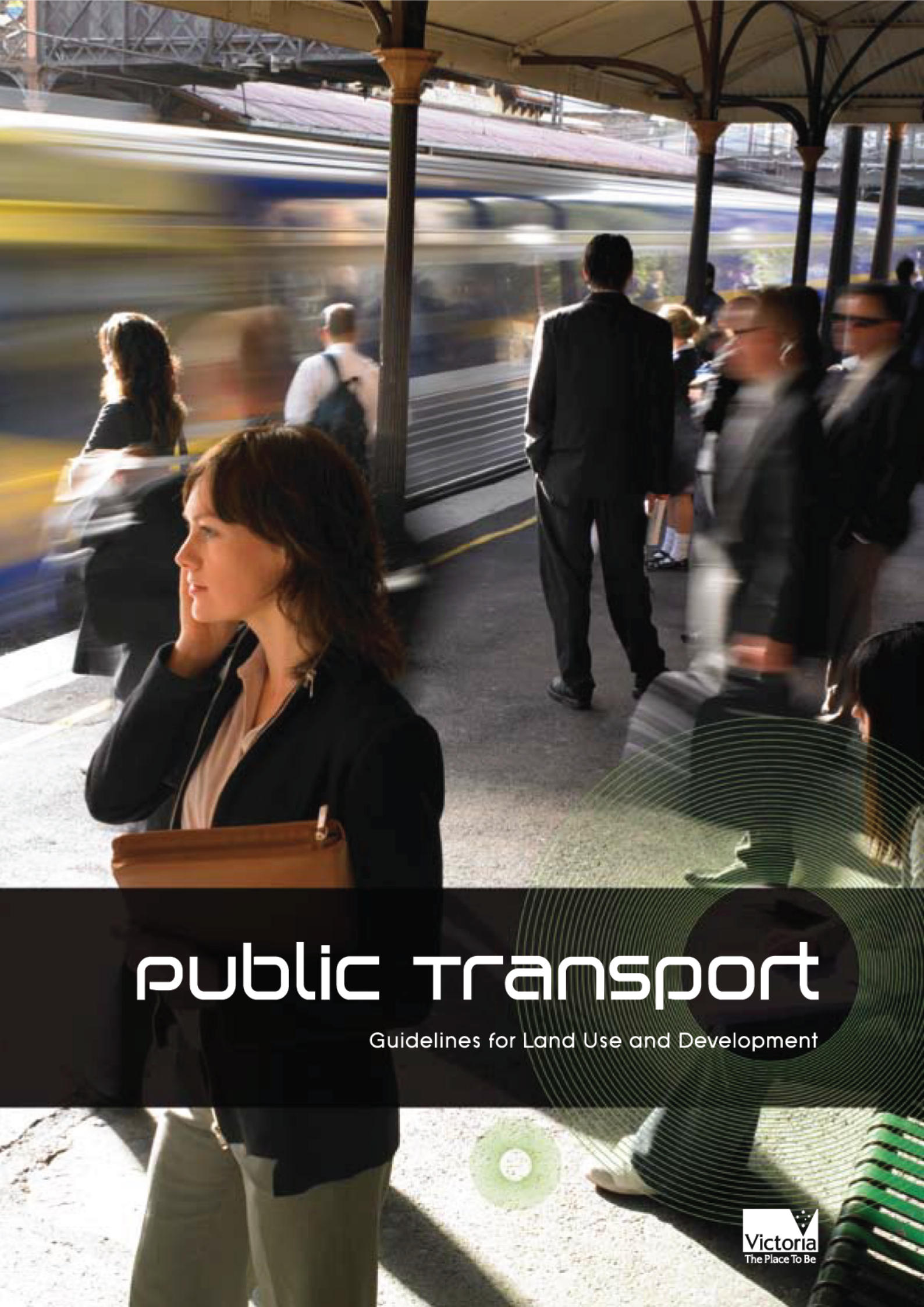

# public transport

## Guidelines for Land Use and Development

Victoria
The Place To Be

# FOREWORD

The Department of Transport (DOT) is the State agency responsible for the management and development of transport infrastructure and services throughout Victoria, including contracting with private sector operators to deliver transport services on behalf of the State.

Integration between land use and transport is critical to achieving successful outcomes, both for the developer and for an efficient and effective transport system. It is particularly important that optimal public transport is designed into developments from the outset to promote sustainable and equitable outcomes. The DOT is keen to work closely with developers and Councils to facilitate developments that meet these objectives.

These Guidelines have been prepared to assist in the integration of land use and public transport planning across Victoria. The Guidelines will be periodically reviewed and, if necessary, developed over time to reflect experience gained in their application. Your comments and contributions are always welcome.

The Guidelines address the transport planning process and design requirements generally. They do not set requirements which would apply in each and every circumstance. While the Guidelines indicate design parameters that facilitate the provision of public transport services, there may be particular planning or policy issues which warrant additional or altered requirements at some sites. These may include topographical constraints, existing infrastructure and the requirements of the State Government's transport and liveability statement, *Meeting Our Transport Challenges*.

The Director of Public Transport will be using these Guidelines as part of the assessment of planning permit applications in his role as a Referral Authority. We trust that the guidelines will assist in designing sustainable urban development and in better integrating landuse and public transport planning.

**Jim Betts**
Secretary
Department of Transport

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Public Transport Division

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# 1.0 INTRODUCTION

## 1.1 Purpose of these Guidelines

The *Public Transport Guidelines for Land Use and Development* aim to assist decision making on statutory and strategic planning proposals for land use developments that affect public transport planning and delivery. It is intended that these Guidelines will assist with site design to facilitate the delivery and use of public transport services. Good design for public transport helps ensure the provision of a sustainable transport network now and for the future.

Efficient public transport has a significant influence on the way our cities and regions grow and develop. Land use patterns which are designed to effectively accommodate public transport have a fundamental effect on how well public transport services can be delivered and utilised.

The Guidelines will also assist in addressing the public transport aspects of:

a) Structure plans and other strategic planning documents
b) Integrated Transport Plans (ITP)
c) Layout of new subdivisions and major developments.

## 1.2 Why public transport guidelines are important

The provision and utilisation of a well designed public transport service network will return a range of significant benefits to the community.

In many situations, public transport can provide a viable and preferable alternative to travel by car. Providing travel choices for car owners is central to achieving more sustainable transport outcomes. The provision of a well-connected and frequent public transport service also increases opportunities for non-car owners to access employment and other activities.

Designing our towns and activity centres to accommodate public transport services, infrastructure and facilities will have additional benefits such as reducing air and noise pollution and road traffic congestion, so as to create more vibrant, walkable town centres.

Road-based public transport services should become more reliable and journey times will be reduced. This will be achieved by implementing a range of measures such as allocating priority for trams and buses on congested roads, improved design of bus routes, improved connections and interchange facilities and targeted investments to increase rail capacity. These outcomes are consistent with the Government's social, economic and environmental objectives as outlined in *Melbourne 2030, A Fairer Victoria,* the *Metropolitan Transport Plan* and *Meeting our Transport Challenges*.

## 1.3 Who are these Guidelines for?

This document is designed to assist local government authorities, developers, operators, agencies and consultants in regard to:

a) The likely requirements of the Director of Public Transport when performing the Referral Authority role, ie. refer to Clause 52.36 (Integrated Public Transport Planning) of the Victoria Planning Provisions (VPP)
b) Clarification of the implications of the State Planning Policy Framework particularly in relation to Clause 12.08 (Better transport links) and Clause 18 (Infrastructure)
c) Technical advice on public transport, eg. in preparing permit applications and development plans.

## 1.4 Delivery of public transport services

In most cases the government, in consultation with stakeholders, determines the location and type of public transport services that operate in Victoria. Route-based public transport within Victoria is delivered by the private sector under contractual arrangements with the state government.

These Guidelines aim to ensure that new developments are designed and implemented in ways that support public transport operations. However, the decision on the level of public transport service provided at a particular site is made as part of the budget processes of government.

## 1.5 Principles for protecting Public Transport

In the past, some aspects of developments have significantly impacted on public transport operations. In responding to proposals, either as a referral authority or as a party who may suffer material detriment, the Director will act to protect public transport operations and infrastructure. Proponents must therefore design proposals so that they adhere to the following principles:

- New level crossings should be avoided. Urban connectivity should be maintained or achieved by grade separations for pedestrians and vehicles. The design of transport routes at new developments must provide for grade separation at level crossings except with the approval of the Minster for Public Transport.
- The proposal must not delay public transport services (except through increased patronage) or otherwise detrimentally impact on public transport operations. New signals should be avoided where possible, as these usually result in delays to public transport, despite signal phasing priority for buses and trams. Proposals which introduce even small detrimental impacts can cumulatively impose significant delays on public transport services.
- Proposals should identify potential impacts and details of how those impacts will be mitigated. Private proposals should not require public investment to redress delays they cause.
- Proponents should try to avoid locating service facilities across public transport corridors, as drains, etc, add to the cost of developing public transport infrastructure. Where service crossings will be unavoidable, VicTrack and / or the Public Transport Division of DOT (PTD) should be contacted.

Proponents are encouraged to consult with PTD at an early stage.

## 1.6 When to contact Public Transport Division (PTD)

Public transport planning should be an integrated part of site planning. Addressing pedestrian and mobility access considerations at the time of initial site planning is crucial to integrated transport and land use planning. This will ensure that public transport is not an add-on but is considered as part of the design process. If public transport is not considered until the end of the design process, this can result in sub-standard solutions for public transport operators, poor outcomes for transport users and reduced access to a development. PTD is responsible for the public transport system and can advise on network plans and design principles. When contacted, PTD will provide up-to-date information of the Government's system-wide and site-specific public transport developments, as well as informal feedback on concepts as they are developed.

Before submitting a planning permit application to the council as responsible authority, please contact the Land Use and Planning Referrals Team, PTD Department of Transport.

## 1.7 Referral Process

The Director of Public Transport is a Referral Authority pursuant to Section 55 of the *Planning and Environment Act 1987*. Details of requirements for referrals can be found in Clause 52.36 (Integrated Public Transport Planning) of the VPP. This means that development proposals which are above the thresholds set out in Clause 52.36 must be referred to the Director for his comment.

A Referral Authority must consider every application being referred and may tell the responsible authority in writing that:

- It does not object to the granting of the permit
- It does not object if the permit is subject to conditions specified by the referral authority
- It objects to the granting of the permit on specified grounds.

If the Director of Public Transport receives an application and considers that insufficient information has been provided to undertake an assessment of the proposal, then further information may be requested of the applicant. If the applicant does not agree to the request for further information, an Application for Review may be lodged at the Victoria Civil and Administrative Tribunal.

The principles, design goals and requirements set out in the Guidelines are used to assess planning permit applications referred to the Director of Public Transport.

Clause 52.36 also sets out circumstances where a referral will not be required, eg. a referral of an application to the Director of Public Transport will not be required where a development is consistent with an adopted structure plan prepared in consultation with, and endorsed by PTD.

A variety of public transport requirements need to be taken into account when undertaking major developments and these are assessed on a case-by-case basis. Prior to preparing and submitting planning permit applications, developers are encouraged to liaise directly with PTD for major development proposals.

## 1.8 Integrated Transport Plan (ITP)

Clause 12.08 in the State Planning Policy Framework of planning schemes provides for better transport links to create a more sustainable transport system. To achieve this, Intergrated Transport Plans (ITP) must be prepared for all new major residential, commercial and industrial developments.

Clause 18.02 Car parking and public transport access to development, provides statewide guidance on integrating public transport with land use and development.

When a responsible authority requires an ITP, ie, to promote sustainable transport outcomes for major developments, this should be submitted with the planning permit application.

The Director of Public Transport has prepared an Advisory Note to set out his view on what should be included in an ITP. The Advisory Note can be found at http://www.transport.vic.gov.au

Further reference should be made to:

- Victoria Planning Provisions, Clause 12 – Metropolitan Development
- Victoria Planning Provisions, Clause 18 – Infrastructure
- Victoria Planning Provisions, Clause 56 – Sustainable Neighbourhoods
- Victoria Planning Provisions, Clause 52.06 – Car Parking
- Melbourne 2030, particularly Policy Direction 8.3.1

# 2.0 Planning and Designing for Public Transport

## 2.1 Public Transport Networks

The public transport network in metropolitan Melbourne is made up of two elements:

1. The Principal Public Transport Network (PPTN) which is the passenger rail network, the tram network and selected metropolitan bus routes (refer to Figure 1)
2. Local networks and services, such as local bus routes, taxis and school bus services which connect to and supplement the PPTN.

Rural and regional public transport services comprise a network of core rail and coach services connecting regional centres and metropolitan Melbourne. Local services include local bus, taxi and school bus services.

Public transport modal interchanges provide for transfers between motorised and non-motorised transport modes, including cycling and walking. These are generally located in Activity Centres.

## 2.2 Principal Public Transport Network

The PPTN will be the focus for the development of a high quality public transport system that connects the Principal, Major and Specialised Activity Centres.

The on-road component of the PPTN includes the tram network and a number of major cross-town and radial bus routes. The off-road component of the PPTN includes all metropolitan passenger rail lines.

The PPTN includes both existing routes and anticipated future routes. By locating major developments on the PPTN, opportunities for integrated development and enhanced public transport outcomes will be maximised.

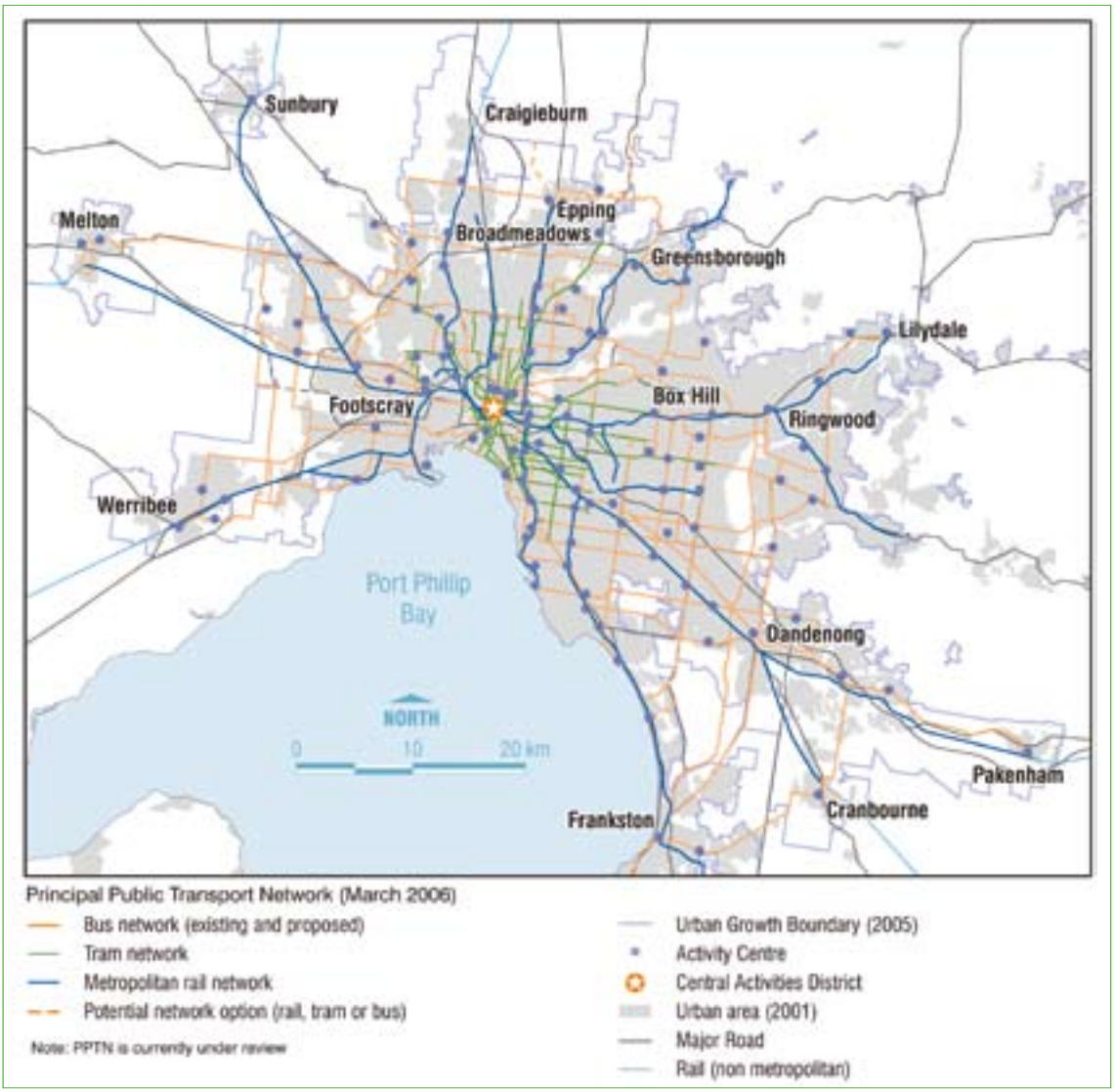



Figure 1: Principal Public Transport Network

Note 1: Proponents should have regard to and rely on the PPTN as shown in planning schemes for planning purposes.

Note 2: The PPTN is currently under review in light of the implications of Meeting our Transport Challenges and Growth Area planning proposals and is subject to occasional updating. This figure indicates transport opportunities.

The PPTN will periodically be reviewed to account for:

- The potential to maximise opportunities for mode shift and patronage growth
- Opportunities to remove impediments which slow services
- Opportunities to enhance land use and transport integration
- Proposals that complement other public transport system upgrade works.

Improvements sought for the PPTN aim to achieve a reduction in travel times and an improvement in service reliability for public transport services. Integrated land use and transport planning for the PPTN should include:

- Land use decisions to enhance access to the PPTN
- Managing road space giving priority to public transport in congested areas to improve the speed and reliability of tram and bus services
- Facilitating public transport services through interchanges
- Improving the convenience and safety for pedestrians accessing the PPTN
- Upgrading amenity at nodes and transfer points of the PPTN (as illustrated in Figure 2).

The list of existing, proposed and possible PPTN routes may vary from time to time. Local government should also provide input to the planning of future transport routes, particularly those that support the PPTN. Contact PTD to obtain information on current and potential PPTN routes. These routes should be considered when planning developments.

**Figure 2: Box Hill Transport Interchange**

### 2.2.1 Local Network Buses

While the PPTN plays a key role in longer-distance travel, in many cases, access relies on the local public transport network. Most local routes are provided by buses.

Local network bus services access local neighbourhoods, Neighbourhood Activity Centres, Activity Centres and Railway Stations, where interchange to services on the PPTN can take place. The expectation for Neighbourhood Activity Centres is that they will all be connected to the regional Major Activity Centres (MAC) and/or Principal Activity Centres (PAC) by local public transport services. However, in some cases this role may be also performed by PPTN services.

The ability to provide both direct local services and comprehensive service coverage for a local area will also be based on functionality of urban form, road layout and the level of recurrent budget support.

Improvements to local network services are being made, in addition to premium cross-town services and additional routes and local feeder services. Specific improvements include demand-responsive services, the SmartBus program and vehicle design enhancements.

### 2.2.2 Regional and Rural Services

The major regional centres close to metropolitan Melbourne (Geelong, Ballarat, Bendigo and the towns of the Latrobe Valley) are experiencing accelerated development. Initiatives for these “networked cites” include investigation of transport corridors and service improvements.

## 2.3 Network Principles: Public Transport and Land Use

Targets for planning and designing new public transport routes include the following:

- Ninety-five percent (95%) of residential land uses in established and urban growth areas to be designed to allow access to public transport services within 400 metres safe walking distance (refer to Figure 3)
- To improve accessibility for the disabled and elderly, it would be desirable that aged-care facilities, educational, medical and community facilities be located within 200 metres of an existing or planned bus stop, train or light rail station or tram stop. Site factors such as steep grades may reduce this distance. In cases where public transport facilities need to be accessed by patrons with limited mobility, appropriate facilities should be located on the route
- As a guideline, bus and tram stops should be located every 300 metres and reflect the location of key attractors
- Every home within urban areas should have direct access to a Principal or Major Activity Centre by public transport, ideally with a maximum travel time of 30 minutes without changing vehicles
- All Principal and Major Activity Centres should be located on the PPTN.


Figure 3: Land use network principles (image courtesy of DPCD)

## 2.4 Activity Centre Planning and Public Transport

Activity centres operate as key nodes in the public transport system. The *Activity Centre Design Guidelines* (DSE) note that:

"If activity centres are to fulfil the promise of increased sustainability, they need to attract more public transport users. Many activity centres function as critical nodes in the public transport system already. However, if public transport use is to be increased, it must become a central feature of every activity centre and offer a more convenient alternative to car-based travel. Improving the connection between different routes and modes of public transport in well-located interchanges that are integrated with the street and building fabric of the activity centre is an important component in encouraging increased use."

### 2.4.1 Activity Centres

Planning for activity centres should improve movements of public transport vehicles, provide for convenient, safe and user friendly interchanges and ensure an appropriate level of integration with the surrounding streetscape, street network and built form.

Objectives for integrated planning of public transport and activity centres include:

- Encouraging public transport use by providing convenient, prominent and active environs around railway stations and interchanges (refer to Figure 4)
- Providing high quality amenity for passengers (including lighting, seating and shelter)
- Providing safe, attractive and direct pedestrian and cycle access to railway stations, interchanges and transit stops
- Minimising the potential dividing effect and urban form impacts of railway corridors
- Supporting the reduction in the need for car parking where appropriate.

**Figure 4: Subiaco Railway Station - WA**

### 2.4.2 Activity Centre Structure Plans

The involvement of PTD in the creation of structure plans is a crucial part of activity centre planning. PTD is keen to support local government to identify strategic directions and proposals for activity centres, which will support the use, operation and delivery of public transport services.

Structure plans prepared for activity centres should reflect the following principles:

- Incorporate higher density mixed use development near public transport nodes which in turn will support increased public transport services, extended hours of operation and higher frequency levels
- Surround railway stations, transit stops and interchanges with active, ground-level uses
- Integrate transit stops and interchanges into the design and layout of the activity centre, and locate them centrally
- Prioritise pedestrian access in the activity centre and to the public transport modal interchange whilst also facilitating easy movement of public transport vehicles
- Recognise that the public transport interchange is a 'gateway' to the activity centre
- Design for minimal access by private motor vehicles into the modal interchange, to reduce competition for road space, remove conflict between buses, cars, pedestrians and cyclists and maintain reliability of public transport services
- Provide direct access for public transport vehicles to minimise travel times
- Give priority to public transport movements, especially on the PPTN
- Provide "kiss and ride" and taxi facilities around transport interchanges.

For more information regarding structure plans and activity centres, please refer to *Activity Centre Design Guidelines* (DSE). Reference should also be made to the Planning Practice Note – *Structure Planning in Activity Centres*.

### 2.4.3 Growth Areas Precinct Structure Plans

The DSE *Precinct Structure Planning Guidelines for creating new communities in Melbourne's Growth Areas* set out the objectives for designing new neighbourhoods. The planning principles must be met:

> Objective 3: To provide sustainable transport networks: "Early planning of public transport services, including local bus services is critical and should be a key element that defines the structure of new neighbourhoods".

For more information regarding growth areas precinct structure planning, please refer to *Growth Area Framework Plans* and *Precinct Structure Planning Guidelines* (DSE) at *http://www.gaa.vic.gov.au.*

### 2.4.4 PTD Structure Planning Process

Early involvement of PTD in the structure planning process is highly desirable. PTD can assist the preparation of structure plans in a number of capacities including:

- Providing advice and feedback on proposals to increase access to and use of public transport services
- Providing advice on improvements to public transport services and facilities including longer term network improvements and operational requirements
- Providing advice on Government's priorities for the future planning and delivery of public transport services and facilities
- Assisting in consultations with public transport service providers.

A coordinated approach to the implementation of structure plans is critical in integrating land use planning with transport planning. Structure plans should clearly identify responsibility for delivery, proposed timing and sequencing of actions.

Referral of a permit application (under Clause 52.36 of the VPPs) is not required if the development is consistent with an adopted structure plan that has been prepared in consultation with and endorsed by the PTD.

## 2.5 Subdivision Development and Public Transport

Subdivisions must identify and make provision for public transport routes and pedestrian and cycle access to public transport services. Public transport will need to be a core consideration in subdivision design.

Planning to provide access by public transport should be integrated with the preparation of development plans and planning permit applications. These Guidelines provide technical design guidance for the provision of public transport access and infrastructure. New urban developments should be contiguous, allowing sequential public transport route development.

## 2.6 Relationship between Transport Routes and the Surrounding Area (Pedestrians, Cyclists and Park and Ride)

### 2.6.1 Pedestrians

Public transport networks and services should be considered in the context of their surrounding areas, including how pedestrians will access the services. This means that pedestrian design objectives such as Disability Discrimination Act (DDA) accessibility, safety, amenity and urban design considerations are important when planning for public transport.

High standard facilities for walking will support an increase in public transport patronage. Paths should be legible, smooth, uncluttered, well lit, overlooked by active land uses, have places to rest and include safe crossing points. Key design principles include:

- Paths should be separated from traffic, direct and of sufficient width (particularly if the path is shared by pedestrians and cyclists)
- Provide landscaping and street furniture for shade, comfort and street enclosure
- Pedestrian crossings should be conspicuous and clearly indicate where pedestrians can cross eg. include zebra crossings, use of colour or raised pavement to delineate pedestrian priority spaces (refer to Figure 5)
- Main pedestrian routes and public transport stops should be well lit, have good visibility and be DDA compliant (refer to Figure 6)


Figure 5: Pedestrian crossing should be conspicuous

Figure 6: Cleary defined pedestrian route

- Car parking spaces for the mobility impaired should be very close to interchange entrances
- Maps and way-finding signage should set out key destinations, including public transport stops (refer to Metlink: *http://www.metlinkmelbourne.com.au/*)
- Public transport, walking and cycling routes should connect to the heart of an area and be as close as possible to meeting areas and public spaces
- Pedestrian and cyclist access to public transport should be convenient and direct. Similarly, access between bus, rail and tram should be direct.

### 2.6.2 Pedestrian Crossings

In new railway and light rail stations, pedestrians should have separate, safe routes to the platform. Paths should be planned along pedestrian desire lines and not require pedestrians to walk along car park aisles or driveways.

The following design principles apply to the design and designation of a pedestrian crossing within or to an interchange facility:

- Crossings which require pedestrians to turn their heads at a greater than 45° angle to view oncoming buses and trams are unacceptable (refer to Figure 7)
- In many situations, a 'zebra' type crossing provides sufficient control and protection for pedestrians
- Signal controlled crossings are necessary where high pedestrian flows exist
- Standard crossing width is 2.4 metres
- Crossing length should not exceed 10 metres, unless refuge islands are incorporated.

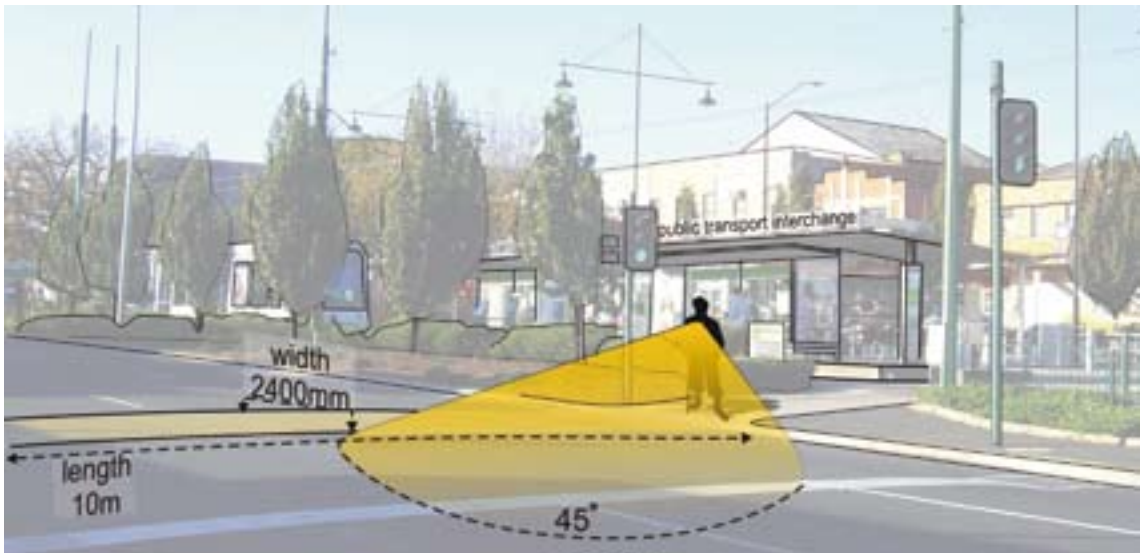



Figure 7: Design principles for a public transport stop.

The *VicRoads Traffic Engineering Manual Chapter 4* also deals with pedestrian facilities and identifies the 'warrants' needed to justify the installation of different categories of crossings. Also refer to *Austroads Part 13 for Pedestrian Standards.*

### 2.6.3 Cyclists

Cyclists need to ride safely and easily to and from public transport facilities and along roads used by buses. Bicycle facilities should be considered in all proposals, including changes to streetscapes. Key design principles include:

- Providing a mix of safe bicycle parking and encouraging provision of end of trip facilities in developments and public transport facilities such as railway stations and modal interchanges (eg. long term secure storage should be considered at interchanges – Figure 8 refers)
- Signposting key destinations on off-road bicycle paths including distance markers, to provide reassurance and certainty to users
- Installing bicycle head start boxes at traffic signals (refer to Figure 9)
- Providing dedicated bicycle lanes/paths to stations and transit stops
- Ensuring all bike networks connect to activity centres, public transport stops and interchanges. Refer to *Austroads Part 14: Cyclists and the VicRoads Cycle Notes Series* in developing appropriate cycle infrastructure.

DOT is providing bicycle lockers and cages at railway stations across the metropolitan area. New or refurbished interchanges must ensure adequate space is designed into the layout of the interchange to accommodate bicycle lockers and cages.

**Figure 8: Individual lockers – Watergardens Railway Station – Melbourne**

**Figure 9: Bicyle head start boxes**

### 2.6.4 DOT Walking and Cycling Branch

A Walking and Cycling Branch has been established in DOT, recognising not only the importance of walking and cycling as travel modes but also of the potential to grow substantially as the community seeks more sustainable forms of transport.

The Waking and Cycling Branch overseas the successful TravelSmart travel behaviour change program and the Local Area Access Program, which supports local government in developing a range of demonstration projects that will improve local access through walking and cycling.

The Branch works closely with a range of stakeholders, including PTD, VicRoads, other state government departments and agencies, councils, cycling and walking organisations (including Bicyle Victoria, Kinect Australia and the Cycling Promotion Fund.) This ensures that walking, cycling and local access issues are strategically managed and that appropriate policy and programs are developed and delivered for the Principal Bicycle Network (PBN) and the Municipal Bicycle Network (MBN).

For more specific advice contact the Walking and Cycling Branch, DOT at *walkingandcycling@doi.vic.gov.au*

### 2.6.5 "Park and Ride" Facilities

"Park and Ride" facilities enable passengers to use private vehicles to access public transport facilities and therefore divert long car trips onto public transport. They also enable an expansion of the catchment for the public transport network.

Strong growth in public transport usage is reflected in the increasing demand for parking spaces at railway stations. There is pressure to increase the size of "Park and Ride" facilities. *Meeting Our Transport Challenges* (MOTC) recognises this demand and includes a substantial program to increase the number of park and ride spaces. The program is being developed and delivered by PTD.

Planning for "Park and Ride" facilites should reflect the following:

- Careful design is required and should include generously proportioned accessways and landscaping
- Very large park and ride facilities may be more appropriately located at railway stations on the periphery of the key activity centres, rather than at the activity centres themselves.
- Private vehicles should not obstruct access to the station interchange for buses, pedestrians and cyclists
- Private vehicles should not, but may attempt to use bus interchanges for passenger drop-off / pick-up
- Commuter car parking facilities should be near to station entrances and should not compromise pedestrian or bicycle access.
- Security and safety are prime concerns at commuter car parks
- A "Park and Ride" should include a "kiss and ride" area at all key activity centres
- The size of each "Park and Ride" facility will depend on local demand
- Excessive car parking at railway stations in the key activity centres may compromise the successful functioning of centres, lessen the focus on the station as a key element of the activity centre and be unattractive

(refer to Figures 10 and 11).

## 2.7 Disability Discrimination Act (DDA) Compliance

Works undertaken on the public transport network are required to comply with the Commonwealth Disability Discrimination Act 1992, and particularly the technical requirements of the *Disability Standards for Accessible Public Transport 2002 (DSAPT).*

Developers should carefully check their responsibilities and liabilities under the Act at the earliest stage when contemplating a project. If a private development will affect public infrastructure, it may trigger a requirement for the developer to make the infrastructure fully compliant with the Act and the DSAPT.

All new public transport services and facilities coming into operation after 2002 had to comply in full with the DSAPT. All existing works and services had to be retrofitted or replaced to comply with the milestones of 25% compliance by 2007, 55% by 2012, 90% by 2017 and full compliance by 2022. Trains and trams (vehicles) must comply in full by 2032.

The DSAPT applies to all conveyances, premises and infrastructure. There are requirements for circulation, ramp grading, handrails, tactile ground surface indicators, toilets, furniture, information, signs, lighting, etc. Vehicles include trains, trams, route buses, scheduled coaches, taxis, ferries and aircraft. Premises and infrastructure include train stations, pedestrian rail level crossings, tram and bus stops and taxi ranks, jetties and other customer service points. School bus services are exempt from the requirements of the DSAPT and local arrangements are often made for people with disabilities under the DDA.

When implementing works, accessibility for passengers with all types of disabilities is a necessity. This includes the requirement for all ramps other than kerb or step ramps to be of grade 1:14 or less and for shelter and boarding points to be equally accessible to patrons of all abilities. For kerb or step ramps the maximum grade is 1:8 (refer to Figure 12).

**Figure 10: Out-of-Centre Park and Ride - Doncaster**

**Figure 11: Park and Ride - Werribee Railway Station**

Upgrading tram stops is complex, involving many stakeholders including VicRoads, tram service providers, local government, property owners and the general community. Platform stops are the preferred DDA compliance solution providing faster and safer loading for all passengers.

Achieving seamless access to train, tram and bus services may require integration of local government and private sector infrastructure.

For more specific advice refer to the DDA *Requirements for Bus Stop Compliance, Requirements for Tram Stop Compliance* or contact the Accessibility Unit PTD.

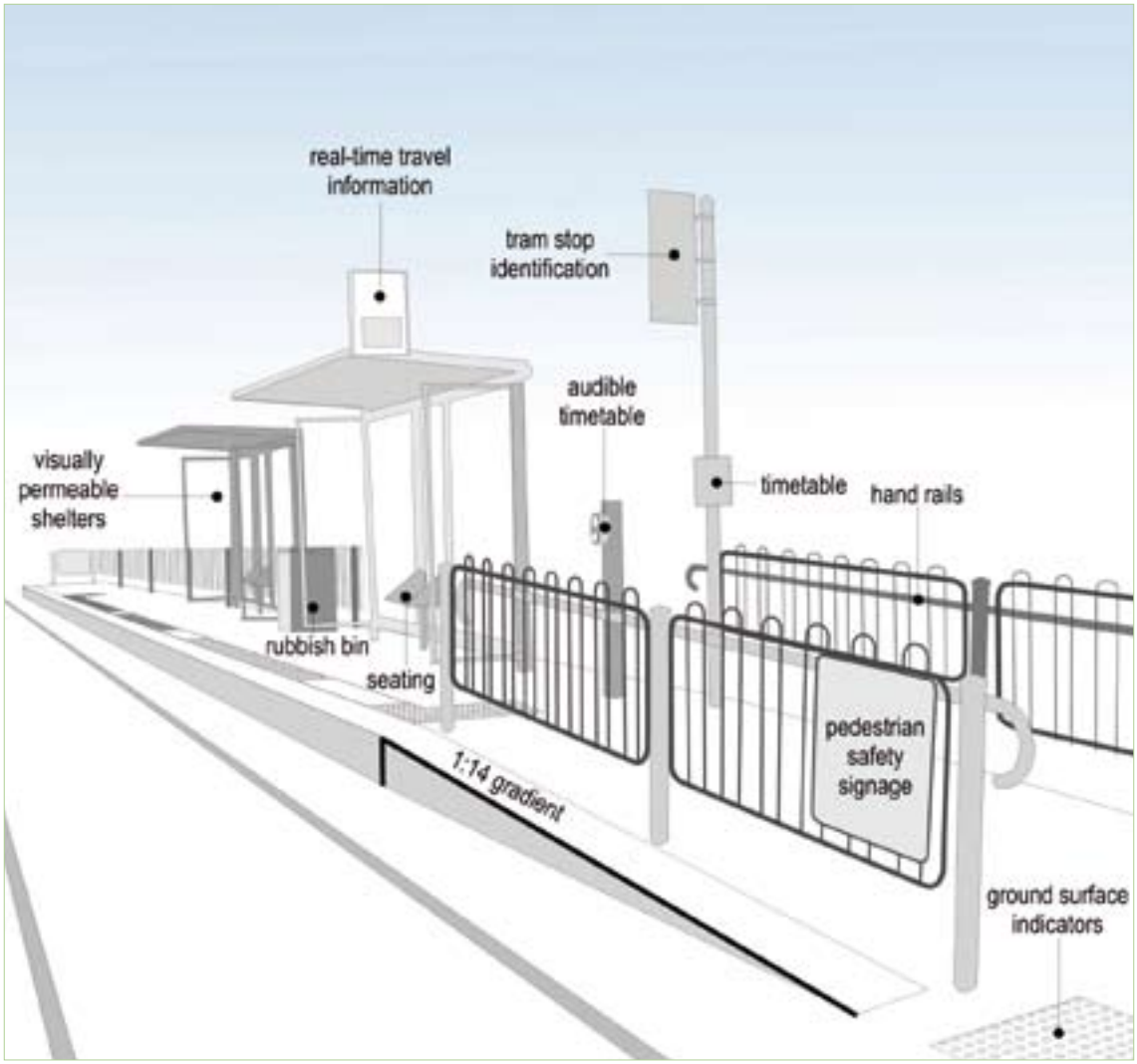



**Figure 12: DDA compliant tram stop**

# 3.0 BUSES

## 3.1 Introduction

Bus operations and requirements must be carefully considered.

Local bus networks seem relatively flexible, however in practice, it is often difficult to alter a bus route once introduced, given community expectations, established travel patterns and the cost of stops and signs. Therefore, it is important to ensure that the bus route and network planning are correct from the outset. It is important to ensure that routes are connected and users can transfer easily between services to access a wide range of activities.

Developers should liaise with PTD to discuss current and potential future bus networks, operational arrangements and how they integrate with proposed developments. Consultation with bus operators can also provide local information on routes and operations.

New developments will need to reflect the following, so as to accommodate new or revised bus routes and their supporting infrastructure:

- *Road Rules – Victoria*
- PTD advice and requirements regarding existing, proposed and potential bus routes, as well as bus infrastructure, stops, priority and bus layover areas
- VicRoads' *Bus Stop Guidelines* and *Bus Priority Guidelines,* VicRoads*' Traffic Engineering Manual, Volume 1* and VicRoads*' Designing Local Roads for Ultra Low Floor Buses Bulletin*.
- Design that minimises delays, so that bus services can achieve contracted operational performance targets

For VicRoads' documents, refer to the VicRoads website: *http://www.vicroads.vic.gov.au/rbptguidelines*

## 3.2 Service Performance Requirements

### 3.2.1 Bus Catchments

Land use developments should propose public transport routes in locations which will optimise population catchments and service viability. Some principles for efficient operation and maximising the demand for services include:

- Neighbourhoods should be designed for bus routes on strategically located connector roads so that dwellings will be within 400 metres of a bus route. For example, if arterial roads are spaced 1600 metres apart, a bus route along a 'central' strategic connector would place virtually all persons within 400 metres of a bus route (either on the connector or arterial roads). Layout of optimal bus catchments is illustrated in Figure 13.
- Design should allow for direct routes and easy access between key destinations
- Higher density development should be located along public transport routes
- Bus stops should be provided in convenient locations
- Direct and safe pedestrian access should be provided to bus stops
- Provide public transport and pedestrian access at and within key destinations such as modal interchanges and activity centres that is suitable for high volume and high frequency passenger movements. (refer to Figure 14).

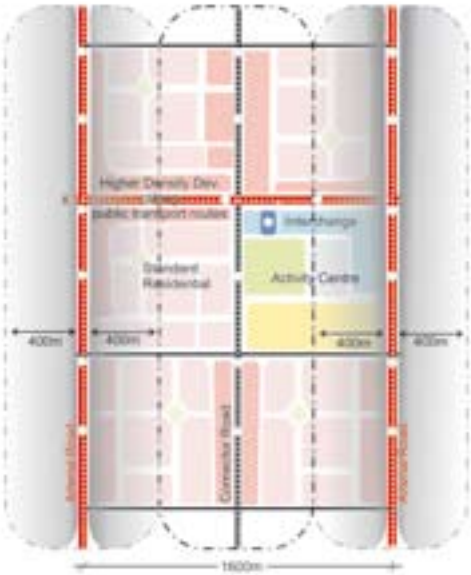



**Figure 13: Optimal bus catchments**

Figure 14: Bondi Junction - Bus and Train Interchange

### 3.2.2 New Subdivisions

Bus route planning for new and/or extended bus services will require sub-regional or development area planning. PTD will assist local government and developers to incorporate wider bus networks and service strategies into their proposals.

Specific elements to consider when planning new land use development for all uses include:

- Patronage-generating uses should be located on both sides of the bus route, ie, avoid 'dead areas' within or between subdivisions where no demand generating land uses abut the route
- Provide direct road connections designed to accommodate buses, as outlined in these Guidelines and in Clause 56 of the VPP (Sustainable Neighbourhoods) (refer to Figure 15).
- Developments incorporating community facilities (e.g. schools, active recreation grounds and tourist facilities) that will or may require bus and coach access should be located to take advantage of existing public transport services or so that aggregate demand for public transport is optimised.
- New infrastructure investment should aim to enhance existing operations and safety
- Stage development in sequence, to allow efficient deployment of bus services.
- Stage the extension of public transport services and provide interim service arrangements until the services can be extended
- Consider the effect of the new development on services moving through or past the development
- The provision of through routes helps to ensure the efficiency and attractiveness of bus services
- Stop infrastructure should only be installed immediately prior to route commencement and should be fully DDA compliant.
- Where it is deemed that a bus route should not pass through a subdivision, the developer should ensure appropriate pedestrian linkages are provided to access existing routes.

Please refer to Section 2.3: Network Principles for more information.

Figure 15: Roads designed to accommodate buses
Cairnlea Estate - Melbourne

## 3.3 Design Principles (Buses)

### 3.3.1 Local Road Design

In new developments, the following road design specifications are required for bus operations (refer to Table 1). For further information refer to VicRoads' *Designing Local Roads for Ultra Low Floor Buses Bulletin.*

| Characteristic | Specification |
|---|---|
| Limit of acceptable grade | 6% |
| Maximum grade (in limited circumstances where acceptable alternatives are not possible) | 9% |
| Minimum distance between legs of staggered 'T' intersection | 40m |
| Pavement design | Heavy vehicle frequency, including buses, will dictate required pavement strength. |
| Pavement appearance – traffic and or parking | Areas for traffic and indented parking need to be clearly distinguished. Areas intended for parking should have marked bays. |

**Table 1:** Road Design Specifications for Bus Operations

The trafficked road width of any carriageway, including one way roads, needs to be sufficient for two buses to pass at normal speed. This width excludes any bicycle lanes, parking lanes/spaces and manoeuvring space for parking vehicles and any traffic islands. See below for more details.

On road sections, other than through roundabouts, undivided connector roads to be used by buses must have:

- For two lane, two way roads a clear trafficable road width of 7.0 metres, with separate designated space for cyclists and/or parking. If parking is intended, then a separate parking lane or indented spaces, or a shared parking and bicycle lane should be provided. Note that the cycling and parking spaces are in addition to the 7.0 metre trafficable road width required for bus operations, as shown by the Undivided Connector Road - A in Figure 16.
- Alternatively, in situations where the above is not feasible, traffic lanes for shared motor traffic and bicycle use of 4.2 metres (minimum) should be provided. If this arrangement is provided on both sides, a trafficked road width of 8.4 metres is required, plus any space required for parking, as shown by the Undivided Connector Road - B in Figure 16. Any parking must be provided in a parking lane of 2.3 metres (minimum).

Connector streets with a central median, if to be used by buses, must have a road carriageway width of:

- At least 5.0 metres in each direction, when a shared bicycle and traffic lane is provided
- 5.2 metres when a dedicated bicycle lane and a separate traffic lane are provided (refer to Figure 17).

In conjunction with the above carriageway dimensions, the overall clear zone must be 7.0 metres. The median surface within the clear zone must be trafficable by low floor buses in all weather conditions and the kerbing must be mountable or semi-mountable in accordance with road authority guidelines. This is illustrated in the two panels of Figure 17.

The specified width of the clear (and trafficable) zone is to ensure that a clear path is available for through buses if a vehicle stops, stands or breaks down within the one way road section. Boulevard treatments are typically urban design features, used to create an entry to a development and are usually short in length. No lanes, other than a bicycle lane, should be included within the 7.0 metres width. Parking facilities must be in addition to the 7.0 metres width.

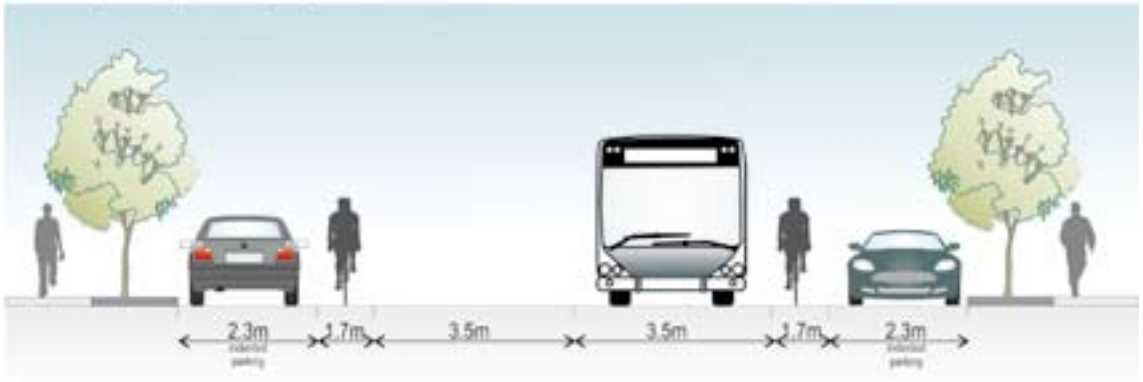
In all cases, road design and any traffic management features must be able to accommodate the turning templates for the standard 12.5 metre ultra low floor bus. The 12.5 metre ultra low floor bus is the standard for DDA compliant bus routes in Victoria.

Design for 19 metre articulated buses is required on existing, proposed or possible articulated bus routes, including access routes to activity centres which may in the future be served by articulated buses (PTD and operators should be consulted). For roundabouts, motor traffic lanes into, through and for departure, need to be at least 4.0 metres wide. The taper to this increased lane width must achieve the 4.0 metres minimum lane width by the tangent point where the kerbing curves for the outside of the roundabout and be otherwise designed in accordance with Austroads Guidelines.

Where bus movements will involve turns, to ensure pedestrian safety, sufficient road pavement must be provided within intersections to accommodate the swept path of the bus without the front or the rear overhang of a bus sweeping over any pre-existing splitter island or kerb

Undivided Connector Road - A

*road with separate bicycle and parking lanes*




Undivided Connector Road - B

*road with separate parking lane (where reservation width is insufficient for cross-section A)*

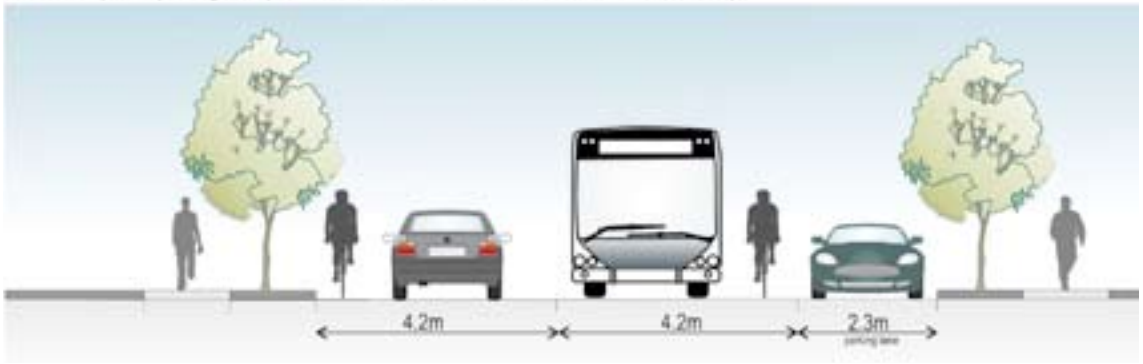
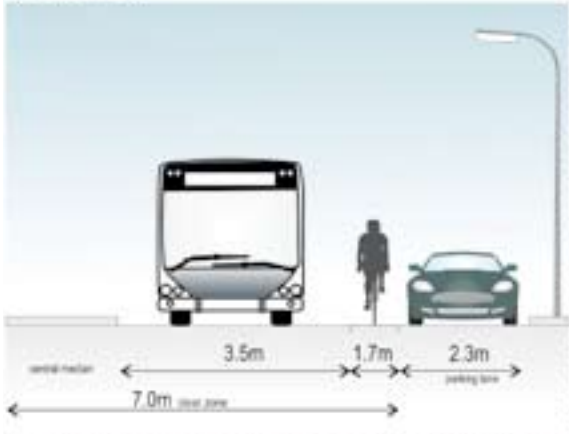



Figure 16: Typical local road cross-sections for bus routes (undivided road)

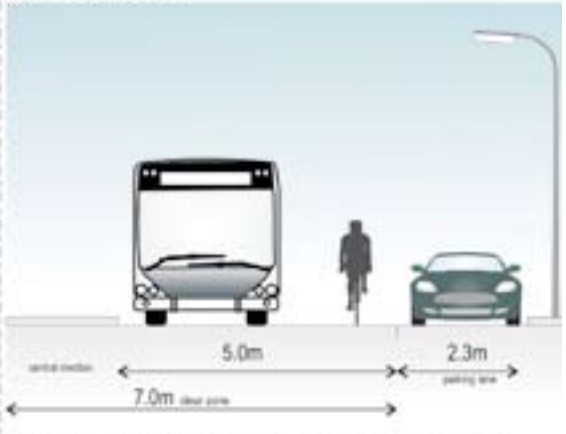
Divided Road - A

*cycle lane marked*




Divided Road - B

*no cycle lane marked*




**Note:** Median surface within clear zone is to be trafficable by low floor buses in all weather conditions. If kerbing is required, it must be mountable or semi-mountable in accordance with road authority guidelines.

Figure 17: Typical local road cross-sections for bus routes (divided road/boulevard treatment)

not to scale

– particularly if the rear overhang sweeps over a surface that could be used by pedestrians.

On roads that may occasionally be used by buses, to accommodate infrequent left-turns by ultra low floor buses, the surface of splitter islands is to be less than 0.1 metre above the road surface. Splitter islands should also be clear of obstructions, except that a 'roundabout' sign may be located off centre in the side of the island adjacent to approaching traffic and positioned 0.5 metre behind the back of kerb of the outer edge of the roundabout.

These islands and the clear zone for other potential obstructions (seats, shelters, signs, etc.) must be in accordance with VicRoads' *Designing Local Roads for Ultra Low Floor Buses* Bulletin.

### 3.3.2 Local Area Traffic Management

Connector roads with 60 km/h or less speed zones are the preferred local road class for buses and are not usually built with or retrofitted with Local Area Traffic Management (LATM) devices. Where LATM devices are being considered on existing and future bus routes, impacts on bus travel times, the safety and comfort of passengers, and driver fatigue should be considered. Drivers need to negotiate the devices, with little room for error, many times each day along the length of each route.

Some common major and minor traffic control items have a serious impact on bus operations and should be avoided, including:

- Speed humps or raised platforms
- Mountable or semi-mountable roundabouts
- One-way road narrowing/slow points and 'weave points'.

In new developments, the street network should be designed with a focus on traffic calming to achieve desired speed limitations, rather than relying on LATM devices

### 3.3.3 Road Humps and Speed Cushions

Designers should have regard to the following matters.

- No new road humps (and raised platforms) should be constructed on roads which form part of a regular bus route
- Speed cushions, which are intended to allow large vehicles (including buses) to straddle them, while requiring smaller vehicles to slow down, should only be installed on smaller access ways (e.g. loop roads around a neighbourhood centre). The use of speed cushions also requires consideration of cycling and parking arrangements (refer to Figure 18).
- Speed cushion installations on bus routes must be designed to ensure that buses can straddle the cushions without experiencing any bump and without requiring a bus to travel too close to the kerb or road centreline. Generally, the outer cushion base must start no closer than 0.8 metre to the face of the kerb and not require the bus to deviate significantly from its path to straddle the cushion. Note that on roads with marked bike lanes, cushion placement will need to be designed to allow for cyclists, slow cars down and provide a smooth passage for buses. Speed cushions must be provided in accordance with VicRoads' *Traffic Engineering Manual Volume 1* and Austroads' *Guide to Traffic Management, Part 8 – Local Area Traffic Management*
- Street lighting must be provided at speed cushions for night time visibility.

**Figure 18: Speed cushions suitable for bus routes**

### 3.3.4 Roundabouts

Roundabouts are not favoured on bus routes as they introduce delays (ie. buses are subject to the same "give way" rules as other vehicles).

If roundabouts are required, they must be designed and located in accordance with Austroads' *Road-Based Public Transport and High Occupancy Vehicles,* Austroads' *Guide to Traffic Engineering Practice, Part 5* and VicRoads' *Designing Local Roads for Ultra Low Floor Buses* Bulletin.

### 3.3.5 Slow Points

Two-lane parallel and angled slow points are the only appropriate forms of slow points for roads used by buses. A minimum lane width of 7.0 metres should be provided (excluding bicycle and parking lanes) at a parallel slow point. Greater width is required for angled slow points, with each case being different. Examples are shown in Austroads' *Guide to Traffic Management, Part 8 – Local Area Traffic Management* and *VicRoads' Traffic Engineering Manual Volume 1*.

One-lane, two-way slow points (parallel or angled) are not to be used on bus routes because of safety concerns and delays to services. Offset and double offset slow points, based on the "one lane" principle, are also inappropriate. (refer to Figure 19).

Parking restrictions may be required near slow points to accommodate the swept path of buses. Slow points should be coordinated with bus stops to minimise delays and adequate street lighting should be provided for night time visibility.

**Figure 19: One-lane, two-way slow points are not acceptable**

### 3.3.6 Splitter Islands (at locations other than at intersections and roundabouts)

Lane widths and islands should be in accordance with Austroads' *Road-Based Public Transport and High Occupancy Vehicles.*

Landscaping and beautification of the islands should not reduce sight distances.

It is not acceptable to require buses to cross a mountable splitter island (because of the discomfort for passengers and drivers).

At sites where buses can be expected to turn (e.g. at significant attractors or destinations) the swept path of buses must be considered and a path provided on the road surface, clear of any splitter island or kerbing. At other sites where buses may occasionally turn, it may be acceptable to provide for the front or rear overhang of the bus to sweep over kerbing and splitter islands where these surfaces are designed to be less than 0.1 meter above the road surface (to accommodate ultra low floor buses).

Adequate street lighting should be provided for night time visibility.

### 3.3.7 'T' Intersection Deviation

Bus routes should be designed to ensure buses do not make right-turns into major roads unless at a signalised intersection.

Design shall be in accordance with VicRoads' *Traffic Engineering Manual Volume 1, Chapter 8.*

Lane widths shall be in accordance with Austroads' *Road-Based Public Transport and High Occupancy Vehicles.*

Bus turning templates should be used to assess the design. The overhang must be clear of the kerb. The template is required to assess all turns and bus vehicle movements.

Adequate street lighting should be provided for night time visibility.

### 3.3.8 On-Road Bus Stop Design (and DDA Compliance)

Bus stops must comply with the Commonwealth *Disability Discrimination Act 1992* and the *Disability Standards for Accessible Public Transport (DSAPT) 2002*. The design of all bus stops should be in accordance with VicRoads' *Bus Stop Guidelines* and the *DOI Requirements for Bus Stop Compliance*.

**Figure 20: On road stop design - Wattle Park Primary School**

### 3.3.9 Bus Stop Identification

Bus stops should be clearly identified and provide timetable and route information in accord with PTD and Metlink requirements (refer to Figures 20 and 21).

The bus stop post and flag must be clear of the clutter of other street furniture, and point away from the road.

The post and flag should be in front of other obstacles, and be reflective.

**Figure 21: Bus stop identification**

### 3.3.10 Tactile Ground Surface Indicators

The layout and specification of Tactile Ground Surface Indicators (TGSI) must be in accordance with the *DDA DSAPT 2002 Part 18 – Tactile Ground Surface Indicators* and should meet *Australian Standard AS1428 Design for Access and Mobility Part 4 (1992), Tactile Indicators*. Typical layouts are shown in VicRoads' *Bus Stop Guidelines* (refer to Figure 22).

**Figure 22: Tactile ground surface indicator**

### 3.3.11 Bus Passenger Shelter

Passenger shelters should be provided at all stops that are expected to be frequently used (eg. at activity centres, interchanges, community facilities, etc).

Bus shelters should be positioned so that the sight distance requirements for road users are not significantly impacted and orientated to provide weather protection. This is illustrated in Figure 23.

Stops without shelters should have sufficient space for a shelter to be provided, at a future time, in accordance with these Guidelines.

Bus shelters should be located outside the roadside "Clear Zone" (as defined in VicRoads' *Road Design Guidelines*). However, if this is not possible, shelters should be constructed of materials that minimise potential injury if hit by an errant vehicle.

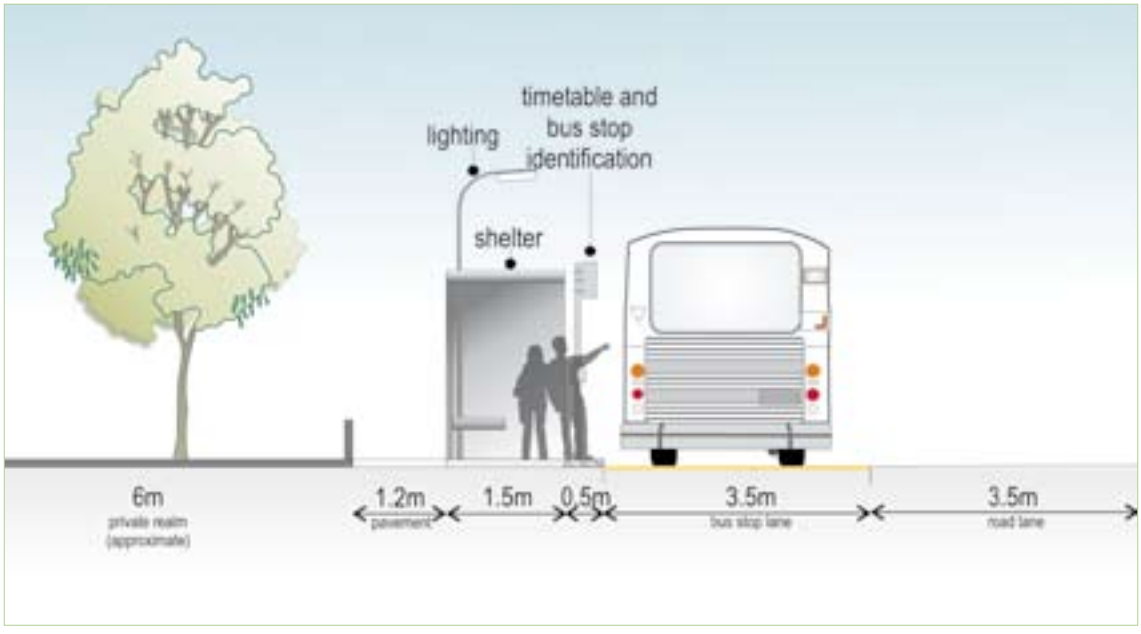



**Figure 23: Bus passenger shelter requirements**

Installation of a bus shelter at an existing bus stop will trigger the obligation to upgrade the existing bus stop to full DDA compliance, including all circulation, grading, paving, TGSI and other requirements.

Minimum requirements are specified in VicRoads' *Bus Stop Guidelines*.

### 3.3.12 Other Design Considerations

Bus shelters should be located such that passengers are visible to the bus driver and buses are visible to waiting passengers. Lighting should be provided (if streetlights are inadequate) and positioned so as to illuminate waiting passengers in poor light. (eg. the morning peak period in winter commences before sunrise).

Shelter size is dependent on the travel demand at the location (refer to Figure 24).

Shelters should not obstruct the view of motorists leaving driveways and side streets. When planning new subdivisions, the provision of shelters for bus-stops should be a priority over the location of a new driveway.

A 1.2 metre continuous accessible path should be provided behind the bus shelter so as to meet DDA requirements. When this is not achievable, an open-ended bus shelter without seats should be provided. If an off-road shared path is provided along the corridor, this path should be maintained at a minimum of 2.5 metres behind the bus shelter. Shelters should not be located in a way which would compromise DDA compliant circulation.

**Figure 24: Weather protection from prevailing weather**

### 3.3.13 Other street furniture

Other street furniture should be located such that the boarding and alighting clear areas are maintained and the 1.2 metres continuous accessible path connects to the pedestrian network (refer to Figure 25). All street furniture should be set back from the kerb by 0.5 metres to allow for bus overhangs.

Clear space is also required for both rear and front doors. Bus stops near cycle routes should consider bicycle parking.

**Figure 25: Continuous accessible pedestrian path**

### 3.3.14 Lighting

Lighting at bus stops is to meet the minimum lighting standard requirements of the *Public Lighting Code A/NZS 1158.*

Lighting levels above those specified in the Code should be considered at locations where there is a high demand for the service.

Lighting at bus stops should be designed so that the timetable is well illuminated and can be read at night.

### 3.3.15 On-Road Bus Stop Siting

Bus stop siting is critical to maintaining pedestrian and passenger safety and convenience, as well as ensuring ease of bus vehicle access and operation. The following should be considered:

- Stops should be located as close as possible to demand generating land uses (refer to Figure 26)
- The desirable average stop spacing is 300 metres
- Bus stops should be located to maximise walking accessibility from the surrounding area (eg. near intersections), with particular reference to demand generating land uses
- Where two bus routes intersect, bus stops should be located close together
- On roads with indented parking, bus stops should be designed and located at kerb outstand areas (refer to VicRoads' *Cycle Note 20 – Providing for Cyclists at Bus Stops)*
- Existing and proposed bus stop locations must be clearly shown in development layout plans
- Bus stops should afford a safe road crossing opportunity reflecting the volume of passengers at the stop and road traffic conditions throughout the day and night. The best case is a controlled pedestrian crossing.

- Bus stops used by late night services, such as Nightrider, should include additional safety measures such as bright lighting, overlooking development and a safe road environment that considers the behaviour of substance impaired pedestrians. These may need to be located near taxi ranks and developments expected to generate patronage later at night (i.e. hotels, bars and nightclubs)
- Guidance on the selection of pedestrian crossing treatments at bus stops can be found in the VicRoads' *Bus Stop Guidelines* and the *VicRoads' Traffic Engineering Manual Volume 1*

**Figure 26: Bus stops located near demand generating uses - High Street - Preston**

- In areas with large trees, structures, etc. close to the road, the vertical clearance needs to be checked, based on the swept path of the bus, to ensure buses are not impeded
- Departure side stops at local street intersections are preferred
- Stops should be located away from a major exit point from a development. If safe, design the exit to reduce the speed of entering traffic to reduce the risk of rear end collisions with buses. Buses, shelters, flags/ totems and waiting passengers at stops that are upstream of major access points can obstruct the safe sight distance for drivers trying to enter the road
- Mid-block locations for bus stops should be avoided unless
    - They service a particular site
    - Passengers can access a signalised pedestrian crossing on a major road, or
    - Where blocks are long and mid block stops are required to provide a reasonable stop spacing. Kerbs should be extended past parking bays at such locations, with the bus stopping in the through lane
- Locate stops near existing subways, bridges, school crossings and other pedestrian crossings, to provide safe road crossing opportunities
- Stops should not be proposed near the crest of a hill, due to poor sight distances and the possibility of rear end or vehicle-pedestrian accidents
- Stops on slopes or at the bottom of hills should be avoided because of the difficulty and hazard of breaking and/or accelerating amid general traffic
- Urban/rural fringe stops must also be in accordance with VicRoads' *Bus Stop Guidelines*. Stop siting should reflect the wider environment, including vehicle speeds and safety for slowing, stopped and accelerating buses, pedestrians walking to and from the stop, and other amenity and roadside issues and hazards (e.g. shoulder widths, deep drains, long grass, personal safety, etc.)
- Locate bus stops on opposite sides of the road. A site-by-site analysis will need to consider pedestrian movement desire lines
- Bus stops should be downstream from formal mid-block crossings. If several routes share the stop, the location of the stop should reflect the effect of two buses arriving and the pedestrian crossing being temporarily blocked by a bus that is waiting to use the stop
- The stopping restrictions for mid-block islands, which help pedestrians cross busy roads, are regulated in *Road Rules – Victoria*, and must be considered in conjunction with the stopping restrictions that apply to bus stops
- Pedestrian routes to and from stops should be constructed so that they are safe underfoot, defined and navigable in poor weather and/or visibility, well lit and landscaped, subject to surveillance and have connections to the broader local movement network and nearby trip generators
- All stop design and location details must be in accordance with VicRoads' *Bus Stop Guidelines*.

### 3.3.16 Providing for Right-Turning Buses

A bus at a kerbside stop that must turn right at an intersection, may have difficulty reaching the right hand lane of a multi-lane road. The following solutions may be applied:

- Locating the bus stop downstream of the intersection on the road the bus intends to turn right into
- If road geometry allows, create a separate right-turn lane with associated bus stop facilities
- Depending on traffic flows, a stop located further upstream may provide bus drivers with additional distance, time and opportunity to merge into the right lane.

### 3.3.17 Future bus stops

Proposed bus stops must provide hard-stand areas as specified in these Guidelines, with sufficient space for the future installation of the appropriate requirements identified in the VicRoads' *Bus Stop Guidelines*. Where indented parking is provided, kerb outstand areas at potential bus stops should be long enough to accommodate a future bus stop. Connecting paths and road crossings should be provided during initial development.

## 3.4 Enabling Bus Priority

The reliability of scheduled bus services can be degraded by congestion, and so priority should be given to public transport vehicles (refer to Figure 27). This is of particular importance at stops, stations, interchanges, major intersections and along key routes and access points identified by PTD.

Bus priority must be considered in the context of overall traffic management. Simply increasing road capacity is not the solution. In many instances, the key congestion points will be at activity centres where road space management is a major issue. Close liaison with VicRoads and the local government authority will be necessary.

Bus priority initiatives include:

- Dedicated bus lanes
- Providing priority lanes where queues may form
- Clearways
- Signal phasing
- Providing bus set backs and lanes at intersections where queues may form eg. queue jump facility
- Introducing and enforcing parking restrictions around and within bus stops.

**Figure 27: Bus priority lane along key routes**

Bus priority measures must be in accordance with VicRoads' *Bus Priority Guidelines* and Austroads' *Road-Based Public Transport and High-Occupancy Vehicles*.

## 3.5 SmartBus

SmartBus is a premium bus service that offers more frequent services and longer operating hours. Buses operate along major arterial roads, connecting activity centres and interchanging with the train and tram networks. They also provide passenger information displays at selected locations, providing passengers with up-to-the-minute information on bus arrival times. Improved passenger information is also given at every stop with a local area map and service timetable (refer to Figure 28).

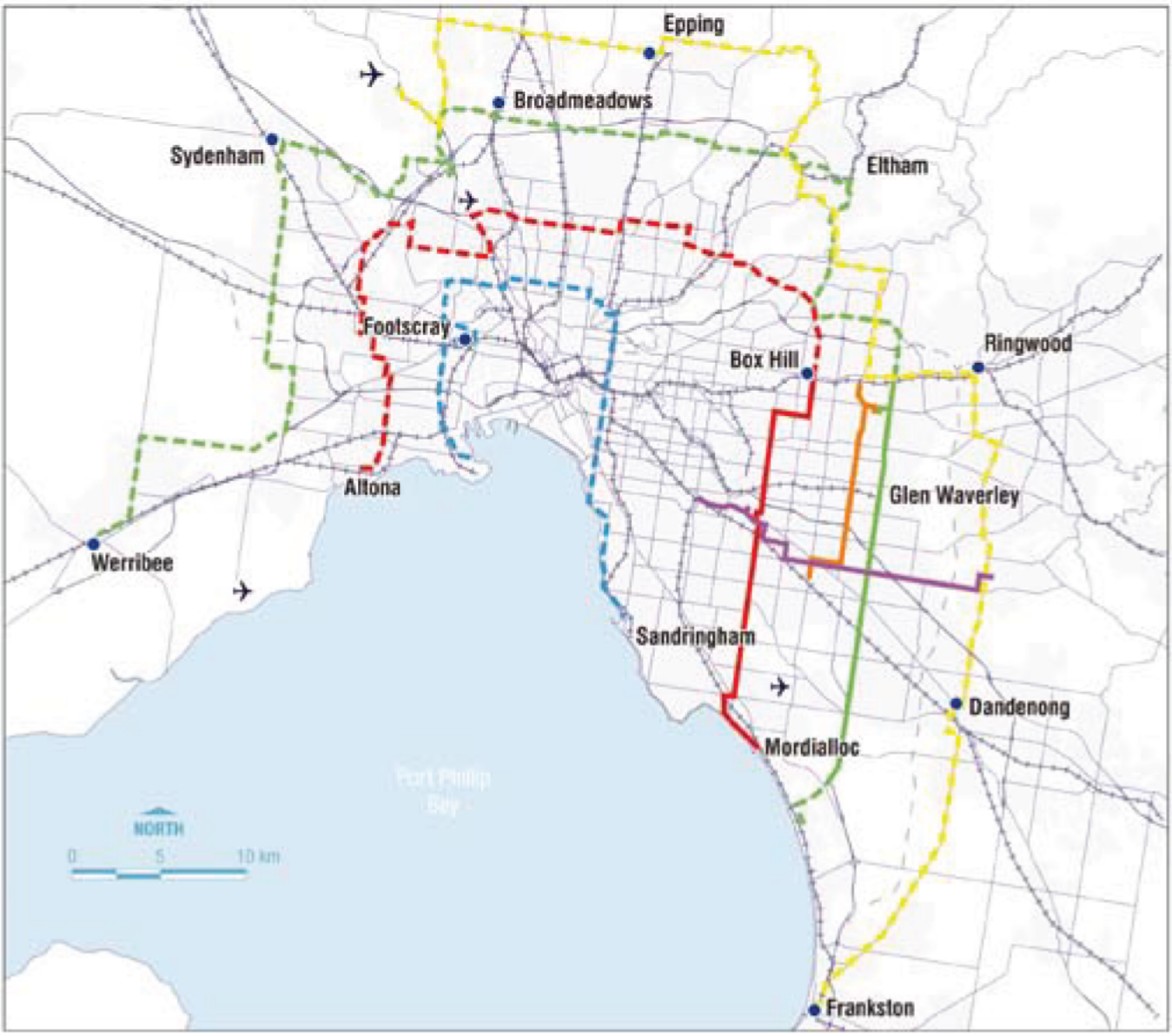
SmartBus services receive extensive levels of on-road bus priority treatments, such as bus lanes, queue jump facilities and the ability to request green light priority. This helps to ensure a timely and reliable service is provided. SmartBus orbital routes are shown in Figure 29.

Development proposals and traffic management devices should enhance and not prejudice bus operations and travel times. Any delay created must be mitigated to ensure that the service travel time remains unchanged.

Guidance on the selection and design of bus priority measures for the SmartBus can be found in Austroads' *Road-Based Public Transport and High Occupancy Vehicles* and VicRoads' *Bus Priority Guidelines*.

New or upgraded intersections should allow for the future inclusion of bus priority measures, eg. bus lanes, in the design, if they are not provided initially. For more information refer to: *www.transport.vic.gov.au/smartbus*

**Figure 28: Real time information display**




SmartBus Routes

Existing SmartBus routes:
- Springvale Road
- Blackburn Road
- Warrigal Road
- Wellington Road

Future SmartBus routes:
- Blue Orbital
- Red Orbital
- Green Orbital
- Yellow Orbital

- Existing urban area
- Major road
- Major road under construction
- Rail network
- Transit City
- Airport

Note:
Future SmartBus routes are under development. Alignments shown are indicative and subject to change.

**Figure 29: Orbital SmartBus Routes**

# 4.0 TRAMS

## 4.1 Introduction

Trams are a Melbourne icon and deliver a huge public benefit for Victorians. They are not as operationally flexible as buses and particular planning considerations apply.

Tram services operate both on the road network and in dedicated reservations. Trams running in separate reservations are more efficient, as interaction with private vehicles is more limited.

Major objectives for tram services are to improve service reliability by

- Improving speeds
- Removing constraints
- Improving customer accessibility

New urban development should facilitate these outcomes.

Developers should design the interface between the development and the tram network so as to:

- Connect new bus routes to the tram network
- Achieve a high degree of pedestrian and cycle accessibility between the development site and tram stops
- Ensure that tram services are not slowed or otherwise detrimentally impacted.

Early consultation with PTD and VicRoads, Yarra Trams and public transport providers will be required.

The tram network must be compliant with the Commonwealth *Disability Discrimination Act 1992* and *Disability Standards for Accessible Public Transport 2002*. PTD is progressively remodelling tram stops with accessible platforms and replacing older trams with new low-floor rolling stock. Tram vehicle specifications are set out in Appendix A.

The potential for tram extensions will continue to be examined. Developers should liaise with PTD on potential network expansion that may need to be accommodated. Consultation with tram operators can also be beneficial in providing local level information on routes and operations.

The provision of new or revised routes intersecting with the PPTN should reflect consideration of the following:

- Vehicle access points onto and off the tram route
- Right-turning vehicles across the tram tracks including U-turns (especially by taxis), ie. “Left in” and “Left out” only access may be required
- Provision of tram priority
- Maintenance and protection of tram infrastructure, including overhead lines
- Provision of tram stops and passenger waiting facilities including road crossings for pedestrians (eg. refer to Figure 30)
- New route alignments and connections where applicable.

**Figure 30: Tram 109 - recent extension to Box Hill**

## 4.2 Service Performance Requirements

High quality urban design plays an important part in the successful development and operation of the tram system. This includes:

- Enabling tram priority and pedestrian and cycle-friendly traffic management
- Maximising tram catchments through higher density development along routes and around stops
- Minimising right-turning vehicle movements in the path of trams
- Separating trams from traffic where possible.

## 4.3 Design Principles (Trams)

### 4.3.1 Infrastructure Design Principles

#### Location of stops along a tram route

The distance between stops in Melbourne has historically been 200-300 metres. However, there are benefits in increasing spacing to 400-500 metres, eg:

- Average journey times are reduced
- Better facilities can be provided when there are fewer but more accessible stops. An optimal mid block tram stop arrangement is illustrated in Figure 31.

Some stops in the CAD have been located further apart to achieve these outcomes. PTD and VicRoads have identified a number of priority locations for tram stops in the CAD. Note however, that in high demand areas such as activity centres, more frequent stops may be appropriate.

Developers should consult with PTD and VicRoads on how to integrate tram stops into developments, activity centres and the road network.

### 4.3.2 Accessible Tram Stops

Accessible tram stops fall into two main categories:

1. Platform stops
2. Kerbside stops.

#### Platform Stops

Platforms should be at least 33 metres in length, which is sufficient to accommodate the new fleet of articulated trams.

A single-facing platform should be 2.4 metres wide. The minimum clear width along the platform to comply with DSAPT 2002 disability access standards is 1.8 metres. Platform facilities such as shelter, audio and real-time information will need to be accommodated.

Platform stops can be located at intersections or mid-block between intersections.

Mid-block platform stops may also be configured as a central island platform (refer to Figure 32). The central platform width should be 4.5 metres, though high patronage stops may require greater widths for safety.

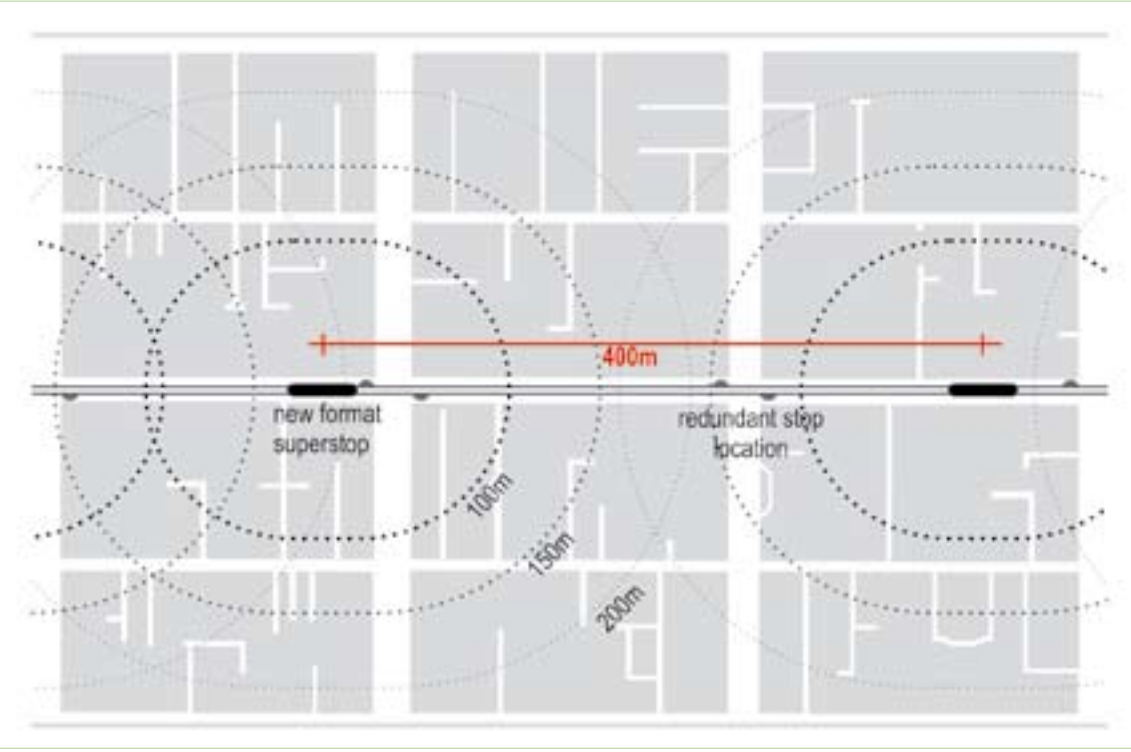



Figure 31: Optimal mid block tram stop arrangement

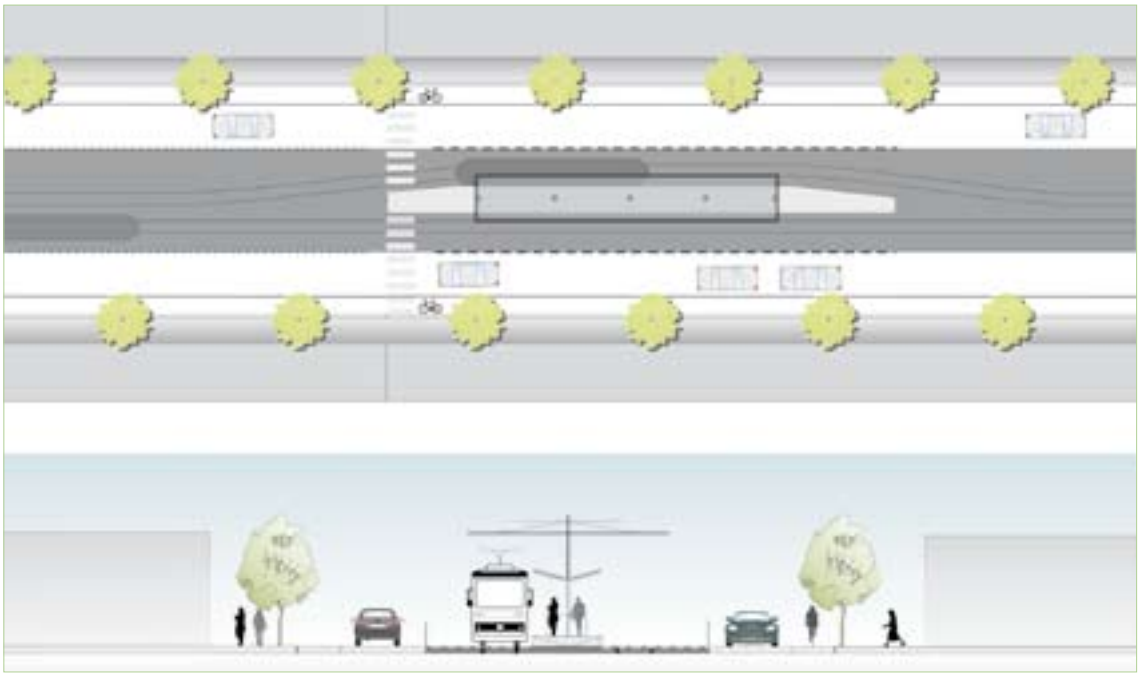


Figure 32: Mid-block platform stop (Indicative)

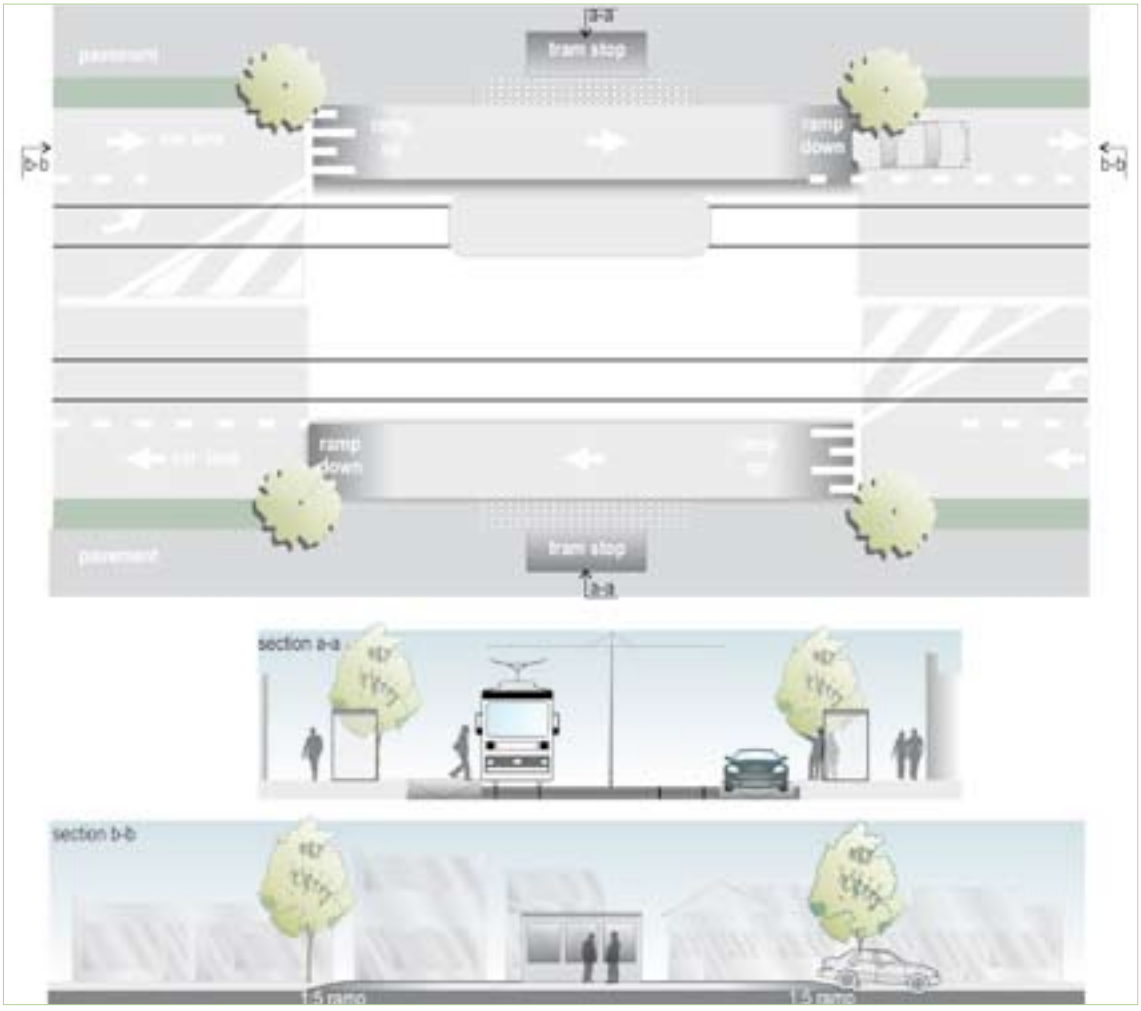



Figure 33: Trafficable platform stop with one traffic lane (Indicative)

The key issues to consider include:

- Pedestrian safety
- Urban design
- Traffic capacity impacts
- On-street parking impacts
- Passenger numbers and safe, convenient access to stops
- Laneway access
- Reduced travel times and improved tram reliability.

For more information please refer to VicRoads' *Design Notes: RDN 3-32 Accessible Tram Stops in Medians* and *RDN 3-33 Accessible Tram Stops in Safety Zones* which are available at *www.vicroads.vic.gov.au/rbptguidelines.*

### Kerbside Stops

Kerbside stops are located on the footpath and form the vast majority of stops on the tram network. There are three options to build platforms in these environments: kerb access stops, trafficable platform stops with one traffic lane (refer to Figure 33) and trafficable platform stops with two traffic lanes.

### 4.3.3 Route Upgrade

Development should not preclude the potential to upgrade or extend existing tram routes to provide:

- Traffic light priority treatments at intersections and on approaches
- Increased segregation of trams and motor vehicles
- Separate tram lanes or delineation between tram lanes and other traffic
- Accessible tram stop platforms
- Improved tram stop spacing
- Interchange between other tram services and other transport modes
- Tram stops on the departure side of intersections.

### 4.3.4 Intersection and Vehicle Access Points

All vehicles except public buses and emergency vehicles are banned from driving along tramways (i.e. a section of tram route specifically set aside for trams), crossing a tramway other than at designated locations, and all stopping across tram tracks at crossing points. Tram lanes may be full time or part time and designations may change. Proponents should therefore liase with PTD and VicRoads on the detail of particular proposals.

Right-turns may be banned at strategic intersections either all day or during a particular time of day, to ensure trams are not delayed by right-turning vehicles. Where a right-turn must be provided, consideration should be given to fully controlling the right-turn when a tram is detected by the signal.

Vehicles accessing side streets along tram routes often result in trams being delayed. Where tram lanes are not full-time, right-turning vehicles are allowed to enter that lane up to 100 metres prior to turning right. Implementing a right-turn ban at non-signalised intersections, either all day or during a particular time of day, can reduce the interference of vehicles to tram operations. Similarly, U-turns can be banned along particular road sections to reduce disruption to tram operations.

Physical separation standards are being developed for the CAD, the approaches to the CAD, boulevards and commercial/residential urban environments. Physical separation treatments should not exclude bike lanes or overlook pedestrian safety at intersections. The status of these standards should be checked prior to development of designs for physical separation. Double yellow lines along tramways may be used where physical separation is not possible.

### 4.3.5 Conflict points for separated tram tracks

In most instances, there is no traffic on separated tram tracks except at intersections and roundabouts. However, there are often conflict points between trams and traffic at median openings and for full-time tram lanes with U-turning and right-turning traffic. For more information please refer to VicRoads' *Driving with Trams Standards* which is available at *www.vicroads.vic.gov.au/rbptguidelines.*

## 4.4 Enabling Tram Priority

Tram priority facilitates improved travel times and increases reliability. The State Government is committed to improving the tram network. Development proposals should take into account measures that will improve tram priority. These measures should also aim to improve passenger and vehicle safety at all intersections, especially those identified as congestion hot spots.

The following list of potential treatments and actions may be applicable. The level of priority will be considered by PTD, VicRoads and Yarra Trams on a case-by-case basis:

- Tramways
- Physical separation of tram lanes (refer to Figure 34)
- Full-time tram lanes with physical separation
- Part-time tram lanes
- Traffic signal phasing
- Parking bans and full-time tram lanes
- DDA tactile tiles and coloured pavement
- Mid-block parking restrictions to clear tram queues
- Hook turns at signalised intersections

- Paired intersection right-turn operations
- Fully controlled right-turns off tram tracks
- Closure or signalisation of median openings
- Right-turn bans at signalised intersections and facilities at signalised intersections
- U-turn bans along road sections
- Ten-metre long parallel parking bays for drive-in parking
- Review of tram stop locations, eg. relocation of stop to departure side of intersection or mid-block
- Faster stop loading using low floor trams and accessible platforms
- Separation of trams from other traffic at intersections
- Dynamic and/or static signage i.e. 'Give Way to Trams'
- Pavement treatment for improved delineation
- Increased visibility of tram clearance line
- Right-turn bans
- Removal of on-street parking

For more information refer to VicRoads' *Tram Priority Guidelines*.

**Figure 34: Physical separation of tram lanes**

# 5.0 TRAINS

## 5.1 Introduction

Melbourne's railway network provides radial public transport linkages to and from the CAD.

Heavy rail services provide the backbone of Melbourne's public transport network and are of increasing importance as the population of Melbourne grows.

Trains provide high capacity, fast and direct services, which operate in dedicated corridors with minimal interaction with road traffic. The rail network is a complex system which includes broad and standard gauge lines.

Opportunities to build new rail lines and stations and extend railway lines are being investigated and planning continues for the introduction of new heavy rail services. Developers should liaise with PTD on potential network extensions that may need to be accommodated in the design of the development.

In the past, service and network improvements for railways tended to focus largely on capital infrastructure investment. Land use planning should support, complement and build on these investments, so as to optimise land use and transport integration.

## 5.2 Service Performance Requirements

To ensure the ongoing safety and reliability of existing rail services, a number of key actions are being pursued. These include:

- Addressing capacity bottlenecks
- Constructing additional tracks
- Upgrading stations to DDA compliance standards
- Improving safety and amenity of pedestrian crossings at both existing and new crossings
- Increasing the number of "Park and Ride" spaces
- Delivering an active urban environment at and around railway stations and interchanges

Proponents are responsible for the interface between a private development and the train network and should consult with PTD. This includes achieving high quality pedestrian and cyclist accessibility between the development and train stations. Proponents also need to consult with key stakeholders, including local government and VicRoads.

## 5.3 Design Principles (Trains)

Some major developments may propose a new railway station or interchange facilities. Early consultation with PTD will be essential, so that consideration is given to infrastructure requirements, efficient operation and cost. PTD supports proposals which deliver mutual benefits for urban developments and public transport.

Each station forms a key node in the public transport network. Stations often act as modal interchanges where the different elements of the public and private transport systems come together and passengers transfer between modes. Key design issues include connectivity, safety and legibility. Specifically these include:

- Grade separation for vehicles and pedestrians
- Provision of clear, continuous and direct pedestrian and cycle routes to transit stops and between modes of transport. Ensure high visibility, activity and surveillance along these routes
- Train facility upgrades or developments along train lines must consider the provision of bicycle and pedestrian facilities
- DDA compliance
- Encouraging use of railway station buildings for retail or commercial uses such as cafes, newspaper kiosks and community facilities
- Provision of safe, accessible and comfortable bus interchange facilities. These should be integrated into the rail station design to provide maximum ease of transfer for passengers (refer to Figure 35)
- Public transport waiting areas should be clearly visible from the street and adjacent buildings and provide clear views of train, tram or bus arrivals and departures
- Lighting should be well integrated with signage and landscaping in order to maximise safety.

**Figure 35: Railway Station Bus Interchange**

### 5.3.1 Level Crossings

The design of transport routes at new developments must provide for grade separation at railway crossings except with the approval of the Minister for Public Transport (refer to VPP 18.01-2 Infrastructure *Australian Standard AS 1742.7–1993* and the *Victorian Rail Industry Operators Group Standard 003.2.2006 Criteria for Infrastructure at Railway Level Crossings – Pedestrian Crossings).*

Key issues to note include:

- New level crossings are not likely to be approved, ie. it is longstanding policy that at grade crossings should be opposed, except in the most unusual circumstances.
- Development proposals which will generate significant volumes of traffic in the road network around an existing level crossing, should endeavour to direct traffic away from the level crossing by creating alternative access / egress points.
- Development proposals in the vicinity of existing at-grade crossings will need to reflect any grade separation works proposed for the crossing and / or respond to the need to upgrade the crossing resulting from demand generated by the development
- Grade separation proposals are likely to impact on access arrangements in and around the crossing and provision will need to be made for alternative access
- Access arrangements will need to consider the requirements of all modes including pedestrian, bus, bicycle, taxi and car.

### 5.3.2 Car Parks

PTD will determine what constitutes adequate car parking provision based on the type, location and role in the network of each railway station.

Proponents contemplating developments close to existing or proposed stations should consult with PTD to ensure adequate consideration of long term parking need and supply.

Design of commuter car parking will need to ensure passive security and visual amenity.

Design principles are shown in Figure 36 and include:

- Ensuring car parks are located in areas where active edges provide natural surveillance and enhance the perception of safety for pedestrians
- Ensuring paths to and from car parks provide appropriate lighting, signage, CCTV surveillance, landscaping and clear sightlines
- Private vehicles should not obstruct access to the station for buses, pedestrians and cyclists
- Providing dedicated pedestrian paths at street level in car parking areas
- Incorporating an appropriate mix of safe bicycle parking at railway stations, which is adequate for local demand
- Decked parking should be encouraged where feasible
- Disabled car parking spaces should be provided at a minimum rate of one in 100 (refer VicRoads Standards).

For more information on car parks, please refer to Section 2.6.5 “Park and Ride” Facilities.

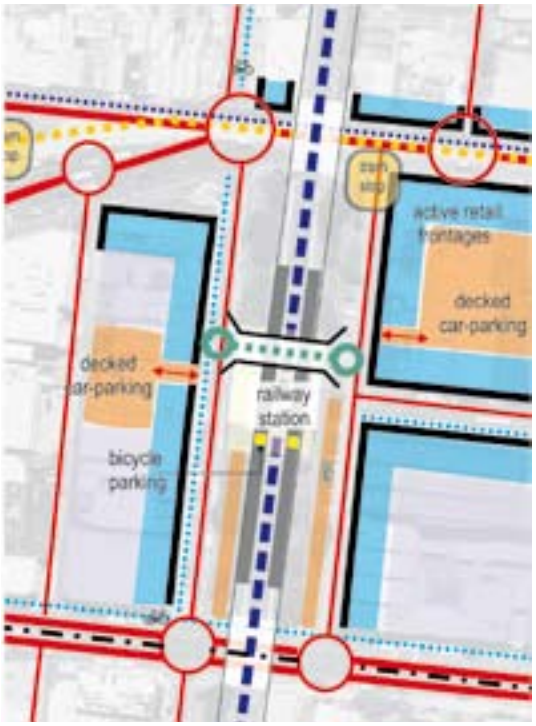



**Figure 36: Link carpark to shops and pedestrian routes.**

### 5.3.3 Short Term Parking and Passenger Drop off

As well as long term car parking, stations require stopping bays for taxis and “kiss and ride” stops.

Prominent signage should indicate the short term nature of these parking bays, which may be provided within the car park or on the roadside..

# 6.0 MODAL INTERCHANGES

## 6.1 Introduction

The quality of modal interchanges is an important determinant of how attractive public transport is and the degree to which it is a viable alternative to private car travel.

Modal interchanges range from local suburban bus stops through to major rail interchanges. There are a variety of potential movements to be accommodated at a modal interchange depending on the network connections and services at that site.

A modal interchange may include the following:

- Multiple train, tram and bus services
- Passenger waiting areas
- Pedestrian circulation space for interchange users and non-interchange users
- Bicycle access and storage
- Taxi ranks
- Park and Ride facilities
- Kiss and Ride facilities
- Ferry services.

A modal interchange design option is illustrated in Figure 37.

## 6.2 Service Performance Requirements

At any interchange, there are a variety of pedestrian and vehicle movements, some of which may conflict with one another. A desirable modal interchange design will enable the efficient movement of interchange users, public transport operators and customers.

The following are design principles for an efficient modal interchange.

- Integrate transit stops and interchanges into the design and layout of the activity centre (refer to Figures 37 & 38)
- Provide appropriate “Park and Ride” and “Kiss and Ride” facilities in strategic locations.
- Design active frontages along pedestrian paths to interchanges and public transport stops
- Provide direct routes to interchange and ensure high visibility, activity and surveillance along these routes
- Public transport waiting areas should be clearly visible from the street and adjacent buildings and provide clear views of train, tram or bus arrivals and departures
- Lighting should be well integrated with signage and landscaping in order to maximise safety. Lighting should also illuminate timetables at night
- Provide current passenger information about services and the range of service timetables
- Provide directional signage to platforms, stops, conveniences, shops, parking and taxi ranks to minimise confusion
- Additional DDA DSAPT 2002 requirements may be triggered at modal interchanges, such as the provision of resting points (seats) every 60 metres between services.

Liaison with PTD and VicRoads during the pre-application phase is essential. For all development plan and major development proposals, the interchange design must be considered at the preliminary design phase.

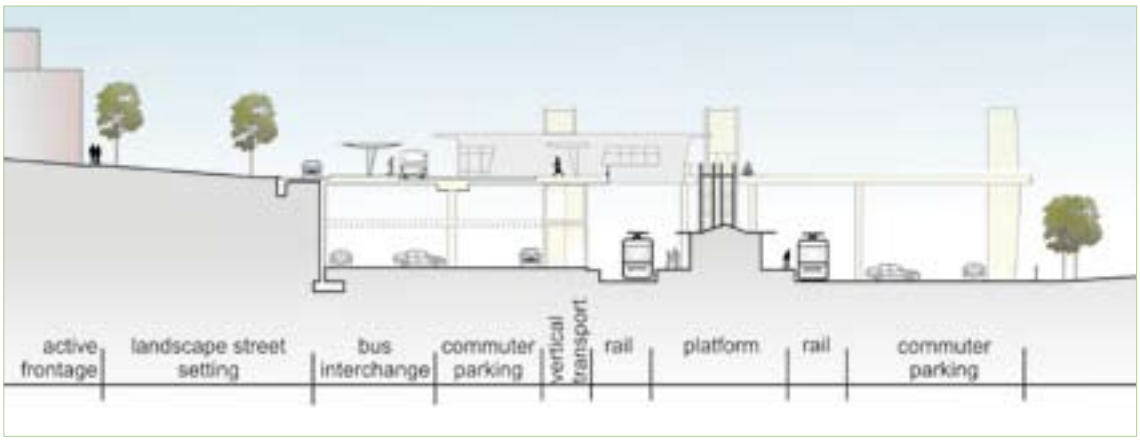



**Figure 37: Model interchange design option for Principal Activity Centre**

## 6.3 Design Principles (Modal Interchanges)

### 6.3.1 Interchange Layout Design

There are several principal objectives to be met in the design of an interchange layout:

- Maximise passenger and public transport vehicle capacity
- Maximise quality, safety and security of the passenger and operating environment
- Minimise the potential for conflict between passenger, cyclist and vehicle movements (refer to Figure 39)
- Minimise walking distances within the interchange and to nearby attractors.

Figure 38: Transit stops integrated into layout of the activity centre

Figure 39: Transport Interchange Epping - NSW

There are a number of design issues and constraints which will need to be considered:

- Location requirements:
  - external road layout influences the direction of vehicle flow within the bus interchange
  - location of trip destinations such as local shops, workplaces, educational institutions, etc, will determine pedestrian 'desire lines' (ie, providing the most direct route reduces unpredictable pedestrian movements)
  - design of the interchange should allow for direct pedestrian routes whilst carefully locating pedestrian crossing points to maximise safety
- Operational requirements:
  - efficient movement of trams and buses to and from the interchange
  - bus layover space will be required at certain interchanges
  - space for temporary parking or 'stacking' of terminating services
  - space for originating and through services to pick up passengers
  - space for staff facilities and toilets
  - space for bicycle facilities (eg. bicycle access paths and storage cages)
- Passenger space requirements:
  - for queuing, circulation, seating and any other facilities
  - passenger information regarding services arriving and departing from the interchange
  - passenger barriers to control movements onto bus services

- Nature of public transport traffic:
  - number of public transport services per mode, per hour
  - number of separate routes
  - configuration of buses, as appropriate (eg. standard or articulated)

### 6.3.2 Off-Road Interchange Design Options

There are three basic patterns of bus interchange layout and two tram-bus interchange layouts that are preferred, ie.

- Bus-Bus:
  - islands
  - concourse
  - perimeter
- Bus-Tram
  - cross platform
  - end-to-end

Factors such as available area, site shape and topography, adjoining road layout, relation to pedestrian and passenger objectives, and/or the number of vehicles and passengers will influence the design.

### 6.3.3 On-Road Bus Interchange Design and Layout

'Independent' operation is when buses arrive and depart to their own schedule. For example, in most interchanges with multiple bus stops, each bus operates on a different route, to its own timetable. The arrival and departure of one bus should not delay any other bus at a stop in the interchange. For this option, kerb space is required for each bus.

'Nose-to-tail' operation is when buses queue and only the bus at the front of the queue can depart. For example, this could be used when multiple buses operate close together on the same route, or at bus-stops and interchanges with small numbers of boardings and alightings that are not likely to significantly delay following buses.

The design (length) of the bays will need to be varied according to whether independent or nose-to-tail operation is required.

The following two examples demonstrate successful designs. The choice between parallel bays and sawtooth bays at bus terminals is dependent upon the size and shape of the site and whether independent bus operation is required. (refer to Figures 40 and 41)

- Parallel:
  Design as for on-street parallel bus bays. An additional requirement is for at least a five metre wide adjacent roadway to accommodate buses pulling out from each stop and then passing others which are stationary.

**Figure 40: Parallel bus bays**

- Sawtooth:
  Sawtooth bays are a variation that permits independent operation within a reduced space. Generally, they are not suitable for public streets because bus drivers may have blind spots behind the angled bus that affect the ability to see approaching cars.

**Figure 41: Sawtooth bus bays**

There are a number of interchange sites, particularly at railway stations, where there is insufficient space for a separate interchange and on-road bus bays will be the preferred solution to bus-rail interchange.

Designs that may direct errant buses towards areas occupied by pedestrians should incorporate physical protection measures.

### 6.3.4 Taxis

Taxis and mini buses are a flexible form of public transport to meet particular local needs. As a number of taxis are wheelchair accessible, all taxi stops must be DDA compliant.

Major development proposals will need to consider the role and location of taxis and taxi ranks.

Taxi rank design should reflect the following requirements:

- Ranks should be in close proximity to public transport stops to facilitate transfer between modes (refer to Figure 42)
- Queuing should be arranged so that people are directed to the vehicle at the head of the rank
- Passenger approach and entry to taxis should be from the passenger side and have satisfactory lighting and signage (e.g. taxis should not be positioned along the opposite kerbside from approach direction, as this would encourage passengers to enter while on the roadway)
- If located at shopping centres, clubs and other venues, ranks should be easily accessed without having to cross busy roads, especially by the elderly and disabled persons or substance affected passengers
- Special arrangements may be needed for wheelchairs, as most wheelchair accessible taxis are rear entry and require additional space for this purpose. Wheelchair loading is also time consuming and can delay taxi flow-through when loading takes place in the rank queue
- Ranks should be positioned so that they do not impede traffic flow
- Ranks should be positioned to the rear of any bus stops to ensure queuing taxis do not block the path of buses.

Further information can be obtained from the Victorian Taxi Directorate, DOT. Also refer to VicRoads' T*axi Rank Guidelines* for more information.

### 6.3.5 Passenger and Staff Facilities

It is expected that public transport interchange areas will have a range of passenger and staff facilities. The passenger waiting area should include shelter, waiting space, CCTV, toilets, telephones, refreshment facilities, route information, timetables, ticket sales and an enquiry office. In some circumstances, lounge facilities will be appropriate.

### 6.3.6 Passenger Waiting Area

- Fixed seating should be provided in waiting areas as close as possible to and in view of boarding points (refer to Figure 43)
- Seating should be located in a way that does not obstruct queuing passengers.
- Litter bins should be sited close to bus stops, seating areas and main pedestrian routes (provided that arrangements are made for regular removal of rubbish)
- Clocks are of great assistance to operators and passengers
- Glazed screens around the passenger waiting area provide weather protection while enabling waiting passengers to identify approaching buses. Toughened glass of between 7.2 and 10.3 millimetres thickness and at least 0.45 metres height should be employed
- Provision for future installation of real-time information systems should be made at all new or refurbished interchanges
- Provision of Metlink signage is mandatory.

**Figure 42: Easily accessible taxi ranks**

**Figure 43: Passenger waiting facilities**

### 6.3.7 Toilets

It is desirable to include passenger and staff toilet facilities at modal interchanges. Provision of public toilets is dependent on the predicted passenger numbers, the availability and proximity of existing public conveniences and the willingness of the relevant local authority to contribute towards operations and maintenance. Where public amenities are provided, it is mandatory to provide a toilet accessible to wheelchair users.

Toilets may be provided in the following combinations:

- Separate staff/ public toilet
- Combined staff/ public toilet
- Staff only – operational staff and interchange staff
- Interchange staff only.

### 6.3.8 Retail Outlets

Retail uses should be incorporated, as they enhance security, meet customer needs and make the interchange a more vibrant place. A range of uses can be provided, including newsagents, snack bars, etc.

### 6.3.9 Development Orientation

Developments proposed adjacent to or near an interchange should aim to facilitate

- active frontages
- direct and short paths
- rear parking
- legible connections to public transport (refer to Figure 44).

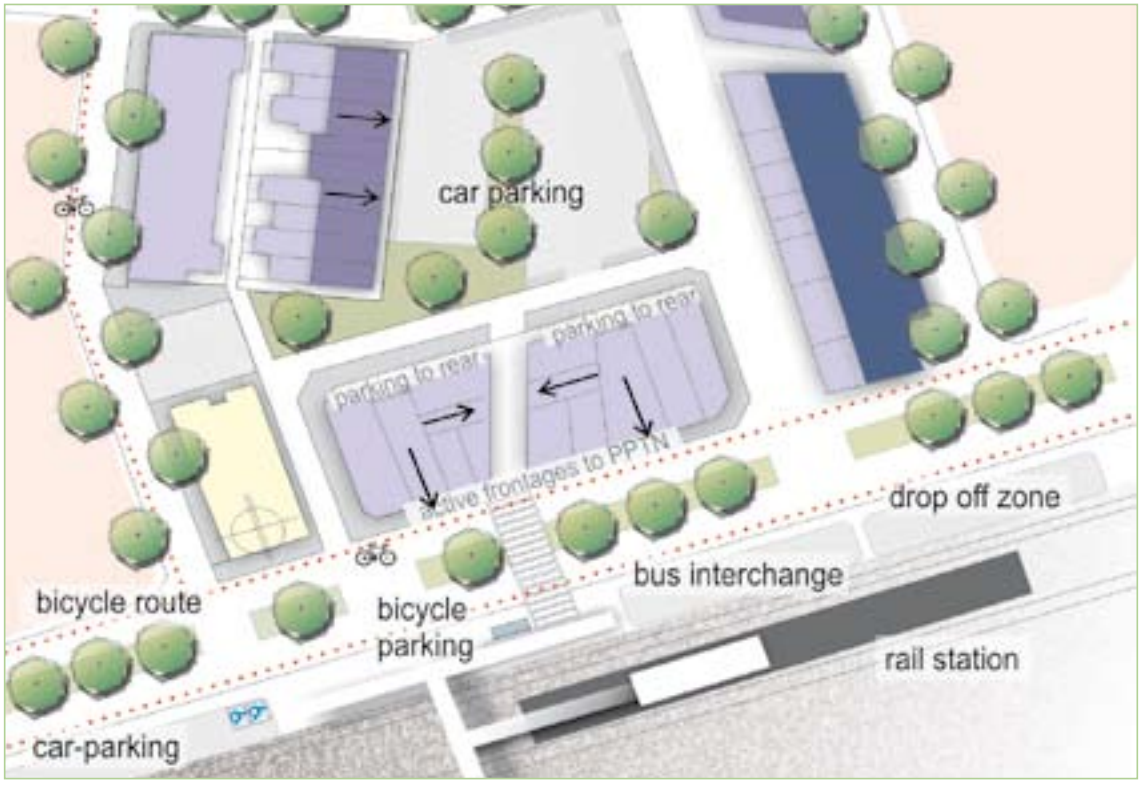



Figure 44: Development orientation around public transport nodes

# APPENDIX A - TRAM VEHICLE SPECIFICATIONS

| All measurements in metres | A Class | B Class | C Class Citadis | D Class Combino (3 section) | D Class Combino (5 section) | W Class | Z Class |
|---|---|---|---|---|---|---|---|
| **Chassis Type** | Rigid | Articulated | Articulated, Low floor | Articulated, Low floor | Articulated, Low floor | Rigid | Rigid |
| **Length (m)** | 15 | 23.6 | 22.7 | 20 | 29.8 | 14.2 | 16.6 |
| **Width (m)** | 2.7 | 2.7 | 2.7 | 2.7 | 2.7 | 2.4 | 2.7 |
| **Overhead Height (m)** | 5.6m | | | | | | |
| **Platform Height (m)** | 2.60 | 2.60 | 2.90 | 2.60 | 2.60 | 2.60 | 2.60 |
| **No. of Seats** | 40 | 76 | 40 | 36 | 58 | 46 | 40 |
| **Standing** | 15 | 103 | 60 | 44 | 62 | 19 | 20 |
| **Minimum Track Radius** | 25m | | | | | | |

# APPENDIX B - GLOSSARY OF TERMS

**Activity Centres** provide the focus for services, employment and social interaction in cities and towns. They are where people shop, work, meet and often live. Usually well-served by public transport, they range in size and intensity of use from local neighbourhood strip shopping centres to traditional universities and major regional malls.

**Arterial Roads** are the principal routes for the movement of goods and people within an area and may be further divided into primary and secondary arterials (Ref: *VicRoads' Traffic Engineering Manual, Volume 1*).

**Central Activities District (CAD)** is focussed on Melbourne's original street layout bounded by the Yarra River, Spring Street, Latrobe Street and Spencer Street.

**CCTV** is Closed Circuit Television installed for security purposes.

**Growth Areas** are areas on the fringe of metropolitan Melbourne around major regional transport corridors that are designated for large-scale change, ie. from rural to urban use. The new communities of the future will be located in growth areas, with housing, shopping, employment, parks and a range of community services.

**Independent Operation** is when buses arrive and depart according to their own schedule.

**Interchanges** are where people change modes of compatible transport, for example, from train to bus.

**Mixed use** means the mixing of a range of compatible uses, integrated in close proximity to each other to improve the efficiency and amenity of neighbourhoods, reduce travel demand and increase walkability.

**Municipal Bicycle Network (MBN)** are networks of local bicycle routes in metropolitan Melbourne and in regional Victoria. The municipal council is the custodian of each MBN and has the primary responsibility for managing its development.

**Nose-to-tail operation** is when buses queue and only the bus at the front of the queue can depart.

**Principal Bicycle Network (PBN)** is a network of arterial bicycle routes in metropolitan Melbourne. VicRoads has primary responsibility for managing the development of the PBN.

**Principal Public Transport Network (PPTN)** is the core public transport network that connects Principal and Major Activity Centres and defines the metropolitan network of train, tram and bus routes.

**Road** means the area of a street reserve which is provided for the movement or parking of vehicles and bicycles.

**Slow Points** mean sections of a street which have geometric features which limit the travel speed of vehicles.

**Streetscape** means the visible components in a street between the facing buildings, including the form of the buildings, garages, setbacks, fencing, landscaping, driveway and street surfaces, utility services and street furniture.

**Structure plans** are planning tools that set out an integrated vision for the desired future development of a place. They establish a planning and management framework to guide development and land use change, in order to achieve stated environmental, social and economic objectives.

**Subdivision** means the division of a cadastral parcel of land into two or more lots which can be disposed of separately sold.

**Tramway** means tram operating in its own reserve.

**Victoria Planning Provisions (VPP)** are policies and requirements for the use, development and protection of land in Victoria. They are set out in all Victorian planning schemes.

# appendix C - references

## Further Reading

- *A Fairer Victoria,* State Government of Victoria (2006)
- *Activity Centre Design Guidelines,* Department of Sustainability and Environment (2005)
- *Government Action Plan,* NSW Health (2000)
- *Growth Area Framework Plans,* Department of Sustainability and Environment (2006)
- *Meeting Our Transport Challenges,* Department of Infrastructure (2006)
- *Melbourne 2030,* Department of Infrastructure (2002 )
- *Linking Melbourne, Metropolitan Transport Plan,* Department of Infrastructure (2004)
- *Planning Practice Note, Structure Planning in Activity Centres (2003)*
- *Precinct Structure Planning Guidelines,* Department of Sustainability and Environment (2006)

## VicRoads:

- *Austroads Part 13: Pedestrian Standards*
- *Austroads Part 14: Cyclists and the VicRoads Cycle Notes*
- *Bus Priority Guidelines (2003) (Currently under revision)*
- *Bus Stop Guidelines (2006)*
- *Driving with Trams Standards (forthcoming)*
- Information bulletin: *Designing Local Roads for Ultra Low Floor Buses (1999)*
- *Road Rules – Victoria*
- *Taxi Rank Guidelines (2006)*
- *Traffic Engineering Manual Chapter 4*
- *Traffic Engineering Manual, Volume 1*
- *Tram Priority Guidelines (2003)*
- *VicRoads Cycle Note 20: Providing for Cyclists at Bus Stops*
- *VicRoads Design Notes:*
  *(RDN) 3-32 Accessible Tram Stops in Medians (2006)*
  *(RDN) 3-33 Accessible Tram Stops in Safety Zones (forthcoming)*

For VicRoads' documents, refer to the VicRoads website: *http://www.vicroads.vic.gov.au/rbptguidelines*

## Austroads:

- *Guide to Traffic Engineering Practice, Part 5 – Intersections at Grade, Part 13 – Pedestrians and Part 14 – Bicycles.*
- *Guide to Traffic Management, Part 8 – Local Area Traffic Management*
- *Road-Based Public Transport and High Occupancy Vehicles (2002)*

## Further references include:

- *Accessible Public Transport in Victoria Action Plan 2006-12*
- *DDA Requirements for Bus Stop Compliance Public Transport Division (2006)*
- *DDA Requirements for Tram Stop Compliance Public Transport Division (2004)*
- *Australian Standard AS 1742.7–1993 (currently under revision)*
- *Australian Standard AS 1428 Design for Access and Mobility Part 4 (1992)*
- *Commonwealth Disability Discrimination Act 1992*
- *DDA DSAPT 2002 Part 18 - Tactile Ground Surface Indicators*
- *Disability Standards for Accessible Public Transport (2002 DSAPT)*
- *Public Lighting Code A/NZS 1158*

## Victoria Planning Provisions:

- Victoria Planning Provisions, Clause 12 – Metropolitan Development.
- Victoria Planning Provisions, Clause 18 – Infrastructure
- Victoria Planning Provisions, Clause 52.36 – Integrated Public Transport Planning
- Victoria Planning Provisions, Clause 56 – Sustainable Neighbourhoods.
- Victoria Planning Provisions, Clause 52.06 – Car Parking

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