

WALKING PLAN

2014-17



CITY OF MELBOURNE



A CONNECTED CITY

We manage movement in and around our growing city to help people trade, meet, participate and move about safely and easily, enabling our community to access all the services and opportunities the municipality offers.

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Adopted November 2014

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FOREWORD



Melbourne is Victoria's economic engine room and enjoys a vibrant social and cultural scene. Around 840,000 people pass through our city daily. This is likely to rise to more than 1.2 million by 2030. The City of Melbourne is responding to this growth with considered strategies for transport, land use and community services.

The City of Melbourne's Walking Plan is part of an integrated approach to transport, outlined in the City of Melbourne Transport Strategy 2012. It links all modes and is coordinated with city development and urban renewal.

Melbourne is a walking city with most trips to, from and within the city starting or ending on foot. In 2010, 66 per cent of trips within the municipality were walking trips. This figure is even higher in the CBD with 86 per cent of trips being on foot.



And this figure is set to grow as the city does which will put increasing pressure on footpaths and public transport interchanges. The safety of pedestrians is paramount and we constantly seek ways to improve this, whether through design, education or other strategies.

Walking makes economic sense: a 10 per cent increase in the connectivity of the pedestrian network in the city would add \$2.1 billion to the City of Melbourne's economy.

Our vision for Melbourne as a connected city means a place for people, a city with great streets linked by a well-designed transport system.

The Walking Plan includes strategies and actions that will ensure we keep a strong focus on the vital role that walking plays in the city and continue to improve the environment for walking.

A handwritten signature in black ink, appearing to read 'Robert Doyle'.

Robert Doyle
Lord Mayor, City of Melbourne

A handwritten signature in black ink, appearing to read 'C/O'.

Cathy Oke
Chair, Transport Portfolio

EXECUTIVE SUMMARY

Walking is the most important mode of transport for the City of Melbourne. It accounts for 66 per cent of all trips within the municipality and is part of trips by all other modes.

The purpose of the Walking Plan is to highlight the contribution that walking makes to the municipality, while laying out a practical plan to improve the city's walking network and encourage more walking.

The walking plan aims to increase the number of walking trips in 2030 by 63 per cent from 2009 levels.

It establishes principles for planning walking in the city including priority access, safety, access for all abilities, planning for future growth, creating attractive walking environments, permeability (ability to cross streets) and reducing delay to pedestrians.

The plan will help the City of Melbourne to work with the State Government to achieve the Plan Melbourne goal of transforming the transport system to support a more productive central city. In particular it supports improving pedestrian crossing times and reducing speed limits to improve pedestrian safety.

The actions in the plan are grouped in three streams.

Planning:

- amending the Melbourne Planning Scheme to improve the walking environment.

Street management:

- changing traffic signal operation to reduce delays to pedestrians;
- increasing the number of pedestrian streets and shared zones; and
- improving legibility and way finding.

Capital works:

- extensive master planning;
- access around tram and bus stops; and
- increasing the number of road crossings.

THE WALKING CITY

The importance of walking in Melbourne

Role of walking

Walking is our most fundamental mode of transport; almost everyone walks, and walking makes up part of every journey in the city.

Walking accounts for 66 per cent of all trips within the municipality. Council has a target for this to grow to 69 per cent by 2030 (CoM, 2012, p. 17). There will be many more people visiting and

living in the City of Melbourne by 2030. The number of daily weekday city users is predicted to increase from around 840,000 today to over 1,200,000 (CoM, 2013a, p. 14). The number of walking trips is forecast to increase by 64 per cent over this same period (CoM, 2012, p. 15).

Commuting to work in Melbourne

Virtually every public transport trip begins and ends with a walking trip. The share of people commuting to

work in Melbourne by public transport has increased by 11 per cent since 2001 (ABS 2001; 2011a). Over the same period, the share of individuals walking to work has increased by 76 per cent.

Melbourne's public transport patronage grew at an average of 3.9 per cent a year from 2002 to 2012, and at 6.6 per cent a year between 2004 and 2008 (PTV, 2013, p. 4). Projections indicate that 2011 patronage will double by 2029, meaning that there will also be many more people walking to tram stops and train stations in Melbourne.

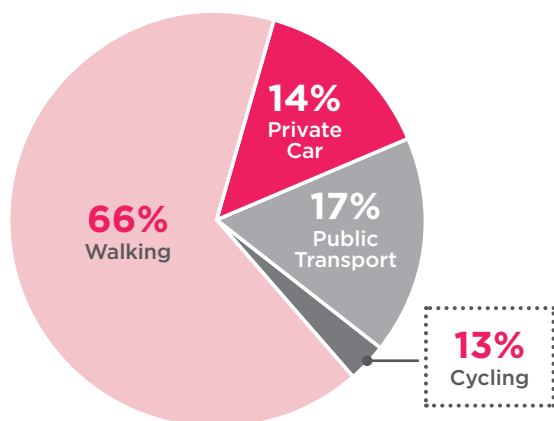


Figure 1: Trips within the City of Melbourne by mode, average weekday, 2009/10. (Source: DoT, 2010)

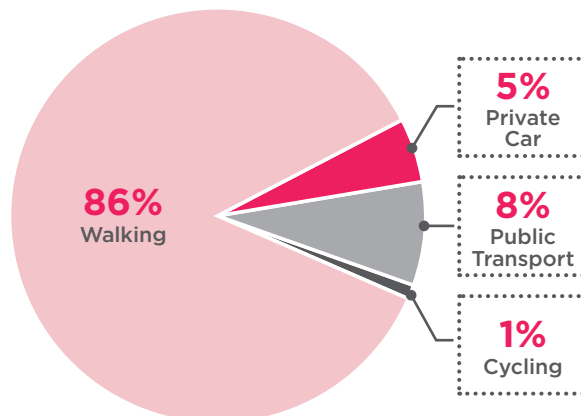


Figure 2: Trips within the Hoddle Grid and Docklands by mode, average weekday, 2009/10. (Source: DoT, 2010)

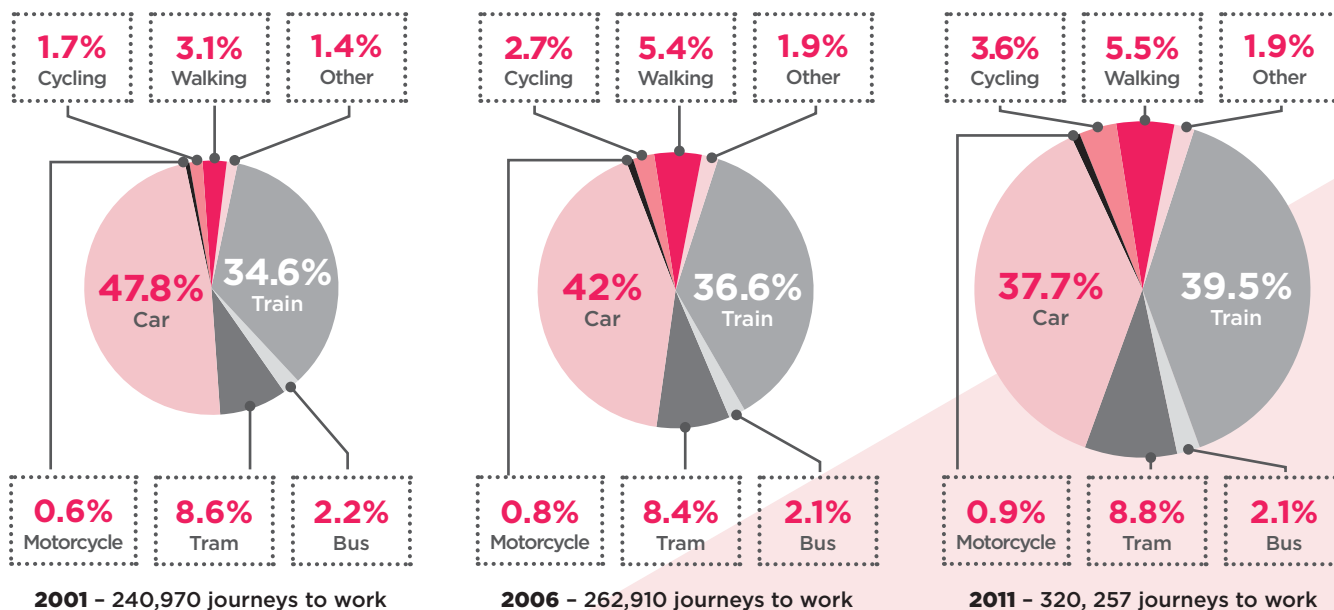


Figure 3: Method of travel to work in the City of Melbourne, 2001, 2006, 2011 (Source: ABS, 2011a; 2006; 2001)

Pedestrian accessibility provided by the walking network

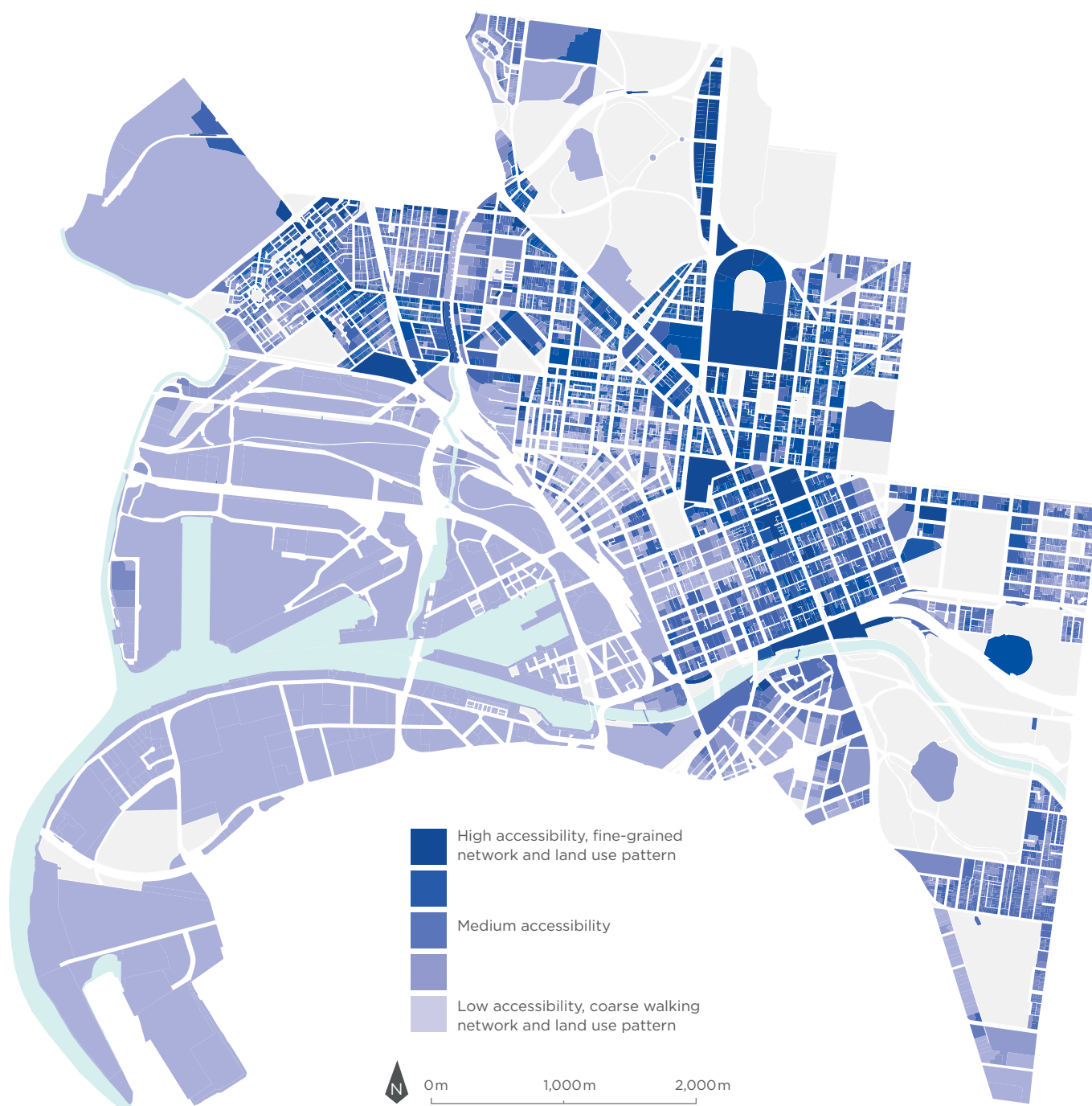


Figure 4: Pedestrian accessibility provided by the walking network.

This map shows how well each property is connected to other areas via the walking network based on walking time. Areas with greater permeability – more streets – laneways – smaller block sizes and parkland – result in higher levels of pedestrian accessibility.

THE WALKING CITY

The walking economy

Walking trips are important for the economy. About 63 per cent of trips made within the City of Melbourne for a work purpose are on foot (DoT, 2010). Walking is the primary mode for shopping, tourism and city visitors (DoT, 2010). Walking has also grown as more people have come to live in the municipality – 35 per cent of residents of the Hoddle Grid and 34 per cent of Southbank residents walk to work (ABS, 2011b).

Walking and agglomeration

Central business and retail precincts in large cities, such as in the Hoddle Grid and the expanded central city in Docklands and Southbank, foster connections within the central city community. These connections generate knowledge which circulates through both formal and informal links, and from this knowledge income is generated. Much of this knowledge transfer takes place face to face and is often the result of a walking trip within the central city. This is why dense city centres are so important to the economic prosperity of cities and nations. The large number of people located in close proximity to each other allows ideas to be quickly generated, refined into knowledge and put to work solving complex problems. There is a strong relationship between connectivity and productivity. This relationship is referred to as agglomeration economies.

Analysis of the impact of walking on agglomeration has found that if the walking connectivity within the Hoddle Grid was increased by 10 per cent, the value of the economy of the Hoddle Grid would be increased by up to \$2.1 billion per annum. This represents a 6.6 per cent increase in the value of the current economy (SGS, 2013, p. 2).

Agglomeration can be measured using Effective Job Density (EJD). Figure 5 shows the EJD provided by the walking network; that connectivity across the walking network contributes to the economy of the City of Melbourne.

Areas with darker colours represent both a richer walking network and a higher concentration of employment and economic activity. This measure of EJD is based on the number of jobs (working people) that can be reached within 30 minutes by walking on the pedestrian network (scaled by the time it takes to reach them).

Walking connectivity contributes to EJD by supporting knowledge transfer. The connectivity of the walking network across the City of Melbourne is shown in Figure 4, demonstrating how well each land parcel is connected to other land parcels. It shows the amount of land that can be reached by a 30-minute walk, divided by how long it takes to reach each of the land parcels within the 30-minute catchment.

Attractive streetscapes enhance the city experience

A high-quality walking environment is key to delivering on the vision of the city's retail and hospitality strategies. Walking is low cost, environmentally sustainable and promotes physical and mental health. As a mode of transport, walking is also the main mode of transport for tourists and visitors for events. However, one of the main problems reported by visitors to Melbourne is the difficulty of walking around the city due to narrow footpaths or delays at signals (Destination Melbourne, 2010, p. 60).

Policy background

There is a significant policy background supporting the goals of this plan including documents from the Commonwealth and State governments as well as the City of Melbourne. Details of these documents are available in Appendix 4.

Economic impact of the walking network

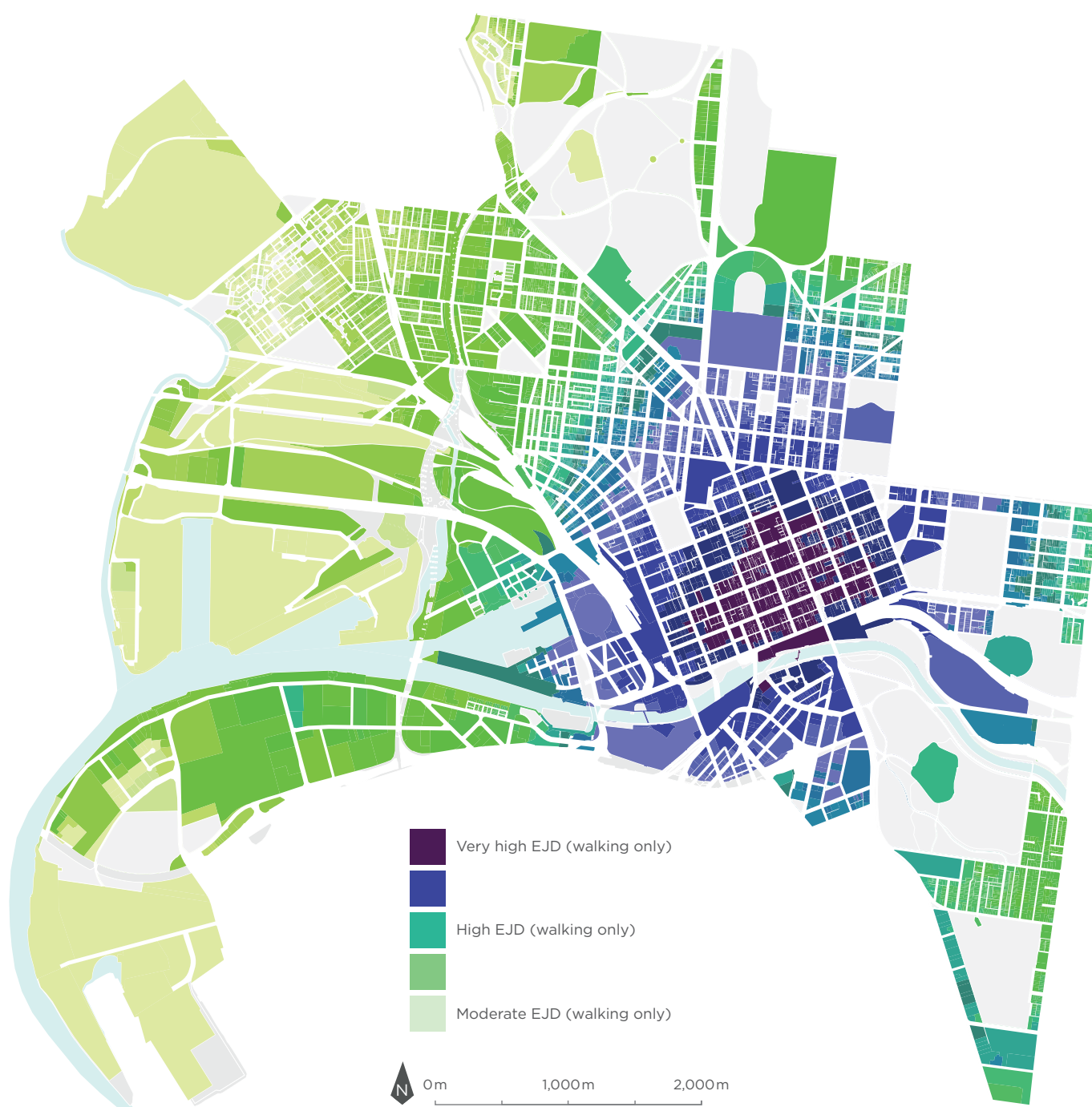


Figure 5: Effective Job Density (EJD) provided by the walking network

This map shows the connectivity across the walking network and its contribution to the economy of the City of Melbourne. Areas with darker colours represent both a richer walking network and a higher concentration of employment and economic activity. This measure of EJD is based on the number of jobs (working people) that can be reached within 30 minutes by walking on the pedestrian network (scaled by the time it takes to reach them).

THE WALKING CITY

Achievements to date

Walking environment

For more than 30 years the City of Melbourne has been transforming the municipality's walking environment. Melbourne's iconic Bourke Street Mall opened officially in 1983. Guided by the Places for People studies in 1994 and 2005, the City of Melbourne has widened footpaths, laid high quality pavements, encouraged outdoor dining and reduced traffic signal cycle times to support improvements to public transport to make Melbourne a more attractive place to be.

The city has increased pedestrian safety and level of service with:

- Widened footpaths, especially in areas of high pedestrian use, such as approaching train stations;
- Creation of Bourke Street Mall and transformation of Swanston Street into a pre-eminent civic space;
- High-quality pedestrian environments including bluestone paving, trees and street furniture;
- Level access trams stops;
- Signalised pedestrian and zebra crossings;
- Safe staging points for pedestrians to cross busy roads;
- Reductions in traffic signal waiting times especially in the central city;
- Extending the time that walk signals are displayed to give pedestrians a longer window in which to cross at signals;
- Shared zones with speed limits reduced to 10 km/h, which allow pedestrians and drivers to share the road and make more efficient use of space;
- 30 km/h and 40 km/h speed limits in key pedestrian streets;
- A speed limit in the central city of 40 km/h;

- Conversion of laneways to active uses including retail and hospitality;
- Negotiating laneways to be built in new developments;
- Conversion of underused road space to pedestrian use, such as removing slip lanes;
- Enhancement of existing public spaces, such as City Square in 2000 and the creation of new spaces such as Queensbridge Square in 2006;
- Signal cycle time reductions at Spencer and King streets to reduce pedestrian wait times and crowding;
- Painted pedestrian medians on Toorak Road, Errol Street and Victoria Street; and
- Expanding the amount of footpath space by 160,000 square metres or nearly 15 per cent since 2007, from 1,107,627 square metres to 1,270,793 square metres in 2012.

Walk 21 Charter

In 2008 the City of Melbourne became a signatory to the Walk21 International Charter for Walking. This requires the city to 'work with others to create a culture where people choose to walk' (Walk21, 2006) through the following strategic principles:

- increased inclusive mobility;
- well-designed and well-managed spaces and places for people;
- improved integration of networks;
- supportive land-use and spatial planning;
- reduced road danger;
- less crime and fear of crime;
- more supportive authorities; and
- a culture of walking.



THE WALKING CITY

Challenges for walking in Melbourne

Growth

The City of Melbourne will experience significant increases in residential and employment populations which will result in more people walking in the municipality.

Some key footpaths in the city are already routinely overcrowded with people forced to walk on the roadway. The volume of pedestrian traffic in Melbourne will rise as the city grows from about 844,000 daily visitors in 2012 to 1.256 million per day in 2030 (CoM, 2013a, p. 14). The central city is expanding into urban renewal areas including Southbank, Docklands, Fishermans Bend, City North and Arden-Macaulay. Figure 7 shows where growth will be concentrated. These areas need to be designed to offer similar levels of walkability to that currently experienced in the central city.

Crowding and delay

Crowding is already a significant issue for the walking network in Melbourne and city growth will exacerbate this. Locations where crowding occurs include in and around public transport stops and stations and in areas of the retail core of the city, such as Swanston Street.

Crowding discourages people from walking, creates delays which waste time and money and undermines Melbourne's international reputation for liveability. It can 'squeeze out' other normal functions of a footpath, such as socialising, window shopping or enjoying a space, and it can undermine retail and hospitality experiences. Overcrowding and delays that result from waiting at intersections can cause annoyance and discourage people from returning to the city.

Traffic congestion in Melbourne costs the city's economy \$3 billion a year. This is projected to rise to \$6 billion by 2020 (BTRE, 2007, p. 13). A significant amount of traffic congestion experienced in Melbourne is suffered by people walking, especially through delays at traffic lights or other crossings.

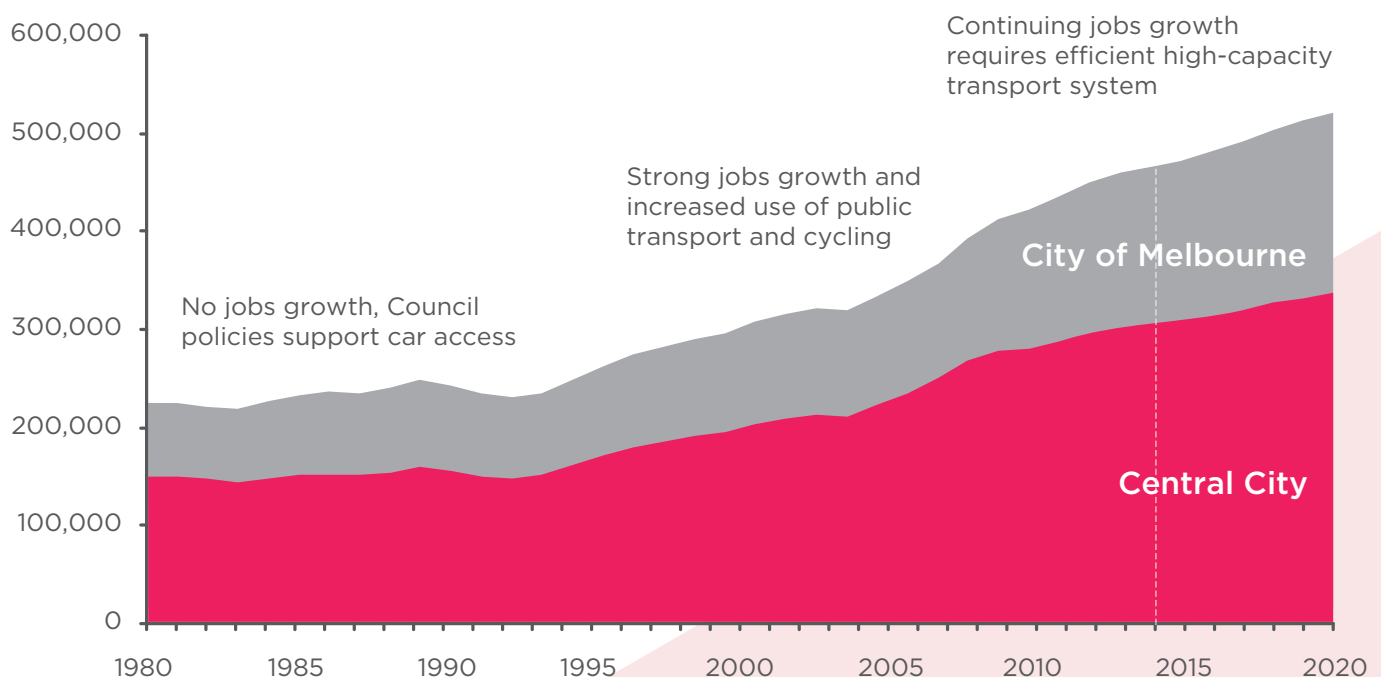


Figure 6: City of Melbourne jobs growth, 1980 to 2020

Growth in the City of Melbourne, 2012 - 2031

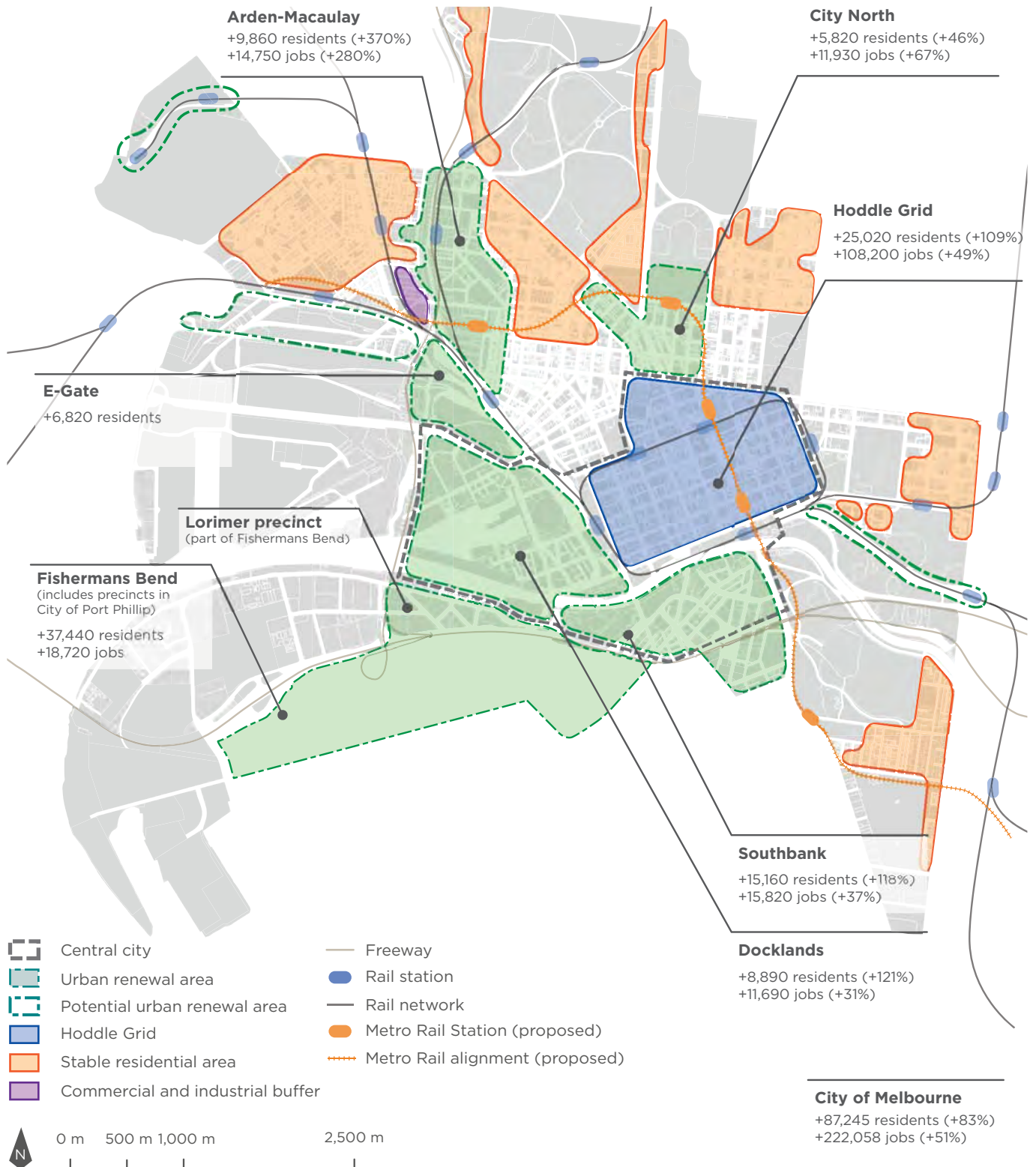


Figure 7: City of Melbourne growth 2012 - 2031

THE WALKING CITY

Connecting to public transport

Public transport nodes attract the largest and most concentrated walking activity in the city. For example, 171,160 people use Flinders Street Station each weekday, 111,290 use Southern Cross and 47,360 use the Federation Square tram stop (PTV, 2011a, 2011b).

Public transport use has grown strongly in recent years and is expected to continue to grow based on central city job growth and new infrastructure such as Melbourne Metro and Regional Rail Link. Providing an efficient walking network supports public transport operation.

Increases in tram patronage and crowding at tram stops will also require the conversion of some high-intensity tram stops to new designs that provide more space for people waiting, more permeable access from footpaths and potentially low-speed road space to increase opportunities for pedestrians to cross roads.

The walking network

Increasing the number of pedestrian connections and ensuring new developments are permeable is a challenge for the future.

A rich walking network with many routes, links, crossings and connections provides more walking choices, spreads the pedestrian load, stimulates more walking, reduces walking times, creates more economic activity by bringing people into new spaces and reduces walking distances.

New developments must be able to provide new connections whilst remaining viable both in their own right and in order to deliver a net community benefit through the viability of the development yield and the pedestrian network overall.

Links may be footpaths, lanes, shared zones and formal or informal pedestrian crossings. They also include part-time links through arcades and other public connections through private property.

The walking network in the Hoddle Grid is relatively rich with many through-block connections, mid-block pedestrian crossings, laneways and little streets. There are still opportunities to add connections to this network. In urban renewal areas, however, the walking network is relatively less rich and will require significant improvement to achieve its development goals.

Safety

In the City of Melbourne, a pedestrian is killed or sustains a serious or other injury every two days. There were 956 pedestrians injured or killed in the five years to 2011 (VicRoads, 2011, p. 7). The City of Melbourne has the highest rates of pedestrian death and injury in the state.

The road safety approach in a people city is to reduce death and injury by addressing the road danger posed by vehicles while supporting the growth of walking and the expansion of the walking network. City of Melbourne's Road Safety Plan 2013–2017, approved in July 2013, seeks to deliver an environment in which pedestrians are prioritised and supported by a safe, attractive and engaging urban environment.

People walking in Melbourne need to feel personally secure. A high level of personal security will encourage more people to walk more, including at night and in places with which they are not familiar. This encourages more economic activity. Passive surveillance is a key factor in creating a feeling of personal security.

Balanced transport priority

Walking is the most fundamental mode of travel in the City of Melbourne and decisions about the transport network and land use should reflect this priority. The walking network in Melbourne should be planned and managed to increase the priority given to walking to reduce delay and avoid overcrowding.

Access for all

Providing access for people of all abilities and ages is a key component of developing the walking network in Melbourne.

Attractive walking environments

The City of Melbourne will continue to strive to create attractive walking environments. This includes creating walking environments that encourage a variety of uses: places to pause or window-shop, space for kerbside dining, art, seating and expansion of the urban forest.

Pedestrian network volumes

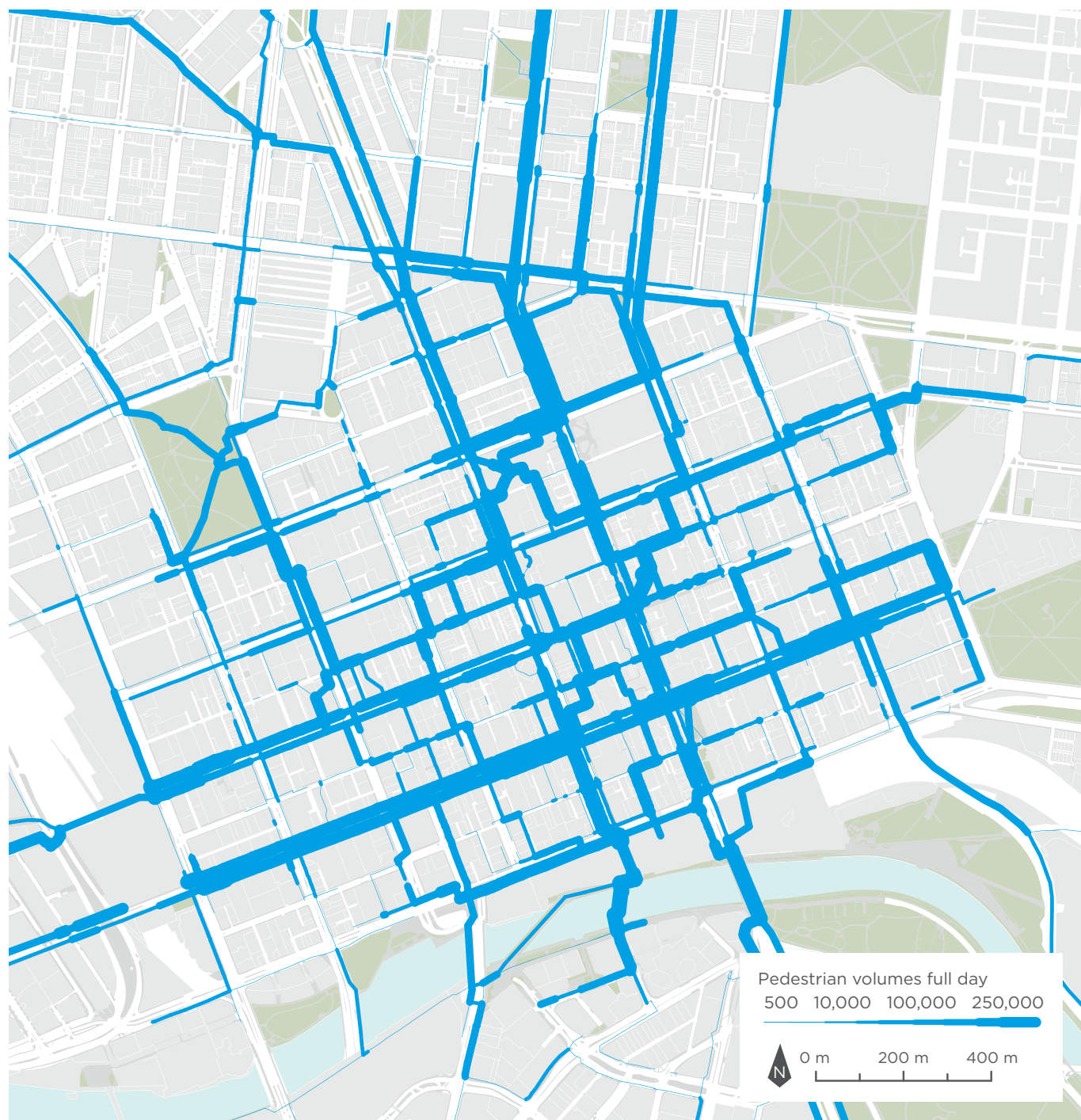


Figure 8. Central city pedestrian dynamic

This map shows the overall walking dynamic across the city by approximating volumes across the pedestrian network. A range of data sources have been combined to approximate where people walk from car parks, train stations and other places in the city to shops, jobs, classes or other activities. Pedestrian counters across the city have been used to refine the results.

Data used includes ABS Census journey to work, Victorian Integrated Survey of Travel and Activity (VISTA), City of Melbourne Census of Land Use and employment (CLUE) and the City of Melbourne Pedestrian Counting Program information.

GOALS

1. Expand the pedestrian network

The City of Melbourne Council Plan 2013-17 has a four-year priority of expanding and prioritising a connected, safe and easy to access pedestrian network.

The City of Melbourne will create an excellent and safe walking environment for residents, workers and visitors, with seamless high-priority links between the city's public spaces and the public transport system.

2. Plan for future growth

A key goal of this plan is to accommodate increasing amounts of walking in Melbourne. The city is experiencing significant growth. Figure 9 shows that walking will account for 30 per cent of all trips to, within and from the City of Melbourne in 2030, corresponding to over one million walking-only trips (on top of walking connections to public transport trips) on an average weekday. Decisions about the transport network and land use that affect pedestrians should take into account the likely future growth in numbers of people walking in Melbourne and plan accordingly.

3. Reduce delay

This plan will reduce delays to pedestrians through changes to the walking network, footpaths, intersections and traffic signals.

4. Improve safety

The safety of people walking in the City of Melbourne is very important. This includes personal safety and road safety. The City of Melbourne faces a significant challenge addressing the high numbers of people injured by vehicles while walking.

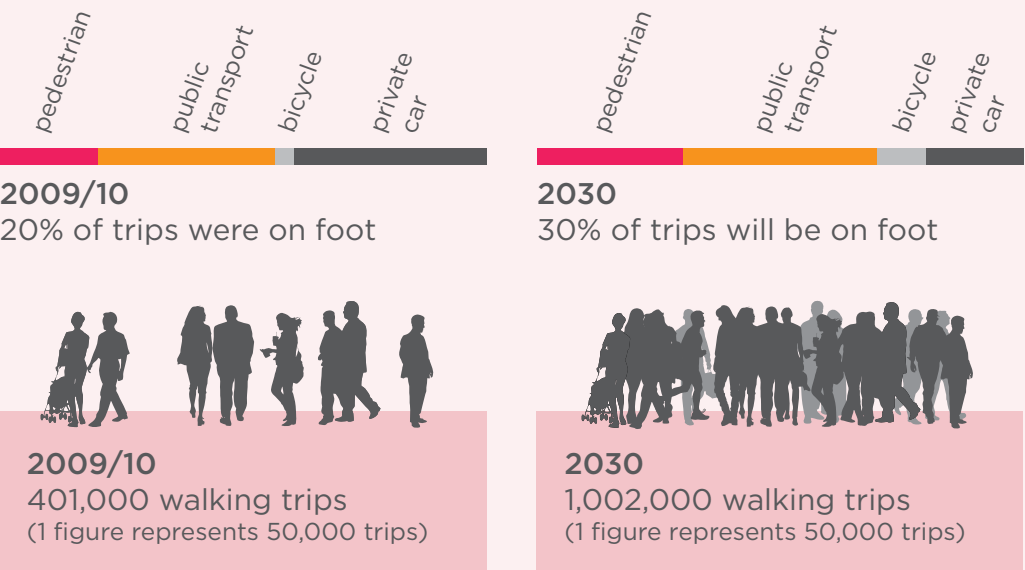


Figure 9. Walking mode share and trip growth in the City of Melbourne



Figure 10. Example of pedestrian crowding at Collins and Swanston streets



ACTIONS

Actions in this plan have been framed within the existing structure of the operations of the City of Melbourne and its stakeholders. This will ensure the effective implementation of these actions to achieve the strategy vision.

1. Planning

- 1.1 A central city subregion walking plan
- 1.2 Using the planning scheme to improve the walking network
- 1.3 Principal Pedestrian Networks

2. Street Management and Operation

- 2.1 SmartRoads
- 2.2 Signal operation
- 2.3 Pedestrian street hierarchy
- 2.4 Investigate streets as places
- 2.5 Investigate new Walking Streets
- 2.6 Investigate High-Mobility Walking Streets
- 2.7 Create new shared zones
- 2.8 Making roads safer for pedestrians
- 2.9 Walking navigation
- 2.10 Stop lines
- 2.11 Travel behaviour change
- 2.12 Promoting health

3. Capital Works

- 3.1 Addressing pedestrian crowding
- 3.2 Pedestrian crossings at intersections
- 3.3 Master plans
- 3.4 Access around stations
- 3.5 Tram and bus stops
- 3.6 Increasing the number of formal crossings
- 3.7 Making streets easier to cross
- 3.8 Technical notes

1. PLANNING

1.1 A central city subregion walking plan

Work with the Metropolitan Planning Authority, the Department of Economic Development, Jobs, Transport and Resources (DEDJTR) and Inner Melbourne Action Plan councils to deliver improvements to walking in Melbourne.

Objective

To ensure that planning for the central subregion of Melbourne provides for a high-quality pedestrian network.

Issue

Plan Melbourne identifies walking as a critical element in the economy of central Melbourne. It also proposes that the new Metropolitan Planning Authority facilitate work with subregional groups on shared priorities. Meanwhile, the Inner Melbourne Action Plan, which is made up of the same councils as the central subregion, will need to be reviewed and may be able to be incorporated in planning. Walking must be a high priority in planning for the central subregion.

Rationale

Plan Melbourne, the metropolitan planning strategy, is a framework which articulates a whole-of-government policy direction to integrate transport and land use strategic planning for an expanded central city in 2050. The framework provides a high-level central city transport narrative and strategic transport network corridors for Melbourne.

The framework will also provide guidance to urban renewal precincts, such as Arden-Macaulay, City North and Fishermans Bend. It will highlight potential transport connections in areas where people's preferences for getting around may include walking, cycling and frequent public transport networks that connect destinations both across and within the expanded central city and Inner Melbourne neighbourhoods. This framework will assist short- and medium-term projects to incrementally contribute to the shared long-term vision for transport in the central city.

Implementation

- Work with the Metropolitan Planning Authority, the DEDJTR and Inner Melbourne Action Plan councils to deliver improvements to walking in Melbourne, including capital works and planning scheme amendments to support the Plan Melbourne goal to create a more productive central city.
- Work with the Metropolitan Planning Authority to integrate the highest levels of walking, cycling and public transport use in the planning of urban renewal precincts.
- Work with the Metropolitan Planning Authority to integrate the City of Melbourne Walking Plan into master planning for urban renewal precincts.

The central subregion

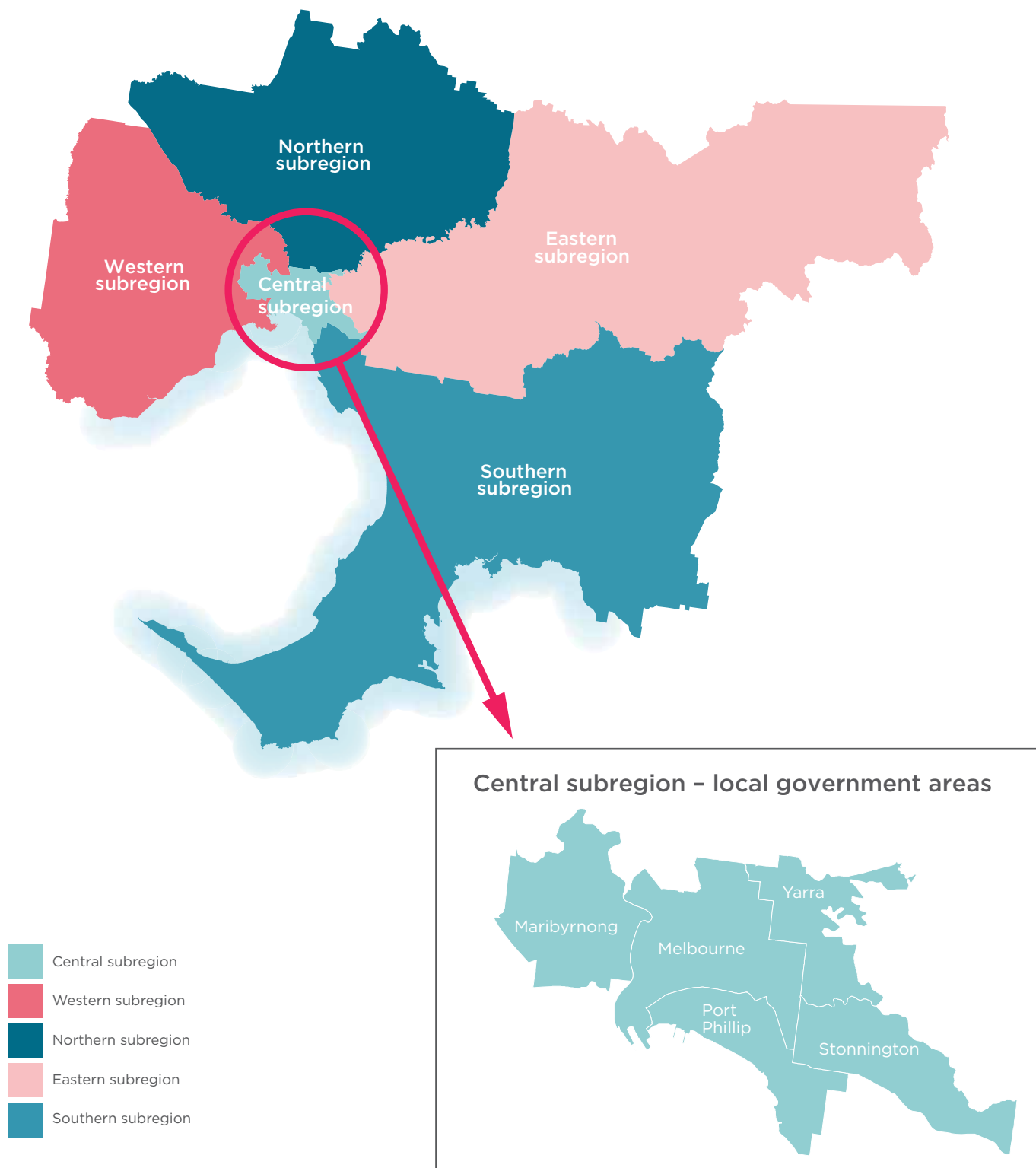


Figure 11: Local government areas in the central subregion

Source: Adapted from State of Victoria, 2013

1. PLANNING

1.2 Use the planning scheme to improve the walking network

Establish a future fine-grained pedestrian network for the City of Melbourne for implementation in the Melbourne Planning Scheme.

Objective

To ensure that land is developed in Melbourne in a way that contributes to the development of a fine-grained walking network with short blocks and many routes, links and connections.

Issues

A fine-grained walking network reduces walking distances and travel times and has been a goal of the City of Melbourne for many years. It increases accessibility and boosts the city's economy in a similar way to other transport infrastructure. Support for the concept is in the Municipal Strategic Statement as well as in structure plans for Southbank, Arden-Macaulay and City North. However, the fine-grained walking network is not clearly established in the Melbourne Planning Scheme. The planning scheme is the tool used to manage the development of private land. Creating a fine-grained network will require many new walking links on private land. It will also identify mid-block road crossing points.

Provisions already exist in the planning scheme (including Design and Development Overlays, Public Acquisition Overlays and Developer Contribution Plans) to require developers to provide through-block links, but these are not always effective or desirable. Developers often provide fine-grained pedestrian links in commercial developments (such as the QV Building at the corner of Lonsdale and Swanston streets), but they can be reluctant to do so for other land uses, particularly residential developments. In these situations, the mechanisms do not serve the broader strategic context of an overall plan for Melbourne's walking network.

Also, previous attempts to establish a fine-grained pedestrian network in urban renewal areas through the

planning scheme have not been justified to the satisfaction of planning panels.

Another issue is specifying the quality of through-block links, such as whether they are open to the air or attractive to pedestrians, levels of sunlight, width and whether they should provide clear sight lines through the block.

In the Southbank precinct (and currently proposed for City North), controls in the planning scheme require pedestrian through-block links to be provided where the average length of a street block exceeds 100 metres (DTPLI, 2014, p. 2). Research shows that the optimum spacing for pedestrian connections in city centre retail core areas may be 50 to 70 metres (Siksna, 1996). However, planning scheme provisions do not specify the exact location of the link and planners are merely obliged to negotiate the link placement with developers as each land parcel is developed. As a result, links may not be provided in the best location.

Work that is needed to support changes to the planning scheme includes:

- specifying a fine-grained pedestrian network that will be developed throughout the City of Melbourne including through-block links on private land;
- assessing the economic contribution and other benefits of a fine-grained walking network to the city's economy; and
- assessing the costs of developing the walking network, including impacts on landowners who would be required to provide the links.

This will involve expanding and improving the current pedestrian monitoring and counting program as well as pedestrian network modelling.

Rationale

The walking network in the City of Melbourne already has a significant impact on the city's economy. Increasing the level of walking connectivity by 10 per cent – for example, by adding through-block links – would increase the value of the overall Hoddle Grid economy by \$2.1 billion per annum or 6.6 per cent. This is because people would then be better connected, particularly to jobs and for work-related walking trips. (CoM & SGS, 2013d)

Through-block links add to the quality of the walking network by:

- shortening walking distances;
- increasing the amount of street frontage leading to business and job opportunities;
- creating more intersections and offering more route choices;
- providing alternatives to crowded routes;
- providing intimate and interesting spaces; and
- enhancing the city's reputation for laneway experiences.

Implementation

- Continue to expand the pedestrian monitoring program to inform decisions about pedestrian planning.
- Develop a model of the walking network to test scenarios for improving the network such as the location of through-block links or predicting future crowding.
- Establish a future fine-grained pedestrian network for the City of Melbourne particularly in urban renewal areas for implementation in the Melbourne Planning Scheme.

1.3 Principal pedestrian networks

Define a principal pedestrian network in the Planning Policy Framework and SmartRoads to complement the fine-grained pedestrian network.

Objective

To ensure that land is developed in Melbourne in a way that contributes to the development of a fine-grained walking network with short blocks and many routes, links and connections.

Rationale

The State Government has been reviewing the State Planning Policy Framework. Part of this review has been to include in the planning system the principal networks for the main modes of travel: motor vehicles, trams, buses, bicycles and walking. One aim of the framework is to ensure that the planning system provides appropriate protection for the operation and enhancement of these principal routes when land is developed. This is a specific objective of the Transport Integration Act to integrate transport and land use planning.

A principal pedestrian network is a designated network of routes in a given area that supports walking trips into and around key destinations. These networks are being trialled and evaluated in four metropolitan municipalities. When this work is complete, City of Melbourne will have more information about how these would work in the central city. City of Melbourne's planning scheme already provides some of the protections for the pedestrian environment that Principal Pedestrian Networks would consider, such as reducing the number of driveway crossovers in high-volume pedestrian areas.

The principal pedestrian network would be included as Pedestrian Priority Areas in VicRoads' SmartRoads system (see Section 2.1).

Implementation

- Work with the Department of Economic Development, Jobs, Transport and Resources to define a principal pedestrian network in the Planning Policy Framework. This would complement the fine-grained pedestrian network and pedestrian priority areas as defined in SmartRoads.

2. STREET MANAGEMENT AND OPERATION

2.1 SmartRoads

Use SmartRoads to assess road space allocation in the City of Melbourne.

Objective

To ensure that the SmartRoads Network Operating Plan gives appropriate priority to pedestrians.

Rationale

The SmartRoads Network Operating Plan is VicRoads' system for managing all modes of movement on the road network to deliver the greatest benefit to the community.

The plan allocates priorities for different modes on all roads (such as tram or pedestrian priority). Often a road will have several priority modes; Swanston Street, for example, prioritises pedestrians, cyclists and trams.

Network Fit Assessments gauge the extent to which proposals to change network operations fit with the strategy of the Network Operating Plan. This can include changing traffic signals to give more time to one road or another or removing a lane of traffic to add a bicycle lane or widen the footpath. In areas identified as having pedestrian priority, pedestrian movements are given greater weight in the Network Fit Assessment process.

The current Network Operating Plan prioritises pedestrians in the Hoddle Grid, areas of Carlton, some roads in Southbank and some shopping strips. Reflecting the role of walking in the capital city, pedestrian priority areas in the City of Melbourne need to be expanded to include many parts of Docklands and key streets in Southbank as identified in the Southbank Structure Plan, including City Road as well as parts of St Kilda Road. In the future, as the central city area expands, pedestrian priority will also need to be expanded to urban development areas such as Arden-Macaulay and the Lorimer precinct of Fishermans Bend.

As part of integrating transport land use and planning, the Principal Pedestrian Network, developed as part of the Planning Policy Framework, would become the Pedestrian Priority Area for the City of Melbourne in SmartRoads.

Implementation

- Work with VicRoads and State Government agencies to expand SmartRoads Pedestrian Priority Areas in the City of Melbourne to include City Road and other parts of Southbank, Docklands and other areas.
- Use SmartRoads to assess road space allocation in the City of Melbourne.

Increasing accuracy in measuring pedestrian congestion

The Network Operating Plan uses estimates when counting the numbers of people walking across intersections rather than actual numbers. As a result, accurate assessments of delay to pedestrians at intersections cannot be made.

- Work with VicRoads to continue to improve the knowledge of pedestrian volumes and movements, particularly at intersections, to ensure high-quality data is used in Network Fit Assessments. Explore the use of new technology, including de-identified mobile phone data, to reduce counting costs.

Develop a place-based approach in SmartRoads

SmartRoads provides a framework for making decisions about priority access on the road network, particularly at intersections. It assesses proposals on the basis of their contribution to the efficiency of the transport system. This may benefit pedestrians walking to destinations when travel time is important. However, it has been acknowledged that it does not take into account the concept of high-quality places in the same way. For example, proposals to widen footpaths to improve urban design, plant trees or address pedestrian crowding cannot currently be assessed properly by SmartRoads. The DEDJTR has been working with VicRoads, City of Melbourne and others to develop a complementary place-based analysis to be incorporated into the SmartRoads framework. This would allow improvements to the quality of a place to be compared with or against improvements to improve the efficiency of the transport network.

- Continue to work with VicRoads, the DEDJTR and others to develop a place-based assessment to be integrated into SmartRoads.

Current pedestrian priority areas

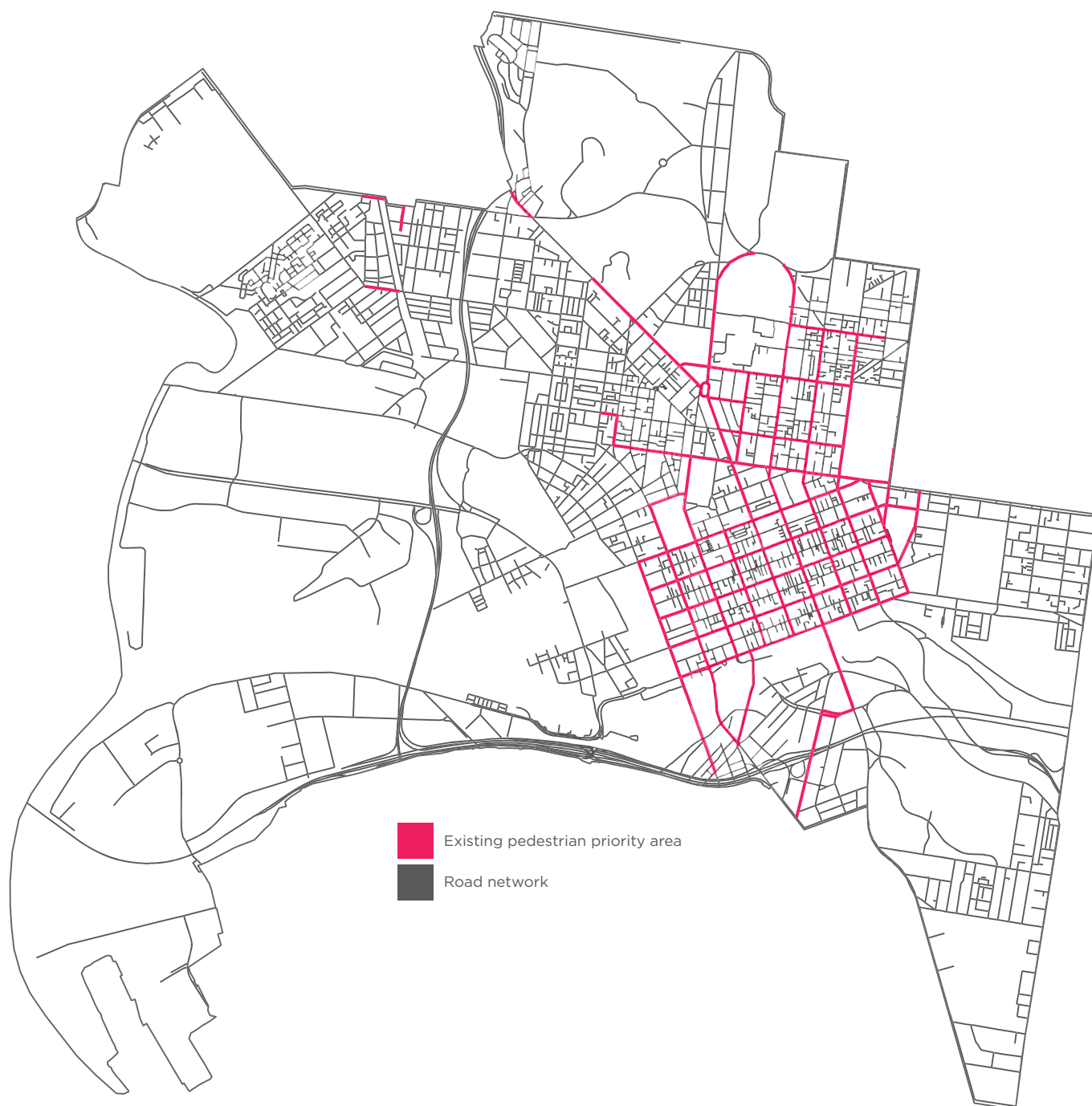


Figure 12: Current City of Melbourne pedestrian priority areas as designated in VicRoads' SmartRoads Network Operating Plan

2. STREET MANAGEMENT AND OPERATION

2.2 Signal operation

Assess pedestrian delay at intersections across the City of Melbourne and develop a prioritised list of projects to reduce pedestrian delay.

Objective

To improve traffic signal operation for pedestrians while balancing priority for all users.

Rationale

Delays to pedestrians contribute significantly to congestion and inefficiency in the City of Melbourne.

Reducing delay to pedestrians at crossings

Delays to pedestrians at traffic signals contribute significantly to traffic congestion costs. The cost of pedestrian congestion grows as the numbers of pedestrians increases.

The City of Melbourne works with VicRoads to review signal timing to maximise its efficiency and achieve the lowest overall delay across all types of road users. In September 2013, signal times on King and Spencer streets were reduced to bring them closer in alignment with other intersections in the Hoddle Grid, where most signals operate with a 90-second cycle during peak periods. Previously, King and Spencer streets operated at longer cycle times (110 and 120 seconds) during peak periods, and on King Street, north-south movements received a disproportionately high level of priority (72 per cent in the am peak and 66 per cent in the pm peak). This created significant delays for people crossing King Street. Only one third of people using King Street (in all modes of transport) are travelling north-south. Two thirds are travelling east-west, with many people walking to and from Southern Cross Station or travelling in trams and buses.

There are also other techniques for reducing delays including extending the time that the walk signal is displayed without affecting other uses at the signal.

Implementation

- Assess pedestrian delay at intersections across the City of Melbourne and develop a prioritised list of projects to reduce pedestrian delay, focusing on the intersections with the most pedestrians first.
- Reduce traffic signal cycle times on Spencer Street at Collins Street and at Flinders Street.

Auto-on pedestrian phase signals

At crowded intersections, or intersections through which many pedestrians move, the pedestrian phase should be automatically activated rather than pedestrians being required to press buttons to activate crossings.

These signals are called auto-on pedestrian phase traffic signals; they automatically activate the pedestrian signal when traffic lights turn green without needing someone to press a button. They reduce wait times for pedestrians as pedestrians do not miss an opportunity to cross if they reach the intersection after the time a walk phase could start. They give pedestrians a similar level of service to motorists, public transport vehicles and cyclists who do not need to manually activate lights.

The City of Melbourne will work with VicRoads within the current Council term (until 2017) to convert signalised intersections located in the proposed auto-on pedestrian phase areas shown. Traffic signals will be set up to automatically activate the walk signal between 6am and 9pm. After 9pm the noise of pedestrian signals may have a negative impact on residential areas. Beyond 2017, auto-on pedestrian phase signals will be further expanded as the city grows.

Implementation

- Expand the implementation of auto-on pedestrian phase signals at intersections in the area shown where compatible with prevailing signal timings.

Proposed auto-on pedestrian phase area

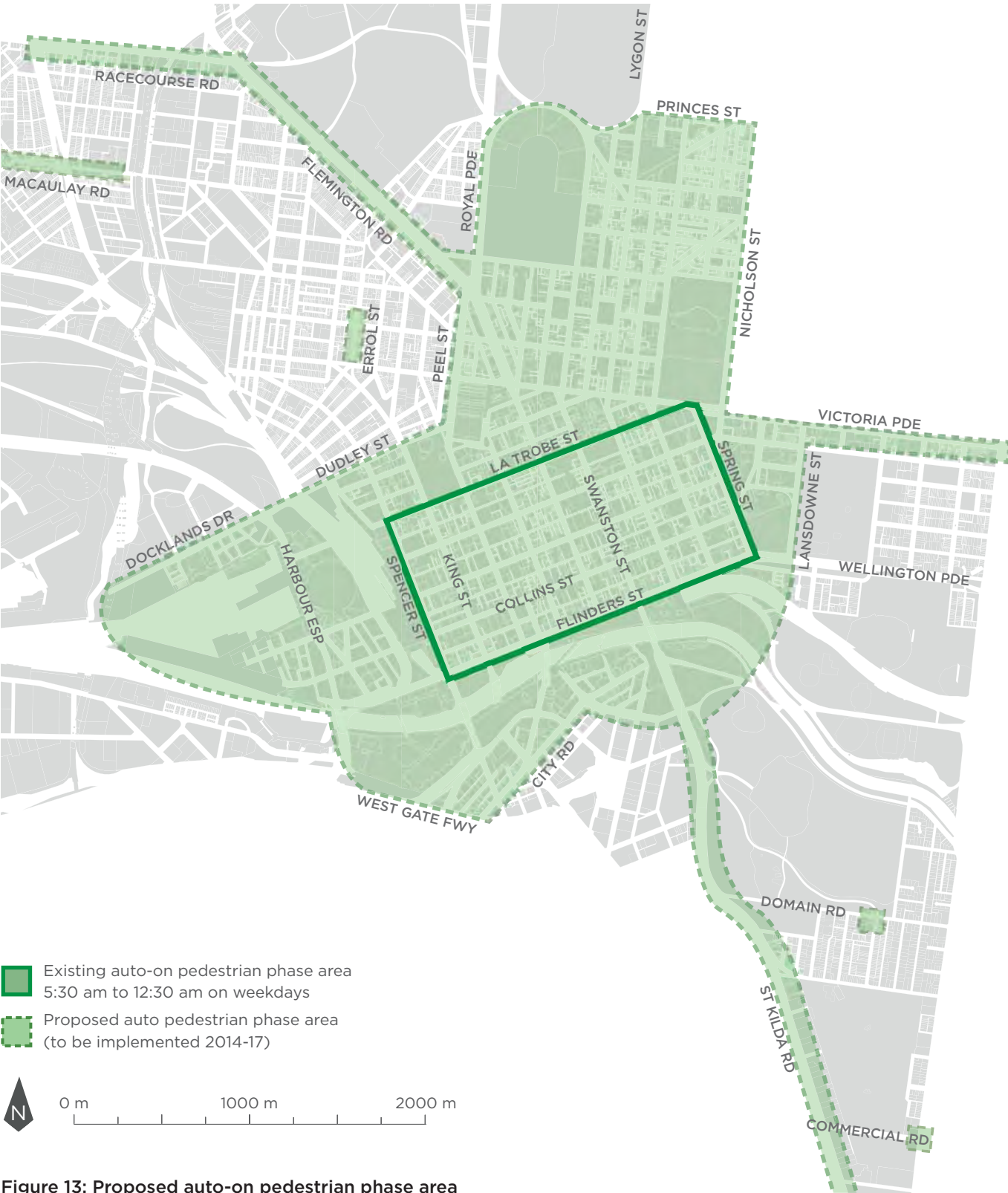


Figure 13: Proposed auto-on pedestrian phase area

2. STREET MANAGEMENT AND OPERATION

Pedestrian lanterns at all Hoddle Grid signalised intersections

Some signals do not include pedestrian displays in all directions.

Many of the traffic signals on 'little streets' that run east-west in the Hoddle Grid between the major streets, such as Flinders Lane or Little Collins Street, do not have full pedestrian signals. This is a historical legacy reflecting when they were installed in the 1940s. However, this means that people with disabilities face significant difficulty when crossing these streets as they are not alerted when it is safe and appropriate to cross. The red traffic light for cars is often positioned such that pedestrians cannot see them clearly.

- Work with VicRoads to install pedestrian crossing lights, push buttons and audible devices at Hoddle Grid signalised intersections to create consistency across the Hoddle Grid and provide vision-impaired pedestrians with better guidance when walking around the city.

Scramble crossings

Pedestrian signals that allow crossing in all directions simultaneously are popular and do have some benefits. However, they also have adverse impacts on pedestrian delay, extending the waiting time between walking phases. They also increase delays to public transport, bicycles and other vehicles on the road as it takes longer for pedestrians to cross diagonally and signal timing must account for this. There are limited opportunities (such as at T-intersections) where these impacts can be reduced, though, and there may be some locations where they could be implemented.

- Scramble crossings will be considered at appropriate intersections to reduce crowding and delay where the adverse impacts on timing and other modes can be minimised.



Example of intersection with no pedestrian lantern at Little Collins and Elizabeth streets



Example of pedestrian lantern at Little Collins and Swanston streets

Pedestrian lanterns



Figure 14: Locations which need pedestrian lanterns installed (only Hoddle Grid shown)

2. STREET MANAGEMENT AND OPERATION

2.3 Pedestrian street hierarchy

Adopt a pedestrian street hierarchy to provide direction for the operation of streets.

Objective

To define a pedestrian street hierarchy and provide direction for the design and operation of streets based on this hierarchy. To identify streets that should increase in function as pedestrian streets.

Rationale

Melbourne's streets provide the connections between the places that people are and where they want to go, and allow for the delivery of goods. They also play many other roles, including providing a significant amount of the city's open space, meeting places and views. The streets provide for movement by a variety of modes; as we create a city for people and as the numbers of people walking increase we must cater for that growth and be innovative in the way we use our streets.

There is an opportunity to provide safe and enjoyable places for children and families in the central city as the pedestrian street hierarchy is implemented.

One innovation is to develop a hierarchy of pedestrian streets ranging from those in which pedestrians can move freely across the full width of the street and vehicles – if present – travel slowly, through to arterial roads where pedestrians use sidewalks while trams, buses, bicycles and other vehicles use the street at higher speeds. This hierarchy allows each street or laneway to be assessed as to its position in the hierarchy based on factors such as current and future pedestrian demand or requirements for other modes (such as deliveries, providing access to car parks, etc.). Streets may operate differently at different times of day depending on demand for different modes.

As pedestrian numbers grow, more streets will have an increasing pedestrian function. This plan proposes a number of locations, mostly in the central city, where the pedestrian function of streets could increase.

Vehicle access

Maintaining access for deliveries and service vehicles, as well as to off-street car parks, is important for city commerce. The walking plan does not propose to remove motor vehicle access to off-street car parks nor to remove delivery, service or disabled access to properties.

The bicycle network identified in the City of Melbourne Bicycle Plan will also be considered when investigating proposals that change the layout or operation of a street in the City of Melbourne. Where there are high volumes of cyclists as well as pedestrians, separation will be considered.

Streetscape Framework

The pedestrian street hierarchy will be implemented in accordance with the Streetscape Framework Plan.

Any proposals that change the layout or operation of a street in the City of Melbourne would require thorough consultation with appropriate stakeholders including building owners, businesses and residents to understand their access requirements.

The City of Melbourne introduced the Streetscape Framework in 2011 to work with businesses and the community to effectively respond to the changing needs of our streets.

The Streetscape Framework guides planning and implementation of new streetscapes, and involves the community in deciding on streetscape design and improvements.

The City of Melbourne is upgrading many of its streets as part of the Streetscape Improvements program, which aims to enhance streets and laneways through road and footpath-works, landscaping and other improvements.

INCREASING PEDESTRIAN FUNCTION

	CHARACTERISTICS	STREET MANAGEMENT
Street as Place (local street)		
 <p>Hardware Lane</p>	<ul style="list-style-type: none"> • Pedestrians move freely across the street. • People linger on the street, at cafes, on public seating or to play. • Amenity increased by providing spaces for people to be in. • Low traffic function. 	<ul style="list-style-type: none"> • Can be used as a place permanently or during specific times (such as lunchtimes or in evenings). • Can operate as a shared zone to provide traffic access. • Provide for deliveries, property servicing, cycling and access to off-street car parking.
Walking Street (local street)		
 <p>Little Collins Street</p>	<ul style="list-style-type: none"> • Pedestrians move freely across the street. • Key transport link for pedestrians. • Amenity and safety increased by reducing crowding. • Low through-traffic function. 	<ul style="list-style-type: none"> • Can be used as a walking street permanently or during specific times (such as lunchtimes or in evenings). • Can operate as a shared zone to provide traffic access. • Provide for deliveries, property servicing, cycling and access to off-street car parking.
High Mobility Walking Street (public transport corridor)		
 <p>Swanston Street</p>	<ul style="list-style-type: none"> • Streets shared by trams, buses, bikes and pedestrians. • High-frequency public transport corridor. • Low traffic function. • Significant interchange between public transport and walking network. 	<ul style="list-style-type: none"> • Provide for deliveries, property servicing, cycling and access to off-street car parking.
High Mobility Street (public transport corridor)		
 <p>Victoria Parade</p>	<ul style="list-style-type: none"> • Streets shared by trams, buses, private vehicles (including bikes) and pedestrians. • High frequency public transport corridor. • Traffic function. 	<ul style="list-style-type: none"> • Trams, buses and pedestrians have priority under SmartRoads. • Provide for deliveries, property servicing, cycling and access to off-street car parking.
Other streets used by pedestrians		
 <p>Lygon Street</p>	<ul style="list-style-type: none"> • Streets shared by private vehicles (including bikes) and pedestrians. • Traffic function. • Examples include shopping strips, local residential streets or arterial roads. 	<ul style="list-style-type: none"> • Varies depending on use. • Provide for deliveries, property servicing, cycling and access to off-street car parking.

2. STREET MANAGEMENT AND OPERATION

2.4 Investigate Streets as Places

Investigate the suitability of the proposed Streets as Places.

Characteristics

The characteristics of Streets as Places are that:

- pedestrians move freely over the street;
- people linger on the street at cafes, on public seating or to play;
- there is low traffic function; and
- amenity is increased as more space is provided for people to be in.

Street management

Streets as Places are managed to:

- be used as a place permanently or during specific times (such as during lunch times or in evenings);
- possibly operate as a shared zone to provide traffic access; and
- provide for deliveries, property servicing, cycling and access to off-street car parking.

Implementation

- Investigate the suitability of the proposed Streets as Places as indicated in 'Figure 15: Proposed Streets as Places'. This will include consideration of local access requirements.
- Investigate Market Street (at Collins Street) and Spring Street outside the Princes Theatre as shared zones.
- Investigate closing Dodds Street to through traffic between Grant Street and Southbank Boulevard to create an open-space plaza.



Flinders Lane

Proposed Streets as Places

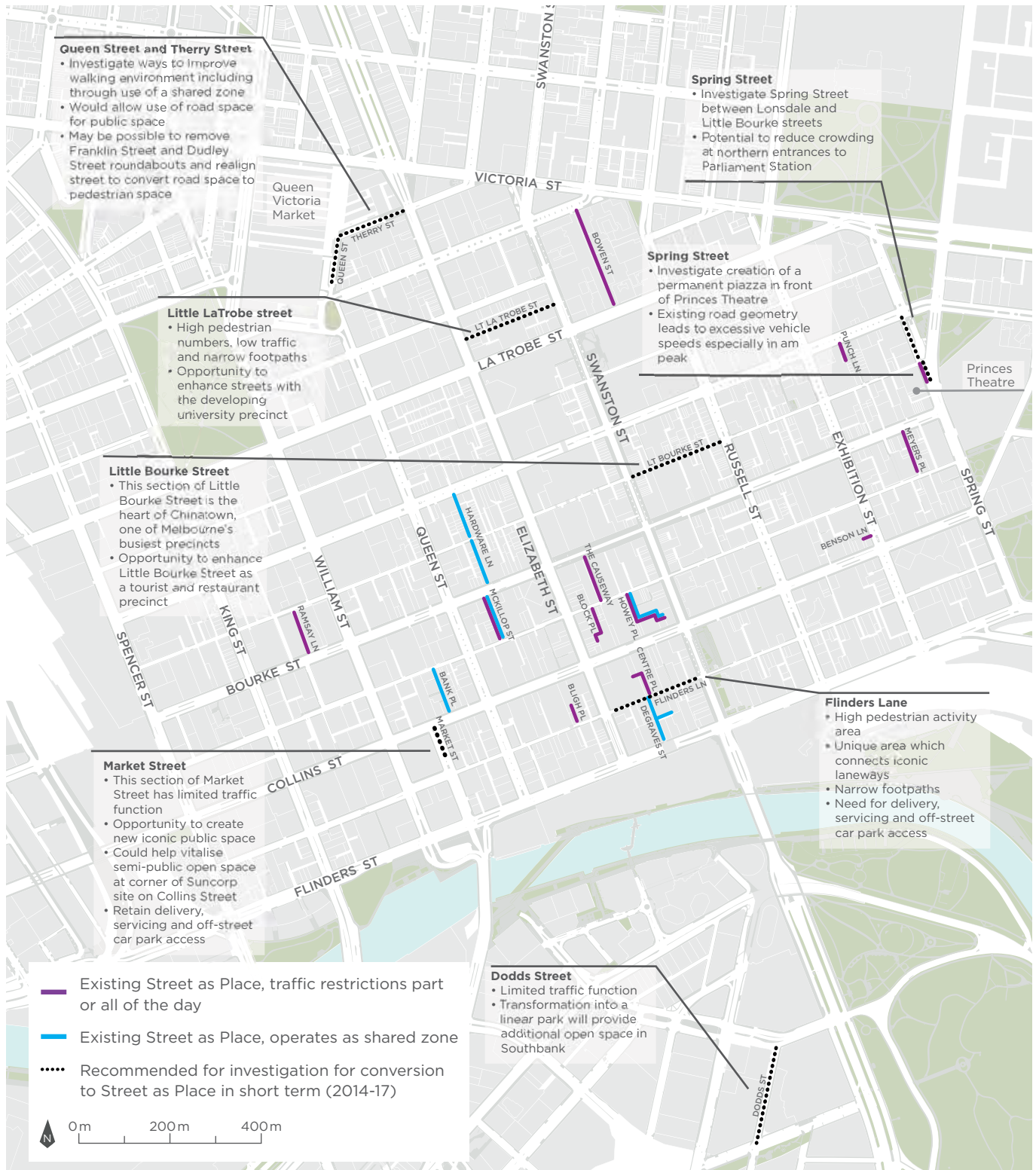


Figure 15: Proposed Streets as Places

2. STREET MANAGEMENT AND OPERATION

2.5 Investigate new Walking Streets

Investigate the suitability of the proposed Walking Streets.

Characteristics

The characteristics of Walking Streets are that:

- pedestrians move freely over the street;
- they provide a key transport link for pedestrians; and
- amenity and safety are increased by reducing crowding.
- low through traffic function;

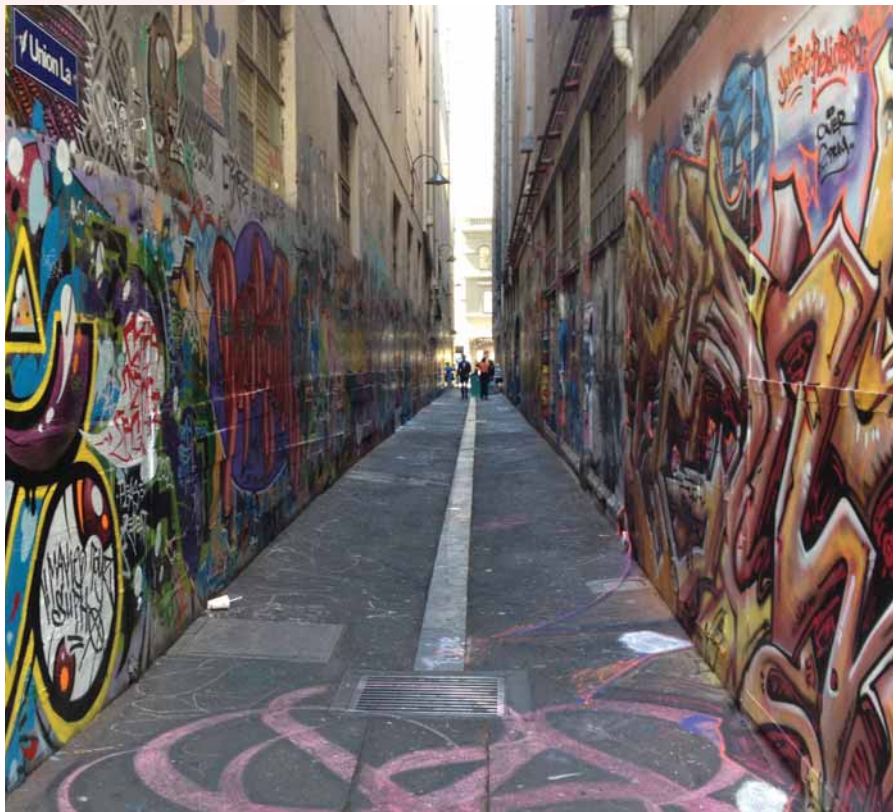
Street management

Walking Streets are managed to

- be used as a Walking Street permanently or during specific times (such as lunch times or evenings);
- operate as a shared zone if traffic access is needed;
- provide for deliveries, property servicing, cycling and access to off-street car parking.

Implementation

- Investigate the suitability of the proposed Walking Streets as indicated in 'Figure 16: Proposed Walking Streets'. This will include consideration of local access requirements.



Union Lane

Proposed Walking Streets

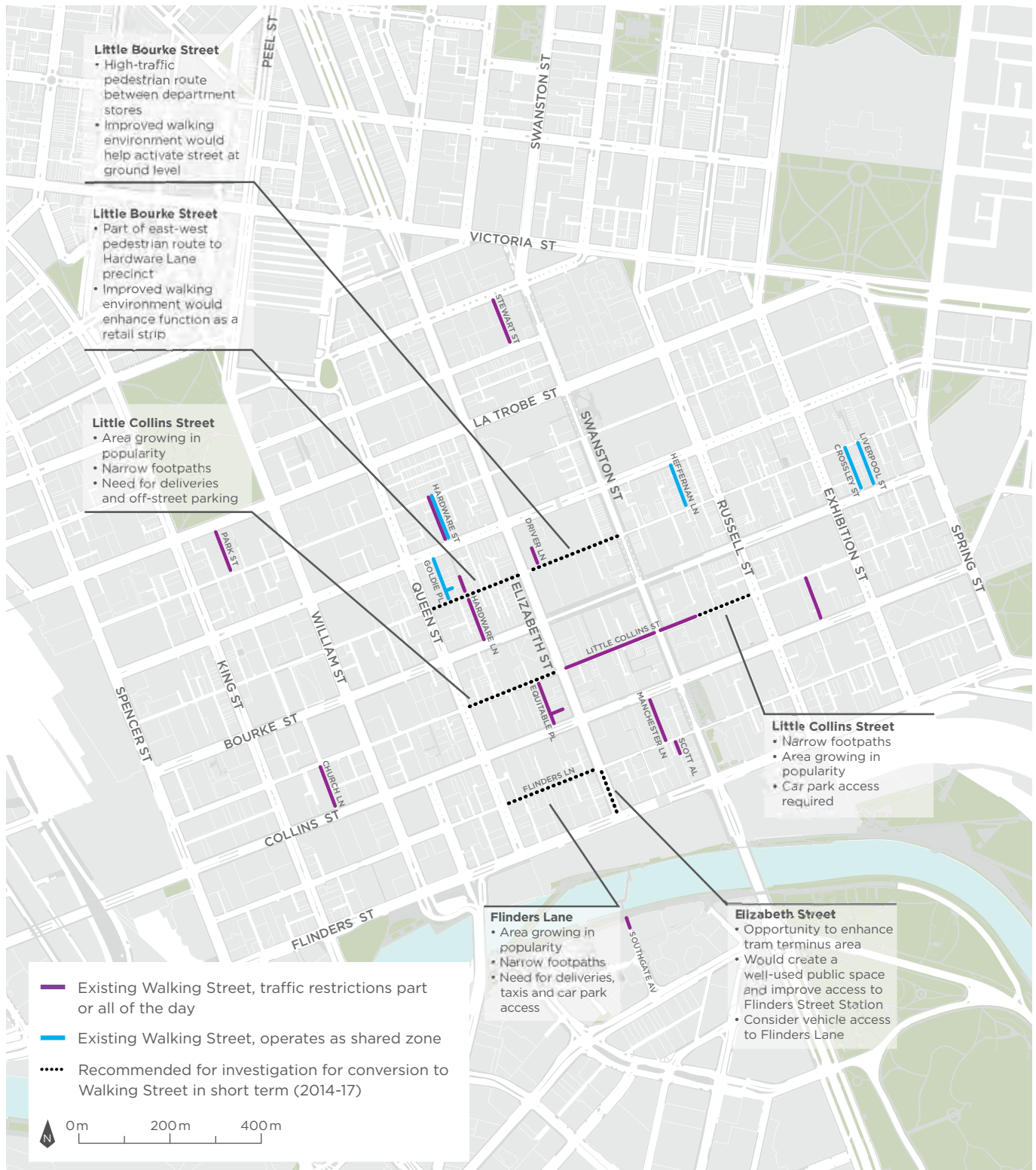


Figure 16: Proposed Walking Streets

2. STREET MANAGEMENT AND OPERATION

2.6 Investigate High-Mobility Walking Streets

Investigate the suitability of the proposed High-Mobility Walking Streets.

Characteristics

Characteristics of High-Mobility Walking Streets are that:

- they are shared by trams, buses, bicycles and pedestrians;
- they provide a high-frequency public transport corridor;
- they have a low-traffic function; and
- there is significant interchange between the public transport and walking networks.

Street Management

High-Mobility Walking Streets are managed to

- provide appropriate priority to trams, buses, cyclists and pedestrians under SmartRoads; and
- provide for deliveries, property servicing, cycling and access to off-street car parking.

Implementation

- Investigate the suitability of the proposed High-Mobility Walking Streets as indicated in 'Figure 17: Proposed High-Mobility Walking Streets'. This will include consideration of local access requirements.



Swanston Street level access tram stops

Proposed High-Mobility Walking Streets

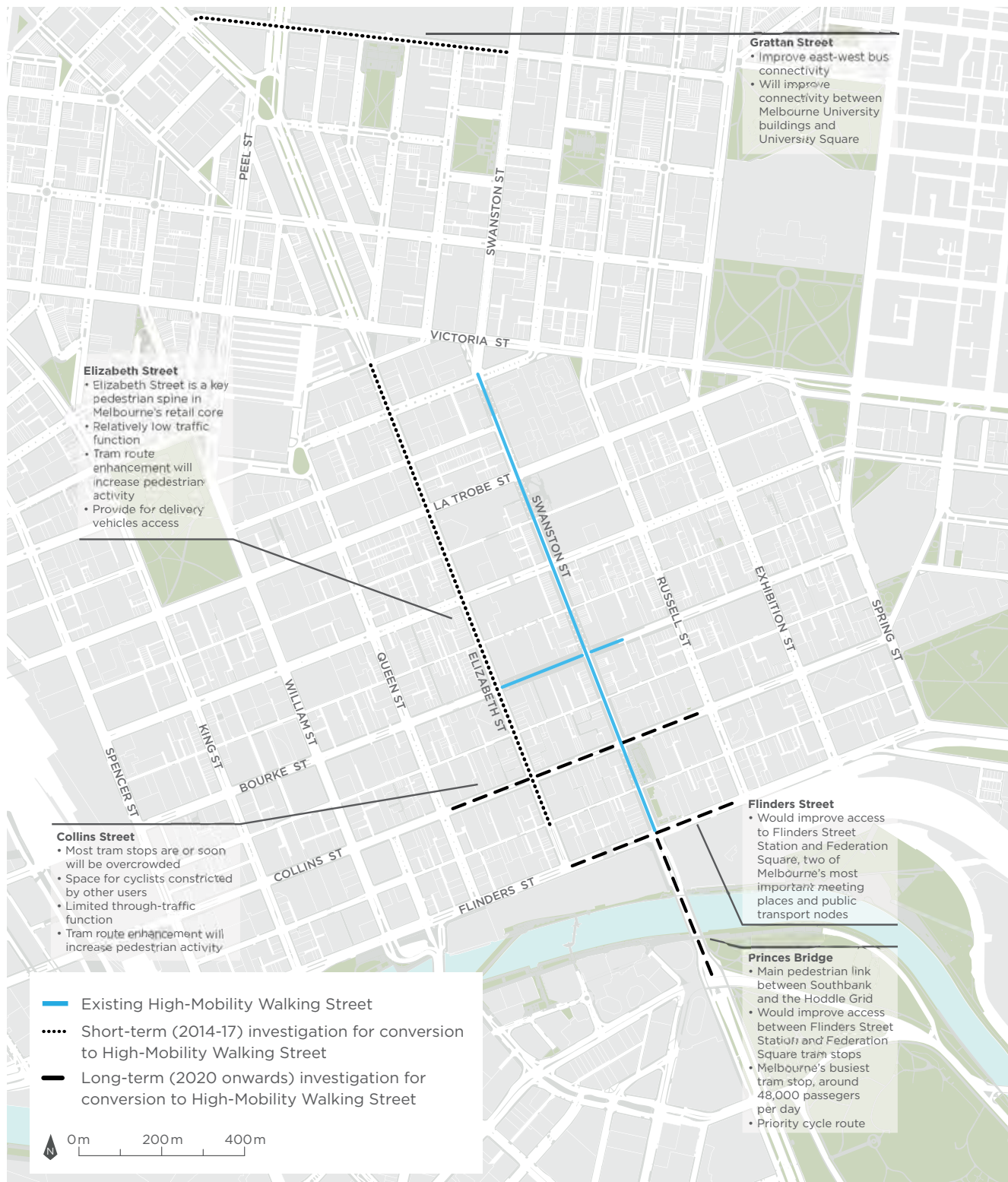


Figure 17: Proposed High-Mobility Walking Streets

2. STREET MANAGEMENT AND OPERATION

2.7 Create new shared zones

Extend the program of converting laneways, roads and other spaces into shared zones in line with VicRoads' guidelines and the City of Melbourne Pedestrian Street Hierarchy.

Melbourne is renowned for its network of laneways. In the Hoddle Grid there are around 230 laneways. Laneways increase connectivity in urban renewal areas and established suburbs alike. Most are through-block links that allow pedestrians to take a more direct route to their destination rather than having to walk 'around the block'.

In many lanes and narrow roads in the City of Melbourne there is not

enough space for vehicles, pedestrians and cyclists to each have their own dedicated space. The default speed limit (40 km/h in the Hoddle Grid or 50 km/h in other areas) is not compatible with sharing space. In many cases, the most effective way to improve the walking network while still retaining access for vehicles is to convert the road into a shared zone with a speed limit of 10 km/h.

Shared zones can make it easier to introduce trees, landscaping and other uses, such as on-street dining, while allowing people to walk comfortably – perhaps two or three abreast. They can offer significant economic benefit with outdoor dining generating up to \$25,000 in revenue per square metre per annum. The conversion of selected narrow streets into shared zones will make the city safer and legitimise pedestrians as users of narrow streets.

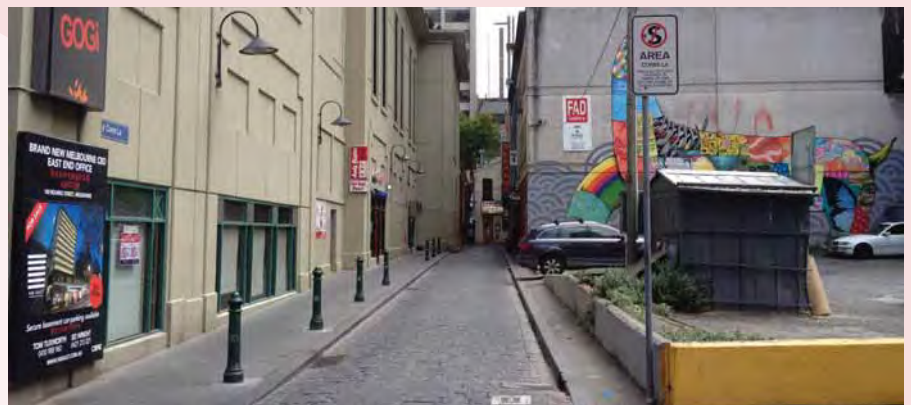
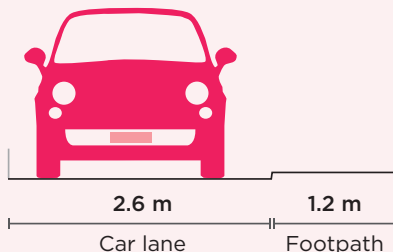
Shared zones are a specific type of speed limit under Victoria's Road Safety Road Rules (2009). These zones provide for the sharing of spaces by vehicles, pedestrians and cyclists at low speeds. Using a pedestrian street hierarchy, shared zones could be Streets as Places or Walking Streets.

Implementation

- Extend the program of converting laneways into shared zones. Laneways that currently operate as shared zones and require only signage changes are shown in 'Figure 19: Laneway shared zones'.
- Convert roads and other spaces into shared zones in line with VicRoads' guidelines and the City of Melbourne Pedestrian Street Hierarchy.

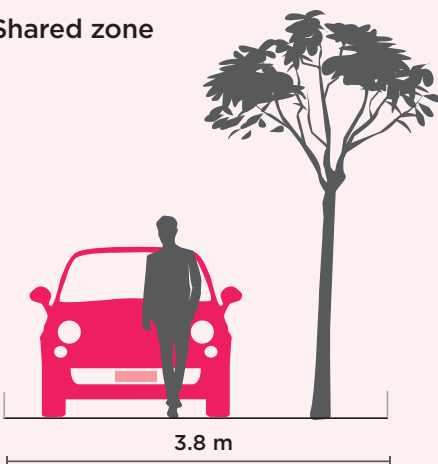
Separated road layout

- All users experience narrow spaces
- No space for trees, cafe seating, art or other street activity



Example of separated layout: Corrs Lane

Shared zone



Lane shared by vehicles and pedestrians



Example of shared zone: Hardware Street

Figure 18: Shared zones improve the use of space by creating the conditions under which vehicles and pedestrians can share the same space rather than have separate areas. A key design criterion for shared zones is lower speeds, usually 10 km/h.

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2. STREET MANAGEMENT AND OPERATION

2.8 Make roads safer for pedestrians

Review existing lower speed limits and implement more on local and arterial roads where appropriate.

Objective

To achieve motor vehicle speeds in the City of Melbourne which are compatible with high levels of walking and a city for people while also being logical and easy for drivers to comply with.

Issues

Higher motor vehicle speeds can save time for motorists driving longer distances. However, they can also lead to greater road trauma, separation of land uses, reduced permeability and reduced opportunities for streetscaping.

Rationale

The pedestrian street hierarchy recognises that pedestrians share many streets with private vehicles. Speed limits have a significant impact on how pedestrian-friendly a street is.

Lower speed limits increase the likelihood of surviving being hit by a vehicle and reduce the severity of injuries due to collision. Lower speeds also mean less need for expensive traffic controls, road safety barriers and expensive and disruptive traffic management for temporary works. Also, when speeds are lowered, more roadside furniture and trees can be installed. Lower speeds also allow for a more permeable city where pedestrians and drivers can make eye contact and allow for safe road crossing without delaying either party. Drivers travelling more slowly have greater opportunities to observe the city and see things that they might want to visit either during the current trip or later. In some countries lower speed limits have been introduced in urban areas alongside changes to traffic signals, which have together increased traffic throughput.

In 2012 the City of Melbourne reduced the speed limit in the Hoddle Grid to 40 km/h following approval by VicRoads. This is expected to save one life, nine serious injuries and 25 other injuries every year in the city. 40 km/h speed limits were introduced to local streets in Parkville in early 2014. Reducing motor vehicle speeds in areas of high pedestrian movement is a strategic objective of the City of Melbourne's Road Safety Plan 2013 – 2017.

Implementation

- Review the performance of the 40 km/h zone in the central city considering road safety as well as other costs and benefits.
- Investigate speed limit reductions to 40 km/h on local streets throughout the City of Melbourne where appropriate.
- Investigate speed limit reductions on arterial roads in the City of Melbourne where significant numbers of pedestrians and vulnerable road users use the road now or are expected to in the future.



2. STREET MANAGEMENT AND OPERATION

2.9 Walking navigation

Install a 'heads-up' mapping system in high-pedestrian areas and work to implement this system across Melbourne.

Objective

To help people navigate the city by making walking easier and more enjoyable while making it easy to transition from walking to using public transport.

Issue

The City of Melbourne can be difficult to navigate for people not familiar with its layout, such as visitors from other parts of Melbourne, out of town, interstate or overseas. There are currently many different way-finding signage systems carrying inconsistent messages, language and naming conventions.

'Heads-up' mapping

'Heads-up' mapping systems – which orient maps so the person reading them sees the view in front of them reflected in the map – make walking easier and more enjoyable and encourage more walking. 'Heads-up' maps orient people based on the direction they are facing and what is in their field of view. They have been successfully introduced in London, Bristol and New York City.

The City of Melbourne is developing a 'heads-up' mapping system to be deployed throughout the city beginning with the areas where the most walking occurs. These maps will assist way-finding by highlighting nearby destinations and public transport services that a person viewing a 'heads-up' map can easily access. The system will be extensively tested and regularly reviewed to ensure it is up-to-date and delivering on its objectives.

Implementation

- Install a 'heads-up' mapping system in high-pedestrian areas.
- Investigate the potential for the 'heads-up' mapping system to be applied across the central subregion as proposed in Plan Melbourne in collaboration with Public Transport Victoria, Yarra Trams and others.
- Investigate the potential for the system to be introduced at Melbourne's visitor entry points (air, rail, roads and sea).
- Work with inner Melbourne councils and Victoria's roads, public transport and tourism authorities to improve the consistency of way-finding systems that visitors rely on.



Figure 20: Indicative location map for first stage of implementation of the 'heads-up' mapping system depicting Yarra's Edge, WTC Wharf, South Wharf and the Melbourne Convention and Exhibition Centre precincts



Figure 21: Indicative district map example of the 'heads-up' mapping system, facing north near Webb Bridge

2. STREET MANAGEMENT AND OPERATION

2.10 Stop lines

Progressively install stop lines on laneways at the building line rather than the intersection line along Bourke, Collins, Elizabeth and Flinders streets.

Objective

To improve the walking network in Melbourne by giving pedestrians priority at minor intersections and lanes.

Issues

A single motor vehicle exiting a minor road or lane can delay and inconvenience many pedestrians on a well-used footpath.

Rationale

On some streets in the city, stop lines have been installed so that drivers exiting minor laneways are required to give way to pedestrians on the footpath that the driver needs to cross. This

reverses the usual convention where the stop line would be at the point where the two streets intersect. This means that a stopped motor vehicle would block the passage of pedestrians. In the central city many footpaths carry thousands of people per hour and it is appropriate that pedestrians have priority. The treatment allows pedestrians and motorists to make eye contact and negotiate to ensure drivers are not unreasonably delayed.

Pedestrians also need to be responsible for their own safety and ensure intersections are clear before proceeding. City of Melbourne will work with VicRoads to ensure stop lines at the building line will not compromise the safety of pedestrians.

Implementation

- Progressively install stop lines on laneways at the building line rather than the intersection line along Bourke, Collins, Elizabeth and Flinders streets.

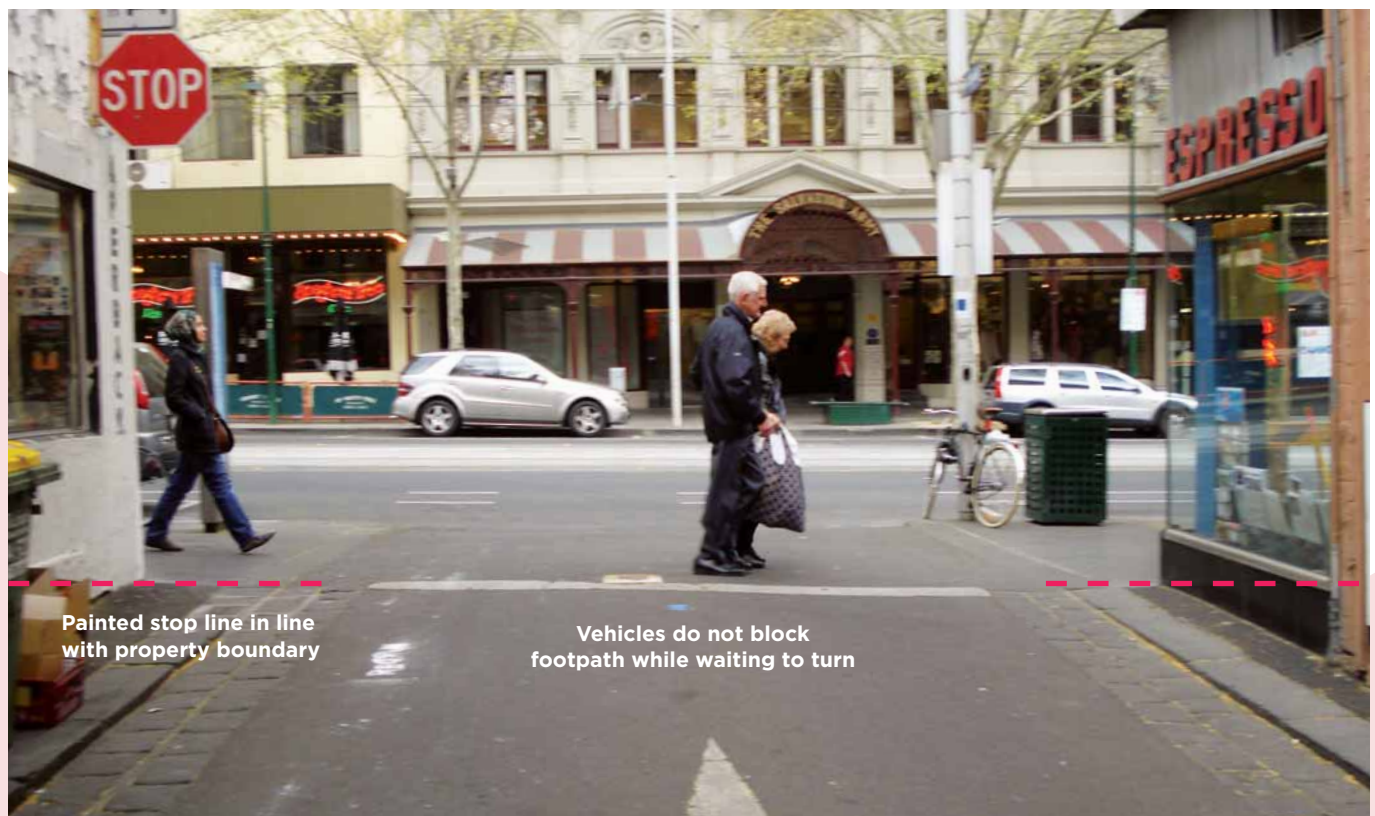


Figure 22: Example of stop line on property line at Crossley Street facing Bourke Street

Stop lines

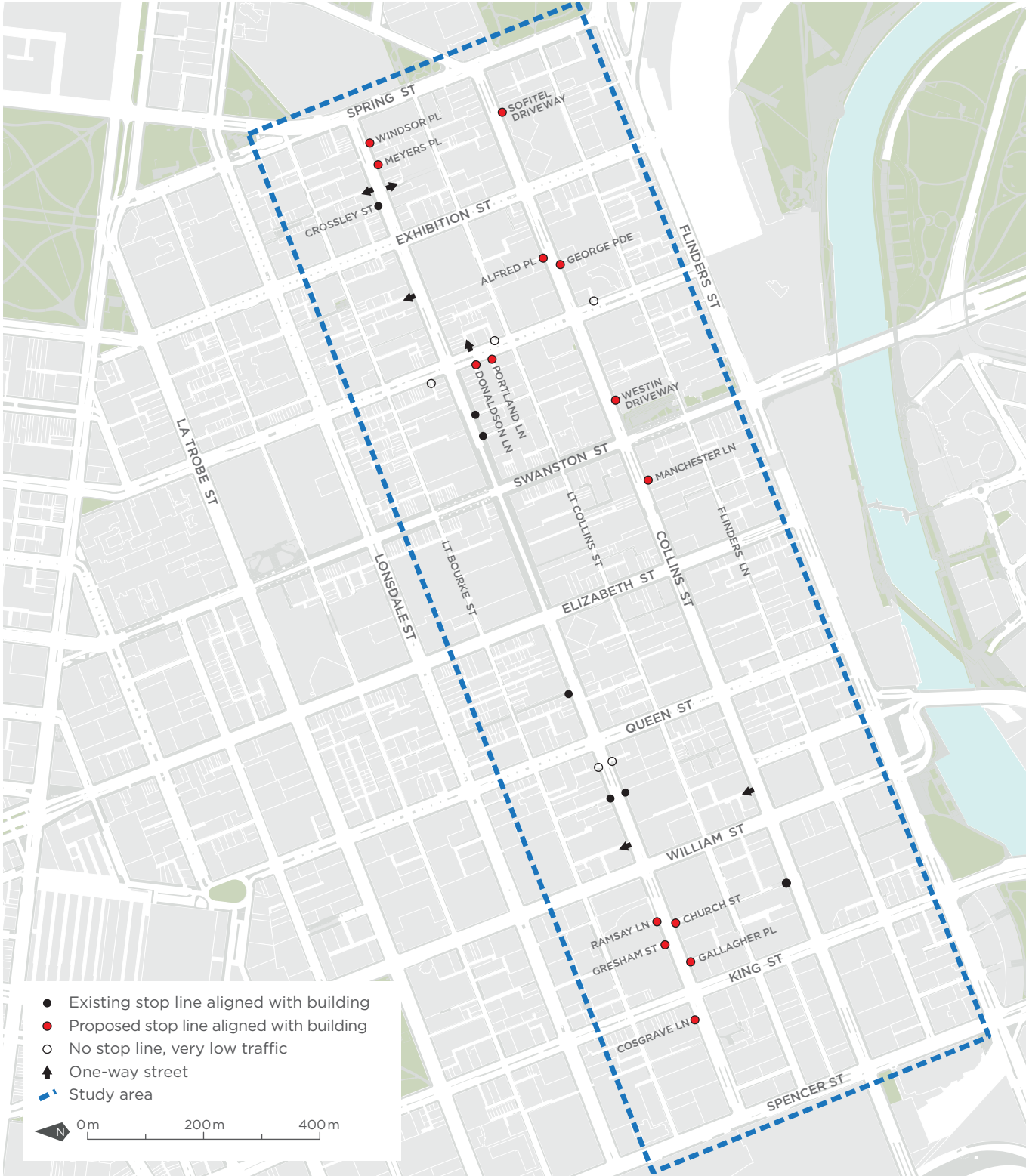


Figure 23: Locations to install stop lines on building line

2. STREET MANAGEMENT AND OPERATION

2.11 Travel behaviour change

Continue to deliver the Share Our Streets multi-modal behaviour change program to improve safety and harmony amongst all road users.

Objective

To encourage everyone to use the roads collaboratively and respectfully to improve safety creating a more enjoyable road environment in the City of Melbourne and adjacent municipalities.

Issues

Respectful and cooperative behaviour by all road users can make the city safer and more efficient creating an environment that will encourage walking.

Rationale

The City of Melbourne has launched a travel behaviour change program called Share Our Streets as part of its Road Safety Plan. Many cities and jurisdictions

around the world run behaviour change programs as a cost-effective way to improve the way road space is shared.

Pedestrians have much to gain from a program that delivers more considerate road behaviour. Benefits include drivers giving way appropriately, driving within the speed limit, allowing pedestrians to cross mid-block without creating delays and not using mobile devices while driving as well as cyclists slowing appropriately to allow pedestrians to get on trams and riding considerately in shared areas. Therefore, City of Melbourne will work with Victoria Police to enforce road rules in line with the Road Safety Plan to support the Share Our Streets Campaign.

Pedestrians also contribute to their own road safety as well as the safety of others. Share Our Streets promotes being considerate, observing road rules, not walking in bicycle lanes and paying attention when walking, particularly when using mobile devices. Keeping to the left on footpaths and crossings, especially in crowded areas, will also make the city easier to walk around.

Implementation

- Continue to deliver the Share Our Streets multi-modal behaviour change program to improve safety and harmony amongst all road users.



Figure 24: Poster from the Share our Streets campaign, April 2014

2.12 Promote health

Investigate the potential for encouraging walking to deliver health benefits in Melbourne including through the new Active Melbourne Strategy to be developed by the City of Melbourne.

Objective

To capitalise on the mental and physical health benefits and community benefits provided by walking.

Issues

Walking offers significant mental and physical health benefits. There is an opportunity to gain significant community benefit by promoting walking for health in the city, including getting exercise as a part of everyday travel.

Rationale

Promoting walking can be a cheap and simple way to improve the health of the community. Walking has been shown to address obesity, heart disease, blood pressure, arthritis, diabetes, anxiety, depression and other health issues.

Walking can be done on its own or in conjunction with public transport. For example, people who use public transport on a particular day also spend an average of 41 minutes walking or cycling as part of their travel, while those who did not use public transport spend only eight minutes walking or cycling as part of their travel (Bus Solutions, 2010, p. 3).

Victoria Walks promotes walking meetings, 'exercise snacks', workplace walks and local area mapping to encourage people to identify local walking destinations (www.victoriawalks.org.au). New York City has a campaign to 'Make NYC Your Gym'. There are opportunities for the

City of Melbourne to promote walking as a way to help the community to be healthier, potentially with a focus on the large number of employees who travel to the city each day.

The perception of a lack of safety and security can be a significant barrier to walking, particularly in relation to children walking to school or for trips that include public transport use. Initiatives should include the promotion of walking to school and addressing barriers to this behaviour, such as parental perceptions of risk.

Implementation

- Investigate the potential for encouraging walking to deliver health benefits in Melbourne including through the new Active Melbourne Strategy to be developed by the City of Melbourne.
- Investigate advocating for changes to the Planning and Environment Act 1987 to include health and wellbeing as an objective of planning.



3. CAPITAL WORKS

3.1 Addressing pedestrian crowding

Develop a tool to assess and identify current and future crowding and develop measures to address these locations through a range of interventions.

Objective

To reduce pedestrian crowding through targeted actions at intersections, pedestrian crossings and footpaths.

To develop and adopt appropriate crowding standards for Melbourne to ensure footpaths are not subject to overcrowding now or in the future, including those under investigation for a pedestrian street hierarchy.

Issues

No guidance is available on what level of crowding is optimal in different environments.

In general higher crowding levels can be tolerated in the approach to busy public transport interchanges during peaks, however there is a limit to this tolerable level of crowding. Lower levels of crowding are appropriate in shopping areas and locations where people want to stand, be stationary or wander.

As pedestrian numbers have grown, pedestrians have been increasingly affected by a range of footpath obstructions, including infrastructure, construction, street furniture and both motorcycle and bicycle parking. Both motorcycle and bicycle use is growing in the City of Melbourne and allocating space for parking for these modes must be addressed with consideration of the needs of pedestrians.

Crowding standards and guidelines

The City of Melbourne can specify maximum numbers of people ideal for specific locations using various types of spaces to ensure that whether walking or waiting, people are comfortable and safe. Crowding standards and guidelines vary depending on locations; there are different crowding standards for places where people move along footpaths and where they wait at intersections.

Crowding standards are useful in maintaining pedestrian comfort when designing infrastructure (such as footpaths), managing street operations (such as signal timing) or placing street furniture.

London has a maximum pedestrian comfort level of 11 people per minute per metre of footpath width in mid-block locations (Atkins for TfL, 2010, p. 13). As an interim measure, the City of Melbourne will adopt Transport for London standards (which differ based on land use context and are shown in Appendix 6).

Further research will assess whether these are appropriate standards for Melbourne, develop crowding standards and pedestrian comfort levels for crossings and provide guidance on how to achieve these.

Crowding standards and guidelines can be used by City of Melbourne when designing infrastructure such as street upgrades as well as when reviewing proposals by developers that will have an impact on the pedestrian network in the public realm.

Implementation

- Develop a council tool to assess crowding in high pedestrian activity areas and develop measures to address overcrowding through a range of interventions.
- Identify current and future overcrowded areas and develop plans to address overcrowding in these locations.
- Plan future capital works in consideration of a crowding standard, taking into account likely future growth in pedestrian numbers.
- Identify current and future locations where footpath obstructions reduce the pedestrian comfort level below acceptable levels and take action to address this including relocation, education, regulation or enforcement.

Crowding at intersections



Figure 25: Estimated existing crowding on footpaths at intersections at peak times

3. CAPITAL WORKS

3.2 Pedestrian crossings at intersections

Progressively widen, de-clutter, extend and protect pedestrian crossings through engineering, enforcement and design interventions.

Objective

Reduce crowding on and around pedestrian crossings.

Issues

Intersections can be crowded places where movement intensifies as people come together at safe crossing points. Crowding on corners makes it difficult for pedestrians heading for one crossing to get through the crowd waiting for the perpendicular crossing.

Given central city growth projections, more space and other improvements to the pedestrian network will be needed to avoid overcrowding.

In the Hoddle Grid, most older crosswalks in the central area are about three metres wide.

Wider crosswalks can reduce the problem of pedestrian crowding at intersections. They also minimise conflict between opposing pedestrians as they cross the road.

At some places where new tram stops have been constructed, crosswalks have been widened to cater for increased tram passenger volumes. The new pedestrian crossing at Elizabeth Street is more than eight metres wide. At other places the crosswalks are still quite narrow.

Generally, crosswalks should be made four metres wide across the central city and eight metres wide at busy tram stops or where pedestrian crowding is a problem. To provide for future increases in pedestrian numbers, it is worthwhile implementing wider crosswalks whenever opportunities arise with the installation of new tram stops or when road works are carried out.

Building out kerbs at intersections can shorten crossing distances and increase walk times. This can lead to improved traffic signal timings. Additional footpath space is more comfortable for waiting pedestrians and will help to reduce crowding at busy intersections.

Where pedestrian crowding is a problem now or in the future, the area near the crosswalk should be as clear as possible. This is important so that pedestrians with a visual disability do not walk into furniture. It also provides more space to avoid crowding. The clear area should be the full extension of the crosswalk lines, not just the area adjacent to the kerb ramp.

Implementation

- Progressively widen crosswalks within the Hoddle Grid that are less than four metres wide.
- Relocate footpath furniture and other infrastructure away from corners at busy intersections.
- Build kerb outstands at Hoddle Grid intersections where there is space to do so.

Blocked crossings and intersections

Vehicles blocking crossings and intersections because of queuing along a road add to pedestrian crowding and frustration while also causing operational delays to the tram network in certain locations. This is more significant for eastbound traffic in the pm peak.

Signs placed warning drivers to 'Keep Intersection Clear' are not effective and merely add to sign clutter. The road rules are quite clear that drivers must not block intersections or crossings.

Certain things can be done in terms of traffic engineering, signal timings and other techniques to minimise drivers blocking intersections or crossings, depending on the location. Enforcement, media coverage and traffic signal adjustments can deliver improvements to pedestrian and public transport movement in the most affected locations.

Implementation

- Work with Victoria Police to direct and inform enforcement activities in the City of Melbourne to achieve the transport and safety objectives of the City of Melbourne Transport Strategy 2012, Road Safety Plan 2013-17 and the Walking Plan.
- Work with Victoria Police, VicRoads and PTV to prevent vehicles from blocking intersections and crossings. This will include investigation of potential use of vehicle detector loops connected to traffic signals at certain intersections to prevent vehicles from blocking intersections.
- Assess the feasibility of trialling departure side detector loops at Elizabeth and Flinders streets to prevent queuing of southbound traffic on Flinders Street from blocking the intersection.

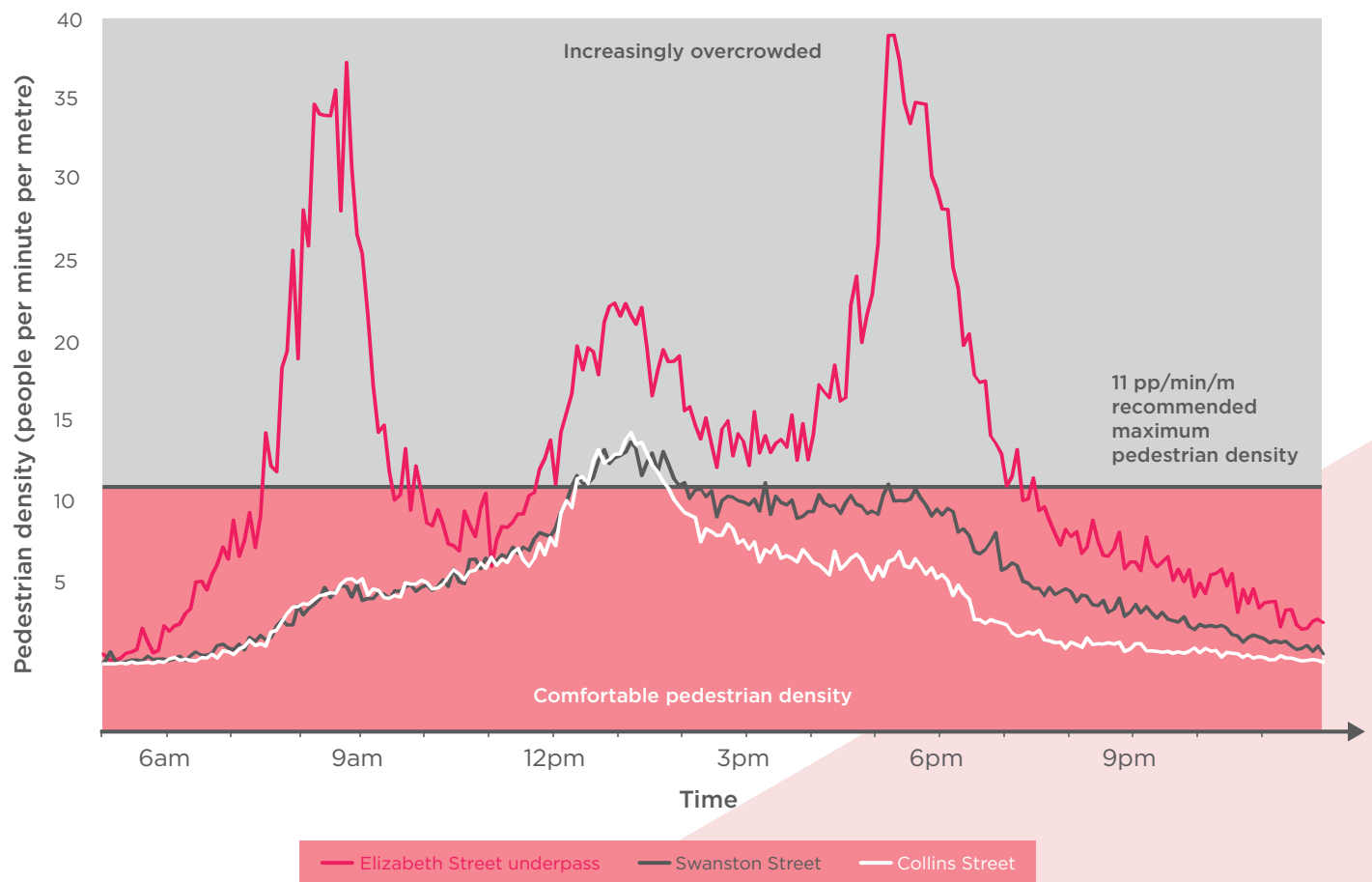


Figure 26: Counted pedestrian volumes on central city footpaths on an average Tuesday, September 2012

3. CAPITAL WORKS

3.3 Master plans

Ensure master plans and precinct plans deliver an enhanced pedestrian network consistent with the principles of the Walking Plan.

Objective

To focus master planning and precinct planning efforts in the City of Melbourne on areas which will experience significant future growth in walking to ensure designs cater for that growth.

Issues

Rapidly increasing numbers of pedestrians are putting stress on existing infrastructure.

Rationale

Master planning and precinct planning are the appropriate tools to ensure that the city is well-adapted to changing demands such as significant growth in pedestrian numbers, major new public transport infrastructure and significant

land use development particularly in growth and urban renewal areas.

The construction of Melbourne Metro, delivery of changes to the tram network (including changes required by construction of Melbourne Metro) and planning for future patronage of these services provides the impetus for new master plans. Other reasons include the need to change the operation of streets, such as City Road in Southbank, which were previously bypass routes but now run through busy, central city areas. (Figure 29 identifies future master plan projects, and more detail about the context of these projects is included in Appendix 2).

Pedestrian Street Hierarchy

The Walking Plan establishes a Pedestrian Street Hierarchy to provide direction for the design and operation of streets. The hierarchy will be used to identify streets for short term investigation but will also be used in future development of Master Plans to ensure an enhanced pedestrian network consistent with the principles of the Walking Plan.

These plans will direct advanced streetscape designs and will lead to capital works delivery in accordance with the Streetscape Framework (2011).

Implementation

- Ensure master plans and precinct plans deliver an enhanced pedestrian network consistent with the principles of the Walking Plan.



Figure 27: Road section produced as part of the development of the City Road Master Plan.

The pedestrian experience on City Road could be enhanced by providing a high level of accessibility, supporting on-street activities and requiring wider footpaths.

Walking network issues and opportunities in urban renewal areas

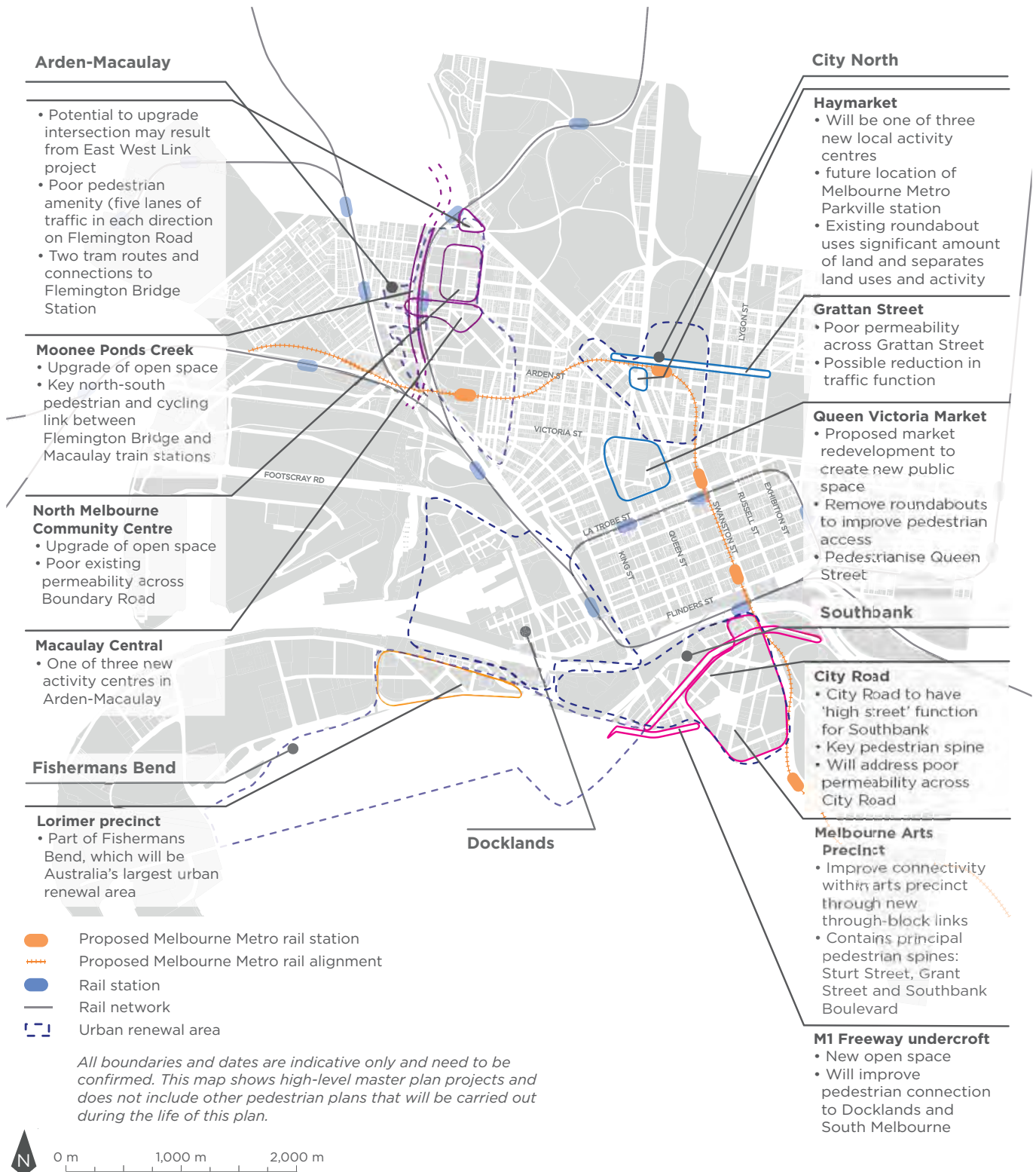


Figure 28: Walking network issues and opportunities in urban renewal areas

3. CAPITAL WORKS

Walking network issues and opportunities in future master plan areas

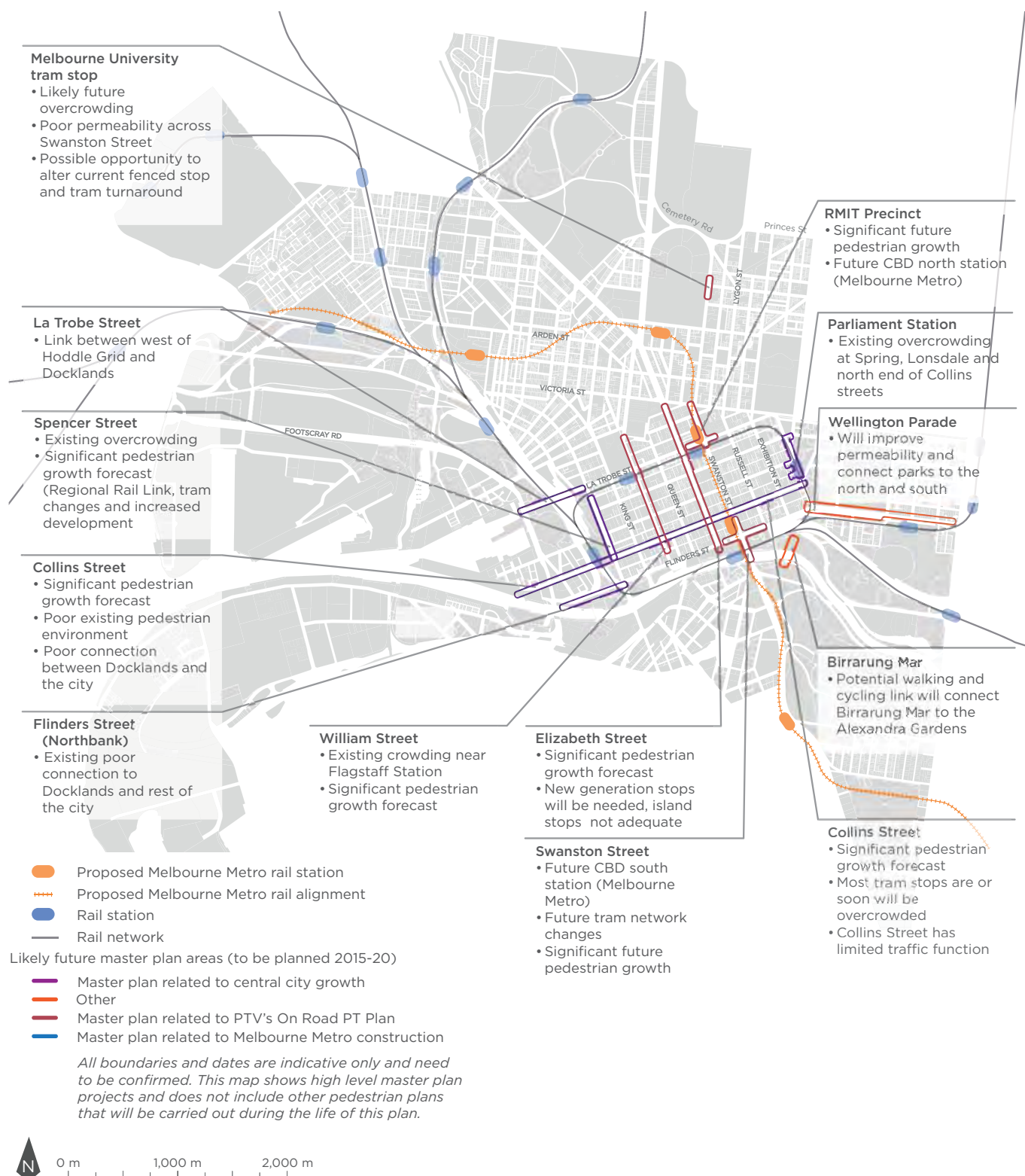


Figure 29: Walking network issues and opportunities in future master plan areas



3. CAPITAL WORKS

3.4 Access around stations

Prepare pedestrian accessibility plans for train stations in the Hoddle Grid and in urban renewal areas.

Objective

To increase pedestrian safety and service around Melbourne's public transport nodes by redesigning them to provide more links and improve amenity.

Issues

Footpaths around stations are frequently overcrowded and the problem is getting worse.

Rationale

Melbourne's major stations are experiencing significant patronage growth which is expected to continue.

Public Transport Victoria and Metro Trains are continuing to adjust services to provide more capacity into and out of the city. Adjustments include rerouting and changing timetables to make the system more efficient. Major projects, such as Regional Rail Link and Melbourne Metro, are also expected to have a significant impact.

Footpaths outside city loop train stations are currently experiencing significant crowding. Issues include people spilling onto the road because footpaths are not large enough for the number of people waiting, significant delays to pedestrians and crowded footpaths at midblock and crowded crossings. These problems are likely to get worse given projected increases in patronage and nearby development which will attract more travellers.

Actions to address crowding around stations must allow for pedestrian permeability and not create barriers.

Implementation

- Work with the Department of Economic Development, Jobs, Transport and Resources (DEDJTR), Public Transport Victoria and VicRoads to prepare pedestrian accessibility plans for the precincts around train stations in the Hoddle Grid.
- Prepare pedestrian accessibility plans for Spring Street and Collins Street at Parliament Station.
- Prepare pedestrian accessibility plans for Little Collins Street and King Street at Southern Cross Station.
- Work with the DEDJTR, Public Transport Victoria and VicRoads to ensure high levels of pedestrian priority in planning for new Melbourne Metro stations.



Figure 30: Pedestrian crossing outside Southern Cross Station

Parliament Station

Long term:

- Investigate installing pedestrian underpass and new entrance to reduce crowding at Lonsdale Street

Lonsdale Street entrances experience the greatest pedestrian congestion

Long term:

- Install escalators
- Provide weather protection

Long term:

- Investigate installation of zebra crossing over Nicholson Street

Short term:

- Investigate reducing to one lane to allow footpath widening and slow traffic
- Investigate full-time closure of Spring Street in front of Princes Theatre

Short term:

- Encourage use of Bourke Street entrance through signage and installation of an escalator

Medium term:

- Install escalator between concourse and ground levels
- Realign signalised pedestrian crossing to align with Little Collins Street

Short term:

- Investigate narrowing traffic lane to increase footpath space

Short term:

- Investigate relocating parking bays, east side of Spring Street or Ulster Lane

Medium term:

- Relocate traffic signal boxes to Gordon Reserve to increase footpath space

Severe pedestrian crowding at corner of Spring and Collins streets; footpath narrows north of Collins Street

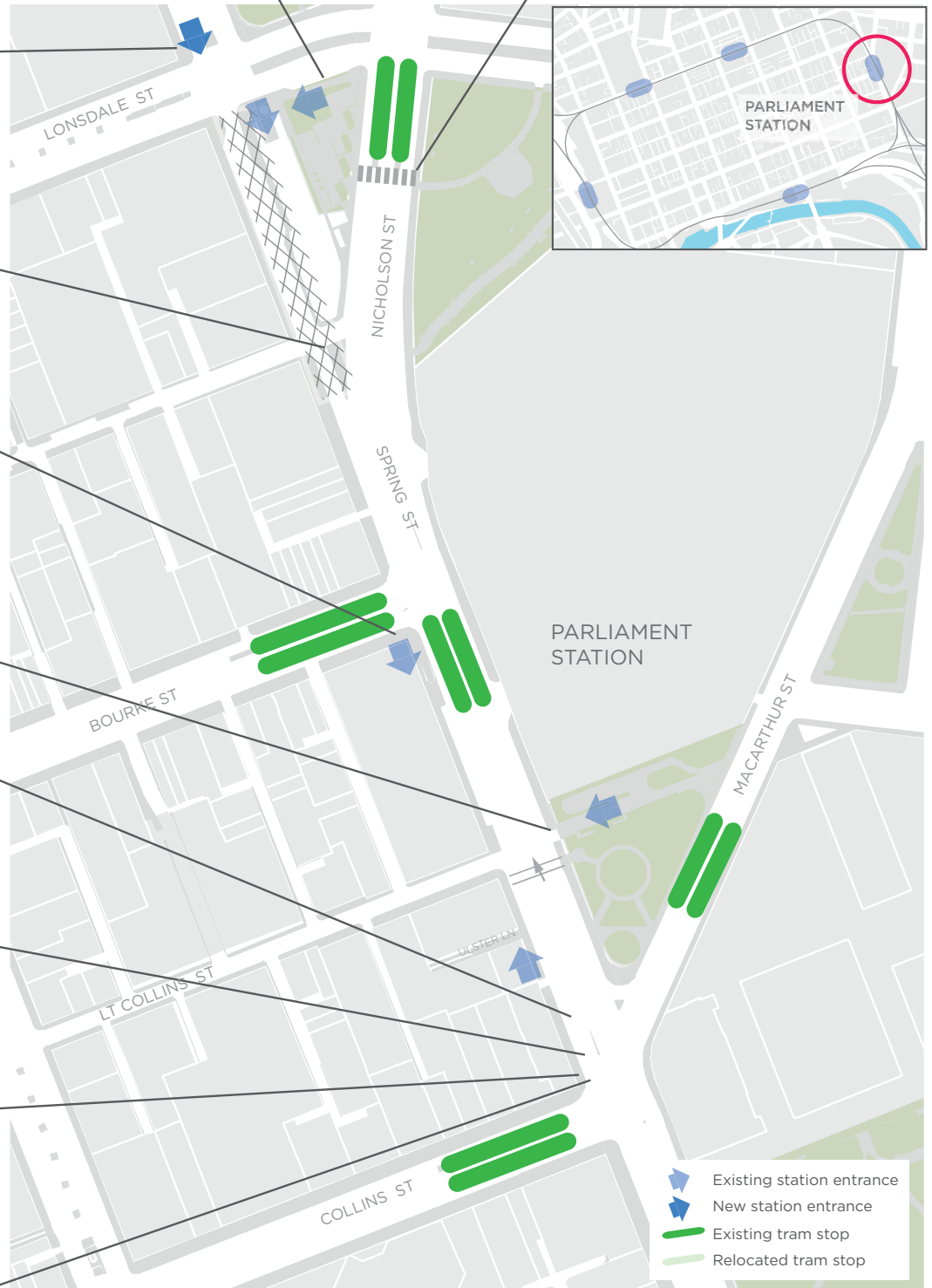


Figure 31: Possible improvements to pedestrian access to Parliament Station

3. CAPITAL WORKS

Flagstaff Station



Figure 32: Possible improvements to pedestrian access at Flagstaff Station

Southern Cross Station



Figure 33: Possible improvements to pedestrian access at Southern Cross Station

3. CAPITAL WORKS

Melbourne Central Station



Figure 34: Possible improvements to pedestrian access at Melbourne Central Station

Flinders Street Station

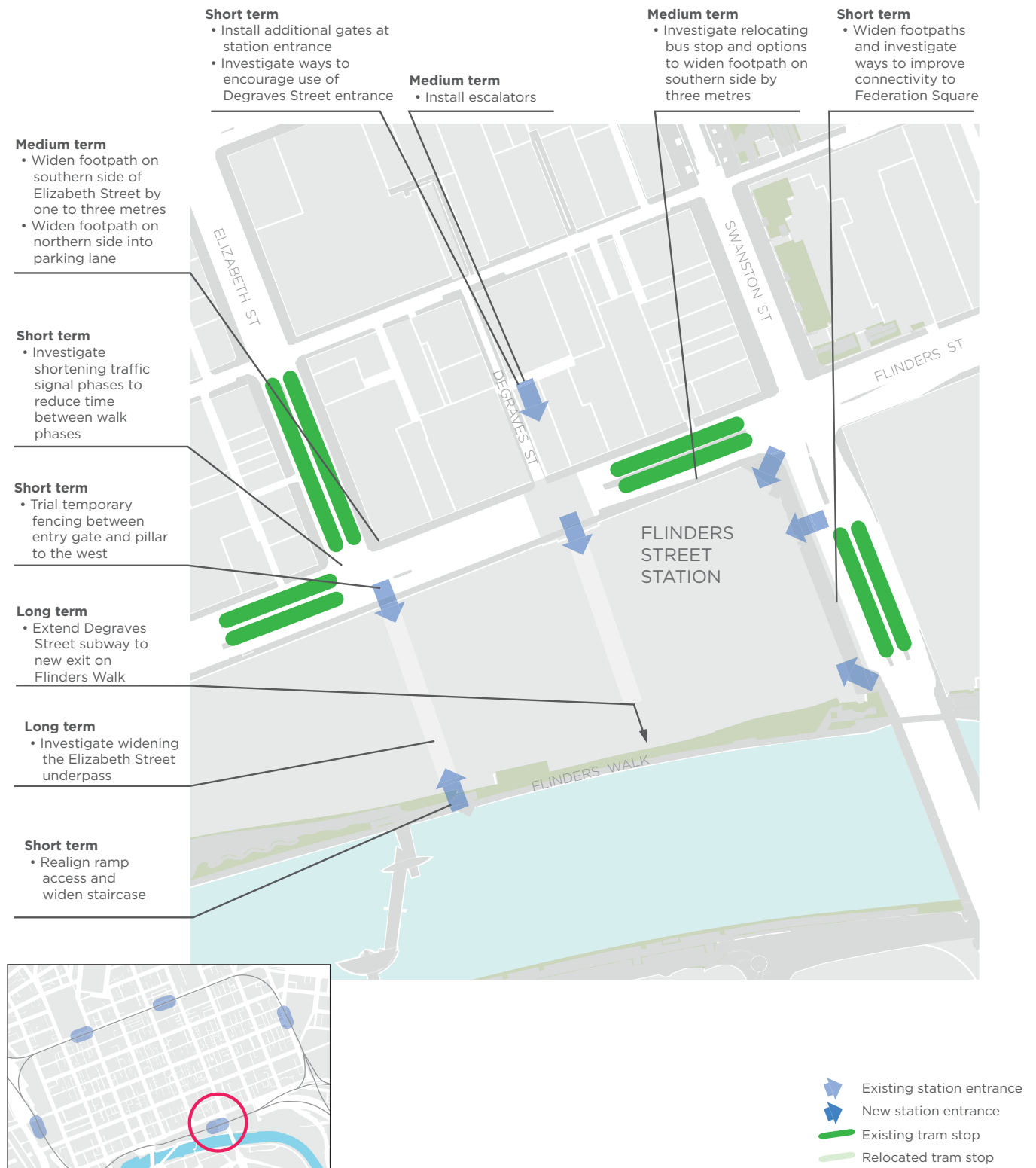


Figure 35: Possible improvements to pedestrian access at Flinders Street Station

3. CAPITAL WORKS

3.5 Tram and bus stops

Work with the DEDJTR, PTV and Yarra Trams to review current loadings, forecasts and location changes for tram and bus stops to improve their design, account for better streetscape integration and future pedestrian volumes.

Objective

To develop designs for tram and bus stops which create a high level of amenity while reducing crowding and delays to passengers to integrate stops well with the walking network.

Issues

Some key tram stops are overcrowded and the problem is worsening as tram use rises. Access to some island tram stops is restricted by their width and small number of access points.

Rationale

Tram stops are key access points to the public transport network in Melbourne. The city has many tram stops that are busier than most suburban train stations. Around 47,360 people get on and off trams at the Federation Square tram stop on an average weekday (PTV, 2011b). At the stop on Collins Street just west of Swanston Street, more than 25,740 people get on and off trams on an average weekday (PTV, 2011b). Patronage on the tram network grew by 4.5 per cent in the year ending 30 June 2012 (DoT, 2012, p. 167). Overall growth across the public transport network is forecast to be 4.4 per cent per year to 2021, and 3.2 per cent between 2021 and 2031 (PTV, 2013; p. 4). If these growth rates apply to these individual stops, around 96,900 people will use the Federation Square tram stop, and 53,630 will use the Collins Street stop each day by 2031.

Many stops are already uncomfortably crowded during parts of the day; this is expected to worsen. Crowding at tram stops is a critical safety issue.

The stops provide level access (no step up) to the tram network and, in many cases, are island stops separated from the footpath by a traffic lane. Most of the platform stops are fewer than 10 years old but some have already reached capacity.

There are currently no crowding standards for the stops.

Tram stops in urban renewal areas need to be designed to cater for future growth.

Significant changes are expected for central Melbourne's tram network. They include reducing overloading and tram congestion on Swanston Street by moving some routes to the west, as well as increasing the number of trams and passengers on most routes including Elizabeth Street and the construction of Melbourne Metro, which may mean the re-routing of all trams from Swanston Street for a period of time.

- Work with the Department of Economic Development, Jobs, Transport and Resources (DEDJTR), Public Transport Victoria and Yarra Trams to review the current loadings, forecasts and proposed location changes for tram and bus stops in consideration of the walking network around stops, prioritising tram stops that are currently over-crowded or forecasted to experience excessive crowding.
- Work with the DEDJTR, Public Transport Victoria and Yarra Trams to adopt appropriate crowding and permeability standards for stops.
- Ensure master planning for Elizabeth Street takes into account significant future tram patronage growth and provides for highly accessible tram stops which are well-integrated with the footpath network.
- Improve the design of tram stops to account for better streetscape integration and higher pedestrian volumes in locations that already are or will be busy over the long term.

Tram stops likely to be overcrowded by 2030

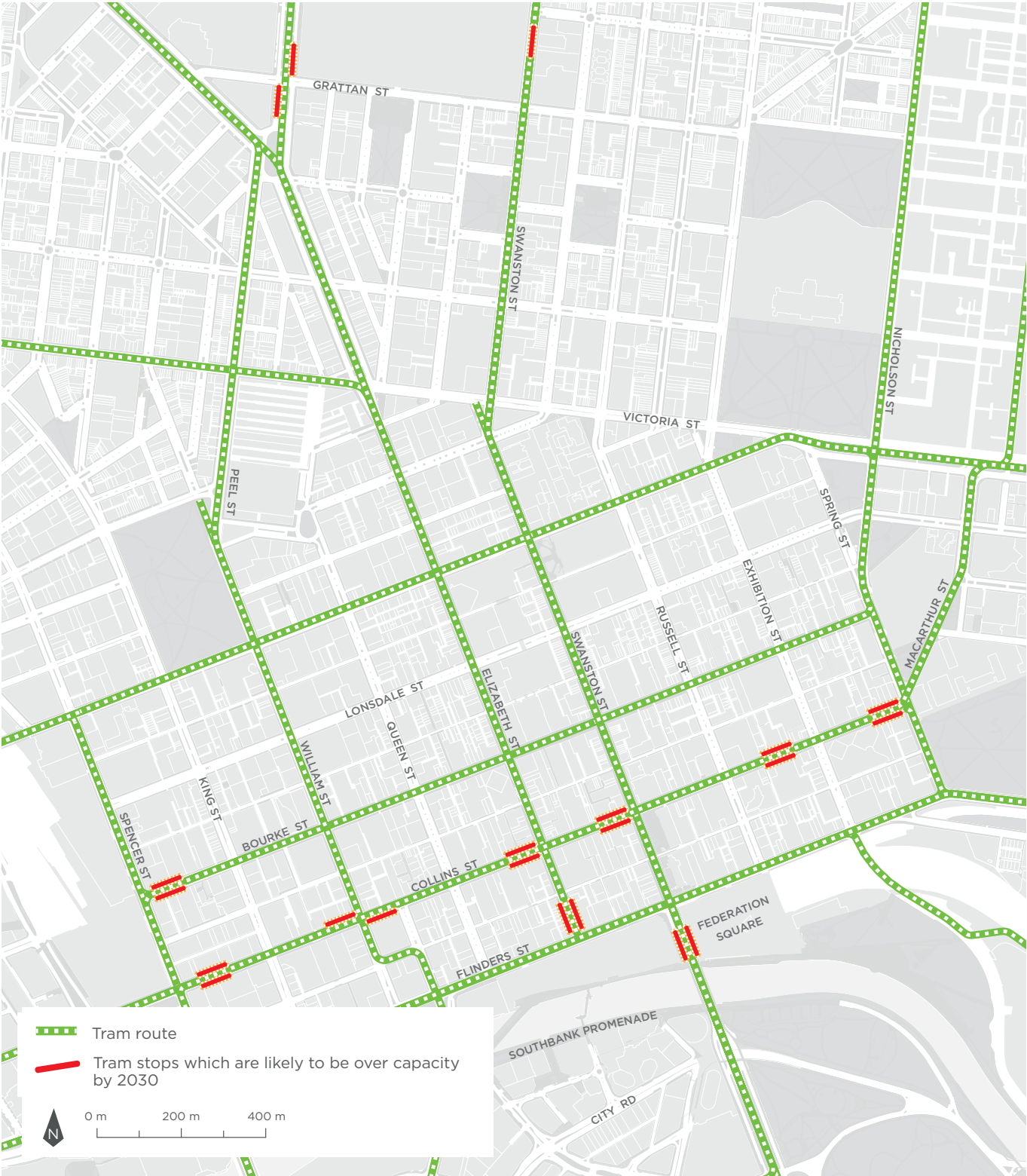


Figure 36: Tram stops likely to be at capacity by 2030

3. CAPITAL WORKS

3.6 Increasing the number of formal crossings

Develop a prioritised list of locations for new or improved pedestrian crossings where demand is high, crossing is difficult, including at roundabouts, and where distances between crossings are long.

Objective

Provide new pedestrian crossings to enable safe and easy pedestrian access.

Issues

A lack of pedestrian crossings or connections can make walking journeys unnecessarily long or create road safety hazards.

Rationale

Pedestrian crossings provide a safe way for people to walk from one side of the road to the other. They provide vital links in the walking network and reduce walking distances. There are locations in the City of Melbourne where new crossings are needed. Some are needed to deal with significant flows from stations (such as on Lonsdale Street at Crombie Street). Others are needed to connect developing areas to centres of activity (such as across City Road in Southbank) or to improve connections to key attractions such as the west side of the intersection of Flinders and Russell streets near Federation Square.

Walking north or south in the Hoddle Grid, formal pedestrian crossings are provided at a maximum spacing of every 100 metres. Walking east-west, formal pedestrian crossings are only every 200 metres. If a mid-block crossing is present this reduces to around 100 metres, assuming the crossing is in the middle of the block.

In some parts of the city, the distance between crossing points is extremely long. For example, the distance between crossing points on Alexandra Avenue between the Alexandra Gardens

and the Queen Victoria Gardens is more than 630 metres (from the intersection at Linlithgow Avenue west to the pedestrian signals at Fanning Street on City Road). As the city grows, larger numbers of people walking will mean a need for more crossings.

Connections across the Yarra and other rivers must also be frequent enough to prevent the river being a barrier to pedestrian movement, especially in busy areas.

The City of Melbourne has been progressively installing mid-block signalised crossings on east-west streets in the Hoddle Grid similar to the well-used crossing on Collins Street between Swanston and Elizabeth streets.

Zebra crossings, which can be used on single-lane roads (in each direction) and work well in areas with lower vehicle speeds, are significantly cheaper to install than signalised crossings. They give a higher level of priority to pedestrians, who can cross them without having to wait for a signal.

Implementation

- Develop a prioritised list of locations for new pedestrian crossings and work with VicRoads to install them.
- Design and reconstruct the pedestrian bridge at the existing railway overpass at Arden Street.
- Construct a pedestrian refuge at Queensberry and Bouverie streets.
- Consider improved pedestrian connections across the Yarra River as part of the proposed Collins Street tram extension from Docklands to Fishermans Bend.
- Continue to install crossing points and meet VicRoads guidelines, prioritising locations where demand is high, crossing is difficult and distances between crossings are long.
- Review existing roundabouts on local streets and investigate the possibility of installing zebra crossings on pedestrian desire lines at these intersections.



Figure 37: City Road, Southbank, is an example of a street with long distances between formal pedestrian crossings – 259 metres on average

Proposed central city mid-block pedestrian crossings



Figure 38: Proposed pedestrian mid-block crossings



Figure 39: Kerb extensions, like this example on Little Bourke Street, reduce the crossing distance for pedestrians

3. CAPITAL WORKS

3.7 Making streets easier to cross

Investigate techniques to assist pedestrians to cross streets legally and safely at 'non-crossing' locations.

Objective

Make streets easier to cross safely, particularly mid-block.

Issues

A lack of crossings can make walking journeys unnecessarily long or create road safety hazards.

In addition to the installation of formalised crossings, there may be an opportunity to develop a program of low-cost painted medians and other infrastructure to help pedestrians cross the street safely and reach their destination more quickly.

Rationale

Pedestrian crossings create safe crossing points, mostly at intersections, by giving priority to people crossing the street. As previously described, zebra crossings require motorists to stop whenever a pedestrian wishes to cross. Signalised crossings require motorists to stop when signals turn red.

There are also many other places that pedestrians may wish to cross the street where formal crossings are not provided. It would be too expensive and inefficient for the operation of the street to provide crossings in all these locations. Under the road rules, pedestrians wishing to cross the road may do so anywhere except within 20 metres of a pedestrian crossing. Painted median islands have been used to assist people to cross in places where no crossing is provided. Allowing people to cross the street safely where they want to often reduces delay and walking distances. It can also promote business in shopping streets by allowing easier access between shops on different sides of the road.

Implementation

- Investigate techniques such as, medians, pedestrian refuges and raised thresholds to assist pedestrians to cross streets legally and safely at 'non-crossing' locations.

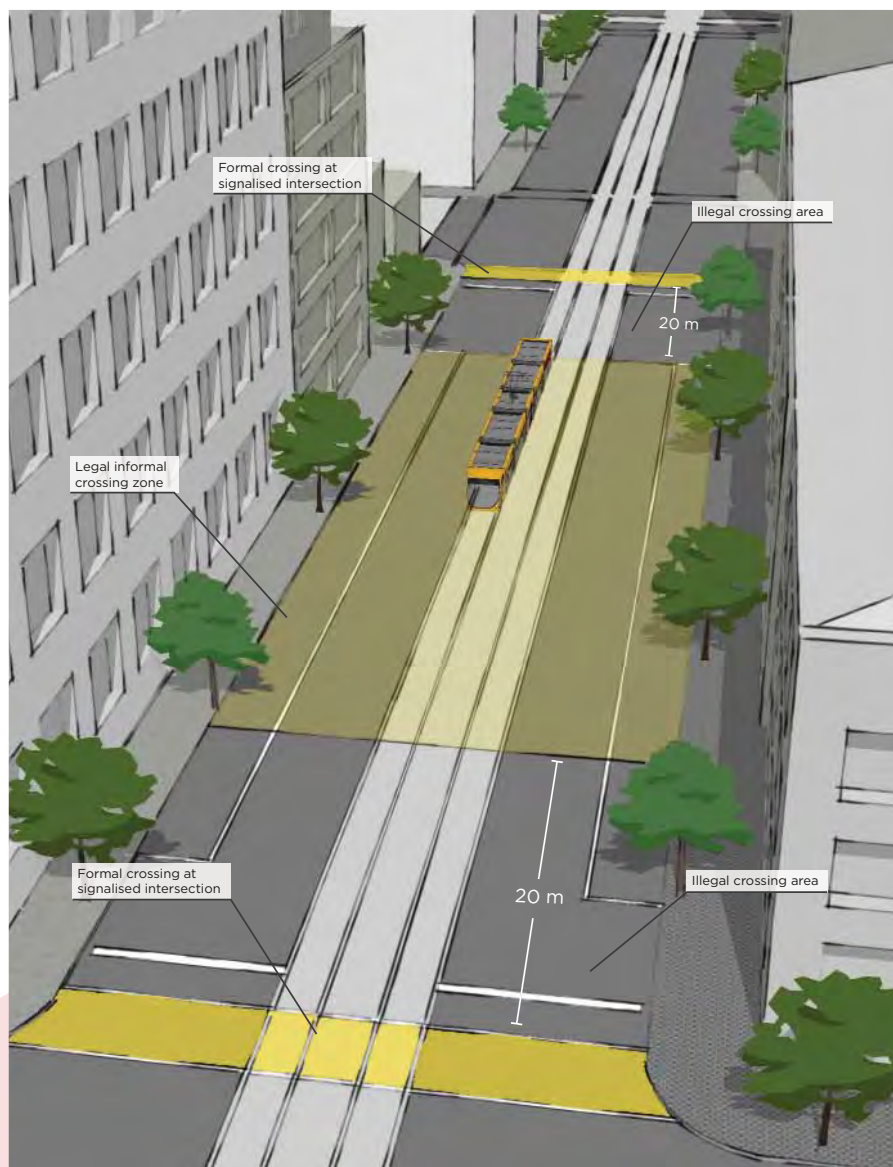


Figure 40: Example of legal informal crossing zone

3. CAPITAL WORKS

3.8 Technical notes

Review Technical notes to ensure alignment with the Walking Plan.

Objective

To ensure that design and construction standards as well as standard drawings at City of Melbourne outline specifications which are aligned with Council's Walking Plan.

Issues

City of Melbourne Technical Notes and Design and Construction Standards must continue to adapt in order to provide designs that cater for growing numbers of pedestrians and new types of walking infrastructure.

Rationale

Technical Notes and Design and Construction standards are provided by the City of Melbourne to developers

and contractors to ensure that works in the public realm are of an appropriate standard. Much of the content of the standard drawings is aimed at creating a high-quality pedestrian environment. Compliance with the Docklands Design and Construction Standards is a requirement under the City of Melbourne's Activities Local Law 2009.

The City of Melbourne is planning to extend the current Docklands Design and Construction Standards to cover the entire municipality. This provides the opportunity to ensure specifications provide for pedestrian 'future-proofing', for example setting footpath widths that are appropriate for the growing numbers of people walking in the city.

Implementation

- Review Technical notes to ensure alignment with the walking plan.



Figure 41: A review of technical notes could address tripping hazards and barriers to wheelchair accessibility across the city, such as this bull-nose ledge.



WALKING PLAN ACTIONS

	2014/15	2015/16	2016/17
1. Planning			
1.1 A central city subregion walking plan Work with the Metropolitan Planning Authority, the Department of Economic Development, Jobs, Transport and Infrastructure and Inner Melbourne Action Plan councils to deliver improvements to walking in Melbourne.	●	●	●
1.2 Use the planning scheme to improve the walking network Establish a future fine-grained pedestrian network for the City of Melbourne for implementation in the Melbourne Planning Scheme.	●	●	●
1.3 Principal pedestrian networks Define a principal pedestrian network in the Planning Policy Framework and SmartRoads to complement the fine-grained pedestrian network.		●	●
2. Street Management and Operation			
2.1 SmartRoads Use SmartRoads to assess road space allocation in the City of Melbourne.	●	●	●
2.2 Signal operation Assess pedestrian delay at intersections across the City of Melbourne and develop a prioritised list of projects to reduce pedestrian delay.	●	●	●
2.3 Pedestrian street hierarchy Adopt a pedestrian street hierarchy to provide direction for the operation of streets.	●		
2.4 Investigate Streets as Places Investigate the suitability of the proposed Streets as Places.	●	●	●
2.5 Investigate new Walking Streets Investigate the suitability of the proposed Walking Streets.	●	●	●
2.6 Investigate High-Mobility Streets Investigate the suitability of the proposed High-Mobility Walking Streets.	●	●	●
2.7 Create new shared zones Extend the program of converting laneways, roads and other spaces into shared zones in line with VicRoads' guidelines and the City of Melbourne Pedestrian Street Hierarchy.	●	●	●
2.8 Make roads safer for pedestrians Review existing lower speed limits and implement more on local and arterial roads where appropriate.	●	●	
2.9 Walking navigation Install a 'heads-up' mapping system in high-pedestrian areas and work to implement this system across Melbourne.	●	●	

	2014/15	2015/16	2016/17
2.10 Stop lines Progressively install stop lines on laneways at the building line rather than the intersection line along Bourke, Collins, Elizabeth and Flinders streets.	●	●	●
2.11 Travel behaviour change Continue to deliver the Share Our Streets multi-modal behaviour change program to improve safety and harmony amongst all road users.	●	●	●
2.12 Promote health Investigate the potential for encouraging walking to deliver health benefits in Melbourne including through the new Active Melbourne Strategy to be developed by the City of Melbourne.	●		
3. Capital Works			
3.1 Address pedestrian crowding Develop a tool to assess and identify current and future crowding and develop measures to address these locations through a range of interventions.	●	●	●
3.2 Pedestrian crossings at intersections Progressively widen, de-clutter, extend and protect pedestrian crossings through engineering, enforcement and design interventions.	●	●	●
3.3 Master plans Ensure master plans and precinct plans deliver an enhanced pedestrian network consistent with the principles of the walking plan.	●	●	●
3.4 Access around stations Prepare pedestrian accessibility plans for train stations in the Hoddle Grid and in urban renewal areas.	●	●	
3.5 Tram and bus stops Work with the Department of Economic Development, Jobs, Transport and Resources, Public Transport Victoria and Yarra Trams to review current loadings, forecasts and location changes for tram and bus stops to improve their design and account for better streetscape integration and future pedestrian volumes.	●	●	
3.6 Increase the number of formal crossings Develop a prioritised list of locations for new or improved pedestrian crossings where demand is high or crossing is difficult, including at roundabouts and distances between crossings are long.	●	●	●
3.7 Make streets easier to cross Investigate techniques to assist pedestrians to cross streets legally and safely at 'non-crossing' locations.	●	●	●
3.8 Technical notes Review technical notes to ensure alignment with the walking plan.	●		

APPENDICES

Appendix 1

Information on actions not adopted in this plan

Pedestrian countdowns

Countdowns at traffic signals let road users know the amount of time remaining before a signal changes.

Most pedestrian countdowns begin at the end of the green walk phase and count down the time remaining during the flashing red walk phase. This type of pedestrian countdown was trialled in metropolitan Melbourne in 2010 and in Sydney in 2011. In both cities, the trial was not able to show improvement in pedestrian safety, and at some locations in Sydney non-compliance increased, with more people crossing after the end of the green walk phase (ARRB, 2010, p. 38; 2011, p. 56). A review of signal operation in Melbourne concluded that the benefits of 'red walk countdown are likely to be limited and technical challenges may make installation costs high'. It may, however, be worth trialling them at a small number of sites where there are long crossing distances, such as the intersection of Elizabeth and Flinders streets.

An alternative pedestrian countdown displays the time pedestrians have to wait before they can begin to cross. This version has the potential to improve pedestrian safety while providing information to pedestrians about waiting times. Technology will need to be developed to implement this type of pedestrian countdown. Because traffic signals are linked as part of a coordinated system, the length of the 'do not walk' phase is not the same every light cycle and existing pedestrian countdown technology cannot accommodate the corresponding change in countdown length. It is also possible this type of countdown may encourage pedestrians to pre-empt the signal (as occurred with the Marshalite traffic signal clocks which operated up to the 1960s).

It is likely to be confusing if two different types of countdown timers operate in the same city.

Given the high cost, complexity and limited benefits, at this stage, the City of Melbourne does not intend to pursue pedestrian countdown signals.

Scramble crossing

Exclusive pedestrian phases are sometimes called a scramble crossing or a Barnes Dance. During this phase in the traffic signal cycle, pedestrians are allowed to walk diagonally across the intersection as well as parallel to the roads. An example is at the intersection of Flinders and Elizabeth streets.

Intuitively, it may seem that providing a scramble phase would improve pedestrian service, but this is demonstrably not the case in the great majority of typical intersections. A study of two typical Hoddle Grid intersections – Collins and Exhibition streets, and Spencer and Little Collins streets (Nash & Smith, 2010; John Piper Traffic Pty Ltd, 2008), found that implementing a scramble phase at each intersection would:

- result in slight increases in overall average pedestrian delay;
- markedly increase overall average vehicle delay; and
- increase average tram delay by at least double.

Though scramble phases free pedestrian movement by allowing them to cross in any direction, they also decrease the frequency of crossing opportunities by forcing pedestrians to wait through both the A and B traffic phases when vehicles pass through the intersection. Furthermore, within the scramble phase, pedestrian clearance time needs to be sufficient for an individual to clear the intersection diagonally rather than just straight across. For a typical Hoddle Grid intersection, the clearance interval would increase from about 16 seconds to 26 seconds, which is 10 seconds of additional lost time in the signal cycle. Running scramble phases would make it more difficult to achieve lower cycle times in light traffic conditions. The absolute minimum cycle time would be 65 seconds, made up of 15 seconds for each of A and B phases plus 35 seconds for the scramble phase, assuming all three phases run each cycle.

Pedestrian early starts

Pedestrian early starts provide an early introduction of the pedestrian 'walk' signal ahead of the parallel vehicle green at signalised intersections. This allows pedestrians to establish themselves on the crossing before

left-turning traffic has a chance to reach the point of conflict with the pedestrians. The early start is generally in the order of two seconds. This type of operation is also called a 'leading pedestrian interval' in New York.

This measure provides pedestrians with no improvement to their level of service, as the timing of the lights for pedestrians remains unchanged. However, it provides a perceived priority because the parallel vehicle movement is delayed. This can easily be perceived to be an unnecessary penalty for motorists as it is actually achieved through a 'late start' for the vehicle green.

Unless there is clear evidence of a safety benefit, it could be difficult to get community support. A trial would probably need several years of operation before a reliable road safety evaluation would be possible as the road safety benefits, if any, would be marginal. A simple implementation of pedestrian early starts would adversely affect trams, buses and bicycles, as they are usually governed by the same green light as the general vehicular traffic. To overcome this, additional lanterns would have to be installed for the relevant vehicle types. This would add a level of complexity, expense and visual clutter that is unlikely to justify the small benefits of a two-second head start. General vehicular traffic would be adversely affected by about one vehicle per lane per cycle. In congested conditions, this increases the likelihood of queues blocking an upstream intersection or crossing.

The main idea of pedestrian early starts is to overcome the situation where a left-turn driver makes their manoeuvre without looking for pedestrians. The delay for the vehicle drivers should get the pedestrian onto the crossing where the left-turn driver will see them. However, the benefit of this at intersections along Collins Street, for example, is questionable as drivers would have every expectation that they must give way to pedestrians, and driver compliance is good in Melbourne compared to many other cities. The pedestrian early start concept is more likely to have safety benefits where pedestrian presence is unexpected. That is certainly not the case along Collins Street.

When there are many pedestrians waiting to cross there is always someone who starts to walk quickly the moment the green man is displayed. In most cycles at Hoddle Grid intersections, the pedestrians are well established on the crosswalk before the first left-turn vehicle has a chance to reach the crosswalk. This is even more so as stop lines are set back through the installation of bicycle head-start boxes and wider crosswalks.

The effect of pedestrian early starts (vehicle late starts) on the operation and safety of hook turns would need to be examined carefully. According to Road Rule 34, a driver undertaking a hook turn must wait to complete the turn 'until the traffic lights on the road that the driver is entering change to green'. However, many drivers would complete the turn from the propped position within the intersection as soon as the lights facing them turn to yellow. This disparity between expected behaviour and legal requirements could cause legal problems if any cases went to court. The extra all-red time between vehicle movements is likely to encourage more drivers per cycle to try to complete a hook turn, running the risk of interlocking hook turners.

Although pedestrian early starts provide a symbolic action showing priority for pedestrians over vehicles, the implementation is not supported for the following reasons:

- they provide no reduction in pedestrian delay;
- they adversely impact vehicular traffic;
- there is no evidence of a safety advantage, or any such benefit is likely to be small in locations where turning drivers expect to have to give way to pedestrians;
- to alleviate extra delays to bicycles, trams and buses, additional lanterns would have to be installed at considerable cost, adding to visual clutter; and
- they would create legal and operational problems at intersections with hook turns.

APPENDICES

Appendix 2

Walking network improvements in urban renewal areas: policy context and detailed rationale

WALKING NETWORK IMPROVEMENT	POLICY CONTEXT	RATIONALE
1. Intersection at Flemington, Racecourse and Boundary roads	Arden-Macaulay Structure Plan	<ul style="list-style-type: none"> Increase in pedestrian activity associated with forecast growth in Arden-Macaulay, around 10,900 jobs and 10,000 residents between 2011 and 2031.
2. Moonee Ponds Creek	Arden-Macaulay Structure Plan	<ul style="list-style-type: none"> Increase in pedestrian activity associated with forecast growth in Arden-Macaulay, around 10,900 jobs and 10,000 residents between 2011 and 2031. Upgrade of open space. Key north-south pedestrian and cycling link between Flemington Bridge and Macaulay stations.
3. North Melbourne Community Centre	Arden-Macaulay Structure Plan	<ul style="list-style-type: none"> Increase in pedestrian activity associated with forecast growth in Arden-Macaulay, around 10,900 jobs and 10,000 residents between 2011 and 2031. Upgrade of open space. Permeability improvement needed across Boundary Road.
4. Macaulay Central	Arden-Macaulay Structure Plan	<ul style="list-style-type: none"> Increase in pedestrian activity associated with forecast growth in Arden-Macaulay, around 10,900 jobs and 10,000 residents between 2011 and 2031. One of three new local activity centres.
5. Lorimer precinct	Fishermans Bend, identified as an urban renewal precinct in Plan Melbourne	
6. Haymarket	City North Structure Plan	<ul style="list-style-type: none"> Melbourne Metro and development in City North will result in more pedestrian activity. Forecast growth in City North – around 6,700 jobs and 5,400 residents between 2011 and 2031. Location of future Melbourne Metro station (Parkville), which will have around 16,000 morning peak commuters. Will be the centre of one of three local service hubs in City North. Existing roundabout uses significant amount of land and separates land uses, making walking less attractive.
7. Queen Victoria Market	City North Structure Plan	<ul style="list-style-type: none"> Current overcrowding at Elizabeth Street tram stops. City North forecast to grow by around 6,700 jobs and 5,400 residents between 2011 and 2031. Hoddle Grid forecast to grow by around 120,340 jobs and 18,800 residents between 2011 and 2031. Currently Queen Victoria Market has more than 10 million annual visitors. Upgrade needed to ensure long-term market viability. Will build connections to and improve walking access within the market.

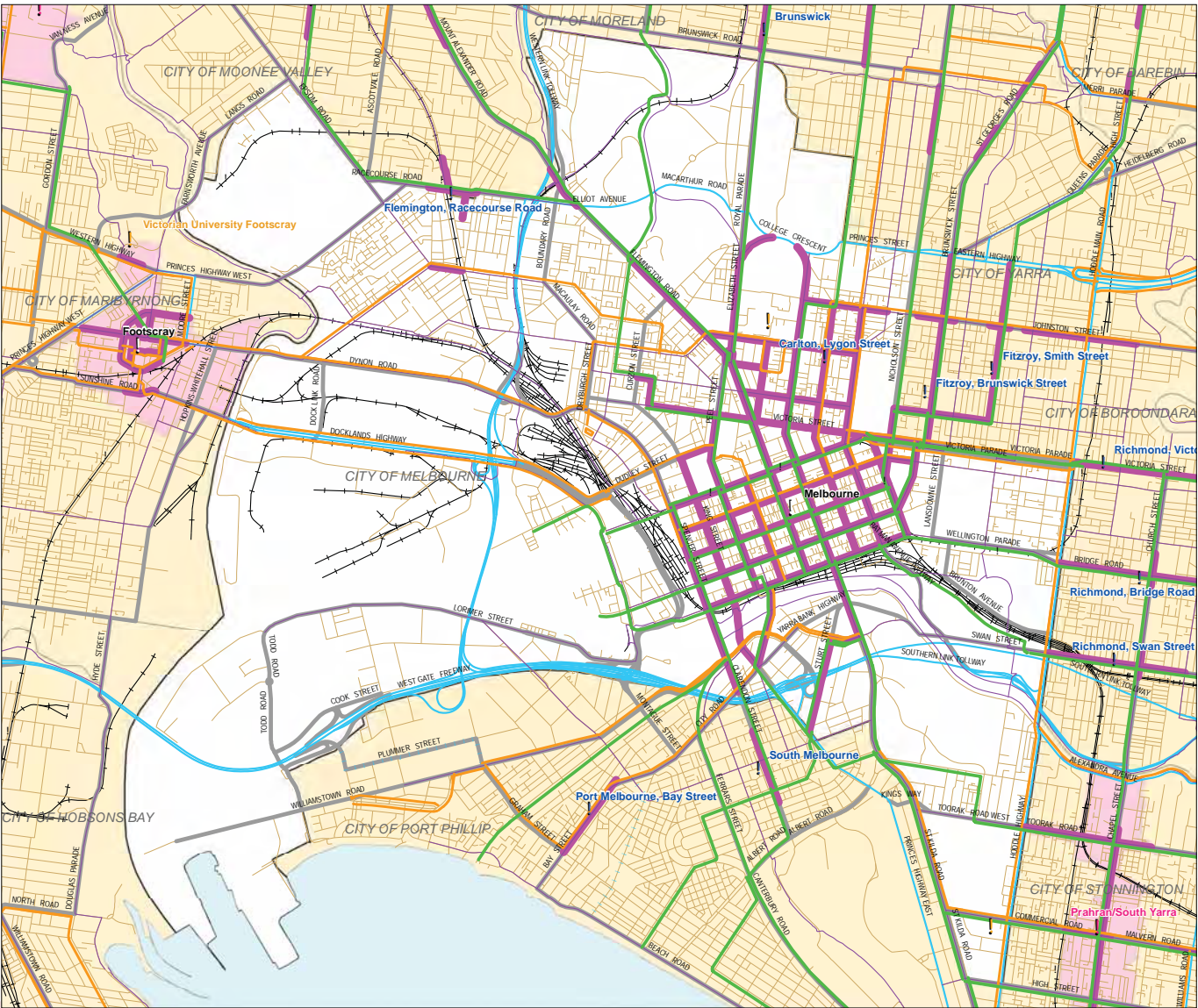
WALKING NETWORK IMPROVEMENT	POLICY CONTEXT	RATIONALE
8. City Road	Southbank Structure Plan	<ul style="list-style-type: none"> • Increase in pedestrian activity associated with forecast growth in Southbank, around 16,700 jobs and 13,400 residents between 2011 and 2031. • City Road to be developed to have 'High Street' function for Southbank. • One of the principal pedestrian spines for Southbank. • Will address poor permeability across City Road and poor existing pedestrian amenities.
9. M1 Freeway undercroft	Southbank Structure Plan	<ul style="list-style-type: none"> • Increase in pedestrian activity associated with forecast growth in Southbank, around 16,700 jobs and 13,400 residents between 2011 and 2031. • Will improve pedestrian connection to South Melbourne and Docklands. • New open space.
10. Southbank arts precinct	Southbank Arts Precinct Blueprint	<ul style="list-style-type: none"> • Arts Victoria project in partnership with the City of Melbourne and the University of Melbourne. • Funded in the 2011-12 Victorian State Budget and through additional funding by the Commonwealth Liveable Cities program. • Will service local residents as well as local, regional, interstate and international visitors. • Will improve connectivity within the arts precinct through new pedestrian through-block links. • Area contains principal pedestrian spines – Sturt Street, Grant Street and Southbank Boulevard – as identified in Southbank Structure Plan.
11. Wellington Parade	Open Space connections	<ul style="list-style-type: none"> • Permeability increase needed across Wellington Parade to connect parks.
12. La Trobe Street	Central city growth	<ul style="list-style-type: none"> • Link between west of Hoddle Grid and Docklands
13. Southern Cross Station	Central city growth	<ul style="list-style-type: none"> • Current pedestrian overcrowding on footpaths; crowding has been alleviated in the short term by reducing signal cycle timing and pedestrian waiting period. • Regional Rail Link and development in the west of the Hoddle Grid will result in more pedestrian activity. • Regional Rail Link will increase capacity of Southern Cross Station by 16 extra services (regional and metropolitan) in two-hour peak period, and is due for completion by early 2016. (State of Victoria, 2012, p. 15) • Possible tram stop move on Collins Street from east of Spencer Street to west may alleviate some crowding. • Possible opportunity for an air-bridge across Spencer Street, dependant on future development plans for former Savoy Tavern site at corner of Bourke and Spencer streets.
14. Parliament Station	Central city growth	<ul style="list-style-type: none"> • Current pedestrian overcrowding on footpaths on Spring Street, Lonsdale Street and north end of Collins and Little Collins streets.

APPENDICES

WALKING NETWORK IMPROVEMENT	POLICY CONTEXT	RATIONALE
15. Flinders Street (Northbank)	Central city growth	<ul style="list-style-type: none"> Development in the west of the Hoddle Grid, Northbank and surrounding urban renewal areas will result in more pedestrian journeys to trams and trains. Forecast growth in Northbank of around 17,000 jobs between 2011 and 2020. (DPCD, 2012) Existing poor pedestrian environment creating conflict between pedestrians and cyclists. Existing poor connection to Docklands and the rest of the city.
16. CBD South Metro station Flinders Street Station at Federation Square tram stop	Central city growth Melbourne Metro	<ul style="list-style-type: none"> Federation Square and Flinders Street Station are 'Melbourne's meeting place'. Busiest train station and tram stop in Melbourne. Flinders Street Station has around 171,000 people walking to and from the station each weekday, Federation Square tram stop has around 50,000. (PTV, 2012) Construction of Metro station will result in more pedestrians accessing stations and tram stops.
17. CBD North Metro station Melbourne Central Station	Central city growth Melbourne Metro	<ul style="list-style-type: none"> Significant future pedestrian growth and major interchange point. Construction of Metro station will result in more pedestrians accessing stations and tram stops.
18. Collins Street	Central city growth Melbourne Metro	<ul style="list-style-type: none"> Current overcrowding on most tram stops along Collins Street; most are already or will be unmanageable soon. Construction of CBD South Metro station will result in more pedestrians accessing Collins Street tram stops and footpaths. Collins Street has limited traffic function. Pedestrian growth likely to lead to overcrowding.
19. Grattan Street	City North Melbourne Metro	<ul style="list-style-type: none"> Permeability increase needed across Grattan Street. Construction of Metro station will result in more pedestrians on Grattan Street.
20. Elizabeth Street	Realignment of tram routes detailed in Public Transport Victoria's forthcoming On Road Network Development Plan	<ul style="list-style-type: none"> Elizabeth Street bookends the walking heart of Melbourne centred on the retail core. Future volumes of pedestrians accessing Elizabeth Street from two train stations and several tram lines will grow significantly and more footpath space will be needed. New-generation tram stops will be needed as island platforms will not be adequate.
21. William Street	Realignment of tram routes due to Melbourne Metro and as per On Road Network Development Plan	<ul style="list-style-type: none"> Current pedestrian crowding into and out of Flagstaff Station. Melbourne Metro construction will mean significantly more trams using William Street. Development in west of the Hoddle Grid will result in increased use of Flagstaff Station.
22. Melbourne University tram stop at Swanston Street	Realignment of tram routes due to Melbourne Metro and as per On Road Network Development Plan	<ul style="list-style-type: none"> Permeability increase needed across Swanston Street. Tram stop likely to be overcrowded in future. Current fenced arrangement and tram turnaround possibly able to be altered given realignment of tram routes as part of Melbourne Metro construction

Appendix 3

Current VicRoads Network Operating Plan, 2012



ROAD USE HIERARCHY

CITY OF MELBOURNE

DISCLAIMER

This VicRoads map is provided for general information purposes only. VicRoads does not accept any liability to any person for the information or advice (or use of such information or advice) which is provided on the map or incorporated into it by reference.

LEGEND

Road Use Hierarchy

- Tram Priority Route
- Bus Priority Route
- Bicycle Priority Route
- Pedestrian Priority Area
- Preferred Traffic Route
- Future Preferred Traffic Route
- Traffic Route
- Future Traffic Route

Note: Some lines are offset to improve clarity.

Activity Area

- Central Activities Area
- Principal Activity Area
- Major Activity Area
- Specialised Activity Area

Other

- Railway Station
- Railway Line
- Local Roads
- Activity Area Boundaries

KEY MAP

APPENDICES

Appendix 4

Policy background – list of Commonwealth, State and City of Melbourne policy documents

Plan Melbourne, 2014

Department of Transport,
Planning & Local Infrastructure
www.planmelbourne.vic.gov.au

SmartRoads framework

VicRoads
[www.vicroads.vic.gov.au/Home/
TrafficAndRoadConditions/
HowWeManageTraffic/Smartroads/](http://www.vicroads.vic.gov.au/Home/TrafficAndRoadConditions/HowWeManageTraffic/Smartroads/)

Transport Integration Act, 2010

www.legislation.vic.gov.au
The Transport Integration Act sets out a vision for Victoria's transport system that supports a city that is inclusive, prosperous, safe and green, using careful planning to maximise opportunities and reduce risks. The Act impacts on both the transport and place-making function of roads. All Victorian transport planning and management needs to have regard for the six key objectives of the Act, which are: environmental sustainability, economic prosperity, safety, integration of land use and transport planning; and efficiency, coordination and reliability.

Transport Strategy, 2012

City of Melbourne
www.melbourne.vic.gov.au/futuregrowth

Council Plan, 2013-2017

City of Melbourne
[www.melbourne.vic.gov.au/
aboutcouncil/plansandpublications/
councilplan](http://www.melbourne.vic.gov.au/aboutcouncil/plansandpublications/councilplan)

Road Safety Plan, 2013-2017

City of Melbourne
www.melbourne.vic.gov.au/roads

Active Melbourne Strategy, 2007

City of Melbourne
[www.melbourne.vic.gov.au/
ParksandActivities/ActiveMelbourne](http://www.melbourne.vic.gov.au/ParksandActivities/ActiveMelbourne)

Streetscapes Framework, 2011

City of Melbourne
[www.melbourne.vic.gov.au
ParkingTransportandRoads/Roads/](http://www.melbourne.vic.gov.au/ParkingTransportandRoads/Roads/)

Melbourne for All People Strategy, 2014-2017

City of Melbourne
[www.melbourne.vic.gov.au
ParkingTransportandRoads/
Roads/communityservices/Pages/
CommunityServices.aspx](http://www.melbourne.vic.gov.au/ParkingTransportandRoads/Roads/communityservices/Pages/CommunityServices.aspx)

Bicycle Plan, 2012-2016

City of Melbourne
[www.melbourne.vic.gov.au
ParkingTransportandRoads/Roads/
AboutCouncil/PlansandPublications/
strategies/Pages/Bikeplan.aspx](http://www.melbourne.vic.gov.au/ParkingTransportandRoads/Roads/AboutCouncil/PlansandPublications/strategies/Pages/Bikeplan.aspx)

Appendix 5

Pedestrian Level of Service as defined in SmartRoads

Source: Australasian Institute of Traffic Planning and Management (AITPM) and VicRoads Seminar Training Manual: Application and Use of Network Fit Assessments

TRANSPORT TYPE	LOS	DESCRIPTION
Pedestrian	A	Crossing opportunities are within 25m of demand. Minimal delay in crossing.
	B	Crossing opportunities are within 50m of demand. Average delay before being able to safely cross is less than 30 seconds.
	C	Crossing opportunities are within 100m of demand. Average delay before being able to safely cross is less than 45 seconds.
	D	Crossing opportunities are within 200m of demand. Average delay before being able to safely cross is less than 60 seconds. Significant numbers of pedestrians start crossing illegally.
	E	Crossing opportunities are within 400m of demand. Average delay before being able to safely cross is less than 90 seconds.
	F	Crossing opportunities are within 400m of demand. Average delay before being able to safely cross more than 90 seconds.

	PEDESTRIAN LEVEL OF SERVICE (LOS)						
Wait time at Crossing (seconds)	151-180	D-	D-	E+	E	F	F-
	121-150	D	D	E+	E	F+	F-
	91-120	D+	D+	D-	E+	F+	F
	61-90	C-	D+	D	E+	E-	F
	46-60	C+	C	D+	D-	E-	F+
	31-45	B-	C+	C-	D-	E-	F+
	16-30	B	B-	C-	D-	E-	F+
	0-15	A-	B	C	D	E	F+
Spacing (m)	0-25	26-50	51-100	101-200	201-400	400+	

The table above shows a matrix of the time required to travel to the crossing points and the wait times for crossing opportunities, consistent with the above descriptors.

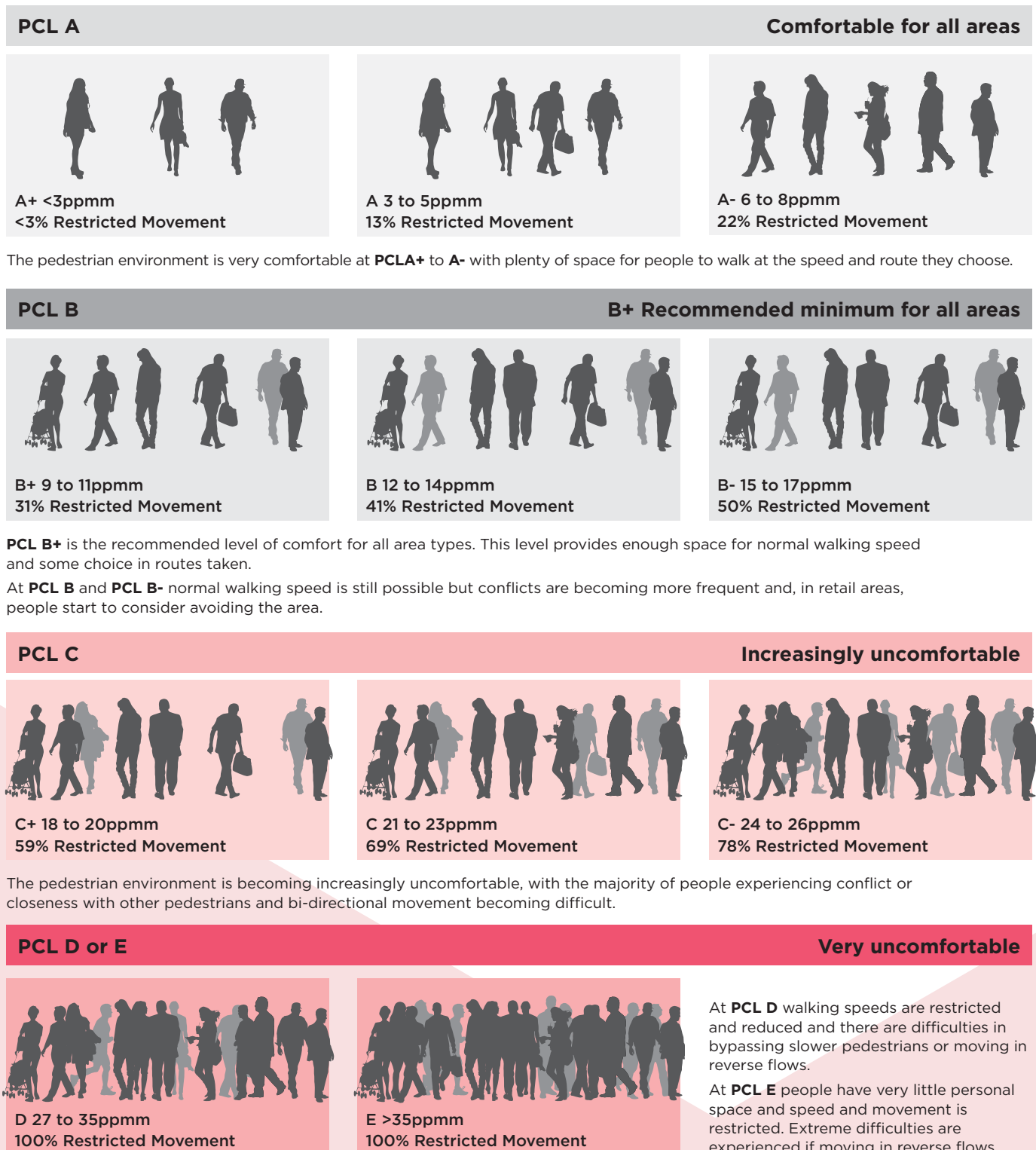
Spacing refers to the closest walking distance required for pedestrians to safely cross the road. Safe crossing areas can be signalised intersections/crossings, formalised unsignalised crossings (eg. pram ramps), zebra crossings, and school crossing areas when a school crossing supervisor is present.

APPENDICES

Appendix 6

Pedestrian comfort level (PCL) guidance

Source: Atkins for Transport for London, 2010, page 13



Guidance on applying pedestrian comfort levels in different area types

Source: Atkins for Transport for London, 2010, page 14

	HIGH STREET		OFFICE AND RETAIL		RESIDENTIAL		TOURIST ATTRACTION		TRANSPORT INTERCHANGE	
	Peak	Ave. of Max	Peak	Ave. of Max	Peak	Ave. of Max	Peak	Ave. of Max	Peak	Ave. of Max
A	Comfortable		Comfortable		Comfortable		Comfortable		Comfortable	
B+										
B	Acceptable		Acceptable		Acceptable		Acceptable		Acceptable	
B-	At risk						At risk			
C+	Unacceptable/ uncomfortable		Acceptable		At risk	At risk	Unacceptable/ uncomfortable		Acceptable	
C-			At risk	At risk	At risk				At risk	
D			At risk		Unacceptable/ uncomfortable					
E			Unacceptable/ uncomfortable		Unacceptable/ uncomfortable					
			Unacceptable/ uncomfortable		Unacceptable/ uncomfortable					
	Peak and Average of Maximum Activity levels have similar guidance as people visiting retail areas stated they were particularly sensitive to crowding.		The 'at risk' level is set at a lower PCL during the Average of Maximum Activity than peak flows. This is because of the greater number of single travellers and the short duration of maximum activity.		The 'at risk' level is set at a lower PCL than peak flows in Residential Areas to reflect the short time this is likely to occur. A site visit to Residential sites is particularly important to check if there is school activity or a bus stand in the area.		Peak and Average of Maximum Activity levels have similar guidance as people visiting tourist areas are likely to be particularly sensitive to crowding.		The 'at risk' level is set at a lower PCL during the Average of Maximum Activity than peak flows. This is because of the greater number of single travellers and the short duration of maximum activity.	

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