0 (absolute minimum)	General minimum is 1.2 m for most roads and streets. Clear width required for one wheelchair. Not adequate for commercial or shopping environments.
High pedestrian volumes	2.4 m (or higher based on demand)	Generally commercial and shopping areas.
For wheelchairs to pass	1.8 to 1.5 (desired minimum)	Allow for two wheelchairs to pass (1.8 m comfortable, 1.5 m minimum) Narrower width (1.2 m) can be tolerated for short distances.
For people with other disabilities	1.8 to 1.0	

Source: Guide to Road Design, Part 6A: Pedestrian and Cyclist Paths, Austroads, 2009

Based on the guidance in **Figure 4-2** a desired minimum 1.5 metre path is required to allow a wheelchair user and pram to pass.

A clear path of travel of 1.8 metres wide or greater is recommended for busier paths and provides more space for two wheelchairs to pass in addition to greater path capacity. In the context of a CBD environment a 1.8 metre clear path of travel will be the general recommended minimum width on streets, however it is noted in Austroads that people with ambulant disabilities require 1.0 metre of clear space and therefore at least 2.0 metres of clear path of travel would be required for people with ambulant disabilities to pass each other.

On lower volume lane-ways, narrower paths may be sufficient depending on the prevailing pedestrian volumes.

Transport for London specify path widths for low, medium and high volume streets as outlined in **Table 4-1**.

Table 4-1 Transport for London path width recommendations

Category	Low	Medium	High
Pedestrians per hour	<600	600 – 1,200	>1,200
Total width (metres)	2.9	3.3 - 4.2	5.3
Clear width (metres)	2.0	2.2	3.3

It is important to note that Transport for London utilise custom criteria which has a relatively low threshold of pedestrian congestion when compared to Fruin's pedestrian congestion criteria, discussed further in **Section 4.2**.

Considerations of obstacles and environmental conditions may also render some path width areas as clearance zones. Transport for London nominate a 0.2 metre clearance zone adjacent to building facades and kerbs. The clear width measurements in **Table 4-1** include this buffer zone. In the scenario of a kerb to building footpath, the effective width would be the total minus 0.4 metres.

4.2 Path Level of Service

Path Level of Service considers guidance from:

> Fruin's Level of Service

> City of Melbourne, Pedestrian Level of Service and Trip Generation, Mia Pantzar, 2012

> Pedestrian Comfort Guidance for London, Transport for London, 2010

> Cardno's previous interchange experience for Transport for NSW Transport Access Program

Austroads footpath width recommendations

Austroads provides general guidance on path width recommendations as shown in **Table 4-2**.

Table 4-2 Austroads footpath width recommendations for footpaths

Situation	Desired width (m)	Comments
General low demand	1.2 to 1.0 (absolute minimum)	General minimum is 1.2 m for most roads and streets. Clear width required for one wheelchair. Not adequate for commercial or shopping environments.
High pedestrian volumes	2.4 m (or higher based on demand)	Generally commercial and shopping areas.
For wheelchairs to pass	1.8 to 1.5 (desired minimum)	Allow for two wheelchairs to pass (1.8 m comfortable, 1.5 m minimum) Narrower width (1.2 m) can be tolerated for short distances.
For people with other disabilities	1.8 to 1.0	

Source: Guide to Road Design, Part 6A: Pedestrian and Cyclist Paths, Austroads, 2009

A path width of 1.8m wide or greater is recommended for busier paths and provides more space for two wheelchairs to pass in addition to greater path capacity. In the context of a CBD environment a 1.8 metre wide path will be the general recommended minimum width on streets.

Fruin's Level of Service

Fruin's Level of Service (LoS) is a series of density and flow rate bands that correspond to levels of service between A (highest) and F (lowest), depending on location. It was developed by John J Fruin PhD in the 1970's, and is the accepted industry standard in Australia and many other international jurisdictions for analysing pedestrian congestion.

Fruin LoS can be measured using density or flow rate, depending on circumstance. The density or flow rate also varies as a relation of flat walkways, stairs or queues. The ranking parameters of Fruin LoS are reproduced in **Table 4-3**.

In the context of Parramatta CBD, Walkways are the most relevant measurement parameters, with density to measure public spaces with a higher place function and flow rate to measure the cross section of footpath with a high movement function. The flow rate should be measured at the narrowest point.

Transport for NSW nominates the minimum desirable LoS C through transport interchanges, with the exception of stairways and escalators where a LoS E is acceptable and often cannot be controlled and interchange users willingly accepted this LoS for limited periods at constraint points. These values are less relevant for CBD streets where higher LoS will generally be expected by pedestrians.

Gehl Architects nominates a level of 13 pedestrians/ minute/ metre as the threshold for a crowded footpath based on their research. Their research found that pedestrians begin to divert trips where pedestrian density are above this level. This level falls into the Fruin LoS of A.

Table 4-3 Fruin's Level of Service

Fruin's Level of Service	Walkways		Stairs		Queue
	Density (m^2/ped)	Flow rate (ped/min/m)	Density (m^2/ped)	Flow rate (ped/min/m)	Density (m^2/ped)
A	>3.24	<23	>1.85	<16	>1.21
B	2.32 – 3.24	23 – 33	1.39 – 1.85	16 – 23	0.93 – 1.21
C	1.39 – 2.32	33 – 49	0.93 – 1.39	23 – 33	0.65 – 0.93
D	0.93 – 1.39	49 – 66	0.65 – 0.93	33 – 43	0.28 – 0.65
E	0.46 – 0.93	66 – 82	0.37 – 0.65	43 - 56	0.19 – 0.28
F	<0.46	>82	<0.37	>56	<0.19

Transport for London's Pedestrian Comfort Levels

Transport for London (TfL) have a comprehensive set of criteria that assesses pedestrian LoS based on Pedestrian Comfort Levels (PCL) as reproduced in **Figure 4-4**.

Acceptable PCL's apply to different environments which Transport for London categorise as presented below in **Table 4-4**:

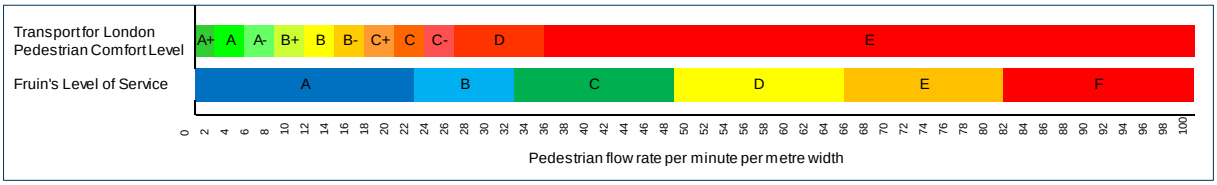
Table 4-4 Comfort 'At Risk' PCL against environmental context

Average of maximum activity level comfort 'At Risk' PCL	Transport for London environment category	CBD equivalent example
B -	High Street	Church Street between Parramatta River and Macquarie Street
D	Office and Retail	Commercial core bound by O'Connell Street, Phillip Street, Charles Street and George Street.
C -	Residential	South west precinct of CBD
B -	Tourist Attraction	(Future) Powerhouse Museum
D	Transport Interchange	Parramatta Interchange

Figure 4-4 Transport for London Pedestrian Comfort Levels

A comparison of TfL's PCL and Fruin's Level of Service is shown in **Figure 4-5**.

Figure 4-5 Pedestrian service rating comparison



As can be seen in **Figure 4-5**, TfL's desirable comfort ratings, A+ to C- fall into Fruin's LoS A and B only.

4.2.2 Case study centres

The determination of the appropriate design of footpaths in each of the four study centres (Parramatta, Sydney, Melbourne and London) is dependent on factors including the function of the route/s surrounding the development, and the anticipated pedestrian volumes.

Table 4-5 provides a summary of the minimum clear path of travel currently required across the four CBDs.

Table 4-5 Clear path of travel requirements

City	Current clear path of travel
Parramatta (Current)	The Public Domain Guidelines recommend a minimum clear path of travel of 1.8 metres.
Sydney	Primarily dependent on the function of the route as a high priority level connecting the regional centres, or a local route linking nearby facilities within a centre. ▪ In the Sydney CBD, 2.0 metres is the preferred clear path of travel width for a local route, and 4.0 metres for a high volume link.
Melbourne	The City of Melbourne considers two elements; Minimum clear path of travel and Pedestrian Comfort Levels (PCL). ▪ Clear path of travel is adopted from the Design Construction Standards for Docklands. At an absolute minimum, a 1.5 metre clear path of travel must be provided, with larger widths along most streets. ▪ The City of Melbourne has adopted Transport for London's recommended minimum PCL of B+, defined as 11 persons per minute per metre of clear path of travel.
London	The clear path of travel is dependent on the anticipated flow volumes. The following clear path of travel widths are recommended: ▪ For low flow (less than 600 persons per hour), the minimum width is 2.0 metres; ▪ For medium flow (600 to 1,200 pph), the minimum width is 2.2 metres; and ▪ For high flow (more than 1,200 pph) the minimum width is 3.3 metres.

Following a comparative analysis of both methods, PCL was determined to be more suitable for calculating clear path of travel recommendations in the Parramatta CBD as it provides a more nuanced assessment.

The minimum clear path widths recommendations for the CBD to achieve a PCL of B+ or higher are provided in the main body of the Pedestrian Strategy.

4.3 Driveways and crossings

In each of the four case study cities, the primary focus of driveway and crossing design is the inclusion of elements that indicate a change in both the walking environment for pedestrians, and the transition for vehicles to or away from the conventional road network.

Table 4-6 presents a summary of the measures currently implemented in different CBD contexts.

Table 4-6 Driveways and crossing requirements

City	Driveway design elements
Parramatta (Current)	The Public Domain Guidelines (February 2016) require the following design components for the CBD: ▪ Driveways are considered a component of the footpath, and thus pedestrian movements are prioritised ▪ The use of smaller sized pavers than those of the footpath, to emphasise pedestrian priority, but indicate caution for the change in the walking environment. ▪ Tactile Ground Surface Indicators (TGSI) to be installed on both approaches to the driveway for the width of the clear path of travel.
Sydney	The City of Sydney provides the following guidelines in regards to driveway design: ▪ Driveways should generally be located away from high priority pedestrian streets ▪ The design should not provide an interruption to the prevailing footpath link; surface treatments should be consistent with the adjacent path, and the gradient should be level with the footpath at the kerb. ▪ Flexibility is afforded to industrial developments with regards to appropriate surface treatments. Final approval on the design is granted by the City of Sydney Council.
Melbourne	The City of Melbourne provides the following guidelines: ▪ Where possible, the number of driveways along high volume pedestrian areas should be reduced. ▪ All driveways must be designed to provide an asphalt surface. The use of paving treatments, including those of any adjacent footpath is not permitted.
London	Guidance on the design of driveways is given by the UK government's Manual for the Streets. ▪ Designing to provide adequate sight lines should take into consideration the anticipated volume of pedestrians and the adjacent footpath width. Higher volumes and/or smaller path widths should yield to wider visibility splays. ▪ If possible, it may be beneficial to provide a single access and egress point to a site rather than at multiple locations that can present unnecessary interruptions to pedestrian movements.

4.4 Building frontages and accessibility

The design of building frontages in the case study cities are influenced primarily by the need to ensure continuity with the surrounding urban context and local character (including heritage elements) of the area in which the development is proposed. Common to all CBD's is the need to incorporate design features that also promote pedestrian safety and security through permeable frontages.

The key principles for building frontages in other CBD contexts is provided in **Table 4-7** below.

Table 4-7 Building frontage and accessibility requirements

City	Building frontage and accessibility considerations
Parramatta (Current)	Specific requirements have been outlined in the Parramatta DCP to maximise building frontage activation; these include: ▪ A minimum of 50% of the building frontage to be activated where the subject site is located along a primary street; for a secondary street, 40% is acceptable. ▪ A minimum of one entrance point is to be provided for a development for each street where a frontage is provided. ▪ Frontages to open public spaces, including squares, parks and the river foreshore are highly desirable.
Sydney	The City of Sydney DCP outlines the following considerations: ▪ Ground floor frontages are to be designed of a high visual quality, and be targeted to passing pedestrians ▪ Encourage activation of new areas where development occurs ▪ Blank walls and service facilities are to be minimised, with frequent entrance points encouraged. ▪ A minimum of 70% of the building frontage is to be visually permeable to a depth of 6 metres.
Melbourne	The key design considerations outlined in the Melbourne Planning Scheme for the Capital City Zone include: ▪ Designing facades that align with the existing frontages, but does not replicate those of surrounding buildings ▪ Incorporating detail that engages passing pedestrians. ▪ Where the building incorporates the street corner, designing the frontages to ensure continuity. ▪ Incorporating lighting of the adjoining path for safety and activation purposes; and ▪ Discouraging the use of solid roller shutters along frontages, with open mesh products preferred.
London	The City of London has provided guidance on the design of shopfronts; the key considerations include: ▪ Retention of heritage elements in the design where the location is in a conservation area of historical significance. ▪ Entrances should be clear and wide enough to allow for easy access, including disabled access. ▪ Restriction of large advertising signs within the façade design, with the focus being on using high quality materials that reflect the local character of the area. ▪ The use of external security roller shutters is discouraged, with focus on implementing security measures within the interior of the building.

4.5 Personal safety and security

The case study cities enhance personal safety and security of pedestrians primarily through the implementation of measures that assist in activating the domain within and surrounding the proposed development, and aim to reduce the incidence of crime. The key principles for personal safety and security in other CBD contexts is provided in **Table 4-8** below.

Table 4-8 Personal safety and security requirements

City	Personal safety and security measures
Parramatta (Current)	The Parramatta Safety Plan 2014 – 2018 provides a strategic overview of the key objectives and actions to be implemented to improve safety in the Parramatta LGA and reduce the incidence of crime and disorderly behaviour. The key actions for the CBD include: ▪ Implementing CCTV coverage in Church Street ▪ Increasing access to public toilets in the CBD after hours ▪ Building safety measures into the future Parramatta Square, and the surrounding connections ▪ Developing a network of safe walking routes through the CBD that link transport services with key land uses.
Sydney	The City of Sydney Walking Strategy provides guidance for safety measures across the LGA; these include: ▪ Applying CPTED principles to all new developments as a means of enhancing safety for pedestrians, particularly after dark. The key actions include activating laneways, and maintaining clear sight lines. ▪ Implement planning controls in the DCP that require new developments to ensure passive surveillance is available, both through building frontages and in the public domain. ▪ Delivering high quality LED lighting across all routes along the Council developed Liveable Green Network (LGN).
Melbourne	The City of Melbourne Walking Plan 2014 – 2017 provides a series of key actions relating to personal safety and security; these include: ▪ Promoting passive surveillance measures through good design of development frontages, ensuring clear sight lines from the footpath. ▪ Ensuring new developments incorporate adequate external lighting to improve safety and activate the adjacent streetscape. ▪ Minimising access to car parks and service areas along street frontages, and locating garbage collection areas to off-street areas away from the public domain. ▪ Discouraging the inclusion of spaces or alcoves that are not visible by passing pedestrians.
London	The London Manual for Streets provides examples of good design with respect to pedestrian safety and security; the key considerations include: ▪ Good passive surveillance from activated frontages that provide clear sightlines to the adjoining street. ▪ Promotion of the footpath network through high quality path design and activation that promotes higher volumes of walking trips ▪ Minimised evidence of anti-social behaviour, which includes graffiti, vandalism or rubbish in the public domain ▪ Good lighting throughout the path of travel that promotes clear sight lines for pedestrians; and ▪ Clearly designated entry and exit points within land uses and the public domain to reduce the perception of potential entrapment and incidence of crime.

4.6 Weather protection

Weather protection measures along pedestrian routes are desirable across all the case study cities; the main differences are in regards to the factors considered that influence the design and subsequent implementation of the facility.

The key principles for weather protection in other CBD contexts is provided in **Table 4-9** below.

Table 4-9 Weather protection requirements

City	Weather protection measures
Parramatta (Current)	The Public Domain Guidelines provide recommendations for the provision of awnings as part of new developments. The key considerations include: ▪ Awnings are required along the main CBD streets, however they are not required for laneways. ▪ Awnings must be cantilevered from the building face; no posts are allowed along the footpath as they restrict sight lines along the path of travel. ▪ Retractable awnings are preferred along laneways if they are to be provided. ▪ Awnings must be set back 600mm from the edge of the road carriageway ▪ Sufficient clearances must be provided where street trees are provided along the footpath.
Sydney	The City of Sydney Walking Strategy provides the following guidelines for weather protection: ▪ Continuous weather protection is desirable, to minimise the impact on underground pedestrian corridors and the public transport system during periods of inclement weather. ▪ Street trees are a recommended initiative to be implemented across the Liveable Green Network (LGN) to provide shade on warm days and provide a pleasant walking and rest environment for pedestrians. ▪ Awnings are preferred along high volume streets in the CBD to facilitate pedestrian movements in busy areas.
Melbourne	The Melbourne Planning Scheme for the Capital City Zone provides the following recommendations for weather protection: ▪ Where building towers/skyscrapers are proposed, these should be set back from the street to mitigate the effects of high wind downdrafts. Treatments can be installed closer to the street level if required. ▪ The design of weather protection facilities such as awnings and canopies should be consistent with that of the surrounding buildings and streetscape. ▪ Canopies and awnings should be transparent where possible to allow for light exposure along the footpath.
London	The City of London's Manual for the Streets provides the following guidance with respect to weather protection measures: ▪ Awnings should be installed at a minimum height of 2.6 metres above the footpath surface. ▪ Tree species should be selected so as their growth does not encroach onto the clear zone for pedestrians or produce low-hanging branches. Regular maintenance is required to ensure the comfortable passage of pedestrians.

4.7 Through site links

Through site links are preferred by all four case study cities where it is feasible to do so, with the common objective of maximising pedestrian permeability through the development site, and improving general access to new buildings and connectivity to surrounding land uses.

The key principles for weather protection in other CBD contexts is provided in **Table 4-10** below.

Table 4-10 Through site link requirements

City	Through site link opportunities
Parramatta (Current)	The 2011 Parramatta DCP provides the following guidance: ▪ Through site links are encouraged, with particular emphasis on improving connectivity between different land uses and public transport services ▪ Passive surveillance must be achievable within the new links ▪ The alignment of the link must allow for efficient access both through and to the subject site. ▪ Through site links are to be well lit and landscaped, and attended to through regular maintenance ▪ Public and private spaces must be clearly delineated within the site; and ▪ Through site links must be a minimum of 3 metres in width, and incorporate Council approved surface finishes.
Sydney	The City of Sydney Walking Strategy provides the following recommendations: ▪ Through site links are preferred, particularly along large site blocks and in new public spaces. ▪ Through links are a key recommendation to meet the target of ensuring every LGA resident is within a three minute walk of the Liveable Green Network (LGN). ▪ Planning controls include the provision of through site links, particularly in urban renewal areas such as Green Square to maximise permeability, and encouraging and promoting the viability of walking.
Melbourne	The City of Melbourne Walking Plan 2014 – 2017 provides the following recommendations: ▪ Through site links are generally desirable as they provide more route choices to pedestrians and act to distribute demand volumes more effectively. ▪ The provision of through links should reflect the type of development; the facility is preferred for commercial and retail developments, however it is not advisable for residential land uses. ▪ The provision of the links must be reflective of modelling and monitoring initiatives to determine whether the provision of such facilities are warranted.
London	The City of London Manual for the Streets provides the following guidance for through site links: ▪ Through-site connections are highly desirable for precinct master plans as they improve connectivity to different land uses. Each street in the internal layout can be designated to serve a particular function in the movement of pedestrians and the local character in the area.

4.8 Construction impacts

The objectives of addressing construction impacts are common across all four case study cities, each requires documentation submitted that propose measures to minimise the effect on all user groups, and ensures their safety at all times during the construction phase of a development.

The following principles regarding the preparation of a CTMP are addressed below, with examples presented for each of the four case study cities.

> **Parramatta (Current)**: The preparation of a CTMP addressing pedestrian movements is recommended, to be submitted with the DA package.

> **Sydney**: The City of Sydney provides guidance on the content to be included in the CTMP. The key considerations for pedestrians include:

- Project details including proposed location, works, and hours of construction
- Details of the impact on users including residents, businesses, pedestrians, cyclists, local traffic, emergency vehicles and temporary staff parking.

> **Melbourne**: Depending on the subject site and the proposed works, the City of Melbourne requires the submission of a Construction Management Plan (CMP) which covers six elements of the associated demolition and building work. The key pedestrian considerations include:

- Protection of existing assets including signs, road markings and street furniture that may be impacted by the works. Where required, temporary ramps may be installed with approval by Council.
- Damage caused to the adjoining footpath, road or kerb and gutter is the responsibility of the developer or contractor. Immediate remediation works are required where the damage impacts on the safe movement of pedestrians, cyclists or vehicles.
- Construction equipment must not obstruct a pedestrian thoroughfare; if unavoidable, a gantry or overhead protection is recommended.
- Permission is required from Council to occupy any footpath space
- Safety barriers must be provided to prevent pedestrian access to the site, as well as along any temporary path designated as a result of the works.
- Pedestrian routes (including temporary routes) must provide a clear path of travel of 1.2 metres, with passing bays of 1.8 metres provided every 20 metres.

> **London**: Transport for London has prepared a guidance document for the preparation of a Construction Logistics Plan (CLP). The key considerations when preparing a CLP include:

- Information on the type of development, location and the proposed works.
- Hours of construction
- Proposed access to the site for public transport, cyclists and pedestrians, and any changes required for services during construction; and
- Management of movements for pedestrians, cyclists, buses and other traffic.
- Any anticipated impact on existing infrastructure, including pedestrian paths and other facilities (such as crossings, street furniture)

APPENDIX

F

WALKING GUIDELINES FOR GREEN TRAVEL PLANS

Walking Guidelines for Green Travel Plans

1 Introduction

A Green Travel Plan (GTP) is an important tool used in delivering accessible and sustainable communities and workplaces. As well as the need for developments to be well-connected, with facilities that promote safe with easy access to local shops and services, steps need to be taken to ensure that future mode choice is influenced by sustainable travel behaviour.

GTP's aim to increase active transport and public transport mode share of all trips, promote higher car occupancies and reduce the number of overall trips due to trip containment. It is usually created by a central organising person or group and should be applicable to the widest audience possible.

GTPs are usually presented in the form of a package of measures to encourage residents and workers to reconsider the use of single-occupancy car travel, and divert their travel behaviour to more sustainable choices. It can include a range of precinct-wide measures, such as:

> Offering residents, commercial tenants and staff detailed guidance on travel options;

> Car share schemes;

> A commitment to improve pedestrian and cyclist end of trip facilities;

> Employment of a dedicated travel plan officer; and

> Restricted car parking allocation and innovative travel demand management.

There are two types of GTPs, ones for residential developments and ones for workplace developments – often called Work Place Travel Plans (WPTP).

1.1 Green Travel Plan structure

A typical GTP and WPTP structure usually includes the key sections listed below:

> Purpose and benefits;

> Objectives;

> Existing and future network;

> Mode share analysis;

> Actions ; and

> Monitoring and reporting.

1.2 Purpose of these Guidelines

An important aim of GTPs is to encourage residents and workers to choose to walk for short trips to and from the development. These Guidelines set out the walking aspects that should be included in all GTPs and WPTPs prepared for new developments in the Parramatta CBD. Each of the topics listed in **Section 1.1** is discussed with reference to how walking should be

promoted and addressed by new developments. These walking aspects of GTPs should be integrated into a comprehensive GTP that addresses all modes of travel.

2 Walking benefits

The GTP and WPTP should include a summary of the economic, social and environmental benefits of increasing walking mode share such as described below.

Walkable city centres provide a wide range of social, environmental and economic advantages for the CBD and the people who access it. City centres with a high proportion of trips made on foot, and less made by private motor vehicle will benefit from reduced traffic congestion, pleasant street environments, more activity and less demand for parking spaces. A list of walking benefits is presented in **Table 2-1** below.

Table 2-1 Summary of benefits of a walkable city

Walking benefits		
Environmental	**Social**	**Economic**
▪ Reduced noise pollution ▪ Reduced emissions pollution ▪ Improved street environment ▪ Reduced heat island effect	▪ Supports equitability and accessibility ▪ More social inclusion ▪ Improved safety ▪ Better personal security ▪ Improves physical health ▪ Less stressful ▪ Sense of community ▪ Opportunities for diverse land use	▪ Local business opportunities ▪ Reduction in travel time ▪ Lower commuter cost ▪ Reduced traffic congestion ▪ Reduced demand for parking

2.2 Walking objectives for GTPs

The objectives section of a GTP should describe the overall vision for the future travel patterns at the site and outlines the goals and objectives which have informed the development of the GTP for the site. The GTP should specify walking objectives to ensure that the proposed actions target and address the opportunity to encourage more walking trips to and from the development.

Walking objectives for GTPs in the CBD could include:

> Provide a connected network of cycle paths/ footpaths of sufficient width, grade, and illumination and surface conditions to promote safe access to destinations;

> Improve the permeability of the CBD by providing pedestrian connections through the site via laneways and shortcuts designed appropriately and in accordance with Crime Prevention through Environmental Design (CPTED) principles;

> Ensure the internal road network balances connectivity with amenity, creating equal priority for all road users;

> Include mixed use facilities in the development to reduce the distance people have to travel for some trips; and

> Promote active transport travel choices and their benefits to new residents and workers.

2.3 Identify existing and future walking network

This section of the GTP should provide a description of existing transport infrastructure and services. It is generally divided into the different mode of transport categories: walking; cycling; public transport; driving; and parking. It also should provide an overview of the planned transport improvements proposed as part of the development proposal as well as those that are not part of the development proposal.

For walking, this section of the GTP should address:

> Existing Infrastructure
  - Description of the existing footpath network.
  - Missing infrastructure.
  - Pedestrian crossing infrastructure
  - Destinations within a five minute and a ten minute walk from the development.
  - Walking access to public transport services.
> Planned Transport Improvements- Walking
  - List the proposed improvements to the walking network by Council, State Government and the proposed and surrounding developments.
> Summary of barriers to Walking
  - Summarise the current issues associated with walking to and from the development site.
> Summary of opportunities for Walking
> Identify the opportunities for walking at and around the development site to increase the attractiveness of walking and a travel choice.

2.4 Collect information on mode share

This section of the GTP should present the existing travel trends and community profile information for the CBD, with a particular focus on understanding how people travel for their daily activities including work trips.

> Collect information on demographics
> Trip purpose
> Trip length
> Car ownership
> Mode of travel

Understanding trip length will be useful for understanding which trips are short enough that they can be converted from private vehicle to walking in relationship to the development.

2.5 Mode share target for walking

GTPs should include mode share targets that aim to shift travel to sustainable transport modes like walking, cycling and public transport. These targets should acknowledge existing State and Council policies and plans and be ambitious statements about future travel patterns to and from the site.

The mode share target should specify a walking mode share for trips to and from the development site. The target should reflect the opportunities to improve the walking environment.

2.6 Walking actions

GTPs should contain a package of measures tailored to the needs of individual development sites and aimed at promoting sustainable, healthy travel choices and reducing reliance on the car. This set of actions can enable developments to reduce the impact of travel and transport on the environment and foster healthy lifestyles, whilst also bringing a number of other benefits residents or workers.

2.6.1 Action types

GTPs have two types of actions; 'hard' actions and 'soft' actions. Both are described below.

2.6.1.1 Hard actions

Infrastructure

Recommendations which generally can be seen or felt or built. These actions are more intense and often expensive measures, but they are also the actions which can provide the most substantial improvement in sustainable transport behaviour change.

2.6.1.2 Soft actions

Education

Actions which increase the knowledge residents or workers, providing them with new skills and abilities, and improving their understanding of transport options and choices.

Advocacy

Actions which involve developers, workplaces and communities pursuing improvements internally and externally, including working collaboratively with stakeholders and governments to achieve desired sustainable transport outcomes.

Incentive

Actions which motivate and encourage communities and employees to choose sustainable transport modes, such as recognition, give-aways and discounts.

2.6.2 Types of actions

There are numerous actions that a GTP can include; a series of examples are provided in **Table 2-2** below.

Table 2-2 Summary of actions

Action type	Walking action	Relevant for	Responsibility
	Provide high quality change rooms and showers for people who walk to work or at lunchtime. Facilities to include change rooms, showers, lockers and laundry/drying facilities.	Workplace GTPs	Developer
	Improve the permeability of the CBD by allowing high quality on-street and off street public pedestrian and cycle connections throughout the development. New pedestrian and cycle pathways should connect to the external network.	Workplace and Residential GTPs	Developer Council
	Install 'wayfinding signage' in the immediate vicinity of the development, to assist legibility for unfamiliar pedestrians. This signage should be consistent with signage used throughout the CBD.	Workplace GTPs	Council
	Improve pedestrian safety along streets fronting the development through installing lighting and promoting passive surveillance with appropriate architectural design.	Workplace and Residential GTPs	Developer Council
	Provide pedestrian access to community facilities and public areas, including civic structures and public art.	Workplace and Residential GTPs	Council
	Hold promotional activities and special events, such as 'walk to work day'. On special days such as these strata management should organise a breakfast for participants and hand out prizes.	Workplace GTPs	Developer Council
	Ensure network of footpaths and shared paths are of sufficient width, grade, illumination and surface condition.	Workplace and Residential GTPs	Developer Council

Action type	Walking action	Relevant for	Responsibility
	Lobby State and Local government for improvements to surrounding pedestrian network including crossings and missing sections of footpath .	Workplace and Residential GTPs	Developer Council
	Minimise vehicle speed and calm vehicle traffic entering the development.	Workplace and Residential GTPs	Council
	Appoint a Travel Plan Champion to be in charge of the implementation of the GTP, its action list and monitoring results	Workplace and Residential GTPs	Developer Council
	Develop a travel information package to be distributed to all new residents by the travel champion as they move into the development. Information packages are further described in **Section 2.6.3**.	Workplace and Residential GTPs	Developer Council
	Hold face to face briefings between the Travel Plan Champion and residents/workers to discuss available transport options pertinent to individual cases.	Workplace and Residential GTPs	Developer Council
	Hold or contribute to a Travel Fair – to introduce the new GTP and educate residents about the available transport options in their area. Invite State government, Council, public transport services, cycling and walking organisations, as well as environmental groups to attend.	Workplace and Residential GTPs	Council
	Activate external street frontages and public spaces through orientation of development towards these corridors.	Workplace and Residential GTPs	Developer Council
	Hold Annual ‘Sustainable Employee Award’ – to recognise and laud the person who fulfils the ambitions of acting sustainably in their travel and transport patterns.	Workplace GTPs	Employers

2.6.3 Travel Guide Package

A tailored information package should be prepared for distribution to all new residents or employees as part of the GTP. The information package should be made available in hardcopy format and PDF format for distribution, preferably through a web-based platform.

The travel guide package will comprise the following elements:

A map which clearly identifies:

> Pedestrian pathways including estimated time taken from the site to reach public transport (bus stops/train station) locations by foot; and

> Illustrative network of bus routes, train lines, and on and off road bike paths.

An information section with:

> Directions to the site;

> Key bus and light rail routes and train station information;

> Access arrangements for people with disabilities;

> Facilities- showers/change facilities, lockers;

> An environmental message regarding sustainable transport;

> Further information including phone numbers and web addresses for public transport and taxi service providers;

> Pricing structures for public transport;

> Promotional messages which highlight the benefits of sustainable transport for the environment, road network congestion, costs, health and social well-being;

> Distribute maps of walking routes with resident information packs; and

> Key contacts of the Travel Plan Champion, and the Council GTP representative.

2.7 Monitoring

It is essential to monitor the implementation and achievements of the GTP. The following sections propose a monitoring approach for tracking the walking elements of the plan.

2.7.1 Short Term

Initial methods to collect information and feedback during and following the implementation of a Residential GTP or WPTP can include:

> A feedback form or email system to allow suggestions and ideas.

> An online survey after a couple of months to identify transport use.

> A review of the usage of taxi vouchers, car pool, bike pool and company public transport tickets.

> A review of the use of bicycle parking facilities.

> A review of the use of parking facilities and search for evidence of overflow parking at nearby locations.

The online survey should take place every 6-12 months. This survey needs to be designed to gather information under the following key categories:

- Origin location;
- Travel demands and commitments beyond the primary destination;
- Mode of travel used;
- Attitudes toward modes used;
- Level of knowledge regarding travel options; and
- Suggestions and feedback on issues.

2.7.2 Long Term

In the longer term, more detailed and targeted investigations and monitoring will be required. These investigations must determine the following facts and trends:

- What transport modes are being used to access the key destinations?
- How do people feel about the modes they use?
- Are targets for mode share being met?
- Are there information gaps?
- What elements are working well, and why?
- What elements are not succeeding, and why?
- What new innovations could be developed to help improve the use of sustainable modes?

Answering these key questions will help guide the future of the Residential GTP or WPTP and its next stages. As travel behaviour evolves, the plans will require refinement and alteration to meet the changing needs of the populace.

Given this, the reviews must be ongoing and thorough. There will be little effort required to analyse the travel behaviour and obtain the valuable information and insights so that actions can be reviewed and revised.

When available, reviews should include analysis of updated data collected by the State and Federal Government such as the ABS census (JTW data) and through the Household travel surveys (HTS).

APPENDIX

G

APPROACH TO BEHAVIOUR CHANGE COMMUNICATION

Approach to behaviour change communication

1 Introduction

Encouraging people to choose walking as their preferred travel mode in the CBD will require more than infrastructure upgrades like new crossings and wider footpaths.

People living in, and travelling to the CBD need to become aware of the opportunity to walk instead of drive, weigh up the benefits of walking instead of driving, prepare to replace a driving trip with a walking trip and then actually attempt it. Their 'walking trial' needs to be successful if they are to continue to walk and form a habit.

Transport behaviours are complex and influenced by a range of factors that can include journey distances, availability, safety and pricing of different transport modes, personal circumstances and knowledge, cultural and personal perceptions and values (Department for Transport, 2011).

Behaviour can be divided into habitual behaviour which is routine, automatic and often sub-conscious and non-habitual behaviour which is novel and occurs after consideration and decision-making (Department for Transport, 2011). Habits are often what needs to be overcome when attempting behaviour change to sustainable transport choices.

To support people to make changes to their travel habits in the CBD and choose walking for short trips, these guidelines set out an approach based on understanding the different audiences, promoting walking and targeting communication and activities to address barriers, motivate and influence behaviour for long term habit changes.

These guidelines cover the following steps to achieving sustainable behaviour change:

> Define the behaviour that needs to change;

> Get to know the target populations;

> Developing a brand and key messages;

> Plan communication channels; and

> Engage the different target populations.

2 Define the behaviour that needs to change

It is important to understand the different behaviours that need to change. People who walk, or could walk in the CBD are not a homogenous group of travel trips. They travel for different reasons, at different times of the day and experience different barriers to choosing to walk.

Consider who is not taking walking trips in the CBD at the moment who could be? There are likely to be a number of behaviour types that could be targeted to define target populations, for example:

> People who drive their children to school;

> People who drive to work in the CBD because they have a company carpark;

> People who drive to and within the CBD for business meetings;
> People who drive to and within the CBD for shopping;
> People who live in the CBD and drive to a job located in it;
> People who live in the CBD and drive to a job located outside of the CBD;
> People who catch taxis or Uber to access the city; and

Specify the different behaviours that should be changed to define the target populations for the behaviour change communication and activities.

3 Get to know the target populations

Once target populations based on behaviours are determined, it is important to gain an understanding of each group. Undertake surveys to understand:

> What are the demographic and social characteristics of each target population?
> How long is their trip?
> What motivates them?
> What influences them? And who?
> What are their barriers to walking?
> What do they perceive as the benefits and costs of walking versus other modes?
> How do they consume media, get news and what social networks do they belong to?

Target populations may not be easily divided into workers, residents, students and visitors. Within these groups there may be further segmentation based on many factors including where they live, the time and resources available to them, what they value and their lifestyles. Similarly, some people will fit into more than one target population, they may be workers as well as residents.

Potential barriers to walking could include their travel distance, inconvenience, weather impacts, the need to make multi-stop trips, need to carry things, need to ferry passengers, perceptions of safety. Determine which barriers are real and which are perceived. The perceived ones can be challenged with engagement and messaging.

Undertake surveys and analysis to determine the quantitative and qualitative data that will help to define the target populations:

> Quantitative and characteristic data – patronage, Census demographic data
> Qualitative and attitudinal data – focus groups, surveys

4 Develop a brand and key messages

4.1 Develop a brand

A strong and consistent brand will be an excellent platform to communication with each of the target populations. Council could further develop the 'Walk Parramatta' brand or develop another stand-alone brand. The brand should:

> Identify and represent Council's aim for a vibrant walking culture community;

> Have an engaging personality and communication style;

> Be attractive and recognisable;

> Be tested via surveys;

> Align with other Council brands and communication tools; and

> Be used consistently across all communication platforms.

Walk Parramatta (or the new brand) should be able to be used across all Council communications when talking about transport.

4.2 Key messages

4.2.1 Core key messages

The brand should include a set of core key messages that align with the behaviour change objectives and present the brand in a positive and engaging light. These core key messages are applicable to all target populations and the general community. They should be general and appeal to a wide range of audiences. Examples of a core key message could be around the health benefits of walking for 30 minutes a day, how walking is an easy and free form of transport or how it is faster to walk through the centre of the CBD than it is to drive.

4.2.2 Tailored key messages

While the Walk Parramatta brand and core key messages will be ubiquitous, tailored key messages should also be developed and targeted to each of the identified target populations.

Research and plan a set of key messages for each target population that align with the Walk Parramatta brand and core key messages. The tailored key messages should address each target population's specific circumstances, barriers to walking and motivations.

For example, a target population of parents who drive their children to school could have a key message around their children's improved health and wellbeing from walking to school or one that reassures parents that walking to school is a safe activity for children over 10 years.

Tailored messaging should also be developed for specific communications campaigns, for example raising awareness about pedestrian safety.

4.2.3 Testing and use

Core and tailored key messages should be tested in workshops to ensure they resonate with the target populations and wider community.

Ensure that everyone at Council who will be responsible for promoting, communicating and educating the community are informed of the core and tailored key messages and their application in different situations.

4.3 Create a style guide

Create a style guide of how and when the brand and key messages should be used. The style guide should set the standards for how Walk Parramatta is used across all media and in publications. Consider allowing other organisations to 'borrow' the brand as well. Keeping the brand style, a workplace wanting to promote active transport to its employees could use the brand for internal messaging to staff, for example 'Walk Sydney Water'.

Provide training and guidance on how to apply the brand and key messages across Council communication.

5 Plan communication channels

The Walk Parramatta brand and key messages should be promoted through specific campaigns and ongoing media channels. Communication channels selected for different campaigns will depend on the purpose of the communication, the key message, the target population's media consumption and their travel habits.

Some of the general communication channel options are set out in **Table 5-1** along with their benefits and potential uses.

Table 5-1 Communication channels

Communication channel		Use for
Online	Council website	Raise awareness
	Online advertising	Campaigns, allows the targeting of different target populations by location and demographic information
Social media	Facebook posts	Two way engagement
	Twitter posts: @discoverparra and @parracity	Two way engagement
Mobile phone application	MyParra app	Providing walking information
	Walk Parramatta app	Providing real-time walking information, support travel choices
Website	Walk Parramatta website	Providing walking information for planning trips, support travel choices
Newsletters	Parra Pulse	Raise awareness
Outdoor advertising	Bus shelter advertisements	Raise awareness
	Construction works hoardings	Raise awareness, provide on-the-spot walking information
	Pavement stencils	Raise awareness
	Wayfinding signage and on-street maps	Provide on-the-spot walking information
Local newspapers	Parramatta Advertiser	Raise awareness
Market stalls	Lunchtime markets	Providing walking information
	Lanes Festival	Providing walking information

6 Engage the different target populations

The identification of target populations and the subsequent surveys should determine the specific key messages and communication channels needed to engage with each of the target populations. The following sections set out suggestions for behaviour change activities for the broad potential target populations of workers, resident, school students and visitors. These suggestions should be refined as more information about the target populations and their characteristics, circumstances and preferences are discovered through the surveys and travel analysis.

6.1 Workers

Engage current and new workplaces to commit to encouraging their staff to travel by sustainable transport modes and walk for health at lunchtime.

Invest in developing with organisations located in the CBD, particularly while they are planning to move to the CBD. They will be concerned about the new travel arrangements for their staff accessing the new office location and will be open to guidance and support.

6.1.1 Green Travel Plans

Council should also support workplaces to develop their own Green Travel Plans (GTP) to encourage sustainable transport choices. Council could provide a template for a GTP and work with each organisation to identify the opportunities to reduce single occupancy private vehicle trips.

6.1.2 Workplace walk program

Develop a workplace walk program to roll out to existing and new workplaces throughout the CBD. An example of a similar workplace program run by Councils is the CitySwitch Green Office Program. Engage with and educate management in each organisation on the benefits of walking for employees and businesses to get buy-in from the top.

Get commitment from organisations who sign up to the workplace walk program to promote and support walking and public transport to their staff and visitors. Specific actions could include:

> Appoint a workplace walk champion;

> Staff survey of current and preferred modes of transport. What will they need to make the choice to walk all or part of the way to work? Organisations should share the survey results with Council;

> Promote walking benefits and the company support for employee walking trips;

> Keep umbrellas in reception;

> Provision of clean and secure change rooms and lockers for people who walk to work;

> Participation in the Global Corporate Challenge;

> Provision of pedometers to staff; and

> Provision of personal alarms to staff.

Promote the participating workplaces, acknowledging their contribution to a sustainable CBD and the health of their employees.

Ongoing engagement with workplaces can be extend across a range of activities to enhance the vibrancy of the CBD. CBD events such as Parramatta Lanes can be promoted through workplaces, information on road closures and rerouting of pedestrian walkways during construction and the opening of new infrastructure and the public transport can be communicated through a close, two-way relationship.

6.1.3 Access to businesses

Encourage organisations to promote the location of their office from public transport to their visitors and provide walking directions (instead of just the access to the car park). Encourage them to also provide walking directions for events they hold throughout the CBD.

6.2 Residents

Communication to residents on walking more could focus on health benefits, access to high quality open space, social interaction and the ease of accessing destinations within the CBD on foot.

Residents could be reminded that walking is free, easy and good for their health. It is a way of combining travel and exercise together to save time.

New and existing residents should be introduced (or reminded about) the extensive recreational walking routes throughout the local government area that are accessible from the CBD. They may not realise how close some of the area's natural assets are, or the best way to access them.

Specific activities to promote walking amongst residents could include:

> Establishment of neighbourhood walking groups;

> Promotion of different regional recreational walks via local media, targeted online advertising and Council communication. A different regional walk could be featured every month to keep content fresh;

> Running a regular 'CBD residents choose to walk' feature in Council's newsletter and other communication channels which introduces readers to a different CBD resident and explains their sustainable transport choices and what they enjoy about being within walking distance of many attractions in Parramatta;

> Letter drop maps of walking attractions to residents. A version of the maps could include games for children including activities where they have to visit a location on foot to collect clues and solve puzzles;

> Promote a hashtag on social media for Parramatta residents to upload photos from their walking trips and the items of interest they are discovering in the CBD;

> Close CBD streets on a Sunday and encourage residents to explore the area free of vehicle traffic;

> Run an annual walking program that measures steps, collect individual data as well as community. Engage surrounding Council areas to make it competitive; and

> Supply activity monitoring devices like Fitbits as part of Council promotions.

6.3 School students

Schools represent a good opportunity to address behaviour change with a captive audience but there may be many perceived barriers from both the school and parents. Engage with schools

and families to understand poor perceptions around walking to school. Consider running a trial program with one school to identify issues and opportunities before rolling out a behaviour change program more broadly. Select a school which is open to change.

Some specific actions for encouraging more walking trips to schools could include:

> Run walking safety course with the school.

> Ask parents and students how their walking route to school could be improved, and then make this infrastructure upgrades as part of a Safe Routes to School program.

> Develop school GTPs.

> Encourage students to keep walking journals, tracking their trips and distances.

> Establish and support a walking bus from different neighbourhoods to access schools.

> Encourage schools to have a 'clearing time' where the children who are walking home are able to exit the school first before vehicles are allowed to enter and pick up children.

6.4 Visitors

Infrequent visitors to Parramatta are likely to consciously plan their journey. Engaging with them at the point of trip planning will allow them to be influenced to consider walking as part of the visit. Specific actions to encourage visitors to incorporate walking could include:

> Ensure the Walk Parramatta website is search engine optimised so that people can easily find access walking information.

> Promote the walking distances and times from public transport to key destinations and attractions.

> Encourage people visiting for events and sporting matches to leave the car behind.

> Engage with destinations and attractions across Parramatta to promote walking access to their site with links to the Walk Parramatta maps and online information.

> Promote the regional recreational routes and access to nature from the CBD.

> Incentivise shops, restaurants and bars to use the Walk Parramatta brand and to promote their walking distance and route from public transport on their website.

7 References

> Ausport Example Communication Plan www.ausport.gov.au/__data/assets/word_doc/0011/.../Communications_Plan.doc

> Department for Transport, Social Research and Evaluation Division. (2011). Behavioural Insights Toolkit.

> Transport Canada. (2010). Changing Transportation Behaviours.

> Easy Steps: a toolkit for planning, designing and promoting safe walking.

APPENDIX

H

ECONOMIC BENEFITS EVALUATION STRATEGY

Economic Benefits Evaluation Strategy

1 Introduction

The City of Parramatta Council is interested in the opportunities for refocussing the city's position as the key western hub in the greater Sydney region. A centrepiece of the strategy is the transformation of the CBD. It has developed a comprehensive multi-layered plan for future economic and social development including expanding the living opportunities and amenity of its CBD beyond normal office hours. Its vision is:

"To be the driving force and heart of Australia's most significant economic region; a vibrant home for diverse communities to prosper; and a centre of excellence in research, education and enterprise."

There is considerable underutilised investment in retail establishments and urban infrastructure which for which there is very little value capture or utility without the right conditions. High density living is associated with a particular level of services, entertainment and consumer retail demands and expectations. Within a compact area cars are less practical than active transport which provides an equitable, efficient and sustainable means of access within a limited urban footprint and a vibrant street scene with retail, entertainment, dining and safe open space options. Hence the Pedestrian Strategy forms a roadmap for the future.

Council is keen to avoid the lost opportunities of unbalanced CBD hub developments which have occurred elsewhere in Sydney. The latter attempt a mix of combined urban, retail, commercial and transport with varying degrees of success and often with little urban amenity or after hours/weekend activity or value uplift to match the infrastructure available.

The purpose of this report is to examine ways which Council can identify the economic value to society associated with the walking economy and the strategy for developing the CBD into a vibrant world class CBD. The report focuses mainly on the qualitative approach but this in no way diminishes many qualitative contributions to urban transformation which are difficult to numerate or monetise.

2 Types of Benefits

Ideally there will be time series data so that internal benchmarks can be used to support a cause and effect argument that increased pedestrian access translates into increased value and economic benefit. At the outset it appears there are several main classes and beneficiaries of benefit:

- Financial or commercial gain to commercial operators through:
  - sales of goods and services,
  - increased property values,
  - increased rents payable to property owners
  - reinforcement as a commercial hub for western Sydney
- Increased utility and benefit to pedestrians and society in general including:
  - access to goods and services
  - more dining/entertainments options
  - vibrant streetscape and atmosphere
  - potentially reduced greenhouse emissions etc.
- Increased collections of rates levied by council as a result of more valuable properties
- Equity issues
  - social inclusion
  - addressing social disadvantage
  - not everyone has a car
- Safety aspects
  - Increased pedestrian flows lead to greater street safety than deserted streets

In assessing the value add of growth in pedestrian traffic it is important to separate:

- tangible from intangible effects
- monetary from non-monetary effects
- and measurable from non-measurable

Cardno propose a matrix as the assessment tool to determine how different benefits can be classified.
The following sections discuss individual items contained in a suggested list of benefits and KPIs which potentially could be used to quantify or describe them to support the Council's Pedestrian Strategy.

2.1 Financial or commercial gain to business

This class of benefits is a significant driver in gaining commercial support for the Pedestrian Strategy initiative particularly relating potential range and duration of trading hours, services or products on offer and the development of the after-hours economy. In a way this is attempting to mitigate a "chicken and egg" situation with respect to developing the 24/7 economy. Put simply, the people will not come unless the stores are open, and the stores will not stay open without customers.

2.1.1 Retail and Commercial Sales of Goods and Services

One of the key measures of economic benefit is the level of retail and commercial sales. While this data is routinely collected by all businesses, most businesses will consider this commercially sensitive and therefore not make this information available. However, rental agents and leasing agents normally have a good understanding of relativities and this provides

a good starting point. Indeed their advertisements usually give an assessment of passing trade and gross sales.

The link between passing trade and sales is often based on the simplistic relationship depicted in **Table 2-1.**

There are some caveats in accepting the cause and effect relationship which must be managed. Unfortunately the real life linkages are not as clear or as measurable as depicted here. While crude numbers may satisfy broad information requirements, there is considerable segmentation and niches within the market. For example – the time of day has critical impacts on particular types of business – lunch bars and sandwich shops have midday peaks but rarely operate at night.

Crude value of sales has limited meaning until benchmarked against parameters such as:

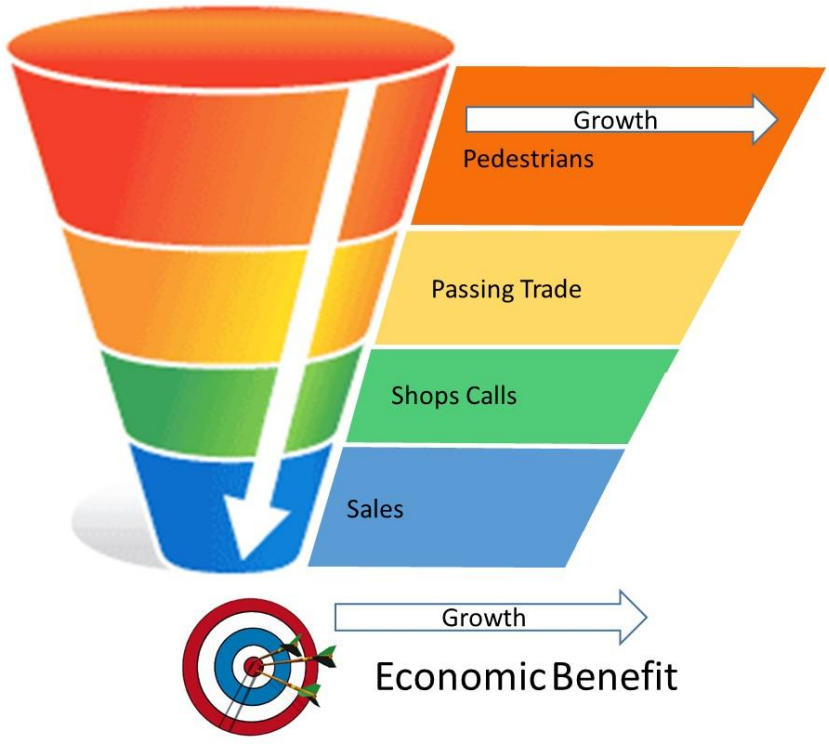
- $ per m2 (survey of establishments/ town plan, etc.)
- $ per store (survey of establishments)
- $ per passer by (from the pedestrian count)

This means collection not only of sales data but contextual data as well.

Although there are different relationships between sales and store footprint in some segments, this is especially relevant when comparing low- value but high-volume outlets such as supermarkets, with high end luxury goods stores such as jewellers. Information linking footprint and sales by segment might be available through leasing agents, realtors, the town plan and other sources.

In demonstrating the link between growth in pedestrian volumes and commercial/economic benefit, it is often difficult to establish a firm cause and effect relationship.

Figure 2-1 Pedestrian, sales and economic benefit



The link between the passing public and retail sales is further complicated by the types of products on sale and the consumers of those products. Liraz[1] provides the following guidance:

Consumers tend to group products into three major categories: convenience, shopping, and specialty.

Convenience usually means low unit price, purchased frequently, little selling effort, bought by habit and sold in numerous outlets. Examples: candy bars, cigarettes, and milk.

Shopping usually means high unit price, purchased infrequently, more intensive selling effort usually required on the part of the store owner, price and features compared, and sold in selectively franchised outlets. Examples: men's suits, automobiles, and furniture.

Specialty usually means high unit price although price is not a purchase consideration, bought infrequently, requires a special effort on the part of the customer to make the purchase, no substitutes considered, and sold in exclusively franchised outlets. Examples: precious jewellery, expensive perfumes, fine furs, and so on, of specific brands or name labels.

Pedestrian counts and their relevance to sales apply best to “convenience” items and outlets but are perhaps less useful for predicting “shopping” behaviours and are probably irrelevant for “speciality” goods outlets. Cafés, lunch bars and takeaway food outlets identify more closely with the “convenience” categories however, restaurants and fine dining straddle the “shopping” and “speciality” categories.

Within the CBD, there will naturally be a blend of different types of shops and products with differing clientele. It is important to consider the impact of the neighbouring Westfield establishment with its anchor tenants and many speciality stores. It is expected that the Westfield retailers will develop a competitive response to counteract the potential threat of sales loss through the new pedestrian trade. Westfield may well argue that their competitive advantage is in their skill of blending tenants to maximise each other’s sales.

[1] Liraz M, *Finding The Best Retail Location* http://www.bizmove.com/starting/m1o.htm accessed 5MAy 2016

2.1.2 Commercial Footprint and number of establishments

Another simple reference point might be the footprint assigned to retail and commercial activities. The important issue is to have a before and after reference point and this is one source which may help to provide a proxy for before and after. It is also important to consider the impact of higher density vertical expansion of the footprint. This information can be obtained from a variety of sources including:

- Survey of properties
- Survey of town plans/ DAs
- Survey of property agents
- Check of rate notices as issued by council

There may be time series data available held by ABS, state and local government sources which can be applied to this situation.

2.1.3 Commercial Property Values

Rateable value of commercial properties within the CBD is a good indication of land value. This data is already collected by Council however it is important to make relevant comparisons as far as possible. Thus measures of interest include:

- The relative rental value of the same property before and after
- The relative rental value of the overall CBD
- The relative rental value per m2 or per hectare before and after

Data source as the same as above and can be gathered in the same process to save time and unnecessary duplication.

2.1.4 The 24 hour economy

One of the key benchmarks of a global city is round the clock activities in terms of availability of shopping, dining and entertainment opportunities beyond normal office hours. However, businesses are more likely to remain open if there is a significant population presence which may be associated with high density living. All areas within the CBD are easily accessible by walking and the high volume of pedestrian traffic provides a large target market to businesses.

To measure the 24 hour economy, a simple survey of opening and closing hours can be obtained by:

- Interview store management
- Noting the opening hours as advertised
- Checking website information

2.2 Benefit to Pedestrians and Society

According to Transport for NSW:

"*The most popular form of active transport is cycling and walking which produce positive financial, environmental and social benefits that can be used in economic evaluations."*

Table 2 1 outlines their recommended values to be used in economic evaluations.

Table 2-1 Active Transport Parameters

Costs/Benefits	Walking ($/km)
Health Benefits	1.67
Congestion cost savings	0.32
Vehicle operating cost savings	0.33
Public transport fare cost savings	0.12
Tolling cost savings	0.38
Accident cost	0.13
Air pollution	0.0308
Greenhouse Gas Emission	0.024
Noise	0.01
Water Pollution	0.0047
Nature and Landscape	0.0006
Urban Separation	0.0071
Roadway provision cost savings	0.05
Parking cost saving	0.013
Travel time cost	0

Source: Economic Policy, Strategy & Planning, Finance, Audit & Strategy, TfNSW

This table accounts for incremental values compared to car. If toll charges are deducted and the cost of providing roadways is offset against the cost of providing walking infrastructure, this results in savings of about $2.66 per pedestrian km. Thus if it is assumed 1000 persons walk 1 kilometre instead of driving, within the CBD, this will generate an estimated benefit to society of $2,600 per day. Based on a 300 days per year and a thirty year period this generates an estimated present value benefit of $9.9 million based on a 7 per cent discount rate. With a modest 2.5% growth rate per year, this grows to an estimated $12.85 million over the same period. This benefit could be much higher depending on actual pedestrian numbers and the possibilities within a 24/7 CBD.

In interpreting pedestrian count data, factors such as gender, time of day etc. will have little relevance and can be discarded for this class of benefit.

2.3 Increase Council Rates Collections

Gross rateable revenue should be a relatively easy data collection exercise within Council. Further this gives contextual support to the value uplift of property and the relative split between commercial and residential properties. An appreciation of the effects of the vertical expansion

of residential property and higher infill population density will be reflected by the changes in gross collections over time.

2.4 Equity issues

One of the major issues is about social inclusion. The TfNSW guidelines[2] include a Social Inclusion Index for economic appraisals. According to the guidelines:

"Social inclusion refers to people's ability to participate adequately in society, including education, employment, public service, social and recreational activities. Social exclusion describes the existence of barriers which make it difficult or impossible for people to participate fully in society."

The guidelines are based on overseas work into forms of social inclusion and links to transport. To quote the TfNSW guidelines:

"Inadequate transport sometimes contributes to social exclusion, particularly for people who live in an automobile dependent community"

Car-free pedestrian areas are accessible to everyone as opposed to road based developments where car ownership provides a powerful barrier to entry. In this way the planned precinct addresses some of the grounds of social disadvantage by removing (for example) the need for car ownership. The CBD development is compact enough for people to be able to effectively use active transport and not rely on alternative means.

Although this notion of social justice is not easily valued in the conventional sense, TfNSW suggests the Transport Social Exclusion Index is described in **Table 2-2**. It contains six factors that represent aspects of mobility and are rated 0 to 5 up to a maximum score of 30 meaning least socially excluded and below 10 "could be considered facing significant problem of social exclusion".

Table 2-2 Transport social inclusion index

Factor	Definition	Indicators	Rating
Mobility Need	Number of "essential" trips outside the home a person must make	From 5, subtract one point each for: enrolled in school - employed outside the home - is a primary caregiver (responsible for children or disabled adults) - has special medical requirements (such as dialysis) - has other responsibilities that require frequent travel	
Land Use Accessibility	Average travel distance to common destinations, based on land use clustering and mix, and roadway network connectivity	One point for each different type of public services within 0.8 kilometre of residences: - food store, other retail shops - post office / newsagency - school - park	

[2] TfNSW 2013 Principles and Guidelines for Economic Appraisal of Transport Investment and Initiatives Transport Economic Appraisal Guidelines Appendix 9

Factor	Definition	Indicators	Rating
Physical and Communication Ability	An individual's ability to use an automobile	One point for being able to: - walk one kilometre - bicycle 3 kilometres - speak and read the local language - has residential telephone - has residential internet service	
Automobile Access	An individual's ability to use an automobile	One point for: - having a driver's license - having a vehicle rental within suburb - living in a household that owns at least one motor vehicle - owning a personal car - having a major paved highway within 5 kilometres of home	
Mobility Options	Number of non-automobile mobility options available to an individual for local travel	- Three points for accessing a train station - Two points for access a bus stop or transitway station	
Financial Wealth	Ability to pay for transport services.	One point for each income quintile: - Lowest quintile <$436 per week - Second quintile $436 - $634 per week - Third quintile $635 - $$853 per week - Fourth quintile $854 - $1174 per week - Highest quintile >$1174 per week3	
Total			

[3] based on ABS Household Income and Income Distribution in 2010/11 dollars.

2.5 Safety Aspects

There are two main aspects of the safety benefits of the Pedestrian Strategy:

- Personal safety within the CBD
- Traffic safety issues related to the reduction in car number in the CBD.

There is some evidence that increased pedestrian flows lead to greater street safety than deserted streets. This represents a circular process that more people will go out with more people because they are safer with more people around.

Council is supporting this philosophy with the Pedestrian Strategy which will place more people all over the CBD thus reinforcing this trend. While this benefit may be difficult to monetise, there are quantitative measures which can assess the effectiveness. For example police time series data on various classes of infringement could be compared against the pedestrian count data and then benchmarks developed over time.

Traffic safety issues have been accounted for separately in Section 2.2 and relate to TfNSW economic appraisal guidelines.

3 Potential approaches to collecting information

This section outlines some of the options open to Council which can be used to demonstrate some of the benefit to the CBD's economy from growth in pedestrian volumes.

3.1 Pedestrian Traffic Counts

The Council has already collected considerable pedestrian count data and is in a position to use this to profile the "walking economy and this provides the key data source for further investigation.

Based on the segmentation outlined earlier, it is important to structure how the survey/count was conducted and the stakeholders' vested interests and to arrange the data so that it can be most usefully deployed. For example, the key variables of interest to retailers will be associated with the range of products they have on offer, time of day, etc. Factors which will influence the count and the success in turning pedestrians into potential commercial benefit are:

- Time of day – for example: espresso bars are more popular than movie theatres before 10:00 am. Lunchtime has peaks as works attend to meals, errands, banking etc. Children play sport on Saturday mornings which will reduce the target population
- Day of the week – many restaurants are closed on Mondays and "Cheap Tuesday" is entrenched
- Time of year – there are seasonal fashions, seasonal demands for hot or cold beverages, school holidays may increase or reduce pedestrians, etc.
- Weather – rainy days may deter people, or they seek retail therapy. Alternatively on a nice day people may prefer non-retail forms of leisure. There is no rule of thumb which can be generally applied
- Significant events – Christmas, Easter, Ramadan, New Year, Autumn Carnival, Grand finals, public holidays.

- Gender and age profile – consider the difference between a sports store and a jewellery store
- Location and proximity to particular types of products - this is complicated because convenience stores will try to locate in convenient locations i.e. to maximise passing trade. This is less important for movie theatres. Similarly complementary and competing activities have an influence – food courts normally locate next to the entertainment precinct.
- Power authorities such as AGL could provide data on residential and commercial energy consumption within the CBD.
- Sydney Water could provide data on consumption within the area.
- Council could survey the area to provide a census of housing/apartments, number of persons etc. on a periodic basis
- Realtors may be in a position to inform the number of dwellings and occupancy, number of commercial establishments, footprints, etc. on a monthly basis.

3.2 Business Surveys

Other Supporting Data would include a survey of business establishments. Data collected could be:

- Daily/weekly/monthly sales (ideal but maybe hard to obtain)
- Daily/weekly/monthly calls (probably very subjective and unreliable)
- Deliveries of freight
- Rents per m^2

Because of the complexity, volume and general sensitivity of some of the material to be collected a stratified approach is recommended based on targeting the most useful segments. For example realtors will have a different perspective to lessees and there may be possibilities that a verification process could be achieved.

As noted earlier, the range of commodities and business activities is extremely varied and surveying particular niche groups may be unproductive. Convenience stores represent a good benchmark for assessing the pedestrian economy simply because of their location and the type of good for sale.

3.3 Pedestrian Questionnaires

The purpose of these is to update the pedestrian count data base and to provide a narrative of the dynamics of pedestrian patterns over time. Typically this is a time consuming, high cost and often intrusive (to responders) way of obtaining data. But it also provides considerable flexibility and completeness of data even though only a sample is usually obtained. With electronic mail-outs, survey monkeys, phone surveys etc. there is now more flexibility in execution compared with traditional face to face techniques, however, a one size fits all questionnaire is often found to be inadequate. Further, accurate qualitative anecdotal information is usually more useful than guesstimated quantitative “data”.

Increasingly people suffer from “survey fatigue” thus only the particularly interested are in a position to give a considered response- particularly in the case of paid professional survey takers. As noted before, the aim is not to provide a heavily funded survey using conventional random sampling techniques to satisfy full statistical processes but rather to provide information

which informs the process and gives guidance to stratifying individual market segments, timings, etc. for policy makers.

The least cost method is to provide one page survey handouts at strategic points for people to fill out and deposit in convenient collection points. Some potential locations are near food courts where seated people have time to eat, relax and maybe fill out the survey and deposit nearby. The waiting rooms at cinema complexes or station platforms/interchange waiting areas are also viable locations for surveys especially when there are bored people with nothing to do except wait.

4 Summary

Table 4-1 summarises Cardno's approach to defining benchmarks relevant to assessing the walking economy. It also classifies the types of benchmarks whether they are tangible, monetised and measurable. The final column outlines likely data sources and methods of data collection. The approach is firmly aimed at quantitative methods mainly because they are less subjective than other criteria and more rigorous to cause and effect to linking pedestrians to economic value.

Table 4-1 Summary of Benchmarks and Collection Processes

Benchmark	Tangible	Monetary	Measurable	Data Requirements/Collections
Retailing				
Goods establishments	✓	✗	✓	Survey of businesses, properties, realtors, property owners, review of town plan, site inspection
Service establishments	✓	✗	✓	
Gross Value of Sales	✓	✓	✓	
Number of Outlets by Type/Size	✓	✗	✓	
Per Commodity Niche	✓	✗	✓	
Commercial Property				
Values	✓	✓	✓	Survey of businesses. properties, realtors, property owners, audit of DAs, review of town plan
Annual Growth	✓	✗	✓	
Occupancy rates	✓	✗	✓	
Footprint	✓	✗	✓	
Annual Growth	✓	✗	✓	
Average Rents	✓	✗	✓	
Residential Property				
Values	✓	✓	✓	Survey of properties, realtors, property owners, audit of DAs, review of town plan
Annual Growth	✓	✗	✓	
Occupancy rates	✓	✗	✓	
Footprint	✓	✗	✓	

Benchmark	Tangible	Monetary	Measurable	Data Requirements/Collections
Annual Growth	✓	✗	✓	
Average Rents	✓	✓	✓	
Increased Rate Receipts	✓	✓	✓	Estimate from Council data
Global City/Walking Economy				
24/7 establishments	✓	✗	✓	Survey or visual inspection
Operations outside 0900 to 1700	✓	✗	✓	
% outside 0900 to 1700	✓	✗	✓	
CBD management per block				
24/7 establishments	✓	✗	✓	Survey or visual inspection
Operations outside 0900 to 1700	✓	✗	✓	
% outside 0900 to 1700	✓	✗	✓	
Society				
Health Benefits	✗	✗	✓	Estimate from pedestrian count and TfNSW guidelines Mode share, trip distance and growth in walking trips analysis
Car replacement savings	✗	✗	✓	
Environmental Savings	✗	✗	✓	
Amenity Savings	✗	✗	✓	
Accident Savings	✗	✗	✓	
Parking Savings	✗	✗	✓	
Number of pedestrians by hour of the day	✓	×	✓	From pedestrian count