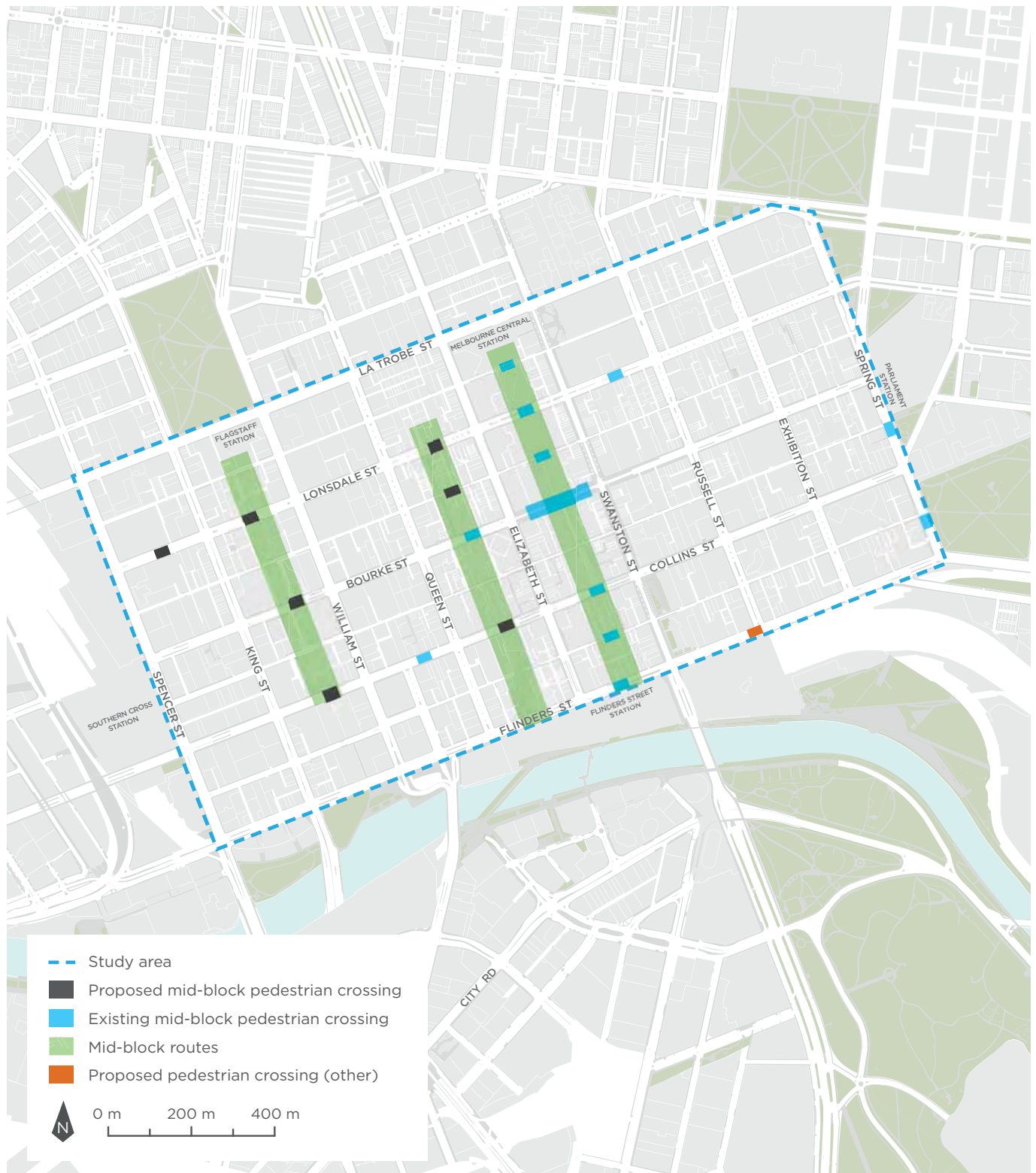# Proposed central city mid-block pedestrian crossings

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.
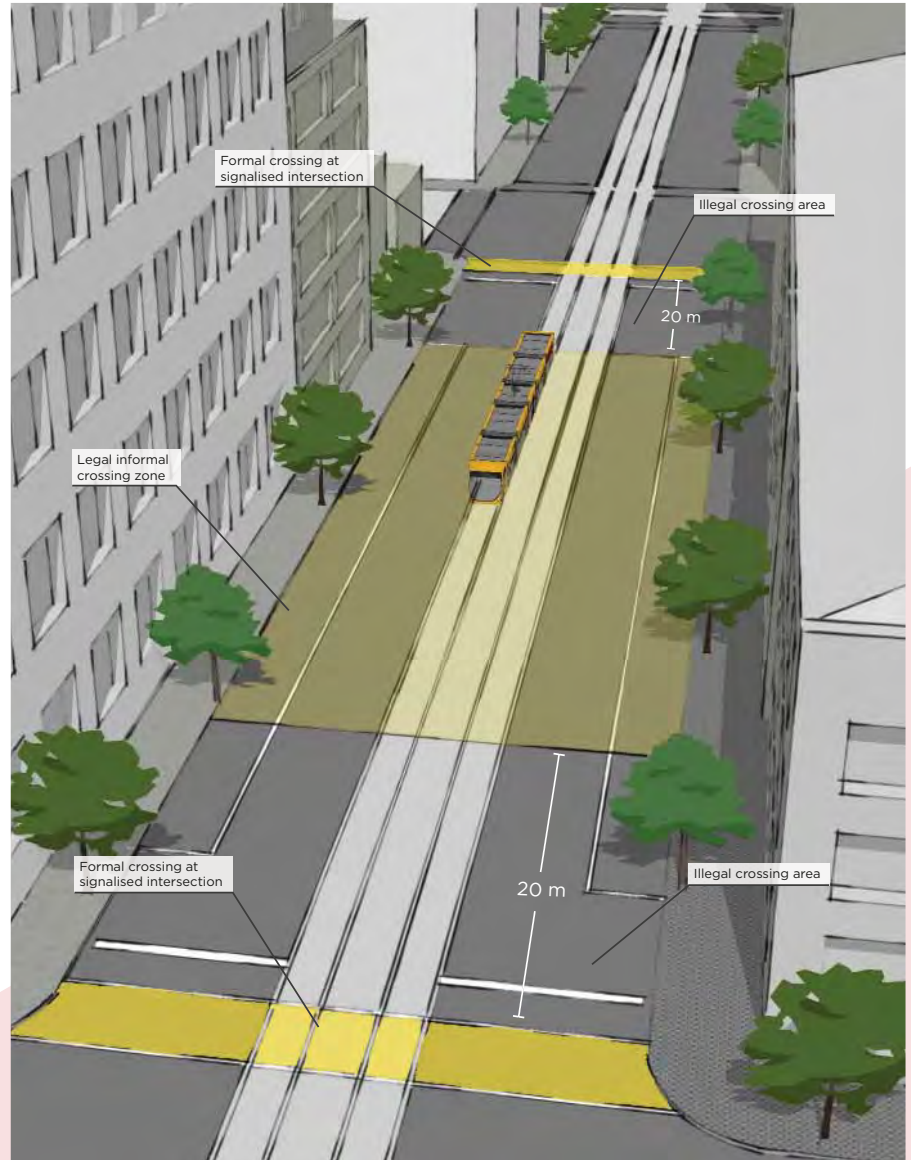

Figure 40: Example of legal informal crossing zone

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

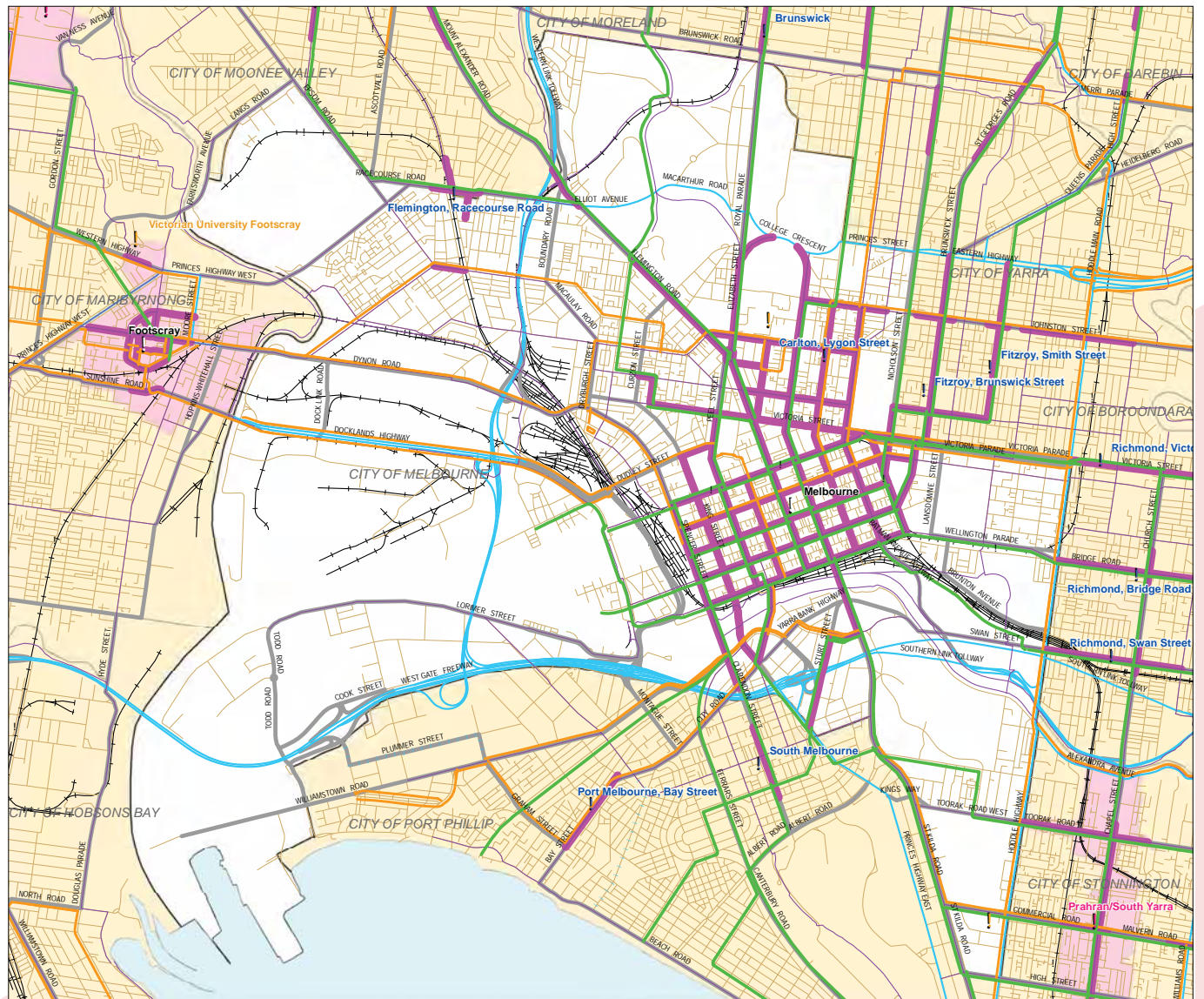| WALKING NETWORK IMPROVEMENT	POLICY CONTEXT	RATIONALE
1. Intersection at Flemington, Racecourse and Boundary roads	Arden-Macaulay Structure Plan	• Increase in pedestrian activity associated with forecast growth in Arden-Macaulay, around 10,900 jobs and 10,000 residents between 2011 and 2031.
2. Moonee Ponds Creek	Arden-Macaulay Structure Plan	• 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	• 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	• 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	• 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	• 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.

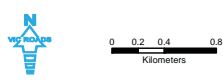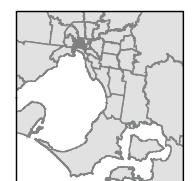| WALKING NETWORK IMPROVEMENT	POLICY CONTEXT	RATIONALE
8. City Road	Southbank Structure Plan	• Increase in pedestrian activity associated with forecast growth in Southbank, around 16,700 jobs and 13,400 residents between 2011 and 2031. • City Road to be developed to have 'High Street' function for Southbank. • 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	• 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	• 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	• Permeability increase needed across Wellington Parade to connect parks.
12. La Trobe Street	Central city growth	• Link between west of Hoddle Grid and Docklands
13. Southern Cross Station	Central city growth	• 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	• 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	• 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	• 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	• 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	• 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	• 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	• 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	• 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	• 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

N
VIC ROADS

0   0.2   0.4   0.8
Kilometers

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/

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

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

Streetscapes Framework, 2011
City of Melbourne
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

Bicycle Plan, 2012-2016
City of Melbourne
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)	0-25	26-50	51-100	101-200	201-400	400+
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

| **PCL A** | **Comfortable for all areas** |

A+ <3ppmm
<3% Restricted Movement

A 3 to 5ppmm
13% Restricted Movement

A- 6 to 8ppmm
22% Restricted Movement

The pedestrian environment is very comfortable at **PCLA+** to **A-** with plenty of space for people to walk at the speed and route they choose.

| **PCL B** | **B+ Recommended minimum for all areas** |

B+ 9 to 11ppmm
31% Restricted Movement

B 12 to 14ppmm
41% Restricted Movement

B- 15 to 17ppmm
50% Restricted Movement

PCL B+ is the recommended level of comfort for all area types. This level provides enough space for normal walking speed and some choice in routes taken.

At **PCL B** and **PCL B-** normal walking speed is still possible but conflicts are becoming more frequent and, in retail areas, people start to consider avoiding the area.

| **PCL C** | **Increasingly uncomfortable** |

C+ 18 to 20ppmm
59% Restricted Movement

C 21 to 23ppmm
69% Restricted Movement

C- 24 to 26ppmm
78% Restricted Movement

The pedestrian environment is becoming increasingly uncomfortable, with the majority of people experiencing conflict or closeness with other pedestrians and bi-directional movement becoming difficult.

| **PCL D or E** | **Very uncomfortable** |

D 27 to 35ppmm
100% Restricted Movement

E >35ppmm
100% Restricted Movement

At **PCL D** walking speeds are restricted and reduced and there are difficulties in bypassing slower pedestrians or moving in reverse flows.

At **PCL E** people have very little personal space and speed and movement is restricted. Extreme difficulties are experienced if moving in reverse flows.

Guidance on applying pedestrian comfort levels in different area types

	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+	Comfortable		Comfortable		Comfortable		Comfortable		Comfortable	
B	Acceptable		Comfortable		Acceptable		Acceptable		Comfortable	
B-	At risk		Acceptable		Acceptable		At risk		Acceptable	
C+	Unacceptable/ uncomfortable		Acceptable		At risk	At risk	Unacceptable/ uncomfortable		Acceptable	
C-	Unacceptable/ uncomfortable		At risk	At risk	Unacceptable/ uncomfortable		Unacceptable/ uncomfortable		At risk	At risk
D	Unacceptable/ uncomfortable		At risk	At risk	Unacceptable/ uncomfortable		Unacceptable/ uncomfortable		Unacceptable/ uncomfortable	At risk
E	Unacceptable/ uncomfortable		Unacceptable/ uncomfortable		Unacceptable/ uncomfortable		Unacceptable/ uncomfortable		Unacceptable/ uncomfortable	

HIGH STREET	OFFICE AND RETAIL	RESIDENTIAL	TOURIST ATTRACTION	TRANSPORT INTERCHANGE
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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Atkins for Transport for London (TfL) 2010, 'Pedestrian Comfort Level Guidance', TfL website, accessed on 14 May 2014: www.tfl.gov.uk/assets/downloads/pedestrian-comfort-guidance-technical-guide.pdf

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