APPENDIX

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	Where possible, 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 and key partners 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	Work with key stakeholders to promote Walk to work day 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

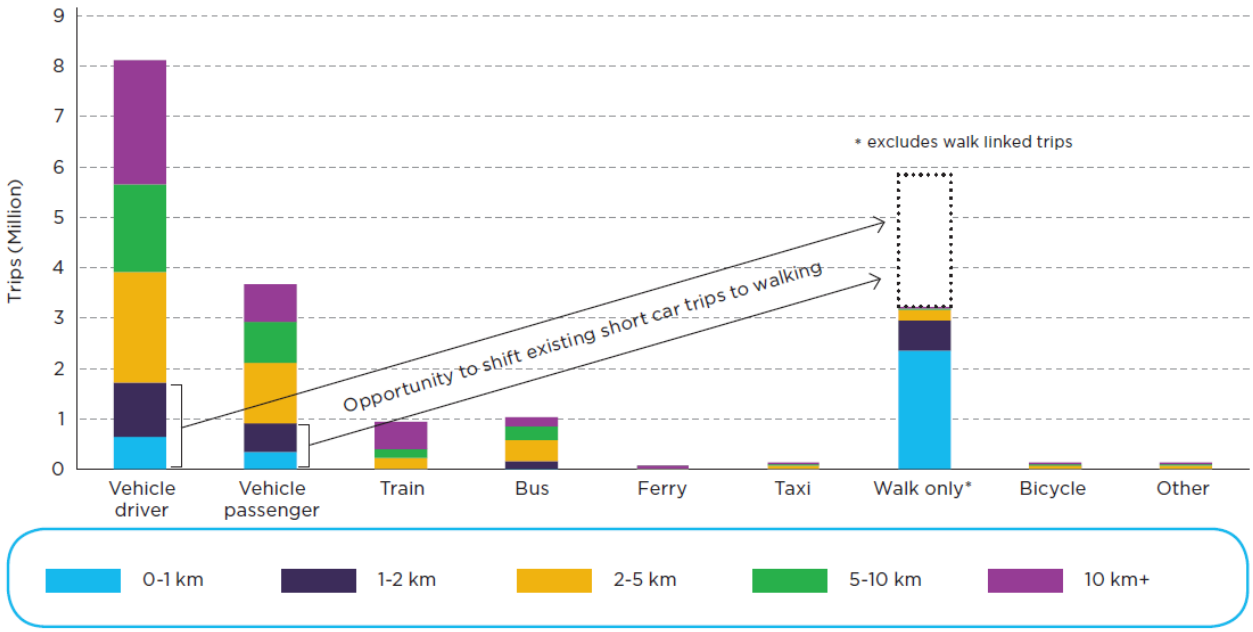
A Plan for Growing Sydney	
	extend from Westmead to Rydalmere through the Parramatta CBD, with potential to designate a Parramatta City Ring Road. > The Plan recommends the delivery of new housing within already established urban areas in Parramatta so as to facilitate the use of already existing transport 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

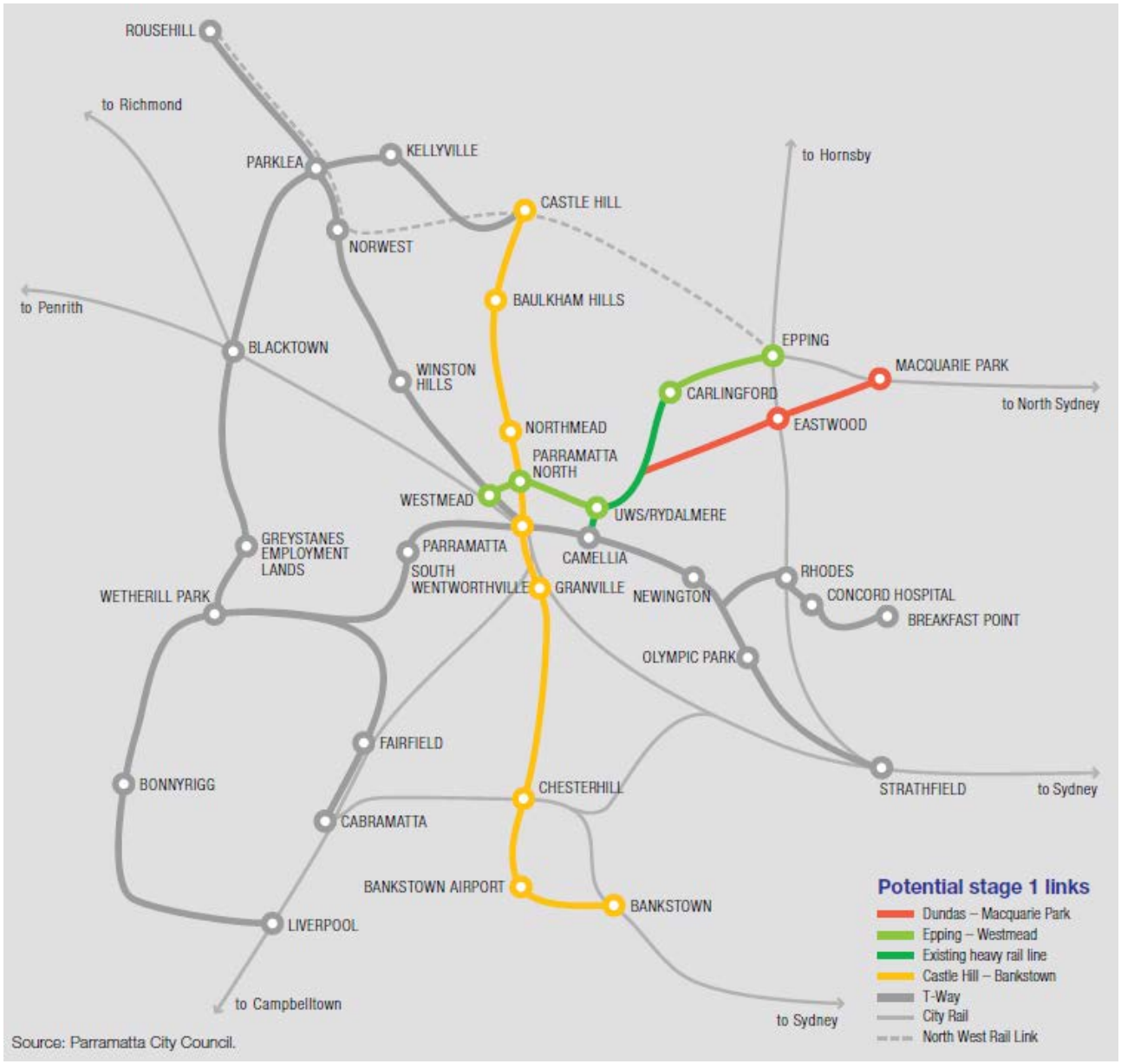
Figure 2-1 Mode share split broken down by distance travelled



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



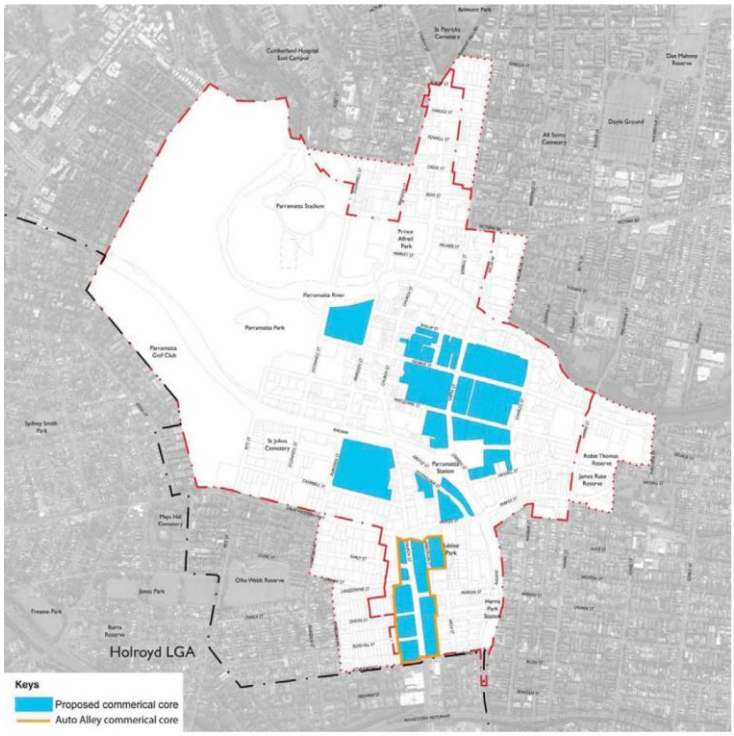
3 Parramatta Strategic Context

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

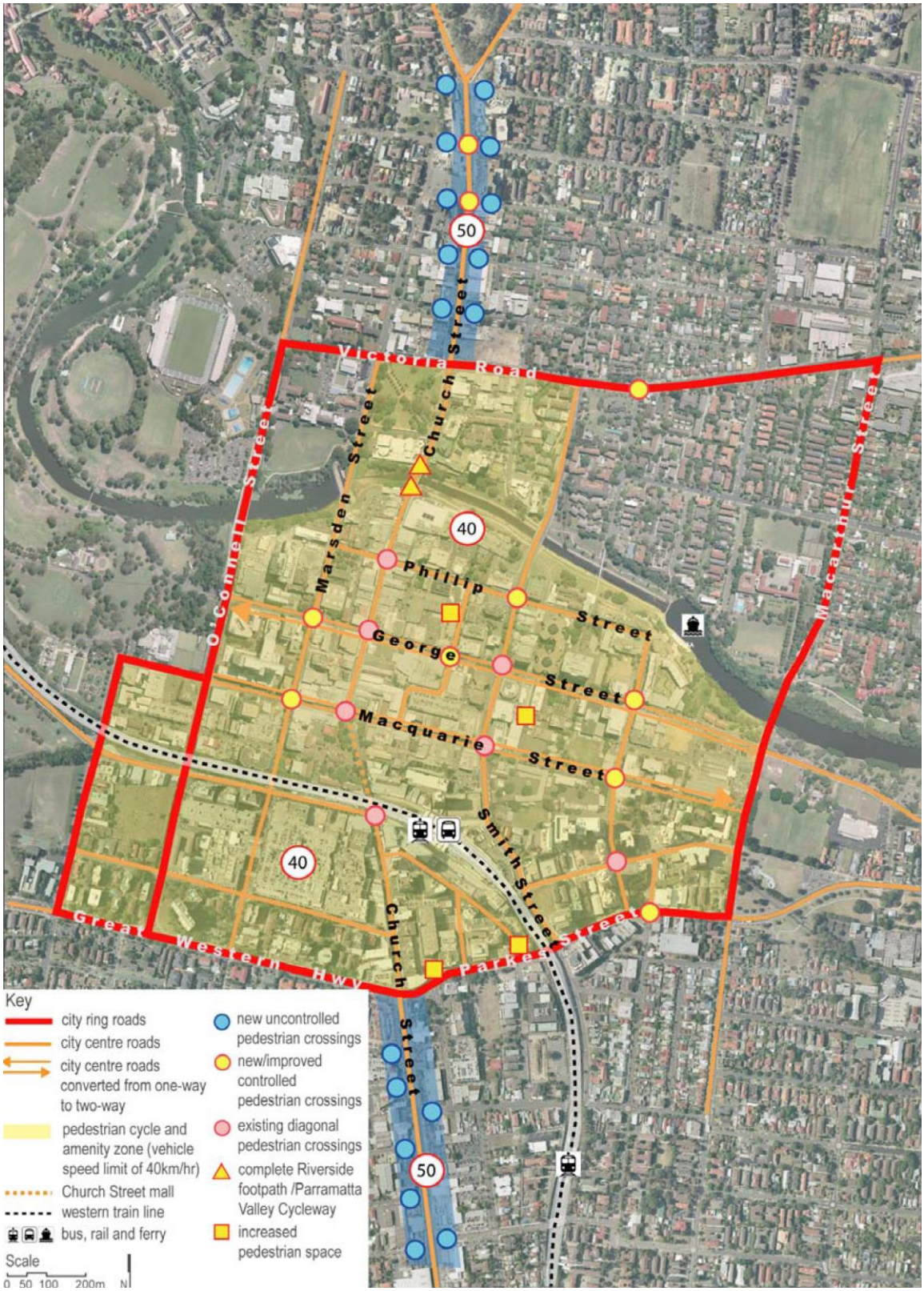
Figure 3-2 Proposed commercial core sites



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

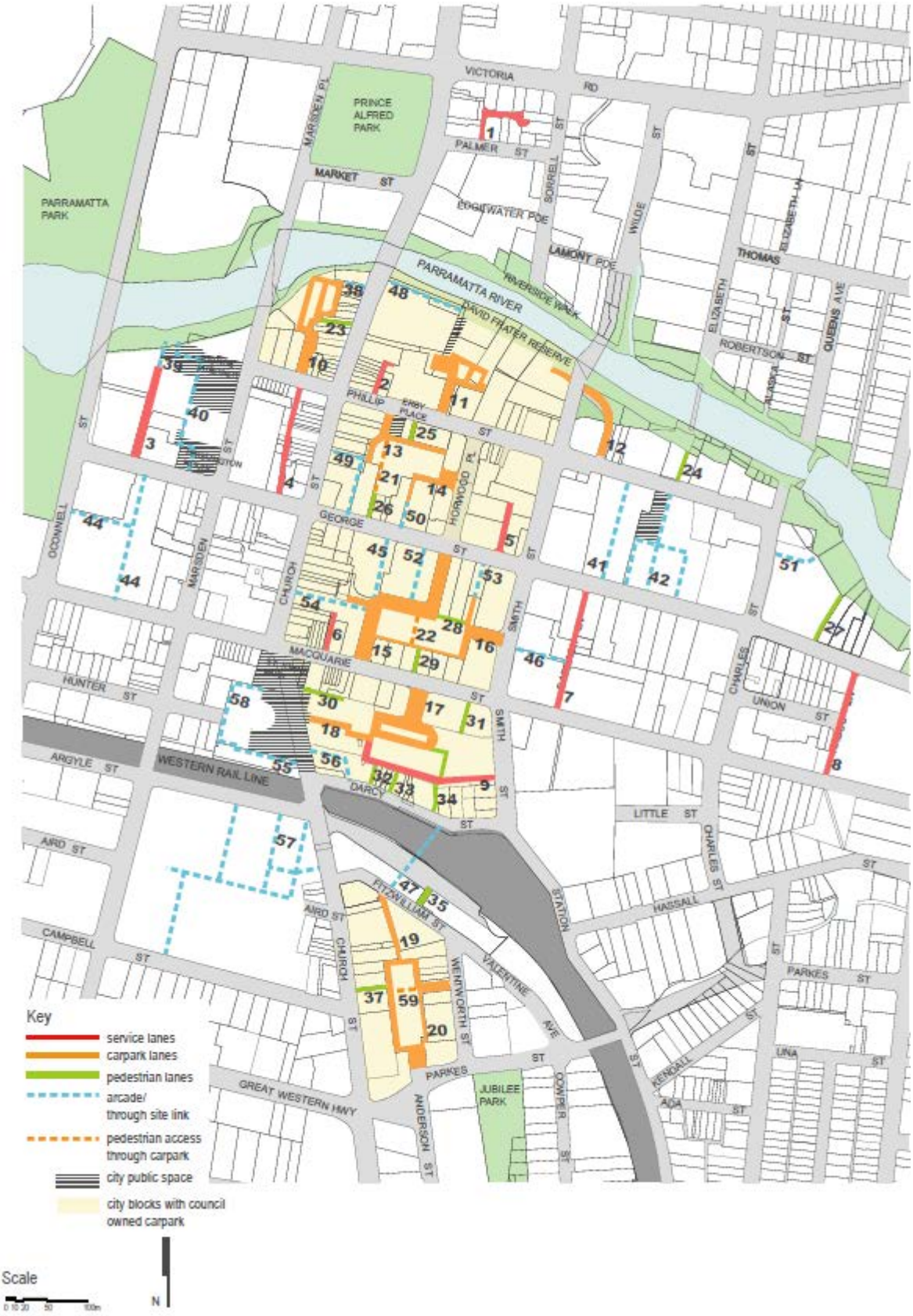
Parramatta City Centre Planning Framework Study	
Organisation	Architectus
Date published	September, 2014
Summary of document	> The Parramatta City Centre Planning Framework Study was prepared by Architectus in September 2014, with recommendations adopted by Parramatta City Council. The Study reviews 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

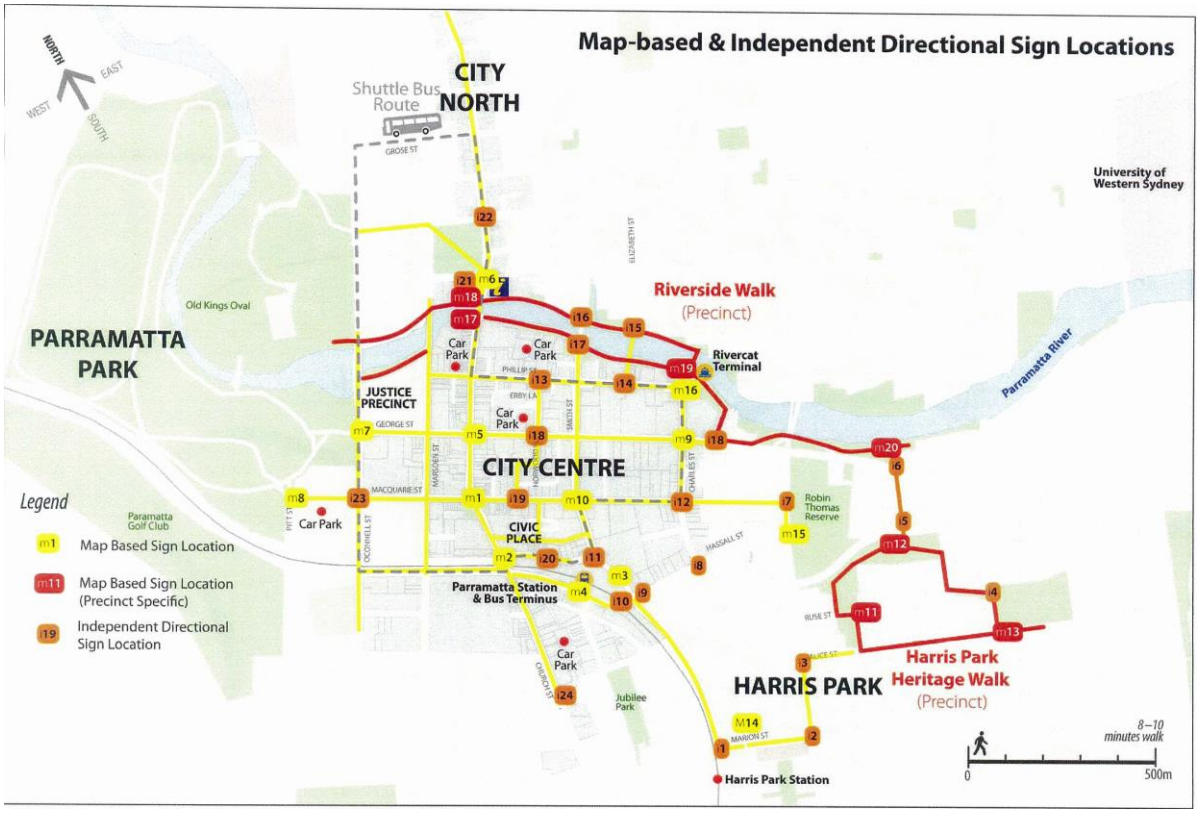
3.11 Parramatta Parking Strategy: Implementation Plan

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

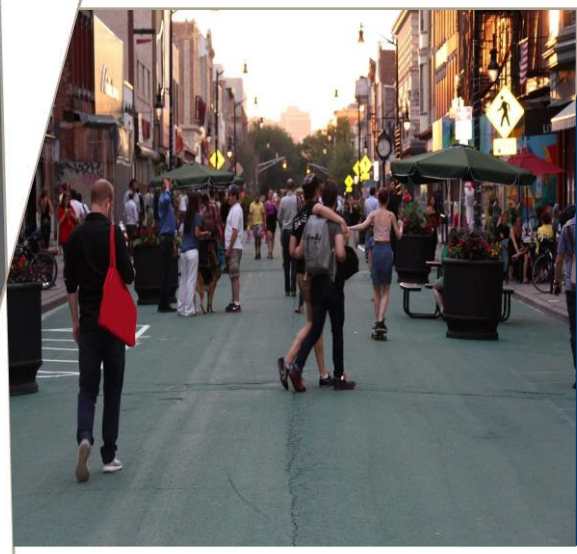
B

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 Information

Prepared for	City of Parramatta Council
Project Name	Best practice walkable city centre examples
Job Reference	80016067
Date	30 March 2017

Document History

Version	Date	Prepared by:	Reviewed by:
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).

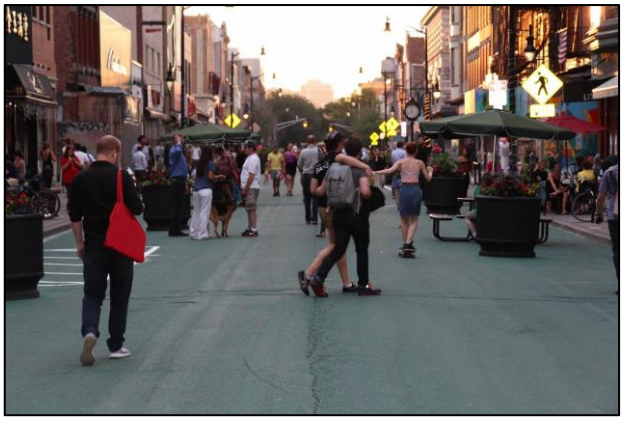
The city is relatively dense, and has been influenced by its neighbouring cities with regards to development and economic growth, particularly in the downtown area. There are however, smaller and quieter "village" areas surrounding the city which have also been maintained.

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 l 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**.

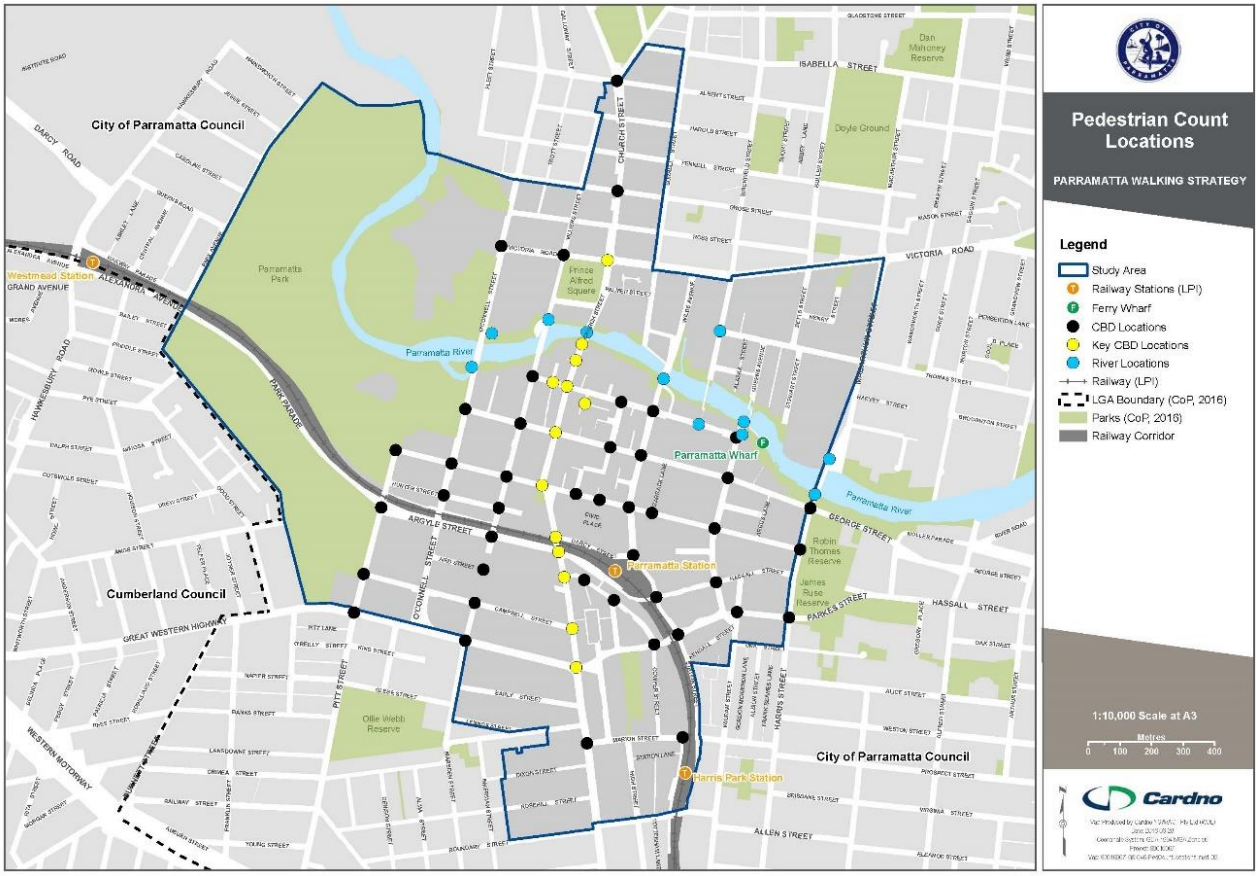
The days and times recorded were:

> 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

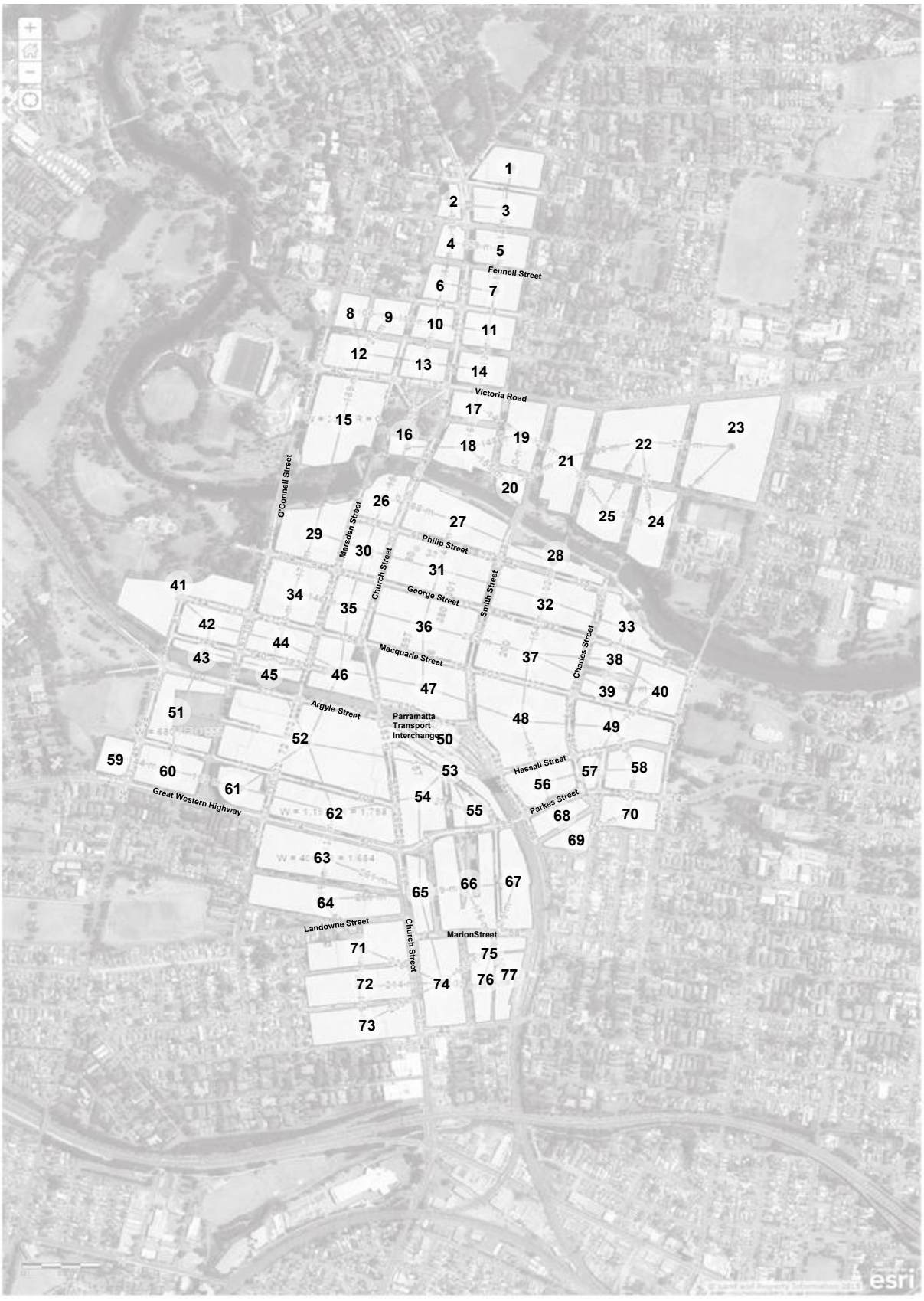
The pedestrian network has been modelled along existing key links with volumes modelled at survey locations only. Each link represents the pedestrian network between intersection points or nodes. The links generally correspond to the road network, however some additional pedestrian links create extra 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.

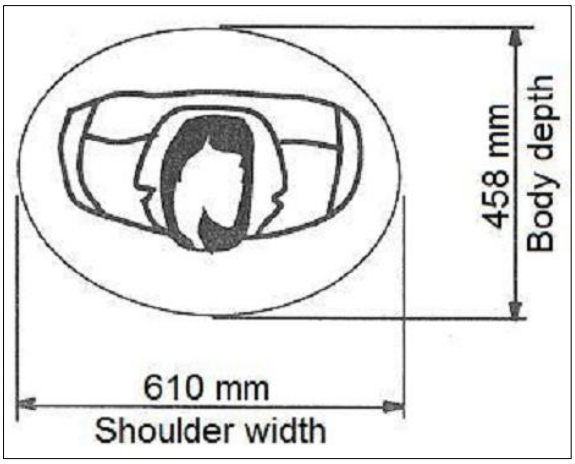
Summaries of the research of best practice for each of the seven facility components affecting the walking environment are presented in the sections below. These guided the development of the design requirements for the CBD, which are outlined in **Section 3** of this Appendix.

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

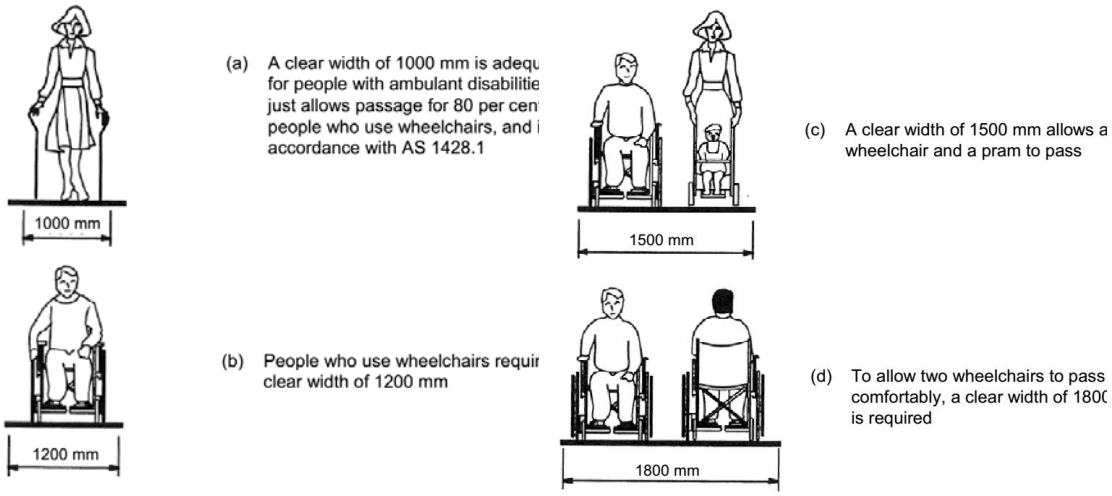


Source: Guide to Road Design Part 6A: Pedestrian and Cycle Paths, Austroads, 2009

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**:

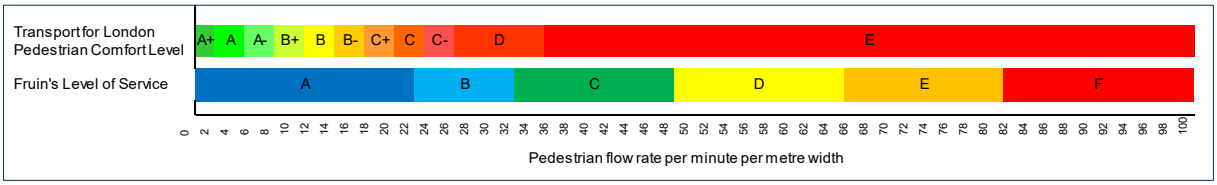
Table 4-4 Comfort 'At Risk' PCL against environmental context

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:

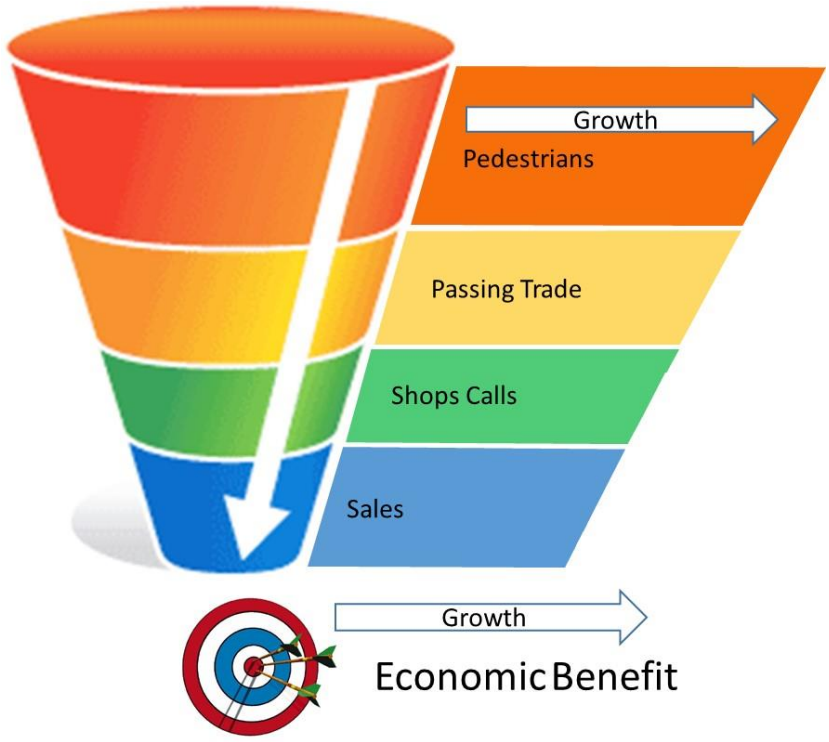
- $ per m2 (survey of establishments/ town plan, etc.)
- $ per store (survey of establishments)
- $ per passer by (from the pedestrian count)

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

ATTACHMENT 1

COMMUNITY CONSULTATION SUBMISSIONS

Cardno
Shaping the Future

1 Community consultation submissions

The submissions received during the community consultation period have been summarised in **Table 1-1** below.

Table 1-1 Community consultation submissions

#	Stakeholder	Comment
1	Museum of Arts & Applied Sciences (MAAS)	That the new Museum will form a key node in the day/night pedestrian network, and that holistic planning for signage, route planning and urban design should be developed in concert with the New Museum development (relates to Action IO9, IO14, IO15, IO24)
2	Museum of Arts & Applied Sciences (MAAS)	Action IO4 may be incompatible with the operational needs for the New Museum to successfully operate on the Riverbank Site (it is not clear from the draft Strategy whether Phillip or Wilde Avenue would be regarded as 'Main' streets – but it seems likely they would be – if so, new driveways are likely to be required)
3	Museum of Arts & Applied Sciences (MAAS)	Most of the identified Behavior Change actions represent opportunities for the New Museum to collaborate with the City of Parramatta in terms of public communications.
4	Department of Planning & Environment, Arts and Culture Division	We seek further clarification of which streets would be classified as 'Main' for the purposes of the plan as this could potentially impact the operation of the New Museum. Passenger and heavy vehicle access from Phillip Street and/or Wilde Avenue will be required.
5	Geoff Lee MP, Member for Parramatta	Improve the condition of existing footpaths and walkways. Many footpaths in the CBD are in poor condition. For the next five years, the construction of major projects will further deteriorate footpaths. Attention needs to be given to continually address maintenance needs and reinstatement of all footpaths in the CBD.
6	Geoff Lee MP, Member for Parramatta	New developments widening footpaths by counter-levered building design. This can allow for widened street frontage. All footpaths need to have adequate width to allow people to move freely especially in peak hour and during construction of sites.
7	Geoff Lee MP, Member for Parramatta	Street tree planting strategy. Improve the amenity of the CBD and suburban streets by planting appropriate trees to create boulevards and green corridors. Trees and landscaped areas provide much needed shade and form a microcosm to alleviate heat-island effects within the CBD.
8	Geoff Lee MP, Member for Parramatta	Provide clear wayfinding and destination signage. Visitors must be encouraged to explore the city and its destinations.
9	Geoff Lee MP, Member for Parramatta	Build underground pedestrian connections. The development of Parramatta Square and its surrounding blocks provides the opportunity to build connected-underground pedestrian routes. Pedestrians should have the option to walk from the Parramatta Station to the river through an underground precinct. All new developments within the CBD should add to the promenade to form a network that provides pedestrians with the option of on-surface or underground access to retail and offices. This principle is being used by the City of Sydney who have already established significant underground precincts radiating from Town Hall Station.
10	Western Sydney Local Health District (WLSHD) Centre for Population Health	To ensure implementation of the Parramatta CBD Pedestrian Strategy, PH encourage the CoP to incorporate into the final version of the strategy, the next steps identified in this current document, including: • Setting a mode share target for walking, which provides a goal and makes it easier to measure progress.

#	Stakeholder	Comment
		• Aligning the recommended walking actions with other Council works, available budget and redevelopment of city blocks; incorporating the walking strategies into the Integrated Planning and Reporting Framework and Delivery Plans of Council, will provide a framework for monitoring progress. • Incorporating the principles of movement and place in the current design framework. • Continuing to engage with stakeholders (health included) in walking actions that will need their involvement.
11	Western Sydney Local Health District (WLSHD) Centre for Population Health	While PH support all of the actions outlined, the following actions are ones in which PH could play a role in working with Council to support their implementation, these are: • I01: Implement 40 kilometres per hour (and advocate for 30 kilometres per hour) speed zones throughout the CBD. — PH to collate health data on injuries and deaths associated with road speed. • BC4: Create an online presence with Parramatta Walking Information, (discover, times, routes, items of interest). — Incorporate health messaging into Parramatta Walking Information. • BC5: work with schools to understand and cater for their student's needs. — PH through the state-wide Live Life Well at School initiative, engage with both primary and secondary schools to encourage active travel as a key health promoting initiative. PH can partner with Council to facilitate this action. • BC8: Promote Walk to Work days with events and campaigns. — PH to engage organisations through NSW Health's Get Healthy at Work initiative, to promote active travel to their employees. • BC9: Encourage organisations to promote and support employee-walking trips. — PH to engage organisations through NSW Health's Get Healthy at Work initiative to support active travel as an organisation and promote it to their employees. • BC10: Identify, signpost and promote a city circuit walk. — PH to work with CoP to incorporate health messaging into the city circuit walk.
12	Western Sydney Local Health District (WLSHD) Centre for Population Health	Monitoring and reporting framework: the identification of walking indicators to measure performance and progress, within a monitoring and reporting framework are critical elements of the Parramatta CBD Pedestrian Strategy.