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The Principal Bicycle Network (PBN)

The PBN is a network of routes that provide access to key cycling destinations within the Melbourne metropolitan area. The PBN was established in 1994 and the earliest version was based on a medium to coarse rectangular grid of cycling routes that were mainly on arterial roads.

This report outlines the results of a review of the PBN that was undertaken by VicRoads in partnership with key stakeholders such as Bicycle Victoria, the Department of Transport, Parks Victoria and metropolitan Councils in 2009.

What is the purpose of the PBN?

The purpose of the PBN is to guide investment in cycling infrastructure in Melbourne. This investment aims to increase the numbers of people riding bicycles for transport. Cycling for transport includes riding bicycles to work, to school, for shopping, visiting friends and other events.

In particular, our investment in the PBN is guided by:

- providing access to key destinations such as the Melbourne, Frankston, Dandenong, Ringwood, Box Hill, Broadmeadows and Footscray Central Activities Districts;
- maximising separation between cyclists and motor vehicles so that we can encourage less confident and/or experienced people to ride bicycles for transport; and,
- increasing the number of medium distance (3-15 km) transport trips made by bicycle.

While development of the PBN can increase recreational cycling, walking and bicycle tourism (and these outcomes are important and welcome), the primary aim of the PBN is to increase cycling for transport.
Our understanding of cycling in Melbourne has increased since the PBN was first identified in 1994. Furthermore, the role that cycling plays in our transport system is now recognised.

**Cycling in Melbourne has changed**

A number of things have changed since the PBN was established in 1994. Since then Melbourne has grown significantly and travel patterns have changed across the city. Cycling has also changed. There has been a rise in the level of cycling and in particular cycling for transportation purposes.

Previously, there was a clear distinction between cycling for transport along arterial roads and cycling off road for recreation. This has been replaced with more cycling along off-road routes for transport. Data shows that many off-road routes carry more riders during the working week than on the weekends. We also have better tools available to maximise separation between cyclists and motor vehicles along on-road routes.

**Transport and Land Use Strategies**

Since 1994, our understanding of cyclists’ needs and the role that cycling plays in the transport system has increased. Cycling has also been incorporated into land use and transport strategies such as the Victorian Transport Plan (VTP) and the Victorian Cycling Strategy (VCS).

In addition, VicRoads has been working closely with the Department of Transport and metropolitan Councils in the development of Network Operating Plans (NOPs) and Road Use Hierarchy Maps. The purpose of this initiative is to assign an order of modal priority and to define performance characteristics for arterial roads on a route by route basis in Melbourne. The development of NOPs has considered the needs of cyclists and the PBN needs to evolve in order to complement the outcomes of this initiative.

The above changes warrant the identification of a new set of cycling routes in Melbourne. This will ensure that the PBN continues to be an effective network that is made up of the highest priority bicycle routes and that it continues to serve the needs of cyclists.

**Victorian Cycling Strategy (VCS)**

The Victorian Government signalled a strong commitment to increasing the levels of cycling, particularly within Melbourne, with the release of the VCS in March 2009. The new PBN supports the implementation of the VCS.

The VCS places a strong emphasis on developing bicycle networks through the provision of high quality infrastructure to provide access for cyclists to key destinations. Key directions within the VCS include building networks to connect communities, promoting and encouraging a culture of cycling, reducing conflicts and risks for cyclists and better integration with public transport and land-use planning.

Building networks to connect communities aims to develop quality cycling networks in priority areas across Victoria that are connected to significant destinations and attractions. It also aims to establish better processes for planning cycling networks.

Priority actions include prioritising network development in areas of high demand and growth, including the inner 10 km of Melbourne, Central Activities Districts (CADs), and regional centres. Bicycle facilities will also be provided as part of major transport projects and may include the development and upgrading of on-road bicycle lanes or off-road bicycle paths as part of the project, in most cases as a matter of course.
Previous PBN development
The previous PBN was mainly based on:
- a grid network for the whole metropolitan area where the maximum spacing between routes was no more that 1.5 km; and,
- giving a preference to arterial roads as PBN routes on the basis that these routes provide the most direct route for cyclists.

In addition, the previous PBN had been developed with little consideration for:
- the potential for off-road path networks to serve the needs of commuter cyclists as well as recreational cyclists;
- the population density or demographics of particular areas and communities within Melbourne;
- the feasibility of providing bicycle facilities (on-road bicycle lanes and/or off-road paths) on the routes that had been identified;
- the origins and destinations for cycling trips, the locations that cyclists wish to access and how the PBN supports other transport networks;
- recent developments in transport priorities and planning as outlined in the VTP and the VCS; and,
- the nomination of the Frankston, Dandenong, Ringwood, Box Hill, Broadmeadows and Footscray as Central Activity Districts as part of the “Melbourne@5million” review of Melbourne 2030.

Network and catchment principles for the PBN
As indicated above, the PBN will evolve as a network of routes that are selected for their effectiveness in providing access to significant and key destinations and their ability to serve the catchments around these destinations. Implicit in this approach is that the PBN will no longer be based on a broad grid of routes across the entire of metropolitan area.

The four key principles for the new PBN are that:
- it maximises, in a cost-effective manner, the number of trips that are made by people riding bicycles for transportation;
- at least 80% of people in Melbourne live within 1.6 km of a route that is on the PBN;
- the PBN is contained within the Urban Growth Boundary as defined by the Department of Planning and Community Development;
- within each local authority area up to 1 km of PBN route exists per 1,000 population, as measured by the 2006 census.

Melbourne Central Activity Districts
Revising the PBN will ensure that it remains an effective tool for planning bicycle networks in Melbourne and that we can continue to increase cycling for Melbourne.
The focus of the PBN will be to provide access to key destinations in Melbourne such as the Melbourne CBD and the Central Activity Districts.

A destination based network

The PBN will be destination based. All routes will focus on and connect to significant and relevant destinations across metropolitan Melbourne. These destinations include the Melbourne Central Business District (CBD) and all six Central Activities Districts (CADs), relevant Principal Activity Centres and Specialist Activity Centres.

The routes selected for inclusion in the PBN and their length will be based upon the population and employment density of the catchment, the strength of the destinations in terms of generating cycling trips and the distances to the destinations. Only in exceptional circumstances will a route go beyond the estimated catchment of a destination. Catchments that have low residential and employment densities that are more than 15 km from significant destinations are not considered a high priority for inclusion on the PBN.

Routes that were on the previous PBN that are beyond the catchment of a destination and/or have low residential and employment densities have either been removed from the network, downgraded to a “PBN Support Route” or re-nominated as a “PBN Training Route”.

Catchment areas and outer boundary of PBN

The Melbourne CBD and the inner suburbs around Melbourne have the highest employment densities in Melbourne and generate the highest numbers of bicycle trips in Victoria. As a result, the PBN for access to the Melbourne CBD has been based on a catchment of 15 km.

The six CADs, which have lower employment densities than the CBD, have been assigned catchments of between 7 km and 10 km. Other activity centres, strip shopping centres and some railway stations have been assigned catchments of between 3 km and 5 km.

The outer boundary of the PBN is broadly aligned with the proposed Melbourne Urban Growth Boundary. Areas of low population and employment density within the boundaries of metropolitan Melbourne may not be served by the PBN.

Isolated areas of high population and employment densities may be served by routes on the PBN but these networks may not be connected to the main network. Areas of future development will be addressed by on-going additions and future reviews of the PBN.

Route selection – arterial roads and local roads

Unlike earlier versions of the PBN, routes selected for inclusion on the PBN will be based upon their potential for providing direct access and connectivity to key destinations. As a result, routes may be selected along both local and arterial roads.

Other alignments such as parks and reserves, railway lines, utility easements such as electricity, water, gas and sewerage, and rivers and creeks may also be considered for inclusion on the PBN.
Route selection criteria

The following criteria was considered when selecting potential routes for inclusion on the PBN. Routes have been assessed based upon their compliance with one or more of these criteria.

- routes that have already been upgraded to provide an on-road bicycle lane or an off-road path and that provide access to key destinations; and/or,
- routes that have sufficient space within the road reserve for the provision of an off-road bicycle path or an on-road bicycle lane as opposed to routes where it is more difficult to provide bicycle paths and/or lanes; and/or,
- routes that provide direct or radial access to CADs and Principal Activity Centres from areas of high population density were given higher priority than routes that provide non-direct or non-radial access; and/or,
- routes that maximise directness, separation and priority for cyclists, especially at intersections and provide an equivalent or higher level of priority for cyclists, such as off-road bicycle paths, were given a higher priority for selection than routes that provide minimal separation, especially in outer suburbs; and/or,
- routes where a significant conflict, or impacts on service levels for freight and/or public transport are not expected to occur, will be given higher priority for selection; and/or,
- routes that provide an equivalent or higher level of priority for cyclists at intersecting roads and other physical barriers, will be given higher priority for selection than routes that provide an inferior level of priority.

A key objective of a PBN route is to implement bicycle lanes and paths that maximise separation between cyclists and motorists.
The PBN now includes “priority routes” and “support” routes. Priority routes will be developed in a more proactive manner, and are eligible for 100% VicRoads funding.

The PBN is made up of:
- PBN Priority Routes
- PBN Support Routes.

The PBN is complemented by local routes and routes that have been identified as part of the Metropolitan Trail Network by Parks Victoria.

The PBN will be enhanced – and to some extent will be shaped – by Major Project Routes that occur as a result of major infrastructure investments such as roads and rail lines.

New routes developed in new suburbs and greenfield sites will be made up of support routes and local routes. In some instances they may also be classified as Priority Routes.

The following sections describe these route types in more detail.

PBN Priority Routes

PBN Priority Routes are the highest priority routes within the PBN and are considered critical for increasing the numbers of people riding bicycles for transport, the development of the bicycle network in Melbourne and in guiding our investment in cycling infrastructure.

The purpose of PBN Priority Routes is to provide access for cyclists to the centre of all CADs, some Principal Activity Centres and Specialised Activity Centres. A PBN Priority Route reaching the limit of a catchment should aim to anchor at a local destination, especially transport interchanges such as train stations.

Responsibility for developing PBN Priority Routes

The development of bicycle facilities on PBN Priority Routes will be a major focus of VicRoads’ Bicycle Facilities Program and will be undertaken in a pro-active manner. As a result, PBN Priority Routes will be eligible for 100% funding through the VicRoads Bicycle Program.

Other opportunities to develop bicycle facilities on PBN Priority Routes will also arise as part of major road and transport projects and programs from other state agencies such as Melbourne Water, VicTrack and Parks Victoria. In this context, bicycle facilities may be provided on PBN Priority Routes as part of these projects, in most cases as a matter of course.

Local Councils may also play a role in developing PBN Priority Routes. These opportunities may occur as a result of local Councils choosing to develop a route because it has a high local priority. Local councils may also be completing development or improvement works in an easement and may take the opportunity to provide a bicycle facility as part of these works.

Design objectives for PBN Priority Routes

PBN Priority Routes have been chosen on the basis that they maximise directness to these destinations and will be developed in order to maximise separation and priority for cyclists, especially at intersections. They will also be developed to provide a continuous level of quality from the activity centre through its catchment.

In particular, the separation that is achieved mid-block on PBN Priority Routes should be maintained up to and through signalised and other intersections with due regard for the needs of other road users.
The design objective of PBN Priority Routes is to maximise separation between cyclists and motor vehicles. This will be achieved by either physical barriers on the road surface or by an off road path in the relevant easement. It is likely that the development of a route to this standard will be achieved through a series of incremental improvements.

All bicycle facilities on PBN Priority Routes must be designed and constructed in accordance with relevant Austroads Guidelines, Australian Standards and VicRoads’ standards including Traffic Engineering Manual Volumes 1 and 2 and Cycle Notes.

Off-road paths on PBN Priority Routes should be at least 3.0 metres wide and must consist of reinforced concrete with saw cut expansion joints (no trowelled joints) or full depth asphalt with concrete edge strips.

PBN Support Routes

PBN Support Routes support the role of the PBN Priority Routes in increasing the numbers of people riding bicycles for transport. PBN Support Routes are considered important routes for increasing the numbers of people riding bicycles for transport, the development of the bicycle network in Melbourne and in guiding our investment in cycling infrastructure.

One of the main purposes of PBN Support Routes is to provide a facility that cyclists can use to access PBN Priority Routes or to access other destinations. A PBN Support Route reaching the limit of a catchment should aim to anchor at a local destination, especially transport interchanges such as train stations or provide access to another adjacent network.

PBN Support Routes are considered to be “opportunistic routes” that may be developed as opportunities arise rather than as part of a pro-active program. This may include situations where major roads are being upgraded and/or redeveloped or where other projects are being implemented. Funding may be found from a number of sources including contributions from metropolitan Councils as well as the VicRoads Bicycle Program.

Responsibility for developing PBN Support Routes

The primary opportunities for developing bicycle facilities on PBN Support Routes will be as part of major road and transport projects and programs from other state agencies such as Melbourne Water, VicTrack and Parks Victoria. In this context, bicycle facilities may be provided on PBN Support Routes as part of these projects, in most cases as a matter of course.

PBN support routes are considered “opportunistic” routes where they can be developed through other transport related projects.
Local Councils may also play a role in developing PBN Support Routes. These opportunities may occur as a result of local Councils choosing to develop a route because it has a high local priority. Local councils may also be completing development or improvement works in an easement and may take the opportunity to provide a bicycle facility as part of these works.

**Design objectives for PBN Support Routes**

PBN Support Routes have been chosen on the basis that they provide access to PBN Priority Routes and other major destinations. They will be developed opportunistically rather than pro-actively in order to provide separation and priority for cyclists, where possible. They will also be developed to provide high quality access between activity centres and their catchments.

In particular, any separation that is achieved mid-block on PBN Support Routes may not be maintained up to and through signalised and other intersections due to the need to maintain capacity or safety for other road users.

The design objective of PBN Support Routes is to provide some separation between cyclists and motor vehicles. This is more likely to be achieved by the provision of wide kerbside lanes, on-road bicycle lanes with a painted edge line or by an off road path in the relevant easement. It is likely that the development of a route to these standards will be achieved as a one-off project rather than through a series of incremental improvements.

All bicycle facilities on PBN Support Routes must be designed and constructed in accordance with relevant Austroads Guidelines, Australian Standards and VicRoads’ standards including Traffic Engineering Manual Volumes 1 and 2 and Cycle Notes.

Off-road paths on PBN Support Routes should be at least 2.5 metres wide and should consist of reinforced concrete with saw cut expansion joints (no towelled joints) or full depth asphalt with concrete edge strips.

**Local Routes**

Local routes provide access to local destinations such as schools, local shopping centres, libraries and sporting facilities within a community or access to PBN Priority Routes and PBN Support Routes. Local routes are identified and developed by local Councils and are not part of the PBN.

All bicycle facilities on local routes should be designed and constructed in accordance with relevant Austroads Guidelines, Australian Standards and VicRoads’ standards including Traffic Engineering Manual Volumes 1 and 2 and Cycle Notes.
For metropolitan Melbourne there are 22 draft maps showing: PBN Priority Routes and PBN Support Routes. The maps are arranged as follows; and can be downloaded from www.vicroads.vic.gov.au

**Municipalities – Inner Urban Areas**

Map 1 - Port Phillip, Melbourne and Yarra
Map 2 - Boroondara and Stonnington
Map 3 - Moreland and Darebin
Map 4 - Brimbank, Moorree Valley and Maribyrnong
Map 5 - Hobsons Bay

**Municipalities – Outer Urban Areas**

Map 6 - Wyndham
Map 7 - Bayside and Glen Eira
Map 8 - Banyule and Manningham
Map 9 - Monash and Whitehorse
Map 10 - Knox and Maroondah
Map 11 - Greater Dandenong and Kingston
Map 12 - Casey (North)
Map 13 - Casey (South)
Map 14 - Frankston
Map 15 - Mornington Peninsula (northern)
Map 16 - Mornington Peninsula (southern)
Map 17 - Melton
Map 18 - Hume
Map 19 - Whittlesea
Map 20 - Nillumbik
Map 21 - Yarra Ranges
Map 22 - Cardinia
Map 3 – Moreland & Darebin
Map 5 – Hobsons Bay
Map 6 – Wyndham
Map 8 – Banyule & Manningham
Map 9 – Monash & Whitehorse
Map 10 – Knox & Maroondah
Map 13 – Casey (southern part)
CARDINIA

Legend

- PBN Priority Route
- PBN Support Routes
- DoT Urban Growth Boundary

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Map 14 – Frankston
Map 16 – Mornington Peninsula (southern part)
Map 17 – Melton
Map 18 – Hume
Legend

- PBN Priority Route
- PBN Support Routes
- DoT Urban Support Routes
- DoT Urban Growth Boundary
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Datum: Map Grid Australia Zone 55

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Map 21 – Yarra Ranges
Legend

- PBN Priority Route
- PBN Support Routes
- DoT Urban Growth Boundary

Melways Map Page Reference

Datum: Map Grid Australia Zone 55

Scale: 1:22,000

Accuracy: ±10m in plan

This map is intended as a planning tool only and is not intended for use as a reference map. It is not to be used by road users as a navigation aid. All data is as at May 2019.
For further information please phone 13 11 71 or visit vicroads.vic.gov.au